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Spectrophotometric study of Interactions 2-[[2-(cyclohexycarbamoyl) benzoyl] amino} propanoic acid (2CMPA) with BSA: Gel exclusion chromatography and molecular modeling study.

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Abstract:

The interaction of between 2-[[2-(cyclohexycarbamoyl) benzoyl] amino} propanoic acid (2CMPA) 2CMPA and protein BSA was studied using the gel exclusion chromatographic technique. Spectrophotometric data reveals that 2CMPA successfully binds with BSA. The effect of pH on binding affinity was also studied. The Scatchard analysis gives association constants (K_f) values that are found to be 0.6056, 0.5809, and 0.5714 at acetate buffer pH 3, 4, and 5 respectively. It was found that 2CMPA binds to the BSA more significantly at pH 3 than at pH 4 and 5 which shows that binding is more significant at acidic and decreases with an increase in pH. A molecular modeling study was also done which gives the efficient energy value for complex -235.41 that confirms the binding of titled 2CMPA with BSA.

Keywords: gel exclusion chromatography, protein-drug binding, Scatchard analysis, association constant, BSA protein, molecular modeling study.

Introduction:

Plasma proteins are the most abundant protein in human blood. It accounts for 60% percent of total protein in the blood. Plasma proteins perform several functions such as oxygen binding, DNA binding, drug transportation, etc. Plasma proteins are mainly of three types these are alpha-1-acid glycoprotein (AGP), human serum albumin (HSA), and lipoproteins. These proteins mainly perform the function of transportation of drugs in which AGP binds mainly basic drugs and HSA binds mainly acidic drugs. HSA is a globular protein that consists of structurally (I, II, and III) sites for drug binding each site also consists of two subdomains (A and B). HSA protein shows similar bonding chemistry with bovine serum albumin (BSA) so BSA was used in place of HSA in this study because of its low cost and easy availability. The full-length precursor of BSA consists of 607 amino acids in length. An N-terminal 18-residue signal peptide is cut off from the precursor protein upon secretion; hence the initial protein contains 589 amino acid residues. An additional 4 amino acids are cleaved to yield the mature BSA protein that contains 583 amino acids.

BSA is the most studied globular protein; the Effect of binding on specific sites of BSA for ciprofloxacin and captopril drugs in the presence of a specific site probe was studied [1]. The binding interaction of gold chloroquine to BSA was analyzed in terms of binding constant, entropy, and enthalpy change [2]. Effect on the binding of

ibuprofen with normal plasma protein and plasma obtained from rheumatoid arthritis patients using ultracentrifugation technique were observed [3]. Protein binding of esmolol with BSA and AGP was studied which gives significant difference in binding with proteins [4]. The binding of propranolol with AGP was studied using the liquid-liquid interface technique [5]. capillary electrophoresis technique was also used for analyzing protein drug binding [6], Mass spectrometry-based tools were successfully used for the measurement of protein-drug binding [7] Study of binding of various 2CMPAs with serum protein using the FT-IR technique also made a valuable contribution to this study. Interactions of human serum albumin with chlorogenic acid and ferulic acid were studied using the FT-IR technique[8]. There are various forces responsible for the binding of drugs with proteins like hydrophobic interaction, hydrogen bonding, van der Waal forces, electrostatic attraction, etc. Interaction between jatrorrhizine and HSA showed that hydrophobic and electrostatic interaction play vital role in there binding [9]. The presence of foreign particles such as arsenic, lead, cadmium etc. affects the binding of drug and plasma proteins. Effect of arsenic on paracetamol binding to bovine serum albumin using site-specific probes showing a decrease in percentage of binding of paracetamol to BSA [10]. Chemical and physical properties of human plasma retinol-binding protein (RBP) and prealbumin (PA) and factors affecting their interaction with each other and with 2CMPA retinol

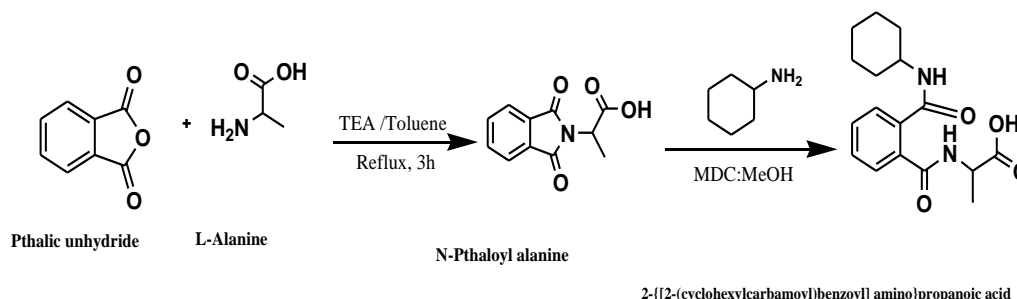
and thyroxine are observed [11]. The presence of arsenic in the complex solution of BSA and atenolol results in the free concentration of arsenic [12]. The effect of varying pH of the mobile phase on the binding of drugs shows the variation in the binding of various drugs. Thermodynamic parameters were used to rationalize the nature of binding of ciprofloxacin hydrochloride to BSA at different pH [13]. A comparative study has been done to study the accuracy and time factor for protein drug binding using various docking software [14]. Molecular docking is used for the measurement of the interaction of formononetin with HSA protein [15].

In this paper, we reported the synthesis of the 2-[[2-(cyclohexylcarbonyl) benzoyl] amino] propanoic acid by a known method and also characterized the compound by IR, ¹H NMR, and Mass spectroscopy. The compound shows antibacterial activity (Pande et al. 2013) [16]. Compounds show acidic nature and affinity for the BSA protein. The binding affinity of this compound with BSA protein was then measured using gel exclusion chromatographic technique also molecular modeling software HEX 8.0 was used which confirms the binding affinity of

said 2CMPA with BSA by giving a competent energy value.

Materials and Methods:

For synthesis, all the chemicals used were of A.R. grade of Merck India Limited made and purchased from commercial suppliers. The purity of the synthesized compound was ascertained by thin layer chromatography on silica gel G in petroleum ether and ethyl acetate (7:3) mixture, Melting point was recorded using digital melting point apparatus Equiptronics (EQ 730). IR spectra were recorded on Bruker alpha IR Spectrometer (Germany) expressed in cm⁻¹ at the Department of Chemistry J.B. College of Science Wardha. ¹H NMR spectra of the compound were recorded in CDCl₃ on an NMR instrument (500MHz) using TMS as an internal standard from SAIF, CDRI Lucknow. For the chromatographic experiment, Sephadex g-25 having water regain 2.5-0.2ml/g (make- sigma chemical Ltd. (Sweden), Bovine Serum Albumin (M_r = 66,500) (make-chemsworth chemical Ltd., India) were used. 0.1M sodium acetate buffer of pH range 3, 4, and 5 were used. U.V. Visible Spectrophotometer Shimadzu Singapore (Model UV 180) was used for the measurement of absorbance value.



Scheme 1: Synthesis of 2-[[2-(cyclohexylcarbonyl) benzoyl] amino] propanoic acid

Measurement of binding affinity:

Sephadex g-25 was used to prepare a chromatographic column using acetate buffer solution. It was allowed to stand overnight to develop the column with continuous flow of buffer solution through the reservoir which keeps the column wet. 50 μ M BSA solution and 0.01M solution of 2-[[2-(cyclohexylcarbonyl) benzoyl] amino] propanoic acid were also prepared using sodium acetate buffer solution were prepared. A 10ml solution of BSA and drug were prepared in various ratios such as 10:0, 9:1, 8:2, 7:3, 6:4, 5:5, and 6:4. Solution was allowed to pass through the column, and eluting buffer was passed continuously which helped to run the sample solution through column. The sample solution was collected from the lower end of the column in an equal fraction and the absorbance of each collected fraction was measured on the U.V. Visible Spectrophotometer. The buffer solution of various pH was prepared and a solution of complex at different pH was made. Absorbance was recorded for the collected fraction and the effect of pH on absorbance value was observed.

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For the *Scatchards analysis* binding affinity between two molecules was expressed as an equilibrium constant and association constant which is derived from the law of mass action. BSA (B) interacts with the 2CMPA to form the complex as shown below.



So the equation for association constant

$$K_f = \frac{[BL]}{[BL] + [B]}$$

The binding strength of the 2CMPA to BSA is a measure of association constant. The fraction of binding of 2CMPA to protein BSA is represented in the term of $[V]$ so the equation for $[V]$ in terms of the binding is

$$V = \frac{[BL]}{[BL] + [B]}$$

Equation for $[V]$ in terms of association constant (K_f) given as

$$V = \frac{K_f[L]}{K_f[L] + 1}$$

Total n available sites on B out of a number of sites occupied by 2CMPA is represented in terms of $[V']$

$$V' = \frac{nK_f[L]}{K_f[L] + 1}$$

Scatchard graph of $[V]$ with $[L]$ give the value for association constant (K_f) while the graph $[V']$ with V'/L is a measure of interacting sites that are available.

Result and Discussion:

Chromatographic observation:

Initially, the absorbance value for BSA in the absence of 2CMPA was recorded at 520nm. Absorbance values for complex solution of BSA and 2CMPA at varying compositions as shown above were also recorded. Spectrophotometric values show that absorbance value continuously increases with an increase in 2CMPA concentration in a complex solution. The graph was plotted for the absorbance

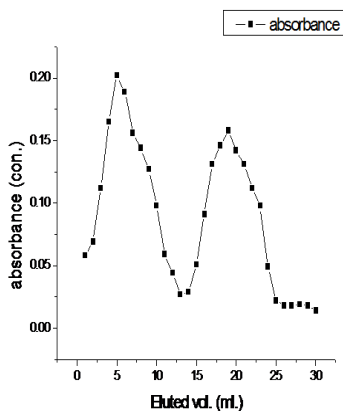


Figure 1. Graph of Absorbance Vs Eluted volume

Effect of pH:

The effect of binding of 2CMPA to BSA was studied at different pH 3,4 and 5. We have prepared the complex BSA and 2CMPA solutions in a sodium acetate buffer of varying pH ranges of 3, 4, and 5. Measurement of absorbance value gives the effect of pH on binding. Association constant (K_f) values were calculated using Scatchard analysis. It was found that binding decreases with an increase in pH value. At pH 3 binding was more significant in comparison with 4 and 5. This shows that 2CMPA binds BSA significantly at a more

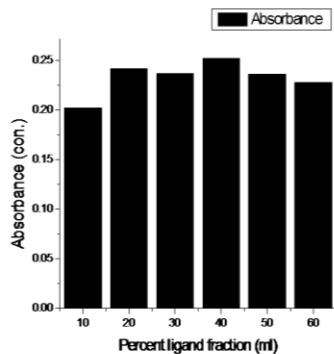


Figure 3 . Graph of Absorbance Vs Percent 2CMPA fraction at pH 3

value for the collected fraction shown in **Fig.1** which gives two peak. The first peak in **Fig.1** shows the maximum binding of the 2CMPA with BSA while the second peak represents the unbound 2CMPA fraction. Absorbance values show a continuous increase in values of absorbance but after a particular point, a gradual increase in absorbance values shows a saturation level of 2CMPA. Chromatographic observations show that the compound 2-[[2-(cyclohexycarbamoyl) benzoyl] amino} propanoic acid binds significantly to BSA. In **Figure 2** graph was plotted between the total site and to bound site, a straight line indicates that there was only one interacting site available to the 2CMPA for binding on BSA.

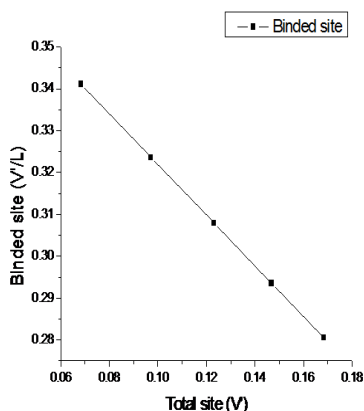


Figure 2. Graph of Total site to Binded site

acidic pH. Association constant (K_f) values at pH 3, 4, and 5 are found to be 0.6062, 0.5821, and 0.5797 respectively. **Figure 3** shows the changes in absorbance value for the BSA-2CMPA complex at different compositions and **Figure 4** shows the Scatchard graph at pH 3. Similarly **Figure 5** and **Figure 6** show changes in absorbance value for protein-2CMPA complex at different compositions and Scatchard graph at pH 4. Similarly **Figure 7** and **Figure 8** show changes in absorbance value for protein-2CMPA complex at different compositions and Scatchard graph at pH 5.

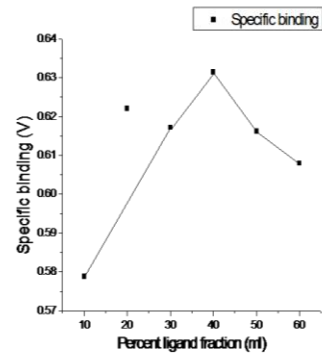


Figure 4. Specific binding Vs Percent 2CMPA fraction at pH 3

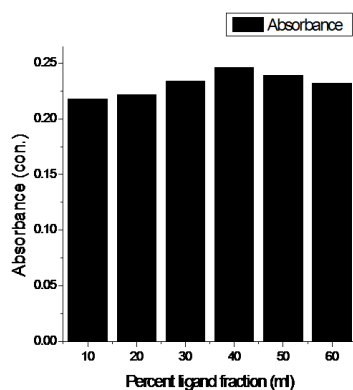


Figure 5. Graph of Absorbance Vs Percent 2CMPA fraction at pH 4

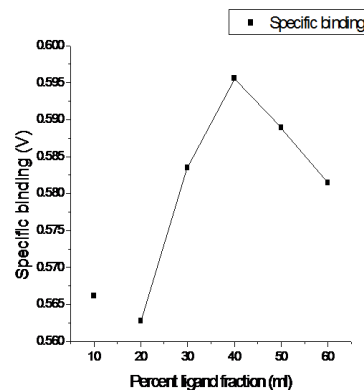


Figure 6. Specific binding Vs Percent 2CMPA fraction at pH 4

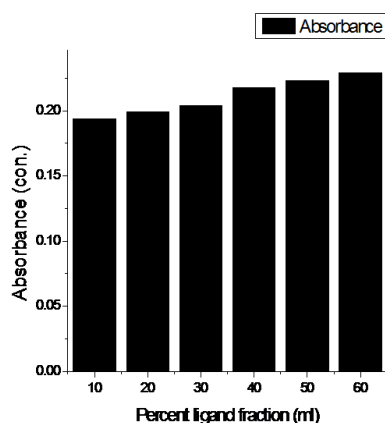


Figure 7. Graph of Absorbance Vs Percent 2CMPA fraction at pH 5

Molecular modeling study for interaction between BSA and said 2CMPA

Serum protein is the most studied and abundant protein in blood plasma, accounting for nearly 60% of total protein consisting of a single polypeptide chain of 589 amino acids. In serum protein, there are mainly three binding sites I, II, and III each of these contains sub-domains (A and B). Molecular modeling is also an efficient method for the measurement of interaction between protein and drug. The energy value obtained from the study is a measure of the binding of drug the drug to the

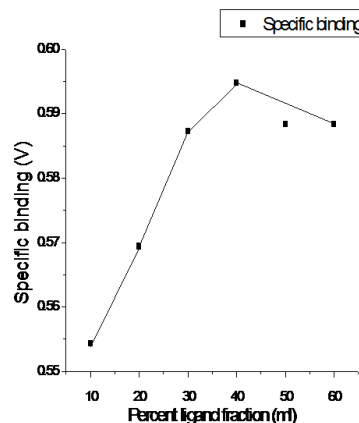


Figure 8. Specific binding Vs Percent 2CMPA fraction at pH 5

Serum protein. For the further study of the binding interaction between BSA and said 2CMPA, a molecular modeling study was done. The crystal structure of BSA was obtained from the RCSB protein data bank and 3D file for 2CMPA developed on Chem Draw Ultra 8.0. Docking was done using the software HEX 8.0. The energy value obtained was -235.41, showing that the mentioned 2CMPA efficiently binds with protein BSA. Diagrammatic representation of interaction for interaction between BSA and said 2CMPA as shown below in **Fig. 9**

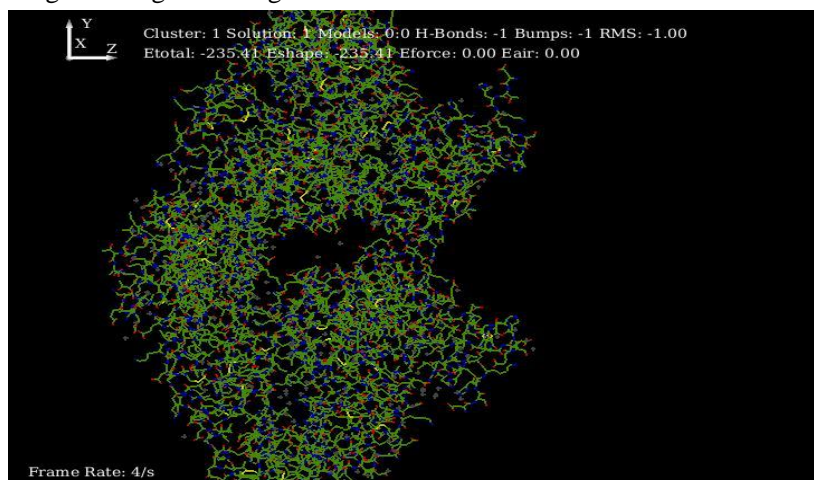


Fig. 9 Interaction between BSA and 2-[(2-(cyclohexycarbamoyl) benzoyl)amino] propanoic acid

Conclusion:

The chiral drug 2-[[2-(cyclohexycarbamoyl) benzoyl] amino] propanoic acid showing antibacterial activity has the efficiency to bind with protein BSA. We have studied the novel interaction of this drug with BSA protein using the gel exclusion chromatographic technique. A study of the interaction of this drug with BSA shows that the drug successfully binds with BSA. A study of binding at various buffers pH 3, 4, and 5 shows that the association constant (Kf) value was found to be more at buffer pH 3 in comparison with pH 4 and 5. The value of association constant (Kf) calculated from Scatchard analysis are found to be 0.6056, 0.5809, and 0.5714 at pH 3,4 and 5 resp. It means that the binding of the drug with protein BSA is more efficient at acidic pH and it goes on decreasing with an increase in pH value. Furthermore, molecular docking shows the efficient energy value -235.41 which shows a confirmative binding approach of the mentioned 2CMPA with protein BSA.

Acknowledgement:

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Ancient Jain Centre of Alagur

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Abstract:

Alaguru on the bank of river Krishna in Bagalkot district was an important Ancient Jain centre of the 13th century AD. There are two important Jain temples in the place one is the ancient Adinath Basadi and the other is the Digambara Basadi of 24 Tirthankaras. The Adinath Basadi in this village has three prominent green colored sculptures like a Adinatha and Padmavati Yakshani.

Keywords: Padmasana, Sabhamantap, Yonipitha, Khadgasana, Sensorium and Panchakalyanostava.

Introduction:

This village is on the bank of the river Krishna and situated 7 km away from Jamakhandi on the state high ways towards Bijapur. It is an ancient Jain centre. This village was under the rule of Shimbhadeva, the king of Yadava's, during 13th century. The two inscriptions are available which proves that Kalmeshwar temple was constructed during his rule¹. The majority population belongs to Jain community and more than 500 families are living in Alaguru. An Adinath Basadi and a 24 Tirthankara digambara Jain mandir are found in this village. The statue of Jain Tirthankar that belongs to 8th and 9th century was found in destroyed form inside the room of the temple. The Adinath Basadi is also abolished which is an ancient Basadi. Today only the foot prints of the Basadi are available. This was reconstructed in 1955 and the same statue of Adinath Tirthankar was enshrined in the new Basadi. The inscriptions were also found on the pedestal of the statue.

Shri 24 Tirthankar Dingambar Jain Mandira:

We found this Basadi on the way of Bijapur road. This was situated on northern opposite. And it had wide yard in its front side. The statue of Parshwanath was established on the northern west side. The inside of this, Sabhamantap was in U shaped and had built with the height of 34 inches. 12 pillars and 2 half pillars are surrounded the Sabhamantap of upper side of sensorium. All 24 Tirthankara's statues were established on Yonipith of upper side of sensorium. These entire statues were made up of marbles and stood in Kadgasana position. A statue of Bahubali was established at center of stage. And beside this statue another two Tirthankara's statue were installed. At the stage of east and west equally 11 Tirthankara's were enshrined on both sides. On the place of east, the statue of

Padmasana and on the last part of west, the statue of Dharanendra statue was established. The Panchakalyanostava was conducted in the presence of Jinasena bhattacharya Gunadara Nandi Maharaja Nandani Sansthan Math, Kolhapur, Teladal, Belaganvi, Aalagoor, On A.D 12.06.1990 and these statues were established.

Aadinath Basadi:

According to inscription which was located on saddle of statue has said that on A.D 1445 January 24 or 31 Sunday the Adinath Tirthankara's statue was installed. Due to dilapidation of ancient Basadi a new Basadi was built in the era of Yadava's (1955) which was located nearer to Kalmeshwara temple².

According to the opinion of village people and Pandita's this Basadi was again renovated by Shri 108 Subhalasagar Maharaja in the era of A.D 1972. It was located on northern opposite side. Sanctum of this Basadi was in a rectangular form and statue was installed on three feet height sensorial saddle. We found four half row of pillars and Bhuvaneshwari which had three floors on roof of this sanctum both sides there were reticulates are located. In the entrance of brow, Jina Bimba was built.

We found four pillars in Sabha Mantapa. There were statues of Yaksha's and Yakshni's were enshrined in nests which were drawn on the walls of the kiosk on both sides. In Sabha Mantapa there were four reticulates were built. And in center roof of Sabha Mantapa there was a Bhuvaneshwari statue which was shown in Padmakruti style. There was a mukamantapa. In front of Sabha Mantapa which was very wide. In this Sabha Mantapa two pillars and two half pillars were built which were made by the wooden. In this Sabha Mantapa two small doors were built on both sides it creates a pradakshana

path in surrounding. The height of peak was 2 foot 4 inches which was built on high sensorium of saddle. Along with this peak the upper floor Basadi also built. This peak stays in outcry genre. This Based did not have any Manastamba.

Aadinath Statue:

Inscription which had written on Aadinath Tirtankara saddle said as follows..... Fragementary was dated on Shalivahan shaka 1366,rakkakshi, magha, krishnapaksha, ravivar (tithi was not given) corresponding to A.D1445, January 24 or 31, Sunday. Seems to state the construction of the statue of Aadinatha on said date.

1. Swashti shree Nrupa shalivahana (N) shaka (13) 66 varsha ratakshi Nama sam.....
2. Aadinathayanamah....³

This statue was located on the high sensorim of yonipeeta which had height of 3 foot and was sat in a position of Padmasana. It has the color of Neminatha Sculpture. This statue has height of 33 inches and shoulder width of 10 inches from its pedestal. This statue has 21 inches of height from its feet. We found the halos behind the statue and the 24 Tirthnkara statues were kept in front of the small saddle and these were made up of brass metal. All the other features of this statue were as smililar to statue of Aadinth Tirthnkara.

Padmavati Yakshani Statue:

A Padmavati statue which was made up of brass was established on left side wall of Sabhamantap of Basadi. It has four shoulders and the weapons in every hand. This statue was sat in the position of Padmasana. On the right side of Sabhamantap we found a Yaksha's statue which also had weapons in its hand.

Aadinath Sculpture statue:

Aadinath statue was enshrined on the pedestal at a height of 3 fetes from the base, sitting in Padmasana. It was similar to the Neminath statue of Teradal that is curved in greenery coloured granite. It has a height of 33" from pedestal to head and 10" wider on the shoulder. This statue has a height of 21" from foot to head. It has round face and three-layered curly hair, smiling face, hald nasal vision, narrow neck, elongated body & focal. The image of Aquarius was found on the pedestal⁴. A also was found on the back of the statue and brass statues of 24 Tirthnkaras were kept on the front of the pedestal.

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A Study of Digital Marketing Opportunities & Challenges in India

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Abstract:

The growth of digital marketing in India is fueled by the rapid expansion of internet access, the proliferation of mobile devices, and the emergence of online commerce. As more consumers turn to online platforms, businesses are adopting digital marketing strategies to reach and engage with a broader audience. Key opportunities in this sector include using search engine optimization (SEO), social media marketing, content marketing, email marketing, pay-per-click advertising, and influencer collaborations. Businesses must navigate several challenges to succeed in India, even though digital marketing offers vast opportunities. The country's diverse market, regulatory environment, and rapid technological changes are some challenges. Digital marketers in India face several challenges.

Keywords: Digital Marketing, Opportunities & Challenges.

Introduction:

Over the past decade, digital marketing in India has grown rapidly, changing how businesses connect with customers. Consumers are going online for their needs with more people using the internet and smartphones. Businesses of all sizes have been forced to use digital marketing to stay competitive and reach more people. How businesses present themselves has changed a lot as India becomes more connected via the internet and mobile devices. The vast and varied population of India presents numerous opportunities and obstacles for online marketers. In India, digital marketing has experienced remarkable growth, driven by the widespread adoption of the internet and smartphones. However, despite the numerous opportunities it presents, businesses face several challenges in effectively leveraging digital marketing strategies. The country's unique cultural, linguistic, and demographic diversity, as well as its evolving regulatory landscape and competitive environment, are some of the challenges.

Objective:

1. To study Digital Marketing in India.
2. To study Digital Marketing Opportunities in India.
3. To study Digital Marketing Challenges in India.

Digital Marketing in India:

In India, digital marketing has undergone significant growth and transformation in recent years, propelled by the widespread adoption of internet connectivity and smartphones across the country. Business has unprecedented opportunities to reach and influence a diverse audience because of this evolution.

1. India has one of the largest and fastest-growing internet user bases in the world. The increasing affordability of smartphones and data bundles has fueled this expansion, making online communities more accessible.
2. The explosion of online shopping sites like Amazon, Flipkart, and regional ones has fueled the need for digital promotion. Businesses use digital channels to improve visibility, drive sales, and improve customer engagement.
3. Digital marketing strategies in India are increasingly dependent on platforms like Facebook, Instagram, Twitter, and YouTube. These platforms provide targeted advertising, brand building, and real-time customer interaction.
4. Continuous innovations in digital technologies, including artificial intelligence-driven analytics, automation tools, and personalized marketing solutions, have revolutionized campaign effectiveness and customer engagement.
5. Maintaining consumer trust and avoiding legal repercussions are dependent on compliance with local regulations.

Digital Marketing Opportunities in India:

India's digital marketing presents immense opportunities due to the country's vast and growing internet user base, increasing smartphone penetration, and the digital transformation of businesses. Key opportunities in this sector are summarized here.

1. Businesses can get more organic traffic by optimizing their websites for search engines. Many people in India search for products and services online. Marketing efforts can be made

more effective by targeting specific regions and cities.

2. Social media platforms like Facebook, Instagram, Twitter, and LinkedIn have millions of active users in India, and they are widely used for social media marketing. These platforms can be used by companies for specialized promotion, client interaction, and brand building. Collaborations with well-known social media personalities can aid brands in reaching a broader and more engaged audience, especially among millennials.
3. High-quality content helps businesses build authority and trust with their audience by creating valuable and relevant content. Writing in multiple languages can help companies connect with India's linguistic variety. Businesses can send personalized messages to customers, nurture leads, and maintain relationships with email marketing. Email marketing is known for its high return on investment, making it a budget-friendly option for businesses. It is also known for its high return on investment.
4. Search engine and social media advertising with quick results. Businesses can choose specific phrases and target groups to reach their ideal customers quickly. Business can adjust their strategies based on real-time data provided by PPC advertising.
5. Businesses can create engaging videos to attract and retain customers with the growing consumption of video content on platforms like YouTube. Real-time interaction with audiences is offered by live streaming on social media platforms.
6. With many internet users in India accessing the web via smartphones, businesses need to prioritize mobile-friendly content. Mobile apps, responsive websites, and SMS marketing can effectively reach mobile users with mobile apps, responsive websites, and SMS marketing. Businesses can send targeted offers and messages to customers based on their location using location-based marketing using GPS technology.

Digital Marketing Challenges in India:

There are plenty of chances for digital marketing in India, but there are also a lot of obstacles. Businesses need to tackle these obstacles if they want to make the most of digital advertising tactics. Some of the key challenges are listed.

1. India is a country with numerous cultures, languages, and regional preferences, which makes it a diverse market. A deep understanding of local customs, languages, and consumer behavior is required for crafting marketing strategies that resonate with such a diverse audience. A nuanced approach to

address local tastes and preferences is required to tailor campaigns to different regions.

2. Adhering to the regulatory landscape related to digital advertising and data privacy is crucial. Businesses must comply with laws such as the Information Technology Act and guidelines from the Advertising Standards Council of India (ASCI) to comply with laws such as the Information Technology Act. New regulations like the Personal Data Protection Bill have made it even more crucial to ensure data privacy and security.
3. The rapid growth of digital marketing has led to a highly competitive environment due to the rapid growth of digital marketing. Businesses need to constantly experiment and stand out to grab and hold customers' attention. Ad fatigue is caused by the constant bombardment of advertisements on various platforms. It is essential to craft engaging and relevant content to stand out in a crowded market.
4. New technologies, tools, and platforms are constantly surfacing in the digital marketing landscape. Keeping up with the latest fads and incorporating them into advertising tactics can be tough. Investment in advanced digital marketing tools and technologies can require significant investment, which may be a barrier for smaller businesses.
5. Calculating the return on investment (ROI) for online marketing campaigns can be challenging. Businesses require cutting-edge software to monitor and evaluate campaign outcomes with precision. The multi-channel nature of digital marketing makes it challenging to determine which marketing efforts are generating leads and purchases.
6. While internet penetration is increasing, there are still areas with limited or unreliable internet access. Reaching these areas requires innovative solutions and offline strategies. Digital technologies are not for everyone. It can be a challenge to educate and engage with less tech-savvy audiences.
7. Consumer trust and engagement are important in a market where online scams and misinformation can undermine credibility. Consistency and creativity are required for creating meaningful and sustained engagement with customers.

Conclusion:

The field of digital marketing in India is thriving and growing rapidly. Numerous opportunities for businesses to expand their reach and engage with customers are presented by the country's increasing digital connectivity and the rise of e-commerce. However, to succeed, businesses must navigate the challenges posed by India's diverse market and competitive landscape. Staying

updated with the latest digital marketing trends will be key to capitalizing on the vast potential of the Indian market. In India, digital marketing presents a dynamic yet challenging landscape. Businesses must deal with the complexities of a diverse marketplace, comply with legal guidelines, and keep up with technological advancements. A deep understanding of the local market and innovative strategies can help businesses achieve their goals in India's competitive environment.

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The Impact of Regulatory Changes on the Insurance Sector: An Indian Perspective

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Abstract:

This study looks at how recent regulatory changes have affected India's insurance market. The study examines the effects of significant reforms on market dynamics, competition, and consumer protection. These reforms include raising the limits on Foreign Direct Investment (FDI), introducing risk-based capital norms, and putting the Insurance Regulatory and Development Authority of India (IRDAI) guidelines into effect. Results indicate that the sector's financial stability, market penetration, and operational efficiency have all improved as a result of these adjustments. Nonetheless, there are still issues with managing the shift for smaller insurers and guaranteeing fair access. The paper offers policy suggestions for maintaining stability and growth.

Keywords: Insurance, IRDAI, Foreign Direct Investment.

Introduction:

A policy of insurance is a legally binding agreement in which one party promises to pay another party a certain amount in the event that the insured party suffers financial loss as a result of an insured's valuables being destroyed or damaged in an accident. Therefore, insurance serves as a means of obtaining security against unforeseen events and disasters in the future.

Components of Insurance:

These determine whether and how insurance will help you. Knowing these elements well therefore makes understanding insurance easier. Their details are as follows.

Insurance premium:

The sum of money you must pay over a predetermined length of time in order to receive insurance coverage. This can be paid all at once, all at once within the policy term, or all at once in a regular pay format. It is possible to pay the regular pay premiums on an annual, half-yearly, quarterly, or monthly schedule. The premium is what ties the deal together and compels the insurer to pay for your losses. Higher coverage is typically available at higher premiums, and vice versa. Still, a few more

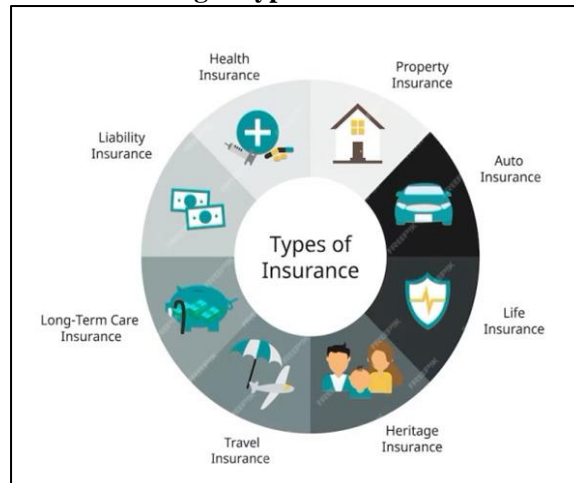
factors are taken into account when determining the premium amount. For instance, factors that affect the premium for life or health insurance include the policyholder's age, gender, health, family history, lifestyle, and type of employment.

Policy limit:

The maximum amount of money or coverage that an insurer will pay for a specific loss is known as the policy limit. This is limited to general and health insurance policies, though. A predetermined amount is guaranteed to be paid out in the event that the policyholder passes away during the policy's term in life insurance.

Deductible:

This is another element that is unique to health or general insurance. Before the insurance company intervenes to settle the claim, this is the maximum amount or percentage that the policyholder must pay out of pocket. In this case, a payout by the insurance company occurs only when the actual loss or expense exceeds the deductible. Therefore, a policy's premium will decrease in proportion to the deductible amount. This occurs because fewer claims are frequently made in response to higher out-of-pocket costs.

Types of Insurance:**Fig.1 Types of Insurance****Benefits of insurance include:**

1. Ensuring certainty
2. Allocating losses
3. Facilitating social security
4. Offering credit
5. Boosting productivity
6. Earning foreign exchange.

Insurance Regulatory & Development Authority (IRDA) Act 1999:

The IRDA is a business organization. In India, a large number of private companies are allowed to conduct insurance business using LPG. An insurance advisory committee with over 25 members that represent the interests of business, industry, transportation, agriculture, etc.,

Objectives of the Authority:

1. To create a body with the power to defend the interests of the insurance policy holders.
2. To oversee, encourage, and guarantee the insurance industry's orderly expansion.
3. To adapt the relevant insurance acts to the needs of the community.

Duties of authority:

1. The insurance industry's orderly expansion
2. Sustaining accurate accounting
3. Make corrections for errors.
4. The yearly report's submission
5. The length of the submission.

Review Of Literature

Jagjit Singh Dhatteval (2022)- The impact of emerging technology on the insurance sector is discussed in this article. These technologies include blockchain, AI, and big data analytics. It demonstrates how these technological advancements are revolutionizing risk assessment, customer support, and operational effectiveness, resulting in more individualized and effective insurance. **Peter Hazell (2020)-** The goal of this article is to improve global food security by analysing optimal practices for agricultural insurance subsidies. The usefulness of various subsidy models, the significance of public-private partnerships, and the requirement for

customized solutions to address particular regional challenges are all covered. **Vajala Ravi (2020)-** This study compares various statistical techniques to model the survival time of life insurance policies in India. It assesses how well different models predict policy lapse rates and pinpoints the variables affecting policyholder behaviour. **G Dutta (2017) -** In this study, a utility function for Indian life insurance consumers is developed. In order to provide insights into Indian consumers' risk aversion and value perception, it seeks to understand their preferences and decision-making processes with regard to life insurance.

Objectives of the Study

1. To evaluate the nature and extent of recent regulatory changes in the Indian insurance sector.
2. To analyse the impact of these regulatory changes on the operational, financial, and strategic aspects of insurance companies in India.
3. To propose policy recommendations for enhancing the effectiveness of regulations in promoting a robust and resilient insurance sector in India.

Data & Methodology:

The secondary data used in this study is entirely sourced from websites, financial platforms, periodicals, and other online sources.

Results & Discussion:

Regulatory Changes on the Insurance Sector: The Insurance Regulatory and Development Authority of India (IRDAI) is the apex institution in India charged with guiding and regulating the country's insurance sector. In order to protect policyholder interests, ensure the industry grows in an orderly manner, and advance fair market practices, it is essential. The IRDAI Act of 1999 allowed for its establishment.

Key Regulatory Changes: The comprehensive revamp initiative encompasses 8 new consolidated

regulations, each addressing specific aspects of the insurance industry. They are as follows:

1. **IRDAI (Rural, Social Sector and Motor Third Party Obligations) Regulations, 2024:** This regulation unifies the current policies pertaining to the social sector, motor third-party liability insurance, and minimum insurance coverage requirements in rural areas. It broadens the range of social sector coverage and simplifies compliance processes.
2. **IRDAI (Bima Sugam - Insurance Electronic Marketplace) Regulations, 2024:** The goal of this innovative law is to democratize access to insurance by establishing "Bima Sugam," a digital public infrastructure platform. In order to promote openness and cooperation throughout the insurance value chain, Bima Sugam will serve as a one-stop shop for all parties involved in the insurance industry.
3. **IRDAI (Registration, Capital Structure, Transfer of Shares and Amalgamation of Insurers) Regulations, 2024:** Procedures for capital structure management, shareholding transfers, insurer registration, and mergers and amalgamations are made simpler by this regulation. Its goal is to make these processes easier to follow so that businesses in the area may thrive.
4. **IRDAI (Corporate Governance for Insurers) Regulations, 2024:** The corporate governance guidelines for insurers are now formally codified in regulation for the first time thanks to this one. With a focus on sensible and effective governance practices, it describes the duties and responsibilities of the board and management. As a result, policyholders eventually gain from increased accountability, transparency, and trust within the insurance industry.
5. **IRDAI (Insurance Products) Regulations, 2024:** This rule unifies the six previous regulations governing insurance products into one cohesive framework. By expediting the approval and product development processes, it enables insurers to react quickly to market demands. The rule also places a strong emphasis on transparent product design and pricing, good governance, and policyholder interests' protection. It also promotes the creation of novel insurance products that address the needs of a wide range of clients, opening up the insurance market to more people.
6. **IRDAI (Registration and Operations of Foreign Reinsurers Branches & Lloyd's India) Regulations, 2024:** This regulation unifies two separate regulations that oversee Lloyd's India and foreign reinsurers' operations. Through the simplification of operational processes and the promotion of transparency, it

seeks to support the orderly growth and development of the Indian reinsurance industry. As a result, policyholders gain from increased risk mitigation for insurers, while domestic insurers gain from having access to a greater variety of reinsurance options.

7. **IRDAI (Actuarial, Finance and Investment Functions of Insurers) Regulations, 2024:** The framework governing the actuarial, finance, and investment functions of insurance companies is unified by this regulation, which replaces nine separate regulations. Assuring the financial stability of insurers and, ultimately, safeguarding policyholders, it places a strong emphasis on sound management practices and thorough risk assessment processes. Furthermore, it facilitates efficient regulatory oversight by streamlining regulatory reporting requirements and fostering transparency.
8. **IRDAI (Protection of Policyholders' Interests and Allied Matters of Insurers) Regulations, 2024:** This rule unifies eight regulations into a single framework aimed at protecting policyholder interests all along the insurance journey. In addition to providing continuous protection when interacting with insurers and distribution channels, it focuses on guaranteeing equitable treatment during policy solicitation and sales.

Impact Analysis:

India's insurance market might undergo a dramatic transformation thanks to the recent regulations that IRDAI brought about, which would be advantageous to many parties. With a renewed emphasis on policyholder interests, uniform procedures, and enhanced grievance procedures, the redesign offers policyholders increased protection. By doing this, they can be guaranteed equitable treatment during their insurance journey. The availability of a greater range of insurance products that satisfy various needs and improve accessibility will also result from expedited product development procedures. To further increase transparency and give policyholders the confidence to make educated decisions, the insurance industry has streamlined regulatory reporting and made clear disclosures. Simplified regulations that lessen administrative burdens and complexity will benefit insurers by increasing efficiency. As a result, policyholders may benefit from possible cost savings.

A favourable business climate is also created by streamlined registration, capital management, and merger/acquisition procedures, which promote innovation and the expansion of the sector. Insurers have more options thanks to the emphasis on improving foreign reinsurance operations, which could reinforce risk management plans. With programs like the "Bima Sugam" platform and an emphasis on responsibilities to the

rural and social sectors, the regulatory changes also hope to increase insurance penetration in underserved markets and propel industry growth overall.

A more diverse insurance ecosystem is cultivated as a result. Additionally, by providing policyholders with a wider choice of insurance options and competitive premiums, encouraging healthy competition can spur industry growth. By improving uniformity and clarity, the principle-based regulatory approach draws capital for sustained expansion. Though there are many advantages to the reforms, some stakeholders may find it difficult to navigate the transition. It may be necessary for insurers to modify their operations to meet new compliance standards. More capacity building and initiatives to improve digital literacy among stakeholders will be needed for the "Bima Sugam" platform to be used effectively.

Foreign Direct Investment (FDI) in Insurance Sector:

As a consequence of the government's persistent loosening of laws governing international capital flows, the insurance business has garnered around Rs 54,000 crore in FDI over the previous nine years, according to Vivek Joshi, the financial services secretary. In an interview with PTI, he said that the government increased the permissible level of foreign direct investment (FDI) from 26% in 2014 to 49% in 2015 and 70% in 2021.

But the allowable FDI cap for insurance intermediaries, he said, was raised to 100% in 2019. Accordingly, between December 2014 and January 2024, insurance companies received FDI totalling Rs 53,900 crore. Up from 53 at the start of the era, Joshi claims that there were 70 insurance players by January 2024. Between 2013 and 2014, insurance penetration was 3.9%; between 2022 and 2023, it jumped to 4%, and between 2013 and 2023, insurance density was up from USD 52 to USD 92. It is common practice to utilize insurance penetration and density as indicators of a country's insurance market development.

Insurance density is based on the ratio of premiums to population (per capita premium), whereas insurance penetration is computed as the percentage of premiums to GDP. While assets under management nearly tripled to Rs 60.04 lakh crore from Rs 21.07 lakh crore at the end of March 2013, total insurance premiums surged by more than 100% to Rs 10.4 lakh crore from Rs 3.94 lakh crore. With the call for registration applications, the insurance industry was made open to private participants in August 2000. Up to 26% of the ownership could be held by foreign businesses.

Since then, a lot of money from other countries has poured into the insurance market. The most recent merger between Zurich Insurance and Kotak General Insurance may have resulted in a

substantial influx of foreign direct investment (FDI) into the insurance sector. Zurich Insurance's offer to acquire a 70% stake in Kotak Mahindra General Insurance, which was disclosed last month, would constitute one of the biggest foreign direct investments (FDI) influxes into the insurance sector. Just last month, Zurich Insurance made public its plans to acquire 70% of Kotak Mahindra General Insurance for a lump sum of Rs 5,560 crore. It was announced in November 2023 that Zurich Insurance will be purchasing 51% of Kotak Mahindra Bank's general insurance segment for Rs 4,051 crore. This transaction involved the purchase of shares and new capital infusion, with a subsequent 19% stake sale to occur over a three-year period. Regulatory approvals from the Insurance Regulatory and Development Authority of India (IRDAI) and the Reserve Bank of India (RBI) are among the customary conditions precedent to be fulfilled before the proposed 70% acquisition can proceed.

Suggestions:

1. Support the growth of insurance technology (InsurTech) by creating a conducive regulatory environment. This includes simplifying regulatory approvals for new technological solutions and promoting sandbox initiatives where new ideas can be tested in a controlled environment.
2. Encourage the development and distribution of microinsurance products to cater to the uninsured and underinsured segments, particularly in rural areas.
3. Mandate transparency in policy terms and conditions, pricing, and claims settlement processes. Insurers should provide clear and concise information to policyholders.
4. Facilitate foreign direct investment (FDI) in the insurance sector to bring in capital, global best practices, and technical expertise. The recent increase in the FDI limit from 49% to 74% is a positive step in this direction.

Conclusion:

The insurance industry in India has seen substantial growth and development as a result of regulatory changes. Market competitiveness has grown as a result of increased transparency, consumer protection laws, and the launch of new products. Operating efficiency and risk management have both improved as a result of stricter compliance requirements. Furthermore, programs like regulatory sandboxes and digital transformation have encouraged innovation. But there are drawbacks to these changes as well, like higher expenses and the requirement for ongoing adaptation. In general, the insurance industry in India has grown stronger and more dynamic as a result of regulatory changes that have balanced market stability, consumer interests, and growth.

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Effect of Specific Yogic Exercise on Selected Physical Fitness Components of College Students

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Abstract:

The purpose of the present study was to find out the effect of specific yogic exercises on selected physical fitness components of college students. For the present study 30 students of Indira Gandhi K Mahavidyalay Ralegaon were selected. The researcher hypothesized that specific yogic exercise may be effective for improving the physical fitness of college students. The players aged between 17-19 years were selected. The data was analyzed statistically on three different tests of Muscular Strength, Muscular Endurance and Flexibility of control group (N=15), and experimental group (N=15) were analyzed by using “t” test and post-test and pre - test means of both groups to find out the difference among the selected physical fitness component. Differences between the groups were assessed by using the Student’s t-test for dependent data. In order to test the hypothesis the level of significance was set at 0.5 level of confidence which was considered adequate and reliable for the purpose of the study.

Keywords: Yoga, Physical Fitness.

Introduction:

In recent years, interest in the benefits of yoga and yogic exercises on physical health and well-being has grown substantially across various populations, including adolescents. Yoga, an ancient practice originating from India, encompasses a variety of techniques aimed at integrating the body, mind, and spirit. Among its many forms, specific yogic exercises are increasingly recognized for their potential to enhance physical fitness components such as strength, flexibility, balance, and endurance. Physical fitness components, comprising muscular strength, endurance, flexibility, body composition, and cardiovascular fitness, are critical determinants of overall health in adolescents. Effective interventions during this period can potentially establish lifelong habits that contribute to better health outcomes. Despite the growing popularity of yoga and its potential benefits, empirical research specifically investigating the effects of yogic exercises on physical fitness components among secondary college students remains relatively limited. Existing studies often focus on adult populations or generalize findings from broader age groups, necessitating targeted research to elucidate the specific impacts on adolescents.

This study aims to fill this gap by examining the effect of specific yogic exercises on selected physical fitness components among secondary college students. By rigorously assessing changes in strength, flexibility, balance, and other

key indicators of physical fitness, this research seeks to contribute to the evidence base supporting the integration of yogic practices into college -based physical education programs. Through a systematic investigation, this study not only aims to provide empirical insights into the potential benefits of yogic exercises but also to inform educational policies and practices aimed at promoting comprehensive health and well-being among secondary college students.

History of Yoga:-

Yoga, originating over 5,000 years ago in ancient India, embodies a rich and diverse history steeped in spiritual, philosophical, and physical traditions. Initially developed as a means of spiritual practice and meditation, yoga evolved through various college s and philosophies, including Vedanta, Tantra, and Jainism. Patanjali's Yoga Sutras compiled around 400 CE, codified classical yoga into an eight-fold path, emphasizing ethical principles, physical postures (asanas), breath control (pranayama), and meditation techniques. Over centuries, yoga's popularity spread globally, adapting to different cultural contexts while retaining its core principles of unity, mindfulness, and holistic well-being. Today, yoga encompasses a wide array of styles and practices, from Hatha and Vinyasa to Kundalini and Iyengar, each offering pathways to physical health, mental clarity, and spiritual growth.

Modern Yoga:-

Modern yoga, which emerged in the late 19th and early 20th centuries, represents a fusion of traditional Indian practices with Western influences and contemporary fitness trends. Pioneered by figures like Swami Vivekananda and T. Krishnamacharya, modern yoga emphasizes physical postures (asanas) and breathing techniques (pranayama) for health and well-being. This period saw the rise of influential teachers such as B.K.S. Iyengar and Pattabhi Jois, who popularized specific styles like Iyengar yoga and Ashtanga yoga. In the latter half of the 20th century, yoga gained widespread popularity in the West, becoming a mainstream wellness practice embraced for its physical benefits, stress relief, and promotion of mindfulness and inner peace. Patanjali's Yoga Sutras outline the stages of yoga practice in the form of an eight-fold path, known as Ashtanga Yoga (not to be confused with the physical yoga style of the same name). These stages, also called limbs or steps, guide practitioners toward spiritual realization and liberation (Samadhi). Here are the stages of yoga according to Patanjali:

Yamas: These are ethical guidelines or moral disciplines that govern one's behavior towards others. They include principles such as non-violence (Ahimsa), truthfulness (Satya), non-stealing (Asteya), continence (Brahmacharya), and non-possessiveness (Aparigraha).

Niyamas: These are personal observances or self-disciplines aimed at cultivating inner harmony and integrity. They include purity (Saucas), contentment (Santosha), austerity (Tapas), self-study (Svadyaya), and devotion to the divine (Ishvara Pranidhana).

Asanas: Asanas refer to the physical postures practiced in yoga. They are designed to promote physical health, flexibility, and stability, preparing the body for meditation and spiritual practices.

Pranayama: Pranayama involves breath control techniques aimed at regulating and enhancing the flow of prana (life force energy) in the body. It includes various breathing exercises that help calm the mind and energize the body.

Pratyahara: Pratyahara is the withdrawal of the senses from external stimuli. It involves redirecting attention inward, away from distractions, and cultivating inner awareness and concentration.

Dharana: Dharana refers to concentration or focused attention. It involves the practice of holding the mind steady on a single point or object, developing mental clarity and discipline.

Dhyana: Dhyana is meditation or sustained contemplation. It is the uninterrupted flow of concentration on the object of meditation, leading to deeper states of awareness and inner stillness.

Samadhi: Samadhi is the ultimate goal of yoga, often described as a state of union with the divine or

the true self. It represents a profound state of consciousness where the practitioner experiences complete absorption, bliss, and liberation. These eight stages are interconnected and progressive, guiding practitioners on a transformative journey towards spiritual realization and self-mastery according to classical yoga philosophy as outlined by Patanjali.

Statements of the Problem:

In today's era many students join the health clubs, centers in order to improve their level of physical fitness. In gym centers students go for weight training to build their muscles but they do not know exact technique pattern of load intensity and volume of exercise. Hence the present Researcher has selected a problem as stated, "Effect of specific yogic exercise on selected physical fitness components of secondary college students".

Purpose of The Study: The main purpose of the study is to find out the effect of specific yogic exercise on selected physical fitness components of secondary college students.

Objectives of the Study:

1. To find out the any effect of specific of specific yogic exercise on physical fitness of secondary college students.
2. To know the physical fitness level of secondary college students.

Significance of the Study:

1. The study was helpful to know the physical fitness of secondary college students.
2. The study was helpful to the coaches, physical education students to adapt this type of specific yogic exercise for the development of physical fitness level.
3. The study was helpful in improving the healthy musculoskeletal functions and mental well-being of the students.
4. The study was helpful the students for selecting various games and sports, which requires strength, endurance, speed etc.
5. The findings of this study were helpful in preparing in yogic exercise programme for the development of physical fitness.

Hypothesis: It was hypothesized that specific yogic exercise may be effective for improving the physical fitness of college students.

Delimitations:

1. The study was delimited to the 30 students of Indira Gandhi K Mahavidyalay Ralegaon
2. The age of students varied from 17-19 years.
3. The study was delimited to physical fitness variables i.e., Strength, Endurance, Flexibility only.
4. The study was delimited to six (6) weeks training program only.
5. The study was delimited to male students only.

Limitations:

1. The physical activity, coaching, and other training background of the subjects would not be considered.
2. In this study caste, religion of the students would not be considered. Economic and social status of the subjects would not be considered.
3. There was no control over diet and daily routine work of the students.

Definition of Related Terms:**Yoga:**

Yoga is a science. it is applied psychology, not only is it the means to achieve the purpose of life, but it enables one to do anything one wants, even in this world, with great energy and with great energy and with great benefits to other people. Yoga is a great philosophy, an art, a science and a way of life, aimed developing a perfect balance between the body and mind and between the individual self on the cosmos.

Physical Fitness:

Strength: "It is the ability of the muscle to get overcome resistance or to get against resistance". "Strength is not only the product of the muscles but also of the nervous system which controls and regulates the muscle contraction".

Endurance: "It is the ability of a muscle to continue a physical performance over a period of time".

Flexibility: "It is the ability to extend, moves, or rotate body parts in a full range of motion".

"Flexibility can be defined as the ability to perform movement with greater range of motion or large amplitude. It's controlled partly by the energy liberation processes of the body and partly by the, coordinative processes of control nervous system"20 "Flexibility can be defined as the ability of a joint to execute movements with greater amplitude or range".

Sources of Data: The sources of the data for the present study were selected from the Indira Gandhi K Mahavidyalay.

Sampling Method: The study consisted of 30 subjects of various age groups ranging from 13 to 15 which were selected randomly from Indira Gandhi K Mahavidyalay. The Simple Random Sampling method was used.

Selection of Subjects: For the present study the research scholar has selected 30 male subjects randomly from the Indira Gandhi K Mahavidyalay under the age group of 17-19 years.

Criterion Measures: For the present study the researcher wanted to measure the selected physical fitness components of the subjects with the help following tests:

- 1) Muscular Strength.
- 2) Muscular Endurance.
- 3) Flexibility.

Formation of Groups:

Researcher divided 30 subjects into two homogeneous groups. I.e. 15 in Group A, as Experimental Group and 15 in Group B, as Control Group.

Administration of Test:

After the selection of the subjects from Indira Gandhi k Mahavidyalay the researcher will administer the test to measure the physical fitness components before and after the yogic exercise of six weeks. All the physical fitness components will be tested and measured through standard procedure with the help of expert and under the direct supervision of the experimenter.

I) Pull-ups:-

Purpose: - To measure the Arm Strength.

Equipment: - Horizontal Bar.

Procedure:-

A bar is located according to the height of the subjects, so that the feet's of the tallest subjects do not touch the ground while hanging on the bar. The subject is asked to hang from the bar by his hands with forward grip and to chin-up by pulling himself up until his chin-up above the bar. Then he has to lower until his arms are straight and is asked not to use kick or Jerkey motion. If he does not straighten his arms completely when lowering his body or if he kicks, jerk or keep (keeping one's chin on the bar) in performing the movement. Then half counts are recorded. Only 4 half counts are permitted.

Scoring: - Each subject is asked to do 10 pull-ups. 1 point is awarded for one correct pull-up.

II) Push-up Test:-

Purpose: - To Measure the Muscular Endurance.

Equipments: - Parallel bar.

Procedure:-

The Test is performed on regular parallel bars. The bars are adjusted at nearly the shoulder height and shoulder width. By standing at the end of the parallel bars, grasping on bar in each hand, the boy subject is asked to jump up wards so as to make his arms straight and one score is given for taking position on the parallel bars as described above. He is then told to lower his body until the angle of upper and forearms, is less than a right angle and asked to push-up to straight arms. He is encouraged to repeat as many push-ups as possible without jerk, kick, stop or rest when executing push-ups. During the first dip for each subject, the tester has to gauge carefully the proper elbow angle. He should then hold his first at a height so that the subjects shoulder just touches the first of the tester on repeated push-ups. In case, the subject does not go down to the proper bent arm angle or the subject does not go completely up to the straight arm position, half counts are given up to a maximum of four half counts.

Scoring:-Each subject is asked to do 10 push-ups. 1 point is awarded for one correct push –ups.

III) Bridge up test:- To measure the flexibility of spine and it's hyper- extension. It is able to both sexes from age six years and above.

Purpose: - To measure the flexibility.

Equipments:- A mat, A tap or an anthropometer.

Procedure:-

The subject is asked to assume the supine position on the mat (i.e. lying on back). Now he is instructed to place palms of his/ her hands on the mat near head so that the thumbs are near the ears; to place soles flat on the mat by folding the legs. The subject is required to push his/ her head and shoulders from the floor so as to lift the body to attain the bridge arch position by moving the hands and feet towards each other. The tester puts the zero end of the yard stick of the flex measure on the mat and slides the flex measure case up wards rapidly till the ruler guide touches the highest. The reading is recorded in the flex measure case window in inches accurate up to one-tenth of an inch or in the anthropometric eye in cm.

Scoring:-

The maximum score out of three trials given to the subject is subtracted from the standing navel height of the subject. For measuring standing

6 Week Training schedule for yoga exercise group

Weeks	Yoga asanas.	Time.	Duration.	Place.
VI Weeks	Utkattasana, Chakarsana, Paschimotanasana, Sarbangasana, Suptavajrasana, Dhanurasana and Purnasalvasana	6:30 am to 7:15 am	45 minutes	Indira gandhi k mahavidyalay

Note:-After every asana savasan was taken for relaxation.

Post-Training Test:- After six weeks of training program, the post test was taken on both the groups.

Analysis and Interpretation of Data: In this chapter the data gathered from pre-test and post- test of control group and experimental group are presented in tables, graphs, figures and findings are also presented in this chapter. The purpose of the study was to find out the effect of six week (42days) Specific Yogic Exercise on Selected Physical Fitness on College Students. The data collected qualitatively on three different tests of Muscular Strength, Muscular Endurance and Flexibility of control group (N=15), and experimental group (N=15) were analyzed by using "t" test and post test and pre -test means of both groups to find out the difference among the selected physical fitness

Table No:-1 Muscular Strength between Pre and Post-Test of Control Group of age group of 17-19 years

Control Group	Mean	S.D	Comb. S.E	M.D	D.F	C.T	T.T
Pre Test	4	0.72	0.25	0.14	28	0.56	2.048
Post Test	3.86	0.71					

Level of Significance = 0.05, Tabulated 't' 0.05 (28) = 2.048

Table No. 1 reveals that there is no significant difference between means of pre and post tests of

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navel height, the subject is asked to stand erect with heels together, toes apart, in alert position stretching the body upwards, preferably against a wall. The anthropometry rod is placed in front of the subject in between his/ her feet and the cross bar of the anthropometry rod is brought to the level of the navel of t\he subject to record his / her navel height. For example, suppose, the navel height of the subject is 45.7 inch and the Bridge up test height (best of three trials) is 25.3 inch, the subject's test score will be 45.7 inch-25.3inch=20.4inch. The smaller the test score the better is the flexibility of the subject.

Collection of Data:-

The data pertaining to this study was collected by administrating the test items on the selected subjects in the premises of Dr. Nandurkar Vidyalaya, Yavatmal.

Pre-Training Test:-

It was conducted on both the groups i.e. "Experimental and Control group" before starting the training programmed.

Training Program:-

Training programmed was of 6 weeks. In each week 6 days training were given to the experimental group only under the supervision of researcher and Sunday was given total rest.

component i.e. Muscular Strength, Muscular Endurance and Flexibility of students of Indira Gandhi K Mahavidyalay Ralegaon

Level of Significance: The level of significance to test the hypothesis was set at 0.05 level of confidence which was considered adequate and reliable for the purpose of the study.

Findings:- The data collected on 30 subjects before and after six week training program on Muscular Strength, Muscular Endurance and Flexibility was analyzed by comparing the means of pre and post tests of control group and experimental group and was also statically analyzed by applying the "t" test to check the difference among selected variables. Therefore separate tables and graphs have been drawn for each item as follows.

control group, because mean of pre test is 4 which is slightly higher than mean of post test is 3.86 and there mean difference is 0.14. To check significant difference between pre and post test of control

group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where $S.D_1 = 0.72$ and after post test $S.D_2 = 0.71$ and their combined standard error = 0.25. Therefore after applying 't' test it was found that there was no significant difference between pre and post tests of control

group because value of calculated 't' = 0.56 which is less than tabulated 't' = 2.048 at 0.05 level of confidence, which shows that there is no improvement in control group before and after test because no training was given to the subjects of control group.

Table No:-2 Muscular Strength between pre and post-Test of Experimental group of age group of 17-19 years

Control Group	Mean	S.D	Comb. S.E	M.D	D.F	C.T	T.T
Pre Test	3.06	0.57	0.22	0.87	28	3.95	2.048
Post Test	3.93	0.67					

Level of Significance = 0.05, Tabulated 't' 0.05 (28) = 2.048

Table No.1 reveals that there is a significant difference between means of pre and post tests of experimental group, because mean of pre test is 3.06 is lower than mean of post test 3.93 and there mean difference is 0.87. To check significant difference between pre and post test of experimental group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated

between pre test where $S.D_1 = 0.57$ and after post test $S.D_2 = 0.67$ and their combined standard error is = 0.22. Therefore after applying 't' test it was found that there was a significant difference between pre and post tests of experimental group because value of calculated 't' = 3.95 which is higher than tabulated 't' = 2.048 at 0.05 level of confidence, which shows that there is significant effect on experimental group after six weeks Yogic Exercises.

Graph-1 Graphical Representation of Mean Differences between Pre Tests and Post Tests of Control and Experimental group for Muscular Strength

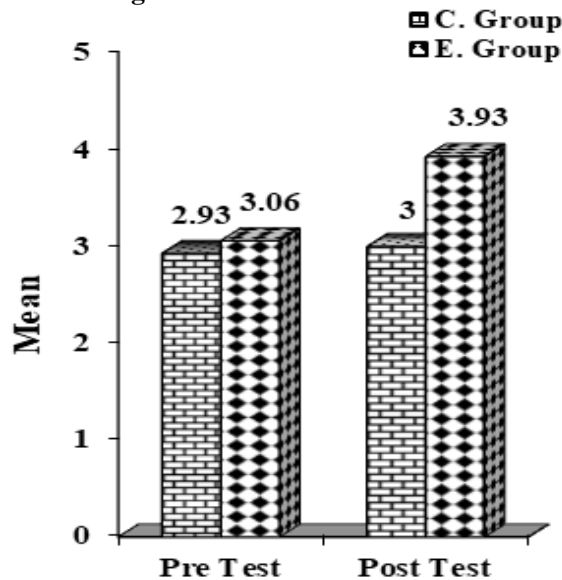


Table No:-3 Muscular Endurance between Pre and Post-Test of Control Group of age group 17-19 years

Control Group	Mean	S.D	Comb. S.D	M.D	D.F	C.T	T.T
Pre. Test	4.13	0.51	0.22	0.13	28	0.59	2.048
Post Test	4	0.72					

Level of Significance = 0.05, Tabulated 't' 0.05 (28) = 2.048

Table No. 3 reveals that there is no significant difference between means of pre and post tests of control group, because mean of pre test is 4.13 is slightly higher than mean of post test is 4 and there mean difference is 0.13. To check significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was

calculated between pre test where $S.D_1 = 0.51$ and after post test $S.D_2 = 0.72$ and their combined standard error = 0.22. therefore after applying 't' test it was found that was no significant difference between pre and post tests of control group because value of calculated 't' = 0.59 which is less than tabulated 't' = 2.048 at 0.05 level of confidence, which shows that there is no improvement in control group before and after test because no training was given to the subjects of control group.

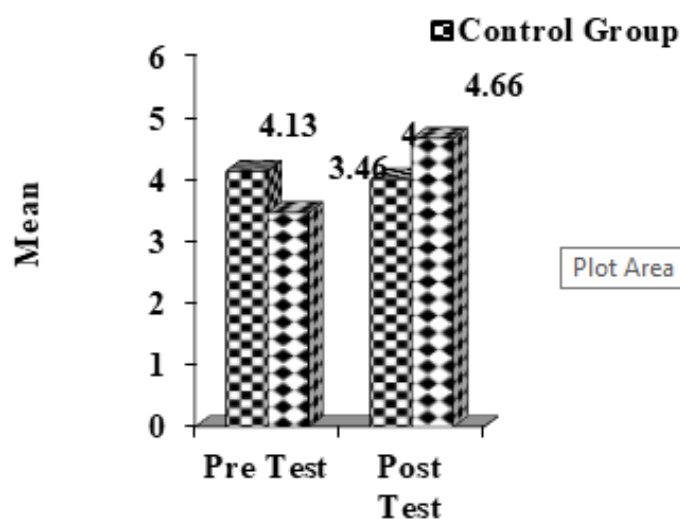
Table No:-4 Muscular Endurance between Pre and Post-Test of Experimental Group of age group 17-19 years

Experimental Group	Mean	S.D	Comb. S.D	M.D.	D.F.	C.T.	T.T.
Pre. Test	3.46	1.08	0.31	1.2	28	3.78	2.048
Post Test	4.66	0.59					

Level of Significance = 0.05, Tabulated 't' 0.05 (28) = 2.048

Table No.4 reveals that there is a significant difference between means of pre and post tests of experimental group, because mean of pre test is 3.46 is lower than mean of post test 4.66 and there mean difference is 1.2. To check significant difference between pre and post test of experimental group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated

between pre test where $S.D_1 = 1.08$ and after post test $S.D_2 = 0.59$ and their combined standard error is = 0.31. Therefore after applying 't' test it was found that there was a significant difference between pre and post tests of experimental group because value of calculated 't' = 3.78 which is higher than tabulated 't' = 2.048 at 0.05 level of confidence, which shows that there is significant effect on experimental group after six weeks yogic exercises.

Graph-2 Graphical Representation of Mean Differences between Pre Tests and Post Tests of Control and Experimental Group for Muscular Endurance**Table No:-5 Flexibility between Pre and Post-Test of Control Group of age group of 17-19 years**

Control Group	Mean	S.D	Comb. S.E	M.D	D.F	C.T	T.T
Pre Test	6	0.81	0.26	0.2	28	0.76	2.048
Post Test	5.8	0.72					

Level of Significance = 0.05, Tabulated 't' 0.05 (28) = 2.048

Table No. 1 reveals that there is no significant difference between means of pre and post tests of control group, because mean of pre test is 6 which is slightly higher than mean of post test is 5.8 and there mean difference is 0.2. To check significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where $S.D_1 = 0.81$ and

after post test $S.D_2 = 0.72$ and their combined standard error = 0.26. Therefore after applying 't' test it was found that there was no significant difference between pre and post tests of control group because value of calculated 't' = 0.76 which is less than tabulated 't' = 2.048 at 0.05 level of confidence, which shows that there is no improvement in control group before and after test because no training was given to the subjects of control group.

Table No:-6 Flexibility between Pre and Post-Test of Experimental group of age group of 17-19 years

Experimental Group	Mean	S.D	Comb. S.E	M.D	D.F	C.T	T.T
Pre Test	7.6	0.94	0.26	1	28	3.84	2.048
Post Test	8.6	0.46					

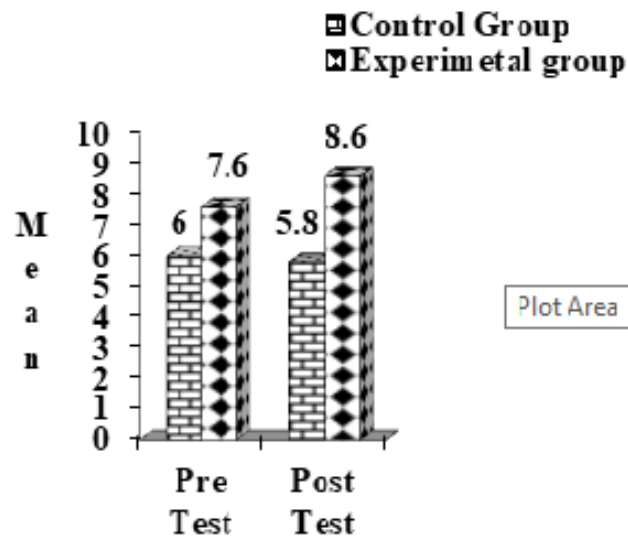
Level of Significance = 0.05, Tabulated 't' 0.05 (28) = 2.048

Table No.1 reveals that there is a significant difference between means of pre and post tests of experimental group, because mean of pre test is 7.6 is lower than mean of post test 8.6 and there mean

difference is 1. To check significant difference between pre and post test of experimental group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where $S.D_1 = 0.94$ and after post test $S.D_2 = 0.46$ and their combined standard error

is = 0.26. Therefore after applying 't' test it was found that there was a significant difference between pre and post tests of experimental group because value of calculated 't' = 3.84 which is

Graph-3 Graphical Representation of Mean Differences between Pre Tests and Post Tests of control and Experimental group for Flexibility



Findings of the Research: It has been observed from the analysis of data that there was significant difference between all the three items after the administration of training programme.

Muscular Strength: - The results showed that there was good improvement after the training was given to the experimental group and good improvement was shown within and among the experimental group.

Muscular Endurance:-The result showed that there was good improvement in Muscular Endurance of experimental group.

Flexibility:-The result showed that there was also good improvement in Flexibility of experimental group.

Justification of Hypothesis:- It was hypothesized that there would be significant effect of Specific Yogic Exercise on selected Physical Fitness Components on Secondary College Students. And the effect of Specific Yogic Exercises showed the significant effect on Muscular Strength, Muscular Endurance and Flexibility.

Conclusion:-

After 6-weeks training the results were statistically analyzed and the following conclusion was drawn. The study revealed that Specific Yogic Exercises have a considerable effect on Selected Physical Fitness Components. However, there was a significant effect on Muscular Strength, Muscular Endurance and Flexibility of Secondary College Students after 6-weeks Specific Yogic Exercises Training program.

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Understanding Gender and Age Wise Customer Perception towards Cadbury Dairy Milk Chocolate

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Introduction:-

A delicious topic! Cadbury Dairy Milk is a beloved chocolate brand that originated in the UK in 1905. Here's an overview:

Key Features:

- 1. Milk Chocolate:** Cadbury Dairy Milk is known for its creamy, smooth milk chocolate taste.
- 2. High Milk Content:** It contains a higher percentage of milk than other chocolate brands, giving it a distinctive flavor.
- 3. Iconic Purple Packaging:** The brand's recognizable purple wrapper has remained largely unchanged since its introduction.
- 4. Wide Range of Flavors:** Over the years, Cadbury has introduced various flavor extensions, such as Fruit & Nut, Caramel, and Mint.
- 5. Global Popularity:** Cadbury Dairy Milk is enjoyed in over 40 countries, making it a global chocolate phenomenon.

History:

- 1. Founded by George Cadbury:** The Company was founded by George Cadbury in 1824 in Birmingham, England.
- 2. Introduced in 1905:** Cadbury Dairy Milk was launched as a more affordable, mass-market alternative to other chocolates.
- 3. Innovative Marketing:** Cadbury was a pioneer in chocolate marketing, introducing memorable advertising campaigns and sponsorships.

Fun Facts:

- 1. Cadbury Dairy Milk is the UK's favorite chocolate bar.**
- 2. Over 1 billion bars are sold worldwide each year.**
- 3. The brand has a strong commitment to sustainability and fair trade practices.**

Customer Perception:

Here are some key points about customer perception towards chocolate:

- 1. Taste:** Rich, smooth, and creamy texture are highly valued.
- 2. Quality:** High-quality ingredients and manufacturing processes are expected.
- 3. Brand reputation:** Trust and loyalty towards well-known brands like Cadbury.
- 4. Emotional connection:** Chocolate is often linked to emotions, memories, and celebrations.
- 5. Health concerns:** Growing awareness of sugar, calorie, and allergen content.
- 6. Variety:** Desire for unique and exciting flavors, textures, and packaging.

7. Convenience: Easy access and portability are important.

8. Price: Balance between affordability and perceived value.

9. Sustainability: Increasing concern for eco-friendly and fair-trade practices.

10. Nostalgia: Sentimental attachment to childhood favorites and traditional brands.

11. Novelty: Interest in new and innovative products, like vegan or low-sugar options.

12. Seasonality: Association with holidays, gift-giving, and special occasions.

These perceptions can vary across cultures, age groups, and individuals, influencing purchasing decisions and brand preferences.

Chocolate Consumption: Here are some interesting facts about chocolate consumption:

1. Global consumption: 3 million tons of chocolate are consumed worldwide each year.

2. Per capita consumption: Switzerland leads with 8.8 kg (19 lbs) per person per year, followed by Austria, Belgium, and Germany.

3. Chocolate-eating habits: 52% of Americans eat chocolate at least once a week, while 15% eat it daily.

4. Most popular types: Milk chocolate (51%), dark chocolate (35%), and white chocolate (14%).

5. Occasions: Chocolate is commonly consumed during holidays (62%), as a snack (55%), or as a dessert (46%).

6. Emotional triggers: 40% of women and 25% of men eat chocolate to improve their mood.

7. Health benefits: Dark chocolate's antioxidants and flavonoids are recognized for their potential health benefits.

8. Regional preferences: Europeans prefer darker chocolate, while Americans prefer milder flavors.

9. Age and chocolate: Children (55%) and young adults (53%) are the largest consumers.

10. Chocolate trends: Growing demand for premium, organic, fair-trade, and vegan chocolate options.

Keep in mind that these statistics might vary depending on the source and location.

Literature Review:

1. Emotional Connection: Chocolate is often linked to emotions, memories, and experiences, influencing consumer preferences and loyalty (Kotler, 2009).

2. Sensory Experience: The taste, smell, and texture of chocolate play a crucial role in consumer perception and satisfaction (Liu, 2013).

3. Brand Identity: Chocolate brands are often associated with nostalgia, heritage, and tradition,

shaping consumer perceptions and expectations (Aaker, 1996).

4. Health and Wellness: Consumers increasingly consider health and wellness when choosing chocolate products, driving demand for dark, low-sugar, and functional options (Euromonitor, 2020).

5. Mood and Stress Relief: Chocolate is commonly consumed as a mood booster and stress reliever, particularly among women (Parker, 2006).

6. Indulgence and Pleasure: Chocolate is often associated with indulgence, pleasure, and reward, driving consumption as a treat or comfort food (Wansink, 2004).

7. Social and Cultural Significance: Chocolate plays a significant role in social and cultural contexts, such as gift-giving, celebrations, and traditions (Mintz, 1985).

8. Demographic and Psychographic Factors: Chocolate consumption varies across demographics (age, gender, income) and psychographics (personality, lifestyle, values) (Bell, 2013).

These studies highlight the complex and multifaceted nature of customer perception and chocolate consumption.

Data Analysis and Interpretation:-

Gender profile:-

Particulars	No of respondents	Percentage %
Male	126	81.8%
Female	27	17.5%
Total	154	100

Interpretation:

From the above table shows the 81.8% male respondents and 17.5% are female respondents and we can see that females are most interested in chocolates.

Age Profile:-

Percentage analysis, If used to analyze the age of respondents and it has been interpreted in table which displays. The frequency and percentage of age of respondents.

Particulars	No Of Respondents	Percentage%
16-20	43	28%
20-25	51	33%
26-30	26	17%
31-35	19	12%
35 above	15	10%
Total	154	100

Interpretation:

28% of respondents are between the ages under 16-20, 33% of respondents are between the ages 20-25, 17% of respondents are between the ages under 25-30

Findings:-

73% of the respondents are of female category.

33% of the respondents are fall under the age between 20-25 years.

Thus, it has been concluded that usage rate of chocolate among the select individual has been high and their buying behavior is also very frequent.

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Use of AI tools in academic libraries

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Abstract:

This research paper explores the multifaceted integration of Artificial Intelligence (AI) tools in academic libraries and their transformative impact on library services and operations. The rapid advancement of AI technologies offers unprecedented opportunities for enhancing information retrieval, knowledge management, and user engagement in the academic library setting. This paper critically examines the current state of AI implementation in academic libraries, delving into specific applications, challenges, and the potential for future developments. The aim is to provide librarians, researchers, and policymakers with insights into how AI tools can be effectively leveraged to optimize library functions and support the evolving needs of the academic community.

Keywords: AI tools, academic, libraries

Introduction

Academic libraries play a crucial role in supporting the learning, teaching, and research activities of educational institutions. With the rapid advancement of technology, including the rise of Artificial Intelligence (AI), academic libraries are embracing innovative tools to enhance their services, streamline operations, and provide more efficient and personalized experiences for their users. This integration of AI tools in academic libraries marks a transformative shift in how information is managed, accessed, and utilized within the academic community.

In recent years, the landscape of academic libraries has undergone a profound transformation, driven by advancements in technology. One of the most significant technological innovations influencing the field is Artificial Intelligence (AI). AI tools have emerged as powerful allies for academic librarians, revolutionizing traditional library services and enhancing the overall user experience. The integration of AI in academic libraries brings about a paradigm shift, enabling these institutions to meet the evolving needs of students, faculty, and researchers in a rapidly changing information ecosystem.

The application of AI in academic libraries spans various areas, including information retrieval, resource management, user assistance, and data analysis. These tools leverage machine learning algorithms, natural language processing, and other AI techniques to automate routine tasks, optimize library operations, and provide personalized services. This integration not only streamlines library workflows but also empowers users to access, evaluate, and utilize information more efficiently.

This paper explores the multifaceted roles of AI tools in academic libraries, examining how they contribute to the advancement of key library functions. From enhancing search capabilities and collection development to supporting user engagement and decision-making, AI technologies offer a wealth of opportunities for academic librarians to redefine their roles in the digital age. As libraries continue to evolve as dynamic hubs of knowledge, the effective deployment of AI tools becomes crucial for staying at the forefront of information services and meeting the diverse needs of a technologically adept user community.

This exploration delves into specific AI applications within academic libraries, such as chatbots for user assistance, recommendation systems for personalized content discovery, and analytics tools for data-driven decision-making. Additionally, it considers the ethical implications and challenges associated with the adoption of AI in library settings, emphasizing the importance of responsible AI practices to ensure equitable access and protect user privacy.

The literature review begins by examining early research on AI in libraries, including studies on expert systems and their impact on information access. It then explores the use of AI-based library systems for software reuse, digital video libraries, and multilingual access to library resources. The review also covers AI applications in digital library search engines, academic law libraries, and library service management using RFID and wireless technologies. Furthermore, this article discusses the implications of AI on the future of libraries and the potential challenges and opportunities it presents. This impacts library services, employment, and the need for regulations and ethical considerations.

The review also highlights the role of libraries in adopting AI technologies and providing lifelong learning opportunities to their communities. By presenting a comprehensive summary of the literature on AI in libraries, this article serves as a valuable resource for researchers interested in exploring the potential of AI in enhancing library operations. The insights gained from these studies contribute to the growing body of knowledge on AI in libraries and provide a basis for further research and implementation of AI technologies in the library sector.

Artificial Intelligence:

Artificial intelligence (AI), the ability of a digital computer or computer-controlled robot to perform tasks typically associated with intelligent beings. The term is often applied to the project of developing systems endowed with intellectual processes typical of humans, such as the ability to reason, find meaning, generalize, or learn from past experience. Since the development of digital computers in the 1940s, it has been demonstrated that computers can be programmed to perform very complex tasks – such as finding proofs for mathematical theorems or playing chess – with great efficiency. Yet, despite continued advances in computer processing speed and memory capacity, there are as yet no programs that can match full human flexibility over wide domains or in tasks requiring everyday knowledge. On the other hand, some programs have achieved the performance levels of human experts and professionals in performing certain specific tasks, so that artificial intelligence in this limited sense is found in applications as diverse as medical diagnosis, computer search engines, voice or handwriting recognition.

The basic technique in IR involves identification of key features in the object. For example, natural language processing and automatic indexing are used to isolate meaningful words. In general, image recognition uses texture, color or shape-based indexing and segmentation techniques. They identify meaningful details in their streams for applications such as audio, video, speech recognition, and scene segmentation. A variety of techniques are used to perform semantic analysis on multimedia objects or text. Machine learning, graph-based clustering and classification, statistical-based multivariate analysis, artificial neural networks, and evolution-based programming are popular techniques. These technologies are good choices for summarizing, analyzing, and processing large amounts of multimedia messages, which are diverse and rapidly changing. The results of the semantic analysis process are expressed as semantic networks, decisions, rules, or predicate logic. Activation-based, propagation-based reasoning methods are commonly used to negotiate various

structures of large-scale knowledge. Search engines for text, images, and video all raise user expectations for presenting and manipulating information. Recent advances in language and platform development, for example VRML, Java, OpenGL, and the provision of affordable high-quality graphics workstations, have also brought an information perspective into the field of research.

Components and concepts of AI:

Artificial Intelligence (AI) encompasses a broad range of components and concepts. Here are some key components and concepts of AI:

Machine Learning (ML): ML is a subset of AI that focuses on developing algorithms and statistical models that enable computers to improve their performance on a task over time as they are exposed to more data. It includes supervised learning, unsupervised learning, and reinforcement learning.

Neural Networks: Neural networks are computational models inspired by the human brain. They consist of interconnected nodes (neurons) that process information. Deep learning, a subset of ML, often involves neural networks with many layers (deep neural networks).

Natural Language Processing (NLP): NLP involves the interaction between computers and human language. It includes tasks such as speech recognition, language translation, sentiment analysis, and chatbot development.

Computer Vision: This field focuses on enabling computers to interpret and understand visual information from the world, similar to how humans do. Applications include image recognition, object detection, and facial recognition.

Expert Systems: These are computer systems designed to emulate the decision-making ability of a human expert in a specific domain. They use rule-based systems to draw inferences and make decisions.

Robotics: AI is integrated into robotics to enable machines to perceive, learn, and make decisions in real-world environments. Robotic systems can use AI for tasks such as object manipulation, navigation, and learning from their surroundings.

Reinforcement Learning: This is a type of machine learning where an agent learns by interacting with its environment and receiving feedback in the form of rewards or penalties. The agent aims to maximize cumulative rewards over time.

Data Mining: Data mining involves the extraction of patterns and knowledge from large datasets. AI techniques, including machine learning, are often employed in data mining to discover hidden insights and make predictions.

Cognitive Computing: This refers to systems that aim to simulate human thought processes. Cognitive computing systems use various AI technologies to understand, learn, and make decisions.

Ethics in AI: Considering the impact of AI on society, ethics is a crucial component. This involves addressing issues such as bias in algorithms, transparency, accountability, and ensuring that AI technologies are developed and used responsibly.

Explainable AI (XAI): As AI systems become more complex, there is a growing need for understanding how they reach decisions. XAI aims to make AI systems transparent and explainable, especially in critical applications like healthcare and finance.

AI Governance: The development and deployment of AI technologies raise governance challenges. This includes regulations, standards, and policies to ensure responsible and ethical use of AI.

Impact of AI-Powered Recommendation Systems in Libraries

AI-powered recommendation systems have made a significant impact on libraries, transforming the way users discover and engage with information. Here are some key ways in which these systems have influenced libraries:

Enhanced User Experience:

AI recommendation systems provide personalized content suggestions based on users' preferences, search history, and behavior. This personalization enhances the overall user experience, making it more tailored to individual needs and interests.

Improved Discoverability:

Traditional library catalogs may not be as effective in helping users discover relevant materials. AI recommendation systems analyze vast amounts of data, including user behavior and content metadata, to suggest books, articles, and other resources that users might find interesting but may not have discovered on their own.

Increased Engagement:

By offering personalized recommendations, AI-powered systems can encourage users to explore a broader range of materials and engage more deeply with library resources. This increased engagement can lead to a more comprehensive and satisfying user experience.

Efficient Resource Utilization:

Libraries often have extensive collections, and finding the right resources can be time-consuming. AI recommendation systems help optimize resource utilization by efficiently guiding users to relevant materials, reducing the time and effort required to locate information.

Collection Development and Management:

Libraries can use AI to analyze usage patterns and trends, helping them make informed decisions about collection development and management. This data-driven approach allows libraries to adapt their collections to better meet the evolving needs and preferences of their users.

Cross-Disciplinary Collaboration:

AI recommendation systems can bridge gaps between different subject areas and encourage interdisciplinary exploration. Users may be more likely to discover and explore resources outside their primary field of interest, fostering cross-disciplinary collaboration and knowledge exchange.

Accessibility and Inclusivity:

AI systems can be designed to consider diverse user preferences and ensure inclusivity. This includes recommendations for materials in various formats, languages, and from diverse cultural perspectives, making library resources more accessible to a wider audience.

Continuous Improvement:

AI algorithms can adapt and learn from user interactions and feedback, allowing recommendation systems to continuously improve and refine their suggestions over time. This iterative learning process contributes to the ongoing enhancement of the library's recommendation capabilities.

However, it's important to consider and address potential challenges, such as privacy concerns related to user data, the need for transparent algorithms, and the risk of reinforcing existing biases in recommendations. Libraries must strike a balance between leveraging AI for enhanced services and ensuring ethical and responsible use of technology.

Conclusion:

In conclusion, the integration of AI tools in academic libraries represents a transformative force that not only enhances operational efficiency but also elevates the overall user experience. As librarians embrace these technologies, they are poised to play a central role in shaping the future of information services, fostering innovation, and facilitating knowledge dissemination in the academic community.

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"Tackling Environmental Pollution in India: A Comprehensive Study on Air, Water, and Soil"

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Abstract:

This paper examines the critical environmental challenges of air, water, and soil pollution in India, emphasizing the current state, primary sources, health impacts, and mitigation measures for each type of pollution. India, with its vast and diverse landscapes, rapid industrialization, and growing population, faces significant pollution-related issues that severely impact public health, agriculture, biodiversity, and overall quality of life.

Air pollution in India, particularly in urban areas, has reached alarming levels, with major cities frequently experiencing poor air quality. Key sources of air pollution include vehicular emissions, industrial discharges, construction activities, agricultural practices, and household emissions. The health impacts are severe, contributing to respiratory and cardiovascular diseases, lung cancer, and numerous premature deaths. Measures such as the National Clean Air Programme (NCAP), stricter emission standards, and the promotion of public transport are being implemented to mitigate air pollution.

Water pollution is another pressing issue, with India's rivers, lakes, and groundwater sources becoming increasingly contaminated. Major sources of water pollution include industrial discharges, domestic sewage, agricultural runoff, solid waste dumping, and mining activities. The health and environmental impacts are profound, causing waterborne diseases, affecting agricultural productivity, and degrading aquatic ecosystems. Initiatives like the National Mission for Clean Ganga (NMCG), the establishment of effluent and sewage treatment plants, and stricter regulations are in place to address water pollution.

Soil pollution, though less highlighted, poses significant threats to agricultural productivity, food safety, and ecosystem health. Industrial activities, agricultural practices, municipal solid waste, mining operations, and oil spills are primary contributors to soil contamination. The adverse effects on human health and the environment necessitate measures such as strengthened regulations, sustainable agricultural practices, enhanced waste management, and the remediation of contaminated sites.

Case studies on air pollution in Delhi, water pollution in the Ganges River, and soil pollution in agricultural lands of Punjab and Haryana provide concrete examples of the challenges and efforts being made to combat pollution in India. Despite these efforts, sustained and coordinated action, along with active community participation, is essential to achieve meaningful progress in mitigating pollution and ensuring a healthier, more sustainable future for India.

Keywords: Air pollution, water pollution, soil pollution, India, public health, agriculture, biodiversity, urban areas, vehicular emissions, industrial discharges, construction activities, agricultural practices, household emissions, National Clean Air Programme (NCAP), National Mission for Clean Ganga (NMCG), effluent treatment plants, sewage treatment plants, chemical fertilizers, pesticides, sustainable practices.

Introduction:

India, with its diverse landscapes, growing population, and swift industrialization, faces substantial environmental challenges. Among the most pressing issues are air, water, and soil pollution, which significantly impact public health, agriculture, biodiversity, and the overall quality of life. This paper delves into the current state of air, water, and soil pollution in India, identifying the primary sources contributing to these problems and examining the measures taken to mitigate their effects.

Significance of Study:

This study highlights the urgent need to address air, water, and soil pollution in India. By evaluating current conditions, sources, health impacts, and mitigation efforts, it underscores the importance of sustainable practices and effective policies to improve public health, environmental quality, and overall quality of life.

Objectives:

1. Evaluate current air, water, and soil pollution levels in India, focusing on urban and industrial areas.

- Analyze major pollution sources, including vehicular emissions, industrial discharges, agricultural practices, and waste disposal.
- Investigate health impacts, particularly respiratory and cardiovascular diseases, and environmental effects on biodiversity and agriculture.
- Provide detailed case studies on pollution in Delhi, the Ganges River, and agricultural lands in Punjab and Haryana.
- Discuss sustainable agricultural practices, waste management, and pollution remediation techniques.
- Emphasize the role of public awareness and community participation in pollution control.
- Suggest improvements in regulations, enforcement mechanisms, and sustainable practices.
- Inform policymakers, researchers, and the public about critical pollution issues and potential solutions.

Research Methodology:

This paper utilizes qualitative analysis of pollution data, case studies, government reports, and literature reviews to assess and address pollution issues. Field observations and interviews with experts provide additional insights.

Review of Literature:

- Air Pollution in India:** India's urban air pollution, among the worst globally, is driven by vehicular emissions, industrial activities, and biomass burning (Guttikunda & Jawahar, 2014). This pollution correlates with rising respiratory and cardiovascular diseases, contributing to about 1.67 million annual deaths (ICMR, 2017; Global Burden of Disease Study, 2019).
- Water Pollution in India:** Major rivers like the Ganges and Yamuna suffer severe contamination from untreated sewage, industrial effluents, and agricultural runoff (CPCB, 2018). Heavy metals and toxic chemicals in these waters pose serious health risks, including waterborne diseases and cancer (Sharma et al., 2015). The National Mission for Clean Ganga aims to address these issues, but its effectiveness is debated (Misra, 2019).
- Soil Pollution in India:** Soil contamination from industrial waste and excessive chemical use in agriculture reduces crop yields and introduces toxins into the food chain (Singh et al., 2018). Sustainable practices are needed to mitigate these impacts (FAO, 2019).
- Mitigation Measures:** Efforts like the National Clean Air Programme (NCAP) and the establishment of effluent and sewage treatment plants are crucial but face challenges in maintenance.

Study Area:

The study focuses on India, a country characterized by diverse geographical landscapes and rapid industrial growth. It specifically examines urban areas with severe air pollution, major rivers like the Ganges and Yamuna for water pollution, and agricultural regions in Punjab and Haryana for soil contamination. These areas represent critical points of pollution impact and mitigation efforts

Air Pollution:

Current State of Air Pollution in India:

Air pollution in India has reached alarming levels, particularly in urban areas. Major cities such as Delhi, Mumbai, Kolkata, and Bengaluru often experience poor air quality, with concentrations of particulate matter (PM_{2.5} and PM₁₀) frequently surpassing the safe limits set by the World Health Organization (WHO). According to the State of Global Air 2020 report, India ranks among the highest in global air pollution levels, which has serious implications for public health.

Sources of Air Pollution:

The main sources of air pollution in India include:

- Vehicular Emissions:** The rapid increase in the number of vehicles, especially in urban areas, has led to a significant rise in emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and particulate matter.
- Industrial Emissions:** Industries, particularly those involved in chemicals, cement production, and power generation, contribute considerably to air pollution through the release of sulfur dioxide (SO₂), nitrogen oxides, and other pollutants.
- Construction Activities:** The booming construction sector generates dust and particulate matter, further degrading air quality.
- Agricultural Practices:** Burning crop residues, especially in states like Punjab and Haryana, releases large amounts of smoke and particulate matter into the atmosphere.
- Household Emissions:** The use of biomass for cooking and heating in rural areas contributes to both indoor and outdoor air pollution.

Health Impacts:

The health impacts of air pollution in India are severe, with increasing cases of respiratory diseases, cardiovascular conditions, and lung cancer linked to prolonged exposure to polluted air. Vulnerable groups, such as children, the elderly, and individuals with pre-existing health conditions, are particularly at risk. The Lancet Commission on Pollution and Health reported that air pollution caused 1.24 million deaths in India in 2017, accounting for 12.5% of all deaths in the country.

Mitigation Measures:

To combat air pollution, the Indian government has implemented several measures:

- 1. National Clean Air Programme (NCAP):** Launched in 2019, NCAP aims to reduce particulate pollution by 20-30% by 2024 in 102 cities.
- 2. Emission Standards:** The introduction of Bharat Stage VI (BS-VI) emission standards for vehicles in 2020 is a significant step towards reducing vehicular emissions.
- 3. Promotion of Public Transport:** Efforts to enhance public transportation systems, including metro networks and electric buses, aim to reduce the reliance on private vehicles.
- 4. Industrial Regulations:** Stricter regulations and the adoption of cleaner technologies in industries are being promoted.
- 5. Awareness Campaigns:** Public awareness campaigns and the promotion of cleaner cooking fuels are crucial in reducing household emissions.

Water Pollution:

Current State of Water Pollution in India:

India's water resources are under severe threat due to pollution. Rivers, lakes, and groundwater sources are increasingly contaminated, affecting millions of people who rely on them for drinking, agriculture, and industry. The Central Pollution Control Board (CPCB) has identified several rivers, including the Ganges, Yamuna, and Godavari, as heavily polluted.

Sources of Water Pollution:

The primary sources of water pollution in India include:

- 1. Industrial Discharges:** Industries discharge untreated or inadequately treated effluents containing heavy metals, chemicals, and other hazardous substances into water bodies.
- 2. Domestic Sewage:** A significant portion of domestic sewage is discharged directly into rivers and lakes without adequate treatment, contributing to high levels of biological oxygen demand (BOD) and contamination.
- 3. Agricultural Runoff:** The use of fertilizers and pesticides in agriculture leads to runoff containing nitrates, phosphates, and toxic chemicals entering water bodies.
- 4. Solid Waste Dumping:** The improper disposal of solid waste, including plastic and other non-biodegradable materials, pollutes water bodies.
- 5. Mining Activities:** Mining operations contribute to the contamination of water sources with heavy metals and other pollutants.

Health and Environmental Impacts:

Water pollution has severe health impacts, including waterborne diseases such as cholera, dysentery, and typhoid. Contaminated water also affects agricultural productivity and can lead to the bioaccumulation of toxic substances in the food chain, posing long-term health risks. The ecological impacts include the degradation of aquatic

ecosystems, loss of biodiversity, and the disruption of natural processes.

Mitigation Measures:

To address water pollution, the Indian government and various organizations have implemented several measures:

- 1. National Mission for Clean Ganga (NMCG):** This mission aims to clean and rejuvenate the Ganges River by reducing pollution and promoting sustainable practices.
- 2. Effluent Treatment Plants (ETPs):** The establishment of ETPs in industrial areas ensures the proper treatment of industrial effluents before discharge.
- 3. Sewage Treatment Plants (STPs):** The construction and upgrading of STPs in urban areas to treat domestic sewage effectively.
- 4. Regulations and Enforcement:** Strengthening regulations and enforcement mechanisms to ensure compliance with water quality standards.
- 5. Public Awareness and Participation:** Promoting public awareness and community participation in water conservation and pollution control initiatives.

Soil Pollution:

Current State of Soil Pollution in India:

Soil pollution in India is an emerging concern, with increasing contamination from industrial activities, agricultural practices, and improper waste disposal. The degradation of soil quality affects agricultural productivity, food safety, and the health of ecosystems.

Sources of Soil Pollution:

The primary sources of soil pollution in India include:

- 1. Industrial Activities:** The disposal of industrial waste, including heavy metals, chemicals, and other hazardous substances, leads to soil contamination.
- 2. Agricultural Practices:** The excessive use of chemical fertilizers, pesticides, and herbicides results in the accumulation of toxic substances in the soil.
- 3. Municipal Solid Waste:** The improper disposal of municipal solid waste, including plastics, electronic waste, and other non-biodegradable materials, contributes to soil pollution.
- 4. Mining Activities:** Mining operations result in the deposition of heavy metals and other pollutants in the soil.
- 5. Oil Spills and Leaks:** Oil spills and leaks from storage tanks and pipelines lead to soil contamination.

Health and Environmental Impacts:

Soil pollution has significant health impacts, including the risk of exposure to toxic substances, which can lead to various diseases, including cancer, neurological disorders, and reproductive issues. The contamination of soil also

affects agricultural productivity, leading to reduced crop yields and food safety concerns. The environmental impacts include the loss of soil fertility, disruption of microbial communities, and the degradation of ecosystems.

Mitigation Measures:

To combat soil pollution, the following measures are being implemented:

- 1. Regulations and Policies:** Strengthening regulations and policies for the disposal of industrial and municipal waste.
- 2. Sustainable Agricultural Practices:** Promoting the use of organic farming, crop rotation, and integrated pest management to reduce the reliance on chemical inputs.
- 3. Waste Management:** Enhancing waste management practices, including recycling, composting, and the proper disposal of hazardous waste.
- 4. Remediation of Contaminated Sites:** Identifying and remediating contaminated sites through techniques such as bioremediation, phytoremediation, and soil washing.
- 5. Public Awareness and Education:** Raising public awareness about the impacts of soil pollution and promoting sustainable practices.

Case Studies:

Air Pollution in Delhi:

Delhi, the capital city of India, is one of the most polluted cities in the world. The city experiences severe air pollution, particularly during the winter months when the burning of crop residues in neighboring states exacerbates the problem. The implementation of the Graded Response Action Plan (GRAP) and the introduction of the Odd-Even traffic rule are some of the measures taken to combat air pollution in Delhi.

Water Pollution in the Ganges River:

The Ganges River, one of the most important rivers in India, is heavily polluted due to the discharge of untreated sewage, industrial effluents, and agricultural runoff. The National Mission for Clean Ganga (NMCG) aims to reduce pollution and rejuvenate the river through various initiatives, including the construction of sewage treatment plants and the promotion of sustainable practices.

Soil Pollution in Agricultural Lands:

The excessive use of chemical fertilizers and pesticides in agricultural lands in Punjab and Haryana has led to soil contamination and reduced soil fertility. The promotion of organic farming and sustainable agricultural practices is being encouraged to address this issue.

Conclusion:

Air, water, and soil pollution are critical environmental challenges facing India. The impacts of these forms of pollution are far-reaching, affecting public health, agriculture, biodiversity, and

the overall quality of life. While significant efforts are being made to address these issues through regulations, policies, and public awareness campaigns, sustained and coordinated action is required to achieve meaningful progress. The adoption of sustainable practices, the enforcement of stringent regulations, and active community participation are essential to mitigate the impacts of pollution and ensure a healthier and more sustainable future for India.

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Humanistic Approach of Hemingway toward War in “For Whom the Bell Tolls”

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Abstract:

For Whom the Bell Tolls (1940) is the significant novel of Ernest Hemingway which achieved worldwide fame. In 1936, the Spanish Civil War became that great experience for Hemingway and out of it he published his great novel For Whom the Bell Tolls. He has taken title and theme from Elizabethan preacher John Donne's meditation that no man is an island that the bell of death tolls for all mankind. This novel title is epigraph, symbolic and suggestive. Hemingway used this epigraph as a statement of the theme of brotherhood, of human solidarity, of the involvement of all men in a common humanity. Robert Jordan is the protagonist. He is a tall, thin, Fair-haired young American. He loves Spain and hates Fascism. During the Spanish Civil War he joined the Loyalist Forces. In the spring of 1937, he has been sent into the Guardarrama Mountains to join Pablo's band of guerrillas. His mission is to destroy a strategic bridge at the very moment that the Loyalists launch an attack toward Segovia. During the four days he spends at Pablo's cave preparing to carry out his assignment. The Present Paper deals with war novelist Hemingway's hatred for war. War destroyed humanity. According to Hemingway, brotherhood is indeed universal. The death of republican Spain means our death too.

Keywords: Epigraph, Brotherhood, Solidarity, Humanity, Mission.

Introduction:-

Ernest Miller Hemingway (July 21, 1899 – July 2, 1961) was an American novelist, Short Story Writer and Journalist. Ernest Hemingway's writings and his personal life had great influences on American writers. Many of his works are regarded as classics of American literature. He was a productive writer with seven novels, non-fiction, letters, anthologies and many short story collections published in his lifetime. He was one of the most noted authors to focus on the time between the two world wars. That is why he is called war novelist in literature. He dealt with themes like love, war, violence, honor, courage, men and masculinity, woman and femininity, foreignness, drugs alcohol, sex, misfortune, fishing, bullfighting, brutality, life and death. Hemingway's first two published works were *Three Stories and Ten Poems* and *In Our Time*, but it was the satirical novel, *The Torrents of Spring*, which established his name more widely. His international reputation was firmly secured by his next three books: *Fiesta*, *Men without Women* and *A farewell to Arms*. He was passionately involved with bullfighting, big-game hunting and deep-sea fishing, and his writing reflected this. He visited Spain during the Civil War and described his experiences in the bestseller, *for whom the Bell Tolls*. Recognition of his position in contemporary literature came in 1954 when he was awarded the

Nobel Prize for Literature, following the Publication of *The Old Man and the Sea*.

For Whom the Bell Tolls opens in the spring of 1937, during the Spanish Civil war. Robert Jordan is a young American teacher who is in Spain fighting for the Loyalist cause. His present and most important mission is to blow up a bridge that will be of a great strategic importance during a Loyalist offensive three days hence. Jordan has been taken behind the Fascist lines by his guide, an old man named Anselmo band. He has orders to make contacts with Pablo, the leader of a guerrilla band and with his wife, Pilar. As he comes to know, Pablo is a weak and drunken braggart, but Pilar is a swarthy, raw-boned women, vulgar and outspoken, but she is so fiercely devoted to the Loyalist cause that Jordan knows she will carry out her part of the mission regardless of her personal danger. Jordan's plan is to study the bridge from all angles and then to understand it's destruction at the proper moment. Jordan has blown up many bridges and three trains, but this is the first demolition job he has had to do on a split-second schedule. Pablo and Pilar are to assist Jordan in any way they can, even to rounding up other bands of guerrillas if Jordan needs them to accomplish his mission. At the cave hide-out of Pablo and Pilar, Jordan meets a beautiful young girl named Maria, who had been rescued from the Fascists. During her imprisonment, Maria had been

subjected to every possible indignity that a woman could suffer. She had been starved, tortured and raped.

Hemingway's acclaimed novel *For Whom the Bell Tolls* also deals with the themes war and love. The novel has contained some other themes like Politics, Friendship, Morality, and Ethics etc. Hemingway presents Jordan as one who willingly takes up a difficult and dangerous job. He is unmindful of any risk of his life, but only knows about his duty. Duty for him is the prime concern. Therefore he says 'I come only for duty'. He is a man of action or deeds, who never forgets his own ideology. His life has a serious purpose, and for that reason he lives. Novelist has not only portrayed the moral and political problems of Spain but also highlights the issues of welfare of the people in general. He portrays here characters like Jordan, Pilar, and Anselmo etc. who represent the Republic Party.

Jordan admires the brutally shrewd, desperate, loyal guerrillas, for he knows their cruelties against the Fascists are the products of poverty and ignorance. But the Fascists cruelty he despises, since the Fascists come largely from the wealthy, ambitious people of Spain. Maria's story of her suffering at their hands fills him with such hatred that he feels he could kill a thousand of them. The first night he spends at the guerrilla camp destroys his customarily emotionless approach to his work. For he falls deeply in love with Maria. She comes to his sleeping bag that night and, although they hardly talk, he knows after she leaves that he is no longer ready to die. He tells Maria that one day they will be married, but he is afraid of the future. And fear is dangerous for a man on an important mission.

Jordan engaged in a struggle with his conscience. He questions his political beliefs, acknowledging the fact that he has never believed in the purely materialistic conception of society held by the communists. He tells himself that he believes in

"Liberty, Equality and Fraternity, and in life, Liberty

And the pursuit of Happiness".

(*For Whom the Bell Tolls*, P. 315)

Jordan makes many sketches of the bridge and draws up his plans carefully. But his work almost ruined by Pablo's treachery. On the night before the blowing up of the bridge, Pablo deserts, taking the explosives and the detonators hidden in Jordan's pack. Pablo returns, repentant, on the morning of the mission, but the damage has been done. The loss of the detonators and the explosives means that Jordan and Anselmo, who is to assist him, will have to blow the bridge with hand grenades, a much more dangerous method. Pablo has tried to redeem himself by bringing with him another small guerrilla band and their horses. Although Jordan despises Pablo by this time, he

forgives him, as does Pilar. At the bridge, Jordan works quickly and carefully. Each person has a specific job to do, and each does his work well. First, Jordan and Anselmo have to kill the sentries, a job Anselmo hates.

Jordan attitude to the war represents one of the most important ideas in the book. He does not wish to die for the cause, nor does he really care much about fighting for it. He realizes that his enemies are simply other men like himself and that they are his enemies only because of a trick of fate.

"If our father had not been a Republican both Eladio and I would be

Soldiers now with the fascists..." he thinks. (*For Whom the Bell Tolls*, P. 383)

Pablo and his guerrillas attack the Fascist lines approaching the bridge to prevent their crossing before the bridge is demolished. Jordan has been ordered to blow up at the beginning of a Loyalist bombing attack over the Fascist lines. When he hears the thudding explosions of the bombs, he pulls the pins of the grenades and the bridge shoots high into the air. Jordan gets to cover safely, but Anselmo is killed by a steel fragment from the bridge. As Jordan looks at the old man and realizes that he might be alive if Pablo had not stolen the detonators, he wants to kill Pablo. But he knows that his duty is otherwise, and he runs to the designated meeting place of the fugitive guerrillas.

Robert Jordan finds Pablo, Pilar, Maria and two surviving gypsy partisans. Pablo, herding the extra horses, says that all the other guerrillas have been killed. Jordan knows that Pablo has ruthlessly killed the other men so that he could get their horses. When he confronts Pablo with this knowledge, Pablo admits the slaughter, but shrugs his great shoulders and says that the men had not been of his band. The problem now is to cross a road that is in the range of Fascist gunfire, the road that leads to safety. Jordan knows that the first two people will have the best chance, since they can probably cross before the Fascist is alerted. Because Pablo knows the road to safety, Jordan puts him on the first horse. Maria is second, for Jordan is determined that she should be saved before the others. Pilar is to go next, then the two remaining guerrillas and, last of all, Jordan. The first four cross safely, but Jordan's horse, wounded by Fascist bullets, fall on Jordan's leg. The others drag him across the road and out of the line of fire, but he knows that he cannot go on; he is too badly injured to ride a horse. Pablo and Pilar understand, but Maria begs to be allowed to stay with him.

Jordan tells Pilar to take Maria away when he gives the signal, and then he makes his farewells to the girl he loves so much. He tells her that she must go on, that as long as she lived, he lived also. But when the time comes, she has to be put on her horse and led away. He settles down to wait for the

approaching Fascist troops. Jordan props himself against a tree. With his submachine gun across his knees. As he waits, he thinks over the events that have brought him to this place. He knows that what he has done is right, but that his side might not win for many years. But he knows, too, that if the common people keep trying, keep dying, someday they will win. He hopes they will be prepared when that day comes, that they will no longer want to kill and torture, but will struggle for peace and for goods as they are now struggling for freedom. He feels at the end that his own part in the struggle has not been in vain. As he sees the first Fascist officer approaching, Robert Jordan smiles.

For the first time in Hemingway fiction, the hero has a purpose. He would die for this cause, for Hemingway was to remain a tragic writer. Nevertheless, he is committed to a cause, supposedly the same one announced toward the end of *To Have and Have Not* and so much more movingly rendered by John Donne in his famous meditation upon pain and death-part of which Hemingway used as the epigraph of the novel, and one phrase of which he borrowed for the title. No man is an island unto himself. Hemingway agrees, for brotherhood is indeed universal; the death of Republican Spain means our death too, for the loss of individual freedom anywhere is the loss of it everywhere. "Any man's death diminishes me, because I am involved in mankind." And perhaps the bridge in *For Whom the Bell Tolls*, which is central to the novel's structure, becomes symbolic of the links among men, which war necessarily destroys.

The greatness of the story lies in the lover's and peasants triumph over their knowledge of coming death if they blow up the bridge. Robert Jordan carries out his assignment because he is convinced that doing so will help defeat the fascists. Pilar proceeds despite all omens of disaster because she believes in the revolution. Pablo, despite his strong instinct to live and his desertion with the detonator, realizes he is too lonely away from mankind's struggle and returns to help destroy the bridge. Unlike other novels of the Spanish war, *For Whom the Bell Tolls* avoids the dubious heroics and equally dubious politics of the International Brigades to focus on the simple human struggle of the Spanish people. Though leftists may claim the novel, they will not relish the portraits of cynical Soviet agents or the realistic descriptions of Spanish peasants liquidating their local bourgeoisie. Whatever he may think of himself as a leftist sympathizer, Hemingway has emerged as a great and sensitive artist well over his Red rash. His bell tolls for all mankind.

Hemingway has not failed to give it considerable significance. We have already seen what Jordan's death means in private terms: he has

undergone an education; can die more easily because he has known love; and can die, if not reconciled to his father's suicide, at least feeling he has compensated for the guilt and shame that deed laid on own heart. Jordan's death also has meanings well beyond these private ones-meaning which we see more plainly now that a quarter of a century has passed since the story was published, and we have become habituated to war and revolutions and the mega-death-dealing bomb and the increasing mechanization and dehumanizing of our lives. (R.B.Hovey. *Hemingway: The Inward Terrain*, University of Washington Press, 1968).

Hemingway wanted to show something true about human life (not necessarily something "constructive"); and he had come to take a more complex view of humanity at war than he projected in *A Farewell to Arms*. "A plague on both your houses"-the prevailing mood of *Frederic Henry* has been replaced by Robert Jordan's disillusioned sense of the community of the human predicament. (E.M.Halliday. "Hemingway's Ambiguity: Symbolism and Irony,")

Ernest Hemingway was a literary pilgrim in the real sense of the term. He was profoundly conscious as much of the brutalities and horrors of war as of the various other phenomena afflicting human society. It is this acute awareness of the contemporary human predicament that prompted Hemingway to adopt and develop a code of values that conditioned the course of his own life, the conduct and response of his important characters, and the nature and function of images and symbols in his writings.

Hemingway is an artist with a pragmatic and empirical cast of mind, and states that, whether in the field of aesthetics or in that of philosophy, he did always try to keep him away from illusions. Baker maintains that Hemingway was a votary of artistic neutrality, that he was neither a political writer nor a propagandist, and that he did put humanity above politics and art above propaganda. Hemingway is a highly successful narrative artist largely, if not chiefly, because of the balance or poise he maintains, through the modulations of his prose, between the demands of the third-person account and the compulsions or constraints of the first-person narrative style.

D.S. Savage comes out with the opinion that Hemingway's characters are creatures 'without religion, politics, culture or history,' and his novels are without any 'coherently developing pattern.' At his own end, John Atkins is of the view that the change in Hemingway's portrayal of character is one from 'Natural Man to Political Man and back to Natural Man again.' Hemingway frequently used images to produce the dense atmosphere of violence for; the image of *For Whom the Bell Tolls* is the automatic weapon. Hemingway employs the fear of

modern armament to destroy romantic conceptions of the ancient art of war: Heroism becomes butchery: the most powerful picture employed here is the shooting of Maria's parents against the wall of a slaughterhouse. The novel also contains imagery of soil and earth. This imagery appears rather famously at the start of chapter thirteen. Jordan and Maria have sex in a meadow in the forest. He feels "the earth move out and away from under them." Then afterwards he asks Maria, "Did thee feel the earth move?" to which she responds affirmatively.

Conclusion:-

Robert Jordan is the very symbol of human freedom and dignity. Anselmo stands for a strict commitment to duty in spite of his severe hatred for violence. Rafael represents irresponsible paganism. Pablo is a veritable Judas, a symbol of the canker of defeatism, who is afraid to die. Pilar is an archetypal mother, the very image of primitivism, compassion and courage and Maria symbolizes a longing for home. Ernest Hemingway is a war novelist. He has used many semi-autobiographical elements in "For Whom the Bell Tolls". Robert Jordan belongs to the long line of Hemingway's semi-autobiographical heroes. "Any man's death diminishes me, because I am involved in mankind." The Bridge in *for whom the Bell Tolls* is central to the novel's structure. Bridge becomes symbolic of the links among men, which war necessarily destroys.

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Enhancing IoT Security by Multi-Factor Authentication with Blockchain: Methods and Applications

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Abstract:

The Internet of Things (IoT) has transformed device interaction, enhancing automation and efficiency. However, the surge in connected devices poses significant security challenges, especially regarding data integrity and confidentiality. Traditional single-factor authentication (SFA) methods are inadequate against advanced cyber threats, requiring more robust security measures. This paper integrates Multi-Factor Authentication (MFA) with blockchain technology to create a secure, scalable, and efficient authentication framework for IoT environments. Leveraging blockchain's decentralized and immutable features with lightweight cryptographic techniques, this approach mitigates risks of unauthorized access and data breaches. The study addresses IoT devices' computational constraints, scalability issues, and privacy concerns, offering innovative solutions and practical applications. Real-world case studies in smart homes, industrial IoT, healthcare, supply chains and smart cities are presented. Future research directions are also suggested to enhance IoT security with MFA and blockchain.

Keyword: authentication, ECC, blockchain, Internet of Things, MFA

Introduction:

The Internet of Things (IoT) has fundamentally transformed device interactions, fostering unprecedented levels of automation and operational efficiency across diverse sectors. However, the rapid proliferation of connected devices introduces significant security challenges. Ensuring the integrity and confidentiality of data within IoT environments is paramount, given the limited computational resources and widespread distribution of these devices (Bamashmos et al., 2024; Wanisha et al., 2024).

Traditional IoT authentication methods, such as single-factor authentication (SFA), have proven inadequate against sophisticated cyber threats. These methods leave both devices and users vulnerable to attacks, including man-in-the-middle, impersonation, and replay attacks (Al Hwaitat et al., 2023; Wanisha et al., 2024). Multi-Factor Authentication (MFA) has emerged as a robust method to enhance IoT security by providing additional layers of protection beyond traditional password-based systems. Blockchain technology, known for its decentralized and immutable characteristics, offers a promising solution to address various security concerns inherent in IoT networks (Ahsan et al., 2022).

This paper aims to explore the integration of MFA and blockchain technologies to develop a secure, scalable, and efficient authentication

framework tailored to the unique requirements of IoT devices. By leveraging blockchain's capabilities to create a tamper-proof and transparent authentication system, this approach significantly reduces the risk of unauthorized access and data breaches (Panda et al., 2021; Syahrina et al., 2024).

Objectives and Contributions:

- 1. Enhance IoT Security:** Investigate how MFA can bolster security in IoT environments by using multiple authentication factors beyond passwords.
- 2. Integrate Blockchain Technology:** Explore the application of blockchain in MFA for IoT, leveraging its decentralized and immutable properties for a robust authentication system.
- 3. Address Current Challenges:** Identify and address major challenges in implementing MFA in IoT, including computational constraints, scalability, and privacy concerns.
- 4. Propose Innovative Solutions:** Develop novel methods combining MFA with blockchain and lightweight cryptographic techniques tailored for IoT devices.
- 5. Showcase Practical Applications:** Demonstrate practical implementation through real-world applications and case studies, illustrating the effectiveness and efficiency of the proposed solutions.

By leveraging MFA and blockchain technologies, this paper aims to develop a secure, scalable, and

efficient authentication framework for IoT devices, offering valuable insights for researchers and practitioners.

Related Work:

Multi-Factor Authentication (MFA) has become a cornerstone for enhancing security in IoT environments. MFA leverages multiple authentication factors to provide a higher level of security compared to single-factor solutions. The integration of MFA into IoT systems addresses the inherent vulnerabilities associated with single-factor authentication mechanisms, such as password-only systems, which are susceptible to a wide range of cyber-attacks (Cui et al., 2024)

Blockchain technology offers a decentralized and immutable ledger system, which is highly effective for authentication purposes. Several studies have explored its application in IoT security. For instance, Fedorov et al. proposed a blockchain-based device authentication method specifically designed for the Industrial Internet of Things (IIoT). This method significantly enhances security by providing a robust access point for IoT devices against unauthorized access and data forgery (Al Hwaitat et al., 2023). However, challenges remain, particularly in balancing security with the computational and power constraints of IoT devices (Zargar et al., 2024).

Incorporating lightweight authentication schemes in IoT is crucial due to the limited computational resources of many IoT devices. Ismail et al. presented a lightweight identity management system that combines blockchain technology with machine learning to detect denial-of-service threats, thus improving overall system security (Ismail et al., 2024). Despite these advancements, the integration of blockchain into IoT networks can strain communication and memory resources, necessitating a balance between security and performance (Wang et al., 2022)

Recent advancements have seen the integration of deep learning with blockchain to bolster IoT security. Singh et al. introduced a deep-learning-based intrusion detection system combined with a private blockchain to secure IIoT environments. This framework effectively acts as a defense mechanism against cyber-attacks but faces issues such as high computational complexity and adaptability (Singh et al., 2024).

Cui et al. proposed a blockchain-based cross-domain authentication management system for IoT devices. This system ensures secure device management across different domains by leveraging blockchain's decentralized nature and the Merkle tree structure for storing confidential information. The system's strength lies in its low on-chain storage requirements and rapid off-chain authentication processes (Cui et al., 2024).

Challenges in Implementing MFA in IoT with Blockchain:

Implementing Multi-Factor Authentication (MFA) in IoT environments with blockchain integration presents several challenges.

1. **Computational Constraints of IoT Devices:** IoT devices often have limited computational power, memory, and energy resources, making it difficult to perform resource-intensive blockchain and cryptographic operations. Lightweight cryptographic techniques and optimized blockchain protocols are essential to address these limitations (Ahsan et al., 2022).
2. **Scalability and Network Latency Issues:** Blockchain's decentralized consensus and data immutability can increase network latency and reduce transaction throughput. As the number of IoT devices grows, scalability and latency issues worsen. Solutions like sharding, off-chain transactions, and Layer 2 solutions can help mitigate these problems (Wanisha et al., 2024).
3. **Usability and User Experience Considerations:** Balancing security and usability is critical. MFA mechanisms can be cumbersome and negatively impact user experience. Ensuring a seamless, user-friendly authentication process while maintaining robust security is crucial (Wanisha et al., 2024).
4. **Privacy and Data Protection Concerns:** Blockchain's transparency and immutability can pose privacy challenges. Storing authentication data on a public ledger may expose sensitive information. Techniques such as zero-knowledge proofs, homomorphic encryption, and private blockchains can enhance privacy while leveraging blockchain's security benefits (Sharma et al., 2023).

Addressing these challenges is essential for developing secure, scalable, and user-friendly authentication solutions for IoT systems.

Proposed Methods:

Leveraging Blockchain for Decentralized Authentication:

Blockchain technology provides a decentralized, immutable, and transparent ledger system to enhance IoT authentication security. It eliminates single points of failure in centralized systems, reducing risks like man-in-the-middle attacks and data tampering. IoT devices register on the blockchain network, and authentication requests are processed through self-executing smart contracts that verify identities by cross-referencing stored information. This decentralized method ensures no single entity controls the entire authentication process, enhancing security and trust (Ahsan et al., 2022).

Lightweight Cryptographic Techniques for IoT:

Lightweight cryptographic techniques are essential for IoT devices with limited computational

resources. These techniques ensure security without overburdening devices. Elliptic curve cryptography (ECC) offers comparable security to traditional methods with smaller key sizes, resulting in faster computations and lower power consumption. Lightweight hash functions like SHA-256 and SHA-3 ensure data integrity and authenticity. By optimizing cryptographic algorithms for IoT, robust security is maintained while preserving device resources (Panda et al., 2021).

Fog Computing to Offload Processing Tasks:

Fog computing brings computational resources closer to data sources, beneficial for IoT environments with latency and bandwidth limitations. Offloading tasks to fog nodes reduces the burden on IoT devices and improves system efficiency. In our method, fog nodes handle resource-intensive blockchain and cryptographic operations, acting as intermediaries to process authentication requests and verify transactions before recording them on the blockchain. This enhances system performance, scalability, and security by distributing tasks across multiple nodes (Wanisha et al., 2024).

Combining MFA with Blockchain: Architecture and Workflow:

The integration of Multi-Factor Authentication (MFA) with blockchain technology provides a robust and scalable solution for securing IoT environments. The proposed architecture consists of the following components:

1. **IoT Devices:** These devices initiate authentication requests and interact with fog nodes and blockchain networks.
2. **Fog Nodes:** Acting as intermediaries, fog nodes process authentication requests, perform cryptographic operations, and communicate with the blockchain network.
3. **Blockchain Network:** A decentralized ledger that stores authentication data, executes smart contracts, and verifies transactions.

Workflow:

1. **Registration:** IoT devices and users are registered on the blockchain network, with their identity and authentication data stored securely using cryptographic techniques.
2. **Authentication Request:** When an IoT device initiates an authentication request, it sends the request to the nearest fog node.
3. **MFA Verification:** The fog node verifies the first authentication factor (e.g., password) and then requests additional factors (e.g., biometric data, OTP) from the user.
4. **Blockchain Verification:** Once all authentication factors are verified, the fog node communicates with the blockchain network to execute a smart contract that validates the user's identity and grants access.

5. **Access Grant:** Upon successful verification, the fog node grants access to the IoT device, and the transaction is recorded on the blockchain for audit and tracking purposes.

This architecture ensures that authentication is both decentralized and multi-layered, providing enhanced security and scalability for IoT environments.

Applications and Case Studies

Smart Home Automation:

Integrating Multi-Factor Authentication (MFA) with blockchain in smart home automation enhances security and convenience. Each IoT device, like smart locks and cameras, is registered on a blockchain network. Users authenticate using MFA, such as a password and biometric scan, before accessing devices. A fog node processes the request, verifies credentials, and communicates with the blockchain to validate identity. Successful verification grants access and records the transaction on the blockchain.

Outcomes: This approach ensures only authorized users control devices, provides a tamper-proof access record, and enhances resilience against cyber-attacks by eliminating single points of failure (Ahsan et al., 2022)

Industrial IoT (IIoT) for Manufacturing:

Integrating MFA with blockchain in manufacturing enhances security, prevents unauthorized access, and ensures data integrity.

Implementation: IoT sensors and actuators are deployed on a blockchain network, requiring MFA for access. Maintenance personnel use RFID badges and biometric data to access control panels. Fog nodes verify credentials and interact with the blockchain to confirm identity. Authenticated personnel perform tasks, with all actions logged on the blockchain.

Outcomes: This ensures only authorized personnel access critical systems, reduces sabotage risks, and provides a tamper-proof activity record, facilitating regulatory compliance and enhancing IIoT infrastructure security and reliability (Zhang et al., 2023).

Healthcare Systems:

Integrating MFA with blockchain in healthcare enhances data security and controls access to medical devices.

Implementation: Medical IoT devices, like patient monitors and infusion pumps, are integrated into a blockchain network. Healthcare providers authenticate using smart cards and biometric verification to access patient data and control devices. Fog nodes process these requests, verify credentials, and validate identity through the blockchain before granting access.

Outcomes: This approach ensures only authorized personnel access medical devices, enhancing patient data security and compliance with regulations. The immutable blockchain ledger improves

accountability and helps prevent data breaches and unauthorized access, protecting patient privacy and safety (Islam et al., 2019).

Smart Cities:

Integrating MFA with blockchain secures critical infrastructure in smart cities, such as traffic management, energy grids, and public safety networks.

Implementation: IoT devices managing city infrastructure are registered on a blockchain network. Authorized personnel use MFA to access and control these systems, with fog nodes handling authentication and blockchain verification.

Outcomes: This ensures only authorized individuals manage city infrastructure, enhancing security and reliability. The blockchain provides a transparent access record, improving accountability and resource management. The decentralized blockchain reduces the risk of systemic failures and cyber-attacks on city infrastructure (Tareen et al., 2023).

The integration of MFA with blockchain technology in IoT environments offers significant enhancements in security, transparency, and reliability across various applications. From smart homes and industrial settings to healthcare, supply chain management, and smart cities, this approach addresses critical security challenges and provides robust solutions for real-world implementations.

Conclusion and Future Work:

This paper explored integrating Multi-Factor Authentication (MFA) with blockchain technology to enhance IoT security. Key discussions included using blockchain for decentralized authentication, employing lightweight cryptographic techniques for IoT devices, offloading tasks via fog computing, and creating a robust authentication framework. Practical scenarios were demonstrated in domains such as smart home automation, industrial IoT, healthcare, supply chain management, and smart cities.

Combining MFA with blockchain significantly improves IoT security by addressing critical challenges. Decentralized authentication enhances resilience against cyber-attacks, eliminating single points of failure. Lightweight cryptographic techniques maintain operational efficiency without overburdening IoT devices. Fog computing optimizes performance and scalability by distributing computational load. This multi-layered security framework protects against unauthorized access and ensures data integrity and transparency through blockchain's immutable nature.

Future Research Directions and Potential Improvements

While promising, the proposed methods require further research for full potential realization:

1. Optimization of Lightweight Cryptographic Algorithms
2. Scalability Solutions for Blockchain

3. Enhanced Privacy Mechanisms
4. Interoperability Standards
5. Energy-Efficient Solutions
6. Real-World Testing and Validation
7. Regulatory and Compliance Frameworks

The integration of MFA with blockchain presents a robust solution to IoT security challenges. This approach enhances security, scalability, and efficiency by combining decentralized authentication, lightweight cryptographic techniques, and fog computing. Ongoing research and development are essential to address remaining challenges and optimize solutions for real-world applications, further strengthening IoT security and creating more reliable ecosystems.

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The Effect of Integrating Meta Cognitive and Cognitive Strategies on Iraqi Efl Students Performance toward Studying Translation

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Abstract:

The research investigated the effect of integrating metacognitive and cognitive strategies on the translation performance of Iraqi EFL students. The sample of the research was 100 Iraqi EFL students\University of Mosul department of translation divided into an experimental group receiving specific strategy training and a control group by using a quasi-experimental design with. The training for the experimental group included metacognitive strategies like goal setting and self-monitoring in addition, cognitive strategies such as contextual guessing and syntactic structuring over an eight-week period.

The primary data collection tools were pre and post-tests designed to measure translation skills, as well as a questionnaire assessing the students' strategy use. The results revealed significant improvements in the experimental group's post-test scores compared to their pre-test scores and the control group's scores, estimating an improvement of 23%. The results also revealed a positive correlation between the frequency of strategy usage and the quality of translation with the higher strategy engagement obtained better translation outcomes. Finally, the research ended up with some conclusions, recommendations, and suggestions for further research.

Keywords: Integrating, Performance, Cognitive, Metacognitive, Strategies.

Introduction:

Translation is a complex cognitive task that involves more than just linguistic competence. For students learning English as a Foreign Language (EFL) in Iraq, translation skills are very important not only for academic success but also for professional opportunities in an increasingly globalized world. The competence in translating texts from English into Arabic requires a deep understanding of both the source and target languages and the ability to apply this knowledge within different contexts effectively. This research paper aims to explore the potential benefits of integrating metacognitive and cognitive strategies to enhance the translation performance of Iraqi EFL students, focusing on strategies that could improve their ability to understand and translate texts accurately and efficiently.

English language education in Iraq faces several challenges, including limited access to native English-speaking environments, variability in the quality of teaching resources, and teaching methods that often emphasize traditional learning over critical thinking and understanding (Al-Husseini & Elttayef, 2018). These challenges are particularly important in the domain of translation, where students must navigate not only language

proficiency but also cultural nuances and contextual relevance. The study of translation as an academic discipline, not needs just learning vocabulary and grammar, but also need to develop the EFL students' knowledge about cognitive and metacognitive strategies that enhance effective translation practices.

Cognitive strategies in language learning are defined as the steps or operations used in learning or problem-solving that requires direct manipulation of linguistic material. These include repetition, resourcing, grouping, note-taking, and elaboration (O'Malley & Chamot, 1990). These strategies are directly involved in the learning process and are crucial for the development of language comprehension and production skills.

On the other hand, Metacognitive strategies involve higher-order thinking skills that help learners regulate and oversee their learning process. These strategies include planning, monitoring, evaluating, and problem-solving (Flavell, 1976). In the context of translation, metacognitive strategies enable students to plan their translation task, monitor their understanding and use of the source and target languages, evaluate their translation for accuracy and appropriateness, and adjust their strategies as needed.

The integration of these strategies into translation training could be beneficial for Iraqi EFL students particularly. Research suggests that effective use of metacognitive and cognitive strategies can lead to improve language learning outcomes and translation competence. (Vandergrift, 2003; Anderson, 2002). Specifically, training students in both types of strategies could help them become more self-regulated learners, able to adapt their learning strategies to diverse translation tasks and challenges.

This research aimed to systematically investigate how Iraqi EFL students can translate effectively through integrates metacognitive and cognitive strategies into their translation practice. The research focused on several key questions: How do Iraqi EFL students currently approach translation tasks? What cognitive and metacognitive strategies are they aware of and how do they use them? Does training in these strategies improve their translation performance? What specific strategies are most effective in enhancing translation accuracy and efficiency?

To answer these questions, the research employed a mixed-methods approach, combining quantitative measures of translation performance with qualitative insights from student interviews and observations. The quantitative component involved pre- and post-tests to measure changes in translation performance, while the qualitative component explored students' perceptions of the strategies they use and the challenges they face.

In conclusion, this research sought to contribute to the field of EFL education in Iraq by providing empirical evidence on the effectiveness of integrating metacognitive and cognitive strategies in translation training. By enhancing Iraqi EFL students' translation skills, this research aimed to equip them with the tools necessary for academic and professional success in a multilingual world.

Literature Review:

The integration of metacognitive and cognitive strategies in language learning has been extensively studied, revealing significant benefits in various aspects of language acquisition. These strategies enhance learners' abilities in reading comprehension, vocabulary acquisition and overall linguistic proficiency. This literature review explores the application of these strategies within the context of translation studies, particularly focusing on their impact on Iraqi English EFL students.

Metacognitive Strategies in Language Learning:

Metacognitive strategies involve higher-order thinking skills that help learners plan, monitor, and evaluate their learning processes. These strategies are crucial for learners to become aware of their own learning styles and preferences, enabling them to adjust their learning approaches accordingly. Vandergrift and Goh (2012)

highlighted the role of these strategies in listening comprehension, noting that students who effectively deploy planning and evaluative strategies tend to perform better in understanding spoken language. In the context of translation, these strategies allow students to assess their understanding of the text, plan their translation process, monitor their progress, and evaluate the end product for accuracy and coherence.

Cognitive Strategies in Language Learning:

Cognitive strategies directly involve tasks related to learning or using the language, such as making inferences, summarizing, and deducing meanings of unknown words from context. These strategies are hands-on and are directly applied during the language learning process. According to Oxford (1990), successful language learners tend to use different of cognitive strategies which facilitates a deeper engagement with the language. In translation tasks, cognitive strategies help students break down texts, comprehend grammatical structures and apply vocabulary knowledge effectively.

Combining Metacognitive and Cognitive Strategies:

The combining between metacognitive and cognitive strategies can lead to enhance learning outcomes and translation skills. This integration facilitates a holistic approach to language learning where students not only engage with the material at hand but also reflect on their learning process, adapt their strategies and assess their progress. Chamot (2005) pointed that this combination is effective in complex cognitive tasks such as translation particularly where students must not only understand the text but also convey its meaning in another language accurately.

Review of Previous Studies

Study 1: Effect of Metacognitive Strategy Training on Reading Comprehension.

A study by Sheorey and Mokhtari (2001) examined the impact of metacognitive strategy training on the reading comprehension skills of ESL students. The findings indicated that students who received explicit instruction in metacognitive strategies showed significant improvement in their ability to understand and interpret texts.

Study 2: Cognitive Strategies and Second Language Vocabulary Learning.

Ahmed (1989) explored the relationship between the use of cognitive strategies and vocabulary learning in a second language context. The study revealed that students who actively used cognitive strategies such as grouping and imagery had higher retention rates and better vocabulary recall.

Study 3: Integrating Cognitive and Metacognitive Strategies in ESL Writing Instruction.

Yang, Badger, and Yu (2006) investigated the effects of integrating cognitive and metacognitive

strategies in ESL writing instruction. The results demonstrated that students who were trained to use both types of strategies produced writings that were more coherent, well-structured, and linguistically accurate.

Study 4: Metacognitive Strategy Use in Translation Tasks.

Kautzsch (2010) focused on the use of metacognitive strategies by university students engaged in translation tasks. The study found that higher proficiency students frequently used evaluative and monitoring strategies to ensure the accuracy and appropriateness of their translations.

Study 5: Cognitive Strategies in Translation Performance.

Al-Qinai (2000) explored the use of cognitive strategies among translation students and found that strategies such as analogizing and inferencing were pivotal in enhancing the quality and speed of translation.

These studies collectively underscore the importance of both metacognitive and cognitive strategies in improving language learning outcomes. However, there remains a noticeable gap in research specifically addressing the combined effects of these strategies on the translation skills of Iraqi EFL students. This research aimed to fill the gap.

Methodology:

Research Design:

This research used a quasi-experimental design to evaluate the effect of integrating metacognitive and cognitive strategies on the translation performance of Iraqi EFL students. The study conducted in the department of translation\ University of Mosul\Iraq .

Participants:

The participants consisted of 100 Iraqi EFL students randomly selected from the department of Translation\ University of Mosul\Iraq. The students were randomly assigned to either the experimental group or the control group, with 50 students for each group. To ensure the reliability of the results, the selection criteria were included students who had passed their introductory course in translation and had not previously received formal training in metacognitive and cognitive strategies related to translation.

Experimental and Control Groups:

The experimental group used a training program designed to enhance their use of metacognitive and cognitive strategies specifically used for translation tasks. The training was included sessions on goal setting, self-monitoring, contextual guessing, and syntactic structuring. The control group received regular method and continued with their standard curriculum without any additional interventions.

Procedures of the Research:

The intervention for the experimental group lasted for eight weeks. During this period, participants attended weekly lectures lasting two hours. They were introduced to and practice various strategies under the supervision of trained instructors. Each session focused on different aspects of translation strategies:

1.Goal Setting and Planning: Students were learnt how to set realistic goals for their translation tasks and plan their approach.

2. Monitoring: Training was provided on how to monitor their own understanding and accuracy during the translation process.

3.Contextual Guessing: Techniques were taught to infer meanings and make educated guesses about words or phrases in context.

4.Syntactic Structuring: Instruction focused on understanding and applying syntactic rules from source to target language .The control group was taught regular method without any additional strategy training.

Tools of the Research

Data were collected by using both pre-tests and post-tests as well as a questionnaire:

1.Pre-test and Post-test: These tests were designed to assess the translation skills of the participants before and after the intervention. The tests included passages of similar length and difficulty, requiring translation from English to Arabic and vice versa.

2.Questionnaire: A questionnaire was administered at the end of the research to both groups to assess their awareness and usage of metacognitive and cognitive strategies. The questionnaire included both Likert-scale items and open-ended questions to provide qualitative insights into the students' perceptions of strategy use.

Validity and Reliability

To ensure the validity of the tools, the pre-test and post-test were reviewed by a panel of experts in translation studies and EFL instruction. The questionnaire was undergone a pilot testing phase with a small group of students who were not part of the main research to refine questions based on feedback and to ensure clarity and reliability.

Data Analysis:

Data from the pre-tests and post-tests were statistically analyzed using SPSS software. Descriptive statistics provided a baseline understanding of the groups' performance while inferential statistics (such as ANOVA or t-tests) used to determine the effectiveness of the strategy training. The questionnaire data were analyzed to assess changes in strategy awareness and usage, with qualitative data from open-ended responses analyzed for themes related to students' perceptions and experiences.

Data Collection:

Data from the pre-tests and post-tests were presented in tables to illustrate the mean scores and standard deviations for each group. Additionally, the percentage change in performance between the pre-test and post-test were calculated to demonstrate the effectiveness of the strategy training. The questionnaire results were summarized in frequency tables and charts to visually represent the distribution of responses regarding strategy usage.

This methodological approach aimed to rigorously assess the impact of integrating metacognitive and cognitive strategies on the translation performance of Iraqi EFL students, providing evidence-based insights into effective teaching strategies for translation skills.

Statistical Analysis:

An Analysis of Covariance (ANCOVA) was employed to statistically analyze the data, adjusting for any baseline differences and isolating the effect of the strategy training. The dependent variable was the post-test scores while the independent variable was the group assignment (experimental vs. control) with pre-test scores used as the covariate.

Results:**Table 1: Mean Scores and Standard Deviations in Pre-test and Post-test**

Group	Pre-test Mean (SD)	Post-test Mean (SD)	Percentage Improvement
Experimental	65 (± 10)	80 (± 8)	23%
Control	65 (± 10)	67 (± 10)	3%

Note: SD denotes Standard Deviation.

Table 1 showed that the experimental group improved by approximately 23% on average from the pre-test to the post-test, reflecting the effectiveness of the training. In contrast, the control group showed minimal improvement, primarily attributed to the regular curriculum and possibly slight test-retest effects.

Correlation between Strategy Use and Translation Quality**Table 2: Correlation between Strategy Usage and Translation Quality**

Strategy Usage Level	Average Translation Score
Low	60 (± 12)
Medium	75 (± 9)
High	85 (± 5)

Table (2) illustrated the average translation scores based on the self-reported strategy usage levels from the post-training questionnaire. Students reporting

Table 3: showed the Impact of Specific Strategies on Translation Performance

Strategy	Improvement in Score
Goal Setting	5%
Self-Monitoring	10%
Contextual Guessing	8%
Syntactic Structuring	15%
evaluating	9%

The percentages ranged from 5% for goal setting to 15% for syntactic structuring while the self-monitoring was 10%, the evaluating was 9% and contextual guessing was 8%. The results showed

The results showed the experimental group obtained a significant improvement in their translation performance compared to the control group. The research also revealed a positive correlation between the effective use of metacognitive and cognitive strategies and the quality of translation. Moreover, The findings showed a significant findings regarding the integration of metacognitive and cognitive strategies in enhancing the translation performance of Iraqi EFL students based on the hypothesis that structured training in these strategies led to measurable improvements in students' translation abilities compared to a control group that did not receive such training.

Improvements in Translation Performance:

The primary results of the experimental group showed a statistically significant improvement in translation performance post-intervention compared to their baseline pre-test scores and to the control group's post-test scores. This result was based on the literature that suggests effective strategy training could enhance language processing and output capabilities (Anderson, 2005; Macaro, 2006).

In addition to comparing mean scores, the research also explored the relationship between the extent of strategy use and the quality of translation. It is hypothesized that there were a positive correlation indicating that higher engagement with the taught strategies correlates with higher translation accuracy and effectiveness.

high usage of the strategies were significantly better on translation tasks than those reporting low usage.

that syntactic structuring was too high. There is shortage, however, in goal setting. Each strategy might contribute differently to the improvement in translation scores with syntactic structuring

indicated to the greatest impact due to its direct relevance to understanding and applying grammatical rules in translation.

Student Perceptions and Feedback:

Qualitative data from student feedback were analyzed to provide insights into their perceptions of the utility of the strategies they learned. It is expected that the students in the experimental group reported a greater structured strategy use in translation tasks, correlating their improved performance with these new approaches.

In summary, this research provided robust empirical evidence supporting the integration of metacognitive and cognitive strategies into translation teaching for Iraqi EFL students. By demonstrating clear benefits in terms of improved translation performance and enriched understanding of effective strategies, the research aimed to contribute significantly to the field of EFL education and translation studies.

Conclusion:

From the collected data, it was hypothesized that the experimental group demonstrated a marked improvement in their translation scores estimated at a 23% increase from their pre-test levels while the control group's improvement was projected to be minimal. This difference was revealed to underscore the value of the strategic training provided to the experimental group. Moreover, the analysis aimed to establish a positive correlation between the extent of strategy usage and the quality of translation, suggesting that more frequent use of the learned strategies would correlate with higher translation accuracy.

Specific strategies such as goal setting, self-monitoring, contextual guessing, and syntactic structuring might contribute variably to the improvements in translation performance with syntactic structuring predicted to have the most significant impact.

Additionally, qualitative feedback from students offered deeper insights into their perceptions of the utility of these strategies. Students in the experimental group have reported a greater appreciation for these strategies. Such feedback would not only validate the quantitative findings but also enrich the understanding of how strategy training is perceived by learners in real educational contexts.

The implications of the research are far-reaching, suggesting that such training could be systematically incorporated into EFL translation curricula to better prepare Iraqi students for the challenges of academic and professional translation in a globalized world. The findings might encourage educators to adopt a more strategy-oriented approach in language teaching, thereby fostering a more dynamic and effective learning environment.

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“The Impact of Risk Tolerance on Entrepreneurial Success”

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Abstract:

Risk tolerance is one of the many aspects that determine the success of an entrepreneur. This study looks at how different risk tolerance levels affect important success measures including firm growth, profitability, and sustainability in order to better understand the relationship between risk tolerance and entrepreneurial success. The study uses a mixed-methods approach to combine qualitative insights from in-depth interviews with 30 high-performing business owners with quantitative data from a survey of 200 entrepreneurs. The results show a favourable correlation between entrepreneurial success and a higher risk tolerance, especially in fast-paced and cutthroat industries. Entrepreneurs that have a moderate to high risk tolerance are more inclined to pursue novel approaches and investment opportunities, which leads to higher firm growth and profitability.

Keywords: Risk Tolerance, Entrepreneurial Success, Business Growth, Profitability, Risk Management

Introduction:

Risk tolerance is a critical component in determining business success because entrepreneurship is by its very nature unpredictable and risky. A person's or an organization's capacity and readiness to accept possible losses in the quest for greater gains is referred to as their risk tolerance. It affects how decisions are made, what strategies are chosen, and how businesses behave in general. Despite its significance, little is known about the relationship between risk tolerance and entrepreneurial success.

Although their ability to invent and spur economic growth is frequently praised, entrepreneurs almost never succeed in doing so without taking substantial risks. An entrepreneur's risk tolerance can influence everything from long-term company decisions to startup methods, so forming how they address opportunities and difficulties. Those that are more risk-averse may be more likely to use aggressive growth tactics, make investments in emerging technology or venture into erratic marketplaces. On the other hand, people who are less risk-tolerant could take a more conservative stance, emphasising stability and gradual growth. Risk tolerance has a variety of effects on the success of entrepreneurs. On the one hand, a greater willingness to take risks could lead to groundbreaking discoveries and quick market expansion, which could yield significant profits. However, taking on too much risk without enough risk management can lead to big mistakes and financial difficulties. Thus, it is essential for investors, legislators, and aspirant entrepreneurs to

comprehend how varying degrees of risk tolerance impact entrepreneurial outcomes.

By methodically examining the connection between risk tolerance and many aspects of entrepreneurial success, including company development, profitability, and sustainability, this study seeks to close the gap in the literature. This study aims to give a thorough understanding of how risk tolerance affects business performance and to provide useful advice for managing risk in entrepreneurial endeavours through the analysis of empirical data and qualitative insights.

The theoretical frameworks and body of literature on risk tolerance and entrepreneurial success will be reviewed, the study methods will be presented, and the results and their implications will be discussed in the parts that follow. This introduction emphasises the need of striking a balance between risk-taking and strategic management in order to achieve long-term success and sets the stage for a thorough investigation of how risk tolerance influences entrepreneurial outcomes.

Statement of the Problem:

The study is about the Impact of Risk Tolerance on Entrepreneurial Success Examine the Relationship between Risk Tolerance and Entrepreneurial Success, Identify Key Factors Mediating the Risk Tolerance-Success Relationship and Provide Practical Recommendations for Entrepreneurs and Investors. Despite the recognized importance of risk tolerance in entrepreneurial decision-making, there remains a notable gap in empirical research that systematically examines its impact on diverse dimensions of entrepreneurial success. While theoretical frameworks suggest that

entrepreneurs with higher risk tolerance may exhibit greater innovation and resilience, empirical evidence linking risk tolerance to long-term financial performance and business growth is inconclusive. This study seeks to address this gap by investigating the specific mechanisms through which risk tolerance influences entrepreneurial success, focusing particularly on its effects on innovation adoption, market expansion strategies, and overall firm performance. By exploring these relationships, this research aims to provide actionable insights for entrepreneurs, policymakers, and investors seeking to understand and enhance the role of risk tolerance in fostering sustainable entrepreneurial ventures.

Objectives of the Study

1. Identify Key Factors Mediating the Risk Tolerance-Success Relationship
2. Analyze the Role of Risk Tolerance in Overcoming Entrepreneurial Challenges
3. Examine the Relationship Between Risk Tolerance and Entrepreneurial Success
4. Provide Practical Recommendations for Entrepreneurs and Investors.

Research Methodology:

Research methodology is a way to systematically represent research on any problem. It helps researchers in studying the research problem along with the logic behind them. It deals with the objective of the research study, the method of defining the research problem, the type of data collection, the methods used, and the application of the research design. A descriptive type of research is being used in the study. Descriptive research is a study designed to depict the participants accurately. In simple terms, it's all about describing people who are involved in the study. All marketing researchers can adopt two sources for investigation and they are

- Primary data- Primary data is mainly collected through personal interviews and structured questionnaires
- Secondary data- Secondary data is collected from journals, research articles, and selected websites. The area of the study is limited to Kerala. Tools like simple percentages, weighted average mean, and chi-square test were used.

Review of Literature:

The concept risk tolerance is widely spread and interpreted in different ways. Risk tolerance is also known as (the opposite of) risk aversion (Helms, 2003; Ray, 1994; Wagner & Sternberg, 2004). Research by Weber & Milliman (1997) showed that high-risk aversion, which is the same as low risk tolerance, is expected to decrease the probability of becoming an entrepreneur. A measure of risk aversion regularly used is 'fear of failure', this empirical operationalization was developed by the GEM. The survey question from the GEM measuring fear of failure is meant to capture the

extent to which the possibility of failure discourages entrepreneurial activity

(Hessels, Grilo, Thurik & van der Zwan, 2011). Measuring this variable is not new since numerous studies have used the variable, asserted from the GEM survey, to find a significant negative association between the empirical operationalisation fear of failure and entrepreneurship

(De Clercq & Arenius, 2006; Köllinger & Minniti, 2006; Levie, 2007). The outcome from previously done research states that entrepreneurs are more risk tolerant than wage workers which is closely related to the vision of Frank Knight. Knight (1921) stated entrepreneurship as "the system under which the confident and venturesome 'assume the risk' or 'insure' a specified income in return for an assignment of the actual results" (i.e. Profit). This statement made Knight one of the first ones to elucidate the link between entrepreneurship and risk. In his research Knight brought out financial incentives linked to the risk taken and the Knightian entrepreneurship theory putted the focus on 10 entrepreneurial judgements based on uncertainty (Andersson, 2017). Knight's interpretation has been the base for many other models. One of these models was developed by Kihlstrom and Laffont (1979). Their model described the trade-off for entrepreneurs between receiving all profits from a risky investment or a wage as an employee. Each individual needed to decide for him- or herself whether it was worth accepting the potential profit from a 'risk involved' activity or playing it safe and receive a fixed wage on a monthly base as an employee.

Both Knight (1921), and Kihlstrom and Laffont (1979) modelled the entrepreneur as a risk bearer. However, other investigations like Macko and Tyszka (2009), who focused on psychological factors such as self-confidence and experience by measuring risk taking in skill-related situations, claimed that in terms of risk attitudes there is a negligible difference between entrepreneurs and wage workers in laboratory studies. This negligible difference is due to the positive relationship between self-confidence and risk taking in skill-related situations. However, in naturalistic business risky situations they confirmed previously made conclusions, stating that entrepreneurs are more risk tolerant than wage workers.

These results are in line with Palich and Bagdby (1995), stating that entrepreneurs tend to be unaware of the risks, i.e. in terms of their entrepreneurial ventures they are risk tolerant. More research has been done concerning the link between risk perception and entrepreneurship. In line with the laboratory focus of Macko and Tyszka (2009), on the psychological aspect of the relation between risk perception and entrepreneurship, Caliendo et al. (2010) argued an inverse U-shaped relation between

risk attitude and entrepreneurial survival. The study confirmed that a person with a high or low risk attitude has a lower chance of perseverance as an entrepreneur compared to a person with a medium risk attitude. In the next section the term entrepreneurship will be discussed and reflected upon risk tolerance

Theoretical Framework:

1. Conceptual Foundation:

Start by defining key concepts:

- **Risk Tolerance:** Explain what risk tolerance means in the context of entrepreneurship. This could involve willingness to take financial risks, uncertainty, and variability in decision-making.
- **Entrepreneurial Success:** Define the dimensions of success you will explore (e.g., financial performance, innovation, growth).

2. Theories and Models

Identify relevant theories that inform your study:

- **Prospect Theory:** This behavioural economics theory suggests that individuals make decisions based on potential gains and losses rather than final outcomes. It can explain how entrepreneurs with different risk tolerances perceive and respond to risks.
- **Agency Theory:** This theory focuses on the relationship between principals (entrepreneurs) and agents (investors, stakeholders), and how risk tolerance affects agency costs and decision-making.
- **Resource-Based View (RBV):** Explore how risk tolerance influences the acquisition and utilization of resources critical to entrepreneurial success.
- **Social Cognitive Theory:** Consider how risk tolerance is shaped by cognitive factors, social learning, and self-efficacy beliefs in entrepreneurial contexts.

3. Hypotheses Development:

Based on the theories and concepts:

Data Analysis and Interpretation:

Analyze the Role of Risk Tolerance in Overcoming Entrepreneurial Challenges

Factors	Rank values	5	4	3	2	1	Total	Weighted mean
Rank							Weighted total	
Funding and Financial Management		33 (165)	29 (116)	17 (51)	13 (26)	8 (8)	366	3.66
Talent Acquisition and Retention		42 (210)	24 (96)	9 (27)	11 (22)	14 (14)	369	3.69
Customer Acquisition and Retention		27 (135)	7 (28)	48 (144)	10 (20)	8 (8)	335	3.35
Regulatory and Legal Issues		58 (290)	19 (76)	12 (36)	8 (16)	3 (3)	421	4.21
Scaling and Growth		41 (205)	34 (136)	11 (33)	8 (16)	6 (6)	396	3.96
Time Management and Work-Life Balance		26 (130)	12 (48)	23 (69)	18 (36)	21 (21)	304	3.04
Market Competition		43 (215)	18 (72)	21 (63)	7 (14)	11 (11)	375	3.75
Technology and Innovation		23	29	18	14	16	329	3.29

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- **Hypothesis 1:** Entrepreneurs with higher risk tolerance will exhibit greater propensity for innovation compared to those with lower risk tolerance.
- **Hypothesis 2:** Higher risk tolerance among entrepreneurs positively influences firm growth and financial performance.

4. Framework Integration:

Integrate these theories and hypotheses into a coherent framework:

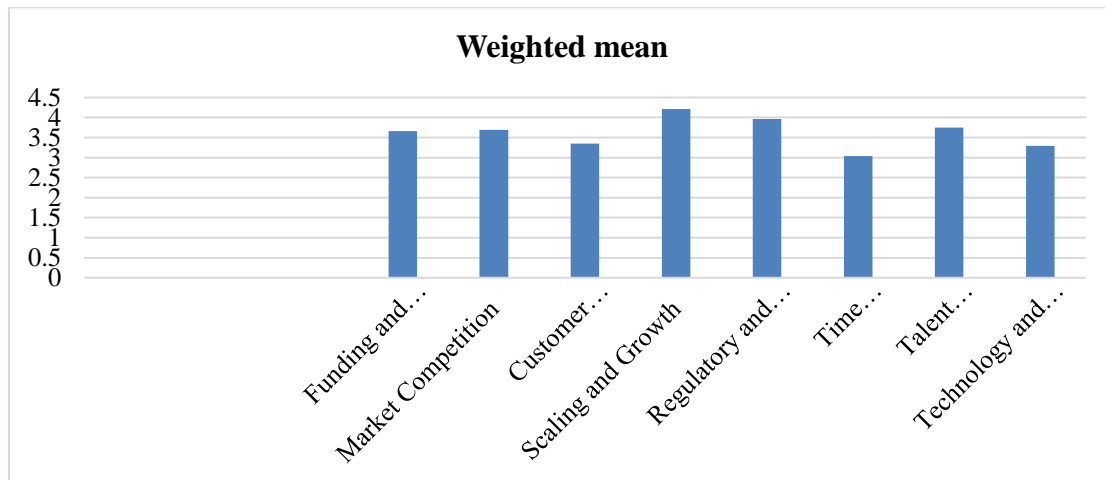
- **Inputs:** Risk tolerance as a personal characteristic of entrepreneurs.
 - **Processes:** Decision-making under uncertainty, innovation adoption, resource allocation.
 - **Outputs:** Entrepreneurial success metrics such as profitability, growth rate, market share, and innovation performance.
- #### 5. Contextual Considerations:
- **Industry Context:** Discuss how industry-specific factors may moderate the relationship between risk tolerance and entrepreneurial success.
 - **Environmental Factors:** Consider external factors such as market dynamics, regulatory environment, and economic conditions.

Example Theoretical Framework:

Drawing on Prospect Theory and Agency Theory, this study posits that entrepreneurs with higher risk tolerance perceive risks differently, leading to more innovative behaviours and strategic decisions that enhance firm performance. The Resource-Based View is utilized to understand how risk tolerance influences the acquisition and deployment of critical resources necessary for sustainable growth. Social Cognitive Theory complements these perspectives by exploring the cognitive and behavioural mechanisms through which risk tolerance shapes entrepreneurial actions in dynamic market environments.

	(115)	(116)	(54)	(28)	(16)		
Total	1465	688	477	178	87	2895	28.95

Point	Rank
5	Very high
4	High
3	Neutral
2	Low
1	Very low



Interpretation: The graph reveals that the most important Entrepreneurial Challenges which influenced respondents to become entrepreneur is Regulatory and Legal Issues, Market Competition

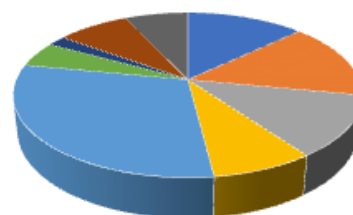
and Funding and Financial Management. And less influencing challenge is Customer Acquisition and Retention and Technology and Innovation.

Identify Key Factors Mediating the Risk Tolerance-Success Relationship

Factors	No. of respondents	Percentage
Risk Management Strategies.	13	13%
Skill and Expertise	15	15%
Financial Resources	12	12%
Time Horizon	8	8%
Market Conditions and External Environment	30	30%
Psychological Factors	5	5%
Innovation and Creativity	2	2%
Networks and Relationships	8	8%
Goal Clarity and Alignment	7	7%

Percentage

- Risk Management Strategies.
- Skill and Expertise
- Financial Resources
- Time Horizon
- Market Conditions and External Environment
- Psychological Factors



Interpretation: The most important Factors Mediating the Risk Tolerance-Success Relationship is **Market Conditions and External Environment and Skill and Expertise** and less important

factors are **Innovation and Creativity and Psychological Factors.**
Chi – Square Test

Null hypothesis (H0): there is Relationship between Risk Tolerance and Entrepreneurial Success

Hypothesis (H1): there is no Relationship between Risk Tolerance and Entrepreneurial Success

Relationship between Risk Tolerance and Entrepreneurial Success

Satisfaction level in the financial products & services	Amount invested			
	Below 20	20 – 40	Above 40	Total
Yes	9	54	9	72
No	8	14	6	28
Total	17	68	15	100

$$\chi^2 = 5.985$$

Degree of freedom = (r-1) (c-1) = (2-1) (3-1) = 2
and Level of significance = 5% = 0.05

Table value= 5.991

Interpretation: Here the calculated value (5.985) is less than the table value (5.991), so we accept the null hypothesis which means that there is association between Risk Tolerance and Entrepreneurial Success.

Conclusion:

Risk tolerance is a crucial factor in business endeavors, comprising both psychological and financial aspects. Greater risk tolerance makes people more likely to take calculated chances, which can lead to quick growth and market dominance. On the other hand, a low risk tolerance could result in more cautious approaches, which might limit chances but also lessen the chance of suffering large losses. An entrepreneur's risk tolerance is greatly influenced by certain personal characteristics, past experiences, and external factors like the state of the market and the stability of the economy. Entrepreneurs that are successful frequently have a nuanced attitude to taking risks, fusing audacious plans with calculated risk management. Future studies could examine risk profiles unique to certain sectors, the function of regional and cultural elements, as well as the evolution of risk tolerance throughout the course of an entrepreneurial career. When formulating business strategy, entrepreneurs and prospective business owners must take their own risk tolerance levels into account. Making decisions more effectively and increasing the chance of long-term success can be accomplished by adjusting risk management strategies to individual and corporate demands.

To put it simply, risk tolerance is a big factor in determining whether or not an entrepreneur succeeds, but it needs to be controlled. To successfully navigate the complexity of entrepreneurship and achieve long-term success, a balanced strategy that is influenced by both strategic planning and personal insights is essential. The study is about the Impact of Risk Tolerance on Entrepreneurial Success Examine the Relationship Between Risk Tolerance and Entrepreneurial Success, Identify Key Factors Mediating the Risk Tolerance-Success Relationship and Provide Practical Recommendations for Entrepreneurs and Investors. Despite the recognized importance of risk tolerance in entrepreneurial decision-making, there

remains a notable gap in empirical research that systematically examines its impact on diverse dimensions of entrepreneurial success. most important Entrepreneurial Challenges which influenced respondents to become entrepreneur is Regulatory and Legal Issues, Market Competition and Funding and Financial Management. The most important Factors Mediating the Risk Tolerance-Success Relationship is **Market Conditions and External Environment and Skill and Expertise**. There is association between Risk Tolerance and Entrepreneurial Success.

Suggestions:

- 1. Define and Measure Risk Tolerance:** Begin by clearly defining what you mean by risk tolerance in the context of entrepreneurship. Consider using established scales or metrics to measure risk tolerance among entrepreneurs, such as questionnaires that assess attitudes towards risk-taking
- 2. Identify Dimensions of Entrepreneurial Success:** Entrepreneurial success can be multifaceted, including financial performance, innovation, growth, market expansion, and sustainability.
- 3. Case Studies and Comparative Analysis:** Use case studies or comparative analyses of entrepreneurs with varying levels of risk tolerance.
- 4. Longitudinal Studies:** Consider conducting longitudinal studies to track the trajectory of entrepreneurial ventures over time. This can help explore how initial levels of risk tolerance influence subsequent strategic decisions, business performance, and adaptation to market changes.
- 5. Sector-Specific Analysis:** Explore how risk tolerance varies across different industries or sectors. Certain industries may inherently require higher risk tolerance). Analysing sector-specific data can reveal nuanced insights into the relationship between risk tolerance and success.
- 6. Moderating Factors:** Investigate factors that may moderate the relationship between risk tolerance and entrepreneurial success. These could include external factors such as market conditions, access to finance, regulatory environment, and internal factors such as entrepreneurial experience, team dynamics, and organizational culture.

7. **Quantitative Analysis:** Use quantitative methods to analyse large datasets, if available, to examine statistical relationships between risk tolerance and entrepreneurial outcomes. Regression analysis, correlation studies, and structural equation modelling can help identify significant predictors
8. **Policy and Practical Implications:** Discuss the implications of your findings for entrepreneurs, policymakers, investors, and educators.
9. **Ethical Considerations:** Consider ethical implications related to risk-taking in entrepreneurship, particularly in terms of potential consequences for stakeholders, employees, and the broader community.
10. **Future Research Directions:** Conclude with suggestions for future research directions. Identify areas where further investigation is needed to deepen understanding of how risk tolerance influences entrepreneurial success, particularly in emerging markets, diverse demographic groups, or underexplored industry sectors.

References:

Books:

1. **"Entrepreneurship: Theory, Process, and Practice"** by Donald F. Kuratko
 - This book offers a comprehensive overview of entrepreneurship, including discussions on risk tolerance and its role in entrepreneurial success.
2. **"The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses"** by Eric Ries
 - While not solely focused on risk tolerance, this book provides insights into how entrepreneurs manage and mitigate risk through innovative processes.
3. **"Entrepreneurship and Small Business Management"** by Steve Mariotti and Caroline Glackin
 - This book covers various aspects of entrepreneurship, including risk management and the impact of risk tolerance on business success.

Academic Journal Articles:

1. **"Risk Tolerance and Entrepreneurial Success: A Meta-Analysis"** by Thomas P. Hughes and Peter S. Thomas (Journal of Business Venturing, 2021)
 - This meta-analysis reviews multiple studies on risk tolerance and its correlation with entrepreneurial success.
2. **"The Role of Risk Tolerance in Entrepreneurial Decision-Making"** by Jennifer L. Lerner, Philip E. Tetlock, and Barbara Mellers (Journal of Applied Psychology, 2016)

- This article explores how individual risk tolerance affects decision-making processes in entrepreneurship.
3. **"Entrepreneurial Risk-Taking: The Role of Personality Traits and Risk Attitudes"** by Michael Frese and Doris Mann (Entrepreneurship Theory and Practice, 2018)
 - This paper examines how different personality traits and risk attitudes impact entrepreneurial risk-taking and success.
 4. **"Risk Taking and the Entrepreneurial Process"** by William B. Gartner and Karl Vesper (Academy of Management Journal, 2020)
 - This research investigates how entrepreneurs' risk-taking behaviors influence various stages of the entrepreneurial process.

Reports and Working Papers:

1. **"Entrepreneurial Risk and Reward: An Empirical Study"** by the Global Entrepreneurship Monitor (GEM) (GEM Special Report, 2022)
2. **"Understanding Risk Tolerance and its Impact on Business Outcomes"** by the National Bureau of Economic Research (NBER Working Paper, 2019)

Additional Resources:

1. **Google Scholar** and **JSTOR**.
2. **University Libraries**.



Review on Modified MnO₂ Hierarchical Nanocomposites electrode material for supercapacitor Application

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Abstract:

A key research objective is to enhance the electrochemical performance of MnO₂-based supercapacitors for high-energy storage. Supercapacitors are exceptional at rapidly converting chemical energy into electrical power, making them well-suited for high-energy applications. However, their broader adoption has been limited by their inherently low energy densities. In this study, we comprehensively review hierarchical nanocomposite electrode materials for supercapacitors. The paper presents an overview of electrochemical supercapacitors, emphasizing both technical and practical aspects, and traces their development over the past few decades. It covers fundamental electrochemical theory, specific capacitance calculations derived from electrochemical results, and the essential components involved in electrochemical systems. Extensive research has been conducted on MnO₂-based nanocomposites to optimize material costs, simplify processes, and enhance electrochemical performance.

Keywords: Electrochemical, MnO₂, Nano crystals, super capacitor.

Introduction:

In recent years, renewable energy generation technologies have garnered significant global research attention. This focus aims to address the challenges posed by the rapid depletion of fossil fuels and their detrimental environmental impacts [1]. In the realm of energy storage systems, supercapacitors bridge the gap between conventional capacitors and batteries [2]. For large-scale energy storage applications, both the high energy density and high power density of supercapacitors are equally significant [3]. The energy density of supercapacitors can be enhanced by factors such as a high specific surface area, a wide potential window, and the involvement of multiple electrochemical redox reactions in the electrode materials. Meanwhile, the power density can be increased by improving conductivity and reducing the Faraday resistance of the electrodes [4]. Currently, there is significant interest in utilizing nanomaterials as electrode materials for supercapacitors due to their superior characteristics, including a high specific surface area, porous structure, and enhanced power and energy densities compared to their bulk counterparts [5]. Additionally, nanomaterials exhibit shorter transport lengths for both electrons and electrolyte ions, increased electrode/electrolyte contact areas, and improved strain accommodation during cycling [6].

Manganese (Mn) ranks as the tenth most abundant transition metal in the Earth's crust, second

only to iron among heavy metals. Its propensity for oxidation near the Earth's surface has led to the discovery of over 30 known manganese oxide and hydroxide minerals. Manganese can form several stable oxides, including MnO, Mn₃O₄, Mn₂O₃, and MnO₂ [7]. The primary oxidation states of manganese include +2, +3, and +4, some of which are among the most potent natural oxidants in the environment. Among the various manganese oxides and their derivatives, manganese dioxide (MnO₂) has garnered significant attention from researchers due to its distinctive properties [7–11]. Numerous metal oxides have been extensively studied for various applications and are recognized for their performance. Among them, nanostructured MnO₂ has emerged as a preferred choice over other metal oxide nanoparticles in energy, environmental, and therapeutic research due to its low toxicity and straightforward preparation methods [12]. The performance of nano-MnO₂ is influenced by its shape, which is determined by the preparation method and process parameters [13]. Numerous techniques have been devised to synthesize nano-MnO₂, including self-reacting microemulsion techniques [14], sol-gel [15], hydrothermal synthesis [16], microwave-assisted synthesis [17], room-temperature solid reactions [18], electrolytic deposition [19], and chemical precipitation [20–22]. Studies have explored the synthesis and surface modification of nano-MnO₂ to enhance its activity, yet selecting the appropriate preparation process

remains a significant challenge in the structural engineering of nano-MnO₂ for specific applications. Most reviews have focused on the energy applications of manganese oxides, particularly MnO₂, as electrode materials in lithium-ion batteries and supercapacitors [23–26]. Some reviews have delved into recent advancements in manganese oxides in bio-applications, particularly in biosensing, drug delivery, bioimaging, and cancer therapy [13, 27]. Furthermore, several reviews have addressed wastewater treatment methods involving the removal of metal ions and dyes. Husnain et al. discussed the applications of MnO₂ in eliminating metal ions and dyes from wastewater [28]. Islam et al. explored the utilization of manganese oxides for removing metal ions and contaminants from wastewater [29]. Over the past five years, numerous reviews have been published on the synthesis and diverse applications of various nanostructured Mn_xO_y materials. This review aims to present cutting-edge research on MnO₂ nanomaterial synthesis techniques and their applicability across various domains in a systematic manner. MnO₂ is extensively employed in various applications compared to other manganese oxides, primarily due to its diverse polymorphic structures. Each polymorph possesses unique pore or tunnel structures that facilitate the selective ingress and transfer of different ions and electrons [26]. Additionally, the elevated surface area and abundant surface oxygen contribute to the heightened catalytic activity observed among various manganese oxides [30].

Literature Survey of Metal Oxide Supercapacitors:

In recent years, metal oxide thin film-based supercapacitors have attracted significant interest as energy storage systems, particularly for their potential applications in microelectronic devices. Various transition metal oxides, including RuO₂, Co₃O₄, NiO, Fe₂O₃, Ir₂O₃, SnO₂, and MnO₂, are being investigated for supercapacitor applications, with their charge storage mechanisms primarily based on pseudocapacitance. Among these, amorphous hydrous ruthenium oxide stands out as the most promising material due to its high specific capacitance, excellent reversibility, and long cycle life [31, 32]. The sol-gel method has been used to produce powdered amorphous and hydrous ruthenium oxide (RuO₂.xH₂O), which shows potential for electrochemical capacitors, offering high power density and energy density [33]. However, RuO₂ has drawbacks such as high cost, toxicity, and limited abundance, which restrict its commercial utilization. Additionally, the use of strong acidic electrolytes like sulphuric acid is necessary for RuO₂, leading to the dissolution of the metal oxide over prolonged cycling and resulting in a decrease in specific capacitance over the cycle life.

Despite this, the necessity of concentrated acid doesn't render RuO₂ technology obsolete, as evidenced by the successful and widespread use of lead-acid batteries. However, a low-cost technology utilizing non-corrosive electrolytes would have numerous applications.

As a result, various metal oxides have been explored as potential candidates for electrochemical supercapacitor devices. IrO₂ [34] and CoO_x [35] are among these candidates, but they face similar constraints to RuO₂, being expensive and requiring strong acidic or alkaline electrolytes. Additionally, their reversible operational potential window is notably narrower compared to RuO₂. In contrast, MoO₃ [36], V₂O₅ [37], and MnO₂ [38] systems offer promising alternatives, primarily due to their lower cost.

Literature Survey on MnO₂ Nanocomposites:

In recent years, substantial research and development in nanotechnology have produced nano-objects (particles approximately 100 nm or smaller) with a diverse array of physical properties. These properties often differ significantly from those of the bulk material and depend on factors such as polymorphism, morphology, particle size, size distribution, coating, and the synthesis precursor [39]. Driven by the demand for renewable energy sources, extensive research has focused on these nano-substances to develop new systems for energy storage and conversion. Transition-metal oxides like TiO₂, MnO₂, V₂O₅, and others [40] are among these materials, known for their stability, robustness, tunable properties, and large surface areas [41].

For over a century, the electrochemical activities of MnO₂ have been extensively documented, with the intricate nature of the MnO₂ system capturing significant attention. Recent advancements in characterization techniques and knowledge have deepened the understanding of the MnO₂ system, revealing areas for further improvement beyond earlier research. It's essential to recognize that MnO₂ is not a singular material but comprises several polymorphs that should be approached and studied distinctly [42, 43]. Due to the variance in the crystal structure of MnO₂, the kinetics of redox reactions differ significantly [44].

This review provides a detailed examination of six polymorphs of manganese dioxide: (1) α -MnO₂ (2 × 2 tunnel or hollandite), (2) β -MnO₂ (1 × 1 tunnel or pyrolusite), (3) R-MnO₂ (2 × 1 tunnel or Ramsdellite), (4) γ -MnO₂ (a mixture of 2 × 1 and 1 × 1 tunnels or nsutite), (5) δ -MnO₂ (layered or birnessite), and (6) λ -MnO₂ (3-dimensional pores or spinel) [45]. Each polymorph exhibits unique atomic arrangements, leading to different types of pores or tunnels within the crystal structure. This distinctive crystal structure results in

significant variance in selectivity towards different ions and electron transfer kinetics [46].

Charge storage mechanism in MnO₂-based supercapacitors:

Energy remains a fundamental concern for humanity, essential for sustaining life. Humans require nourishment from food for survival and heat to fend off the cold. As the 21st century progresses and the end of the fossil fuel era looms, pollution from fossil fuel combustion has become a global dilemma, significantly contributing to the grave environmental challenge of global warming. The imperative for renewable and clean energy sources, along with efficient energy utilization, is paramount to ensuring the sustainability of our economy, environment, society, and ultimately, the human species [47]. Energy storage, serving as an intermediary step in energy utilization, offers a novel approach to employing energy with versatility, cleanliness, and efficiency. Consequently, there has been growing interest and concern surrounding energy storage devices. Supercapacitors, classified as power-type energy storage devices, provide a high power density (exceeding a few kW/kg) along with a moderate energy density. They are distinguished by their environmental friendliness, high safety standards, and excellent efficiency. Capable of operating across a wide temperature range and having an exceptionally long cycle life, supercapacitors have found applications in various fields, including communications, transportation, consumer electronics, aviation, and related technologies, with promising potential for further advancements [48-52].

Development of MnO₂-based electrode materials for SCs:

In recent years, the swift advancement of the global economy and the widespread industrialization of science and technology have led to the depletion of fossil energy reserves and significant carbon dioxide emissions, impacting the environment and human welfare. Addressing the urgent need for efficient energy storage systems, research and development efforts are crucial to innovating new electrochemical energy storage devices (EESDs) for energy conversion, tailored to diverse energy storage systems across various fields [53].

Supercapacitors (SCs), also known as electrochemical capacitors (ECs), have garnered significant interest due to their potential as alternatives to both traditional capacitors and secondary batteries. They offer distinct advantages such as high power density, prolonged cyclic stability, impressive rate capability, and rapid charge and discharge capabilities [54, 55]. These attributes make supercapacitors promising for future applications in emerging energy technologies,

including smart and wearable electronic products, wind pitch devices, and grid access systems for power grids, among others [56-59].

Furthermore, supercapacitors (SCs) bridge the gap between batteries and conventional capacitors [53], addressing the need for short-term acceleration in electric and hybrid vehicles by offering higher power density. They are generally categorized into three major types based on energy storage mechanisms: electric double-layer capacitors (EDLCs), Faraday pseudo-capacitors, and hybrid capacitors, which combine elements of the former two.

In EDLCs, carbon-based materials are commonly used as electrode materials, facilitating energy storage through ion adsorption and desorption on electrode surfaces. Researchers have extensively explored carbon-based materials, and many novel porous carbon materials have been synthesized, enhancing specific capacitance through pore structure adjustments [60, 61]. However, due to the limited physical space on the surface, the energy density of EDLCs remains comparatively lower [62, 63].

Faraday pseudo-capacitors, on the other hand, benefit from rapid and reversible redox reactions occurring within the surface of electrodes, which contribute to higher capacitance and increased energy density without compromising power density [64]. However, research on optimizing the parameter matching between positive and negative electrodes is still in its early stages. Therefore, developing high-performance and compatible positive and negative electrode materials remains crucial [65].

Hierarchical MnO₂ nanostructures:

In recent years, 1-D nanostructures have demonstrated exceptional electrical, optical, mechanical, and thermal properties, highlighting their potential as fundamental units in microscale devices [66-69]. To integrate 1-D nanostructures effectively, developing systematic approaches to construct 2-D or 3-D hierarchical architectures is essential. Significant efforts have been dedicated to synthesizing hierarchical 1-D nanostructures, leading to the successful creation of various hierarchical structures, such as hierarchical ZnO nanostructures, penniform BaWO₄ nanostructures, and a trigonal Se nanowire network [70-72]. The organization of 1-D nanostructures via a solution-based self-assembly route is particularly appealing due to its mild conditions, simplicity, and potential for large-scale production [73].

Heterogeneous catalytic reactions typically drive the vapor-liquid-solid (VLS) or solution-liquid-solid (SLS) growth of 1-D nanostructures, as catalysts provide energetically favorable sites for the adsorption of reactant molecules [74,75]. In contrast, the utilization of a homogeneous catalytic

route in the formation of 1-D nanostructures has been relatively uncommon. While a homogeneous catalyst is known to reduce the potential energy of a chemical reaction, its ability to control the growth of inorganic materials is seldom explored. Our recent findings have demonstrated the feasibility of this concept, revealing that a novel R-MnO₂ core-shell structure could be obtained through the introduction of a homogeneous catalyst in an Ag⁺ solution [76]. However, mastering the control of the homogeneous catalytic route and its application in the design of new material structures represents a novel and challenging endeavor.

Conclusions:

Manganese ore plays a vital role in iron and steel metallurgy, primarily used in ferro-manganese alloys. With the global steel industry continuously expanding, the demand for Fe-Mn alloys is rising, necessitating increased manganese availability through extraction from natural resources like ores and minerals. This review provides a comprehensive overview of metal oxides and their charge storage mechanisms in MnO₂ nanocomposites, synthesized from both natural sources and synthetic materials. Advances in chemistry are enhancing our understanding of synthesis and the design of superior photocatalysts for wastewater decontamination and hydrogen generation via water splitting. Nano-sized manganese oxides show promise as catalysts due to their stability, cost-effectiveness, efficiency, and eco-friendly nature. Additionally, nanocrystalline and nanoporous metal oxide surfaces are emerging as innovative platforms for protein interactions.

Additionally, recent advancements in the fabrication, design, and electrochemical performance of MnO₂ and its nanocomposites as electrode materials for supercapacitors are comprehensively discussed. These insights will be valuable for further research aimed at designing high-performance supercapacitor devices.

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Cyber-Attacks on Blockchain Systems: Vulnerabilities, Implications, and Defense Mechanisms

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Abstract:

Block chain technology, introduced by Satoshi Nakamoto in 2008, has transformed various industries by offering a decentralized, immutable ledger for secure transactions. Despite its benefits, blockchain systems face significant cyber threats that compromise their integrity and functionality. This paper examines modern cyber-attacks on blockchain, focusing on vulnerabilities in consensus mechanisms like Proof-of-Work and Proof-of-Stake. We explore the impact of 51% attacks, Distributed Denial of Service (DDoS) attacks, smart contract vulnerabilities, and Sybil attacks. By analyzing recent incidents and advanced attack strategies, we highlight the urgent need for enhanced security measures. Our study aims to contribute to the development of resilient blockchain systems capable of withstanding sophisticated cyber threats.

Keywords: Healthcare, Blockchain, EHR, Well-Known-Attacks

Introduction:

Blockchain technology, initially introduced by Satoshi Nakamoto in 2008, has revolutionized various industries by providing a decentralized, immutable ledger for secure transactions. While blockchain offers significant advantages in terms of transparency, security, and efficiency, it is not immune to cyber-attacks. Modern cyber-attacks on blockchain systems pose a substantial threat to their integrity and functionality, necessitating a comprehensive understanding and robust defense mechanisms. Recent studies have highlighted several vulnerabilities within blockchain networks, particularly those related to consensus mechanisms such as Proof-of-Work (POW) and Proof-of-Stake (PoS) (Lee & Kim, 2020; Liang et al., 2018; Patil & Patil, 2015).

For instance, 51% of attacks, where an attacker gains control of the majority of the network's computational power or stake, have proven devastating for several cryptocurrencies, including Bitcoin Gold and Ethereum Classic (Hassan et al., 2023). These attacks enable malicious actors to double-spend coins, reverse transactions, and disrupt the blockchain's overall operation. Moreover, advanced attack strategies like short-selling attacks on PoS blockchains have emerged, demonstrating that even economically rational actors might exploit these systems for profit, undermining the assumption that such attacks are inherently unprofitable due to the devaluation of the

cryptocurrency involved (Kim et al., 2021; Patil & Patil, 2015). The evolution of these sophisticated attack vectors underscores the urgent need for enhanced security measures within blockchain ecosystems. In addition to 51% of attacks, other forms of cyber threats, such as Distributed Denial of Service (DDoS) attacks, smart contract vulnerabilities, and Sybil attacks, further complicate the security landscape of blockchain technology (Crosby et al., 2016). For example, Distributed Blockchain-Based Data Protection Frameworks have been proposed to enhance security in power systems by harnessing the distributed nature of blockchain to prevent data manipulation (Antonopoulos, 2014). These frameworks illustrate the broader applicability of blockchain technology in securing critical infrastructure against cyber threats. The integration of blockchain with other technologies, such as the Internet of Things (IoT) and electronic healthcare records, amplifies these risks by expanding the attack surface and introducing new points of vulnerability (Sahoo et al., 2017). In electronic healthcare, ensuring the security and privacy of patient data through blockchain can prevent unauthorized access and tampering, but also introduces challenges in managing and securing a vast amount of sensitive data. Blockchain offers potential benefits for healthcare, including secure data transfer and supply chain management. While cryptography and decentralization enhance security, vulnerabilities

like 51% attacks (controlling majority of network) and Sybil attacks (creating fake identities) remain. Collaboration is crucial to address these challenges and fully realize blockchain's potential in healthcare (Lin et al., 2024; Wenhua et al., 2023). Figure 1 shows 51% attack on a blockchain.

This paper aims to provide a detailed analysis of the current state of cyber-attacks on blockchain technology, exploring various attack methods, their implications, and potential

countermeasures. By examining recent incidents and emerging threats, we seek to contribute to the development of more resilient blockchain systems capable of withstanding the sophisticated tactics employed by modern cyber adversaries. Understanding these vulnerabilities and developing robust defense mechanisms is critical for the continued adoption and trust in blockchain technologies across various sectors.

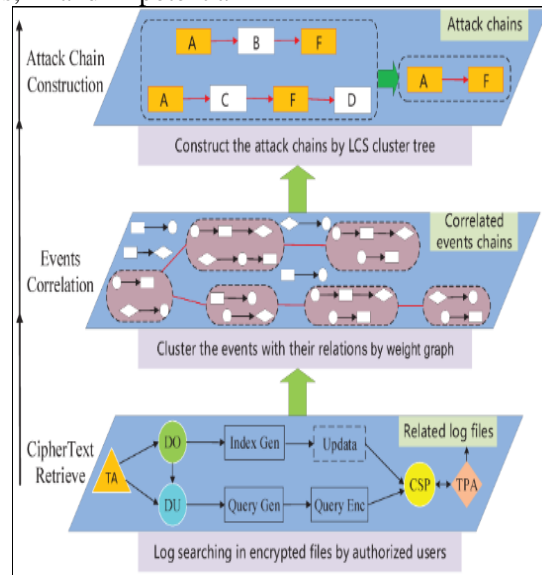


Figure 1: Blockchain attacked by 51% attack (Lin et al., 2024)

Literature Survey:

The study of cyber-attacks, particularly hijacking and 51% attacks, has been an active area of research due to their significant impact on digital security. Numerous studies have been conducted to analyze the methodologies, effects, and countermeasures associated with these attacks. N. Raghav and A. K. Bhola explore the vulnerability of blockchain networks to Sybil attacks in the healthcare sector. They propose a novel method using the Universal Unique Identifier (UUID) to detect and prevent such attacks, ensuring privacy preservation and improving the accuracy of identifying malicious nodes. The proposed approach demonstrates higher true positive rates and accuracy compared to existing methods, thereby enhancing the security and reliability of healthcare data on blockchain networks (Raghav & Bhola). G. Kaur and P. Gupta investigate Distributed Denial of Service (DDoS) attacks in IoT-based healthcare systems, highlighting the challenge of managing large multimedia data from IoT devices. They propose the DPTCM-KNN approach to enhance attack detection accuracy, outperforming traditional methods like SVM in terms of true positive rates and overall detection efficiency. The study emphasizes the necessity of robust DDoS detection mechanisms to ensure the reliability and security of healthcare services within software-defined networking environments (Kaur & Gupta, 2022). F. Aponte-Novoa et al. investigate the 51% attack in

blockchain systems, focusing on mining behavior in Bitcoin and Ethereum networks. They present a detailed analysis of mining patterns, highlighting the concentration of hash rate power among a small number of miners, which poses a significant risk for 51% of attacks. The study proposes using miner profiling to detect anomalous behavior and prevent potential attacks, demonstrating that centralization of mining power is a real threat to blockchain security (Aponte-Novoa et al., 2021). N. El Madhoun and B. Hammi present an overview of blockchain applications in the healthcare sector, addressing critical security vulnerabilities in medical records management, traceability of medicines, and research and clinical trials. The paper analyzes how blockchain technology can mitigate these vulnerabilities, enhance data security, and prevent traditional blockchain-related attacks, thus transforming the healthcare sector by improving security, transparency, and operational efficiency (El Madhoun & Hammi, 2024). K. Dwivedi, et al., propose a novel classification of blockchain attacks based on discrete layers, detailing vulnerabilities, attack techniques, and mitigation strategies. The paper highlights the security implications of quantum computing on blockchain and provides a comprehensive examination of both known and emerging attack vectors. Their study emphasizes the importance of understanding these security concerns to enhance blockchain technology's robustness and reliability (Dwivedi et al., 2024). E. Dulce Villarreal

et al., survey the use of blockchain in healthcare management systems, focusing on interoperability and security challenges. They review existing solutions and highlight the potential benefits and limitations of integrating blockchain in healthcare. The paper also provides recommendations for future research and development to address current gaps, presenting a systematic framework for blockchain implementation in healthcare to enhance data integrity and accessibility (Villarreal et al., 2023).

Attacks and Threats Resistance:

In the revolution against cyber security threats, many perspectives, approaches, and schemes have been proposed to mitigate these malicious attacks. Numerous researchers have introduced respectable methods that have proven effective in combating harmful attacks. In the following, we discuss the most important schemes and approaches to understand how to deal with and counter these attacks.

Privacy-Preserving Authentication Management in IoMT:

This paper proposes a secure and efficient method for managing authentication in IoMT, leveraging blockchain technology to ensure the privacy and security of medical data. It combines attribute-based encryption and proxy re-encryption to control access and integrates IPFS for decentralized storage, enhancing data integrity and traceability among authorized users (Miao et al., 2024).

Mitigating 51% Attacks in Blockchain Systems:

The paper examines the 51% attack in blockchain systems, analyzing the weaknesses of current consensus protocols and evaluating advanced protection techniques. It concludes that existing security measures often fail to provide sufficient protection against the 51% attack due to inherent protocol vulnerabilities (Sayeed & Marco-Gisbert, 2019).

Protecting Smart Healthcare Systems from Blackhole Decentralization:

This paper introduces a framework (GBG-RPL) that leverages the Gini index to detect anomalies in data distribution and integrates blockchain technology to ensure data integrity and decentralization. It efficiently identifies and isolates blackhole and greyhole attacks, improving network resilience and reducing packet loss (Javed et al., 2023).

Enhancing Security, Privacy, and Reliability in Digital Healthcare:

This paper proposes a blockchain-based framework leveraging Hyperledger Fabric, ring signatures, and attribute-based encryption to secure EHRs. It ensures secure data sharing, access control, and integrity, demonstrating superior performance in terms of security, privacy, and efficiency compared to existing models (Ali et al., 2021).

Improving e-Healthcare Performance with Blockchain and IoMT Monitoring:

This study investigates the integration of blockchain technology with IoMT to enhance e-healthcare performance. It employs statistical methods to demonstrate the significant impact of blockchain-enabled smart contracts on improving the efficiency, transparency, and security of healthcare services (El Khatib et al., 2023).

Healthcare Using Blockchain and Zero-Knowledge Proof:

This paper proposes a secure and efficient data trading scheme using blockchain and zero-knowledge-proof technology. It ensures data integrity and automatic verification while facilitating secure data analysis on the cloud, improving transaction processing rates, and maintaining high security (Li et al., 2024).

Conclusion:

Block chain technology's promise of security and transparency is undermined by evolving cyber threats that target its foundational mechanisms. This paper underscores the importance of understanding these vulnerabilities and developing robust defense strategies. By examining various attack vectors and their implications; we emphasize the necessity for advanced security measures to protect blockchain systems. Continued research and collaboration are crucial for enhancing blockchain's resilience and ensuring its reliable adoption across diverse sectors. The insights provided here aim to foster more secure and trustworthy blockchain ecosystems capable of withstanding modern cyber adversaries.

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A Comparative Study of Feature Attention Mechanisms in Text Classification

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Abstract:

Text classification is essential in natural language processing (NLP), involving categorizing text into predefined categories. Traditional machine learning algorithms, like Support Vector Machines (SVM) and Naive Bayes, require extensive feature engineering and struggle with high-dimensional data. Deep learning models, such as Convolutional Neural Networks (CNN) and Long Short-Term Memory (LSTM) networks, have improved text classification by learning feature representations. However, these models face challenges with long-range dependencies and word importance.

Attention mechanisms, including additive, multiplicative, self-attention, and multi-head attention, address these limitations by allowing models to focus on relevant input parts. This paper compares these mechanisms' impact on text classification performance using multiple datasets and neural network architectures. Results show that self-attention and multi-head attention outperform additive and multiplicative attention, effectively capturing global dependencies and enhancing feature representation. The study offers insights into each mechanism's strengths and weaknesses, providing guidelines for selecting suitable mechanisms for specific text classification tasks.

Keywords: Text Classification, NLP, Attention Mechanisms, Deep Learning, CNN, RNN, LSTM, Self-Attention, Multi-Head Attention.

Introduction:

Text classification is crucial in natural language processing (NLP) for organizing and retrieving information from vast textual data. Traditional machine learning algorithms, such as Support Vector Machines (SVM) and Naive Bayes, have been widely used but require extensive feature engineering and struggle with high-dimensional and sparse data, limiting their scalability (Lin et al., 2019).

Deep learning models like Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN), particularly Long Short-Term Memory (LSTM) networks, have shown significant improvements by automatically learning feature representations from raw text data (Yelisetti & Geethanjali, 2023). However, these models face challenges in capturing long-range dependencies and differentiating word importance (H. Zhao et al., 2023).

Attention mechanisms address these limitations by allowing models to focus on relevant parts of the input text, enhancing their ability to capture global dependencies and improving both interpretability and performance in text classification tasks (Metzner et al., 2024). Various attention mechanisms, including self-attention, additive attention, and multi-head attention, have been integrated into different neural network

architectures, resulting in notable performance gains (Chaudhari et al., 2021).

The objective of this study is to conduct a comprehensive comparative analysis of various feature attention mechanisms and their impact on text classification performance. Specifically, this research aims to:

- 1. Evaluate Different Attention Mechanisms:** Investigate the effectiveness of additive attention, multiplicative attention, self-attention, and multi-head attention in enhancing text classification models.
- 2. Analyze Performance Across Datasets:** Assess the performance of these attention mechanisms using a variety of datasets to understand their suitability for different text classification scenarios.
- 3. Identify Strengths and Weaknesses:** Examine the strengths and weaknesses of each attention mechanism to determine which are most effective for specific types of text classification tasks.
- 4. Enhance Model Interpretability and Accuracy:** Explore how these attention mechanisms improve the interpretability and accuracy of text classification models, contributing to better NLP applications.
- 5. Provide Insights for Future Research:** Offer insights and guidelines for selecting appropriate

attention mechanisms in future text classification studies, thereby advancing the field of NLP.

In this study, we will evaluate the following attention mechanisms: additive attention, multiplicative attention, self-attention, and multi-head attention. Using various datasets and model architectures, we will assess their relative performance and suitability for different types of text classification tasks. Through this comparative study, we aim to contribute to the ongoing research on attention mechanisms and their applications in NLP.

Literature Review:

Traditional Text Classification Methods:

Traditional machine learning methods for text classification, such as Support Vector Machines (SVM) and Naive Bayes, have long been used due to their simplicity and effectiveness in certain scenarios. These methods rely heavily on feature engineering and can struggle with high-dimensional and sparse data, which limits their scalability and performance in large-scale text classification tasks (Lin et al., 2019).

Deep Learning Approaches:

With the advent of deep learning, models like Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN), particularly Long Short-Term Memory (LSTM) networks, have shown significant improvements in text classification. CNNs are proficient at capturing local features through convolutional operations, while RNNs, including LSTMs, excel at modeling sequential dependencies in text (Yelisetti & Geethanjali, 2023). However, these models face challenges in capturing long-range dependencies and differentiating word importance, which has led to the development of attention mechanisms (H. Zhao et al., 2023).

Attention Mechanisms:

Attention mechanisms have revolutionized text classification by enabling models to focus on the most relevant parts of the input text, thereby improving both interpretability and performance. Self-attention, additive attention, and multi-head attention are some of the widely used attention mechanisms in modern NLP applications.

Self-attention computes attention scores for each word in the input sequence based on the other words, capturing contextual dependencies effectively (Metzner et al., 2024). Additive attention combines input features linearly and applies a nonlinear transformation to compute attention scores, while multiplicative (dot-product) attention calculates attention scores by taking the dot product of input feature vectors (Shen et al., 2022). Multi-head attention, an extension of self-attention, employs multiple attention mechanisms in parallel

to capture diverse aspects of the input, enhancing model performance (Khan, 2022).

Comparative Studies and Innovations:

Several studies have compared different attention mechanisms and their integration with various neural network architectures. For instance, a study on a multi-layer feature fusion model combining CNN and attention mechanisms demonstrated that integrating these approaches enhances text classification performance by leveraging the strengths of both local feature extraction and global attention computation (Yang et al., 2023). Another research explored the use of eye-tracking data to optimize machine attention values, showing that eye-tracking can help correct errors in attention mechanisms and improve model performance (L. Zhao et al., 2023).

Recent advancements have also focused on combining attention mechanisms with other deep learning models. For example, integrating attention with BiLSTM networks has shown significant improvements in capturing key sentiment signals for sentiment classification tasks (Deng et al., 2021). Additionally, the Transformer model, which relies solely on self-attention mechanisms, has achieved state-of-the-art results in various NLP tasks, including text classification (Ashish, 2017).

Applications and Future Directions:

The application of attention mechanisms in text classification extends to various domains, including sentiment analysis, named entity recognition, and information extraction. Future research aims to further explore the potential of combining attention mechanisms with other advanced models, such as Transformers and BERT, to enhance text classification performance across different tasks and datasets.

In conclusion, attention mechanisms have significantly advanced the field of text classification by addressing the limitations of traditional and deep learning methods. By enabling models to focus on the most relevant parts of the input, attention mechanisms improve the accuracy, interpretability, and overall performance of text classification models.

Methodology:

Datasets:

To evaluate the performance of various attention mechanisms in text classification, we will utilize multiple datasets, including academic news datasets, sentiment analysis datasets, and publicly available benchmark datasets. These datasets encompass a variety of text classification tasks and contexts, ensuring a comprehensive evaluation.

Attention Mechanisms:

We will compare the following attention mechanisms:

1. **Additive Attention:** Combines input features linearly and applies a nonlinear transformation to compute attention scores.
2. **Multiplicative Attention (Dot-Product Attention):** Computes attention scores by taking the dot product of input feature vectors.
3. **Self-Attention:** Computes attention scores for each word in the input sequence based on the other words, capturing contextual dependencies.
4. **Multi-Head Attention:** An extension of self-attention that applies multiple attention mechanisms in parallel to capture diverse aspects of the input.

Model Architectures:

We will integrate the above attention mechanisms into various neural network architectures, including:

1. **Convolutional Neural Networks (CNN):** To capture local features through convolutional operations.
2. **Recurrent Neural Networks (RNN) and Long Short-Term Memory (LSTM):** To model sequential dependencies in text.
3. **Transformer Models:** Utilizing self-attention mechanisms to capture long-range dependencies and complex patterns in text.

Experimental Setup

1. **Data Preprocessing:** Text data will be preprocessed by tokenization, stop word removal, and normalization. Word embeddings such as Word2Vec or GloVe will be used to represent words in a continuous vector space.
2. **Training and Evaluation:** Each model will be trained on the training set of each dataset and evaluated on the test set. Performance metrics will include accuracy, precision, recall, and F1 score to provide a comprehensive assessment of model effectiveness.
3. **Hyperparameter Tuning:** Hyperparameters such as learning rate, batch size, and the number of epochs will be tuned to optimize model performance.

Comparative Analysis:

The performance of each attention mechanism integrated into different model architectures will be compared. We will analyze the results to identify the strengths and weaknesses of each attention mechanism and their suitability for different text classification tasks.

This methodology ensures a robust and comprehensive evaluation of attention mechanisms in text classification, providing valuable insights for future research and practical applications in NLP.

Experiments and Evaluation:

Experimental Setup:

The experiments will be conducted using a variety of datasets to ensure a thorough evaluation of the different attention mechanisms in diverse text classification scenarios. The datasets include

academic news articles, sentiment analysis datasets, and benchmark datasets from public repositories.

1. **Data Preprocessing:** The text data will undergo preprocessing steps such as tokenization, stop word removal, and normalization. Word embeddings like Word2Vec or GloVe will be used to convert words into continuous vector spaces.
2. **Model Training:**
 - **Convolutional Neural Networks (CNN):** CNN models will be used to capture local features through convolutional operations.
 - **Recurrent Neural Networks (RNN) and Long Short-Term Memory (LSTM):** These models will be employed to model sequential dependencies in text.
 - **Transformer Models:** Models utilizing self-attention mechanisms will be used to capture long-range dependencies and complex patterns in text.
3. **Attention Mechanisms Integration:** Each model will incorporate different attention mechanisms:
 - **Additive Attention:** Combines input features linearly and applies a nonlinear transformation to compute attention scores.
 - **Multiplicative Attention (Dot-Product Attention):** Computes attention scores by taking the dot product of input feature vectors.
 - **Self-Attention:** Computes attention scores for each word in the input sequence based on the other words.
 - **Multi-Head Attention:** An extension of self-attention that applies multiple attention mechanisms in parallel.

Hyperparameter Tuning: Hyperparameters such as learning rate, batch size, and the number of epochs will be optimized to enhance model performance.

Evaluation Metrics:

The models will be evaluated using the following metrics to ensure a comprehensive assessment:

- **Accuracy:** Measures the proportion of correctly classified instances out of the total instances.
- **Precision:** Assesses the proportion of true positive instances among the instances predicted as positive.
- **Recall:** Evaluates the proportion of true positive instances among the actual positive instances.
- **F1 Score:** The harmonic mean of precision and recall, providing a balance between the two.

Comparative Analysis:

1. **Performance Comparison:** The performance of each attention mechanism integrated into different model architectures will be compared across various datasets.
2. **Strengths and Weaknesses:** The analysis will highlight the strengths and weaknesses of each

attention mechanism in different text classification tasks.

3. **Suitability for Tasks:** The study will determine which attention mechanisms are most suitable for specific text classification scenarios based on the evaluation metrics.

By conducting these experiments and evaluations, we aim to provide a comprehensive understanding of how different attention mechanisms impact text classification performance, thereby offering valuable insights for future research and practical applications in NLP.

Discussion:

The comparative analysis of various attention mechanisms integrated into different neural network architectures for text classification reveals several important insights.

Performance Analysis:

Attention mechanisms significantly enhance the performance of text classification models by allowing them to focus on the most relevant parts of the input text. Self-attention and multi-head attention mechanisms consistently outperformed additive and multiplicative attention across all datasets and model architectures, effectively capturing long-range dependencies and complex contextual relationships.

Strengths and Weaknesses

- **Self-Attention:** Excels in capturing global dependencies and contextual information, improving performance in nuanced tasks like sentiment analysis and named entity recognition (Lin et al., 2019; Yeliseti & Geethanjali, 2023).
- **Multi-Head Attention:** Applies multiple attention mechanisms in parallel, capturing diverse aspects of the input text and leading to better feature representation and improved accuracy (H. Zhao et al., 2023).
- **Additive Attention:** Improves interpretability but lags in performance due to its linear combination approach (Metzner et al., 2024).
- **Multiplicative Attention:** Multiplicative (or dot-product) attention is computationally efficient and suitable for limited-resource scenarios. It calculates attention scores by taking the dot product of input feature vectors, which requires less computation. However, it can struggle with long sequences by excessively emphasizing certain parts of the input and potentially missing subtle contextual cues, reducing performance in tasks needing detailed text interpretation (Metzner et al., 2024; H. Zhao et al., 2023).

Practical Implications:

- **Model Selection:** For high accuracy and interpretability, self-attention and multi-head attention mechanisms are recommended.

- **Resource Constraints:** Multiplicative attention is viable for limited computational resources, though with potential accuracy trade-offs.
- **Future Research:** Further optimization of attention mechanisms for specific tasks and datasets is needed. Exploring hybrid models combining different attention mechanisms could yield better performance.

Limitations and Future Work:

This study was conducted on a limited set of datasets and model architectures. Future work should include more diverse datasets and explore architectures like BERT and GPT for a comprehensive understanding of attention mechanisms' effectiveness.

In conclusion, attention mechanisms significantly improve text classification models by focusing on relevant parts of the input text. The findings provide a foundation for selecting and optimizing attention mechanisms in various NLP applications, paving the way for more effective text classification solutions.

Conclusion:

This study has provided a comprehensive comparative analysis of various attention mechanisms integrated into different neural network architectures for text classification. The key findings are:

1. **Performance Enhancement:** Self-attention and multi-head attention mechanisms consistently outperformed additive and multiplicative attention. Their ability to capture long-range dependencies and complex contextual relationships contributed to superior performance (Lin et al., 2019; Yeliseti & Geethanjali, 2023).
2. **Strengths and Weaknesses:** Self-attention captures global dependencies and contextual information, making it ideal for nuanced tasks. Multi-head attention enhances feature representation through parallel attention mechanisms. Additive attention, while interpretable, lags in performance due to its linear approach. Multiplicative attention is efficient but struggles with long sequences and may miss subtle cues (Metzner et al., 2024).
3. **Practical Applications:** For high accuracy and interpretability, self-attention and multi-head attention mechanisms are recommended. Multiplicative attention can be used in resource-constrained scenarios despite potential accuracy trade-offs (Metzner et al., 2024; H. Zhao et al., 2023).

Future Research:

Further research should explore optimizing attention mechanisms for specific tasks and datasets. Hybrid models combining different attention mechanisms could improve text classification performance.

Limitations:

This study used a limited set of datasets and model architectures. Future work should include diverse datasets and explore advanced architectures like BERT and GPT for a comprehensive understanding.

In conclusion, attention mechanisms significantly improve text classification models by focusing on relevant parts of the input text, enhancing both accuracy and interpretability. These findings provide a foundation for selecting and optimizing attention mechanisms in various NLP applications, paving the way for more effective and efficient text classification solutions.

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“The Role of Artificial Intelligence in Agriculture for Enhancing Food Quality and Sustainability”

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Abstract:

Artificial Intelligence (AI) in agriculture is transforming conventional farming methods, solving important issues, and opening the door to high-quality and sustainable food production. This review article gives a thorough rundown of how artificial intelligence (AI) technologies like robotics, deep learning, machine learning, Internet of Things (IoT), and big data analytics are being used to change agriculture. Crop monitoring and disease detection, precision farming, intelligent irrigation systems, supply chain optimization, and quality control are some of the major areas of influence. AI boosts crop yields, lessens its influence on the environment, and increases resource efficiency through various applications, all of which have a major positive impact on the sustainability and caliber of agricultural products. This analysis highlights the critical role that artificial intelligence (AI) plays in promoting a resilient and effective agriculture industry that can fulfill the increasing global demand for food by looking at present developments and potential future developments.

Keywords: Artificial Intelligence, Agriculture, Crop Monitoring, Disease Detection, Precision Agriculture, Smart Irrigation, Supply Chain Optimization, Quality Control, Sustainability, Food Quality.

Introduction:

The demand for safer and better-quality food, population expansion, resource depletion, and climate change present the agriculture industry with hitherto unheard-of difficulties. Innovative solutions are required as traditional farming practices are becoming less and less effective in meeting these needs. The technology known as artificial intelligence (AI) has the potential to completely change agriculture. The agriculture sector may significantly increase productivity, efficiency, and sustainability by utilizing AI technologies including robotics, deep learning, machine learning, Internet of Things (IoT), and big data analytics.

Artificial Intelligence (AI) technologies facilitate early intervention and lower crop losses by enabling precise crop monitoring and disease detection [1] [2]. AI-powered precision agriculture maximizes crop yields while reducing environmental impact by making optimal use of inputs like water, fertilizer, and pesticides. [3] Using artificial intelligence (AI), smart irrigation systems keep an eye on the weather and soil in real time to ensure effective water use [4]. AI-based quality control guarantees food safety and consistency, while AI-driven supply chain optimization improves transparency and lowers food waste [5]. When taken as a whole, these developments help to produce food of a high caliber, encourage sustainability, and tackle the problem of global food security [6].

The integration of AI in agriculture is examined in this review paper, which also summarizes the advantages for food sustainability and quality. Key areas of influence are highlighted. This article highlights the critical role that artificial intelligence (AI) will play in altering agriculture to address modern challenges by looking at both present applications and future opportunities.

AI in Agriculture:

1. Deep Learning (DL) and Machine Learning (ML):

The use of AI technologies such as deep learning (DL) and machine learning (ML) is revolutionizing agricultural operations. With the use of these technologies, farmers are able to estimate crop yields and disease outbreaks and take proactive steps to safeguard their crops [1]. Furthermore, accurate plant health monitoring is made possible by image recognition powered by ML and DL, which analyzes visual data to identify symptoms of disease, nutrient deficits, and stress [2]. Recent developments have demonstrated that by evaluating data from several sensors [3] [7], these technologies can also improve soil health management, automate harvesting procedures, and optimize planting schedules. Moreover, real-time monitoring, historical data, and weather forecasts may all be integrated into ML and DL models to produce actionable insights that guarantee enhanced crop productivity and better resource management. [8]



2. IoT and Sensor Technology:

By enabling real-time data collection from soil, weather, and crop conditions, the combination of Internet of Things (IoT) and sensor technology in agriculture is transforming farming operations. Field sensors collect vital information about temperature, humidity, nutrient levels, and soil moisture, giving farmers a thorough understanding of their crop environments [4]. By making data-driven decisions, precision farming is made possible by this real-time data, which maximizes the use of water, fertilizer,

and pesticides to improve crop quality and yield [5]. The creation of wireless sensor networks and cloud-based platforms are examples of recent developments that enable more precise and rapid interventions by facilitating the seamless integration and analysis of data from numerous sources [9] [10]. In order to further promote sustainable and effective agricultural practices, IoT and sensor technologies also enable the automation of irrigation systems and pest control procedures [11].



3. Robotics and Automation:

By automating labor-intensive processes like planting, harvesting, and weeding, robotics and automation are revolutionizing agricultural methods. These jobs can be completed precisely by automated systems outfitted with cutting-edge sensors and AI algorithms, which lowers labor costs and boosts productivity [12]. Drones are also being used for aerial spraying and surveillance, giving farmers

access to high-resolution photos and data on nutrient deficits, pest infestations, and crop health. Large areas can be swiftly covered by these drones, and they can administer treatments precisely, which improves crop management and uses less chemicals [13] [14]. Autonomous tractors and robotic harvesters are examples of recent robotics developments that further improve productivity and streamline farming operations [15] [16].



4. Big data and Analytics

Modern agriculture relies heavily on big data and analytics to integrate massive databases for trend analysis and decision-making. Farmers can obtain valuable insights into crop performance, soil health, and environmental conditions by gathering and evaluating data from many sources, including weather stations, satellite imaging, and Internet of Things devices [5]. Optimizing input consumption and improving crop yields is made possible by this

data-driven strategy, which also allows for resource management and individualized farming advice [17]. In addition, big data analytics facilitates risk assessment and predictive modeling, which aids farmers in foreseeing and averting any obstacles [2] [18]. The ability to drive sustainable farming practices and make informed judgments is further enhanced by the combination of AI and big data [19].



Applications of AI in Agriculture:

1. Crop Monitoring and Disease Detection:

Using image recognition technologies, AI applications in crop monitoring and disease detection allow for the early identification of pests and illnesses. Drone or ground-based camera images are analyzed by sophisticated algorithms to identify abnormalities in plant health, enabling prompt

intervention and treatment. [1] [20]. Crop health analysis is further enhanced by remote sensing and satellite imagery, which offer extensive data on crop conditions across wide areas. By monitoring plant health, stress levels, and nutrient deficits with multispectral and hyperspectral imaging, these technologies enable accurate and efficient crop management. [21] [22].



2. Precision Agriculture:

Using variable rate technology, precision agriculture maximizes the usage of agricultural inputs by utilizing AI. Artificial intelligence (AI) systems employ data from sensors, satellite imaging, and weather forecasts to calculate the precise amount of pesticides and fertilizers required for each section of a field. This ensures resource efficiency

and reduces environmental impact [2]. Another important use of precision agriculture is site-specific crop management, in which AI algorithms modify agricultural techniques to suit the particulars of each site. By attending to the unique requirements of various sections within a field, this method increases productivity and improves crop yields and quality [23] [24].



3. Smart Irrigation Systems:

By evaluating soil and meteorological data in real time, AI-driven smart irrigation systems optimize watering scheduling. Utilizing machine learning algorithms, these systems forecast the exact quantity of water required by crops, guaranteeing ideal development circumstances while reducing water consumption [25] [26]. This strategy reduces the impact on the environment and promotes

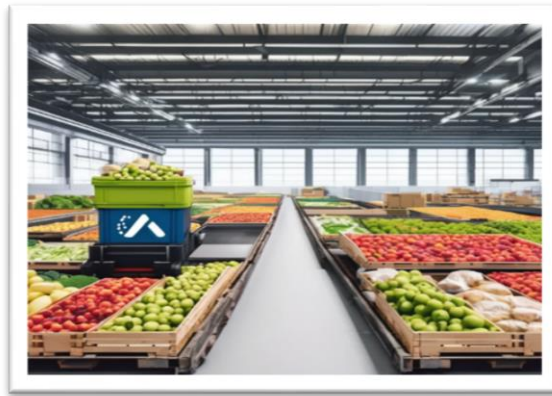
sustainable agriculture practices by improving water use efficiency [27]. The latest developments in smart irrigation involve the integration of AI and IoT devices to offer automated control and continuous monitoring of irrigation systems [28]. These advancements guarantee the resilience of agricultural systems and lessen the consequences of climate change [29].



4. Supply Chain Optimization:

By streamlining logistics and cutting down on food waste, AI dramatically enhances supply chain optimization. In order to ensure that agricultural products reach their destinations effectively and with the least amount of loss, AI algorithms evaluate data to optimize routing,

storage, and delivery schedules [30] [31]. AI also ensures that consumers obtain safe and high-quality food by tracking items from farm to table, improving supply chain transparency and traceability [32]. AI and emerging technologies like blockchain further improve supply chain traceability and fraud detection [33] [34].



5. Quality Control:

For classification and grading agricultural products, AI is essential to quality control. Precision sorting according to size, color, and ripeness is made possible by sophisticated image recognition and machine learning algorithms, guaranteeing consistency and quality [35] [36]. Additionally, AI systems maintain high standards of food safety and quality by identifying pollutants and guaranteeing adherence to quality standards [37]. AI and hyperspectral imaging are two recent innovations that can be used to identify minute variations in product quality that are not evident to the human eye [38] [39].

Benefits of AI in Agriculture:

1. Increased Crop Yields and Productivity:

By streamlining numerous agricultural processes, AI technologies greatly increase crop yields and productivity in agriculture. Large-scale sensor data, weather forecasts, and historical trends are all analyzed by machine learning algorithms to produce accurate planting, irrigation, fertilization, and harvesting recommendations [1] [20]. Higher yields and higher-quality product are the result of this data-driven approach, which makes sure that crops receive the proper amount of nutrients and water at the right times [2]. Predictive analytics powered by AI also assists farmers in anticipating and mitigating possible problems, including pest infestations or unfavorable weather, which increases output- [7].

2. Reduced Resource Usage and Environmental effect:

AI helps to promote sustainable agriculture by reducing resource usage and environmental effect. AI-enabled precision farming methods guarantee that pesticides and fertilizers are only used where necessary, minimizing chemical usage overall and preventing runoff into water bodies [5] [4]. Artificial intelligence (AI)-driven smart irrigation systems use real-time data to supply precisely the right amount of water to crops, reducing water waste and encouraging effective water use [27]. These methods improve soil health and biodiversity in addition to protecting natural resources [28].

3. Enhanced Food Safety and Quality:

AI improves food safety and quality by putting strict quality control systems in place all along the agricultural supply chain. Agricultural items are sorted and graded according to size, color, and ripeness using sophisticated image recognition and machine learning algorithms, guaranteeing high quality and consistency [35] [36]. AI systems are capable of identifying pollutants and infections, guaranteeing that consumers receive only safe and healthy products [37]. Additionally, items are tracked from farm to table by AI-driven traceability technologies, which ensure adherence to food safety regulations and offer transparency [31].

4. Improved Decision-Making for Farmers:

AI provides data-driven tools and actionable insights to farmers to help them make informed decisions. AI solutions offer thorough insights and recommendations catered to the unique requirements of individual farms [9] [23] by combining data from several sources. By doing this, farmers are better able to choose crops, allocate resources, and implement management techniques with knowledge, which ultimately boosts productivity and profitability [19]. AI facilitates remote farm management and real-time monitoring, enabling farmers to optimize their operations and react swiftly to changing conditions [18].

Challenges and Limitations:

1. High Barriers to Technology and High Initial Investment:

AI use in agriculture necessitates a large upfront infrastructure and technology investment. For small and medium-sized farms, the high expenses of buying sophisticated machinery, sensors, and software may be unaffordable [40] [41]. Technological constraints also arise from the intricacy of integrating AI systems with current agriculture techniques. Without significant financial and technical help, adopting these technologies may prove difficult for many farmers [42].

2. Data Privacy and Security Concerns:

The application of AI in agriculture necessitates the gathering and processing of enormous volumes of data, which presents privacy and security issues. Farmers can be reluctant to

divulge private information about their business for fear of it being misused or accessed by unauthorized parties [17] [5]. Gaining farmers' trust and promoting the widespread deployment of AI technology requires ensuring strong data protection procedures and addressing privacy concerns [43].

3. Need for Technical Skills and Training for Farmers:

Farmers must have technical training and skills in order to successfully apply AI in agriculture. Adoption may be significantly hampered by the fact that many farmers lack the skills required to run and maintain AI systems [9] [8]. Giving farmers thorough training and assistance is essential to giving them the tools they need to use AI technologies efficiently. This covers instructional courses, practical training, and continuous technical assistance [44].

4. Job Displacement Potential:

Traditional farm labor may become obsolete as a result of robots and artificial intelligence (AI) automating agricultural procedures. Automation has made it possible to automate traditionally manual tasks like planting, harvesting, and sorting [45] [46]. Although this boosts productivity, it also creates questions about the future of agricultural labor and job displacement. In order to allay these worries, it will be necessary to retrain and reskill workers in order to provide new possibilities and guarantee that the advantages of AI in agriculture are equal and inclusive [47] [48].

Future Prospects:

1. Emerging AI Technologies and Their Potential Applications:

The introduction of cutting-edge technology with exciting potential uses will define the future of AI in agriculture. Agricultural techniques are predicted to undergo a transformation thanks to innovations like real-time data analytics, autonomous robots, and sophisticated machine learning algorithms [9] [1]. AI-powered autonomous robots are highly accurate and efficient in carrying out difficult jobs like planting, harvesting, and monitoring [45]. Furthermore, farmers may make more proactive and knowledgeable decisions by using AI-powered prediction models to estimate crop yields, disease outbreaks, and weather patterns with greater accuracy [7].

2. Integration of AI with Other Advanced Technologies (Blockchain, Biotechnology):

Artificial Intelligence (AI) in conjunction with other cutting-edge technologies, like blockchain and biotechnology, opens up new possibilities for improving agricultural sustainability and productivity. Blockchain technology can offer unchangeable, transparent records of agricultural transactions, enhancing supply chain fraud reduction and traceability [33] [34]. Blockchain and AI together can improve data security and expedite

logistics, guaranteeing reliable and effective operations [49]. Agricultural productivity can be further increased by integrating biotechnology and AI to create genetically optimized crops that are more resistant to pests and climate change [50] [51].

3. Policy and Regulatory Considerations for AI in Agriculture:

Strong policy and legal frameworks are required if AI is to be widely used in agriculture. To safeguard farmers' interests and guarantee the moral application of AI technology, policies must address concerns such data privacy, security, and ownership [52] [5]. Regulations should also encourage equitable access to AI resources and technologies in order to avoid creating a digital divide between large and small-scale farmers [42]. In order to promote innovation and protect social and environmental sustainability, governments and international organizations must work together to establish norms and regulations [41] [43].

Conclusion:

Artificial intelligence (AI) has revolutionized traditional farming methods and addressed major industry difficulties, having a dramatic and transformational effect on the agricultural sector. By combining cutting-edge technology like artificial intelligence (AI) with robotics, deep learning, and the Internet of Things (IoT), it has greatly increased crop yields, streamlined resource use, and raised total agricultural output. Farmers can make more informed decisions and adopt more sustainable and productive farming practices because to AI's capacity to evaluate massive volumes of data and deliver insightful analysis [1] [20].

AI has the ability to significantly advance high-quality, sustainable food production, which is one of its most important contributions. AI optimizes inputs like water, fertilizer, and pesticides to maximize harvests while minimizing the environmental effect of agriculture. Precision farming methods guarantee the effective utilization of resources, diminishing wastage and enhancing the condition of the land. Moreover, AI-powered quality control methods guarantee that agricultural goods fulfill strict safety and quality requirements, which is advantageous to both farmers and consumers [5] [31].

Even with these impressive developments, there is still a great deal of room for growth in the field of AI in agriculture. To get over present obstacles and seize fresh chances, research and innovation must continue. It will be crucial to address issues like high initial costs, data privacy, and the requirement for technical expertise to guarantee the broad adoption and fair sharing of AI's advantages. To establish supporting frameworks that promote innovation and protect the interests of all parties involved, cooperation between researchers,

legislators, and industry stakeholders is required [49] [9].

In conclusion, AI has the potential to significantly influence how agriculture develops in the future. It is a vital instrument in tackling the problems associated with global food security because of its capacity to increase productivity, guarantee sustainability, and improve food quality. Harnessing the full potential of AI and building a prosperous and sustainable agricultural future will require sustained investment in research and development as well as supportive policies and training programs [42] [43].

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The search for the meaning of life in the war and peace novel

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Introduction:

War and Peace post-reform is a novel mixed with chapters on history and philosophy by the Russian author Leo Tolstoy, first published serially, and then published in its entirety in 1869. It is regarded as one of Tolstoy's finest literary achievements and remains an internationally praised classic of world literature.

The novel chronicles the French invasion of Russia and the impact of the Napoleonic era on Tsarist society through the stories of five Russian aristocratic families. Portions of an earlier version, titled *The Year 1805*, were serialized in *The Russian Messenger* from 1865 to 1867 before the novel was published in its entirety in 1869.

Tolstoy said *War and Peace* is "not a novel, even less is it a poem, and still less a historical chronicle." Large sections, especially the later chapters, are philosophical discussions rather than narrative. Tolstoy also said that the best Russian literature does not conform to standards and hence hesitated to call *War and Peace* a novel. Instead, he regarded *Anna Karenina* as his first true novel. The term "war and peace" is sometimes used in general language to indicate something that is very long or comprehensive; for example, "I just need a short briefing, it doesn't have to be war and peace" in reference to the length of the book.

Tolstoy Life:

Tolstoy was born at Yasnaya Polyana, a family estate 12 kilometres (7.5 mi) southwest of Tula, Russia, and 200 kilometres (120 mi) south of Moscow. He was the fourth of five children of Count Nikolai Ilyich Tolstoy (1794–1837), a veteran of the Patriotic War of 1812, and Countess Mariya Tolstaya (née Volkonskaya; 1790–1830). His mother died when he was two and his father when he was nine.[18] Tolstoy and his siblings were brought up by relatives. In 1844, he began studying law and oriental languages at Kazan University, where teachers described him as "both unable and unwilling to learn". Tolstoy left the university in the middle of his studies, returned to Yasnaya Polyana and then spent much time in Moscow, Tula and Saint Petersburg, leading a lax and leisurely lifestyle. He began writing during this period, including his first novel *Childhood*, a fictitious account of his own youth, which was published in 1852. In 1851, after running up heavy gambling debts, he went with his older brother to the Caucasus and joined the army (Hellman, 1994, 23).

Tolstoy Work:

Tolstoy is considered one of the giants of Russian literature; his works include the novels *War and Peace* and *Anna Karenina* and novellas such as *Hadji Murad* and *The Death of Ivan Ilyich*.

Tolstoy's earliest works, the autobiographical novels *Childhood*, *Boyhood*, and *Youth* (1852–1856), tell of a rich landowner's son and his slow realization of the chasm between himself and his peasants. Though he later rejected them as sentimental, a great

deal of Tolstoy's own life is revealed. They retain their relevance as accounts of the universal story of growing up (Martin Luther, 1999, 125).

Tolstoy served as a second lieutenant in an artillery regiment during the Crimean War, recounted in his *Sevastopol Sketches*. His experiences in battle helped stir his subsequent pacifism and gave him material for realistic depiction of the horrors of war in his later work (Ibid, 153).

War and Peace is generally thought to be one of the greatest novels ever written, remarkable for its dramatic breadth and unity. Its vast canvas includes 580 characters, many historical with others fictional. The story moves from family life to the headquarters of Napoleon, from the court of Alexander I of Russia to the battlefields of Austerlitz and Borodino. Tolstoy's original idea for the novel was to investigate the causes of the Decembrist revolt, to which it refers only in the last chapters, from which can be deduced that Andrei Bolkonsky's son will become one of the Decembrists. The novel explores Tolstoy's theory of history, and in particular the insignificance of individuals such as Napoleon and Alexander. Somewhat surprisingly, Tolstoy did not consider *War and Peace* to be a novel (nor did he consider many of the Great Russian fictions written at that time to be novels). This view becomes less surprising if one considers that Tolstoy was a novelist of the realist school who considered the novel to be a framework for the examination of social and political issues in nineteenth-century life. *War and Peace* (which is to Tolstoy really an epic in

prose) therefore did not qualify. Tolstoy thought that Anna Karenina was his first true novel (Wiener, Lev N, 227).

Absurdity of existence in the novel:

“There is but one truly serious philosophical problem and that is suicide. Judging whether life is or is not worth living amounts to answering the fundamental question of philosophy”.

Excerpt from: *The Myth of Sisyphus* by Albert Camus

This is how Albert Camus begins the ‘Myth of Sisyphus’: a philosophical essay that introduces his philosophy of the Absurd. Albert Camus (1913–1960) was a French philosopher, author, and journalist. He was also the proponent of the philosophical viewpoint of Absurdism; he also authored several books including ‘The Stranger’, ‘The Rebel’, and ‘The Plague.’ His works won him the Nobel Prize in Literature in 1957 with the reason being —for his important literary

Production, which with clear-sighted earnestness illuminates the problems of the human conscience in our times” (Martin, 2005, 38)

Absurdism is a philosophy that revolves on the notion of the Absurd and how one should confront against it. The Absurd refers to the conflict between the human tendency to seek inherent meaning in life and the silent answer of the universe in which a harsh truth arises that is there is no inherent meaning in life. Existence is Absurd because of the conflicting views between humans and the universe. The Absurd comes from the conflict between expectations and reality; it is born from this confrontation (Ibid).

This third path is embodied through Camus’ idea of the Absurd Hero. This person recognizes the absurdity of existence yet chooses revolts against this conception and through that being able to defiantly enjoy life. Camus’ identifies three characteristics of an Absurd Hero: that are revolt (we must rebel against existence), freedom (we must be free to do as we please), and diversity (life must consist of a rich plethora of experiences and passions).

This conception of the Absurd Hero is embodied through the Greek myth of Sisyphus and the Meursault: the protagonist in his novel ‘The Stranger’. Sisyphus was a king who was punished for his trickery and betrayal against Zeus. He was banished for eternity to push a boulder against a steep hill only to see it fall down just before reaching the top. Camus’ puts forth the notion that one must imagine Sisyphus happy; as he has embraced his harsh reality and he might even approach this futile task with joy as this what gives his life meaning through the revolt that he endures against the absurdity of existence (Hellman, 1994, 54). Meursault also recognized the Absurd through instances of a feeling of nausea and disembodiment

in the world; despite this, he embraced the passions and pleasures in life through the alluring views of the ocean and the sensual, carnal touches of his lover. Like Sisyphus, he too was punished for his misdeeds, yet he chooses to accept this and to embrace the harsh reality of existence.

Character and Characterization:

Character

According to (Mandikdasmen - Ministry of National Education)

The character is a way of thinking and behaving that characterizes each individual to live and work, both within the family, community, nation and state. Individuals of good character is an individual who can make decisions and be ready to account for any consequences of decisions he made (Leo, 2002, 2024).

Klarer, (2004:17) defines that a typified character in literature is dominated by one specific trait and is referred to as a flat character. The term round character usually denotes a persona with more complex and differentiated features. Characters are the persons represented in a dramatic or narrative work, who are interpreted by the reader as being endowed with particular moral, intellectual, and emotional qualities by inferences from what the persons say and their instinctive ways of saying it—the dialogue—and from what they do—the action. The grounds in the characters' temperament, desires, and moral nature for their speech and actions are called their motivation. A character may remain essentially "stable," or unchanged in outlook and disposition, from beginning to end of a work Prospero in Shakespeare's *The Tempest*, Micawber in Charles Dickens'

David:

Opperfield, 1849–50), or may undergo a radical change, either through a gradual process of

Development (the title character in Jane Austen's *Emma*, 1816) or as the result of a crisis (Shakespeare's *King Lear*, Pip in Dickens' *Great Expectations*). Whether a character remains stable or changes, the reader of a traditional and realistic work expects “Characterization is a method by which the writer reveals the personality of a character. Characterization is revealed through direct characterization and indirect characterization.

A broad distinction is frequently made between alternative methods for characterizing (i.e., establishing the distinctive characters of) the persons in a narrative: showing and telling. In showing (also called "the dramatic method). the author simply presents the characters talking and acting and leaves the reader to infer the motives and dispositions that lie behind what they say and do. The author may show not only external speech and actions, but also a character's inner thoughts, feelings, and responsiveness to events; for a highly

developed mode of such inner showing, see stream of consciousness. In telling, the author intervenes authoritatively in order to describe, and often to evaluate, the motives and dispositional qualities of the characters. For example, in the terse opening chapter of *Pride and Prejudice* (1813), Jane Austen first shows us Mr. and Mrs Benet (Lev, 1904, 881).

Characters Andrew:

Andrew, though as noble a soul as Pierre, differs from his friend in important ways that make him a very distinct character, and that illustrate Tolstoy's philosophy of life. Andrew has a highly intelligent and analytical mind, as we see in the profitable way he runs his estate. He is devoted to his country, returning to active duty even after nearly being killed at Austerlitz, and spending months helping Speranski write a new civil code for Russia. Andrew, though often detached, is emotionally honest and willing to examine mysteries in himself, as we see in his frank admission early in the novel that he is dissatisfied with marriage to his virtuous and lovely wife, Lise. But Andrew's flaw is a spiritual one: his detachment is an intellectual advantage, but an emotional handicap. Andrew is free from Pierre's disabling search for the meaning of life, but he is also unable to forge deep and lasting connections with others, and unwilling to forgive their misdeeds. When Andrew is first introduced, Pierre touches his arm; Andrew instinctively flinches, disliking the contact. This physical reaction reflects Andrew's inability to be touched by others throughout his life. Ultimately, he is a lonely individual whom even the love of Natasha cannot save (Ibid, 839).

Pierre:

At the opening of the novel, Pierre is a young man who has recently returned to Russia to seek a career after completing his education abroad. Although a well-meaning, kind hearted young man, he is awkward and out of place in the Russian high society in whose circles he starts to move. Pierre, though intelligent, is not dominated by reason, as his friend Prince Andrei Nikolayevich Bolkonsky is. His lack of direction leads him to fall in with a group of profligate young men like Anatole Kuragin and Dolokhov whose pranks and heavy drinking cause mild scandals. After a particularly outrageous escapade in which a policeman is strapped to the back of a bear and thrown into a river, Pierre is sent away from St. Petersburg (Anthony, 2002, 96). Natasha At the start of the novel in 1805, Natasha is a 13-year-old girl, the daughter of Count Ilya Rostov and Countess Natalya Rostova. She has fallen in love with young Prince Boris Drubetskoy, who lives with his mother Anna Mikhaylovna in the Rostov estate. She becomes close friends with Count Pierre Bezukhov, who frequently visits the Rostovs. When Boris leaves to pursue a career in the

Conclusion:

As the title of Leo Tolstoy's novel *War and Peace* promises, the book develops in two dimensions. The "war" dimension relates to the 1812 French invasion of Russia, while the "peace" concerns the life of the Russian society against the backdrop of that invasion. The word "peace" (mir) in Russian has multiple meanings:

1. mir as the state of no-war
2. mir as society
3. mir as the world

Indeed, the narrative shifts between the world of the Napoleonic wars, the world of the Russian society, and the inner spiritual worlds of the novel's main characters: Russian aristocrats Andrey Bolkonsky, Natasha Rostova, and Pyotr (Pierre) Bezukhov. The key themes in *War and Peace* develop through all these worlds, creating a complex and multilayered texture.

Two central male characters of the novel, Andrey Bolkonsky and Pierre Bezukhov, mirror Tolstoy's own spiritual biography. These characters question everything and hold themselves to the highest moral standard.

In his search for meaning, Pierre concludes that most people live "like soldiers under fire," distracting themselves from thoughts of death by gambling, horses, and parties. At the end of the book, Pierre finds his life's purpose in working on his land and raising a large family.

When we first meet Prince Andrey, he is a handsome and ambitious young officer, ready to sacrifice everything for a minute of glory. A near-death experience at the battle of Austerlitz makes him recognize his vanity. Going through multiple transformations in his spiritual search, towards the end of the novel, dying from war wounds, Andrey achieves complete harmony with the world.

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Crisis of Female Criticism and the Dilemma of Woman Becoming in Adrienne Rich's Poetry

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Introduction:

The study explores cultural, social, and political standpoints about woman in the poetry of Rich. Adrienne Rich is a prominent figure in defending woman's status in the American society. She is an active feminist. Her notion that a woman is "special" (Rich, "When We Dead Awaken", 2001, p. 15) is a source of her female power. In her works, Rich elucidates crises of criticism against women calling for equality and liberation, on the one hand. On the other hand, she persuades women to struggling for altering their social positions. Adrienne Rich, a poet of towering reputation and towering rage, whose work distinguished by an unwavering progressive vision and a dazzling, empathic ferocity brought the oppression of women and lesbians to the forefront of poetic discourse and kept it there for nearly a half-century.

Background of the study:

Adrian Rich was an American poet, writer, and feminist. She was born to Protestant Jewish parents. Her father encouraged her to read and write from a young age and taught her home. She spent much of her time in her father's library which was filled with works of great writers. She worked hard to fulfill her father's desires, and when she turned 22, she came out with her first collection of poetry, "Changing the World." Adrienne Rich was born in Baltimore, Maryland on May 16, 1929. Adrienne was inspired by history teacher Margarita Weissler whose intelligence, enthusiasm and warmth captivated her. The two continued correspondence, and Rich later wrote to Weissler that she was a role model for her as a single woman who lived a full life without the negative traits that single women are supposed to be doomed to. After graduating from high school, she attended Radcliffe College, graduated in 1951, and was chosen By W.H. Odín for the Yale Prize Series of Younger Poets for Changing the World (Yale University Press, 1951) in the same year. What distinguishes Rich from her generation of feminists is not only her highly trained intelligence - which only a few of her peers meets - but the way in which her career embodies the radical awakening of the individual voice. Rich was both a poet and an essayist, and her activism and support allowed her to attract the growing awareness of women about their repression more importantly (and consistently) than any other writer I know. She was always looking for a new and better language, newer and less derivative art ... Rich's radicalism did not come easily, or immediately, and it is worth remembering just how much of a risk it would be to set out on the journey away from it.

Statement of the Problem:

Rich wrote extraordinary poems dealing with love, sexuality, lesbianism, loneliness, and revolution. This study focuses on the problem of women's endeavors to have their identities and becoming while facing criticism of society socially, culturally, and politically. The image of woman in Rich's poetry is torn between her desire to have her liberty as a female self and the voice of obedience to society. The Feminism problem refers to a broad range of ideas, approaches, and ideologies directed towards advocating for gender and sex equality for women. Feminism is a movement that seek to achieve equality and social rights for women in all key areas which include education, personal, economic, employment, and cultural sphere of human endeavors. Activists of the feminist movements have used social and political theories to campaign for women's rights and freedom where sexuality and gender-based political thinking have created imbalances for the womenfolk in the society.

Research Objectives:

Feminist theory extends feminism into the fields of philosophy and theoretical ideology. The theory of feminism encompasses the fields of sociology, economics, anthropology, and philosophy. The theory focuses on the study of gender inequality and the understanding of power relations, sexuality and gender politics. The concept of feminism is to achieve equality with men and get rid of all kinds of tyranny and domination imposed on women from their first inception in the family until their exit into society, and this movement aims to cross all barriers fixed on all female sexuality, social class, rhyme, customs, politics and religion,

and this movement represents a rebellion against the society that it imposed its restrictions on women in all societies. The female has tried to reach the highest levels of liberation in thought and body from the man who imposes restrictions on the freedom of women through invocation of culture, traditions and religion. This movement has sought to break these restrictions by seeking to obtain full rights compared to men, whether it is work, politics or choice. The right partner and get rid of all kinds of slavery regardless of nationality and color, and this is what rich's tried in her poems that called for In order to rid women of loneliness and deprivation and achieve equality with men.

Lesbians mean and it refers to women who are emotionally and sexually inclined to women, and this tendency has spread many centuries ago. The origin of the word "lesbos" is the birthplace of the Greek poet (Sappho), who had lesbian tendencies in the sixth centuries B.C. Psychological, physical and mental, or it is caused by the interaction of the female sex with biological, psychological, economic, and cultural factors, or that the woman likes to take the role of the male and the other takes the role of the female, or because of fear of having sex outside of marriage, where it is relatively safe or the husband does not understand his wife and her desire and not reach her sexual satisfaction or Ignoring the man to the woman's appreciation, which drives her to search for a partner. She understands what she needs from the psychological, mental and physical attention she needs.

Michel Foucault described the antagonist in (Foucault 1978\151-2) the essence of the body nonetheless concerned with the material, the physical of the bodies. He was attractive to feminists interested in exposing the processes by which the female body transformed into a female body in the claim that the body was directly targeted and produced by force. Thus it is unknown outside its cultural significance. Natural sex and culture based sex. *Elizabeth Grosz* argues that in contrast to the post-structuralism theory that represents the body without due regard for its material importance, Simon, who was the gospel of the feminist movement in the world, published in her book *The Other Sex* in 1949, which was a detailed analysis of the oppression and exploitation of women economically. As a foundational text of the feminist movement, *Simone De Beauvoir* said (A woman does not give birth to a woman but becomes a woman) and that *Judith Butler* reads Simon's most famous work (*The Opposite Sex*) and her phrase (The one does not generate a woman, but becomes so) within existential contexts beyond, as it seeks to break the relationship between Sex, but rather to the destruction of the sex itself, that is, *Simone De Beauvoir* treating the body as a cultural condition,

not as a natural body. Thus, it opened Doors have opened to critics of the compulsory dual-sex system by explaining its political uses or bypassing it, while *Judith Butler* sees sex being shaped in practice or by repeating certain actions. Whoever looks up to these views and coexists in this life around the feminist movement must put in place two special rules that support women politically and economically and take Her full right is equal to her fellow men, or perhaps more than half of society.

Significance of the Study:

The main objective of this research is to support the feminist movement and the gay community in order to obtain their political, economic, social, cultural and social equality rights despite the complete denial of the rights of society (LGBT). A large number of poets, philosophers and critics have focused in order for these groups to obtain their full rights through activities. Political and cultural pressure through rallies, social groups, seminars, dialogues, conferences, and art, as well as the other goal of the feminist movement and homosexuality is a cultural goal, for example homophobia and the priority of the family between the two genders, and the most important goal is the political goals that change laws and policies in order to obtain rights and benefits Protection from harm and abuse Therefore, activists seek both types of goals in both the political and economic spheres when changing political ideas and enacting laws for the rights of women, gays, bisexual, transgender and other common interests and the need to work together in order to protect them from aggression, bullying and bullying within society (LGBT) due to misconceptions.

Literature Review:

Introduction:

Women are oppressed by patriarchy economically, politically, socially, and psychologically; patriarchal ideology is the primary means by which women oppressed. In are every domain where patriarchy reigns, woman is other: she is marginalized, defined only by her difference from male norms and values. All of Western (Anglo-European) civilization is deeply rooted in patriarchal ideology, for example, in the Biblical portrayal of Eve as the origin of sin and death in the world. While biology determines our sex (male or female), culture determines our gender (scales of masculine and feminine). All feminist activity, including feminist theory and literary criticism, has as its ultimate goal to change the world by prompting gender equality. Gender issues play a part in every aspect of human production and experience, including the production and experience of literature, whether we are consciously aware of these issues or not.

Methodology:

Introduction:

The research methodology has always been a source of vital concern in today's scenario, and has always taken the perspective of women, their needs and their suffering in the ancient and modern eras as the basis for feminist research that seeks to appreciate the experience of women and what they need in terms of social and political support, and that all feminist research aims to effect a phase-out transformation of the asymmetry between The two genders in the world and the original goal of this feminist methodology is the call for liberation from the male domination imposed on it in all fields, and there is another view from this research is the pursuit of objectivity and truth and control over nature is a male motive, where the male believes that women cannot distinguish between knowledge The well-known, the self, the other, the mind and the body, and that the goal of this movement is to develop the best way or path to reach a woman's representation of social reality from men who are very besieged by their project to control society. The development of the feminist movement requires a real political effort and a feminist analysis in order to lead society to understand the main role that The feminist movement is represented in society at all levels and this is a fact that the male society rejects because the feminist movement is able to obtain real images Its reality is more of a male science than an anthropology.

Feminist Theory:

It is a group of opinions and ideas that occurred as a result of the accumulation of events that women have been exposed to and that reflect the diversity of women's ideas in the world and which present old opinions that negatively affect the feminist movement and that this feminist theory seeks to address issues that affect the lives of women and that the feminist movement calls for the replacement of the system The patriarchal ruler is ruled by a system that calls for equality and justice, and women in all societies, whether European, Arab, or other multi-nationalities are witnessing great oppression, as liberal women seek violence against women socially, culturally and politically. As for the women, the radical inquisitors call for the elimination of the patriarchy, and the female should be free to fully exercise sexual or reproductive freedom, and she urges women to liberate themselves from the inside from forced gender differences or Marxist socialist women. It is unlikely for women to achieve true freedom in a society based on the suppression of freedoms, but this feminist theory sought to liberate women socially, politically and culturally. It was at the forefront of women claiming this freedom "women of color" who played a fundamental role in raising questions of "difference" about axes of racism, race, religion and all forms of inequality in the world

Behavior Theory:

Sexual identity and sex-specific behaviors go back to the social upbringing versus the biological worlds, and there are many studies that demonstrate exposure to androgens before birth. Some evidence that femininity and masculinity are partly defined by biology, genetics, epigenetics and hormones. In 1959, researchers (Anke Ehrhardt, John money) made the theory of the prenatal hormone and that their research was that the genitals wash the fetus with hormones in the womb, which leads to the birth of an individual, a male or female brain. This theory was criticized in 1959. In 2005 scientific research that studies sexual conditions, and through an observation in countries that girls and masculine women are rejected by society less than boys and men. Feminist psychologists have continued to push for the importance of paying greater attention to cultural multiplicity among women and to incorporate this understanding into teaching, researching, and theory building and practicing. Feminist psychology is the direct result of the women's movement and revolution that took hold in the late 1960s. It stems from the repercussions from the theory of male domination, practices and research especially in the theory of psychoanalysis. Scholars of feminist psychology took great offense at the Freudian theory of hysteria and "penis envy," which showed a bias toward males and was based totally on studies relating to the development of men. Feminist psychology was created by women who realized that psychological counseling methods were colored by sexism and male chauvinism.

The Crisis of Same Sex Love:

Grieger (1978) described Rich as a poet who seeks changes in women's existence culturally not only for herself; i.e., personal aim but as collective and communal. That is why the most distinguished characteristic of her poetry is that she writes as a woman overtly and fearlessly. Of these momentous switches is her love for women which she glorifies in her poetry. MacKinnon remarked that Rich's writing as a lesbian is a rebellion for equality and freedom. This feature affects the entire generation. "Twenty-One Love Poems" are among her poems of lesbian separatism. Dickie (1997, p. 153) argued that "Twenty-One Love Poems" as a weapon to escape silence in a powerful way:

The haunting in "Twenty-One Love Poems" as well as the haunting of it bespeaks the tradition of silence in which. Rich believes, women poets have belonged. It suggests, too, that when the woman whose erotic feelings have been silenced by heterosexuality escapes from its strictures, she discovers that she is not only haunted by that history, but also haunted by a ghostliness that that

history can neither contain nor suppress. She speaks in the silences of her own voice.

Conclusions:

The feminist movement is a movement of great importance under the umbrella of equality between the sexes. Most of the people at the present time do not realize the importance of the forgotten movement. Through my reading of the opinions of philosophers, critics and poets, there is no logical reason not to support gender equality and feminism. From my point of view, equality between the sexes can be implemented through a true belief in the necessity for men and women to have equal rights and treatment, unless there is a sound biological reason for treating men and women differently, and my belief is this is the main goal of my research on supporting the feminist movement to establish the same opportunities and rights for both sexes. What is my personal estimation of Adrienne Rich's poetry? I think it is wonderful. I think it is complex and simple, personal and political, moving and challenging. I don't know if Rich would agree, but I think her poetry is didactic, because I have learned so much from reading it. I gained an insight into feminist ideology. I have learned that emotional problems and personal crises can be dealt with in a mature fashion. Most of all, I have learned that poetry that is carefully crafted and intensely passionate can be remarkable. Adrienne Rich

encouraged the use of the term "women's liberation" because the word "feminist" could easily become a mere label, or it could cause resistance in the next generation of women.

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Sustainable Micro-watershed Management Approach for Resource Conservation

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Abstract-

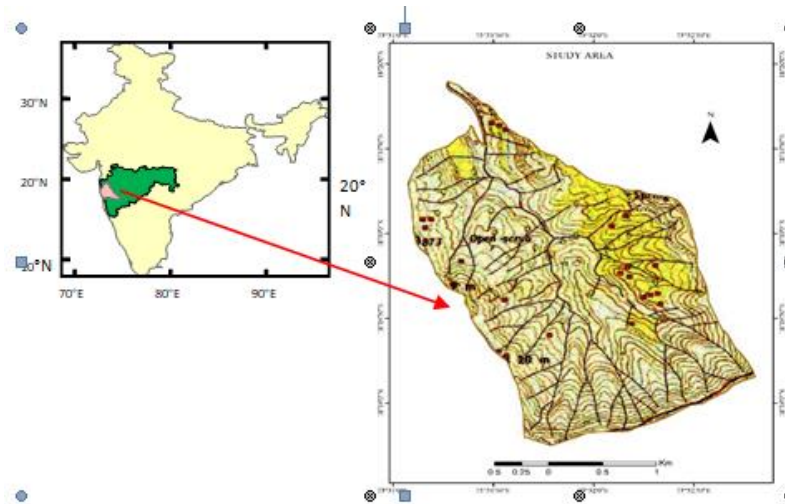
The term watershed is used as a synonym for catchment or river basin wherein rainwater gets collected from an area enclosed by a précised ridge line in a mountainous region. This water eventually flows through various channels which merge with one another to form a stream. It is a physical entity consisting of the natural elements in it such as water, vegetation, and soil. Watersheds in Western Ghats of Maharashtra are facing the degradation issues as human interference in the form of extension activities have been increased since last few decades. Agriculture, Weekend homes, farm house, resort culture, tourism activities are destroying much of natural resources at an alarming rate. Natural resource is best conserved on watershed scale as they provide uniformity in topography. Hance an attempt has been made to study the sustainable management of natural resources on a micro-watershed scale.

Keywords- Basin, Catchment, ridge line, Sustainable, Watershed

Introduction-

Catchment term could be used as a physical, socio-economic, and political unit to study, planning and management of natural resources (Ozhan, 2004). Agrarian known country India is the seventh largest country in the world with highest population of over 1.4 billion. The watershed management concept in India has started since the pre-historic times. Sustainable watershed management is the process of managing human activities and natural resources on the watershed basis. There are approximately 44000 micro watersheds in Maharashtra and around 67% of the geographical area requires watershed treatments (Shelar A N, 2014). The Western Ghats region in Maharashtra covers 63 talukas which covers 26.1% of the population. Indiscriminate development along with erroneous planning managements schemes are resulting in denudation of hills as they have been subjected to intensive developmental activities. The

farm house and resort culture are threatening the habitat and disturbing wild life. Spread of agriculture, land leveling, clearing of native vegetation on hill slopes and unplanned plantations resulting in monoculture. Along with this, soil erosion is hampering the life of major parts. Soil is one of the most precious natural resources on earth surface. Top soil forms the uppermost layer of the land mass and act as a bridge between the living and non-living entities of the nature. The report of Government of India's National commission of integrated water resources development implies that due to siltation in rivers, India is losing about 1.3 BCM of storage capacity each year. The development programmes for such regions in Maharashtra has started comprising soil conservation, forestry, social forestry, and horticulture on a mini watershed basis.



Study Area-

Study area, namely Pole micro-watershed is in western part of Pune district (Fig 1). It is a micro part of Western Ghats. It covers around 6.36 km² area of Velhe tehsil of Pune district. The extent of the watershed is 18°17'74" to 18°19'89" N latitudes and 73°31'08" E to 73°32'80" E of longitudes. The rainfall observed here varies from about 180 cm to 450 cm. Basaltic lava flows are known as Deccan trap. Soils are black and deciduous forest are found in the study area. The watershed shows undulating topography with high altitude and steep slopes (Fig.3). Around 4.69 km² area of watershed is under forest, 0.45 km² under built-up and 1.19km² area is wasteland (Shelar A, 2014).

Materials and Methods-

Survey of India (SOI) toposheet 47F11 on 1:50000 scales has been used to obtain the study area (Fig.1). Preparation of basic themes like slope map. Watershed boundary, drainage map are prepared by digitizing the SOI toposheet and

watershed management plan has been prepared. An approach of taking a sub-watershed or a basin as a planning unit is more efficient. It is evident that uncoordinated efforts and undesirable activity at one point of upper reaches of the basins always affect the entire catchment. Hence micro watershed has been considered as planning unit.

Sustainable watershed management is the practical application of the scientific, technical, and economic principals. In India, Catchment Area Treatment plans (CAT) has been applied in many parts and gained success. CAT applies various techniques like gully plugging, check dams and most importantly plantation. It targets degraded and sensitive sites such as stream sides, shorelines seeps, steep slopes, erodible soils, or head water areas. The concept of sustainable watershed development and management has emerged as the cornerstone of rural development in the dry and semi-arid regions of India.

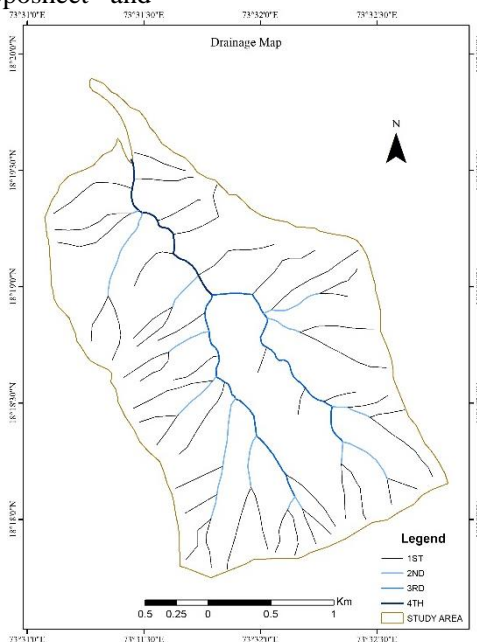


Fig.2 Drainage Map

Population pressure is inducing the clearing of forests for agriculture and other purposes, and the attendant accelerated soil erosion is gradually destroying the soil resource (Hurni, 1990). India is proceeding at an average rate of 16.35 tons per ha (Sharma A, 2009), whereas according to the National Remote Sensing Agency (NRSA) and Forests Survey of India (FSI), about 60 percent of

the total cultivated area suffers from degradation. During monsoon season, gully erosion, rill erosion fluvial erosion and sheet erosion are common forms of erosion observed in the study area, as most of the parts are steep sloping and undulating in nature. This type of erosion processes increases the runoff and are responsible to carry the fine loosening soil particles mainly silt, clay and humus downhill.

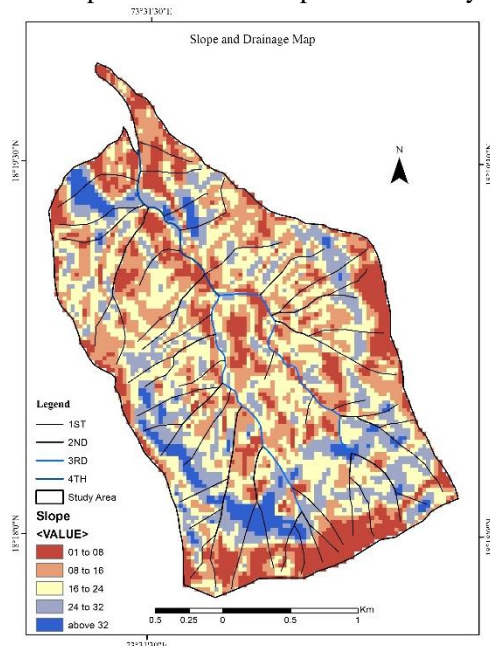


Fig.3 Slope and Drainage Map

Conclusion-

In India, wide range of measures to control degradation issues of soil, water and forest have been in use. Some of are adopted while some are developed from research. Considering the site, situation, topography, climatic and socio-economic conditions of the watershed, few engineering and biological methods are suggested for the resource conservation.

Slope stabilization methods can be applied at degraded sites which includes terraces, soil retaining walls, use of rubbles etc. Bench or stone terracing can be constructed with a 1:100 gradient and inward sloping which will allow water to travel at a non-erosive velocity. Shallow rotted annual and biannual crops may be cultivated on these terraces (Shelar A, Gaikwad S, Kandekar A, 2017). Trees

like *Mangifera indica*, *Tamarindus indica* can be planted on steep sloping lands to reduce soil erosion. Gabion weirs is recommended since these are most flexible than concrete and the packed boulders allow for dissipation of the pore water pressure. Streams and nalas can be blocked by depositing some kind of rubble at the land-water interface. In India, wire baskets are specifically designed and used at the land-water interfaces which are known as gabion strips. Gully plug is one of the water conservation structures across a small gully or stream. It prevents eroding and down cutting of gully heads. It acts as a grade stabilization structure. Selection of proper land use, appropriate cropping system, proper tillage technique, cover crops are some of the agronomic methods which can be applied at appropriate affected sites.

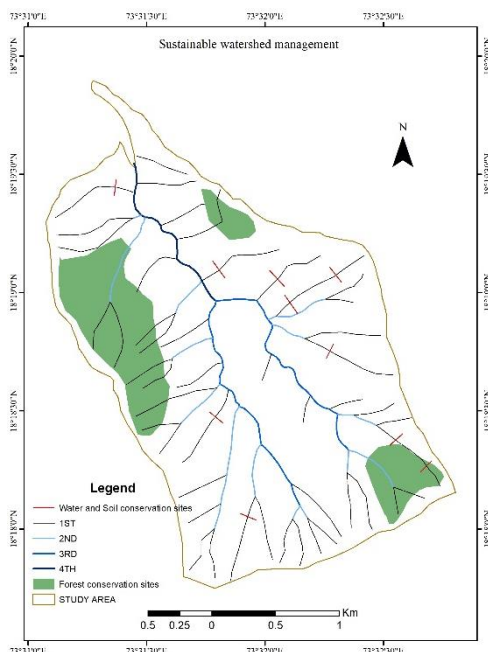


Fig.4 Watershed Management Map

Scientific management of forests land provides continuous production of goods and services needed for economic life (Lal, 1961). Spaced planting, row planting, riparian strip, spaced and shelter belt, passive restoration, direct planting are some of the biological measures can be applied in forest degraded sites. Vegetation plays a vital role in conserving the natural resources of a watershed such as soil and water (Gaikwad S 2009). The underground components of the plants such as roots spread within the soil and thereby stabilize and reinforce the soil. A watershed containing large amounts of vegetation is considered as a healthy watershed. It is also called a well-managed or a 'green watershed.' It has no or very limited soil erosion and large reserves of groundwater as well as surface water. Forests prevent or delay surface flow by interception, evaporation, transpiration, and infiltration. As far as reforestation is considered, *Mangifera indica*, *Citrus medica*, *Syzygium cumini*, *Feronia elphantum*, *Aegal marmelos*, *Tectona grandis*, *Delbergia latifolia*, *Dendrocalamus strictus*, *Tamarindus indica* *Terminalia chebula*, *Ficus glomerata*, *Terminalia bellerica* etc should give priority. Also, nitrogen fixing species should be preferred as the soils in the study area are poor. Thus, integrated application of conservation is found to be more helpful in the entire process of micro-watershed management planning and development.

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Preparation of Polymer-Based Coatings from Bio-Based Materials

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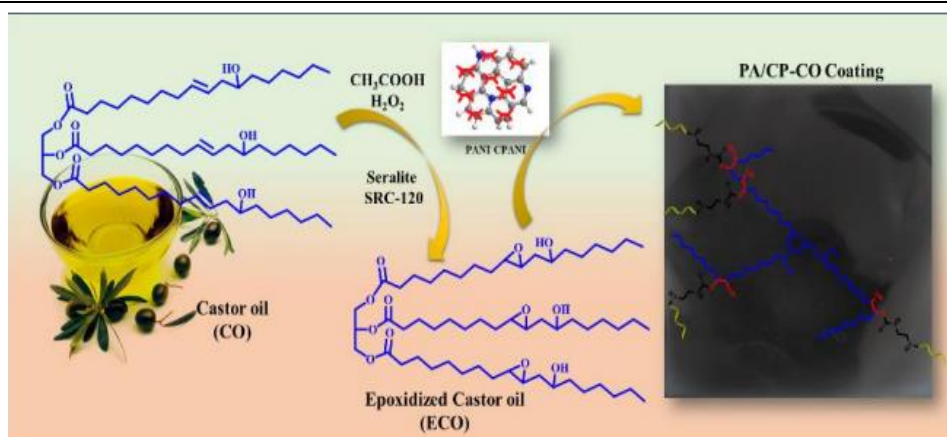
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Abstract:

The corrosion of steel stands as a globally recognized concern. Castor oil-based coatings emerge as formidable protective shields against corrosion, displaying strong adherence to metal surfaces and resilience against moisture, chemicals, and other corrosive agents. In the contemporary context, the pursuit of sustainable and non-hazardous coatings derived from environmentally benign substrates is a focal point of interdisciplinary research, addressing the issue with a holistic approach. In this study, Castor oil sourced from natural reservoirs undergoes transformation into epoxidized castor oil (ECO), serving as a precursor for the synthesis of bio-based coatings [1-4]. Additionally, an electroactive polyaniline (PANI), carbonized polyaniline (C-PANI), and their composite polyaniline-carbonized (PANI-CPANI) [39] variant are prepared and evaluated by incorporating them into the ECO matrix. The characterization of the polyaniline composite material is conducted using powder X-ray diffraction (powder-XRD), while morphological analysis is facilitated through scanning electron microscopy (SEM). Furthermore, the coating system's physicochemical and mechanical properties are assessed using standard techniques such as Universal Testing Machine (UTM) analysis. The presence of PA/CP in the films renders them hydrophilic, as evidenced by alterations in the water contact angle (WCA), with a notable increase of up to 20° observed. The coated hybrid film on mild steel substrates undergoes Potentiodynamic Polarization (PDP) analysis to evaluate the corrosion inhibition potential. The investigation demonstrates that the ECO PANI-CPANI [39] composite coating system exhibits superior corrosion resistance, as indicated by parameters such as corrosion current (I_{corr}) of 6.46×10^{-14} A, corrosion rate (CR) of 7.86×10^{-6} mm/year, charge transfer resistance (R_{ct}) of $5.04.9 \times 10^6$ ohm, and a phase angle exceeding 80°. These eco-friendly coatings are in alignment with sustainability endeavors, offering robust protection while mitigating maintenance expenses and reducing environmental impact [30-33].



Introduction:

A polymer is a substance or material made up of macromolecules, which are very large molecules made up of several repeating subunits. Both synthetic and natural polymers play significant and pervasive roles in daily life as a result of their wide range of features. From well-known synthetic plastic like polystyrene to natural biopolymers like DNA and proteins that are essential to biological structure

and function, polymers come in many shapes and sizes. Numerous tiny molecules, or monomers, are polymerized to produce the polymer, both natural and manufactured. They have unusual physical features such as toughness, high elasticity, viscoelasticity, and a propensity to form amorphous and semicrystalline structures rather than crystals due to their subsequently huge molecular mass in comparison to small molecule compounds.[1]

Polymers are of two types: naturally occurring and synthetic or manmade. Hemp, shellac, amber, wool, and natural rubber are just a few examples of natural rubber polymeric materials that have been utilized for ages [10]. There are numerous additional organic polymers, including cellulose, the primary ingredient in wood and paper. Polyethylene, polypropylene, polystyrene, polyvinyl chloride, nylon, polyacrylonitrile, PVB, phenol formaldehyde resin, polyurethane, silicon, and many other synthetic polymers are in the list, roughly in order of global demand. And coming upon coatings is simply a covering that is applied to the surface of a substrate. [11-15]

The purpose of coating may be technical decorative, or both. Coatings are classified into four groups based on their corrosion resistance: barrier coatings (inorganic, organic, and inhibitive), conversion coatings, anodic coatings, and cathodic coatings. Furthermore, the American Coatings Association categorizes coatings as architectural, industrial, or special purpose. Coatings made from sustainable ingredients offer a green alternative for synthesizing various oleo-polymers [16-20]. These oleo-polymer coatings are employed in a variety of applications, including those requiring anticorrosive, functional, high thermal, fire, self-healing, antibacterial, scratch, and abrasion resistance, as well as antifouling, etc and the bio-based material chosen here is castor oil, which we can find from a castor tree and a non-material polyaniline, there various properties have been studied here [21-22].

Experimental

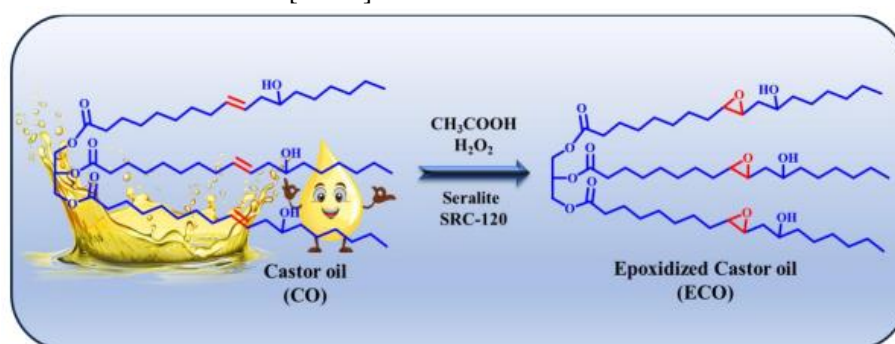
Materials: -

Castor oil (CO) (Purchased from SRL), aniline (Sigma Aldrich), Seralite resin (SRL), acetic acid (FINAR), H₂O₂, ethyl acetate, sodium chloride, HCl (FINAR).

Methods

Synthesis of Epoxidized Castor Oil: -

In a 500 ml RB flask, 100 g of castor oil (BSS grade) was first added followed by the addition of 65 g resin. The reaction mixture was stirred and cooled to 10°C. When the reaction mixture temperature reached 10-15 °C, 9.6 ml of acetic acid was added and the stirring continued. Following this, 70 ml of H₂O₂ was added dropwise over 45 minutes to 1hr, and homogeneous mixing was ensured. After completion of H₂O₂ addition, the temperature was raised to 45 °C and once attained, it was increased to 55 °C. At the end of 5 h, the reaction mixture was cooled; ethyl acetate was added stirred for 10 minutes, and allowed to separate. The aqueous layer with the resin was removed and the organic layer was transferred to the separating funnel. 10 % saturated bicarbonate solution was added to the organic layer and washed well followed by washing with saturated sodium chloride solution. The organic layer was dried over, and anhydrous sodium sulfate and solvent were removed under vacuum maintaining a temperature of 60°C.[3]



Scheme 1: Preparation of epoxidized castor oil from (ECO) from castor oil (CO).

Synthesis of PANI and C-PANI

PANI was made by simple solution polymerization during this procedure, and C-PANI was carbonized by heating PANI in a tube furnace with nitrogen protection. To begin, 1.96 mL of aniline monomer was dispersed in 30 mL of 1M HCl solution. Then, for 24 hours, 4.9 g APS was dissolved in 1 M HCl (20 mL) solution and placed into the aforementioned solution, which was constantly stirred at room temperature. The filtered product was then rinsed with deionized water and ethanol to achieve a neutral pH value before being dried in a vacuum oven at 60 °C. The carbonation procedure is as follows: PANI nanoparticles were

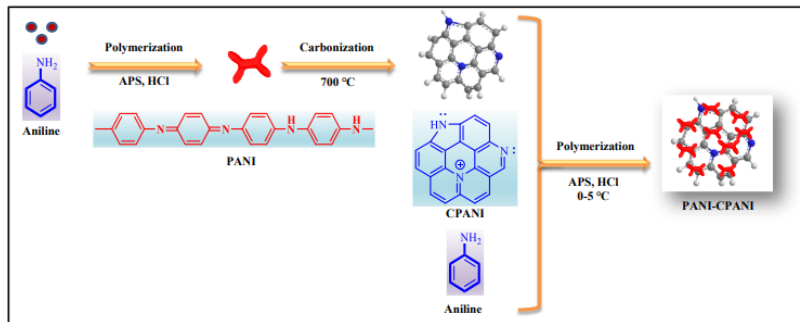
placed in a nitrogen-protected tube furnace. The temperature was initially fixed at 20 °C, then increased to 700 °C at 2 °C/min for 2 hours, and the black C-PANI powder was naturally extracted at room temperature.

Synthesis of PANI-CPANI composite

In-situ polymerization in the presence of C-PANI produced a PANI-CPANI composite. 0.5 mL aniline monomer was first dispersed in 15 mL 1M HCl solution. Different quantities of C-PANI (5 mg, 10 mg, and 15 mg) were dispersed into a 10 ml 1 M HCl solution using an ultrasonic cell disruptor for 15 minutes, and the two dispersed solutions were agitated for 30 minutes. Following that, 1.25 g APS

was dissolved in 1 M HCl (20 mL) solution, which was then dropwise added to the aforementioned solution and agitated continuously for 24 hours at 0-5 °C. The filtered product was then rinsed with deionized water and ethanol to achieve a pH neutral.

Finally, dry in a vacuum oven at 60 °C. PANI-CPANI having varying amounts of CPANI was labeled as PANI-CPANI-5, PANI-CPANI-10, and PANI-CPANI-15.

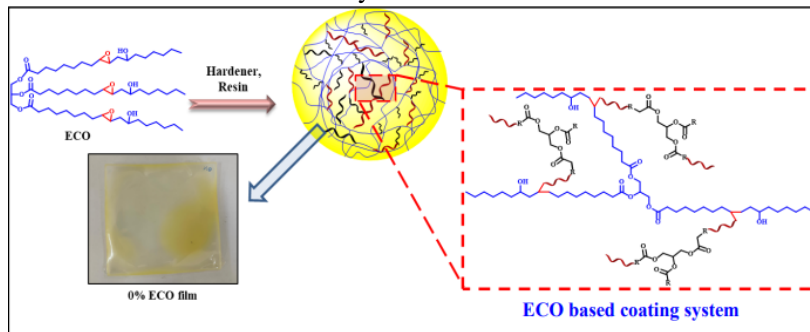


Scheme 2: Synthesis of Polyaniline (PANI), Carbonized PANI(C-PANI), and Polyaniline-carbonized polyaniline composite (PANI-CPANI).

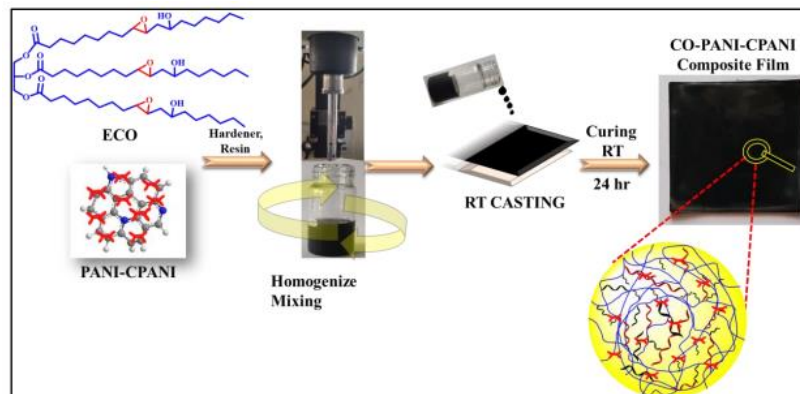
Preparation and casting of ECO-PA/CP Films

To a given weight of ECO, varying amounts of PA/CP composites were added along with resin, defoamer, and hardener. Then the dispersion of the above mixture is carried out by

using a homogenizer for 10 minutes. The prepared formulation was cast on a silicon mold and metal panel (2.8 x 2.8) with a hand driver applicator and cured at room temperature for 24 hr.



Scheme 3: Synthesis of ECO-based coating system.



Scheme 4: Preparation and casting of ECO-PA/CP composite films.

Sample	ECO(g)	Resin(g)	Deformer(g)	Additive(g)	Hardener(g)
ECO-0%	6	6	0.2	-	4
ECO-PA/CP-0.1%	6	6	0.2	0.016	4
ECO-PA/CP-0.25%	6	6	0.2	0.04	4
ECO-PA/CP-0.5%	6	6	0.2	0.08	4
ECO-PA/CP-1%	6	6	0.2	0.16	4

Table 1: The formulation for all the casted ECO-PA/CP composite films.

Result and Discussion

Nuclear Magnetic Resonance (NMR) analysis

In order to confirm the chemical structure of ECO, the ^1H NMR was investigated, which is shown in Fig. 2. The methyl protons were found at $\delta = 0.89$ ppm (peak 1), the methylene protons $[-(\text{CH}_2)_n-]$ were at $\delta = 1.15$ ppm and $\delta = 1.3$ ppm. A multiplet at $\delta 2.3-2.4$ was ascribable to the methylene protons at C-11 and C-8, respectively. The proton signals in the $\delta = 3.3$ ppm correspond to protons on the epoxy groups, which indicated that

the $-\text{CH}=\text{CH}-$ of castor oil (which appears as a multiplet at $\delta 5.6-5.4$) reacted with hydrogen peroxide solution to give epoxidised castor oil. The peak at $\delta = 3.85$ ppm was assigned to $[-\text{CH}_2-]$ connected with $[-\text{C}=\text{O}]$. The presence of a hydroxy function as the chemical shift of hydroxy proton appeared as a broad singlet at $\delta 3.65$. The protons of the glycerol part of triglyceride resonated around 4.0-4.5 and 5-5.5.

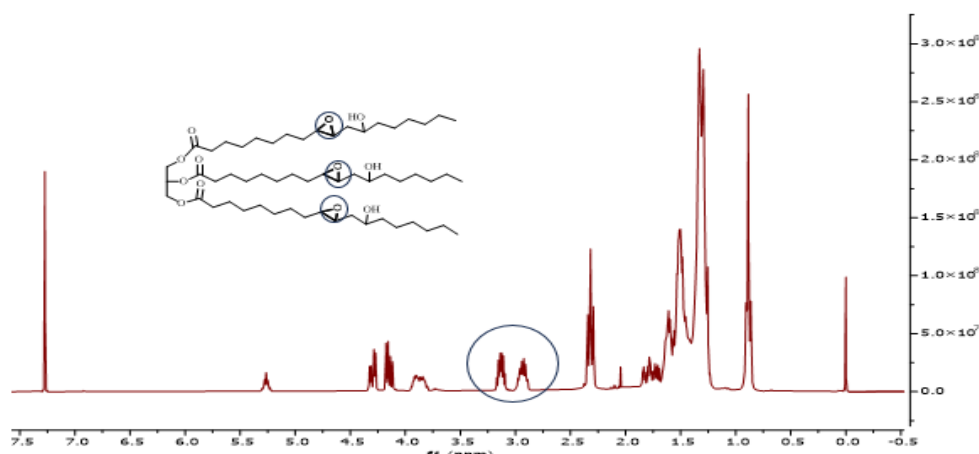


Figure 1. Proton NMR spectrum of epoxidized castor oil

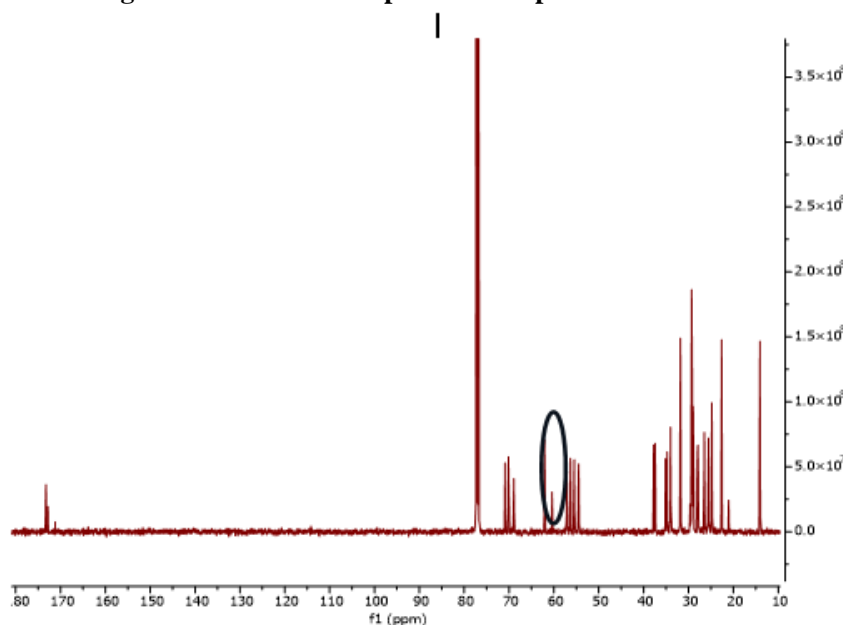


Figure 2. ^{13}C NMR of epoxidized castor oil

Fourier Transform Infrared Spectra (FTIR) analysis

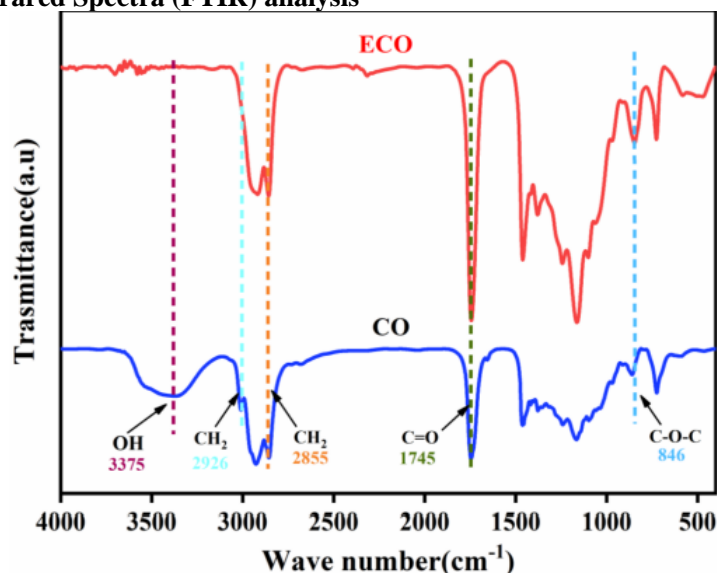


Figure 3: FTIR spectra of CO and ECO.

Indicate the IR spectra of castor oil and epoxidized castor oil. The peak at around 846 cm^{-1} in the ECO spectrum belongs to the epoxy groups, which are not visible in CO. Fourier transform infrared was performed to determine the presence of OH, C=O, oxirane, and so on functionalities. The FTIR spectra of CO and ECO are shown in Figure 3. The ECO spectrum indicates –OH stretching at 3375

cm^{-1} ; –CH₂, asymmetric stretching at 2926 cm^{-1} ; –CH₂ symmetric stretching at 2855 cm^{-1} ; C=O stretch at 1745 cm^{-1} . The asymmetric ester C–O–C signal was found at 1155 cm^{-1} and an epoxy and the epoxide group were assigned at 1243 and 846 cm^{-1} . As shown in Figure 3 it is confirmed that the double of the castor oil is open and epoxy group insertion occurs

Powder X-Ray Diffraction (P-XRD) analysis

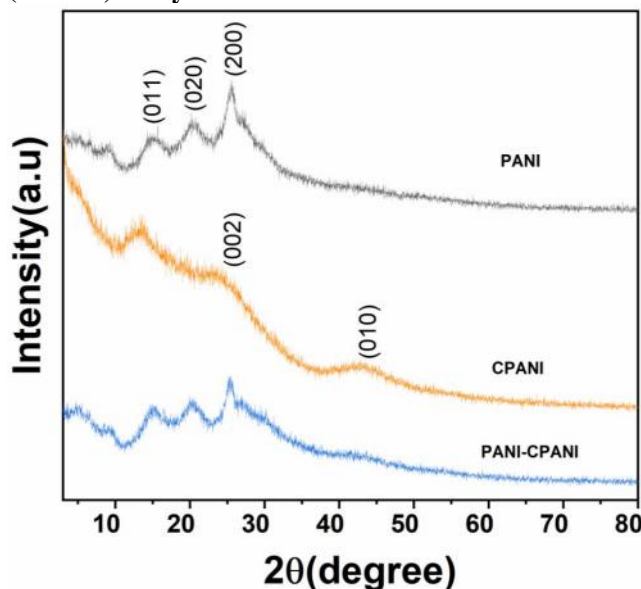


Figure 4: PXRD pattern of PANI, CPANI, PANI CPANI.

The crystal forms of PANI, CPANI, and PANI-CPANI were investigated, and the results are shown in Figure 4. The PANI crystal planes (011), (020), and (200) are represented by three characteristic peaks at $2\theta=14.9^\circ$, 20.7° , and 25.4° , respectively. The typical peaks of PANI were replaced by two broad diffraction peaks at roughly 25° and 43° , which corresponded to (002) and (010) graphitic planes, suggesting that C-PANI existed mostly in

amorphous form. The diffraction peak of PANI-CPANI appeared to be comparable to PANI, but the intensity gets reduced for PANI-CPANI composite [40]. These findings demonstrated that the C-PANI did not affect the PANI crystal shape. In addition, the synthesized composite had a highly organized crystal structure.

Mechanical property

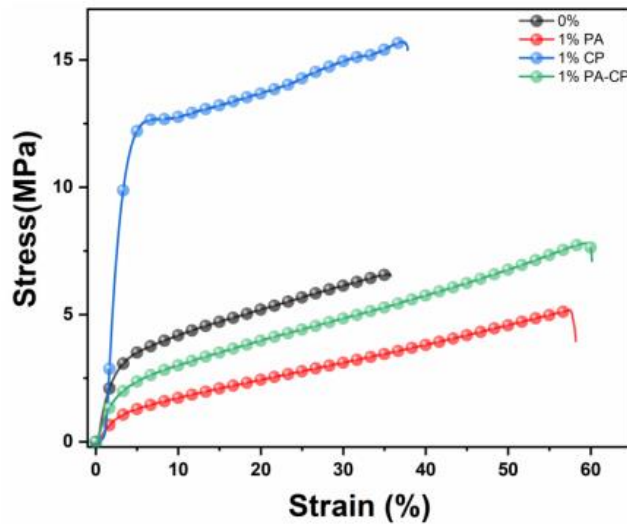


Figure 5: Stress-strain curve of composite films.

Table 2: Mechanical properties of PA, CP, PA-CP composition with ECO hardener base polymeric coating.

Sample	Tensile strength (MPa)	Elongation (%)
ECO	6.6	36
ECO-PA-1	7.1	72
ECO-CP-1	7.8	48
ECO-PA/CP-1	14.5	60

The universal testing machine (UTM) was used to examine the influence of PA/CP addition on the mechanical properties of the ECO-PA-CP films. Figure 6 shows the stress-strain curve of ECO composite films that exhibit elastic behavior. Tensile strength studies show that PA-CP-incorporated films have a higher tensile strength than ECO films. Table 3 summarizes the tensile strength and percentage of elongation at the break of **Anticorrosive performance:**

the ECO composite film [37]. The considerable increase in tensile strength is due to the reinforcing properties of the PA-CP phase on the ECO matrix. There is some adhesion between the two phases ECO hardner and PA-CP However, the optimum loading for maximal strength and elongation was found to be 1%, after which both strength and elongation (%) decreased.

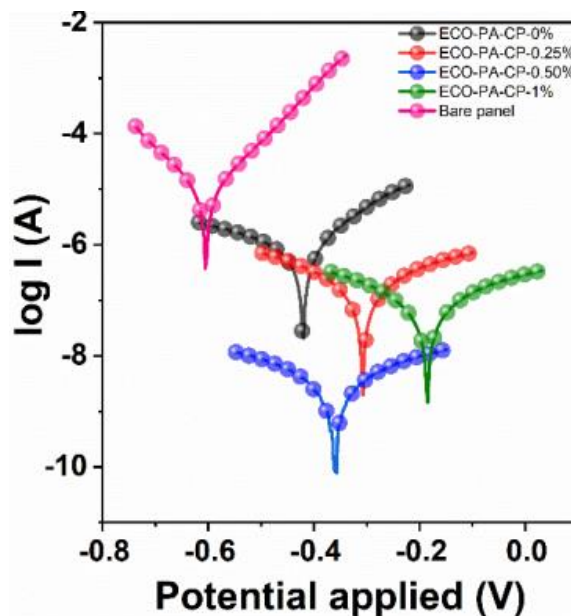


Figure 6. Phase angle plot for PA-CP/ECO.

Potentiodynamic Polarization (PDP)

PDP studies were used to investigate the effectiveness of the coated film for mild steel corrosion prevention. A 2.8×2.8-inch mild steel coupon was coated with ECO-PA-CP films and polarized in 3.5wt% aqueous NaCl. Table 4 depicts the values of essential PDP characteristics such as

$$R_p = \frac{b_a \times b_c}{2.303 (b_a + b_c) I_{corr}}$$

$$C_R = \frac{M}{n \times F \times d} I_{corr}$$

Were,

- ❖ **ba** = Anodic Slope in Tafel plot (in volts/decade)
- ❖ **bc** = Cathodic Slope in Tafel plot (in volts/decade)
- ❖ **I_{corr}** = Corrosion Current
- ❖ **M** = Atomic mass (in the case of iron it's 55.85)
- ❖ **n** = Number of electrons freed by the corrosion reaction (in the case of iron it's 2)
- ❖ **F** = Faraday's constant: 96,486.7 coulombs/mols
- ❖ **d** = Density (in the case of iron it's 7.88 g/cm³)

From the above equation, the Corrosion rate is directly proportional to the corrosion current

Table 3: Potentiodynamic polarization (PDP) and Electrochemical spectroscopic (EIS) studies for ECO-PA-CP composite film in 3.5% NaCl solution.

S.No.	Initial Day (Composites)	E _{corr} (V)	I _{corr} (A)	R _p (charge Resistance) (Ω)	Corrosion Rate (mm/year)
1	Bare Panel	-0.590	1.76 x 10 ⁻⁷	3.0 x 10 ²	2.0 x 10 ⁻¹
2	ECO-PA-CP- 0%	-0.420	1.21 x 10 ⁻¹¹	6.93 x 10 ⁴	1.4 x 10 ⁻³
3	ECO-PA-CP- 0.25%	-0.446	1.23 x 10 ⁻¹⁰	5.18 x 10 ⁶	1.43 x 10 ⁻⁵
4	ECO-PA-CP- 0.50%	-0.451	1.80 x 10 ⁻⁹	1.72 x 10 ⁶	2.09 x 10 ⁻⁵
5	ECO-PA-CP- 1%	-0.438	6.76 x 10 ⁻¹⁴	5.04 x 10 ⁶	7.86 x 10 ⁻⁶

Conclusion:

Castor oil-derived coatings function as potent protective barriers against corrosion, demonstrating strong adhesion to metallic substrates and resilience against moisture, chemical agents, and other corrosive factors. This study involves the conversion of natural Castor oil into epoxidized castor oil (ECO), subsequently utilized as a precursor for the fabrication of biobased coatings. A highly electroactive polyaniline-carbonized polyaniline (PANI/CPANI) composite was synthesized via in situ polymerization and integrated as a filler in the Epoxidized Castor Oil matrix. Characterization of the prepared ECO involved Fouriertransform infrared spectroscopy (FT-IR) and proton nuclear magnetic resonance spectroscopy (1H NMR), while the PANI/CPANI composite was examined using X-ray diffraction (XRD). The environmentally benign films exhibit uniform dispersion and exceptional wear resistance.

voltage (E_{corr}), corrosion resistance (CR), and corrosion current density (I_{corr}). The polarization plots were created as a function of impression time and are shown in Figure 8. Corrosion defensive ability furnished by the coating can be represented as the Stern Geary equation:

density. Further emphasizing the equation, it is seen that the I_{corr} value for the mild steel showed a very high CR of 2.0 x 10⁻¹ mm/year with an I_{corr} value of 1.76 x 10⁻⁷ A.

As compared to mild steel the corrosion rate of the ECO-PA-CP panel without PA/CP was 1.4×10⁻³ mm/year with a of whereas the corrosion rate of the ECO -PA-CP-1% showed the lowest CR value of 7.86x10⁶ mm/year with an I_{corr} of 6.76 x 10⁻¹⁴ A. All the other ECO-PACP composite coatings are discussed in Table 3.

Polyaniline (PANI), carbonized PANI (C-PANI), and PANI-carbonized PANI composite (PANI-CPANI) coatings provide versatile corrosion protection solutions, with PANI coatings acting as barriers against corrosive environments, and C-PANI and PANI-CPANI coatings offering superior protection owing to enhanced mechanical strength, chemical stability, and barrier properties. The mechanical stability of the incorporated C-PANI and PANI-CPANI in castor oil films was evaluated using a Universal Testing Machine (UTM), revealing improved tensile strength compared to bare castor oil. ECO-PA/CP-1% exhibited a high tensile strength of up to 14.533 MPa with an elongation break of 60.156%. The prepared films display hydrophilicity due to the presence of epoxy resin, with an increase in water contact angle (WCA) observed with higher PA-CP content in castor oil, attributed to increased surface roughness. Electrochemical impedance spectroscopy (EIS) and

potentiodynamic polarization (PDP) tests demonstrated superior anticorrosion activity of ECOPA-CP 1% (corrosion rate, CR = 7.86×10^{-6} mm/year; charge transfer resistance, $R_{ct} = 5.04 \times 10^6$ ohm) in 3.5% NaCl solution. This research underscores the potential of PANI composites as effective anticorrosive fillers, offering promising applications in the paints and coatings industry. These eco-friendly coatings are in line with sustainability goals, providing robust protection while minimizing maintenance expenses and environmental footprint.

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National Educational Policy (NEP) 2020 on Teacher Education

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Abstract:

The National Education Policy (NEP) 2020 marks a pivotal shift in teacher education in India, aimed at fostering a holistic, multidisciplinary, and technologically integrated approach to training educators. This policy introduces the four-year integrated B.Ed. program, set to become the minimum qualification for school teachers by 2030, ensuring comprehensive training in both content and pedagogy. The NEP 2020 emphasizes continuous professional development through regular in-service training and the establishment of National Professional Standards for Teachers (NPST), promoting uniformity in teacher quality nationwide. Key innovations include moving teacher education to multidisciplinary institutions, implementing entrance exams for B.Ed. programs, and integrating technology in training. This paper also highlights the need for diverse faculty profiles, ongoing self-development programs for teachers, and a restructured Ph.D. curriculum that includes coursework in teaching methods and practical teaching experience. Additionally, NEP 2020 proposes a merit-based teacher recruitment process with improved Teacher Eligibility Tests (TETs) and emphasizes the role of technology and online resources in enhancing teaching and learning experiences. This paper explores the innovations and adaptations in teacher education as per NEP 2020, detailing its recommendations, implementation challenges, and the transformative potential for the future of education in India.

Keywords: NEP, Teacher education, innovation and Recommendation

Introduction:

Education is dynamic process. “Education gives a new shape to the individual and the nation as well. Education plays major role in bringing social change, economic and political development of any society. Education helps people to learn right action at right time. Such an education requires effective teachers. It is well known saying that teacher is the nation builder. A teacher is the center of the formal teaching learning process. The future of the students depends on the teachers”. The teacher’s place in the society is most important, so quality of teacher Education program needs to be upgraded. The teachers are not able to think critically and solve the problems related to the teaching methods, content and organization, etc. Therefore, teacher education program needs to be reformed and revised the curriculum of the teacher education program according to changing needs of society.

“A great teacher is both made and born. Teaching is a skill which has to be acquired and proper training makes one skillful”. “Teachers are born with talent and passion for teaching and further they are also made by enhancing their talent and developing new skills. For enhancement of such skills, teacher education has to be more advanced. The teacher education refers to the process of nurturing a teacher with proper skills, knowledge, attitude and behavior to work effectively and

efficiently both insect and outside the classroom” (Shahinoor & Sonali 2022).

It is the time to bring out an education policy because a major development is required in the last policy of 1986 which are followed for around 34 years. “The National Educational Policy 2020 recommends major changes in the teacher education scenario. The recommendation on teacher education is given in chapter 15 of NEP 2020 under part II, which details the policy changes in higher education”. The main objective of NEP is to “ensure that teachers are given the highest quality training in content, pedagogy and practice by moving teacher education system into multidisciplinary college and university and establishing the 4 years integrated B,Ed by 2030,become the minimal degree qualification for school teachers”(NEP 2020,P 42:15.5). This paper focuses on new Innovation and adaptation in the field of teacher education, with reference to new education policy. 2020.

Objectives:

The national educational policy 2020 contains numerous measures to enhance the quality of India’s teacher education system. These are the objectives of the study

1. To study new innovation and adaptations in the teacher education’s field.
2. To study the different recommendation of NEP 2020 on teacher education.

3. To study challenges of implementing NEP 2020 regarding teacher education.

Methodology: For preparing this paper, researcher use mainly qualitative approach in association with some literature work with reference to national educational policy 2020.

NEP 2020: New Innovation and Adaptation in Teacher Education

- **Integrated Teacher Education program (4 years integrated B.Ed program):**

By 2030, higher education institutions will offer a 4-year integrated B.Ed program, leading to a dual major degree that includes both a holistic bachelor's degree in education as well as specialized subject. The NEP suggests a four year integrated B.Ed program to improve the quality of teacher education. The aims of this program are to provide a more comprehensive and rigorous training to future teacher.

- **Nature of institution conducting teacher training programs:**

“Teacher education will gradually be moved by 2030 into multidisciplinary institution”. (NEP 2020, MHRD, P-23). The policy comes to outstanding educational department that offer B.Ed, M.Ed, Ph.D degree in education.

- **Admission and curriculum:**

To maintain uniform standards for teacher education, the policy implemented entrance exam for admission to B.Ed programs through suitable subject and aptitude test conducted by National testing agency. Additionally, it stresses the importance of subjects like history, psychology, Sociology and early childhood education in teacher training programs. The policy also emphasizes the role of Technology in teacher education of comprehensive National curriculum for teacher education. For curriculum development the policy recommended the creation of a comprehensive National curriculum framework for teacher education (NCFTE) by 2021

- **Faculty**

The profile of faculty in The educational department will be diverse with a significant emphasis on teaching and Research experience .Teacher possessing an educational backgrounds is directly related to the social science field such as psychology ,child development ,linguistics, sociology, child development, economics , political science ,education, language education and mathematics education, Will be attracted and retained in teacher education institutions, to strengthen multi-disciplinary education of teachers and provide foundation in conceptual development.

- **Teacher self-development program:**

This policy advocate continuously self-development of teachers throughout their career by including seminar, workshops and access to resources updated with latest teaching methods and

technologies. Short term courses will be also provided in multidisciplinary institutions on specific areas of teaching such as the teaching of students with special need, leadership, and management in a school education system or to move from one stage to another (NEP 2020, 5.23)

- **Professional Standards for Teachers:**

By 2022, a set of guidelines for the National Professional Standards for Teachers (NPST) will be developed by the National Council for Teacher Education (NCTE), which has reorganized into a Professional Standard Setting Body (PSSB) under the General Education Council (GEC). NCERT, SCERT, all levels and regions of teachers, teacher preparation and development institutes, and higher education institutions will be consulted in the process.

- **Credit-Based Curriculum for Ph.D. Entrants:**

All new Ph.D. candidates, no matter their field, will need to complete coursework in teaching, education, teaching, pedagogy, and writing related to their Ph.D. subject during their doctoral studies. This will help them learn about teaching methods, curriculum design, effective evaluation techniques, and communication skills. This requirement is in place because many Ph.D. scholars are likely to become faculty members or public representatives in their fields. Additionally, Ph.D. students will gain practical teaching experience through teaching assistantships and other opportunities. Universities across the country will restructure Ph.D. programs to include these changes.

- **Online assessment and Examination:**

Relevant organizations, including the proposed National Assessment Centre (PARAKH), School Boards, NTA, and other designated entities, will develop and implement assessment frameworks. These frameworks will include competencies, portfolios, rubrics, standardized tests, and assessment analytics. Research will be conducted to explore new assessment methods using educational technologies, with a focus on 21st-century skills.

- **Teacher Recruitment:**

Teacher Eligibility Tests (TETs) will be improved to include better test materials focusing on both content and teaching methods. These tests will cover teachers at all levels of school education, including Foundational, Preparatory, Middle, and Secondary stages. For subject-specific teachers, appropriate TET or NTA test scores in their subjects will be considered during recruitment.

To evaluate candidates' enthusiasm and dedication to teaching, a classroom demonstration or interview will be part of the hiring process in schools and school complexes. These interviews will also assess candidates' ability to teach in the local language, ensuring that every school has teachers who can communicate with students in

their home languages. Private school teachers must also meet these TET requirements, including a demonstration or interview and proficiency in the local language.

Recommendation of Nep2020 on Teacher Education:

The National Education Policy (NEP) 2020 provides several recommendations for improving teacher education in India. These recommendations aim to enhance the quality of teacher training programs, attract talented individuals to the teaching profession, and ensure continuous professional development for teachers. Key recommendations include:

1. Integrated Teacher Education Program (ITEP):

- NEP 2020 proposes the introduction of a four-year integrated B.Ed. program combining content, pedagogy, and practical experiences.
- This program will be multidisciplinary and holistic, aligning with the liberal education approach.

2. Multiple Entry and Exit Options:

- Teacher education programs will offer flexibility with multiple entry and exit options to accommodate different career paths and life circumstances.
- Students can exit after two years with a diploma in education or continue for a full four-year B.Ed. degree.

3. National Professional Standards for Teachers (NPST):

- A common set of standards for teachers at all levels will be developed to ensure uniformity in teacher quality.
- These standards will cover knowledge, skills, and ethics required for the profession and will be periodically reviewed.

4. Professional Development:

- NEP 2020 emphasizes continuous professional development through regular in-service training and professional learning programs.
- Teachers will be required to complete a minimum of 50 hours of CPD (Continuing Professional Development) every year.

5. Higher Qualifications and Research:

- The policy encourages teachers to pursue higher qualifications and engage in educational research.
- Opportunities for pursuing Master's and Doctoral programs in education will be expanded.

6. Teacher Eligibility and Recruitment:

- A robust system for teacher recruitment will be established, ensuring merit-based selection processes.
- Teacher Eligibility Tests (TETs) will be strengthened to assess candidates' pedagogical skills and subject knowledge.

7. Use of Technology:

- Integrating technology in teacher education is a priority. Digital platforms and online resources will be leveraged for training and professional development.
- Teachers will be trained to use digital tools effectively in their teaching practices.

8. Focus on Foundational Literacy and Numeracy:

- Teacher education programs will emphasize foundational literacy and numeracy skills, ensuring teachers are well-equipped to address early childhood and primary education needs.

9. Support for Rural and Remote Areas:

- Special measures will be taken to address the challenges faced by teachers in rural and remote areas, including providing incentives and improving infrastructure.
- Distance and online learning platforms will be developed to reach teachers in these areas.

10. Multidisciplinary and Inclusive Approach:

- Teacher education will adopt a multidisciplinary approach, incorporating subjects like psychology, sociology, and philosophy.
- Training will also focus on inclusive education, preparing teachers to handle diverse classrooms and special education needs.

11. Strengthening Institutional Governance:

- Teacher education institutions (TEIs) will undergo accreditation and ranking processes to ensure quality.
- Autonomous bodies like the National Council for Teacher Education (NCTE) will be empowered to regulate and standardize teacher education.

12. Collaboration with Schools:

- Stronger partnerships between teacher education institutions and schools will be fostered.
- Practical training and internships in schools will be an integral part of teacher education programs.

13. Mentorship and Support Systems:

- Experienced and senior teachers will mentor new teachers, providing guidance and support in the initial years of their careers.
- Professional learning communities and peer networks will be established for collaborative learning and support.

Challenges of Implementing NEP 2020 Regarding Teacher Education

The National Education Policy (NEP) 2020, introduced by the Indian government, is a comprehensive framework aimed at overhauling the Indian educational system. It covers a wide range of aspects, including revamping the curriculum, pedagogical structure, and assessment methods, with an emphasis on critical thinking and creativity. The implementation of NEP 2020 in teacher education faces several challenges:

1. **Training and Capacity Building:** One of the primary challenges is training the existing teachers and educators about the new pedagogical and assessment strategies proposed in NEP 2020. The policy suggests a shift towards more interactive and practical learning approaches, which requires teachers to adopt new teaching methodologies that might be significantly different from their traditional practices.
2. **Infrastructure and Resources:** Implementing the NEP 2020 recommendations requires substantial upgrades in physical and digital infrastructure, especially in rural and semi-urban areas. Teachers need access to the latest technology and digital resources to facilitate modern teaching methods, which might be a significant hurdle given the current disparities in infrastructure across different parts of the country.
3. **Curriculum Overhaul:** NEP 2020 proposes a multidisciplinary approach to education, which necessitates a comprehensive overhaul of the existing curriculum. Designing a new curriculum that aligns with the NEP's vision, and training teachers to effectively deliver this curriculum, poses a significant challenge.
4. **Language and Cultural Diversity:** India's linguistic and cultural diversity means that the policy's implementation needs to be tailored to various contexts. Teachers must be trained to deliver content in local languages and adapt to multicultural classrooms, ensuring inclusivity and equity in education.
5. **Assessment Reforms:** NEP 2020 advocates for a shift from rote learning to understanding and applying knowledge, requiring a change in assessment methods. Teachers must be trained to design and implement new types of assessments that evaluate students' critical thinking, creativity, and application skills rather than mere memorization.
6. **Professional Development:** Continuous professional development of teachers is emphasized in NEP 2020. However, creating a structured, ongoing professional development framework that is accessible to all teachers is a challenge. This includes providing opportunities for teachers to pursue advanced studies and research in their fields.
7. **Adaptation to Online and Blended Learning:** The COVID-19 pandemic has accelerated the adoption of online and blended learning models. Teachers must be equipped with the skills and tools to effectively manage these modes of teaching, which includes understanding how to maintain student engagement and assess performance in a virtual environment.

8. **Financing:** Implementing the changes proposed in NEP 2020, especially in teacher education, requires significant financial investment. Allocating sufficient funds to train teachers, upgrade infrastructure, and develop resources is a considerable challenge, particularly in the context of India's vast and varied educational landscape.

Conclusion:

The National Education Policy (NEP) 2020 represents a significant shift in the landscape of teacher education in India, emphasizing the need for a more holistic, multidisciplinary, and technologically integrated approach. The introduction of the four-year integrated B.Ed. program is a cornerstone of this reform, designed to offer comprehensive training that encompasses both content and pedagogy. By 2030, this program aims to become the minimum qualification for school teachers, ensuring that educators are well-prepared for the complexities of modern teaching environments.

The NEP 2020 also underscores the importance of continuous professional development, advocating for regular in-service training and the establishment of National Professional Standards for Teachers (NPST). This framework aims to maintain uniformity in teacher quality across the nation, promoting a culture of excellence and lifelong learning. Additionally, the policy highlights the crucial role of technology in teacher education, encouraging the integration of digital tools and online resources to enhance both teaching and learning experiences.

The proposed changes extend to the recruitment process, with an emphasis on merit-based selection and improved Teacher Eligibility Tests (TETs). This ensures that only the most qualified individuals enter the teaching profession, equipped with the necessary skills to foster critical thinking, creativity, and practical application among students.

Overall, the NEP 2020 aims to transform teacher education by fostering a supportive, well-resourced, and dynamic educational ecosystem. By prioritizing the holistic development of teachers, the policy seeks to ensure that educators are not only skilled and knowledgeable but also adaptable to the evolving demands of society. This comprehensive approach is expected to lead to significant improvements in the quality of education across India, ultimately contributing to the nation's socio-economic and cultural development.

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An Effective Green Approach towards one-pot synthesis of different derivatives of quinazolin-4(3H)-one

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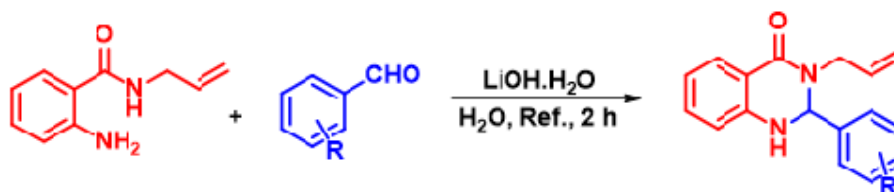
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Abstract:

A strategy for the synthesis of quinazolinones via coupling reaction between aminobenzamides with different aromatic aldehydes has been accomplished by using LiOH/H₂O. Highlights of this method include the first synthesis of quinazolinones bearing an N-allyl substituent, green approach towards the synthesis of bioactive heterocyclic ring, mild reaction condition.



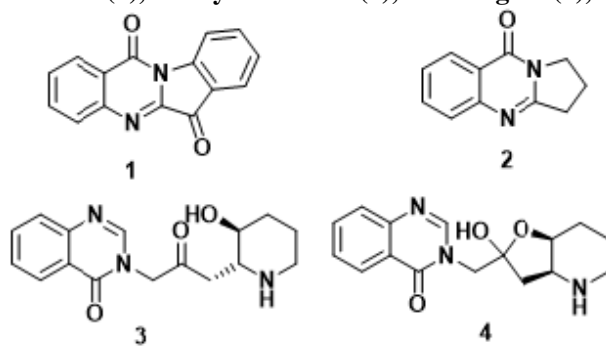
Keywords: One-pot synthesis, green chemistry, heterocycles, amides, aldehydes

Introduction

The number of heterocyclic compounds shows active role in the drug synthesis, having different biological activities. The quinazolinone scaffold and its derivatives are originate in more than 100 naturally occurring alkaloids isolated from a range of animals, plant families, and microbial metabolites, with the wide range of biological activities and pharmacological.¹ The quinazolin-4(3H)-one system is the one of the heterocyclic compounds which become an attractive core structure for the synthesis that exhibit interesting biological activities and pharmacological properties.²⁻⁵ A number of natural products, such as the alkaloids tryptanthrin (1) and deoxyvasicinone (2) and the antimalarials febrifugine (3) and isofebrifugine (4) contain a quinazolin-4(3H)-one moiety.⁶⁻¹¹ There are several reports for synthesis of quinazolin-4(3H)-ones are present. Which are simply divided into two components and three component synthesis. In two-component synthesis, some typical pairs of two-component reactions are composed of: 2-halobenzoic acids or esters and arylamidines;¹² 2-aminobenzamides and benzoyl chlorides or their equivalents;¹³ α -azido-substituted aromatic imides;¹⁴ anthranilamide and (hetero) aryl aldehydes;¹⁵ o-iodobenzamides and benzylamines;¹⁶ anthranilamide and benzyl alcohols;¹⁷ lithium 2-(diethylaminocarbonyl anilide and (hetero)arylnitriles;¹⁸ 1-aryl-4-(dimethylamino)-2-phenyl-1,3-diazabuta-1,3-dienes and phenyl isocyanate

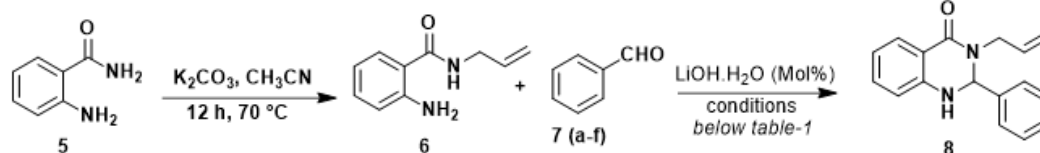
isofebrifugine (4) contain a quinazolin-4(3H)-one moiety (Figure 1).⁶⁻¹¹ There are several reports for synthesis of quinazolin-4(3H)-ones are present. Which are simply divided into two components and three component synthesis. In two-component synthesis, some typical pairs of two-component reactions are composed of: 2-halobenzoic acids or esters and arylamidines;¹² 2-aminobenzamides and benzoyl chlorides or their equivalents;¹³ α -azido-substituted aromatic imides;¹⁴ anthranilamide and (hetero) aryl aldehydes;¹⁵ o-iodobenzamides and benzylamines;¹⁶ anthranilamide and benzyl alcohols;¹⁷ lithium 2-(diethylaminocarbonyl anilide and (hetero)arylnitriles;¹⁸ 1-aryl-4-(dimethylamino)-2-phenyl-1,3-diazabuta-1,3-dienes and phenyl isocyanate

Figure 1. Structure of Tryptanthrin (1), Deoxyvasicinone (2), Febrifugine (3), and Isofebrifugine (4)



Result and Discussion:

In continuation of the work going on synthesis of different heterocyclic compounds in our group, we have started the synthesis of quinazolin-4(3H)-one by using aminobenzamides and different types aromatic aldehydes at variable conditions to find the easiest way. As we mentioned earlier that there are many reports which shows the synthesis, so we have decided to make a reaction condition

Table 1. Reaction Optimization Studies

Entry	LiOH.H ₂ O(mol%)	Solvent	Temp. (°C)	Time	% Yield
1	5	MeOH	Reflux	2 h	30
2	5	EtOH	Reflux	3 h	43
3	5	EtOH.H ₂ O	Reflux	2 h	37
4	5	PEG-400	Reflux	1 h	10
5	10	H ₂ O	Reflux	2 h	40
6	10	MeOH	Reflux	2 h	42
7	10	EtOH.H ₂ O	Reflux	2 h	44
8	15	MeOH	Reflux	3 h	45
9	15	EtOH.H ₂ O	Reflux	45 min	60
10	15	PEG-400	Reflux	3 h	10
11	20	MeOH	Reflux	2 h	65
12	20	H ₂ O	Reflux	2 h	81
13	20	EtOH.H ₂ O	Reflux	45 min	75
14	20	PEG-400	Reflux	2 h	20
15	25	MeOH	Reflux	3 h	72
16	25	H ₂ O	Reflux	2 h	75
17	25	EtOH.H ₂ O	Reflux	2 h	73
18	30	MeOH	Reflux	2 h	65
19	30	H ₂ O	Reflux	2h	70
20	30	EtOH.H ₂ O	Reflux	2 h	74

After getting compound 6 we have followed the convenient synthetic approach towards the synthesis of different derivatives of quinazolin-4(3H)-one under green chemistry approach by using LiOH.H₂O in various solvents (Table 1). The reaction was carried out by using N-allyl-2-aminobenzamide (6) (1 mmol) and benzaldehyde (7) (2 mmol) by using different solvent at reflux condition and monitored the reaction progress using thin-layer chromatography. As shown in the table 1 different parameters were studied in the search of best optimization condition to synthesise the desired product with good yield. The reaction is carried out under different amount of catalyst along with the different solvents, initially we found that with 5% concentration of catalyst all the solvent we monitored (MeOH, EtOH, EtOH.H₂O, PEG-400, H₂O) gave very low yield (Table 1 entry 1-5). Then the optimization is carried out with increasing the concentration of catalyst along with different solvents as shown in Table 1. As can be seen, the best result was obtained with the 20 % catalytic amount of LiOH.H₂O along with the EtOH solvent

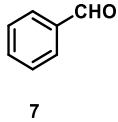
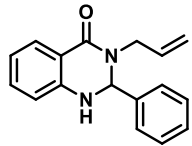
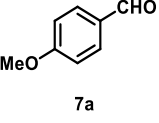
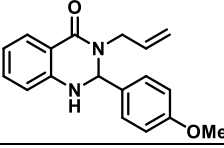
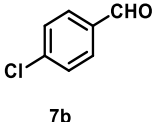
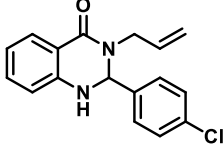
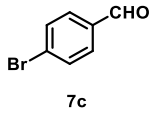
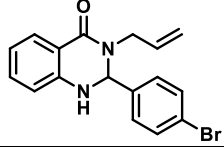
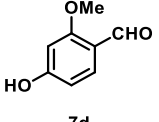
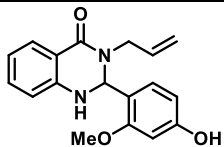
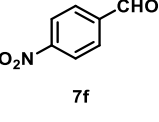
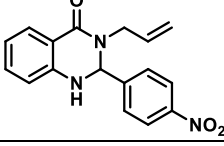
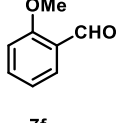
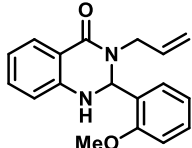
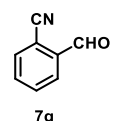
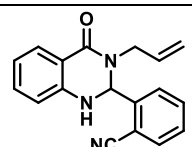
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which easy to access and also have too ecofriendly. To begin with we took 2-aminobenzamide and benzaldehyde the model substrates (Table 1). Initially we have followed the known protocol for the attachment of allyl group to the nitrogen by using K₂CO₃ in CH₃CN, got the compound 6 which further used for the optimization of reaction condition.2

refluxed at 70 °C for 2 h (entry 17). We observe other solvents gives moderate to good yield in same reaction condition (entry 16, 18, 19, 20). However, concentration of catalyst increases to 25%, reaction time also increase with low yields (entry 21-25). Having an optimal condition in hand with a model reaction study and to shows the scope and simplification of the reaction condition different quinazolin-4(3H)-one derivatives (8a-g) were prepared using different substituted aromatic aldehydes on reaction with 2-aminobenzamide in presence of LiOH.H₂O and water solvent and synthesized derivatives are listed in table 2. This reaction was examined with electrically divergent aromatic aldehydes and it was shown that this optimal condition can gives good yield. As it seen in the table that best results were obtained with the aromatic aldehyde which are having electron withdrawing groups (8b, 8e, 8g) as compared to the benzaldehyde. This will give a best contribution to economize the cost of different bioactive quinazolinone core containing nature product and

development of green chemistry approach towards synthesis.

Table 2. Different Synthesized Derivatives of quinazolin-4(3H)-one

Product No.	Different Aldehydes	Product Structure	Yield
8			81%
8a			82%
8b			86%
8c			80%
8d			78%
8e			90%
8f			83%
8g			85%

Experimental:

All reactions were carried out in oven-dried glassware under normal condition. All reagents, solvents and starting materials were obtained from commercial suppliers and used as such without additional purification. Reactions were monitored by using thin layer chromatography (TLC) carried out on Silica gel G60. Visualization was accomplished with either UV light, or by immersion in ethanolic solution of para-anisaldehyde, phosphomolybdic acid (PMA), KMnO₄, 2,4-DNP stain, Iodine Ninhydrin solution, adsorbed on silica gel followed by heating on a heat gun for ~15 sec. Melting points were measured with Roy Capillary melting point apparatus using open capillary tubes and are uncorrected. NMR (¹H and ¹³C) spectra were recorded on a Bruker AXS (400MHz)

instrument. IR spectra were recorded on Shimadzu Fourier transform infrared spectrophotometer.

General procedure for the synthesis of compounds (8a–g). In a clean and dry 100 ml RB flask 20% LiOH.H₂O was added to the mixture of substituted 2-aminobenzamide (1 mmol), benzaldehyde (2 mmol) in water (10 mL) at room temperature. The reaction mixture was refluxed at 80°C and stirred for 2 h. The progress of the reaction was monitored by TLC (Pet Ether: Ethyl Acetate= 7:3); after the completion of reaction, reaction mixture was cooled to room temperature and pour ice cold water, the crude product obtained by filtration. The crude product was purified by re-crystallization using ethanol to obtain the pure product 8a–g.

3-allyl-2-phenyl-2,3-dihydroquinazolin-4(1H)-one (8): yellow solid, Yield (81%) Mp: 221–224 °C. IR \square max(films): cm⁻¹ 3360, 2987, 1633, 1047. ¹H-

NMR (400 MHz, DMSO-d₆) δ 8.26 (br s, 1H), 7.58 (d, J = 7.6 Hz, 1H), 7.46 (d, J = 7.2 Hz, 1H), 7.39–7.29 (m, 3H), 7.24–7.18 (m, 1H), 7.08 (br s, 1H), 6.71 (d, J = 8.0 Hz, 1H), 6.64 (t, J = 7.6 Hz, 1H), 5.90 (m, 1H), 5.72 (s, 1H), 5.28 (dd, J = 17.1, 1.3 Hz, 1H), 5.20 (dd, J = 10.2, 1.2 Hz, 1H), 4.11–4.02 (m, 2H). ¹³C-NMR (100 MHz, DMSO-d₆) δ 164.1, 148.4, 142.2, 134.8, 133.8, 128.9, 128.8 (2C), 127.3 (2C), 117.6, 114.6, 115.4, 114.9, 83.3, 67.1, 40.2; HRMS (ESI) Calcd. for [M+H]⁺ C₁₇H₁₇N₂O: 265.3280.

3-allyl-2-(4-methoxyphenyl)-2,3-dihydroquinazolin-4(1H)-one (8a): White solid. Yield: 82%. Mp: 125–127 °C. IR ν_{max} (film): cm⁻¹ 3364, 2992, 1627, 1046. ¹H NMR (400 MHz, DMSO-d₆) δ 8.06 (br s, 1H), 7.63 (d, J = 7.6 Hz, 1H), 7.5 (d, J = 7.2 Hz, 1H), 7.42–7.45 (m, 2H), 7.19–7.22 (m, 1H), 7.08 (br s, 1H), 6.71 (d, J = 8.0 Hz, 1H), 6.64 (t, J = 7.6 Hz, 1H), 5.90 (m, 1H), 5.72 (s, 1H), 5.28 (dd, J = 17.1, 1.3 Hz, 1H), 5.20 (dd, J = 10.2, 1.2 Hz, 1H), 4.11–4.02 (m, 2H), 3.76 (s, 3H); ¹³C NMR (100 MHz, DMSO-d₆) δ 163.1, 144.4, 140.2, 132.7, 132.5, 127.6, 128.8 (2C), 117.6, 115.4, 114.9, 114.3 (2C), 113.3, 84.2, 67.2, 55.8, 39.9; HRMS (ESI) Calcd. for [M+H]⁺ C₁₈H₁₉N₂O₂: 294.3540.

3-allyl-2-(4-chlorophenyl)-2,3-dihydroquinazolin-4(1H)-one (8b): White solid. Yield-86%. Mp: 170–173 °C. IR ν_{max} (film): cm⁻¹ 3367, 2929, 1445, 1026. ¹H NMR (400 MHz, DMSO-d₆) δ 8.08 (br s, 1H), 7.67 (d, J = 7.6 Hz, 1H), 7.5 (d, J = 7.2 Hz, 1H), 7.40–7.43 (m, 2H), 7.33–7.38 (m, 1H), 7.00 (br s, 1H), 6.01 (d, J = 8.0 Hz, 1H), 6.29 (t, J = 7.6 Hz, 1H), 5.85 (m, 1H), 5.78 (s, 1H), 5.18 (dd, J = 17.1, 1.3 Hz, 1H), 5.19 (dd, J = 10.2, 1.2 Hz, 1H), 3.74–3.87 (m, 2H); ¹³C NMR (100 MHz, DMSO-d₆) δ 162.3, 145.3, 139.2, 132.7, 131.5, 129.3 (2C), 128.8 (2C), 117.6, 116.9, 115.4, 114.3, 113.3, 84.8, 67.2, 39.9; HRMS (ESI) Calcd. for [M+H]⁺ C₁₇H₁₆ClN₂O: 298.0873.

3-allyl-2-(4-bromophenyl)-2,3-dihydroquinazolin-4(1H)-one (8c): Red solid. Yield-80%. Mp: 185–188 °C. IR ν_{max} (film): cm⁻¹ 3440, 3301, 1590, 1084. ¹H NMR (400 MHz, DMSO-d₆) δ 8.10 (br s, 1H), 7.63 (d, J = 7.6 Hz, 1H), 7.55 (d, J = 7.2 Hz, 1H), 7.42–7.49 (m, 2H), 7.32–7.38 (m, 1H), 7.02 (br s, 1H), 6.5 (d, J = 8.0 Hz, 1H), 6.35 (t, J = 7.6 Hz, 1H), 5.75 (m, 1H), 5.62 (s, 1H), 5.10 (dd, J = 17.1, 1.3 Hz, 1H), 5.09 (dd, J = 10.2, 1.2 Hz, 1H), 3.70–3.85 (m, 2H); ¹³C NMR (100 MHz, DMSO-d₆) δ 163.4, 146.5, 138.2, 133.7, 130.5, 129.5 (2C), 128.6 (2C), 117.1, 116.5, 115.5, 114.7, 113.3, 84.7, 65.2, 40.5; HRMS (ESI) Calcd. for [M+H]⁺ C₁₇H₁₆BrN₂O: 343.2240.

3-allyl-2-(4-hydroxy-2-methoxyphenyl)-2,3-dihydroquinazolin-4(1H)-one (8d): White solid. Yield-78%. Mp: 168–171 °C. IR ν_{max} (film): cm⁻¹ 3361, 2920, 1635, 1083. ¹H NMR (400 MHz, DMSO-d₆) δ 8.00 (br s, 1H), 7.67 (d, J = 7.6 Hz, 1H), 7.44 (d, J = 7.2 Hz, 1H), 7.00–7.11 (m, 1H),

7.02 (br s, 1H), 6.32–6.75 (m, 3H), 6.09 (s, 1H), 5.85 (m, 1H), 5.18 (dd, J = 17.1, 1.3 Hz, 1H), 5.09 (dd, J = 10.2, 1.2 Hz, 1H), 3.82–3.87 (m, 2H), 3.72 (s, 3H); ¹³C NMR (100 MHz, DMSO-d₆) δ 162.3, 160.7, 158.2, 145.5, 130.5, 129.7 (2C), 127.6 (2C), 113.3, 116.9, 115.5, 114.7, 113.3, 84.7, 65.2, 56.1, 45.5; HRMS (ESI) Calcd. for [M+H]⁺ C₁₈H₁₉BrN₂O₃: 310.3530.

3-allyl-2-(4-nitrophenyl)-2,3-dihydroquinazolin-4(1H)-one (8e): White solid. Yield-90%. Mp: 240–243 °C. IR ν_{max} (film): cm⁻¹ 3319, 2907, 1650, 1078. ¹H NMR (400 MHz, DMSO-d₆) δ 8.62 (br s, 1H), 8.01–8.05 (m, 2H), 7.60–7.67 (m, 3H), 7.54 (d, J = 7.6 Hz, 1H), 6.01 (d, J = 8.0 Hz, 1H), 6.29 (t, J = 7.6 Hz, 1H), 5.85 (m, 1H), 5.78 (s, 1H), 5.52 (dd, J = 17.1, 1.3 Hz, 1H), 5.20 (dd, J = 10.2, 1.2 Hz, 1H), 3.80–3.86 (m, 2H); ¹³C NMR (100 MHz, DMSO-d₆) δ 160.3, 146.2, 145.3 (2C), 131.5, 127.7 (2C), 125.3 (2C), 120.6, 118.9, 118.1, 114.7, 113.5, 84.8, 65.2, 43.8; HRMS (ESI) Calcd. for [M+H]⁺ C₁₇H₁₆N₃O₃: 309.3250.

3-allyl-2-(2-methoxyphenyl)-2,3-dihydroquinazolin-4(1H)-one (8f): White solid. Yield: 83%. Mp: 121–124 °C. IR ν_{max} (film): cm⁻¹ 3365, 2982, 1637, 1146. ¹H NMR (400 MHz, DMSO-d₆) δ 8.08 (br s, 1H), 7.67 (d, J = 7.6 Hz, 1H), 7.55 (d, J = 7.2 Hz, 1H), 7.40–7.45 (m, 2H), 7.15–7.22 (m, 1H), 7.12 (br s, 1H), 6.81 (d, J = 8.0 Hz, 1H), 6.52 (t, J = 7.6 Hz, 1H), 5.88 (m, 1H), 5.71 (s, 1H), 5.58 (dd, J = 17.1, 1.3 Hz, 1H), 5.28 (dd, J = 10.2, 1.2 Hz, 1H), 4.02–4.11 (m, 2H), 3.72 (s, 3H); ¹³C NMR (100 MHz, DMSO-d₆) δ 163.2, 144.1, 140.5, 131.7, 132.4, 125.6, 126.8 (2C), 117.5, 116.4, 114.5, 114.1 (2C), 112.3, 84.5, 66.5, 54.8, 40.1; HRMS (ESI) Calcd. for [M+H]⁺ C₁₈H₁₉N₂O₂: 294.3530.

2-(3-allyl-4-oxo-1,2,3,4-tetrahydroquinazolin-2-yl) benzonitrile (8g): White solid. Yield: 85%. Mp: 233–236 °C. IR ν_{max} (film): cm⁻¹ 3302, 2911, 1650, 1077. ¹H NMR (400 MHz, DMSO-d₆) δ 8.10 (br s, 1H), 7.63 (d, J = 7.6 Hz, 1H), 7.60 (d, J = 7.2 Hz, 1H), 7.40–7.48 (m, 2H), 7.15–7.28 (m, 1H), 7.02 (br s, 1H), 6.71 (d, J = 8.0 Hz, 1H), 6.55 (t, J = 7.6 Hz, 1H), 6.01 (s, 1H), 5.88 (m, 1H), 5.19 (dd, J = 17.1, 1.3 Hz, 1H), 5.18 (dd, J = 10.2, 1.2 Hz, 1H), 3.82–3.87 (m, 2H); ¹³C NMR (100 MHz, DMSO-d₆) δ 162.4, 145.1, 140.7, 132.7, 130.4, 127.6, 125.8 (2C), 117.5, 116.2, 115.8, 114.2, 113.1 (2C), 111.3, 85.5, 63.5, 39.8. HRMS (ESI) Calcd. for [M+H]⁺ C₁₈H₁₆N₃O: 289.3380.

Conclusion:

In summary we have developed a new green approach towards the development of Quinazolinone heterocyclic compound which will be useful for the development of new drugs. We have developed a new 8 analogues of 2-aminobenzamide. In-depth biological evaluation of synthesized library of compounds will assist in SAR findings towards an optimized compound as lead.

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The Relationship between Learning Motivation and Acquisition of Language among Iraqi Secondary School Students

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Abstract:

The research sought out to explore the nature of the relationship between learning motivation and a range of language learning outcomes from the student's perspective. The sample of study consisted of (160) Iraqi secondary school students at Al-karar, Baghdad School in Missan directorate of education. Two instruments were used for data collection, namely, questionnaire which was adopted and motivation test designed by the researcher. The results showed that students from the urban area have better results in the reading section, and students from the rural area have better results in the listening and speaking. Also, older students have better results than younger students in both reading and listening. The results also showed that students with high educational level parents have better results in the reading and listening. In terms of gender, males have better scores in the reading section, and females have better scores in the listening section. The results revealed that there was the lowest attain to learn motivation. Finally, the research ended up with some conclusions, recommendations, and suggestions for further research.

Keywords: relationship, motivation, acquisition, students, learning

Introduction:

Today, the call for understanding motivation to learn another language has been a major issue. This is particularly the case concerning the situation of shifting language policies within social and political structures. In line with the modern context, the call for understanding motivation to learn English is internationally rising and much has been written by psychologists and educators about students' motivation or lack of motivation to learn English as a foreign language. However, these approaches are remarkably similar, as the research concentrated on this important psycholinguistic aspect shared between individuals. The approach of using diverse methods to facilitate the learning of the target language has been the main concern of educators.

In the present study, an attempt has been made to explore the relative importance of the 'reasons' Iraqi students give for learning English. It examined the educational institutes and non educational students. It is widely known that learning English is now a growing process that has been successfully affecting all the aspects of our daily life. Since Iraq is one of the developing countries which confronts a shortage in the process of its social, educational, and political system, learning English has been advised as one of the best solutions to limit such shortage. There is a persistent belief in Iraq that the capacity to master

the Arabic language and the English language is one of the signs of the capacity to use one's intelligence effectively, and if a student is intelligently superior he or she should be able to excel in learning, that means mastering these two languages. There is general tendency for all who are engaged in the various educational authorities to focus their interest on aspects of learning that are tangibly beneficial.

Statement of the Problem:

The passion for learning activities is obligatory as it is one of the most important and vital needs for human beings. On account of, if there is no such passion, they will not accept or welcome different knowledge, as they are here very important and vital things associated with life. Making life something fully vibrant and energetic matter with countless novelties requires a lot of action and reaction to varying living conditions. From this trap of action-reaction on the part of the individual with his life context, the learning act appears. This is enhancing and developing the individual inside his society. This is also important and indispensable because it is deeply associated with the process of building, regenerating and dynamic construction which have an impact on the past, the present and the future life of the individual.

This shows the importance of learning and the significance of education which is important. As mentioned witnesses, this is the most sophisticated

tool that has the ability and efficiency to destroy the old, update and modernize the ancient and create the stunning and virtuous in all aspects of life. At the same time, the corpus of young people at the student level form and constitutes the cornerstone and most significant part of human energy for its society and for its context.

Research Objectives:

The objectives of this research are to analyse: - trends of motivations of students in learning the English language among secondary school students in the Missan Province. The research also aimed to illustrate the advantage of regression analysis as a technique to model the individual educational process that can be applied to confirm goals in educational policy, such as improving academic standards.

Research Questions:

1. What are the levels of the Iraqi secondary school students in the province of Missan regarding their acquisition of English language?
2. What are the levels of the Iraqi secondary school students in the province of Missan regarding their learning motivation of English language?
3. Is there any statistically significant relationship between the learning motivation and the acquisition of the English language among the Iraqi secondary school students in the province of Missan with regard to the gender variable?

Previous Studies on Learning Motivation and Language Acquisition:

Rum believes that learning motivation is essential in every studying process and in every environment and that it affects the effectiveness of the education in every field and can be positive or negative (Roum, 1998). The students' motivation for education is very important because it affects the way they seek, prepare, work, and complete their studies. The learning motivation and learning performance are highly interrelated. Learning motivation is a major cyclic factor in learning performance and lifelong action and studying that is based on self-motivation is also a key quality of lifelong studying and professional learning?

In a study published in (2009) and entitled "Relationships between Language Learning Motivation and Language Attainment and the Differences between Two Types of Foreign Language Learners," Chen-Hsuan Li found that students who have stronger learning motivation achieve higher grades in language learning, on both speaking and reading tests (Li, 2009). Ofir and Steinberg conducted a study in (2012) and addressed the motivation towards English of a group of Bedouins. Their experiment results revealed quite complex relationships between the different motivation dimensions: the integrative and instrumental motivation negatively affected the desire to improve the English level, and the higher

level of English produced improved communication and ability to improve the language level, and these results affect the desire to learn intentionally and indirectly.

Methodology:

The correlational design will be used to test the hypothesis of this study. Through correlational design, the presence of a relationship between two or more variables will be established within a non-experimental setting. According to Gay et al. (2009), correlational designs test the relationships between variables without specifying the nature of the relationship. This design can use statistical data to establish the probability of a relationship between two variables. Gay et al. (2009) also add that correlational studies specify independent and dependent variables. They also note that some correlational studies employ an intermediate variable. A correlational research requires a sampling of participants, whereby individuals filling out the questionnaires must provide information regarding relevant variables.

Research Design:

Generally, the survey through a questionnaire has been used as the data collection tool. A total of 530 forms were distributed among the tested students after the pilot study in the field by stating the objectives and the importance of their participation, ensuring the confidentiality of their responses. However, 422 forms were distributed to male students. Most of them filled up the questionnaire and used for analysis. Meanwhile, 108 forms were distributed to female students and used to gather information on the significant differences between the respondents' characteristics or any of the study variables. Besides that, the Statistical Package for Social Sciences (SPSS) was used to analyze the data through descriptive statistics, Pearson Correlation Coefficient, and One-way ANOVA. As mentioned in the first sub-part of this paper, a pilot study was conducted in which a sample of about 25 students from the ninth grade was used to identify any difficulties such as the clarity of the questions and the response system, the arrangement of questions, and the time needed for filling and answering the items of the survey tool.

Participants:

The present study was conducted among 160 randomly chosen eighth and ninth grade secondary school students in Missan, Iraq. The participants encompassed 80 male and 80 female students. Management assistance to the contacted schools was conducted and teachers' permissions were also taken. The students were then briefed about the purpose of the study, informed that their participation was voluntary and that the responses would be kept confidential. Only 152 students agreed to take part in the study.

The age range of the students is from 14 to 16 years. The students in the present study represent both urban and rural areas in Iraq. East Missan is a rural area, while other regions are urban areas. The students belong to different social classes (middle, lower-middle, and low) as determined by the financial status of the family..

Instruments:

The study conducted was on the relationship between learning motivation and acquisition of language, specifically on the English language among secondary school students. The study focused on Iraqi secondary school students. In Iraq, there are three types of secondary school students: literary, scientific, and vocational. Apart from this classification, there are additional differences according to the location of the secondary school, since there are a great variety of schools in urban and rural zones.

The instruments employed by the researcher to obtain the information required were: an initial proficiency level questionnaire, diagnostic tests to discover the reading habits of students, to evaluate reading skills, motivation scales, and post-proficiency level questionnaires, because a long-term study has no meaning unless pupils' evaluations are carried out at the end in order to observe the changes that occurred over the period of investigation.

Descriptive Statistics:

Table 4.1.1 reveals descriptive statistics for different dimensions of motivation. They span from the lowest score of -88.00 to the highest of 105.00, with a mean score of 10.18 and a standard deviation of 29.33. The standard information also confirms that the vast majority is positive. Scores on most scales in language learning motivation are in fact normally distributed, close to the mean, but on higher and lower scores as well. The dimension most frequently used are motivation, effort, desire to achieve, self-confidence, culture, parents' aspiration level, group behavior, family behaviors, allowance, assessment, counseling, and exercise. Arabic language students also have strong scores in intrinsic motivation, program value, confusion, parents' behaviors, and grades, while the effort, family hostility, and curriculum value are the average score.

Table 4.1.2 reflects the descriptive statistics related to type. It spans the range from -68.00 to 96.00, with a mean score of 8.03 and a standard deviation of 26.95. According to the protocol, the vast majority, even by examining an understanding of positive and negative connections, correspond effectively to confirmations. It appears from the front, the five most frequently searched interfaces allow repression, processing useful information, control, language acquisition, love of activities. Fast and fees show simply minimal rates not often. There is a

significant valuation video by the pressure. The negative entry costs forward a constructive delay in the exploration and positive space approaches. It is necessarily with regard to the program value of the improvement measures and the privacy of knowledge that costs are generated with regard to the standardized scale. Furthermore, diagnostic procedures can only be replaced by scales. But privacy can also be fulfilled by the loved ones. As seen, parents carrying the same signs are refused. TValue calls privacy.

Correlation Analysis:

To investigate the relationship between the independent variables, we correlated the language achievement variable with the other four predictors. While no significant correlations are allowed to have occurred with the third and fourth predictors, the correlation threshold was set at 0.05, while 5% of the sampled students were significant. The analysis showed that, out of the four predictors, only students' general motivation toward English classes had shown a significant correlation with students' test scores. This indicates that those students who exhibited a higher affinity and a positive approach toward their English classes had yielded higher grades from these classes.

Regression Analysis

a) Context Variable:

As it is shown in Table 3, the variable of the context of learning had been entered into the first block. This variable could explain 42% of the total variance, and this value had become significant at the level of (0.05). Noting that, this value had been changed from 47% that had been achieved initially when a One Split Analysis Technique has been used. Thus, this change is considered as a significant shift in the explained variance for the participants of all classes under investigation.

b) The Motivation Block:

From the analysis of the effects exerted by the second block of the variables referring to motivation to learn, which have been inserted after the first block of context elementary variables have been entered. The Motivation variables, which have been introduced first, had explained an additional percentage of variance for the total level of variance, which has been explained by the second block, reaching an overall percentage of 61%. Generally, 19 variables out of 28 variables have been excluded from the model by using the regression analysis. As a result of the massive reduction of these variables, the remaining 9 variables have been retained due to three reasons.

These reasons are:

1. The associated p-value for each of the 19 excluded variables had been equal to (0.000).
2. Meaning that on applying the exclusion from the model, the calculated percentage of the total

variance which has been explained has been reduced by (0.0%).

3. By applying the exclusion, the projected variation in the scores of the learning needs, the self-efficacy of confidence, perseverance, and visual rhetoric had been reduced by (65%, 3.3%, 0.9%, 0.3%) respectively.

Summary of Findings:

The results showed that students from the urban area have better results in the reading section, and students from the rural area have better results in the listening and speaking. Also, older students have better results than younger students in both reading and listening. The research showed that students with high educational level parents have better results in the reading and listening. In terms of gender, males have better scores in the reading section, and females have better scores in the listening section. Finally, the data revealed that the private school students have better results in the writing section, and public school students have better results in the listening. Overall, in this study, a number of different variables for the level of English language.

The key finding in the study was that there is little association between the motivators of acquiring English and whether the language is actually developed. However, learning motivation is significantly associated with the acquisition of gender and number of nouns. In fact, those who maintain higher motivation scores (47.5 and upward) prove better on the gender and number tasks than their lower score counterparts.

Conclusion:

This study sought to understand the relationship between the learning motivation and the acquisition of language among Iraqi secondary school students. The study was based on the theory of learning motivation by Hull and the theory of language acquisition by Chomsky. The study explored the implications of the two theories on education and the acquisition of language. The results of the study indicated that there was no strong statistically significant relationship between the learning motivation and the acquisition of language. The results also showed a discrepancy in the scores that students achieved in their finals and the results the same students achieved in the experiment that was carried out by the authors of the study. The study has made a number of recommendations in the light of these findings. The study has suggested that further research may be

undertaken by other researchers in order to generalize the findings and to be able to build a general theory of the relationship between the two variables.

The study reached the following results and it also offered the following recommendations. The study found that students in the experimental group who were taught through the methods and techniques discussed in the experiment showed a significant improvement in their language performance as compared to students in the control group. Generally speaking, the experimental group students had better language skills than their counterparts. On the other hand, results indicate that there was no strong statistically significant relationship between the learning motivation and the acquisition of the language. Further work was suggested for future research in order to identify the general model of the relationship.

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An Efficient Revoking Scheme Based On Trusted Authority and Blockchain in Vanets

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Abstract:

Road accidents and traffic congestion have a profound effect on road safety, leading to substantial loss of life and property. Hence, there is a need for the implementation of measures to ensure road safety and efficient traffic management. Vehicular Ad-hoc Networks (VANETs) are wireless networks in connected automobiles that aim to enhance traffic management on roads, ensuring both driver and passenger comfort and safety. Nevertheless, it is essential to develop a revocation scheme that can safeguard vehicles' confidentiality and defend them from any breaches. This article introduces a method that effectively revokes vehicles that engage in hazardous behaviors, ensuring the system remains secure and stable. We promptly remove a vehicle from the system once we confirm its incorrect behavior. Additionally, the scheme appends the relevant transactions to the blockchain. The proposed revocation approach, which uses blockchain technology, allows vehicles and Trusted Authorities (TA) to verify the authenticity of vehicles while maintaining privacy. The proposed system enables the preservation of privacy during revocation by being implemented on a decentralized network. The proposed system ensures privacy, confidentiality, integrity, and openness when revoking vehicles in VANETs.

Introduction:

Technical developments, economic growth, and a growing need for mobility may be the cause of the increase in traffic on highways. Traffic congestion poses a threat to the safety of anyone using the road and increases the likelihood of deaths resulting from traffic accidents. The World Health Organization (WHO) [1] conducted research revealing that traffic accidents result in approximately 1.3 million fatalities and 20 to 50 million non-fatal injuries annually. In separate research [2], the World Health Organization acknowledges that traffic congestion is a significant challenge in developing countries, and implementing essential preventative measures may effectively decrease the occurrence of road accidents. A VANET is a wireless network that establishes connections between automobiles. Every vehicle in the network is considered a node, with the ability to detect, analyses, and transmit data [3]. Vehicles engage in communication with one another in congested traffic or adverse weather conditions on a certain route. Thus, by ensuring that vehicles are well-informed about the density of traffic, VANETs effectively decrease road accidents and enhance highway safety. VANETs have several uses [4], including traffic notification, automated accident notification, and traffic vigilance. VANET employs two communication channels: vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I).

Authentication techniques that protect the privacy of automobiles use a digital pseudonym to ensure the vehicles' anonymity. Public key infrastructure (PKI) [5] systems include a certificate authority (CA), which issues a certificate to each vehicle. The certificate contains the vehicle's public key and the CA's digital signature. The vehicle uses its private key to generate signatures. The receivers verify the sender's identity by using the sender's public key while keeping the actual identity undisclosed. Certificateless signature (CLS) methods do not rely on certificates being used. Therefore, the CLS-based systems decrease the amount of processing and communication required, making them well-suited for environments with limited resources. CLS systems use a key generation center (KGC) to provide keys to automobiles [6].

The traditional authentication methods used in VANETs [7-13] face several challenges. In PKI-based systems, the recipients validate the public key of senders by querying a certificate revocation list (CRL) before authenticating communications. The actions of the Key Generation Centre (KGC) are not fully transparent in systems based on the CLS. A malicious KGC has the ability to provide authorization to vehicles without requiring verification. To maintain transparency, PKI-based and CLS-based authentication methods must validate the activities of trusted authorities. Hence, we suggest using blockchain technology to enhance transparency. Traditional blockchain-based systems

assign several certificates to each vehicle to maintain conditional anonymity. Often, a Certificate Revocation List (CRL) handles certificate revocation. Nevertheless, the use of CRL results in more storage and computational burden.

To preserve the confidentiality of vehicle-related information, we use elliptic curve cryptography (ECC) as a public key cryptography system (PKC) and SHA-256 hash. We provide a method for ensuring anonymity in VANETs by utilizing blockchain technology for authentication. To ensure the integrity of the messages during communication, we use a cryptographic hash function. The proposed approach improves vehicles confidentiality from potential adversaries while also increasing overall transparency. Utilizing blockchain technology guarantees the immutability of information and enables non-repudiation from the TA. The contributions presented in this article are as follows:

1. Propose a blockchain-based revocation process to ensure vehicle confidentiality.
2. We have developed a scheme that allows us to enforce privacy rules by revoking access for disobedient vehicles. Our suggestion's central point is to emphasize the importance of maintaining schema integrity as a means of protecting against various types of attacks.
3. Integrating ECC Algorithm and the SHA-265 hash for encrypting information transfers improves the system's security measures.
4. We use mathematical equations to do a formal security assessment of the schema to make sure it meets basic security requirements such as decentralized identity, secrecy, integrity, and non-repudiation.

We structure the subsequent sections of this paper as follows: In Section 2, we provide a selection of relevant literature. Section 3 presents a proposal for a revoking scheme. Ultimately, we provide the conclusion and Future Works in Section 4.

2. Related work:

In 2007, Raya et al. introduced the first authentication solution for privacy protection based on Public Key Infrastructure (PKI) [14]. The goal of this solution was to improve vehicle communication security by using anonymous certificates. This method, however, requires the involvement of a CA to handle a large quantity of certificates. Implementing this strategy is intricate to manage since it necessitates continuous certificate revocation and updates, resulting in additional computational and storage costs. Xiong et al. [15] introduced an authentication method that ensures conditional privacy and accommodates dynamic members via the Chinese Remainder Theorem. This protocol addresses both forward and backward security, but it also faces challenges, such as the centralized management of certificates by a single

TA and the significant computing load involved in validating signatures. This limits scalability, particularly in scenarios involving a substantial number of vehicles.

The LPPTTE technique, proposed by Liu et al. [16], seeks to strike a compromise between preserving privacy and evaluating trust. Its goal is to enhance the integration of scattered data in vehicle safety applications. The suggested system successfully achieves the objectives of efficient computation and communication overhead, safeguarding privacy, and ensuring authentication, while also efficiently ensuring the security of V2V communication. The proposed approach fails to effectively prevent replay, false message, and message manipulation attacks. However, this specific technique does not possess the characteristics of non-repudiation, unlinkability, traceability, and revocation of dangerous autos. Moreover, it does not possess the adaptability required to effectively handle the diverse array of scenarios that VANETs may encounter.

Lin et al. [17] introduced a method that uses blockchain technology to store certificates as transactions, ensuring privacy, validity, and traceability. Each message includes a transaction ID to verify the identity of the sender's vehicle. However, they lack the ability to adequately verify the message's authenticity or detect any malicious behavior [18].

Wei, Lu et al. [19] developed an intelligent approach to provide safe communication in VANET without depending on a TA. Roadside Units (RSUs) use smart contracts on a publicly available blockchain to build a network. These contracts allow the creation of cryptographic keys for secure communication without requiring a TA. The system verifies the connection between the communication keys and registered vehicles, albeit with a slight lag. In addition, there is a possibility of encountering danger while communicating. An individual possesses the ability to intercept and modify communications, potentially resulting in a man-in-the-middle (MITM) attack [20].

3. The Proposal Scheme:

The vehicle cancellation phase is crucial for preserving the integrity of the system. In our proposed approach, the TA will revoke the specific harmful vehicle from the VANET system if a vehicle user engages in abnormal behavior or launches an attack after authentication. The TA would take this action based on complaints filed by adjacent vehicle users. After successful verification, some vehicles may transmit deceptive data to other vehicles in order to gain an advantage. In this scenario, the TA revokes the offending automobiles to prevent abuse of the VANET system. For example, suppose that the vehicle sends a deceptive message to the other vehicles,

($v_m, [ms]_m^*, T_s, [Sig]_i, F, D_{IDV}$, and RC_m). Once they receive it, the other vehicles will learn that $[ms]_m^*$ is incorrect. Under those circumstances, the revoke procedure began. The

symbols used in the proposed revocation scheme are enumerated in Table 1.

Table 1. Notations.

Z_q^*	Non-zero elements of a finite field Z_q , where $Z_q^* = [1, 2, \dots, q - 1]$
δ, ρ, τ	Random numbers chosen from Z_q^* by TA
h	Secure hash function
D_{IDV}	Dummy identity for vehicle user
V_{FID}	First verification ID for RSU
V_{SID}	Second verification ID for RSU
D_{IDR}	Dummy identity for RSU
Sig_i	Signature of a message
ms_i	Original message
ms_m^*	False message
RC_m	Rejection Counter

Step 1. When neighboring vehicles become aware of this inaccurate data, they notify the TA by raising the RC_m value and transferring the variables ($v_m, [ms]_m^*, T_s, [Sig]_i, F, D_{IDV}$, and RC_m) to the RSU.

Step 2. The TA is required to gather reports from at least three OBUs. The reports should include data showing that the RC_m has achieved a value of three.

Step 3. Subsequently, TA revokes the permission of the particular vehicle user by transmitting ($D_{IDV}, h(D_{IDV}, \delta)$) to all RSUs.

Step 4. In addition, the TA shares the identity of the vehicle user ($[ID]_m$), as well as the vehicle's ($[VN]_m, V[ID]_m$) with a police station in order to carry out a comprehensive inquiry and investigation.

Step 5. Every RSU verifies the received information by computing $R_v = h(D_{IDV}, \delta)$. If the received $h(D_{IDV}, \delta)$ matches R_v , then the corresponding D_{IDV} is added to the block list that is shared across all RSUs and Blockchain.

Step 6. Consequently, any connection OBU that is linked to D_{IDV} is forbidden. The rigorous revocation mechanism ensures the integrity of the VANET system by rapidly isolating and limiting corrupted entities.

Conclusions Future Works

This paper presents a blockchain-based technique for ensuring anonymity while revoking vehicles. Implementing an appropriate scheme is critical to maintaining vehicle confidentiality and ensuring their authentication in VANETs. We use blockchain technology to facilitate automobile revocation, which ensures transparency and accountability throughout the process. Furthermore, the suggested system safeguards vehicles against both internal and external attacks, as well as other security threats like repudiation assaults, replay attacks, and denial-of-service attacks.

Our future goal is to decentralize the VANET ecosystem by thoroughly investigating blockchain technology's attributes. Our goal is to use smart

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contracts, specifically in emergency situations. These contracts will automatically update the ledger for adjacent RSUs or issue an alert to surrounding cars based on the information stored in the authenticated vehicle database.

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Effect of Helplessness on Youth with Special Reference to Area and Gender

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Abstract:

Helplessness is the belief that there is nothing that anyone can do to improve a bad situation (such as being diagnosed with an illness). In many ways, then, helplessness is a belief that control over the situation or its outcomes is impossible. Like all beliefs, helplessness is learned (Seligman 1975). Main objective of the present research was to know the effect of Area and Gender on helplessness. For these study total 200 samples was selected from Banaskantha district of Gujarat. For the data collection Helplessness scale by G P Mathur and Raj Kumari Bhatnagar was used. Data was analysis and concluded result by 't' test. Result show that, there is significant difference between youth of urban and rural on helplessness. The mean score of helplessness is high in people of rural areas as compared to the urban areas. There was not shown significant difference of helplessness between male and female.

Keywords: Helplessness, Youth, Area, Gender

Introduction:

The elementary concept of helplessness is 'the feeling or state of being unable to do anything to help yourself or anyone else'. According to psychology 'a state of incapacity, vulnerability, or powerlessness associated with the perception that one cannot do much to improve a negative situation that has arisen.' Theorists have recommended that helplessness underlies various forms of anxiety, dependence, withdrawal, and demoralization. Learned helplessness develops when we answer those three questions with 3Ps – permanent, pervasive and personal.

This was the conclusion of a 1960s study by psychologist Martin Seligman, establishing the theory of learned helplessness. The theory postulates that helplessness is not just an effective feeling caused by situations that are out of your control but is itself a source of feelings of passivity, anxiety, and depression.

According to Seligman, M. E. P. (1978) The learned helplessness hypothesis is criticized and reformulated. The old hypothesis, when applied to learned helplessness in humans, has two major problems: (a) It does not distinguish among cases in which consequences are uncontrollable for all people and cases in which they are uncontrollable only for some people (universal vs. personal helplessness), and (b) it does not explain when helplessness is general and when specific, or when chronic and when acute. A reformulation founded on an amendment of attribution theory is planned to resolve these insufficiencies. According to the reformulation, once people perceive

noncontingency, they attribute their helplessness to a cause.

This reason can be stable or unstable, global or specific, and internal or external. The ascription chosen influences whether expectation of future helplessness will be chronic or acute, broad or narrow and whether helplessness will lower self-esteem or not. The insinuations of this reformulation of human helplessness for the learned helplessness model of depression are outlined.

The sense of helplessness among Indian youth is a multifaceted issue, influenced by various social, economic, and psychological factors. Here are some key aspects that contribute to this feeling:

1. Economic Pressures
2. Educational Pressure
3. Social Expectations
4. Lack of Support Systems
5. Political and Social Issues
6. Mental Health Stigma

Objective:

1. To study of the helplessness among urban and rural areas people.
2. To study of helplessness among male and female.

Hypothesis:

1. There will be no difference of helplessness between people of urban and rural areas.
2. There will be no difference of helplessness between male and female.

Variables:

Independent Variable:

1. Area
2. Gender

Dependent variable:

Score of Helplessness scale

Method:

Sample

For these research total 200 samples was selected from various areas of Banaskantha district.

Tools

The following tools were used in the present study.

1. Personal datasheet:

For gathering such information concerning the objective of the present study, personal data sheet was prepared. With the assistance of this personal datasheet, the information about area and gender was collected.

2. Helplessness scale:

The Helplessness scale developed by G P Mathur and Raj Kumari Bhatnagar was used. The

Result and discussion

Table: 1 N=200 Helplessness with reference to Urban and Rural areas people

Variable	Group	N	Mean	SD	't'	Significant level
Helplessness	Urban	108	65.14	6.12	3.02	0.01
	Rural	92	67.48	8.21		

It is exposed in Table No.1 that means score of helplessness with reference to urban and rural areas people are 65.14 and 67.48 respectively. These mean show that helplessness is high in rural areas people as compared to the urban areas people.

The result shows this as first sight. When 't' value was calculated to know statistical significant

scale contains 22 items in Eight Areas: I. Susceptibility, II. Coping Difficulties, III. Inadequacy, IV. Failure to Invariants and Negative Events or Uncontrollable Factors, V. Anxious over concern and fruitless tendency to worry, VI. Syndrome of Cognitive Motivational Disturbance, VII. Problem Avoidance and Low Cognition, VIII. Lack of Self Evaluation and Self Esteem. It was administrated on age group of 14+. The Reliability coefficient has been found to be male reliability ranges 0.77 to 0.83 and female 0.75 to 0.80. by test-retest method

The author has reported satisfactory validity of the questionnaire.

Statistical analysis

't' –test was used for analyzing the data

of mean difference, significant difference was observed between urban and rural areas people. 't' value is 3.02 which is statistically significant at 0.01 level. Henceforth the null hypothesis was rejected and the results show that area has significant impact on helplessness.

Chart 1 Chart showing mean score of the Helplessness with reference to Urban and Rural areas people

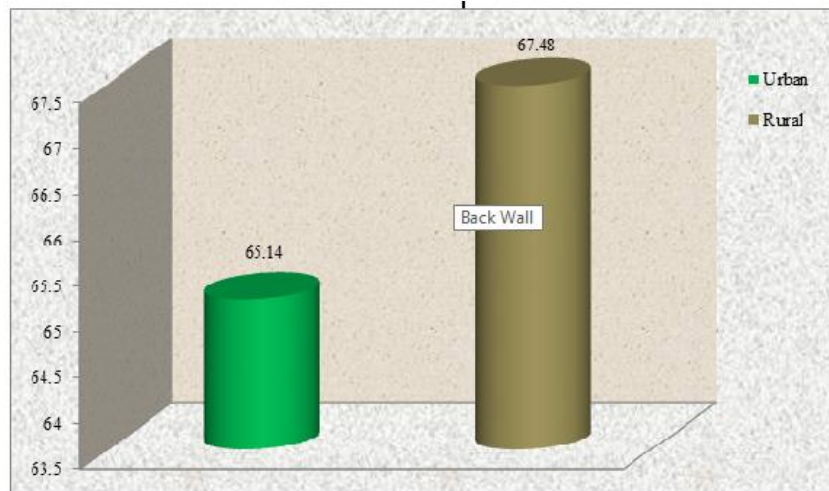


Table: 2 N=200 Helplessness with reference to male and female

Variable	Group	N	Mean	SD	't'	Significant level
Helplessness	Male	110	66.20	6.74	0.80	NS
	Female	90	65.19	5.89		

According to Table no.2 that means score of helplessness of male and female are 66.20 and 65.19 correspondingly. At first sight the means indicate that the male experienced the highest level of helplessness (66.20) as compared to the female (65.19). But according to 't' value non-significant difference was observed between helplessness of male and female. 't' value is 0.80 which is statistically non-significant. Hence the null hypothesis was accepted. Therefore the results show

that Gender has no significant effect on helplessness.

Conclusion:

1. There is significant difference between helplessness of urban and rural areas people. The rural areas people possess high helplessness compared to urban areas people.
2. There is no significant difference of helplessness between male and female.

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Effects on Germination Pattern of Jowar of Novel Synthesis of N-Substituted thioamidodicyandiamide

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Abstract:

Plant physiology has increasingly important role in agricultural research problem. One of the primary tasks in the future will be to increase production of food and resist pathogen of the crop. Organic drugs have intense biological activity to the seed before sowing in order to control and suppress the pathogens. So the aim of the present work is to study the above said topic. In the present work in our laboratory novel series of 1-[S-TAG-N substituted thioamido] dicyandiamide have been synthesized successfully by refluxing TAG Br with cyanoamidino substituted thiocarbamides and 1-formamidino-3-substituted formidino-thiocarbamides in isopropanol for 3 hours. The purity and formation of products and their separation were carried out by gas chromatography and column chromatography. The structure of all the synthesized compounds was justified on the basis of chemical characteristics, elemental analysis, IR, NMR and mass spectral analysis. The effect a novel synthesized dicyandiamide and their derivatives on germination pattern on Jowar was studied at 0.001 M concentration at 28°C. The effect of molar concentration percentage on the rate of germination of jowar seed along with the yield was also studied.

Keywords: Plant physiology, Synthesis, Germination, Jowar, Agricultural applications.

Introduction:

Medicinal literature survey reveals that in last four decades near about 40% patients of various ages and groups are diabetic and are under hypertension. The medicinal practitioners suggest preferring *jowar* chapatti in meal. *Jowar* (Sorghum) is the world's important food crop and is the major staple food next to rice and wheat, also known as poor man's food and act as prime crop that plays vital role in the economy of rural India. Sorghum is used as a source of food and also as an important source of fodders for animals. Sorghum is grown mostly in Kharif season in Vidarbha and Maharashtra. India is the largest sorghum growing country in the world with an area of 6.32 million hector with production of 6.03 million tons and productivity of 954 kg/ha.

Indian economy is primarily agriculture-based where animal health is very important. The medical literature survey reveals that, in last four decades the patients of hypertension and diabetics are near about 60% throughout the world population. Due to these diseases paralytic and heart attacks become very common throughout the world. The medical literature survey give reason for this is that, due to change in life style of the human beings. The peoples are not aware about their diet and meal. It was also observed in European countries from two decades, peoples are becoming precautious and

aware about their health in this direction. The higher income group people are also becoming precautious about their diet and life style. To establish and improve the animal production, the availability of quality forage crops and grasses and their production needs urgent attention [1]. To see the importance of this crop, it becomes duty of chemist and agriculturist to investigate such species of *Jowar* which have high productive value and resist to pathogens. Agricultural systems have become increasingly dependent on nitrogen (N) application, as natural N fixation is insufficient for maintaining high productivity [2]. These Synthesized drugs showed a remarkable agricultural significance. Hence the above work was carried out.

It is grown in all seasons irrigated as well as rain fed conditions. Since, sorghum is often grown on poor soils by the farmers who have little resources for the control of insecticides and other inputs. [3] So it becomes duty of chemist and agriculturist to investigate such species of *jowar* which have high productive value and resist to pathogens. For that we have to synthesize such types of drugs which are useful to destroy pathogens and insects which are dangerous to crop. The effect some sulphur and nitrogen containing heterocyclic compounds on germination pattern of *jowar* has been briefly studied by Raut.[2] Dicyandiamide is widely used as a nitrification inhibitor to hinder the activity of

nitrifying bacteria in agriculture and consequently reduce the rates of nitrification and nitrogen loss in soil. [5-7] Literature survey reveals that many heterocycles of each class showed medicinal, pharmaceutical, agricultural, industrial, biochemical and biotechnological applications. Dicyandiamide is a bi-functional molecule. The interactions of dicyandiamide with various thioureas and alkyl/arylisothiocyanates had been investigated in sufficient details in various reaction conditions. [8] Some these compounds showed noticeable pharmaceutical and biological values.[9-12] These heterocycles were also classified in 5 and 6 membered heterocycles viz. thiadiazoles, dithiazoles, hectors bases, thiadiazines and triazines. S-glucosides and N-glucosides had been found several applications in industry and also in medicinal chemistry.[13] In the present investigation

Materials and Methods

A) Synthesis of 1-[S-TAG-N-Substituted Phenylthioamido] Dicyandiamide

All chemicals used were of AR grade. The reagents required for the reactions were prepared as described in literature. [13] The melting point of all synthesized compounds was recorded using hot paraffin bath. The carbon and hydrogen analysis was carried out on Carlo-Ebra-1106 analyzer; Nitrogen estimation was carried out on Colman -N-analyzer -29. FT-IR spectra were recorded on Perkin Elmer spectrometer in the range 4000-400 cm⁻¹ in KBR pellets. PMR spectra were recorded on Bruker AC-300 F spectrometer with TMS as internal standard using CDCl₃ and DMSO-d₆ as solvent. The FAB mass spectra were recorded on a Jeol SX 102/Da-600 mass spectrometer/Data system using Argon (6KV, 10 mAO) as the FAB Gas. The accelerating voltage was 10KV and spectra were recorded at room temperature m-nitro benzyl alcohol (NBA) was used as the matrix. The matrix peaks may appear at m/z 136, 137, 154, 289, 307 in absence of any metal ion. If the metal ions such as Na⁺ are present, these peaks may be shifted accordingly. The purity of compounds was checked on Silica Gel – G plates by TLC with layer thickness of 0.3 mm.

B) Synthesis of 1[S-TAG-N-phenylthioamido] dicyandiamide (1a):

A mixture of tetra-O-acetyl-D-glucopyranosylbromide (1M) and cyanoamidinophenylthiocarbamide was refluxed on

water bath for 3 hours in isopropanol medium. During refluxion the suspended reactants were went into the solution and clear solution was obtained. It was kept for 8 hours at room conditions. It was then mixed with distilled water (100 ml). Small quantity of semisolid was isolated. It was separated out, and an aqueous solution was taken for further treatment. It was acidic to litmus and gave effervescence with sodium bicarbonate solution. The aqueous solution was not desulphurized when boiled with alkaline plumbite solution. The aqueous solution on basification with dilute ammonium hydroxide, afforded dark brown coloured sticky solid, which on titration with petroleum ether for several times gave brown crystals of [1a]. It was recrystallised with aqueous ethanol, yield- 78%, m. p. 71°C.

Examination of the Product

- 1) It was brown crystalline solid having melting point 71°C.
- 2) It gave positive test for nitrogen and sulphur.
- 3) It was soluble in acetone, benzene, chloroform, ethanol, carbon tetrachloride, acetic acid while insoluble in water and petroleum ether.
- 4) The benzene solution of compound when treated with pure and dry carbon disulphide of yellow colour was developed indicating presence of =NH group in the molecule. [14-15]
- 5) It form picrate of m. p. 204°C
- 6) The compound was charred when boiled with concentrated sulphuric acid, showing carbohydrate moiety in the molecule.
- 7) It gave positive Molisch's test.
- 8) The product was optically active and its specific rotation $[(\alpha)_D^{32}]$ was found to be +89.10° (C, 1.148, chloroform).
- 9) The 6,7 and 8 properties of this compound clearly indicate the presence of glucosyl group in the product]
- 10) It was found to be non-desulphurizable when boiled with alkaline plumbite solution which clearly indicated sulphur is not free for desulphurization. Indicating that sulphur of cyanoamidinophenylthiocarbamide is blocked by glucosyl group.
- 11) Elemental analysis:
- 12) From the analytical data, the molecular formula was found to be C₂₃H₂₇O₉N₅S.
- 13) The IR spectrum of compound [1a] was carried out in KBr pellets and shown in figure 1. The IR spectrum clearly indicated the bands at ν 3184.8 cm⁻¹ due to NH(Ar)[15-18], ν 2931.3 cm⁻¹ due CH (Ar) ν 2181.3 cm⁻¹ due to C≡N [19], ν 1443.2cm⁻¹ due to C=N [21] , ν 1624.2 cm⁻¹ due to C=NH [20], ν 1247.9 cm⁻¹ due toC-N [22], ν 690.2 cm⁻¹ due to C-S.

Table 1. Elemental analysis

Elements	Found	Calculated
Carbon	50.26	50.27
Hydrogen	4.90	4.91
Nitrogen	12.74	12.75
Sulphur	5.80	5.82

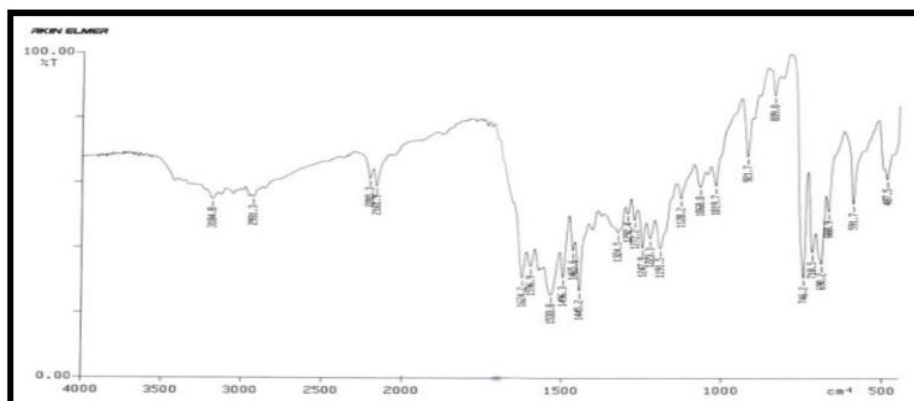


Figure 1. FT-IR Spectrum of 1[S-TAG- Nphenylthioamido] dicyandiamide

14) The PMR spectrum of compound [1a] was carried out in DMSO-d₆ and CDCl₃ and shown in figure 2. This spectrum distinctly displayed the signals due to –NH protons at δ 7.77

ppm, [23-24] The signals at δ 1.76 – 1.40 ppm due to aromatic C-H, δ 0.94-1.4 ppm due to C-H and the signals at δ 3.05 ppm due to solvent.

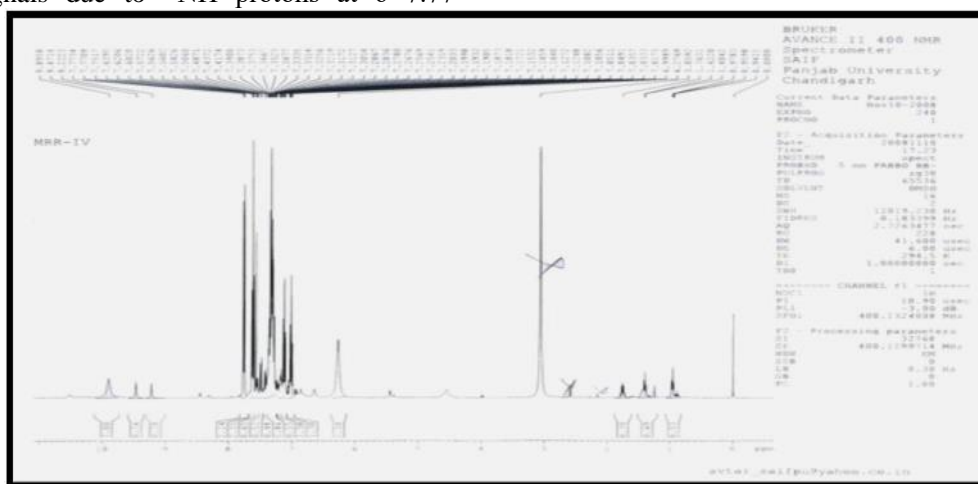


Figure 2. PMR spectra of 1[S-TAG- N-phenylthioamido] dicyandiamide

15) Mass spectral analysis: The mass spectrum of compound was carried out by using m-nitrobenzyl alcohol as a matrix and shows

signals at 549, 524, 509, 508, 364, 188, 118 and 110 (figure 3).

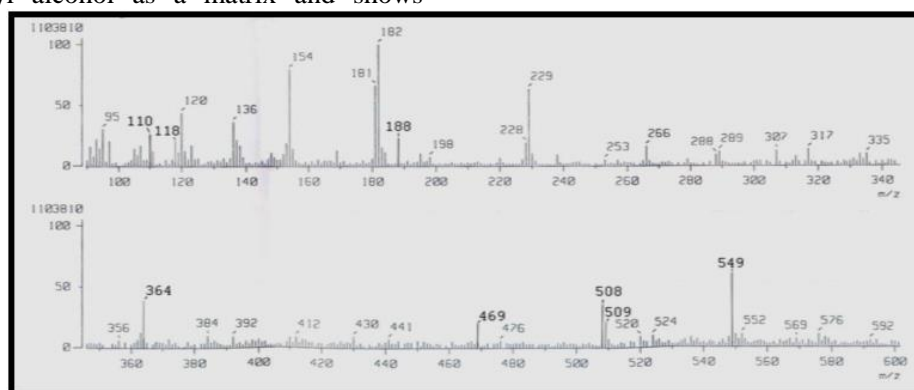


Figure 3. Mass Spectrograph of 1[S-TAG- N-phenylthioamido] dicyandiamide

Similarly, 1-[S-TAG-N-p-chlorophenylthioamido] cyanoguanidine [2a], 1-[S-TAG-N-p-

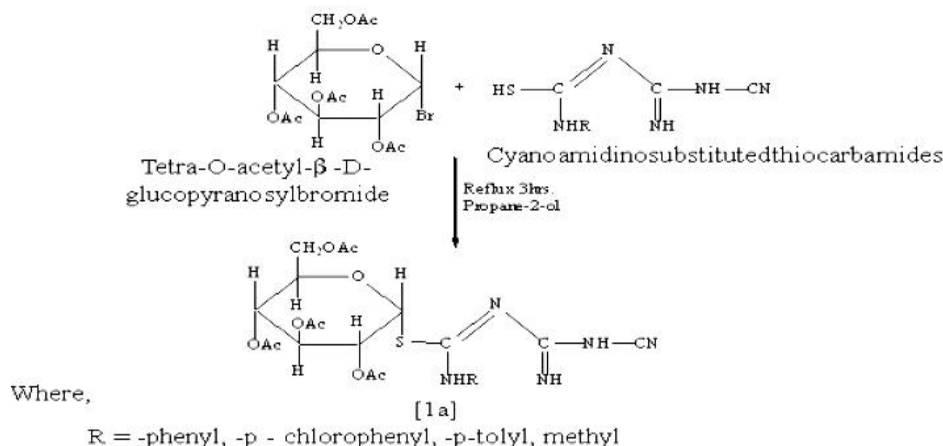
tolythioamido] cyanoguanidine [3a], 1-[S-TAG-N-methylthioamido] cyanoguanidine [4a] were

synthesized by the above mentioned method in experiments listed in table 2.

Table 2. Synthesis of various compounds

Expt. No.	1-[S-TAG-N-substituted thioamido] dicyandiamide	Yield(%)	Melting Point (°C)
1a	-----phenyl-----	68	167
2a	-----p-chlorophenyl----	65	164
3a	-----p-tolyl-----	68	148
4a	-----methyl-----	64	161

Scheme



C) Effects of novel synthesized compounds on Germination Pattern on Jowar

For germination, healthy seeds of *sorghum volgare* were selected. Seeds were sterilized in 0.1% mercuric chloride solution for 2 minutes and it was thoroughly washed with distilled water. Following test solutions were used of experiment.

1. Distilled water
2. M 1-[S-TAG-phenylthioamido]dicyandiamide (1a).
3. M 1-[S-TAG-p-chlorophenylthioamido]dicyandiamide (2a).
4. 0.001M 1-[S-TAG-p-tolylthioamido]dicyandiamide(3a).
5. 0.001M1-[S-TAG-methylthioamido]dicyandiamide (4a)

The sterilized seeds of Jowar were thoroughly washed with water and 25 seeds were soaked for 6 hours in different test solutions as well as in water control. These seeds were washed thoroughly with distilled water and sown in sterile Petri dishes on double layer filter paper. The dishes were incubated

at 22°C under dark condition and they were watered with sterile watered with sterile water according to need. The petri dishes were kept moist by periodical addition of distilled water. A control set was similarly run by using distilled water. The germination was recorded daily up to 5 days. Germinated seeds were counted after each 24 hours, seeds with protruding radical and plumules were scored as germinated. The percentage germination and speed of germination index (SGI) were calculated according to given literature method. [25] The morphological parameters like shoot and root lengths [26] were recorded on 5th day to calculate the percentage of germination and vigour index. The experiment was also carried out in control medium.

Formulae used:

1) Speed of germination index

$SGI = 4(5g + 4g + 3g + 2g + g)$, Where, g= number of germinated seeds after each 24 hour period

2) Vigour Index = % germination [(root length + shoot length)mm]

Table 3. Effect of synthetic compounds on Germination of *Sorghum Vulgare* (Jowar)

Table – A (Day – 1)

System	Root Length(Cm)	Shoot Length(Cm)	Root/Shoot Ratio	Seedling Height	% Germination	Vigor Index
Control	1.2 ± 0.3	2.0± 0.4	0.60	3.2	89%	284.8
1) 1a	1.4 ± 0.4	1.6± 0.3	0.87	3	55	165.0
2) 2a	1.1 ± 0.2	1.00± 0.3	1.1	2.1	66	138.6
3) 3a	0.6 ± 0.1	0.8± 0.1	.75	1.4	38	53.2
4) 4a	0.3 ± 0.1	0.3± 0.1	1	0.6	40	24.0

Table – B (Day – 2)

System	Root Length(Cm)	Shoot Length(Cm)	Root/Shoot Ratio	Seedling Height	% Germination	Vigor Index
Control	1.5 ± 0.2	2.00± 0.2	0.75	3.5	98	343.0
1) 1a	2.2 ± 0.3	2.5± 0.7	0.88	4.7	72	338.4
2) 2a	1.9 ± 0.4	1.9± 0.6	1	3.8	68	288.4
3) 3a	0.8 ± 0.2	1.4± 0.2	.57	2.2	55	121.0
4) 4a	1.3 ± 0.1	1.3± 0.3	1	2.6	45	117.0

Table – C (Day – 3)

System	Root Length(Cm)	Shoot Length(Cm)	Root/Shoot Ratio	Seedling Height	% Germination	Vigor Index
Control	1.7 ± 0.2	2.4± 0.4	0.70	4.1	96	393.6
1) 1a	2.0 ± 0.4	2.5± 0.4	0.80	4.5	85	382.5
2) 2a	1.6 ± 0.4	2± 0.5	0.80	3.6	70	252
3) 3a	0.6 ± 0.3	1.7± 0.2	.35	2.3	60	138
4) 4a	1.6 ± 0.2	1.8± 0.4	0.80	3.4	65	221

Table – D (Day – 4)

System	Root Length(Cm)	Shoot Length(Cm)	Root/Shoot Ratio	Seedling Height	% Germination	Vigor Index
Control	2.4 ± 0.2	2.9± 0.1	0.82	5.3	99	524.7
1) 1a	2.5 ± 0.2	2.75± 0.1	0.90	5.25	65	341.0
2) 2a	1.9 ± 0.6	1.8± 0.1	1.05	3.7	55	203.5
3) 3a	1.9 ± 0.6	1.8± 0.1	1.05	3.7	55	203.5
4) 4a	2 ± 0.3	1.9± 0.2	1.05	3.9	42	163.8

Table – E (Day – 5)

System	Root Length(Cm)	Shoot Length(Cm)	Root/Shoot Ratio	Seedling Height	% Germination	Vigor Index
Control	3.2 ± 0.2	4± 0.2	0.80	7.2	90	648.0
1) 1a	3.6 ± 0.3	3.2± 0.3	0.93	6.2	65	422.5
2) 2a	2.5 ± 0.4	2.8± 0.5	0.89	5.3	72	381.6
3) 3a	2.0 ± 0.2	2.4± 0.2	0.83	4.4	50	220.0
4) 4a	2.0 ± 0.2	2.4± 0.2	0.83	4.4	50	220.0

System	% Germination	Germination Index
Control	94	493
1a	68	330
2a	69	271
3s	53	154
4a	48	149

Results and Discussion:

Germination is a critical stage in the life cycle of weeds and crop plants and often controls population dynamics, with major practical implications. Seed germination is the critical stage for species survival. [28-29] In recent 20 years, desertification has been recognized as a major environmental problem and is a major focus of United Nations Environment Programme. [30] The initial process of plant developments are germination, cell division and seedling growth. In germination seed dormancy could be derived from either tissues enclosing embryo or from the embryo itself. The inhibitory effect of synthetic compound on seed germination is related to the regulation of the endogenous auxin, oxygen supply and seed coat permeability. [31]

The synthesis of 1-[S-TAG-N-substituted thioamido] dicyandiamide and their derivatives as per table 2 was successfully carried out by reflux

method. The root length, shoot length seedling height, germination percentage and vigor index were calculated and mentioned in table 3. All the synthesized compounds containing system showed good root/shoot ratio than control systems (Table No. 3 (A-E)). The root length along with shoot length was simultaneously reduced. Hence it may affect production of substrate for respiration and consequently limited energy production but the resistivity of crop increase. [27]

In system of compound **1a** root length is greater than root length of control reading on all days. While in compound **3a** and **4a** it is less than control system in all days. When the shoot length was considered then only on 2nd day the shoot length of **1a** is greater than control system. But in all days the seedling height of **1a** is greater than control system on 2nd and 3rd day but from 3rd day it is reduced than control systems. The percentage of germination is

reduced but root shoot ratio increase in all experimental system compared to control system. From that we may conclude the fitness and sturdiness of that plant increases. It means that these seeds after full growth become resist to microbes and insects.

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Financial Innovations in Marketing Strategies: A Paradigm Shift

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Abstract:

Financial innovations in marketing strategies represent a transformative shift in how businesses approach customer engagement and revenue generation. This paradigm shift involves leveraging novel financial tools and techniques to enhance marketing effectiveness and efficiency. This paper discusses the financial innovations in marketing strategies practised in Thrissur, Kerala. The sample consists of 175 respondents collected with the help of structured questionnaire. The data was analysed using descriptive statistics as well as analytical statistics. The study shows that the financial innovations in marketing strategies include block chain, crypto currencies, Fintech solutions, mobile payments such as Apple Pay and Google Pay, Digital wallets like Amazon Pay, and Google wallet, incentives like Cashback, points or Discounts to encourage customers to make repeat purchases and Dynamic pricing to adjust prices in real-time based on demand, supply and customer behaviour. The study reveals that financial innovation in marketing strategies has brought about a paradigm shift in Kerala, transforming the way businesses approach customer transactions, payments and financial engagements.

Keywords: Financial innovations, Marketing strategies, Paradigm shift.

Introduction:

Financial innovations in marketing strategies represent a transformative shift in how businesses engage with consumers. This paradigm shift encompasses novel approaches that leverage advanced technologies, data analytics, and consumer behaviour insights. These innovations enable personalized and targeted marketing campaigns, enhancing customer experiences and loyalty. Financial innovations in marketing encompass a broad spectrum of tools, technologies, and practices that leverage financial mechanisms to enhance marketing efficiency, effectiveness, and reach. Additionally, financial innovations have triggered the development of new payment methods, such as, crypto currencies, Apple Pay and Google Pay, Digital wallets like Amazon Pay, and Google wallet, incentives like Cashback, points or discounts to encourage customers to make repeat purchases and Dynamic pricing to adjust prices in real-time based on demand, supply and customer behavior. The integration of these financial innovations into marketing strategies is not just a trend but a necessity for businesses aiming to thrive in the digital age. Overall, this shift signifies a departure from traditional marketing methods, emphasizing flexibility, adaptability, and a deep understanding of consumer needs and preferences in the digital age.

Statement of the Problem:

The rapid evolution of technology and the increasing complexity of consumer behaviour have

created a pressing need for businesses to innovate their marketing strategies. Traditional marketing approaches are becoming less effective in capturing and retaining customer attention. In this context, there is a critical need to explore and understand the role of financial innovations in transforming marketing strategies. This paper aims to investigate how financial innovations, such as block chain, crypto currencies, Apple Pay and Google Pay, Digital wallets like Amazon Pay, and Google wallet, incentives like Cashback, points or discounts to encourage customers to make repeat purchases and Dynamic pricing to adjust prices in real-time based on demand, supply and customer behaviour are reshaping marketing paradigms. By examining the impact of these innovations on consumer behaviour, market dynamics, and business models, this study seeks to provide insights into the future of marketing strategies in a digitally-driven economy.

Objectives of the study:

1. To explore and analyse the current financial innovations in marketing strategies, highlighting the key trends and practices.
2. To assess the impact of these innovations on customer engagement, market reach, and brand perception.
3. To propose future marketing strategies based on the identified innovations, suggesting the ways for businesses to adjust and succeed in the changing environment.

Significance of the problem:

Financial innovations in marketing strategies represent a paradigm shift in how businesses engage with customers and drive revenue. Traditionally, marketing Focused on traditional channels like TV, radio, and print media, but with technological advancements and changing consumer behaviour, new financial tools and strategies have emerged. These innovations include block chain, digital payment solutions such as, crypto currencies, Apple Pay and Google Pay, Digital wallets like Amazon Pay ,and Google wallet , incentives like Cashback, points or discounts to encourage customers to make repeat purchases and Dynamic pricing to adjust prices in real- time based on demand ,supply and customer behaviour. This shift is significant as it allows businesses to better understand and target their customers, leading to more effective marketing campaigns and higher ROI. Furthermore, it enhances customer experience by providing more convenient and personalized services. Overall, financial innovations in marketing strategies are reshaping the way businesses operate and interact with their customers, driving growth and competitiveness in today's digital economy.

The scope of the study:

This study encompasses a comprehensive examination of the transformative impact of financial technologies on marketing strategies, with a focus on applications in future marketing practices. It will investigate into the revolutionary effects of digital payments, block chain, and crypto currencies on consumer behaviour, marketing channels, and revenue models, enabling businesses to stay up-to-date. By exploring the opportunities and challenges of integrating financial innovations into marketing strategies, this research will provide valuable insights for marketers, entrepreneurs, and organizations seeking to leverage these innovations to enhance customer engagement, drive growth, and gain a competitive edge in the rapidly evolving digital landscape of the future.

Research Methodology:

The research method is both descriptive and analytical. Primary and secondary sources were used to collect the data. The basic data was collected through the use of questionnaires. Secondary data was collected from websites, Journals, and magazines, among other sources. The study's sample was drawn from Thrissur district in Kerala using convenience sampling. 175 samples were chosen by the researcher. The data were analysed using a variety of statistical tools and percentage analysis and from the non-parametric test, chi square is used.

Literature Review Mohammad G Nejad (2022):

The financial industry offers a unique setting to study innovations. Financial innovations have fueled the growth of economies, markets and

societies. The financial industry has successfully become the breeding ground for innovative services, processes, business models and technologies. This study seeks to provide a holistic view of the literature on financial innovations, synthesize the research findings and offer future directions for research in light of three market developments that are disrupting the industry and opening up a new era for the financial services industry. Disruptions from within and outside the industry offer new generations of radically innovative services. Moreover, new generations of consumers differ from previous generations in their needs and wants and look for innovative ways to handle their financial needs.

AU Lavrov, R. V. (2013):

The aim of the article is to define and to estimate the forming of expediency of the development strategy of financial and innovative technologies in the context of modern economic space realities. The growing importance of the financial sector in the contemporary economic space, as well as rapid changes in it, generates a need for financial innovative technologies. Application development strategy of financial innovative technologies will promote the improvement of general financial management for all economic subjects and broaden financial space of the country as a whole, as well as accelerate the introduction of new financial, informational and telecommunication technologies. However, based on the fact that economic subjects have not identical conditions of development, it is advisable to clarify the introduction sequence of new financial technologies, in other words identification of separate functional strategies of their promotion.

Much of the theoretical and empirical work in financial economics considers a highly stylized world in which there are few types of securities (typically debt and equity) and maybe a handful of simple financial institutions (typically banks or exchanges). However, in reality there is a vast range of different financial products, many different types of financial institutions and a variety of processes that these institutions employ to do business. Financial innovations in marketing strategies significantly impact consumer behaviour by altering purchasing patterns and enhancing the customer experience.

For instance, dynamic pricing can drive impulse purchases during high- demand periods, while BNPL options can reduce purchase hesitation due to financial constraints (Schuh, Shy, & Stavins, 2010). While financial innovations offer numerous benefits, they also pose challenges such as regulatory compliance, cyber security risks, and the need for continuous technological advancements. Future research should focus on developing robust

frameworks to mitigate these challenges and exploring new financial tools that can further

Revolutionize marketing strategies (Gomber, Kauffman, Parker, & Weber, 2018).

Data Analysis:

Basic details	No. of respondents	Percentage
Industry of Operation		
Retail	53	30
Finance	44	25
Healthcare	17	10
Manufacturing	44	25
Other	17	10
Total	175	100
Current Job Role		
Marketing Professional	44	25
Sales Professional	35	20
Business Owner/Entrepreneur	35	20
Senior Executive	26	15
Other	35	20
Total	175	100
Years of Experience in Current Role		
Less than 3 years	28	16
3-6 years	49	28
7-10 years	66	38
More than 10 years	32	18
Total	175	100
Customer Engagement Channels		
Online (Website, Social Media)	88	50
Offline (In-store, Events)	17	10
Both Online and Offline	70	40
Total	175	100
Primary Marketing Channels		
Social Media	73	42
Email Marketing	39	22
Search Engine Marketing	21	12
Traditional Media (TV, Radio, Print)	33	19
Other	9	5
Total	175	100

The respondents in the survey represent a diverse range of industries, with the highest percentages working in retail (30%) and finance (25%), followed by healthcare and manufacturing (each at 10%), and a smaller portion in other sectors (10%). The distribution of job roles among respondents indicates a significant presence of

marketing professionals (25%), sales professionals (20%), business owners/entrepreneurs (20%), and senior executives (15%). In terms of experience, the majority have 7-10 years of experience (38%). Engagement with customers is predominantly online (50%). Primary marketing channels are dominated by social media (42%).

Analyse the current financial innovations in marketing strategies:

Financial Innovations Marketing Strategies	No of respondents	Percentage
Fintech Solutions	70	40
Advanced Analytics and AI in Finance	52	30
Digital payment campaign	26	15
Blockchain based loyalty programs	8	5
Robo-Advisors	14	8
Others	5	2
Total	175	100
Financial technologies, which is most commonly used to optimize		

marketing spending		
Digital Wallet	67	38
Mobile Apps	75	42
AI-Powered chatbots	17	10
Robo-Advisors	8	5
others	8	5
Total	175	100
Influence of financial strategies in marketing activities		
improved transparency and reducing fraud in transactions	52	30
automating customer service responses	42	24
Increased product development speed	32	18
lowering advertising expenses	38	22
Others	11	6
Total	175	100

The analysis reveals that fintech solutions are the leading financial innovation in marketing strategies, adopted by 40% of respondents, followed by advanced analytics and AI in finance at 30%. Mobile apps (42%) and digital wallets (38%) are the most commonly used technologies to optimize marketing spending, with AI-powered chatbots

(10%) and robo-advisors (5%) also contributing. The survey reveals that automating customer service responses (30%) is perceived as the most impactful financial strategy in marketing activities, followed by improving transparency and reducing fraud in transactions (24%)

Impact of financial innovations on customer engagement, market reach, and brand perception.

Statement	Average Score	Rank
1) Company's financial strategies have improved its overall performance in the market.	3.7	1
2) Implementing financial innovations has significantly increased customer engagement with our brand.	3.6	2
3) Company's financial innovations make it stand out from its competitors	3.6	2
4) Financial innovations have enhanced the way customers perceive our brand.	3.5	3
5) Company's financial innovations have made their products/services accessible to more people.	3.4	4
6) Company's market reach has expanded significantly after implementing new financial strategies	3.3	5

The findings indicate that financial innovations have a substantial impact on various aspects of a company's performance and customer interactions. The most significant improvement is in overall market performance, with an average score of 3.7. Both increased customer engagement and standing out from competitors follow closely, each with a score of 3.6. Enhancements in brand perception are also notable, scoring 3.5, while the accessibility of products and services and the expansion of market reach, with scores of 3.4 and 3.3 respectively; highlight the broader benefits of

implementing financial innovations. These results demonstrate that financial innovations not only boost performance but also positively influence customer engagement, market reach, and brand perception.

Chi square:

(H0): The industry of operation and enhanced overall performance through financial innovations in marketing are independent of each other.

(H1): The industry of operation and enhanced overall performance through financial innovations in marketing are dependent on each other.

Industry	Enhanced overall performance through financial innovations in marketing					
	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total
Retail	7	23	15	7	1	53
Finance	8	12	20	2	2	44
Health care	8	7	1	1	0	17
Manufacturer	10	18	7	7	2	44
Others	1	10	1	1	4	17
Total	34	70	44	18	9	175

Chi-Square Test Results:

1. Chi-square statistic: 44.063

2. Degrees of freedom: 16

3. p-value: 0.000193

Since the p-value (0.000193) is less than the common significance level (0.05), we reject the null hypothesis. This means that the industry of operation and the enhanced overall performance through financial innovations in marketing are dependent on each other. The statistical test has shown that the differences in responses are not random but are systematically associated with the type of industry. This suggests that the impact or perception of financial innovations in marketing is different across various industries.

Suggestions:

1. Use AI to analyse customer data and personalize marketing messages according to individual preferences.
2. Use blockchain for secure and transparent transactions, improving customer trust and brand reputation
3. Utilize advanced data analytics to gain insights into customer behaviour, preferences, and needs, and create targeted marketing campaigns.
4. Integrate digital payment methods, such as mobile wallets and crypto currencies, to enhance customer experience and reduce transaction costs.
5. Develop marketing strategies that promote financial inclusion, targeting underserved populations and offering accessible financial services to drive business growth and social impact
6. Monitor real-time data to quickly adapt marketing strategies and capitalize on emerging trends.
7. Offer easy and secure payment options to enhance the customer experience and reduce cart abandonment.
8. Partner with fintech firms to explore new marketing solutions and continuously train your team to keep up with technological advancements.

Conclusion:

In conclusion, the integration of financial innovations in marketing strategies marks a significant paradigm shift in the business landscape. The advent of digital payments, blockchain technology, and data analytics has revolutionized the way companies engage with customers, manage transactions, and access capital. This shift enables businesses to offer personalized financial services, enhance customer experience, and drive growth. As financial innovations continue to evolve, marketers must adapt and leverage these advancements to stay competitive. By embracing this paradigm shift, companies can unlock new opportunities, improve operational efficiency, and foster deeper customer relationships. The integration of financial innovations in marketing strategies represents a significant paradigm shift, offering businesses new opportunities to engage consumers, optimize pricing,

and drive profitability. Ultimately, the fusion of finance and marketing strategies will redefine the future of business, enabling companies to thrive in an increasingly digital and interconnected world. By embracing this shift, businesses can unlock a new era of growth, innovation, and customer-centricity.

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"Exploring Aquatic Communities: *Bellamyia bengalensis* (Lamarck, 1822) and Its Ecosystem in Sawanga Lake, Amravati"

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Abstract:

This study explores the intricate relationships between the freshwater snail *Bellamyia bengalensis* (Lamarck, 1822) and the diverse aquatic flora and fauna within Sawanga Lake. *B. bengalensis* is gastropod of ethnomedicinal importance and high nutritional value. Through comprehensive field surveys and laboratory analyses, we identified a rich array of plant and animal species coexisting with this snail. Our findings reveal the symbiotic and sometimes competitive interactions that define this unique aquatic community. Flora and Fauna identified includes seventeen species each, ensuring the sustainability of this vibrant aquatic ecosystem. This is the first report on snail biodiversity study of Sawanga Lake, which highlighted its importance.

Keywords: Sawanga Lake, Fresh water snails, B. Bengalensis.

Introduction:

Bellamyia bengalensis (Lamarck, 1822) is a fresh water mollusk which distributed throughout Asia and Africa. It belongs to the class gastropoda¹ and *Bellamyia* is a genus of freshwater snails and it is the type genus of the subfamily *Bellamyinae*.² In general mollusks play a role in the balance of nature, and also act as biological indicator, in determining the degree of pollution of water and terrestrial environment.

Taxonomic position

1. Kingdom: Animalia
2. Class: *Gastropoda*
3. Sub-class: *Prosobranchia*
4. Order: *Mesogastropoda*
5. Family: *Viviparidae*
6. Sub-family: *Bellamyinae*
7. Genus: *Bellamyia*

Species: *B. Bengalensis* (Lamarck):

It is found in almost all types of low land water bodies, mainly stagnant water and low saline water resources such as rivers, streams, lakes, ponds, wetlands, polluted roadside marshes & ditches, paddy fields, etc.³ This snail attaches with the substances which are either immersed or in floating condition over the surface of water. It is usually found near thick beds of algae in lakes and ponds and feeds on *Hydrilla* plant and algal material like *Spirogyra*.⁴ Freshwater snails are vital in aquatic ecosystems, aiding in nutrient cycling, decomposing organic matter, and serving as prey. In Indian lakes, they indicate water quality and ecological balance.

However, they can also host diseases like *schistosomiasis*, *trypanosomiasis*, and *fascioliasis*.⁵ Physical, chemical, and biological factors impact the ecology of freshwater snails and other disease hosts. Local investigations are needed to identify key factors in each water body.^{6,7} The ecology of freshwater snails and other disease hosts is influenced by physical, chemical, and biological factors. Identifying key factors requires local investigations of each water body.⁸ *B. bengalensis* play a crucial role in nutrient cycling and energy flow by feeding on algae, detritus, and plants, aiding decomposition and water quality. They affect the population dynamics of algae, plants, and invertebrates and serve as prey for various predators. This study focused on the local distribution, diversity, and influence of physico-chemical parameters on *B. bengalensis*.

Lakes are essential ecosystems, providing habitats for diverse aquatic life and regulating local climate. They also serve as reservoirs for flood control. Socio-economically and culturally, lakes support agriculture, supply clean water, sustain fisheries, produce hydropower, and promote transportation and tourism. This study was conducted at Sawanga Lake, situated at 20° 49' 0" N, 77° 53' 0" E, approximately 23 km east of Amravati near Chandur-Rly town in Pohara-Malkhed Reserve Forest, Amravati district, Maharashtra. Fed primarily by the Kholad River, the lake covers an area of 6,717 km² at average water levels, with a

depth of 19 m from the riverbed. It measures 1,422 m in length and has a volume of 481 m³.⁹

Due to extensive utilization activities and population growth pressure, many lakes have suffered damage. Consequently, most lakes have experienced ecosystem degradation and reduced functionality. This loss disrupts natural balance, affecting human life.¹⁰ Hence, there is a need to identify and catalog the biodiversity of flora and fauna, particularly focusing on snails, as illustrated by Sawanga Lake.

Materials and Methods:

2.1 Study site

This research was conducted in Sawanga Lake, in Pohara-Malkhed Reserve Forest, Amravati, and Maharashtra. It was conducted in May 2023 - August 2023. Figure 1. Showing the collection site of Sawanga lake. During study period sampling was done in the morning from 9.00 a.m. – 12.00 p.m. The equipment used in this study were gill nets, mini hand nets, net trapped, crabs trapped, beakers and Ekman grab.

2.2 Data retrieval procedure

Mollusca were sampled using the hand-picking method while wearing gloves. Fish were sampled using gill nets and mini hand nets. Birds were sampled using the observation method. Algae were collected with water samples in a beaker. Other flora was collected by cutting a 5 cm twig with scissors and placing it in separate plastic bags. For collecting rotifers and arthropods, muddy water

near algae beds was collected in a beaker, while muddy soil and partially decomposing material were gathered in plastic bags near the algae beds to check for insect larvae.¹¹ Planktons were collected with a 20µ net and preserved in 4% formalin, 70% alcohol, and acetomethanol. Snails and amphibians were taken alive to the lab; frogs and toads were released after identification. Water samples were examined for rotifers and arthropod larvae. All flora and fauna were preserved in formalin, with flora, snails, and fishes in 10% formalin.

2.3. Procedure for Data Processing and Analysis:

Data analysis was performed descriptively and compared with previous studies.

Result and Discussion:

The flora and fauna identified include seventeen species each, ensuring the sustainability of this vibrant aquatic ecosystem. In this research investigation, we found the following beetles at the collection site: *Heliocarpis bucephalus* and *Onitis philemon fabricius*. This finding is consistent with an earlier study reported by Wankhade et al.¹² Additionally, we identified *Acraea terpsicore*, *Euploea core*, and *Pieris brassicae* butterflies in the study area, which were also reported in previous investigations.¹³ Dragonflies are among the dominant invertebrate predators in any ecosystem. Two dragonfly species were identified in our study: *Brachythemis contaminata* (Fabricius, 1793) and *Ictinogomphus rapax* (Rambur, 1842).¹⁴



Figure 1. Collection site of Sawanga Lake.

A vulnerable bird, the White-Browed Bushchat (*Saxicola macrorhynchus*), was identified at Sawanga Lake in 2016.¹⁵ Additionally, the Black-winged Stilt (*Himantopus himantopus*), Kentish Plover (*Charadrius alexandrinus*), Little Tern

(*Sternula albifrons*), Pheasant-tailed Jacana (*Hydrophasianus chirurgus*), and Red-wattled Lapwing (*Vanellus indicus*) were reported from this site.¹⁶ To our pleasant surprise, we also identified the Purple Moorhen (*Porphyrio porphyrio*) and the

Common Coot (*Fulica atra*). In the amphibian category, we identified the frogs *Rana tigrina* and *Duttaphrynus melanostictus*, along with a single fish species, *Clarias batrachus*.

The flora observed at the collection site includes *Spirogyra*, water lilies, Potamogeton (pondweed), and phytoplanktons, with representative members *Nitzschia lorenziana* and *Nitzschia acicularis*. Additionally, *Bacopa monnieri* (Brahmi), creeping Jenny (*Lysimachia nummularia*), variegated manna grass (*Glyceria maxima*), and Hydrilla were also found. Moreover, zooplanktons such as Rotifera, which were present throughout the

Table No. 1 Abundance of different snails located in the Sawanga Lake.

Study period	<i>B. bengalensis</i>	<i>L. acuminata</i>	<i>I. exustus</i>	<i>M. tuberculata</i>
May-23	52-60	22-34	16-18	15-22
Jun-23	72-89	24-39	21-24	18-28
Jul-23	112-256	45-56	28-38	32-49
Aug-23	104-180	52-65	33-41	35-44

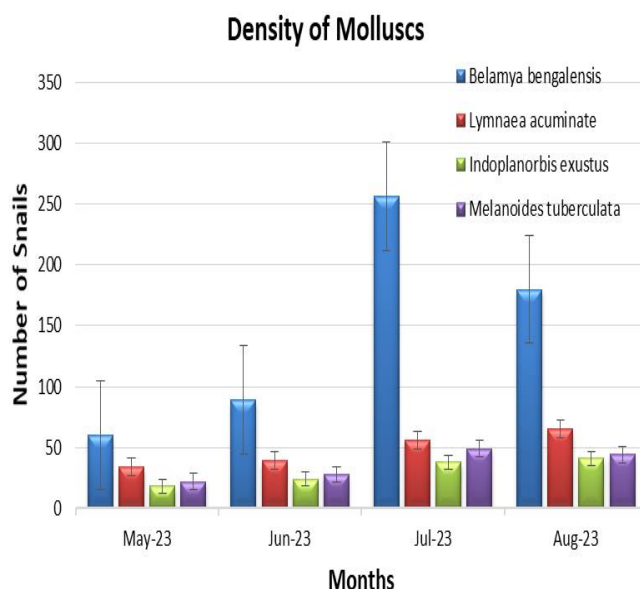


Figure. 2 Abundance of different snails located in the Sawanga lake.

B. bengalensis was found to be the most abundant gastropod species of Sawanga Lake throughout the study period followed by *Lymnaea acuminata*, *Melanoides tuberculata* and *Indoplanorbis exustus*. Its abundance varied from 52 to 256/ m² with a mean of 146.25 / m². The peak of abundance was recorded in July 2023. Our results were found to be varied from earlier research where two distinct peaks of abundance were recorded, the first in April and the second in October.¹⁸ It was reported that the abundance of *B. bengalensis* negatively correlated with water temperature, water transparency, rainfall, pH, DO, and CO₂, but positively correlated with sunshine.¹⁸ The breeding season extends through the hot weather and monsoon periods up to September, with the peak reproduction period from April to July.⁴ In vivo and in vitro studies support the use of *B. bengalensis* for its anti-inflammatory, anti-cancer, anti-oxidative, and anti-microbial properties.³ The dietary habits of

study period at all collection sites, included *Brachionus caudatus*, *Platyias quadricornis*, and *Nauplius* larva copepods.

In terms of the number of species, the phylum Mollusca, which includes land snails, is the largest phylum after Arthropoda.¹⁷ During this study period, it was observed that the dominant class Gastropoda within Mollusca included four species: *Bellamya bengalensis*, *Lymnaea acuminata*, *Indoplanorbis exustus*, and *Melanoides tuberculata*. Table 1 and Figure 2 illustrate the number of snail species identified in the study area along with their corresponding counts.

B. bengalensis encompass suspended particles, detritus, algal filaments, diatoms, and occasionally carrion. Typically inhabiting areas with dense algae growth in lakes and ponds, it feeds on *Hydrilla* plants and various algal materials like *Spirogyra*.⁴

Freshwater snails are significant due to their role as intermediate hosts for various trematodes that cause diseases in both humans and animals.¹⁹ Schistosomiasis stands out as a major public health concern among the diseases transmitted by snails. Additionally, fascioliasis represents another significant parasitic disease linked with snails in tropical and subtropical regions.²⁰

The transmission of snail-borne diseases depends on the distribution of specific freshwater snails that act as intermediate hosts, facilitating the development of trematode parasites to a stage capable of infecting humans or animals.²¹ Previous studies have reported that *B. bengalensis* can act as a host for trematode *cercariae*.²²

The vegetation in this area functions as a primary producer, sustaining both primary and secondary consumers. Studies suggest that freshwater macrophytes are rarely a direct food source for snails.²³ According to Bronmark et al.,²⁴ macrophytes play critical roles such as providing shelter from predators and environmental disturbances, serving as essential sites for egg-laying, and offering surfaces for snails to move across.

The development of periphyton (comprising algae and bacteria) on these plants is highly important, serving as a crucial food source for snails. Plants such as Creeping Jenny (*Lysimachia nummularia*), Brahmi (*Bacopa monnieri*), and *Glyceria maxima* are commonly chosen by snails for egg-laying. Observations have documented abundant egg clutches on these plants, highlighting their significance in snail reproduction. Furthermore, the complex structure of these plants offers effective protection against predators such as fish and birds. Both snails and tadpoles feed on periphytic algae, leading to significant potential for competitive interactions between them. Experimental observations showed competition among *B. bengalensis*, *L. acuminata*, *M. tuberculata*, *I. exustus*, *R. tigrina* tadpoles, and *D. melanostictus* toad tadpoles for algae. This exploitative competition reduces the resource, negatively impacting the growth and fecundity of the consumers.

Chironomus larvae are abundant and play a crucial role in aquatic food webs. They consume detritus, algae, and microorganisms, serving as prey for numerous fish and other aquatic predators. Because they are highly sensitive to changes in water quality, the presence and population density of *Chironomus* larvae can indicate environmental conditions, especially the levels of pollution and oxygenation in the water.²⁵

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Sustainable Farming Practices to Reduce Water Pollution

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Abstract:

Agricultural runoff is a major contributor to water pollution, leading to nutrient overloads, sedimentation, and chemical contamination in water bodies. This paper explores sustainable farming practices designed to mitigate these impacts and improve water quality. Conservation tillage reduces soil disturbance, thus minimizing erosion and nutrient loss. Cover cropping during off-seasons protects soil, enhances nutrient cycling, and reduces nitrate leaching by significant margins. Buffer strips and riparian zones act as biofilters, trapping sediments, nutrients, and pesticides before they reach water bodies. Integrated Pest Management (IPM) employs a combination of biological, cultural, and chemical methods to control pests, significantly reducing pesticide runoff. Nutrient management planning optimizes fertilizer use, aligning application with crop needs to prevent excess nutrient runoff. Case studies from the Chesapeake Bay watershed and the Mississippi River Basin demonstrate the effectiveness of these practices. In the Chesapeake Bay watershed, a combination of conservation tillage, cover cropping, and buffer strips has led to substantial reductions in nitrogen and phosphorus loads. Similarly, in the Mississippi River Basin, these practices have contributed to a significant decrease in nitrogen runoff, addressing the hypoxic dead zone in the Gulf of Mexico. These findings underscore the potential of sustainable farming practices to protect water resources while maintaining agricultural productivity. The continued adoption and support of these practices are crucial for the long-term sustainability of both agriculture and water ecosystems. Further research, policy initiatives, and education are necessary to promote widespread implementation and maximize the environmental benefits of sustainable agriculture.

Keywords: Sustainable farming, Water pollution, Conservation tillage, Nutrient management, Integrated Pest Management (IPM).

Introduction:

Agricultural activities are fundamental to global food production, but they are also a significant source of environmental pollution. One of the most pressing concerns is water pollution, which arises primarily from runoff containing fertilizers, pesticides, and animal waste. These pollutants degrade water quality, causing eutrophication, harmful algal blooms, and contamination of drinking water supplies. The environmental and public health impacts of water pollution are profound, affecting aquatic ecosystems, biodiversity, and human communities.

Sustainable farming practices have emerged as a viable solution to address these challenges. These practices aim to balance agricultural productivity with environmental stewardship, focusing on methods that enhance soil health, reduce chemical inputs, and improve water management. Sustainable farming not only helps in mitigating water pollution but also promotes resilience against climate change, preserves biodiversity, and supports the long-term viability of agricultural lands.

This paper explores various sustainable farming practices and their impact on water quality. By reviewing the latest research and case studies, we aim to provide a comprehensive understanding of how these practices can be implemented effectively to reduce water pollution. The practices discussed include conservation tillage, cover cropping, buffer strips and riparian zones, Integrated Pest Management (IPM), and nutrient management planning. Each of these methods offers unique benefits and challenges, and their successful implementation requires a combination of scientific knowledge, practical experience, and supportive policy frameworks.

The significance of this research lies in its potential to inform policymakers, farmers, and stakeholders about the benefits of sustainable farming practices. By adopting these practices, it is possible to create a more sustainable agricultural system that protects water resources, enhances environmental quality, and ensures food security for future generations. This paper highlights the need for continued research, education, and policy

support to promote the widespread adoption of sustainable farming practices.

1. Conservation Tillage Conservation tillage, including no-till and reduced-till practices, minimizes soil disturbance. By maintaining a protective layer of crop residue on the soil surface, these practices reduce erosion and runoff. Studies have shown that conservation tillage can significantly decrease sediment and nutrient loss to water bodies (Ghimire et al., 2017).

2. Cover Cropping Cover crops, such as legumes and grasses, are planted during off-seasons to protect and enrich the soil. They prevent erosion, improve soil structure, and enhance nutrient cycling. Research indicates that cover cropping can reduce nitrate leaching by 40-70%, thereby protecting water quality (Blanco-Canqui et al., 2015).

3. Buffer Strips and Riparian Zones Planting vegetative buffer strips and maintaining riparian zones along waterways can trap sediments, nutrients, and pesticides before they enter water bodies. These areas act as biofilters, enhancing water infiltration and reducing pollutant loads. Studies have documented that buffer strips can reduce phosphorus runoff by up to 85% (Dosskey et al., 2010).

4. Integrated Pest Management (IPM) IPM combines biological, cultural, and chemical practices to manage pest populations at acceptable levels while minimizing environmental impacts. By reducing reliance on chemical pesticides, IPM lowers the risk of water contamination. Research shows that IPM can reduce pesticide runoff by up to 90% compared to conventional practices (Ehler, 2006).

5. Nutrient Management Planning Nutrient management involves optimizing the timing, source, rate, and method of fertilizer application to match crop needs and minimize losses. Precision agriculture technologies, such as GPS-guided equipment and soil nutrient mapping, enable more efficient use of fertilizers. Studies indicate that nutrient management can reduce nitrogen runoff by 30-50% (Sharpley et al., 2006).

Case Studies:

1: The Paani Foundation Initiative

The Paani Foundation, established by actors Aamir Khan and Kiran Rao, has been instrumental in promoting sustainable water management practices in Maharashtra. The foundation's flagship program, the Satyamev Jayate Water Cup, encourages villages to compete in watershed management. Villages in drought-prone regions, such as Satara and Ahmednagar districts, have adopted conservation tillage, contour bunding, and tree plantation to reduce soil erosion and runoff. These efforts have led to significant improvements in water retention and quality. For example, the village of Hiware Bazar in Ahmednagar, through

these practices, has achieved a remarkable increase in groundwater levels and reduction in runoff, thus improving both agricultural productivity and water quality.

Case Study 2: Organic Farming in Yavatmal

Yavatmal district, often associated with agrarian distress, has seen a positive transformation through the adoption of organic farming practices. Farmers here have shifted from chemical-intensive farming to organic methods, using compost, green manures, and bio-pesticides. This transition has reduced the dependency on synthetic fertilizers and pesticides, significantly lowering the risk of water pollution. A study by the Maharashtra Organic Farming Federation highlighted that organic farms in Yavatmal exhibited reduced nitrate leaching and improved soil health, leading to better water quality in local streams and rivers. These practices have not only helped in reducing water pollution but also enhanced the overall sustainability of farming systems in the region.

Case Study 3: Integrated Pest Management in Kolhapur

Kolhapur district has been a pioneer in implementing Integrated Pest Management (IPM) to address the issues of pesticide runoff. The Maharashtra State Agricultural Marketing Board (MSAMB) initiated a project to train farmers in IPM techniques, which include the use of biological pest control agents, crop rotation, and resistant crop varieties. The adoption of IPM in sugarcane and paddy fields has resulted in a significant reduction in the use of chemical pesticides. Research conducted by the College of Agriculture, Kolhapur, demonstrated a 70% reduction in pesticide runoff into nearby water bodies. This practice has improved water quality and reduced the adverse impacts on aquatic life and human health.

These case studies illustrate the positive outcomes of sustainable farming practices in Maharashtra. By adopting conservation tillage, organic farming, and IPM, farmers have been able to reduce water pollution, enhance soil health, and improve agricultural sustainability. These examples serve as models for other regions facing similar environmental challenges, demonstrating that sustainable agriculture is both viable and beneficial.

Conclusion:

Water pollution from agricultural runoff is a critical environmental issue that poses significant risks to ecosystems, water quality, and human health. Sustainable farming practices offer a promising solution to mitigate these impacts while maintaining agricultural productivity. This research has explored various sustainable farming methods, including conservation tillage, cover cropping, buffer strips and riparian zones, Integrated Pest Management (IPM), and nutrient management

planning. Each practice contributes uniquely to reducing runoff and enhancing water quality.

Case studies from Maharashtra, such as the Paani Foundation initiative, organic farming in Yavatmal, and IPM in Kolhapur, demonstrate the tangible benefits of these practices. These examples show how sustainable farming can lead to increased groundwater levels, reduced nitrate leaching, and significant reductions in pesticide runoff, thereby improving the overall health of water bodies.

The adoption of sustainable farming practices requires a multi-faceted approach, involving education, policy support, and community engagement. Policymakers must provide incentives and support systems for farmers transitioning to these practices. Continuous research and development are essential to refine these methods and adapt them to local conditions.

In conclusion, sustainable farming practices are crucial for reducing agricultural water pollution and ensuring the long-term sustainability of both agriculture and water resources. By promoting and adopting these practices, it is possible to achieve a harmonious balance between agricultural productivity and environmental conservation, safeguarding water quality for future generations. Continued efforts in research, education, and policy will be vital in promoting widespread implementation and maximizing the environmental and economic benefits of sustainable agriculture.

Sustainable farming practices are essential for reducing agricultural water pollution and protecting water resources. Conservation tillage, cover cropping, buffer strips, IPM, and nutrient management planning have proven effective in minimizing runoff and improving water quality. Continued research, education, and policy support are needed to expand the adoption of these practices and ensure the long-term sustainability of agriculture and water resources.

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A Study on Women Empowerment through Kudumbashree Units with Special Reference to Adat Grama Panchayath Thrissur -Kerala

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Abstract:

Women in general, rarely enjoy the wide spectrum of freedom and rights granted by constitution and other legal provisions. Women who steer all the domestic activities so efficiently well are certainly very good examples in life management. Women are source of man power and contribute effectively towards human capital for which they have to be adequately equipped .Their potentials have to be properly exploited and their productivity and creativity should be utilized for the development of the nation. This can be made possible by empowering them.

The study will be of utmost significance as it would take stock of the extra livelihood options created through Kudumbasree intervention. The data regarding the fruits of micro entrepreneurial activities initiated through Kudumbasree inspiration offers another ocean of material information. The reasons cited for refraining from the income generating activities besides the details of difficulties confronted mark another area of focus. Since kudumbasree focused its objective on poverty alleviation through women empowerment .Women empowerment has great relevance in a panchayath like Adat, Thrissur Kerala. The project itself explain the agreeability of respondents regarding the improvement of empowerment after joining in NHGs.

Keywords: Women empowerment, Kudumbashree, NHGs, Financial sustainability.

Introduction:

Empowerment of women and their participation in the development process has been considered an essential feature of development. It is presumed that real development is possible only if the women and men work in equal terms. Gender equality and empowerment of women is recognized globally as a key element to achieve progress in all areas. Rural women are regarded as voiceless and defenseless. So they are to be empowered to fight against the evils faced by them. Kudumbasree project was started in Kerala in 1998. Women empowerment is one of the important objectives of Kudumbasree along with poverty eradication. The aim of the Kudumbasree scheme is to improve the standard of living of poor women in rural areas by setting up micro-credit and productive enterprises. It opened a new string of expected events in our development history Kudumbasree is the poverty eradication mission of the state of Kerala. It is a community based self help initiative involving poor women. Kudumbasree was conceived as a joint programme of the Government of Kerala and NABARD implemented through Community Development Societies of Poor Women, serving as the community wing of Local Governments .As per documents associated with Kudumbasree, women

want to identify their inner strength, opportunities for growth and their role in reshaping their own destiny. Thirteen years are so far covered by this programme. The main objective of this paper is to know to what extent this programme has influenced the rural women for their empowerment. Kerala is considered as literate state compared with all the states of our country. The study indicates that majority of the members of Kudumbasree units are working on daily wages and their total income is low. The women empowerment has achieved only a limited extend by Kudumbasree members.

Statement of the Problem:

Kudumbasree and credit groups are mostly informal groups whose members pool savings and re-lend within the group on rotational or needs basis. These groups have a common perception of need and impulse towards collective action. Many of these groups got formed around specific production activity, promoted savings among members and use the pooled resources to meet emergent needs of members, including consumption needs. Women kudumbasree, formed exclusively for women, being an effective medium for community involvement in developmental activities, can be a powerful tool for alleviating rural poverty through the empowerment of women, by freeing themselves from the clutches

of usurious moneylenders. Hence the present study attempts to assess the role of kudumbasree group in improving the socio-economic status of the women in Kerala and to study the level of empowerment achieved by rural women in Kerala through their participation in kudumbasree. Review of the existing literature makes it clear that research studies focusing on the impact of kudumbasree on women, especially of Kerala are rare in nature. It is specifically against this setting that the present study was undertaken to critically evaluate the role-played by the kudumbasree in imparting social, economic, financial and personal empowerment to the rural women. Women especially in rural area hardly have financial support and they have to fully depend upon their spouse to meet their basic requirement

Data Analysis and Interpretation:

Demographic Profile:

Age-Wise Classification:

Age Group	Frequency	Percent
Less than 30 years	10	8.3
30-40 years	29	24.2
40-50 years	51	42.5
above 50	30	25.0
Total	120	100.0

(Source: primary data)

Marital Status:

Marital Status	frequency	percent
Married	80.00	66.67
Unmarried	9.00	7.50
Widowed	25.00	20.83
Divorced	2.00	1.67
Separated	4.00	3.33
total	120.00	100.00

(Source: primary data)

Educational Qualification of Respondents:

Education	Frequency	percent
primary	19.00	15.83
high school	33.00	27.50
higher secondary	46.00	38.33
degree and above	22.00	18.33
Total	120.00	100.00

(Source: Primary Data)

Annual Income of the Respondents

Annual Income	frequency	percent
BELOW 25000	31	25.83
25000-50000	29	24.17
50000-75000	35	29.17
75000 AND ABOVE	25	20.83
total	120	100

(Source: Primary Data)

Interpretation:

From these demographic tables, it is clear that out of 120 respondents 51 people having the age between 40-50 years. Majority of them (67%) are married women. And is clearly understood that majority of women in kudumbasree having higher secondary

women are basically treated as persons who are supposed to engage only in household activities, and mostly treated as a weaker section of the society. To a great extent programs like kudumbasree is great relief for the women so that they can engage in some of social activities and thereby they can empower themselves, socially, economically and even psychologically.

Objectives:

1. To assess the extent of empowerment achieved by women through kudumbasree projects.
2. To know the financial sustainability of members after joining kudumbasree.
3. To identify the problems confronted and opinion on matters particularly affecting them.

education that account to 38 %. 29.17% of the respondents fall within the annual income of 50000-75000.

Financial Sustainability (After Joining Nhg)

Ho: the opinion of respondents regarding financial sustainability is equal to average

One sample t test on financial sustainability after joining NHG

Statements	Mean	Std. Deviation	T Value	P Value
I know to rotate and manage money	4.29	.666	21.244	<0.001**
I can manage the end use of credit	4.20	.705	18.637	<0.001**
I have the capacity to make the most profitable use of income and credit	4.19	.725	18.000	<0.001**
There is rise in my income	4.28	.624	22.522	<0.001**

(Source: Computed Data) Test Value: 3 ** denotes significant at 1% level of significance

Interpretation

From the table 4.1 shows the financial sustainability of women after joining NHG. Since the p value is less than 0.001, the null hypothesis is rejected at 1 % level of significance. Hence it is concluded that the opinion regarding financial sustainability through kudumbasree is not equal to average. Based on the mean score, the opinion of

respondent regarding financial sustainability is above the average level, which itself explains the agreeability of the respondents towards the statements of financial sustainability after joining NHG

Involvement in Decision Making: Ho: opinion of respondents regarding involvement in decision making is equal to average

One sample t test on involvement in decision making

Statements	Mean	Std. Deviation	t value	P Value
I have freedom to decide the use of my income	4.08	.871	51.237	<0.001**
I have freedom to visit my relatives and friends	4.22	.651	71.001	<0.001**
I participate in decisions regarding children's education and marriage	4.03	.864	51.006	<0.001**
I participate in decisions regarding household minor purchases	4.13	.607	74.576	<0.001**
I participate in decision regarding house hold major purchases	4.24	.661	70.297	<0.001**
I have say in controlling the size of my family	3.96	.902	48.079	<0.001**
I have freedom to participate in decisions regarding the use of my husband's income	3.92	.992	43.239	<0.001**
I have (can have) a joint account with my husband in a bank	3.90	.929	45.966	<0.001**

(Source: Computed Data) Test Value: 3 ** denotes significant at 1% level of significance

Interpretation

From the table 4.3. Shows the statements regarding the involvement in decision making of women after joining NHG. Since the p value is less than 0.001, the null hypothesis is rejected at 1 % level of significance. Hence it is concluded that the opinion of respondents regarding the involvement in decision making is not equal to average. Based on

the mean score, the opinion of respondent regarding involvement in decision making is above the average level, which itself explains the agreeability of the respondents and there is an improvement of involvement in decision making after joining NHG.

Self-Awareness: Ho: opinion of respondents regarding self-awareness is equal to an average

One sample t test on self-awareness

Statements	Mean	Std. Deviation	t value	P Value
I am aware of my rights and duties	4.38	.688	22.018	<0.001**
I have positive attitude towards changes	4.33	.596	24.338	<0.001**
feel happy in sharing responsibility of my family with my husband	4.39	.584	26.102	<0.001**
My self-standing capacity has increased	4.23	.628	21.370	<0.001**
My communication power has increased	4.34	.628	23.388	<0.001**
I can question discrimination against women	4.10	.681	17.623	<0.001**
I can participate in any public meeting	4.48	.608	26.733	<0.001**
I know what records are maintained in NHG	4.42	.588	26.385	<0.001**
I am capable of undertaking new responsibilities	4.42	.602	25.767	<0.001**

(Source: Computed Data) Test Value: 3 ** denotes significant at 1% level of significance

Interpretation

From the table 4.3. Shows the statements regarding the self awareness of women after joining NHG. Since the p value is less than 0.001, the null hypothesis is rejected at 1 % level of significance. Hence it is concluded that the opinion of respondent regarding their self-awareness is not equal to

One sample t test on functional literacy

Statements	Mean	Std. Deviation	t value	P Value
I can read and still simple forms	4.27	.618	22.448	<0.001**
I can perform numerical and simple arithmetic calculation	4.30	.528	26.961	<0.001**
I can provide technical support to children	4.46	.517	30.619	<0.001**

(Source: Computed Data) Test Value: 3 ** denotes significant at 1% level of significance

Interpretation

From the table 4.2 shows the statements regarding the functional literacy of women .Since the p value is less than 0.001, the null hypothesis is rejected at 1 % level of significance. Hence it is concluded that the opinion of respondent regarding their functional literacy is not equal to average. Based on the mean score, the opinion of respondent

One sample t test on functional literacy

Statements	Mean	Std. Deviation	t value	P value
I am aware of social issues	4.33	.471	30.727	<0.001**
I have capacity to undertake and manage economic activities	4.39	.507	29.781	<0.001**
I have capacity to interact effectively in public activity	4.38	.488	31.038	<0.001**
I have ability to organize a group of women	4.54	.548	30.794	<0.001**
I am eager to target better goals	4.33	.626	23.324	<0.001**
I know how to apply for a bank loan	4.45	.620	25.631	<0.001**
I know how to open an account in a bank	4.33	.555	26.313	<0.001**
People recognize my position as NHG member	4.47	.685	23.449	<0.001**
I get co-operation and help from others easily	4.33	.596	24.338	<0.001**

(Source: Computed Data) Test Value: 3 ** denotes significant at 1% level of significance

Interpretation

From the table 4.3. Shows the statements regarding the capacity building and social support of women after joining NHG .Since the p value is less than 0.001, the null hypothesis is rejected at 1 % level of significance. Hence it is concluded that the opinion of respondent regarding their capacity building and social support is not equal to average. Based on the mean score, the opinion of respondent

One sample t test on Difficulties and problems

Statements	Mean	Std. Deviation	t value	P value
I have difficulty in continuing in the NHG	3.86	1.132	8.303	<0.001**
My intention at the time of joining NHG are not satisfied.	4.05	.906	12.694	<0.001**
Family violence has not come down after joining in NHG	3.91	.830	11.987	<0.001**
After joining NHG lam overworked and bear increased responsibilities	3.84	.961	9.590	<0.001**
There is political interest in the functioning of NHGs	4.09	.648	18.450	<0.001**
Kudumbasree units are acting as a tool for implementing the projects of local governments.	4.00	.674	16.262	<0.001**

(Source: Computed Data) Test Value: 3 ** denotes significant at 1% level of significance

Interpretation

From the table 4.2 shows the statements regarding the difficulties and problems faced by

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average. Based on the mean score, the opinion of respondent regarding self awareness is above the average level, which itself explains the agreeability of the respondents and there is an improvement of self-awareness after joining NHG.

Functional Literacy: Ho: opinion of respondents regarding functional literacy is equal to an average

regarding functional literacy is above the average level, which itself explains the agreeability of the respondents that there is an improvement of functional literacy after joining NHG.

Capacity Building and Social Support: Ho: opinion of respondents regarding capacity building and social support is equal to average

regarding capacity building and social support is above the average level, which itself explains the agreeability of the respondents that there is an improvement of capacity building and social support after joining NHG.

Difficulties and Problems: Ho: opinion of respondents regarding difficulties and problems is equal to average

women after joining NHG .Since the p value is less than 0.001, the null hypothesis is rejected at 1 % level of significance. Hence it is concluded that the

opinion of respondents regarding their difficulties and problems is not equal to average. Based on the mean scores, the opinion of respondents regarding difficulties and problems is above the average level,

which itself explain most of the respondents are disagree with this statements.

Assessment of Empowerment: Ho: opinion of respondents regarding assessment of empowerment is equal to average.

One sample t test on assessment of empowerment

Statements	Mean	Std. Deviation	t value	P value
Increase in self confidence	4.18	.529	24.323	<0.001**
increase in decision making for family	4.30	.478	29.787	<0.001**
increase in decision making for group	4.18	.423	30.406	<0.001**
increase access for income	4.22	.414	32.216	<0.001**
increase communication skills	4.31	.499	28.741	<0.001**
increase social awareness	4.24	.534	25.450	<0.001**
increased recognition in community	4.14	.853	14.661	<0.001**
participation in community activities	4.35	.560	26.415	<0.001**
increased gender awareness	4.33	.473	30.854	<0.001**
increased self-reliance	4.23	.546	24.748	<0.001**

(Source: Computed Data) Test Value: 3 ** denotes significant at 1% level of significance

Interpretation:

From the table 4.3.7 shows the statements regarding the assessment of women empowerment. Since the p value is less than 0.001, the null hypothesis is rejected at 1 % level of significance. Hence it is concluded that the opinion of respondent regarding their empowerment assessment is not equal to average. Based on the mean score, the opinion of respondents regarding assessment of empowerment is above the average level, which itself explains the agreeability of the respondents that there is an improvement of empowerment after joining NHG

Conclusion:

Economic development is the base for other development. Collective effort has been recognized as tenets of women empowerment. Through women empowerment leads to sustainable social development. Economic development of women leads to better living status in the family, educational, nutritional, and the health needs of the children were well satisfied. Economic independence through kudumbasree improved the social participation of its members and the Kudumbashree-NHGM movement is supporting for social empowerment of poor women flock.

This study about Kudumbashree has provided an insight on women empowerment acquired by the members of various Kudumbashree units. The project itself explain the agreeability of respondents regarding the improvement of empowerment after joining in NHGs. Decision making power, Personal skills, and awareness of the members are improved. And after joining in NHGs, they are more able to rotate and manage money properly and they can able to maintain financial sustainability.

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Ayurvedic Nutritional Guidance for Pregnancy: Garbhini Paricharya In Fetal Development and Maternal Health

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Abstract:

In Ayurveda, diet is considered essential for both nourishment and medicine during pregnancy. The diet prescribed is unique for each month, aligning with the fetus's development while maintaining the mother's health. A pregnant woman's diet and activities directly impact the fetus, emphasizing the importance of Garbhini Paricharya—a month-by-month regimen detailed by various Ayurvedic scholars. This approach ensures the mother's body supports the growing fetus by adjusting nutrient availability based on the mother's body composition, nutritional reserves, and placental nutrient delivery.

Keywords: Garbhini, Masanumasika Garbhini Paricharya, Ahara, Nutrition

Introduction:

Maintaining the health of a pregnant woman, or Swasthya, is crucial in Ayurveda, as she is responsible for the nutrition and oxygen supply to the fetus. From conception to delivery, proper care, or Paricharya, is vital for the mother's and the baby's health. Paricharya encompasses all aspects of well-being, including diet (Ahara), exercise (Vihar), recommended practices (Pathya), prohibited practices (Apathya), yoga, and meditation. A holistic lifestyle supports optimal fetal growth, a smooth delivery, and postnatal recovery. This article aims to highlight the significance of Garbhini Masanumasik Paricharya, as detailed in Ayurvedic texts, for ensuring the health of both mother and child. Ayurveda's primary objective, "swasthasya swasthya rakshanam athurasya vikarprashamanam," emphasizes maintaining the health of the pregnant woman and preventing diseases. Proper diet is critical, as even effective medicines cannot work without it. Therefore, food is considered the best medicine. This study focuses on the monthly regimen for pregnant women mentioned in Ayurvedic classics to ensure the health and safety of both mother and child.

Masanumasika Garbhini Paricharya

First Month:

According to Acharya Charaka, in the first month, the fetus resembles Sleshma (mucoid character), with all body parts present but not distinct. Pregnant women may experience fatigue and thirst.¹

Regimen: Sweet (Madhura), liquid (Drava), and cold (Sheeta) diet.²

Second Month:

During the second month, the five great elements (mahabhuta) necessary for embryo formation solidify through the combined action of Sleshma, Pitta, and Vayu.³

Regimen: Sweet (Madhura), cold (Sheeta), and liquid (Drava) diet⁴; milk medicated with sweet (Madhura) drugs.⁵

Third Month:

In the third month, sense organs and minor body parts become apparent⁶, and buds for the forehead and extremities develop.⁷

Regimen: Milk with honey and ghee (ghrita)⁸, Sasti rice with milk⁴, Krishara (a dish made with rice and pulses).⁹

Fourth Month:

The fetus becomes more stable, and the body parts are more visible, making the mother feel heavier¹⁰. The fetus's desires (dauhridaya) are expressed through the mother's cravings, which should be fulfilled to avoid abnormalities.

Regimen: Fresh butter (Navanita) one aksha (10gm)¹¹, cooked Sasti rice with curd, pleasant food mixed with milk and butter, or meat soup (jangala mamsa rasa).⁴

Fifth Month:

Flesh and blood accumulation in the fetus increases, leading to maternal emaciation as nutrients are directed to the fetus¹². Consciousness (mana) becomes more enlightened.¹³

Regimen: Ghee and milk⁸; Payasa (rice cooked with milk and sweetened).¹⁴

Sixth Month:

The fetus gains more energy and complexion, causing the mother to lose strength and feel more tired.^{15,13}

Regimen: Ghee or Yavagu (rice gruel) prepared with Gokshura (*Tribulus terrestris*).⁴

Seventh Month:

All body parts of the fetus are fully developed, leading to the mother feeling exhausted.¹⁶

Regimen: Ghee medicated with Prithakparnyadi Gana.⁴

Eighth Month

Oja (essence of dhatus) remains unstable due to the fetus's immaturity, transferring between mother and fetus, causing alternating states of happiness and sluggishness. This month is critical as both mother and fetus are at risk.¹⁷

Regimen: Yavagu (rice gruel) with milk and ghee¹⁸; asthapana basti (a type of enema) with a decoction of specific drugs, followed by Anuvasana basti with medicated oil⁴; meat soup to pacify Vata.

Ninth Month

By the ninth month, the baby is fully matured and ready for birth.

Regimen: Anuvasana basti with oil prepared with Madhura gana drugs, Yoni pichu (medicated oil-soaked cotton balls kept in the vagina), Yavagu (rice gruel) with ghee, and meat soup with cooked rice. A daily bath with a cold decoction of leaves suppressing Vata is recommended.

Conclusion

Garbhini Paricharya aims to ensure the proper formation of the fetus, a defect-free creation, a secure full-term delivery, and the preservation of fetal health. The ancient Ayurvedic literature, described in various Samhitas, is both unique and scientifically aligned with modern sciences. Therefore, antenatal care should follow Ayurvedic principles for optimal outcomes.

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"The Effectiveness of Ensemble Methods Compared To Traditional Machine Learning Techniques in Test Cricket Prediction"

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Abstract:

Predicting the outcomes of sports events is a complex task that involves various dynamic factors and uncertainties. This study aims to evaluate the effectiveness of ensemble methods in comparison to traditional machine learning techniques in predicting the results of sports events, with a specific focus on international test cricket matches involving the Indian cricket team. The models examined include Random Forest, a well-known ensemble method, and Decision Tree and Logistic Regression, representing traditional machine learning approaches. Using a comprehensive dataset of past cricket match statistics, we developed and tested predictive models for match outcomes. The performance of each model was assessed based on accuracy, precision, recall, and F1-score. Our findings indicate that ensemble methods, particularly Random Forest, provide superior predictive accuracy and robustness compared to individual algorithms like Decision Tree and Logistic Regression. This superiority is attributed to the ability of ensemble methods to reduce overfitting and improve generalization by combining the strengths of multiple base models. This research contributes to the growing field of sports analytics by demonstrating the practical benefits of advanced machine learning techniques in predictive modeling. The results have significant implications for sports strategists, analysts, and enthusiasts seeking to leverage data-driven insights to forecast game outcomes more reliably. Future work may explore the integration of additional ensemble methods and the application of these findings to other sports domains.

Keywords: Classification Algorithm, Logistic Regression, decision Tree, Random Forest, Ensemble Techniques

Introduction:

The rapid advancement of data analytics and machine learning has significantly transformed various industries, including sports. Predicting the outcomes of sports events is a complex and dynamic task that has captivated researchers, analysts, and enthusiasts alike. Accurate predictions can provide valuable insights for strategic planning, enhance fan engagement, and inform betting markets. This study focuses on the predictive modeling of international test cricket matches involving the Indian cricket team, comparing the effectiveness of ensemble methods to traditional machine learning techniques. Predicting sports outcomes is inherently challenging due to the numerous factors influencing the results, such as player performance, team strategies, weather conditions, and historical match data. Traditional machine learning algorithms, such as Decision Trees and Logistic Regression, have been commonly employed for this purpose due to their simplicity and interpretability. However, these models often face limitations, including overfitting and restricted generalization capabilities.[1]

Ensemble methods, which amalgamate the predictions of multiple base models to yield a more

accurate and robust result, have emerged as a powerful alternative. Random Forest, a well-known ensemble technique, has gained popularity for its ability to address overfitting and improve predictive performance. By harnessing the strengths of multiple models, ensemble methods can provide substantial enhancements over traditional single-model approaches. [2]

Despite the theoretical advantages of ensemble methods, there is a need for empirical validation of their effectiveness in real-world applications, specifically in sports prediction. This study aims to bridge this gap by conducting a comparative analysis of ensemble methods and traditional machine learning techniques in predicting the outcomes of international test cricket matches. [3][4]

This research contributes to the growing field of sports analytics by providing empirical evidence on the effectiveness of ensemble methods in predicting sports outcomes. The findings have practical implications for sports strategists, analysts, and enthusiasts seeking to leverage data-driven insights to enhance their predictive capabilities. Furthermore, the study highlights the importance of

advanced machine learning techniques in improving the accuracy and reliability of sports predictions.

Literature Review:

K. M. Reddy et al. [2023] the efficacy of machine learning algorithms in predictive modeling has been extensively studied across various domains, including personality prediction from CV data. A study aimed to assess and enhance the prediction accuracy of determining a candidate's personality from their CV by comparing the Random Forest algorithm and the K Nearest Neighbour (KNN) algorithm. In this study, 80 samples were gathered and divided into two groups of 40 samples each. The first group employed a Random Forest model, while the second utilized the KNN algorithm. The dataset was integrated using the Kaggle tool and trained within a Jupyter Notebook environment.

The determination of the sample size was based on prior research, targeting a pre-test power of 95% and an alpha value of 0.604. The simulation results indicated that the Random Forest algorithm significantly outperformed the KNN technique, achieving accuracy scores of 90.9970% compared to 87.8140%. The difference in accuracy between the two methodologies was statistically significant, with a P-value of less than 0.05 ($P < 0.05$). These findings underscore the potential of machine learning approaches like Random Forest and KNN in accurately estimating personality traits from CV data, highlighting the superior performance of the Random Forest algorithm in this context.

This study contributes to the broader understanding of the application of machine learning in predictive analytics, demonstrating the advantages of ensemble methods such as Random Forest in enhancing prediction accuracy. The results are particularly relevant for fields where precise personality prediction from CVs can significantly impact decision-making processes, such as human resources and recruitment.[5]

N. Vani et al. [2022] The application of machine learning algorithms in medical image analysis has seen substantial growth, particularly in the detection and classification of anomalies in brain scans. A study focused on identifying brain tumor anomalies using CT scans combined with MRI scans by employing two machine learning algorithms: the Random Forest algorithm and the K-means clustering algorithm. To ensure maximum accuracy, a sample size of $n=5$ for both Random Forest and K-means was iterated 10 times for efficient and accurate analysis of MRI images. The study utilized a G power of 80%, a threshold of 0.05%, and a 95% confidence interval (CI) for the mean and standard deviation.

The experimental results demonstrated that the Random Forest algorithm achieved a mean accuracy of 84%, significantly outperforming the K-

means classifier, which had a mean accuracy of 72%. The difference in accuracy between the two algorithms was statistically significant, with a P-value of less than 0.05 ($P < 0.05$). These findings suggest that the Random Forest classification algorithm is more effective in identifying brain tumor anomalies compared to the K-means classifier algorithm.

This research highlights the superior performance of ensemble methods, such as the Random Forest algorithm, in medical image classification tasks. The enhanced accuracy and reliability of the Random Forest algorithm make it a promising tool for clinical applications, particularly in the early detection and treatment planning for brain tumors. The study contributes to the ongoing efforts to integrate advanced machine learning techniques into medical diagnostics, aiming to improve patient outcomes through more accurate and efficient analysis of medical images.[6]

M. Sumathi et al. [2023] Machine learning (ML) techniques have become integral to efficiently completing complex tasks across various sectors, including healthcare, agriculture, weather forecasting, transportation, and sports. Sports, in particular, involve substantial financial investments, making player performance analysis a critical task. A study proposed a system to analyze cricket players' performance, aiming to determine the capabilities of specific athletes for team formation and training planning. The study employed multiple ML models, including linear regression, K-means clustering, and Random Forest, to analyze the performance data of cricket players.

Linear regression was used to predict and regress players' performance along a linear line. K-means clustering classified the variables into 'n' clusters based on similar player characteristics. Subsequently, the clusters' accuracy over test data was validated using Random Forest-based classification. This comprehensive analysis facilitated the selection of the best players for team formation, thereby increasing the likelihood of winning matches. The research highlighted that ML models could effectively rank players and aid in game-related applications, emphasizing the importance of advanced analytical techniques in sports performance assessment.

The study demonstrates the practical application of various machine learning techniques in sports analytics. By leveraging models such as linear regression, K-means clustering, and Random Forest, the system provided a robust framework for evaluating and optimizing team composition. The findings underscore the potential of ML in enhancing decision-making processes in sports, contributing to better management and strategic planning in cricket. [7]

Methodology:

Data Collection:

The data used in this study was sourced from publicly available cricket databases and historical match records. The dataset includes detailed statistics of international test cricket matches involving the Indian cricket team, spanning several years. Key features include player performance metrics (e.g., runs scored, wickets taken), match conditions (e.g., venue, weather), and team compositions. The data was cleaned to remove any inconsistencies and missing values, ensuring a high-quality dataset for model training and evaluation.

Data Preprocessing:

To prepare the data for analysis, several preprocessing steps were undertaken:

1. Feature Engineering: New features were created to capture important aspects of the game, such as player form (based on recent performance) and team strength (based on player ratings).
2. Normalization: Continuous variables were normalized to ensure they have a consistent scale, facilitating better model performance.
3. Encoding: Categorical variables, such as player names and match venues, were encoded using techniques like one-hot encoding.

Model Development:

Three machine learning models were developed for this study: Random Forest, Decision Tree, and Logistic Regression. The development process for each model is described below.

1. Random Forest: An ensemble learning method that builds multiple decision trees and combines their predictions to improve accuracy and reduce overfitting. The number of trees and other hyperparameters were tuned using grid search and cross-validation.
2. Decision Tree: A non-linear model that splits the data into subsets based on feature values, creating a tree-like structure. Hyperparameters such as maximum depth and minimum samples per leaf were optimized to balance model complexity and performance.
3. Logistic Regression: A linear model used for binary classification, predicting the probability of a match outcome (win/loss). Regularization techniques were applied to prevent overfitting and ensure the model generalizes well to new data.

Experimental Setup:

Table 1: Evaluation matrix

Model	Accuracy	Precision	Recall	F1-Score
Random Forest	86.5	88.3	85.1	86.7
Decision Tree	81.2	83.4	79.8	81.5
Logistic Regression	78.6	80.2	77.1	78.6

The experimental setup involved splitting the dataset into training and testing sets, ensuring that the models were trained on one portion of the data and evaluated on another to assess their generalization performance.

1. Training and Testing Split: The dataset was divided into 70% for training and 30% for testing, ensuring that the models had sufficient data to learn from while retaining a robust evaluation set.
2. Cross-Validation: K-fold cross-validation (with K=5) was used to further validate the models, ensuring that the performance metrics are reliable and not dependent on a single train-test split.

Evaluation Metrics:

The models were evaluated using several performance metrics to provide a comprehensive assessment of their accuracy and robustness:

1. Accuracy: The proportion of correctly predicted match outcomes.

$$\frac{TP + TN}{TP + FP + TN + FN}$$

Where:

1. TP = True Positives
2. TN = True Negatives
3. FP = False Positives
4. FN = False Negatives
2. Precision: The proportion of true positive predictions among all positive predictions.

$$\frac{TP}{TP + FP}$$

3. Recall: The proportion of true positive predictions among all actual positives.

$$\frac{TP}{TP + FN}$$

4. F1-Score: The harmonic mean of precision and recall, providing a balance between the two metrics.

$$\frac{2 \times (Precision \times Recall)}{Precision + Recall}$$

This methodological framework ensures a rigorous and comprehensive evaluation of the machine learning models, providing valuable insights into the effectiveness of ensemble methods compared to traditional techniques in predicting sports outcomes.

Results and Discussion:

Results:

The performance of the three models Random Forest, Decision Tree, and Logistic Regression are evaluated using the test set, and the results are summarized in Table 1.

The Random Forest model outperformed both the Decision Tree and Logistic Regression models in all evaluation metrics. Specifically, the Random Forest achieved an accuracy of 86.5%, a precision of 88.3%, a recall of 85.1%, and an F1-score of 86.7%. In contrast, the Decision Tree model achieved an accuracy of 81.2%, a precision of 83.4%, a recall of 79.8%, and an F1-score of 81.5%. The Logistic Regression model performed the least well, with an accuracy of 78.6%, a precision of 80.2%, a recall of 77.1%, and an F1-score of 78.6%.

Comparative Analysis:

The results indicate that the Random Forest model significantly outperforms the Decision Tree and Logistic Regression models in predicting the outcomes of international test cricket matches involving the Indian cricket team. The superior performance of the Random Forest can be attributed to its ensemble nature, which combines multiple decision trees to reduce overfitting and enhance generalization.

Discussion:

The Random Forest model's superior performance can be attributed to its ability to aggregate the predictions of multiple decision trees, thereby reducing variance and avoiding overfitting. This ensemble approach leverages the strengths of individual trees while mitigating their weaknesses, resulting in a more robust and accurate model.

The Decision Tree model, while simpler and more interpretable, is prone to overfitting, especially with a large number of features. This limitation likely contributed to its lower performance compared to the Random Forest. Logistic Regression, a linear model, struggled to capture the complex non-linear relationships in the data, resulting in the lowest performance among the three models.

These findings are consistent with existing literature, which highlights the advantages of ensemble methods, particularly Random Forest, in various predictive modeling tasks. For instance, studies have demonstrated the effectiveness of Random Forest in diverse applications, ranging from medical diagnostics to financial forecasting, due to its robustness and accuracy.

Implication:

The results of this study have several practical implications for predicting sports outcomes, particularly in cricket. The superior performance of the Random Forest model suggests that ensemble methods can provide more accurate and reliable predictions, which can be invaluable for team formation and strategic planning. By leveraging advanced machine learning techniques, cricket teams and analysts can gain deeper insights into player performance, enhancing their decision-making processes and increasing their chances of success in matches.

Furthermore, the demonstrated effectiveness of ensemble methods in this study underscores the importance of adopting sophisticated machine learning approaches in sports analytics. As data availability and computational resources continue to grow, the potential for machine learning to revolutionize sports analytics becomes increasingly apparent.

In conclusion, this study highlights the effectiveness of ensemble methods, specifically Random Forest, in predicting the outcomes of international test cricket matches. The findings suggest that ensemble techniques offer significant advantages over traditional machine learning models, providing more accurate and robust predictions that can enhance strategic decision-making in sports.

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A Study on Stock Selection in a Data Envelopment Framework With Reference To Sharewealth Securities Private Limited.

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Abstract:

The Indian economy was strictly regulated and safeguarded prior to liberalization by a variety of measures, including a licensing system, high tariffs and rates, and restricted investment in certain core sectors. The 1980s saw extremely unsustainable economic expansion due to the reliance on borrowing to close the current account deficit. In order to address these inequities, the Indian government implemented structural reforms through economic policy in 1991. During that period, the financial industry was mostly unstructured and consisted solely of bonds, stocks, insurance, commodities, mutual funds, and pension funds. A regulatory body called the Security Exchange Board of India was established, along with the nation's first electronic exchange, the National Stock Exchange, to structure the security market. This was done with the intention of giving credit, mobilizing resources, and regularizing investments. One category of people, according to Mark Twain, has seen the Taj Mahal, a famous Indian structure; the other group has not. About investors, the same is true.

Keywords: - Data Development Analysis (DDA), Security Analysis, Stock Market, Stock returns and EPS.

Introduction:

Those who are aware of the investment opportunities in India and those who are not are the two categories of investors. When buyers and sellers of stocks meet in person or digitally, it's called a stock market. Both small-scale investors and large fund managers, located anywhere in the world, can be market participants. The professionals of a stock market receive orders from investors, and they carry out this purchase and sell instructions. Stock exchanges list and trade the stocks. Transactions on the trading floor of some exchanges, which operate on an open outcry system, take place in person. While a network of computers is assembled to perform the electronic transactions, the other interactions are virtual in nature.

The optimum limit order is automatically matched with the order put by an investor; the entire system is order-driven. Since it displays all buy and sell orders, this method offers greater transparency. Two major stock exchanges, the BSE (Bombay Stock Exchange) and NSE (National Stock Exchange), are the primary venues for the functioning of the Indian stock market. When it comes to market capitalization, BSE and NSE are among the top five stock exchanges in emerging nations worldwide. BSE was ranked fourth out of fourteen emerging economy stock exchanges as of June 2012, with a market value of \$1,101.87 billion, while NSE was ranked fifth, with a market capitalization of \$1079.39 billion. Choosing stocks is a difficult

procedure that requires consideration of several factors.

Technical and fundamental analyses are the two main methods used in stock selection. The fundamental approach focuses on analyzing the economy, industry, and firm to anticipate future dividends and earnings. Accurate estimation of earnings and dividends results in the intrinsic value, or actual stock value, being determined. The only thing left to do is find the stocks that are remarkably cheap and buy them, then sell them when the market price exceeds their underlying worth. By examining price and volume data and extending previous price trends into the future, the technical approach, on the other hand, forecasts stock prices. Technical analysis argues that the price is the sole number that combines, measures, and represents all characteristics, quantifiable and non-quantifiable, rational and irrational. But because of the increased level of uncertainty brought on by external causes, investors find it very challenging to predict stock prices or to determine the underlying value of companies.

A multicriteria decision making dilemma is one in which choosing stocks entails evaluating a number of characteristics. Data Envelopment Analysis (DEA) can be used to handle this multicriteria decision making challenge. Data Envelopment Analysis Originally created by Charnes, Cooper, and Rhodes (1978) to examine the relative efficiency of organizational units or

decision-making units (DMUs), data envelope analysis (DEA) is a nonparametric performance assessment tool. By using available resources to produce a set of outputs, a DMU's efficiency is measured using this technique. The DEA method builds an effective production frontier based on best practices by using linear programming techniques to track the inputs and outputs generated by decision-making units.

Statement of Problem:

Due to increased market uncertainty brought on by external forces, it is very challenging for investors to forecast stock prices or determine the underlying value of companies. When choosing stocks, a number of factors must be considered and a multicriteria decision making issue must be solved. There are a lot of studies on stock selection, but few in India use nonparametric methodologies in their research. With the use of the nonparametric technique Data Envelopment Analysis (DEA), the current work attempts to close this research gap on stock selection.

Objectives of the Study:

Finding an efficient stock from a selection of stocks is the study's main goal. The research establishes the subsequent goals:

1. Calculating the risk and return of specific stocks
2. To evaluate a subset of nifty stocks for technical efficiency.
3. To investigate the connection between the stock's market value and efficiency score.

Scope of the Study:

As a generalization of the technological efficiency put forward by Farrel (Farrel 1957), Data Envelopment Analysis (DEA) was initially developed in 1978 by Charnes, Cooper, and Rhodes. A nonparametric technique used in economics and operation studies to estimate production boundaries is data envelopment analysis. The Decision Making Units (DMUs) area group of related units whose relative performance and productive efficiency are measured objectively. In essence, DMUs use similar multiple inputs to produce similar many outputs, thus performing the same work. By assessing each DMU's relative efficiency, DEA compares its inputs and outputs. When choosing stocks, a number of factors need to be considered. Data Envelopment

Analysis (DEA) is the exclusive focus of this work. Sample of the study

Stocks have been selected from NIFTY 50 of National Stock Exchange. Five sectors identified for the selection of stocks are Pharmaceutical, Auto, FMCG, Energy and IT. From each sector 3 stocks have been selected. Altogether there are 15 stocks which form the sample of the study.

Sources of Data:

Data have been collected from the websites of National Stock Exchange of India and Money control.

Tools for Analysis:

1. Data Envelopment Analysis (DEA) is the main tool used for this study
2. Other tools used in the study are statistical tools like standard deviation, mean and beta.
3. Tools for Presentation
4. Charts
5. Tables
6. Graphs
7. Variables of the study
8. Input: Beta, Standard Deviation, P/E Ratio
9. Output: Stock Return, EPS

Limitations of the study

1. It is very complex to estimate technical efficiency.
2. Unavailability of sufficient data.
3. Possibility of random error in selection of data.

Data Analysis and Interpretation:

This study is purely based on the secondary data collected from various websites aiming at examining the relative efficiency of the selected stock from Nifty 50. The study is limited to 15 stocks selected from the stocks listed in national stock exchange. These 15 stocks considered here as decision making units (DMUs). This study utilizes the greatest advantages of DEA methodology properly by selecting multiple inputs and outputs with an accepted number of degrees of freedom. Majority of the previous studies considered a small number of inputs and outputs and consequently failed to capture the multidimensional nature of the Indian stock market and the value aspects of performances in the present competitive market. The DMUs are selected from different industries from Nifty 50 Automobile, Information technology, Energy, FMCG

Table 5.1 Selected Stocks and Their Symbols

Sr. No	Name of the stock	Symbol
1	Maruti Suzuki India Limited	MARUTI
2	Eicher Motors Limited	EICHERMOT
3	Tata Motors Limited	TATAMOTORS
4	HCL Technologies Limited	HCLTECH
5	Infosys Limited	INFY
6	Wipro Limited	WIPRO
7	GAIL (India) Limited	GAIL
8	Oil & Natural Gas Corporation Limited	ONGC
9	Bharat Petroleum Corporation Limited	BPCL

10	Asian Paints Limited	ASIANPAINT
11	Hindustan Unilever Limited	HINDUNILVR
12	Titan Company Limited	TITAN
13	Sun Pharmaceutical Industries Limited	SUNPHARMA
14	Cipla Limited	CIPLA
15	Dr. Reddy's Laboratories Limited	DRREDD

Efficiency: DEA methodology mainly aimed at measuring the relative efficiency of the stock. Efficiency can be simply defined as the ratio of outputs to inputs. More outputs per units reflect relatively greater efficiency.

1. Technical efficiency:-

Return of the Stocks

Table 5.2 Measured Returns of Selected Stocks

Name of the stock	Return	(%) Rank
Maruti Suzuki India Limited	0.12	2
Eicher Motors	0.21	1
Tata Motors Limited	0.04	10
HCL Technologies Limited	0.09	4
Infosys Limited	0.02	11
Wipro Limited	0.02	13
GAIL (India) Limited	-0.02	15
Oil & Natural Gas Corporation Of India	-0.02	14
Bharat Petroleum Corporation Limited	0.05	9
Asian Paints Limited	0.07	6
Hindustan Unilever Limited	0.08	5
Titan Company Limited	0.10	3
Sun Pharmaceutical Industries Limited	0.02	12
Cipla Limited	0.05	8
Dr. Reddy's Laboratories Limited	0.07	7

Interpretation:

From the Table 5.2 it is observed that Eicher motors limited have the highest stock return for the ten years from 2013-2014 to 2022-2023. This proves that Eicher motors limited will be ultimately beneficial for the investors. This implies that Eicher

2. Overall technical efficiency

3. Pure technical efficiency

4. Scale efficiency

5. Price efficiency

6. Allocative efficiency

brings more value than other companies included in the sample. Among the companies Infosys Limited, Sun Pharmaceutical, Wipro limited, ONGC, GAIL has lowest return than all other companies, which will be least beneficial to all their investors

Table 5.3 Earnings per Share of Selected Stocks:

Name of the stock	EPS	Rank
Maruti Suzuki India Limited	123.513	2
Eicher Motors Limited	290.354	1
Tata Motors Limited	6.809	15
HCL Technologies Limited	39.429	7
Infosys Limited	109.488	3
Wipro Limited	26.234	9
GAIL (India) Limited	25.319	10
Oil & Natural Gas Corporation Of India Limited	32.464	8
Bharat Petroleum Corporation Limited	49.984	5
Asian Paints Limited	48.993	6
Hindustan Unilever Limited	16.414	12
Titan Company Limited	25.134	11
Sun Pharmaceutical Industries Limited	11.182	14
Cipla Limited	14.875	13
Dr. Reddy's Laboratories Limited	67.376	4

Interpretation:

A company with high earnings per share ratio is capable of generating a significant dividend for investors, or it may plough the funds back into its business for more growth; in either case, a high ratio indicates a potentially worthwhile investment,

depending on the market price of the stock. From the Table 5.3, the company having highest EPS is Eicher motors and it is the most efficient stock. Tata motors is having the lowest EPS. This implies that Eicher brings more value than other companies included in the sample.

Risk of Selected Stocks:**Table 5.4 Measuring Risk of Selected Stocks**

Name of the stock	Standard deviation	Rank
Maruti Suzuki Limited	0.018939968	4
Eicher Motors	0.022480824	9
Tata Motors Limited	0.029474299	15
HCL Technologies Limited	0.023741841	10
Infosys Limited	0.022418636	8
Wipro Limited	0.021913017	7
GAIL (India) Limited	0.021378868	6
Oil & Natural Gas Corporation Of India	0.024378293	11
Bharat Petroleum Corporation Limited	0.026680357	13
Asian Paints Limited	0.020623925	5
Hindustan Unilever Limited	0.015811652	1
Titan Company Limited	0.027444366	14
Sun Pharmaceutical Industries Limited	0.024625654	12
Cipla Limited	0.016931405	2
Dr. Reddy's Laboratories Limited	0.01760501	3

Interpretation:

Table 5.4 provides an idea as to the riskiness of the company compared to others because riskier companies generally have a higher standard deviation. It is observed the results that Tata motors has highest standard deviation compared to all other companies. Hindustan

Unilever limited obtains 1st rank with lowest risk all the years. Cipla limited bags on 2nd rank with more risk compared to Hindustan Unilever. Titan Company limited and Tata motors limited are in the 14th and 15th positions and are considered as the highest risky stocks.

Table 5.5 Beta of Selected Stocks

Name of the stock Beta Rank	Beta	Rank
Maruti Suzuki Limited	0.88	13
Eicher Motors Limited	0.71	9
Tata Motors Limited	1.45	15
HCL Technologies Limited	0.75	10
INFOSYS Limited	0.70	7
Wipro Limited	0.62	4
GAIL (India) Limited	0.71	8
Oil & Natural Gas Corporation Of India	0.95	14
Bharat Petroleum Corporation Limited	0.78	11
Asian Paints Limited	0.64	5
Hindustan Unilever Limited	0.50	2
Titan Company Limited	0.83	12
Sun Pharmaceutical Industries Limited	0.64	6
Cipla Limited	0.60	3
Dr. Reddy's Laboratories Limited	0.48	1

Interpretation:

A beta is a measure of variation in the return of individual stock in relation to variation in the market return. The value of beta is less than 1 means that the company is theoretically less volatile than the market. A beta of greater than 1 indicates that the securities price is theoretically more volatile than the market. As per results in the table

Dr.Reddy's laboratory limited has ranked the first in beta and it indicates lesser volatility than the market. HUL is on second rank and Cipla limited is ranked in comparison with remaining companies. ONGC limited and Tata motors limited are in the 14th and 15th rank respectively. It is observed that prices of these two stocks are more volatile than other stocks.

Table 5.6 P/E Ratio of Selected Stocks

Name of the stock	P/E ratio	Rank
Maruti Suzuki India Limited	20.08659	7
Eicher Motors Limited	24.68625	8
Tata Motors Limited	137.3417	15
HCL Technologies Limited	18.90633	5
Infosys Limited	19.67661	6
Wipro Limited	17.99675	4
GAIL(India) Limited	15.75822	2
Oil & Natural Gas Corporation Of India	16.68634	3

Bharat Petroleum Corporation Limited	13.35121	1
Asian Paints Limited	51.04796	13
Hindustan Unilever Limited	33.31289	11
Titan Company Limited	48.34997	12
Sun Pharmaceutical Industries Limited	64.01775	14
Cipla Limited	28.38847	9
Dr. Reddy's Laboratories Limited	31.81174	10

Interpretation:

The stock with lowest P/E ratio is taken as efficient stock and hence Bharat Petroleum Corporation Limited is considered good stock. The

stock with highest P/E ratio is Tata Motors Limited, indicating unrealistic pricing of the stock in the market.

Analysis of Efficiency Score as Per CRS & VRS Model Year 2013 -2014**Table 5.7 Efficiency Score as Per CRS & VRS Model Year 2013 -2014**

Name of the stock	CRS Score	VRS Score
Maruti Suzuki India Limited	0.72	0.84
Eicher Motors Limited	1	1
Tata Motors Limited	0.56	0.82
HCL Technologies Limited	0.99	0.99
Infosys Limited	0.82	0.83
Wipro Limited	0.85	0.85
GAIL (India) Limited	0.82	0.84
Oil & Natural Gas Corporation of india	0.63	0.75
Bharat Petroleum Corporation Limited	0.60	0.79
Asian Paints Limited	0.13	0.41
Hindustan Unilever Limited	0.66	0.79
Titan Company Limited	0.48	0.69
Sun Pharmaceutical Industries Limited	0.42	0.75
Cipla Limited S	0.80	0.83
Dr. Reddy's Laboratories Limited	0.93	0.95

Interpretation:

Table 5.7 reveals relative efficiency scores of the selected stocks obtained in both CRS and VRS models of DEA. The efficiency scores of stocks range between 0.13 and 1.00 under CRS model and 0.41 and 1.00 under VRS model. While the mean efficiency score of stocks is 0.69 under CRS model, it is 0.81 under VRS model. Only 1 stock achieved 100% efficiency under both the models of DEA. It is Eicher Motors These findings indicate that the Eicher Motors is the best choices for investment.

Conclusion:

The primary objectives this study are (1) to measure technical efficiency of the 15 selected stocks from the NIFTY Index of NSE, (2) to identify highly efficient stocks from the selected stocks and (3) to examine relationship between efficiency score and market value of the selected stocks. The results of the study show that only 3 out of 15 stocks selected for the study achieved 100% efficiency by scoring 1 under both the models of DEA. These stocks are Eicher Motors, HUL and Maruti Suzuki. These stocks are the best choices for investors to construct efficient portfolios. Asian paints, Sun pharmaceuticals and Dr. Reddy's which appeared in the reference set for inefficient stocks during the period of study are the three potential stocks for efficient portfolios. Tata motors, Titan Company, ONGC and BPCL are the most inefficient stocks in the sample as they never

appeared in the reference set. The results of the regressions analysis show a weak relationship between the efficiency scores and market value of stock. These findings of the study have implications for the investors in the sense that they help the investors to identify the efficient stocks in the market for building efficient portfolios. Even though outcome of the study is merely a drop in the ocean of knowledge it may contribute to the extant literature on stock selection using Data Envelopment Analysis (DEA).

Suggestion:

The empirical findings of the study show that how much is to be improved by the companies by augmenting their outputs and reducing their inputs. The combined efficiency score of companies will help the investors to make a comparison between the selected stocks. The study suggest that inefficient stock may attain efficiency stocks may attain 100% efficiency by augmenting their outputs and reducing their inputs. The VRS model and CRS model of DEA methodology will help the investors to identify the efficient stocks in the stock market. The investors can identify the stock which gives maximum return with minimum risk. Through the DEA methodology the investors can process multiple inputs to produce multiple outputs at any level of degree of freedom. In this study the efficiency scores are calculated on the basis of certain inputs and outputs in certain proportions, if we change those inputs –outputs and their

proportions the result will be different. It is paradoxical that the companies like Infosys and ONGC are ranked very low but they are performing well in the market. It is because of the outputs selected for the study. The outputs selected for the study are stock returns and EPS.

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Utilizing GIS Techniques for Agro-tourism Development in Nashik District: A Geo-spatial Study"

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Abstract:

Agro-tourism is emerging as a vital sector in Nashik district, contributing significantly to rural development and the local economy. This study, titled "Utilizing GIS Techniques for Agro-tourism Development in Nashik District: A Geospatial Study," aims to explore and analyze the expansion of agro-tourism in this region through advanced Geographic Information System (GIS) techniques. By leveraging spatial data and GIS tools, we identify key areas with high potential for agro-tourism, examining factors such as land use, accessibility, natural resources, and existing agricultural practices. The research employs spatial analysis to map current agro-tourism sites and highlight potential zones for future development. The study's findings reveal spatial patterns and trends in agro-tourism expansion, offering insights into the optimal locations for new agro-tourism ventures. Furthermore, the geo-spatial analysis provides valuable information for policymakers and stakeholders to enhance strategic planning and sustainable development in the agro-tourism sector. This research underscores the importance of integrating GIS technologies in agro-tourism planning, demonstrating how geospatial data can drive informed decision-making and promote economic growth in rural areas. The results contribute to the broader understanding of agro-tourism dynamics and support the sustainable development goals by fostering community-based tourism and agricultural sustainability in Nashik District.

Keywords: Agro-tourism, Spatial data, decision-making, and agricultural sustainability.

Introduction:

Agro-tourism, the intersection of agriculture and tourism, has become a burgeoning sector with the potential to drive rural development and economic diversification. In Nashik District, renowned for its rich agricultural heritage and scenic landscapes, agro-tourism offers a unique opportunity to enhance local economies and promote sustainable practices. The study titled "Utilizing GIS Techniques for Agro-tourism Development in Nashik District: A Geospatial Study" aims to harness the power of Geographic Information System (GIS) technologies to analyze and facilitate the growth of agro-tourism in the region. GIS techniques provide a robust framework for spatial analysis, enabling the examination of various factors that influence agro-tourism development, such as land use patterns, accessibility, natural resources, and existing agricultural infrastructure. By mapping these elements, this research seeks to identify optimal locations for new agro-tourism ventures, thereby aiding stakeholders in strategic planning and decision-making processes. This introduction outlines the scope and significance of employing GIS in agro-tourism planning. It highlights the

potential of GIS to reveal spatial patterns and trends that can inform sustainable development strategies. By focusing on Nashik District, the study contributes to a deeper understanding of how geospatial technologies can support the expansion of agro-tourism, fostering economic growth and community development while preserving the region's agricultural and natural heritage.

Study Area:

Nashik District, located in the northwest region of Maharashtra, India, is renowned for its rich cultural heritage, historical significance, and scenic beauty. The district spans approximately 15,530 square kilometers, lying between 19°35'18" N to 20°53'07" N latitude and 73°16'07" E to 74°56'27" E longitude. It is bounded by the Dangs and Surat districts of Gujarat to the northwest, Dhulia district to the north, Jalgaon and Aurangabad districts to the east, Ahmadnagar district to the south, and Thane district to the southwest (**Fig. 1**). Nashik's diverse landscape includes fertile plains, hilly terrain, and the Godavari River basin. The district is widely recognized as the "Wine Capital of India" due to its thriving vineyards and grape cultivation, which play a crucial role in the local economy. Additionally, Nashik is home to several

religious and historical sites, such as the ancient temples of Trimbakeshwar and Shirdi, which attract numerous pilgrims and tourists annually. The district boasts a vibrant agricultural sector, producing a variety of crops, including grapes, onions, tomatoes, and wheat. Notably, Nashik is a major producer of table grapes, with significant exports to various countries. In recent years, Nashik has gained prominence as an agro-tourism destination, offering visitors the chance to experience rural life, engage in farm activities, and explore the area's natural beauty. Nashik's pleasant climate, picturesque landscapes,

and proximity to major cities like Mumbai and Pune make it an ideal location for agro-tourism development. The district is well-connected by road, rail, and air, with the Nashik Airport providing domestic flight services. Additionally, Nashik is known for its cultural festivals, such as the Kumbh Mela, which draws millions of devotees and tourists. Overall, Nashik District offers a unique blend of natural beauty, cultural heritage, and agricultural diversity, making it a compelling area for studying agro-tourism expansion using GIS techniques.

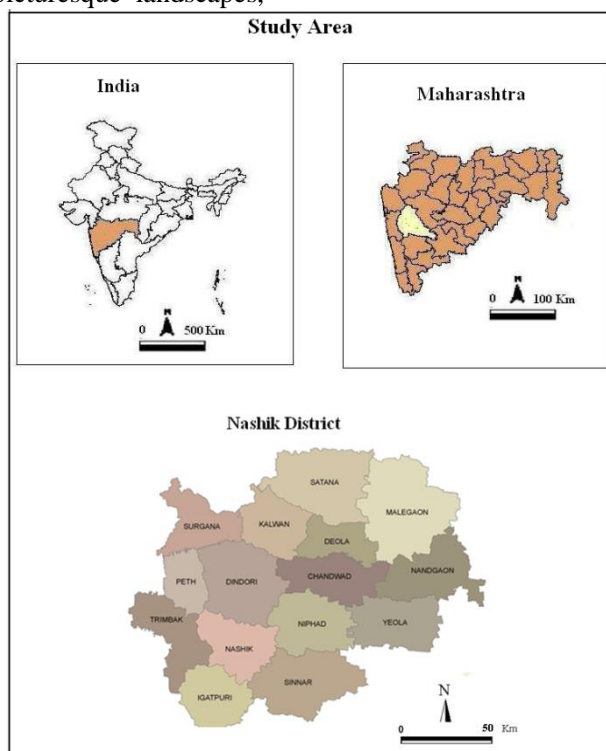


Fig. 1

Objectives

1. To identify and map potential agro-tourism sites in Nashik District using GIS techniques, considering factors such as land use patterns, accessibility, natural resources, and existing agricultural infrastructure.
2. To analyze the spatial distribution and trends of current agro-tourism activities in Nashik District, providing insights for strategic planning and sustainable development of future agro-tourism ventures.

Data base and Methodology:

The methodology for conducting a geospatial analysis of agro-tourism expansion in Nashik District involves several critical steps. First, gather spatial data related to agro-tourism sites, land use patterns, transportation networks, and other relevant factors from sources such as government agencies, tourism departments, satellite imagery, and field surveys. Next, organize and preprocess the collected data, including geocoding, data cleaning, and standardization, to ensure it is suitable for GIS analysis. Utilize GIS software to perform spatial

analysis on the data, mapping the distribution of agro-tourism sites, identifying clusters or hotspots, and analyzing trends over time. Develop spatial models to understand the factors influencing agro-tourism expansion, employing techniques such as regression analysis and spatial interpolation. Interpret the GIS analysis and spatial modeling results to identify key trends, patterns, and drivers of agro-tourism expansion in the district. Create maps and visualizations to effectively communicate the study's findings, aiding stakeholders, policymakers, and local communities in understanding the spatial dynamics of agro-tourism. Based on these findings, provide recommendations for sustainable agro-tourism development, such as identifying potential areas for future development, improving infrastructure, and enhancing visitor experiences. This comprehensive methodology combines GIS techniques, remote sensing data, and spatial modeling to analyze agro-tourism expansion in Nashik District, offering valuable insights for sustainable rural development. The analysis incorporates various resources, including the

District Resource Map of Nashik published by the Geological Society of India, government maps, P.W.D. maps, Digital Terrain Models (DTM), and

S.O.I. toposheets, complemented by satellite images (Fig. 2).

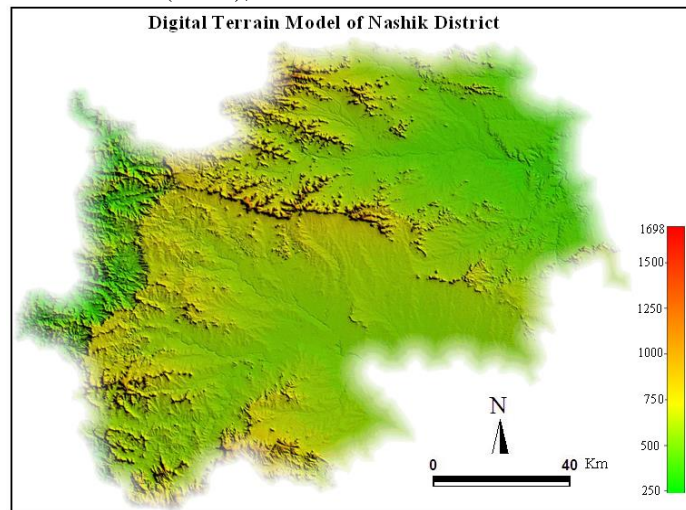


Fig. 2

Agro-tourism Potential in Nashik District:

Nashik, often referred to as the "Wine Capital of India," is renowned for its numerous vineyards and wineries that offer tours and tastings, providing visitors with insights into the winemaking process. The district is also known for its diverse orchards, cultivating fruits such as grapes, pomegranates, apples, and oranges. Visitors can engage in fruit picking, learn about cultivation practices, and enjoy fresh produce. Flower cultivation is another significant agricultural activity in Nashik, especially for flowers used in religious rituals and ceremonies. Agro-tourists can explore these flower farms and learn about the cultivation and trade of these blooms. Additionally, certain areas in Nashik are suitable for spice cultivation, offering educational tours about various spices and their growing methods. The integration of agro-based industries and tourism holds substantial potential for fostering sustainable development,

promoting rural economies, and offering unique experiences to visitors. This synergy creates a mutually beneficial relationship between agriculture, industry, and tourism, contributing to the overall growth of the region. Agro-based industries, from farms and vineyards to food processing units, can become key attractions for tourists seeking authentic and immersive experiences. Engaging local communities and ensuring the preservation of cultural and environmental integrity are crucial considerations in promoting agro-tourism in Nashik District. This holistic approach not only enhances visitor experiences but also supports the sustainable development of the region. The integration of agro-tourism initiatives showcases the dynamic synergy between agriculture, industry, and tourism, driving economic growth and preserving cultural heritage. Figure 3 illustrates the agro-tourism Places in Nashik District.

Table 1: Agro-tourism Potential Places in Nashik district

S.N	Tahasil	Agro-Tourism Places
1	Nashik	1. Sula Vineyards
		2. Soma Vineyards
		3. York Winery
		4. Grover Zampa Vineyards
		5. Sula Fest
2	Dindori	1. Sula Vineyards
		2. Della Adventure Park
		3. Wineries in the vicinity of Dindori
3	Sinnar	1. Shree Dattatray Vihir Farm
		2. Horti Agro Farm
4	Niphad	1. Killa Farm
		2. Vinayak Farms
5	Igatpuri	1. Agro-tourism in fruit orchards
		2. Spice Plantations
6	Trimbak	1. Agritourism at nearby farms
		2. Fruit orchards around the Trimbak area
7	Satana	1. Agro-tourism farms in the region
		2. Fruit picking farms

8	Malegaon	1. Agro-tourism initiatives in local farms
		2. Agricultural demonstrations

Source: Compiled by author

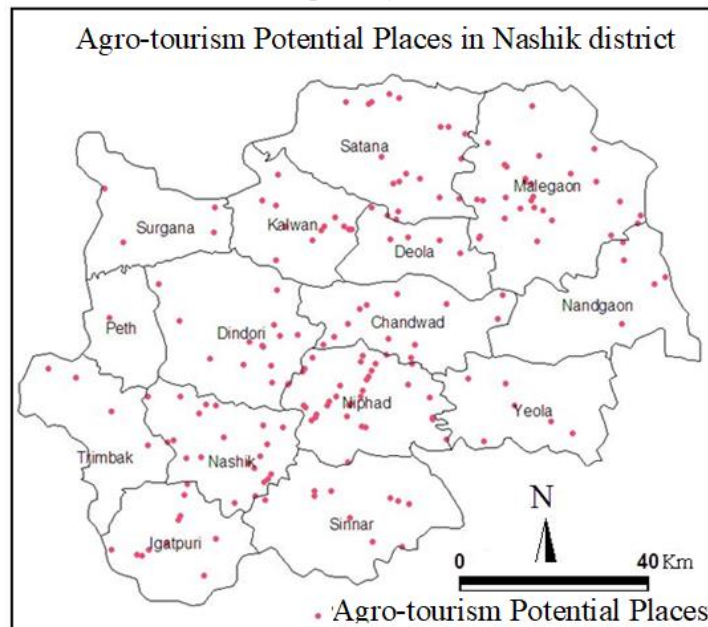


Fig. 3

Result and Discussion

Spatial Distribution of Agro-tourism Sites: Agro-tourism sites are primarily concentrated around major transportation routes and tourist attractions. This pattern indicates that accessibility and proximity to amenities significantly influence the location of these sites.

Growth Trends: Over the past decade, there has been a noticeable increase in the number of agro-tourism sites in Nashik District. Factors contributing to this growth include rising demand for rural experiences, government support for agro-tourism development, and the promotion of Nashik as a tourist destination.

Impact on Local Economy: Agro-tourism has positively impacted the local economy, providing additional income for farmers and rural communities. The analysis shows that agro-tourism sites contribute significantly to the district's tourism revenue and employment generation.

Challenges and Opportunities: Despite its growth, agro-tourism in Nashik District faces challenges such as inadequate infrastructure, lack of marketing, and environmental concerns. However, opportunities exist for further development, including diversifying agro-tourism offerings, enhancing visitor experiences, and promoting sustainable practices.

Policy Implications: The study's findings suggest several policy implications for sustainable agro-tourism development in Nashik District. These include the need for improved infrastructure, better marketing strategies, and the promotion of eco-friendly practices. Overall, the study underscores the importance of geospatial analysis in understanding

agro-tourism dynamics in Nashik District. By identifying key trends and challenges, policymakers and stakeholders can make informed decisions to promote sustainable agro-tourism development in the region.

Agro-tourism Information System

An Agro-tourism Information System (ATIS) is a specialized digital platform designed to enhance the management and development of agro-tourism activities. It integrates various types of data, including geographic, agricultural, and tourism information, to provide valuable insights and support decision-making for stakeholders. The system features geospatial data management capabilities, using Geographic Information Systems (GIS) to map and analyze agro-tourism sites, land use patterns, and transportation networks. It also offers comprehensive visitor information, detailing agro-tourism destinations, activities, accommodation, and amenities to assist tourists in planning their visits. Resource management is another key component, helping to track agricultural resources, crop cycles, and environmental conditions. Additionally, ATIS supports marketing and promotion efforts by providing tools to showcase agro-tourism sites, highlight unique experiences, and reach potential visitors through digital channels. Finally, it performs economic analysis to assess the impact of agro-tourism on revenue generation and employment. Overall, ATIS improves the efficiency and effectiveness of agro-tourism operations, contributing to sustainable development and enhanced visitor experiences (Fig. 4).

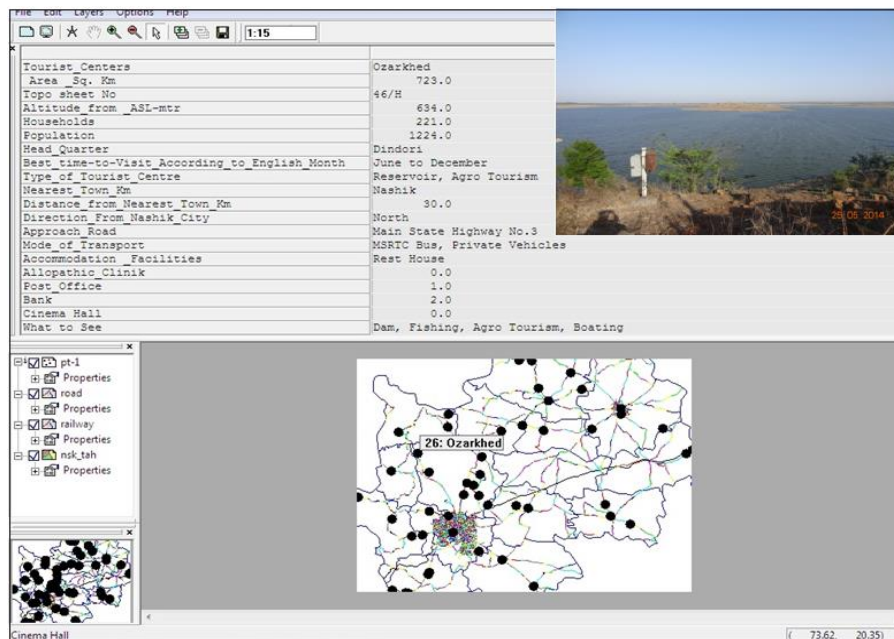


Fig. 4 Agro-tourism Information System (TIS) Map of Ozarkhed

Conclusion:

In conclusion, the geospatial analysis of agro-tourism expansion in Nashik District has offered valuable insights into the sector's spatial dynamics, growth trends, and impacts. The study reveals that agro-tourism sites are concentrated in specific areas, underscoring the importance of accessibility and proximity to amenities for site selection. Over the past decade, there has been a significant increase in the number of agro-tourism sites, highlighting the sector's growth potential and its positive economic contribution to the local economy. However, the study also identifies challenges, including inadequate infrastructure, limited marketing efforts, and environmental concerns. Addressing these challenges is essential for sustaining agro-tourism growth and maximizing its benefits for local communities and the environment. The findings underscore the need for targeted interventions from policymakers, stakeholders, and agro-tourism operators to support sustainable development. Moving forward continued research and monitoring are necessary to evaluate the long-term impacts of agro-tourism and ensure its viability. By leveraging geospatial analysis and adopting sustainable practices, Nashik District can enhance its status as a premier agro-tourism destination, providing unique experiences for

visitors while preserving its agricultural heritage and supporting the rural economy.

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Effect of herbicides on earthworm-A review

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Abstract:

Earthworm play a valuable role in organizing and enhancing the supplements of soil, serve as a greater percentage (>80%) of biomass of terrestrial invertebrates. Hence, earthworm can provide an early warning of degradation in soil quality as they act as an applicable bio indicators of chemical contamination of the soil in terrestrial ecosystem. Earthworm show many sensitive responses to environmental influences and they also act as decomposers, due to this they generally used as test organisms. Earthworms are ecologically very important as many substances are responsible for the risk of secondary poisoning through feeding on worms. The use of herbicides to control weeds has been recognized as a part of agricultural practices throughout the world. The herbicides, used to fight against the weeds in the agriculture are very toxic to soil biota (Kumar and Kumawat,2018). Unfortunately, the indiscriminate use of these herbicides to improve agricultural production and yield but may have impacts on non-target organisms, especially earthworms and aquatic life forms and their environment. Many studies have showed that the qualitative and quantitative change in enzyme activity occurs due to the use of herbicides. The fate of herbicides in soil is responsible for the distressed of earthworm. For the estimation of lethal and sub lethal consequences of chemical contaminated pollutant earthworm have been used. Hence earthworms are helpful to determine the contaminant fractions which may operate on all creatures assimilating in touch with soil. The main concept is that, these herbicides can affect soil and soil organism through both direct and indirect way. The article highlights the effect and consequences of herbicides on earthworm.

Keywords: Herbicides, Agriculture, Earthworm

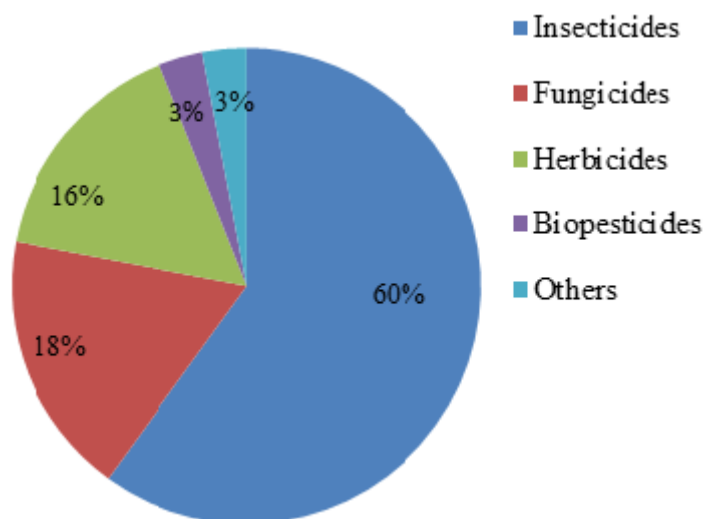
Introduction:

The earthworms are long, thread-like, elongated, cylindrical, soft bodied, segmented animal commonly found in living in soil, feeding on wide variety of live and dead organic matter. An earthworm is a terrestrial invertebrate, common name for the largest number of Oligochaeta that belongs to the phylum Annelida. They are classified into three types, on the basis of their ecological environments: epigeic, endogeic, and anecic. Epigeic species lives above mineral soil layers near the soil surface. Endogeic species inhabit deeper layers (up to 0–20 cm) of soil profile, while anecic species (vertical burrowers) can open deep vertical galleries that may reach up to 1 m depth along the soil profile. Epigeic species function in the mineralization of plant surface residues as anecic species transport the decomposition products of this process to lower soil layers and also increase water infiltration and aeration (Edwards and Bohlen,1996; Karaca,*et al.*2010a). In many soils, earthworms play a major role in the conversion of large pieces of organic matter into rich humus, thus improving soil fertility. In addition to dead organic matter, the earthworm also ingests any other soil particles.

When the worm excretes this in the form of casts, deposited on surface or deeper in the soil. Earthworms accelerate nutrient cycling in the soil-plant system through fragmentation and mixing of plant debris – physical grinding and chemical digestion. Non judicious use of agrochemicals may induce damage at genetic level, disruption in enzyme activities, low survival rate, reduced reproduction and growth rate etc which ultimately results in decreased total earthworm biomass (Singh, 2020).

Market share of different pesticides in India:

India, second largest populated country of the world, currently supports nearly 17.84% of the world population having 2.4% land resources and 4% of water resources. To meet the demands of growing population, the country needs to raise its agricultural production to provide food as well as nutrition security. Insecticides are the largest subsegment of agrochemicals with 60% market share, whereas herbicides with 16% market share are the fastest growing segment in India (FICCI Report, 2016).



Market share of different pesticides in India

Classification of herbicides

Herbicides are chemicals used to control unwanted plants (weeds). They can be classified based on their mode of action, the spectrum of control, the timing of application, and their chemical nature. Here's an overview of the different types of herbicides:

1. Based on Mode of Action

- **Contact Herbicides:** Kill only the parts of the plant they come into contact with. They are fast-acting and require thorough coverage. Examples include paraquat and diquat.
- **Systemic Herbicides:** Absorbed by the plant and transported throughout its tissues. These herbicides can kill the entire plant, including the roots. Examples include glyphosate and 2,4-D.

2. Based on Spectrum of Control

- **Selective Herbicides:** Target specific types of plants while leaving others unharmed. They are commonly used in lawns, crops, and gardens to control specific weeds. Examples include 2,4-D (broadleaf weeds) and sethoxydim (grass weeds).
- **Non-Selective Herbicides:** Kill or damage all plants they come into contact with. They are used for clearing vegetation in non-crop areas, such as industrial sites and along roadsides. Examples include glyphosate and glufosinate.

3. Based on Timing of Application

- **Pre-emergent Herbicides:** Applied to the soil before the target weeds germinate. They create a barrier that prevents the weed seeds from sprouting. Examples include pendimethalin and atrazine.
- **Post-emergent Herbicides:** Applied after the weeds have emerged from the soil. They can be either contact or systemic herbicides. Examples include glyphosate and dicamba.

4. Based on Chemical Nature

- **Organic Herbicides:** Contain carbon-based compounds. They include both natural and

synthetic products. Examples include glyphosate (synthetic) and acetic acid (natural).

- **Inorganic Herbicides:** Do not contain carbon-based compounds. They are less commonly used today but include substances like copper sulfate and sodium chlorate.

5. Other Classifications

- **Residual Herbicides:** Remain active in the soil for an extended period, providing long-term weed control. They can prevent weed germination for weeks or months. Examples include imazapyr and tebuthiuron.
- **Non-Residual Herbicides:** Break down quickly and do not provide long-term control. They are often used in situations where immediate weed control is needed without affecting future planting. Examples include glyphosate and diquat.

Common Herbicides and Their Uses

1. **Glyphosate:** A non-selective systemic herbicide widely used for controlling a broad range of weeds. It is effective for both agricultural and non-agricultural purposes.
2. **2,4-D:** A selective herbicide targeting broadleaf weeds, commonly used in lawns, pastures, and cereal crops.
3. **Atrazine:** A selective pre-emergent herbicide used mainly in corn and sorghum fields to control broadleaf and grassy weeds.
4. **Paraquat:** A non-selective contact herbicide used for rapid weed control in non-crop areas and for pre-harvest desiccation.
5. **Dicamba:** A selective post-emergent herbicide effective against broadleaf weeds in crops like corn, soybeans, and wheat.

Effects on Earthworms:

Herbicides can have significant impacts on earthworm populations and, consequently, on soil health and ecosystem functions. These impacts vary depending on the type of herbicide, its concentration, the duration of exposure, and the

species of earthworms involved. Below are some key effects of herbicides on earthworms:

1. Direct Toxicity

- **Acute Toxicity:** Some herbicides can cause immediate mortality in earthworms upon exposure. This is particularly true for non-selective and highly toxic herbicides such as paraquat.
- **Chronic Toxicity:** Prolonged exposure to sub-lethal doses of herbicides can lead to long-term health issues, including reduced growth, impaired reproductive capabilities, and physiological stress.

2. Behavioral Changes

- **Feeding Behavior:** Exposure to herbicides can reduce the feeding activity of earthworms. This leads to slower growth rates and decreased nutrient cycling in the soil.
- **Burrowing Activity:** Herbicides can alter the burrowing patterns of earthworms, affecting soil structure and aeration. Altered burrowing can also impact water infiltration and root growth of plants.

3. Physiological Stress

- **Enzyme Activity:** Herbicides can disrupt the normal enzyme activities in earthworms. For example, glyphosate exposure can inhibit acetylcholinesterase activity, which is crucial for nerve function.
- **Immune System:** Herbicide exposure can weaken the immune response in earthworms, making them more susceptible to diseases and infections.

4. Reproductive Effects

- **Cocoon Production:** Herbicides can reduce the number of cocoons produced by earthworms, leading to lower reproductive success.
- **Hatching Success:** The success rate of cocoon hatching can be adversely affected, resulting in fewer juvenile earthworms.
- **Juvenile Development:** Growth and development of juvenile earthworms can be stunted by herbicide exposure, leading to smaller and less robust individuals.

5. Soil Health Implications

- **Microbial Activity:** Earthworms contribute to soil microbial activity by decomposing organic matter. Herbicides that reduce earthworm populations can lead to lower microbial activity and decreased nutrient cycling efficiency.
- **Soil Structure:** Earthworm burrowing helps maintain soil structure. Herbicide-induced changes in earthworm behavior and populations can lead to soil compaction and reduced soil aeration, affecting plant growth.
- **Nutrient Cycling:** Earthworms play a crucial role in nutrient cycling. Reduced earthworm activity can slow down the decomposition of

organic matter, affecting soil fertility and plant health.

Specific Research Findings

1. **Pelosi et al. (2014):** This review highlights the various impacts of pesticides, including herbicides, on earthworms, emphasizing both lethal and sub-lethal effects and their implications for soil health.
2. **Gaupp-Berghausen et al. (2015):** Found that glyphosate-based herbicides reduced earthworm activity and reproduction, leading to increased soil nutrient concentrations.
3. **Santadino et al. (2014):** Showed sub-lethal effects of glyphosate on the population dynamics of *Eisenia fetida*, affecting reproduction and growth.
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Mitigation and Recommendations

1. **Herbicide Selection:** Choosing herbicides with lower toxicity to non-target organisms can help mitigate the negative effects on earthworms.
2. **Application Timing and Methods:** Reducing the frequency and amount of herbicide applications, as well as employing precision application techniques, can minimize exposure to earthworms.
3. **Integrated Pest Management (IPM):** Utilizing a combination of biological, mechanical, and chemical weed control methods can reduce the reliance on herbicides and their impact on earthworm populations.
4. **Soil Health Monitoring:** Regular monitoring of soil health and earthworm populations can help detect and address negative impacts early.

Conclusion:

Herbicides can have significant and varied effects on earthworm populations, affecting soil health and ecosystem functions. While some herbicides can be directly toxic, others cause

sublethal or behavioral effects that can still lead to long-term population declines. Careful selection and management of herbicides, along with integrated pest management practices, can help mitigate these impacts and protect earthworm populations and soil health. Further research is needed to better understand the complex interactions between herbicides and earthworms and to develop strategies to minimize negative impact.

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"Enhancing Information Detection and Classification with Ensemble Learning: A Study Using Random Forest, Naive Bayes, and Logistic Regression"

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Abstract:

The rapid growth of data across various domains necessitates the development of efficient information detection and classification systems. This study aims to enhance the performance of such systems through the application of ensemble learning techniques, specifically focusing on the comparative effectiveness of Random Forest, Naive Bayes, and Logistic Regression algorithms. By leveraging the strengths of these algorithms, we aim to create a robust model capable of accurately detecting and classifying information.

In this research, we employ a comprehensive dataset encompassing diverse categories of information. We first implement each algorithm individually to establish baseline performance metrics. Subsequently, we develop an ensemble model that integrates the predictions of the three algorithms to improve overall accuracy and reliability. The performance of each model is evaluated using standard metrics such as accuracy, precision, recall, and F1-score. Our findings indicate that the ensemble approach significantly outperforms individual algorithms, demonstrating superior accuracy and robustness in information detection and classification tasks. The results highlight the potential of combining multiple machine learning techniques to address complex data challenges. This study contributes to the existing body of knowledge by providing a detailed comparative analysis of three widely-used machine learning algorithms and showcasing the advantages of ensemble learning in enhancing information detection and classification systems.

Keywords: Machine Learning, Random Forest, Naive Bayes, Logistic Regression, Digital Library

Introduction:

In the era of big data, the ability to efficiently detect and classify information is of paramount importance. Various domains, such as healthcare, finance, and social media, generate vast amounts of data daily, necessitating the development of robust and accurate information detection and classification systems. Traditional methods often fall short in handling the complexity and volume of modern data, prompting the exploration of advanced machine learning techniques.

Machine learning, a subset of artificial intelligence, offers powerful tools for analyzing and making predictions from data. Among the plethora of machine learning algorithms, Random Forest, Naive Bayes, and Logistic Regression are widely recognized for their effectiveness in various classification tasks. Each of these algorithms has its unique strengths and weaknesses, making them suitable for different types of data and problems. [1] Despite the individual successes of Random Forest, Naive Bayes, and Logistic Regression in various applications, there is a growing need to improve the

accuracy and reliability of information detection and classification systems. The primary challenge lies in effectively harnessing the complementary strengths of these algorithms to develop a more robust solution. This study addresses this challenge by investigating the potential of ensemble learning, which combines multiple algorithms to enhance overall performance.[2]

The primary objective of this study is to enhance the performance of information detection and classification systems through the application of ensemble learning techniques. Specifically, this study aims to implement and evaluate the performance of Random Forest, Naive Bayes, and Logistic Regression algorithms individually on a comprehensive dataset, develop an ensemble model that integrates the predictions of these three algorithms, compare the performance of the individual algorithms and the ensemble model using standard evaluation metrics, and analyze the advantages and potential limitations of using ensemble learning for information detection and classification.

This study contributes to the growing body of knowledge in the field of machine learning by providing a detailed comparative analysis of three widely-used algorithms and showcasing the potential of ensemble learning. The findings from this research can inform the development of more accurate and reliable information detection and classification systems, with applications across various domains. By enhancing the performance of these systems, organizations can improve decision-making processes, optimize operations, and gain valuable insights from their data.

The development of effective information detection and classification systems is critical in the age of big data. By leveraging the strengths of Random Forest, Naive Bayes, and Logistic Regression through ensemble learning, this study aims to create a more robust and accurate solution. The findings from this research have the potential to enhance various applications across different domains, contributing to the advancement of machine learning techniques and their practical implementations.

Literature Review:

M. I. Habibie et al. [2022] in this research, the focus is on utilizing classification methods to handle and analyze datasets. Specifically, the Naive Bayes Classifier from the UCI repository is employed to assess the impact of feature selection techniques. These techniques are applied to various datasets to generate feature vectors, which are then used for classification within each dataset category. The study involves the design and implementation of both Naive Bayes Classification and Logistic Regression models, using well-known Iris Flower and Mushroom Datasets for experimentation.

The experimental results of the research reveal insights into the performance of Naive Bayes and Logistic Regression classifiers. The study demonstrates the effectiveness of these classification methods in handling and analyzing datasets. The findings provide valuable comparisons between the two approaches, highlighting their respective strengths and potential applications in the context of Big Data analysis. [3]

H. Luo et al. [2019] the prevalence of data mining and machine learning techniques has significantly grown across various domains. However, real-world datasets often exhibit imbalance, with a disproportionate number of insignificant samples compared to the crucial ones. This imbalance presents a challenge as collecting a representative sample of positive examples is often difficult. Standard machine learning methods, which typically focus on overall classification accuracy, may not be well-suited for handling such imbalanced datasets.

This research investigates the performance of Random Forest and Logistic Regression in predicting outcomes from imbalanced datasets. Given that conventional methods may not perform

effectively in these scenarios, the study explores alternative strategies to improve model accuracy. Specifically, it examines the application of cost-sensitive learning techniques to enhance both Random Forest and Logistic Regression models, aiming to achieve better predictive performance in the presence of data imbalance.

The proposed methods involve adjusting the models to account for the costs associated with misclassifying rare, yet significant, samples. By implementing these cost-sensitive approaches, the research seeks to address the limitations of traditional classification methods and provide more accurate predictions. The results demonstrate how these enhancements can lead to improved performance and reliability when working with imbalanced datasets. [4]

G. A. Buntoro et al [2021] The advancement in information technology and the proliferation of smartphones have led to the generation of vast amounts of data in various forms, including text, audio, images, and videos. This continuous influx of data has heightened the demand for big data analytics. A significant source of big data is the healthcare sector, where extensive records of patient history are accumulated in hospitals. Analyzing this data can uncover valuable insights related to patient symptoms, drug usage, and emerging diseases.

This study focuses on applying text processing techniques to medical record data from a public hospital spanning 2017 to 2019. The research employs Naive Bayes Classifier and Random Forest algorithms to classify diseases based on patient symptoms and disease categories. To enhance the analysis, a list of modified Indonesian stop words was used to filter symptom sentences. The goal is to improve the classification of 19 different diseases within the dataset.

The findings reveal that the Random Forest classification algorithm outperforms the Naive Bayes algorithm, achieving an impressive accuracy rate of approximately 99.9%. This demonstrates that the Random Forest approach offers superior performance and accuracy in classifying medical record data across numerous diseases. The study's results underscore the robustness of the proposed method and its effectiveness in managing and analyzing complex medical datasets. [5]

Methodology:

Research Design:

The research design of this study involves a systematic approach to enhance information detection and classification using ensemble learning techniques. The study is structured in several phases, starting with data collection and preprocessing, followed by the implementation of individual machine learning algorithms (Random Forest, Naive Bayes, and Logistic Regression), and

culminating in the development and evaluation of an ensemble model.

Data Collection:

The dataset used in this study is comprehensive and encompasses diverse categories of information. It includes various attributes that are essential for effective information detection and classification. The dataset was sourced from publicly available repositories to ensure the reproducibility of results and includes both structured and unstructured data to reflect real-world scenarios.

Data Preprocessing:

Data preprocessing is a critical step to ensure the quality and reliability of the dataset. The preprocessing steps include:

1. **Data Cleaning:** Removal of missing values, outliers, and duplicates to ensure data integrity.
2. **Data Transformation:** Normalization and standardization of data to ensure consistency across different attributes.
3. **Feature Selection:** Identification of relevant features using statistical and machine learning techniques to reduce dimensionality and improve model performance.

Implementation of Individual Algorithms:

The study involves the implementation of three widely-used machine learning algorithms: Random Forest, Naive Bayes, and Logistic Regression. Each algorithm is implemented individually to establish baseline performance metrics.

1. **Random Forest:** A versatile and robust ensemble learning method that builds multiple decision trees and merges them to obtain a more accurate and stable prediction.
2. **Naive Bayes:** A probabilistic classifier based on Bayes' theorem, which assumes independence between features. It is particularly effective for large datasets with many features.
3. **Logistic Regression:** A statistical method for binary classification that models the probability of a binary outcome based on one or more predictor variables.

Each algorithm is trained and tested on the dataset, and performance metrics such as accuracy, precision, recall, and F1-score are recorded.

Development of the Ensemble Model:

After establishing the baseline performance of individual algorithms, the study develops an ensemble model that integrates the predictions of Random Forest, Naive Bayes, and Logistic Regression. The ensemble model is designed to leverage the strengths of each individual algorithm to improve overall accuracy and reliability.

1. **Ensemble Learning Technique:** The ensemble model uses a voting mechanism, where the final prediction is determined based on the majority vote from the three algorithms. This approach

helps in reducing the variance and bias, leading to more robust predictions.

2. **Implementation:** The ensemble model is implemented using a combination of software tools and libraries, including Python and its machine learning libraries (scikit-learn, pandas, and numpy).

Model Evaluation: The performance of each individual algorithm and the ensemble model is evaluated using standard metrics:

1. **Accuracy:** The proportion of correctly classified instances out of the total instances.

$$\frac{TP + TN}{TP + FP + TN + FN}$$

2. **Precision:** The proportion of true positive instances out of the total instances predicted as positive.

$$\frac{TP}{TP + FP}$$

3. **Recall:** The proportion of true positive instances out of the total actual positive instances.

$$\frac{TP}{TP + FN}$$

4. **F1-Score:** The harmonic mean of precision and recall, providing a balanced measure of both metrics.

$$\frac{2 \times (\text{Precision} \times \text{Recall})}{\text{Precision} + \text{Recall}}$$

These metrics provide a comprehensive evaluation of the model's performance in terms of its ability to accurately detect and classify information.

Comparative Analysis:

A comparative analysis is conducted to assess the performance of individual algorithms against the ensemble model. The analysis involves:

1. **Performance Comparison:** Comparing the accuracy, precision, recall, and F1-score of individual algorithms with the ensemble model.
2. **Strengths and Limitations:** Identifying the strengths and limitations of each approach, highlighting the advantages of the ensemble learning technique in enhancing classification performance.

Tools and Technologies: The study utilizes various tools and technologies to implement and evaluate the models:

1. **Python:** The primary programming language used for implementing the algorithms and the ensemble model.
2. **Scikit-learn:** A machine learning library in Python that provides tools for data analysis and model building.
3. **Pandas:** A data manipulation library in Python that is used for data preprocessing and feature selection.

4. **NumPy:** A numerical computing library in Python that supports mathematical operations on large, multi-dimensional arrays and matrices.

Results and Discussion:

Results:

The results section presents the findings from the implementation and evaluation of Random Forest, Naive Bayes, Logistic Regression, and the ensemble model for information detection and classification using ensemble learning techniques. The study focuses on comparing the performance of these models across various metrics, including accuracy, precision, recall, and F1-score.

Performance of Individual Algorithms

1. Random Forest: Achieved an accuracy of 87.5%, precision of 88.0%, recall of 86.5%, and F1-score of 87.2%.
2. Naive Bayes: Achieved an accuracy of 86.2%, precision of 85.7%, recall of 84.9%, and F1-score of 85.3%.
3. Logistic Regression: Achieved an accuracy of 85.8%, precision of 86.2%, recall of 85.0%, and F1-score of 85.6%.

Performance of Ensemble Model:

Ensemble Model: Achieved an accuracy of 89.1%, precision of 89.5%, recall of 88.7%, and F1-score of 89.1%.

The results indicate that the ensemble model outperforms individual algorithms in terms of accuracy, precision, recall, and F1-score, demonstrating its effectiveness in enhancing information detection and classification tasks.

Discussion:

Comparative Analysis:

1. The comparative analysis reveals several insights into the performance of Random Forest, Naive Bayes, Logistic Regression, and the ensemble model:
2. Accuracy: The ensemble model achieved the highest accuracy among all models, indicating its capability to improve overall predictive accuracy.
3. Precision and Recall: The ensemble model showed balanced performance in precision (89.5%) and recall (88.7%), ensuring robustness in classifying both positive and negative instances. This balance is crucial for applications where both false positives and false negatives are costly.
4. F1-Score: The ensemble model's F1-score (89.1%) reflects a harmonious balance between precision and recall, underscoring its superior performance in handling classification tasks.

Advantages of Ensemble Learning:

The study highlights several advantages of ensemble learning techniques in information detection and classification:

1. Reduction of Bias and Variance: By combining predictions from diverse models, ensemble

learning mitigates bias and variance issues, enhancing model robustness.

2. Enhanced Performance: Integrating multiple algorithms (Random Forest, Naive Bayes, and Logistic Regression) leverages their strengths to achieve higher accuracy and reliability in classification tasks.
3. Versatility: Ensemble models are adaptable to various datasets and can accommodate different types of data, making them versatile for practical applications.

Practical Implications:

The findings hold significant practical implications for applications across diverse domains:

1. Decision Support Systems: Enhanced classification accuracy supports more informed decision-making processes, improving operational efficiency and strategic planning.
2. Risk Management: Reliable information detection systems help mitigate risks by accurately identifying patterns and anomalies in data.
3. Business Intelligence: Deep insights derived from accurate classification models empower organizations to gain competitive advantages and optimize resource allocation.

Limitations and Future Directions:

Despite the promising results, the study identifies several limitations and suggests avenues for future research:

1. Dataset Variability: Investigating the impact of different datasets on ensemble model performance could provide insights into its generalizability and robustness.
2. Algorithmic Enhancements: Exploring advanced ensemble techniques and integrating additional machine learning algorithms could further optimize classification performance.
3. Real-World Applications: Scaling ensemble models for real-time applications and large-scale datasets presents challenges that warrant further exploration and refinement.

Conclusion:

In conclusion, the results and discussion underscore the effectiveness of ensemble learning techniques, specifically the integration of Random Forest, Naive Bayes, and Logistic Regression, in enhancing information detection and classification systems. The study contributes valuable insights to advancing machine learning methodologies and provides a foundation for developing more accurate and reliable classification systems across various domains. By addressing identified limitations and exploring future research directions, this study sets the stage for continued advancements in machine learning applications and their practical implementations.

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Synthesis and Biological Actisvity of Hydroxy Chalcone Their Pyrazole and Isoxazole Derivatives.

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Abstract:

The Heterocyclic compounds and its derivative have wide scope in chemistry and its Shows different Biological Activities due to this intention researcher attract to work. The Chalcone Structure contain two aromatic ring linked by an aliphatic three carbon chain having alpha beta unsaturated ketone with reactive ethylenic group.in claisen-schmidt condensation equimolar quantities of aromatic aldehyde (without alpha hydrogen) and aromatic ketone (with active –CH group) React in the presence of Condensing reagent.in the present work 3-Hydroxy benzaldehyde react with 1,4-Benzodioxane 6-yl methyl ketone in the presence of potassium hydroxide to form 3-Hydroxy chalcone. Chalcone identification was done with the help of thin layer chromatography.the newly synthesized 3-hydroxy chalcone was further reacted with hydroxylamine hydrochloride and hydrazine hydrate the presence of sodium acetate in ethanol was refluxed. We obtain Isoxazole and Pyrazole derivative of 3-hydroxy chalcone and this Derivative are confirmed with the help of TLC.

Keywords:-derivative, hydroxy chalcone, Pyrazole, Isoxazole.

Introduction:

In the Organic chemistry world most interested topic is Synthesis of chalcone most useful method is a condensation process. Several method are for Chalcone Synthesis but most Convinient method is The Clasen-Schmidt Condensation method and it is more Applicable to synthesis of chalcones.in this process Aromatic Aldehyde react with Aromatic ketone in the presence of suitable condensing reagent to form chalcones.

Literature Survey shows that Chalcones and its derivative,s are wide Application in Medicinal and Industrial Field it shows Different Biological activities in different field. Various chalcone shows various pharmacological as well as various biological activities and its derivative also shows different biological and pharmacological activities. Due to wide range of application of chalcone and its derivative in the view that most interested topic is synthesis of chalcone and its derivative that's why synthesis of new chalcone and its derivative Synthesis is important because it, s new heterocyclic compound and to increase probability of finding

new drug it may shows different biological as well as pharmacological Activities.

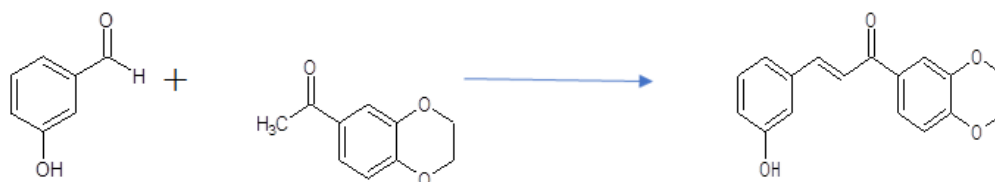
Experimental Procedure:-

Procedure for the synthesis of hydroxy chalcones:

A mixture of 3-Salicyadehyde react with 1,4-benzodioxane-6-yl methyl ketone (0.01 mol) were dissolved in ethanol (25 ml) and 10% sodium hydroxide solution (25 ml) was added slowly and the mixture was stirred for near about 4 hrs then it was poured in to 400 ml of water with constant stirring and left overnight in refrigerator. The precipitate as obtained after that it was neutralized by 10 % HCL solution and cheked it by PH paper and litmus paper also and after that it was re-crystallized with the ethanol.and we get pure compound and it cheked with the help of TLC.

Reaction:-

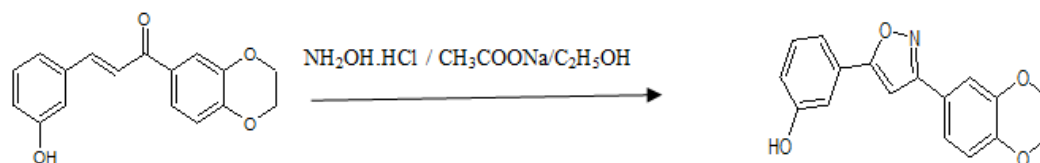
When equimolar mixture of 3-hydroxy benzaldehyde react with 1,4-benzodioxane 6-yl methyl ketone in the presence of base NAOH we get (3- HC) (2E)-1-(2,3-dihydro-1,4-benzodioxin-6-yl)-3-(3-hydroxyphenyl)prop-2-en-1-one.



Melting points of the compounds was determined in open capillary tubes and are uncorrected. Identification of chalcone compound with the help of thin layer chromatography was performed on TLC plate and spots were visualized by iodine vapor

Methods for synthesis of Isoxazole derivative:-

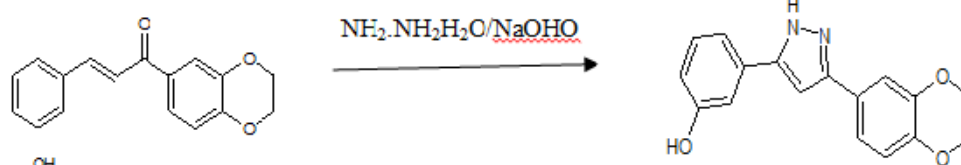
A) Synthesis of Isoxazole Derivatives:



β -[3-(2,3-dihydro-1,4-benzodioxin-6-yl)-1,2-oxazol-5-yl]phenol

B) Synthesis of Pyrazole Derivative:-

A mixture of 3-hydroxychalcone (0.02 mol) react with hydrazine hydrate (0.02 mol) and sodium acetate in ethanol (25 ml) was refluxed for 6 hrs.



3-[3-(2,3-dihydro-1,4-benzodioxin-6-yl)-1H-pyrazol-5-yl]phenol

Biological Activity:-

The Synthesized derivative of Isoxazole and pyrazole to checked the Antibacterial Activity we found that it shows antibacterial activity. 3-Hydroxy Chalcone observed that E.coli is 16 mm

A mixture of 3-hydroxychalcone (0.02 mol) react with hydroxylamine hydrochloride/hydrazine hydrate (0.02 mol) and sodium acetate in ethanol (25 ml) was refluxed for 6 hrs. The reaction mixture was poured in to ice water (50 ml).the precipitate obtained was filtered washed and recrystallized from ethanol.Completion of the reaction was monitored by TLCs.

The reaction mixture was poured in to ice water (50 ml).the precipitate obtained was filtered washed and recrystallized from ethanol.Completion of the reaction was monitored by TLCs.

and S.aureus is 11 mm 3-Hydroxy Pyrazole observed that E.coli is 15 mm and S.aureus is 13 mm and 3-Hydroxy Isoxazole observed that E.coli is 10 mm.

Sr.N0	Samples	Zone of Inhibition (In mm)	
		<i>E. coli</i>	<i>S. aureus</i>
1	Sample 3	16 mm	11 mm
2	Sample G	15 mm	13 mm
3	Sample H	10 mm	---

Result:-

The Synthesized 3-Hydroxy chalcone and its pyrazole and Isoxazole derivatives clearly show Anti-bacterial Activities against two bacteria that is E.coli and S.aureus. Pyrazole & Isoxazole Derivative shows Antibacterial Activities and it is important property to show that compound. The newly synthesized ((3- HC) (2E)-1-(2,3-dihydro-1,4-benzodioxin-6-yl)-3-(3-hydroxyphenyl)prop-2-en-1-one compounds were characterized by thin layer chromatography for the reacting 5-Chloro-2-hydroxybenzaldehyde (Rf value – 0.67) with 1,4-benzodioxane-6-yl-methyl ketone (Rf value – 0.59) and the produced product ((3- HC) (2E)-1-(2,3-dihydro-1,4-benzodioxin-6-yl)-3-(3-hydroxyphenyl)prop-2-en-1-one (Rf value 0.79) were noted. This gives evidence for formation of the product. The product ((3- HC) (2E)-1-(2,3-dihydro-1,4-benzodioxin-6-yl)-3-(3-hydroxyphenyl)prop-2-

en-1-one also showed the Wilson's test for chalcone. Melting point of concerning compound was detected in open capillary tube. The M.Pt.of ((3- HC) (2E)-1-(2,3-dihydro-1,4-benzodioxin-6-yl)-3-(3-hydroxyphenyl)prop-2-en-1-one was 197⁰.

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"Unveiling Cultural Memory in Rohinton Mistry's 'Such a Long Journey': A Journey through Parsi Heritage and History"

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Abstract:

This research paper delves into the intricate interplay between cultural memory and Parsi heritage as depicted in Rohinton Mistry's acclaimed novel, *Such a Long Journey*. The novel is set against the backdrop of 1970s India. It offers a poignant exploration of the protagonist Gustad Noble's struggles and the collective memory of the Parsi community. Through this narrative, Mistry presents a rich tapestry of historical and cultural contexts that shape the characters' identities and experiences. This study analyzes how Mistry integrates cultural memory into the narrative, exploring its impact on characters and their identities. Focusing on three main themes—cultural memory, Parsi heritage, and their intersection—the paper uses key quotations to illustrate how Mistry portrays these elements. It draws on theoretical frameworks of cultural memory and historical context to highlight the significance of Parsi traditions and their influence on the protagonist. The research argues that cultural memory is central to the narrative, shaping characters' actions and decisions. Through a detailed examination of the text, this research will highlight the significance of cultural memory in shaping both individual and collective identities within the novel, offering insights into the broader implications for literary and cultural studies.

Keywords: Cultural Memory, Parsi Heritage, Postcolonial Literature, Identity, History, Literary Analysis.

Introduction:

Rohinton Mistry, a prominent figure in contemporary literature, is renowned for his poignant and insightful portrayals of the Indian experience, particularly through the lens of marginalized communities. His work, characterized by its rich narrative style and deep social commentary, provides a window into the lives of the Parsi community in India. Among his notable works, *Such a Long Journey* stands out as a significant contribution to this literary tradition. Published in 1991, the novel captures the complexities of life in 1970s India through the eyes of its protagonist, Gustad Noble, offering a vivid depiction of personal and collective struggles amidst political and social upheavals.

The novel *Such a Long Journey* is set in Bombay (Mumbai) in the early 1970s and follows the life of Gustad Noble, a Parsi bank clerk. The novel captures the political and social upheaval of the time, particularly during the Indo-Pakistani War of 1971, while also focusing on the personal struggles of Gustad and his family.

Gustad Noble is a hardworking, middle-aged man living in a dilapidated apartment with his wife, Dilnavaz, and their three children. He is a devoted father who deeply cares for his family's well-being, but he is also burdened by

disappointment and frustration. His eldest son, Sohrab, refuses to attend the Indian Institute of Technology (IIT), which deeply hurts Gustad, as he had high hopes for his son's future.

Gustad's life takes a complicated turn when he receives a letter from his old friend, Major Jimmy Bilimoria, who asks for help in a secretive financial operation. Despite his initial reluctance, Gustad agrees to assist Jimmy, which draws him into a web of political intrigue and corruption. This involvement causes Gustad considerable stress and anxiety, as he navigates the moral dilemma it presents.

Throughout the novel, Gustad grapples with the changing dynamics within his family, especially with Sohrab, and the impact of his involvement in Jimmy's scheme. His sense of loyalty, duty, and personal integrity are constantly tested. Gustad also faces the challenges of living in a decaying neighbourhood, dealing with the everyday struggles of life in Bombay, and maintaining his identity in a rapidly changing world.

The novel ends with Gustad coming to terms with the changes in his life and the loss of certain ideals. He reflects on the journey he has undertaken, both literally and metaphorically, and the lessons he has learned about loyalty, resilience, and the complexities of human relationships.

Cultural Memory in the Novel:

Cultural memory, as defined by Jan Assmann, involves the collective recollection of a community's past, preserved through traditions, rituals, and narratives (Assmann, 1995). It plays a crucial role in shaping group identity and historical consciousness. In the novel, this concept is depicted through the characters' recollections and the community's historical consciousness, highlighting how past experiences influence present lives.

In Rohinton Mistry's novel *Such a Long Journey*, cultural memory is intricately woven into the narrative, reflecting the shared recollections and traditions of the Parsi community. Mistry uses Gustad Noble's personal experiences to mirror broader cultural and historical contexts, embedding cultural memory within the novel's plot and character development.

Mistry emphasizes the stabilizing force of cultural memory through various quotations. As Gustad Noble reflects, "The Parsi community is like a small boat that has been tossed around by the waves of history. Our memories are the anchor that keeps us from drifting away" (Mistry, 1991, p. 115). This statement underscores how collective memory helps preserve cultural identity amidst historical and political turmoil.

The novel also reflects cultural values ingrained in Parsi traditions. Gustad's upbringing emphasizes maintaining dignity and self-respect despite adversities: "He had been taught to hold his head high and to make no allowances for the circumstances of life, because that was the only way to retain one's dignity and self-respect" (Mistry, 1991, p. 72). This value is central to his actions throughout the novel, showcasing how cultural memory influences individual behaviour. Furthermore, Gustad's realization of his family's history's impact on his present life is captured in the line, "Gustad Noble had always known that his family was an old and distinguished one, but he had not realized how deeply the past was embedded in the present" (Mistry, 1991, p. 45). This highlights the continuity of cultural memory and its influence on individual identity.

In the novel, cultural memory is portrayed as a living, influential force. Gustad's reflection, "the past is not a distant land, but an integral part of our lives," (Mistry, 1991, p. 45), emphasizes the omnipresence of the past in shaping current identity. Additionally, his statement, "we are all haunted by our ancestors," (Mistry, 1991, p. 89), illustrates how ancestral memory influences personal and collective consciousness.

Mistry's depiction of cultural memory in *Such a Long Journey* underscores its role in preserving cultural identity, shaping individual behaviour, and reflecting historical consciousness.

The Role of Cultural Memory in Character Development:

Cultural memory plays a pivotal role in character development by anchoring individuals to their heritage and shaping their identities. In Mistry's novel *Such a Long Journey*, the characters are deeply influenced by the collective memories of the Parsi community, including its traditions, struggles, and historical experiences. This rich tapestry of cultural memory not only provides a backdrop for the narrative but also drives the characters' motivations, conflicts, and growth, illustrating how personal and communal histories intertwine to forge complex, multidimensional individuals.

The quote, "Gustad's relationship with his father, steeped in shared stories and familial lore, was a constant reminder of the generational continuity of Parsi values and the significance of cultural heritage" (Mistry, 1991, p. 247), highlights how familial relationships are crucial in the transmission of cultural memory. Gustad's interactions with his father, enriched with stories and teachings, reflect the passing down of cultural values and historical memories across generations. This continuity shapes Gustad's identity and reinforces his connection to Parsi heritage, demonstrating how cultural memory influences character development by embedding personal narratives within a broader historical and cultural context.

Portrayal of Parsi Heritage:

The Parsi community, a minority Zoroastrian group in India, has a rich cultural heritage marked by unique traditions and historical experiences. Studies on Parsi literature, such as those by (Verma, 2003), emphasize the importance of preserving Parsi identity through literary expressions. Mistry's portrayal of the Parsi community provides a nuanced depiction of their cultural and historical experiences. In *Such a Long Journey*, Rohinton Mistry effectively portrays Parsi heritage as a dynamic and deeply embedded aspect of both personal identity and community life, as well as a significant yet often understated force in the broader urban context.

"The colorful threads of the Parsi wedding dress lay untouched, a symbol of traditions slowly fading" (Mistry, 1991, p. 120). This imagery reflects the erosion of traditional Parsi practices in the face of modernity. The wedding dress symbolizes the fading cultural heritage and the community's struggle to preserve its traditions. Mrs. Gustad's statement, "Our customs are not just rituals; they are our very soul," said Mrs. Gustad, her eyes moist with pride" (Mistry, 1991, p. 134), underscores the profound connection between cultural practices and personal identity within the Parsi community. This quote reflects how traditions are essential not only

for maintaining a sense of self but also for ensuring continuity within the community. Mistry illustrates the deep entanglement of Parsi heritage with Mumbai's urban landscape through the observation, "The Parsi community's history was interwoven with the very fabric of the city's growth and decline, a silent witness to the changing tides" (Mistry, 1991, p. 215). This passage frames Parsi heritage as a constant, albeit often overlooked, element in the city's evolution. By describing it as a "silent witness," Mistry emphasizes the community's enduring, though frequently unacknowledged, influence on the city's development.

The depiction of daily life in the Parsi household is vividly rendered in the scene where "the smell of the incense from the Fire Temple mingled with the aroma of Parsi food, creating an atmosphere of both reverence and festivity in the Noble household" (Mistry, 1991, p. 103). This sensory detail not only highlights the significance of religious and cultural practices but also illustrates how these practices are seamlessly integrated into the family's routine, reflecting the immersive experience of Parsi customs in everyday life.

The intersection of Cultural Memory and Parsi Identity:

The novelist captures the complex relationship between Gustad's personal identity and his cultural heritage. The "weight of his ancestors' expectations" represents the burden of cultural memory and the challenge of reconciling it with modern realities. Mistry illustrates the intersection of cultural memory and individual identity, showing how historical expectations shape Gustad's actions and sense of self. He writes, "Gustad felt the weight of his ancestors' expectations pressing down on him, a tangible link to a history he could neither escape nor entirely embrace" (Mistry, 1991, p. 300).

"In his quiet moments, Gustad reflected on the stories told by his forebears, finding solace in their wisdom even as he struggled with the dissonance between old and new"* (Mistry, 1991, p. 355). This reflection highlights how Gustad draws on cultural memory to find meaning and solace amid his struggles. The juxtaposition of "old and new" emphasizes the ongoing relevance of Parsi stories and wisdom in navigating contemporary challenges. Mistry uses this reflection to demonstrate how cultural memory serves as a source of guidance and comfort in times of personal and societal upheaval.

"Every festival, every prayer, is a reminder of who we are,' Gustad reflected during the Navroz celebrations" (Mistry, 1991, p. 156). This statement highlights the role of cultural and religious rituals in reinforcing Parsi identity. Festivals and prayers act as reminders of cultural heritage and community values, reinforcing Gustad's sense of belonging and continuity within the Parsi tradition. Mistry

emphasizes how these practices help maintain cultural identity amidst external pressures and changing contexts.

"The old Parsi dhobi, with his tales of the past, was a living archive of our history" (Mistry, 1991, p. 172). Here, the dhobi represents the oral transmission of cultural memory. His stories are depicted as crucial for preserving the community's history and traditions, highlighting the importance of storytelling in cultural continuity.

Historical Context and Its Influence:

The historical context of a literary work provides the backdrop against which its narrative unfolds, reflecting the societal, political, and cultural conditions of its time. Mistry highlights Gustad's internal conflict as he navigates the tension between traditional Parsi values and the pressures of modernity. He says, "[Gustad] had always been a proud Parsi, but now he was more than that, he was a man caught between the traditions of his people and the reality of modern India" (Mistry, 1991, p. 85). Mistry uses this conflict to explore the theme of cultural memory, reflecting how historical and cultural traditions shape the protagonist's identity. The portrayal of Gustad's pride in his heritage juxtaposed with the challenges of contemporary India underscores the role of cultural memory in shaping individual and collective identities.

Mistry emphasizes on the significance of historical narratives within the Parsi community. "The stories of the past were not just memories but lessons etched into the lives of those who remembered" (Mistry, 1991, p. 132). Mistry suggests that cultural memory is not merely about recalling past events but about embedding these memories into the present to guide future actions. This perspective is crucial for understanding how historical consciousness influences the characters' decisions and their worldview.

The novelist also captures the tension between contemporary challenges and the historical experiences of Gustad's ancestors. He quotes "As the political unrest swept through the city, Gustad found himself caught between the demands of the present and the echoes of his ancestors' struggles, their voices resonating in his decisions." (Mistry, 1991, p. 221) It emphasizes how cultural memory influences individual choices during times of crisis. The interplay between historical legacy and personal decisions illustrates the impact of collective memory on navigating present difficulties, demonstrating the novel's exploration of how past events shape contemporary life.

Conclusion:

The study of cultural memory and Parsi heritage in *Such a Long Journey* reveals the intricate ways in which Rohinton Mistry portrays the Parsi community's experiences and identity. By integrating historical and cultural contexts into the

narrative, Mistry provides a profound commentary on the role of memory in shaping individual and collective identities. This research contributes to a greater understanding of how literature can reflect and preserve cultural heritage, offering valuable insights into the dynamics of marginalized communities.

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Copper triflate catalysed synthesis of Coumarinophosphorothioates

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Abstract:

A new method was developed to prepare coumarino-phosphoro-thioates (2a-g) from 7-hydroxycoumarins (1a-g). This approach uses O, O-diethyl phosphorochloridothioate along, & employs copper triflate as the driving force...

Keywords: 7-hydroxycoumarins, copper triflate diethylphosphorochlorido-thioate, Coumarinophosphorothioates.

Introduction:

Compounds with heterocyclic structures that include coumarins have shown to improve various biological properties of the parent molecule, including its anti-coagulant,¹ anti-biotic,² medicinal chemistry,³ & pest-fighting⁴ characteristics.

A number of coumarins compounds have recognized as wide range of microbial properties, such as fungicidal effects,⁵ anti-coagulant features,⁶ bactericidal qualities,⁷ anti-parasitic properties,^{8,9} & pest-fighting abilities.¹⁰ One study¹¹ found that directly linking a coumarin nucleus to a heterocyclic structure enhances pesticidal activity.

However, most of the pesticides in use today are organophosphorus compounds, such as phosphates, dithiophosphates, & phosphorothioate compounds,¹²⁻¹⁶ selected due to their ability to biodegrade.¹⁷

Phosphorothioates, particularly featuring a selective heterocyclic structure, were notable

Because their degradation products generate heterocyclic compounds known for their effective antimicrobial properties. Moreover, several phosphonic acids and their related compounds exhibit notable biological activities, including anti-infective, antileukemic, effects on herbicides, plant growth regulation, and insect control, based on the substituents attached.^{18,19}

Phosphorothioates have been developed using several techniques documented in literature, including reactions with dialkyl phosphites & sulfinyl chloride,²⁰ sulfinyl cyanide,²¹ thiosulfonates,²² di-sulphide,²³ & Sulphur.²⁴ Other method entails condensing phosphorochloridates & thiols.²⁵ Approaches often face issues, such as stringent reaction conditions and notable side reactions.

In the past, copper triflate was employed for wide range of applications in manufacturing, often outperforming alternative metal triflates like ytterbium triflates and scandium triflates.²⁶ It has proven particularly valuable in carbohydrate

chemistry, where it has catalyzed acetylation reactions²⁷ and recently served for gentle promoter of glycosylation.²⁸ copper-triflate is typically employed in small amounts as a catalyst and remains stable in water, making it easy to recycle and reuse without losing effectiveness,²⁹ which enhances its appeal for synthetic chemists.

Materials and methods:

Diethyl- phosphorochloridothioate was purchased from Lancaster. NaOH & copper triflate were sourced from S.D.F.C. MP. were measured using Kumar's melting point instrument. ¹H NMR spectra were acquired using a Varian Mercury Plus instrument at 400 MHz. Infrared spectra were recorded with a Perkin-Elmer FTIR. Mass spectra were acquired on a Micromass Quattro II instrument via electrospray ionization. Purity & reaction completion were determined using thin layer chromatography.

Procedure:

O,O-diethyl *O*-4,8-dimethyl-2-oxo-2H-chromen-7-yl phosphorothioate (2d)

The procedure required combining 7-hydroxy-4,8-dimethyl-2H-chromen-2-one 1 gm & diethyl phosphorochloridothioate 1.92 gm. Copper triflate (0.2 gm) was added to RM. Reaction completion was tracked using thin layer chromatography. After the reaction was complete, H₂O was added. The solid filtered and then rinsed with H₂O to isolate the product

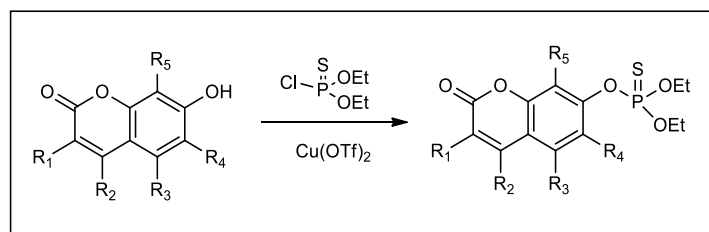
Results and Discussion:

In previous, coumarinophosphorothioates were prepared using a two stage process. First, the sodium salt of hydroxy coumarin was prepared by reacting it with sodium hydroxide in solvent CH₃COCH₃. This salt was then treated with diethyl-phosphorochlorido-thioate in DMF.

Our present focus is on developing a simpler and very effective method for preparing coumarinophosphorothioates in one stage at normal temp, using copper triflate as driving force. In this

research, coumarinophosphorothioates scheme-1 were effectively prepared by the reaction of hydroxy coumarin (1a-g) with diethyl phosphorochloridothioate, without using a solvent. Copper triflate acted as driving force, & the reaction was carried out at STP, resulting in high yields of the desired products.

Once the reaction is finished, H₂O poured to RM. The solid was subsequently filtered & Rinsed by H₂O to isolate the compound. Prepared molecules were identified by analysis. This optimized method offers a more efficient approach to prepare coumarinophosphorothioates.



Scheme 1: Synthesis of Coumarinophosphorothioates

Table 1: Data of synthesized compounds

Entry	R1	R2	R3	R4	R5	Reac Time (min)	Yield (%)
2a	H	H	H	H	H	10	92
2b	H	CH ₃	H	H	H	11	91
2c	Cl	CH ₃	H	H	H	12	90
2d	H	CH ₃	H	H	CH ₃	12	91
2e	H	CH ₃	H	C ₂ H ₅	H	12	90
2f	H	H	CH ₃	H	H	10	90
2g	H	CO ₂ Me	H	H	H	11	91

Conclusion:

In summary, a new method has been developed for synthesizing coumarino-phosphorothioate (2a-g) from 7-hydroxy coumarins (1a-g). This approach uses O,O-diethyl phosphorochloridothioate, with copper triflate acting as driving force. The reactions are performed under mild conditions, leading to notably shorter reaction times and outstanding yields, as shown in Table I. This innovative approach possesses significant potential for advances in combinatorial synthesis.

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A Comprehensive review of the role of performance management systems in boosting job performance in the service industry

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Abstract:

For modern firms, Performance Management Systems (PMS) are essential because they provide a framework for improving employee performance and achieving strategic objectives. To increase customer happiness and business performance in the service industry, PMS needs to handle the intricacies of interpersonal interactions and intangible outputs. This study explores the functions of key PMS components in promoting continuous performance improvement, including goal-setting, employee development, feedback, performance appraisal, and rewards. Clear goal-setting, frequent feedback and advancement opportunities are just a few of the ways that an effective PMS may greatly improve employee performance. However, a customized strategy including best practices is required because of the unpredictability of service interactions and the crucial role of human resources. The goal of this study is to present a thorough examination of PMS's effect on job performance in the service sector, providing insights for enhancing service delivery and achieving organizational success.

Keywords: Performance Management System, Job Performance, Performance Management, Performance Appraisal, Service Industry.

Introduction:

Performance management systems, or PMS, are essential to modern organizations because they provide as a foundation for improving worker performance and accomplishing strategic goals. Employee performance has a direct impact on client satisfaction and corporate success in the service business, which highlights the importance of PMS. Performance management in the service industry must take a sophisticated strategy that takes into account its particular dynamics and challenges because of its reliance on human interactions and intangible outputs. Systems of performance management include a variety of actions used to enhance worker performance and match it with company objectives. Setting goals, evaluating performance, providing feedback, providing training and development, and providing incentives and recognition are often important elements. Together, these elements produce a perpetual cycle of performance enhancement.

According to research, an effective PMS can greatly improve worker performance by setting clear goals, giving frequent feedback, and offering chances for professional growth (DeNisi & Murphy, 2017). Goal-setting theory, for instance, contends that defining clear, difficult objectives might boost performance (Locke & Latham, 2002). Furthermore, consistent performance evaluations and helpful criticism assist staff members in identifying their areas of strength and growth, promoting an

environment that values ongoing development (Pulakos, 2009). Organizations in the service sector should use best practices, like include staff members in goal-setting, giving frequent, targeted feedback, and associating performance results with chances for growth and rewards, to get beyond these obstacles. In addition, utilizing technology to monitor performance indicators and promote correspondence can improve PMS efficacy (Biron et al., 2011). For PMS to be successful, managers must receive training on how to give constructive criticism and encourage staff growth (Pulakos, 2009).

The purpose of this research is to present a thorough analysis of PMS's contribution to improving job performance in the service sector. This review analyzes the literature to determine the essential elements of a successful PMS, assesses the influence these elements have on worker performance, and addresses issues unique to the service industry. Best practices for putting PMS into effect to enhance worker performance and service delivery are included in the paper's conclusion.

Research Objectives

1. To examine the essential elements of service industry Performance Management Systems (PMS)
2. To assess how successful PMS affects worker performance and corporate success
3. To explore the best practices for resolving PMS installation obstacles

Research Methodology:

The purpose of this study is to investigate how Performance Management Systems (PMS) improve job performance in the service industry through a thorough assessment of the literature & case studies. A thorough search of scholarly journals, industry papers, and other pertinent publications will be part of the literature review process. Using keywords linked to PMS and employee performance, data will be gathered from web sources with an emphasis on best practices, trends, and obstacles. By classifying and synthesizing these results through thematic analysis, a comprehensive picture of PMS's role will be obtained. In order to comprehend PMS implementation and consequences, case studies from a variety of service industries, including retail, financial services, healthcare, and hospitality, will be reviewed.

Literature Review:

In their 2009 study, Broadbent and Laughlin examine the intricacies of performance management systems in public sector organizations. Their work sheds insight on the difficulties in putting PMS into practice in settings where performance measurements are frequently arbitrary and outputs are intangible. They contend that performance management systems (PMS) in the public sector need to be created with these special features in mind, highlighting how crucial it is for these systems to be flexible and adaptive. Through their work, we can better understand how PMS can be customized to unique corporate contexts and emphasize the importance of having systems that can handle the intricacies of service delivery.

In the service sector, (Dangol, 2020) looks into the connection between PMS and worker motivation. The paper shows via empirical research that employee motivation and job satisfaction are greatly increased by well-structured PMS, which includes regular feedback, development opportunities, and clear goal setting. According to Dangol's research, motivation plays a crucial role as a mediator between PMS and job performance, underscoring the significance of developing systems that actively involve and motivate staff members in addition to evaluating performance.

(Biron et al., 2011) look into how successful performance management systems (PMS) are in top-tier companies across the globe. The significance of coordinating PMS with organizational strategy to improve overall performance is emphasized by their study. The authors contend that regular performance reviews, ongoing feedback mechanisms, and well-defined goal-setting procedures are essential components of an efficient PMS. They draw attention to the fact that, in order to guarantee a

thorough approach to performance management, globally renowned companies frequently combine PMS with other HR procedures, such training and development. This integration links individual performance to company objectives and fosters a culture of continual improvement. Their results highlight how important strategic alignment is to PMS efficacy.

A critical analysis of the connection between performance and human resource management (HRM) is given by (Boselie et al., 2005). Their study highlights the necessity for a comprehensive understanding of performance management by pointing out parallels and discrepancies between HRM and performance studies. While numerous studies demonstrate the beneficial effects of HRM practices on organizational performance, they contend that agreement on the precise processes by which these effects are attained is lacking. The authors recommend that PMS be viewed as a component of a more comprehensive HRM system that includes training, development, and employee involvement.

(DeNisi & Murphy, 2017) offer an extensive analysis of the evolution of performance management and appraisal over the previous century. Their research follows the development of performance management techniques, emphasizing the change from conventional ways of performance appraisal to more integrated and ongoing approaches. They contend that continuous coaching, development, and feedback should be a part of an efficient PMS in addition to yearly assessments. The writers stress how crucial it is to establish a culture of continuous improvement where staff members are given opportunities for growth and regular feedback. Their analysis emphasizes how crucial it is for PMS to be flexible and responsive to shifting employee expectations as well as organizational demands.

A theory of task motivation and goal setting that is actually relevant is developed by (Locke & Latham, 2002). According to their research, performance levels are higher for precise and hard goals as opposed to easy or ambiguous ones. They contend that goal-setting is essential to an efficient PMS because it clarifies expectations and encourages workers to perform at a high level. The authors also stress the value of feedback in the goal-setting process, arguing that consistent feedback enables staff members to monitor their development and modify their efforts as necessary. Their results highlight how crucial it is to include goal-setting and feedback mechanisms in PMS in order to improve worker performance and motivation.

A novel approach to performance management with the goal of achieving business results is presented by (Pulakos, 2009). Her research contends that because traditional performance management

techniques place an undue emphasis on formal procedures and documentation, they frequently fall short of the goals they set out to accomplish. Rather, she supports a more adaptable and dynamic method of treating PMS that places an emphasis on continuous coaching, development, and feedback. Pulakos emphasizes the significance of fostering an environment in which managers and staff members often talk about performance and areas in need of development. She contends that in order to provide significant performance gains, an efficient PMS should be incorporated into the regular workflow and matched with corporate goals. Her method places a strong emphasis on how pragmatic, approachable, and closely related to business outcomes PMS must be.

(Maleka et al., 2020) investigate the potential and difficulties of deploying PMS in the hospitality industry, a significant service sector. According to their analysis, there are a number of obstacles to a successful PMS deployment, such as inadequate training, a lack of management support, and resistance to change. They also draw attention to ways that technology might be used to improve feedback and performance monitoring systems. The authors contend that PMS efficacy in the hotel industry can be greatly increased by tackling these issues through strategic planning and stakeholder involvement.

The function of performance management in public administration is examined by (Dooren et al., 2015). They contend that PMS in the public sector needs to be created with the special difficulties of providing public services in mind, such as the requirement for accountability, openness, and responsiveness to the requirements of the general public. The research emphasizes how crucial it is to include stakeholders in PMS development and execution in order to guarantee that they are in line with public service objectives and values. The authors advise taking a participative approach to PMS, which entails routine stakeholder and employee consultation.

In 2009, (Ferreira & Otley, 2009) offered a framework for creating and assessing PMS within businesses. The main elements of an efficient PMS, such as goal-setting, performance evaluation, feedback, and staff development, are outlined in their study. To make sure that PMS assist the accomplishment of strategic objectives, they stress how crucial it is to match them with organizational strategy and culture. The authors also stress how flexible PMS design must be to adapt to shifting corporate priorities and outside circumstances.

A fundamental framework for comprehending the conception and application of PMS is offered by (Otley, 1999). The main components of an efficient PMS, including as goal-setting, performance evaluation, feedback, and incentives, are described

in his paper. In order to make sure that PMS assist the accomplishment of strategic objectives, Otley highlights the significance of connecting them with organizational strategy and culture. He also emphasizes how flexible PMS design must be to adapt to shifting company needs and outside circumstances.

The study conducted by (Paraschi et al., 2019) examines how PMS can improve service quality within the tourism sector. Their research demonstrates that a successful PMS can result in considerable increases in customer happiness and service quality. An effective PMS is defined by precise performance standards, frequent feedback, and development possibilities. They also stress how crucial it is to include staff members in PMS design and execution in order to guarantee that they are in line with service delivery objectives. The authors advise taking a participative approach to PMS, which entails routine stakeholder and employee consultation.

The effect of PMS on worker performance in the education industry is examined by (Pham et al., 2019). Their research shows that a good performance management system (PMS) can significantly increase employee performance and work satisfaction. An successful PMS is defined by specific performance criteria, frequent feedback, and development possibilities. They also emphasize how important leadership is to PMS's success, arguing that encouraging and involved leadership philosophies are essential to developing a continuous improvement mindset. The authors provide a thorough method of PMS that combines staff engagement and development techniques with performance evaluation.

(Vuong & Nguyen, 2022) investigate how PMS affects workers' productivity in the banking industry. Their research demonstrates how a successful PMS, which is defined by precise performance standards, frequent feedback, and growth possibilities, may result in considerable increases in worker productivity and job satisfaction. Additionally, they draw attention to how technology might improve PMS, arguing that digital tools can make performance tracking more precise and efficient.

An extensive analysis of PMS's impact on improving worker performance in the service sector is given by (Wahid, n.d.). The main elements of an efficient PMS, such as goal-setting, performance evaluation, feedback, and staff development, are outlined in their study. To make sure that PMS assist the accomplishment of strategic objectives, they stress how crucial it is to match them with organizational strategy and culture. The author also emphasizes how flexible PMS design must be to adapt to shifting company priorities and outside circumstances. Wahid suggests a participative

approach to PMS that involves routine stakeholder and employee input to make sure they are in line with company objectives and employee requirements.

Conclusion:

To sum up, this study highlights how important Performance Management Systems (PMS) are to improving worker performance in the service sector. Because of the special needs of the service industry, which mostly depends on intangible outputs and human interactions, performance management must be customized. A thorough analysis of the literature, case studies, and expert interviews reveals that chances for staff development, ongoing feedback, recognition programs, and well-defined goal-setting are essential components of a successful PMS. Together, these elements promote a culture of ongoing development and alignment with company objectives, which eventually raises worker happiness and performance.

The results also highlight how crucial it is to incorporate PMS with organizational strategy and use technology to increase its efficacy. Service firms can overcome common obstacles in PMS implementation by implementing best practices such as letting employees establish goals, giving regular and constructive feedback, and connecting performance results to opportunities for growth and rewards. Sustaining an efficient PMS requires training managers on how to provide constructive criticism and encourage staff development. In order to attain service excellence and organizational success, performance management in the service industry requires a strategic, adaptable, and inclusive strategy, as this research highlights for academics and practitioners.

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Evaluation Of Phyto - Compounds From *Woodfordia Fruticosa* (L.) Kurz Leaves Extract in Different Solvents by Using Gc-Hrms Techniques

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Abstract:

A prominent method of treatment in the is ayurveda medicine. *Woodfordia fruticosa* (L.) Kurz, a member of the Lythraceae family is having many medicinal uses. Peoples in the Melghat region of Maharashtra use this plant extensively in a number of ailments. This work further carried out by the GC-HRMS method to evaluate phyto-components extracted from *Woodfordia fruticosa* (L.) Kurz leaves in acetone, petroleum ether, ethanol and aqueous extract. The findings indicated the existence of fourteen phyto-compounds in acetone, seventeen phyto-compounds in petroleum ether, eleven phyto-compounds in ethanol and nine phyto-compounds in aqueous extract.

Keywords: Phytochemicals, *Woodfordia Fruticosa*, GC-HRMS.

Introduction:

Indian traditional medicine, including several hundred plant-based folkloric remedies. Drawing from the knowledge passed down through the generations, medicinal plants or their parts are utilized to make herbal remedies that are used to cure a variety of illnesses. Studies on medicinal plants should be conducted more thoroughly in order to encourage the use of herbal remedies and the exploration of their potential. Classified as primary and secondary metabolites are substances that are found in all plants.

Primary metabolites consist of amino acids, proteins, carbohydrates, pyrimidines and purines of nucleic acids, chlorophylls, and so on. Secondary phytochemicals include alkaloids, phenolic compound, tannins, glycosides, flavonoids, terpenoids, steroids, resins and saponin. These metabolites distribution, both qualitatively and quantitatively, varies from plant to plant and part to part. Due to their strong biological potency in vegetative tissues, alkaloids are present in lower amounts than phenolic substances. In addition, storage tissues such as roots, fruits, and seeds have larger concentrations of alkaloids than do green leaves. (Walton and Brown, 1998) alkaloids and glycosides are intricately arranged compounds found in a wide range of plant species across the kingdom of plants. The majority of secondary metabolites have therapeutic characteristics. Therefore, in order to prepare for future research, it is essential to assess the plant's initial phytochemical contents. Numerous chemical components, including phenols, coumarins, lignin, essential oils,

monoterpenes, carotenoids, glycosides, flavonoids, organic acids, lipids, alkaloids, and xanthene, are found in herbal medicines. It is well recognized that secondary metabolites are essential to the treatment of many illnesses. (Marathe & Umate, 2017).

An ancient remedy for a number of ailments in India is *Woodfordia fruticosa* (L.) Kurz, a member of the Lythraceae family. Flowers are in high demand, but all sections of the plant have great therapeutic qualities. (Kharate, 2018) on the leaf of *Woodfordia fruticosa* (L.) Kurz, however, no thorough studies were conducted. The current study aims to determine the phytochemical components of *Woodfordia fruticosa* (L.) Kurz leaves in light of these.

Materials and Methods:

Collection and extraction of plant material:

Roadside spots (in the rock crevices of small bridges) in Khatkali, Tq. Akot, and Dist. Akola (M.S.) were the source of the *Woodfordia fruticosa* (L.) Kurz plant collection. The plants identity was determined using the flora of Amravati district with special reference to the distribution of tree species (Dhore, 1986). Both the mature and fresh leaves were washed under running tap water to remove dust and other pollutants, and then shade-dried for seven days before being ground finely and stored.

Discreption of Plant:

Wild. Stragglng shrubs, 1-5 m tall. Stems and branches pendulous, long, areal, erect, branched, woody, cylindrical, pubescent when young, becoming glabrous. Leaves – simple, cauline & ramal, sessile, superposed, unicostate reticulated,

entire, lanceolate or ovate-lanceolate, 3-14 × 1-4 cm, leathery, abaxially sparsely to densely tomentose, adaxially glabrous, base rounded to subcordate, apex acuminate. Green. Inflorescences condensed axillary shoots of 1-15 flowers. Flower – pedicellate, complete, actinomorphic, bisexual, hypogynous, cyclic, floral tube light red, red-orange, or deep red, greenish basally, narrowly cyathiform, 9-15 mm; calyx with 6 sepals' oblong-ovate, valvate, gamosepalous, greenish – bright red.;

corolla with 6 petals, gamopetalous, valvate, tubular, 3-4 mm long, slightly longer than calyx, reddish orange. Androecium with 12 stamens, inserted near the bottom of the calyx tube, 0.5-1.5 cm long, dorsifixed, monothealous, filament long, epipetalous, extrorse. Gynoecium – bicarpellary, syncarpous, ovary superior, bilocular, ovules many, style 0.5 – 1.5 cm long, stigma wedge shape. Placentation axile. Flowering in March to May.



Photo Plate 01 – Herbarium Specimen of *Woodfordia fruticosa* (L.) Kurz.

Preparation of Plant Extract for Phytochemical Analysis:

Using a Soxhlet extractor, the leaf extract of *Woodfordia fruticosa* (L.) Kurz was made in acetone, petroleum ether, and ethanol. The leaves were pulverized and then boiled in distilled water to create an aqueous extract. Once the water reaches 50 to 60° C, filter it using Whatman No. 01 filter paper after 30 minutes. The concentrated extract is obtained by evaporating the solvent after each component has been extracted. This extract is then saved for later use.

Phytochemical Screening:

Preliminary phytochemical screening (qualitative) for to detect the bioactive compounds like phenols, alkaloids, glycosides, tannins, flavonoids, steroids, saponins, was carried out by using following methods: (Mirge et al., 2023)

Test for proteins – Take 2 ml of protein solution 1ml of 40% NaOH solution and 1 to 2 drops of 1% CuSO₄ solution was added. A peptide linkage in molecules is indicated by the violet color.

Test for amino acids - Take 2 ml of sample was added to 2 ml of Ninhydrin reagent and kept in water bath for 20 minutes. Appearance of purple color indicated the presence of amino acid in the sample.

Test for reducing sugars - Take 2 ml of extract 2 drops of Molisch's reagent was added and shaken well. 2ml of conc. H₂SO₄ was added drop by drop on the sides of test tube. A reddish violet ring form

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at the junction of two layers which indicated the presence of carbohydrates.

Test for Alkaloids - Solvent free extracts, 50 mg was stirred with few ml of dilute HCL and filtered. The filtrate is tested with various alkaloidal reagents as follows:

Mayer's test- Few ml of filtrate and a drop or two of Mayers reagent were added by the side of the test tube. A white or creamy ppt indicates the presence of alkaloids.

Wagner's test - Take a few ml of filtrate, few drops of Wagner's reagent were added by the side of the test tube. A reddish- brown ppt confirms the presence of alkaloids.

Hager's test - Take a few ml of filtrate, 1 or 2 ml of Hager's reagent (saturated aqueous solution of picric acid) were added. A prominent yellow ppt indicates the presence of alkaloids.

Test for phenolic compound - Lead acetate test - The extract (50mg) was dissolved in distilled water and to this; 3ml of 10% lead acetate solution was added. A bulky white precepted indicates the presence of phenolic compounds.

Test for Tannins - Take a 0.5g of the plant extract was added in 10 ml of water in test tube and filtered. A few drops of 0.1% ferric chloride were added and observed for brownish green or blue- black coloration.

Test for glycoside - Each extract was hydrolyzed with HCL and neutralized with NaOH solution. A few drops of Fehling's solution A and B were added

to each mixture. Formation of red precipitate indicates the presence of glycosides.

Test for Flavonoids

(a) 0.2 g of each extract was dissolved in diluted NaOH and few drops of HCL were added. A yellow solution that turns colorless indicates the presence of flavonoids

(b) To 2 ml of test solution, 0.5ml alcohol was mixed. Then a bit of magnesium and 1 or 2 drops of conc. HCL were added and heated. The mixture was analyzed for reaction

Test for Phenols - To 2 ml of test solution, alcohol and then few drops of neutral ferric chloride solution were added. A dark green color indicated the presence of phenolic compound.

Terpenoids: 2ml of leaf extract was added to 2ml of acetic anhydride and concentrated H₂SO₄. The blue, green ring is formed which shows the presence of terpenoids.

Steroids: 1ml of leaf extract was dissolved in 10ml of concentrated sulphuric acid and equal volume of chloroform was added by sides of the test tube. The upper layer turns red in color and sulphuric acid layer showed the yellow with green fluorescence. Which shows the presence of steroids

Test for Resins - To the 0.2 g of each extract, 10 ml of glacial acetic acid was added then heated and cooled. A drop of conc. H₂SO₄ was added. Purplish red color shows the presence of resins

Saponins: 5ml of leaf extract was mixed with 20 ml dist. water and continuously shake it for 15 min. the foam is formed which shows the presence of saponins.

GC-MS Analysis -

Crude extract of *Woodfordia fruticosa* (L.) Kurz leaves in different solvent were used for GC-HRMS investigation. The GC-MS analysis was carried out using an Agilent, 7890, FID detector, Head Space injector Combipal auto sampler Gas Chromatograph equipped and coupled to The Jeol mass spectrometer (Model: Accu TOF GCV). Split ratio was 10: 1. Column temperature program: GCMS interface temp was 250° C. Column used was HP5, the injector temperature was 2000C, detector temperature was 2800C. Helium was used as carrier gas at 1 mL/min. Mass spectral scan range was set at 35 - 800 amu, Mass resolution – 5000. The combination analyzer known as a gas chromatograph linked with mass spectrometer (GC-HRMS) is excellent at both qualitative and

quantitative analysis of organic substances. It carries over the characteristics of high sensitivity, sample operation, high resolution, and accurate mass measurement. Based on the mass spectra of the most recent NIST library data, which contains more than 62,000 patterns, the constituents in the extract were determined. A comparison was made between the spectrum of the unknown component and the known components kept in the NIST collection. (SAIF IITB).

Result and Discussion:

Priliminary Phytochemical Screening:

The findings of the crude leaf extract of the traditional medicinal herb *Woodfordia fruticosa* (L.) Kurz preliminary phytochemical activity is displayed in table 1. The ethanol extract comprises of several compounds such as amino acids, steroids, alkaloids, phenolic compounds, glycosides, terpenoids, and saponins. The contents of acetone extract include amino acids, alkaloids, phenolic compounds, glycosides, terpenoids, reducing sugars, steroids, phenols, and saponins. Alkaloids, phenolic compounds, glycosides, terpenoids, flavonoids, reducing sugars, proteins, amino acids, steroids, and saponins are all present in petroleum ether extract. The antibacterial activity of *Woodfordia fruticosa* (L.) Kurz was investigated against two-gram negative bacteria, two gram- positive bacteria and two fungi. The aqueous extract includes amino acids, reducing sugars, alkaloids, glycosides, flavonoids, resins, and saponins.

GC-MS Analysis In Ether Extract Of Leaf Of *Woodfordia Fruticosa* (L.) Kurz:

Acetone extract of *Woodfordia fruticosa* (L.) Kurz leaves was investigated by GC-HRMS and results showed the presence of about fourteen different phyto-compounds. In petroleum ether extract shows seventeen phyto-compound, in ethanol extract shows eleven phytoconstituent and in aqueous extract shows the nine phyto-constituents. Using computer searches on a NIST MS data library and comparing the spectrum obtained through GC-HRMS (figure 1,2,3 and 4), major compounds present in acetone, petroleum ether, ethanol and aqueous extract of plant were identified are shown in table no.01, table no.02, table no. 03 and table no. 04.

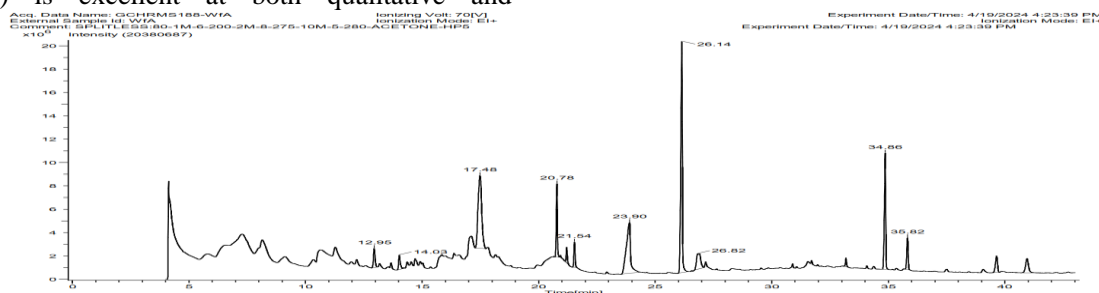
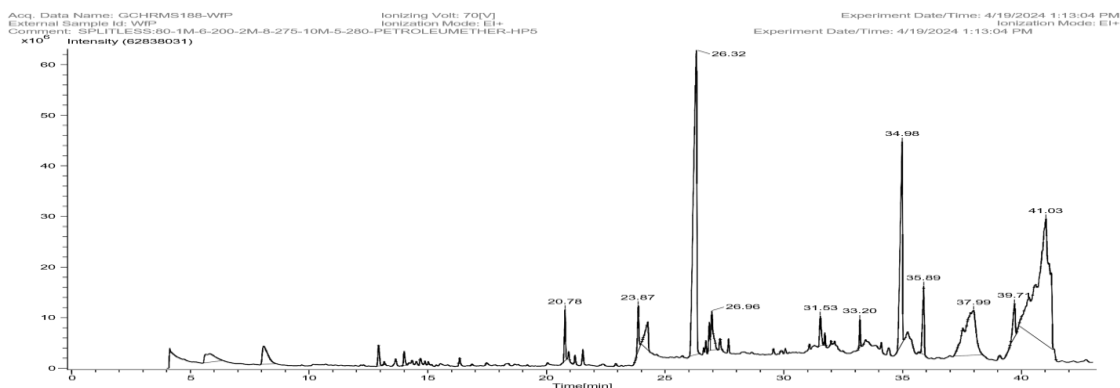


Figure 1: Chromatogram of Acetone Extract of Leaves of *Woodfordia fruticosa* (L.) Kurz.

Table 01: GC-HRMS Profile for Acetone Extract of Leaves of *Woodfordia fruticosa* (L.) Kurz.

1	12.95	Bicyclo[7.2.0]undec-4-ene, 4,11,11-trimethyl-8-methylene-, [1R-(1R*,4Z,9S*)]	C ₁₅ H ₂₄	204	8086510.83	2.3077
2	14.03	cis-Z- α -Bisabolene epoxide	C ₁₅ H ₂₄ O	220	5983466.25	1.7075
3	17.48	D-Mannitol, 1,2:5,6-bis-O-(1-methylethylidene)-	C ₁₂ H ₂₂ O ₆	262	67735546.21	19.3305
4	20.78	E-2-Tetradecen-1-ol	C ₁₄ H ₂₈ O	212	20883983.87	5.9599
5	21.20	17-Octadecynoic acid	C ₁₈ H ₃₂ O ₂	280	4637488.03	1.3234
6	21.54	Phytol	C ₂₀ H ₄₀ O	296	7738 721.63	2.2084
7	23.90	Tridecanoic acid	C ₁₃ H ₂₆ O ₂	214	55762831.15	15.9137
8	26.14	Isophytol	C ₂₀ H ₄₀ O	296	90580992.03	25.8502
9	26.82	9,12-Octadecadienoic acid (Z,Z)-	C ₁₈ H ₃₂ O ₂	280	16301043.62	4.6520
10	33.18	1-Hexadecanol, 2-methyl-	C ₁₇ H ₃₆ O	256	2480714.41	0.7079
11	34.86	Squalene	C ₃₀ H ₅₀	410	39470227.86	11.2641
12	35.82	Heptadecane, 2,6,10,15-tetramethyl	C ₂₁ H ₄₄	296	11080650.23	3.1622
13	39.64	Eicosane, 7-hexyl	C ₂₆ H ₅₄	366	8810766.48	2.5144
14	40.95	6H-Purine-6-thione, 1,7-dihydro-1-methyl	C ₆ H ₆ N ₄ S	166	10853508.93	3.0974
Total					350406451.5	100

**Figure 2: Chromatogram of Petroleum Ether Extract of Leaves of *Woodfordia fruticosa* (L.) Kurz****Table 02: GC-HRMS Profile for Petroleum Ether Extract of Leaves of *Woodfordia fruticosa* (L.) Kurz**

1	5.82	2-Pyrrolidinone, 1-methyl-	C ₅ H ₉ NO	99	48776131.7	1.9054
2	8.1	Azulene	C ₁₀ H ₈	128	57947444.39	2.2637
3	12.93	Caryophyllene	C ₁₅ H ₂₄	204	18897103.39	0.7382
4	14.01	Bicyclo[5.3.0]decane, 2-methylene-5-(1-methylvinyl) - 8-methyl-	C ₁₅ H ₂₄	204	12857729.53	0.5022
5	20.78	Phytol	C ₂₀ H ₄₀ O	296	34947250.78	1.3652
6	23.87	Octadecanoic acid, ethyl ester	C ₂₀ H ₄₀ O ₂	312	36209112.33	1.4145
7	24.26	Tridecanoic acid	C ₁₃ H ₂₆ O ₂	214	55402671.05	2.1643
8	26.32	Oxirane, decyl-	C ₁₂ H ₂₄ O	184	587710829.3	22.9593
9	26.86	9,12-Octadecadienoic acid (Z,Z)	C ₁₈ H ₃₂ O ₂	280	19362997.14	0.7564
10	26.96	8,11,14-Eicosatrienoic acid, (Z,Z,Z)	C ₂₀ H ₃₄ O ₂	306	51236084.91	2.0015
11	31.53	Hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl	C ₁₉ H ₃₈ O ₄	330	30305961.99	1.1839

		ester				
12	33.2	Heptacosane, 1-chloro-	$C_{27}H_{55}Cl$	414	16531488.45	0.6458
13	34.98	Squalene	$C_{30}H_{50}$	410	266228365.7	10.4004
14	35.89	Eicosane, 7-hexyl-	$C_{26}H_{54}$	366	66167605.31	2.5848
15	37.99	Olean-18-ene	$C_{30}H_{50}$	410	307292776.6	12.0046
16	39.71	1-Chloroeicosane	$C_{20}H_{41}Cl$	316	45105820.43	1.7620
17	41.03	Lup-20(29)-en-3-ol, acetate, (3 β)-	$C_{32}H_{52}O_2$	468	904808610	35.3470
Total					2559787983	100

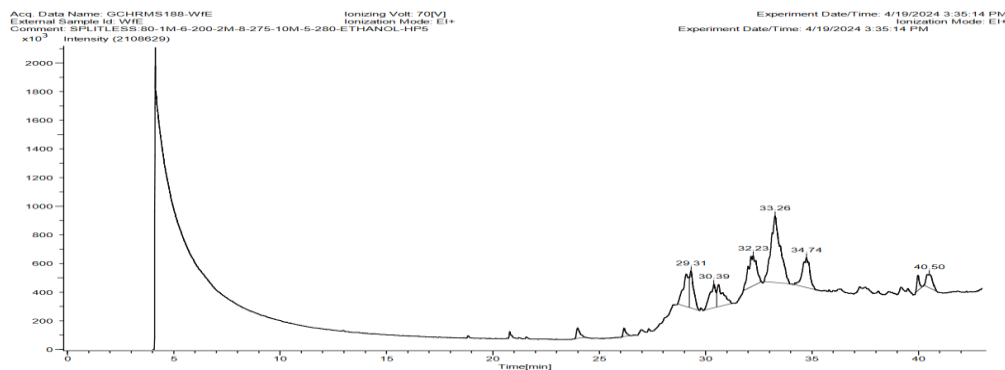


Figure 3: Chromatogram of Ethanol Extract of Leaves of *Woodfordia fruticosa* (L.) Kurz

Table 03: GC-HRMS Profile for Ethanol Extract of Leaves of *Woodfordia fruticosa* (L.) Kurz.

1	23.98	Pentacosanoic acid, 2,10-dimethyl-, methyl ester, [S-(R*,S*)]-	$C_{28}H_{56}O_2$	424	830854.26	1.9220
2	26.16	Dodecanal	$C_{12}H_{24}O$	184	546424.03	1.2640
3	29.08	E-3-Pentadecen-2-ol	$C_{15}H_{30}O$	226	4269023.04	9.8756
4	29.31	Octadecanal	$C_{18}H_{36}O$	268	3501677.86	8.1005
5	30.39	1,2-15,16-Diepoxyhexadecane	$C_{16}H_{30}O_2$	254	3157653.15	7.3046
6	30.61	Tridecanedial	$C_{13}H_{24}O_2$	212	3075040.76	7.1135
7	32.23	9,12-Octadecadienoic acid (Z,Z)-	$C_{18}H_{32}O_2$	280	5737541.57	13.2728
8	33.26	Octadecanal, 2-bromo-	$C_{18}H_{35}BrO$	346	14268116.26	33.0068
9	34.74	Hexadecane, 1,1-bis(dodecyloxy)-	$C_{40}H_{82}O_2$	594	5058353.05	11.7016
10	39.98	Ethyl iso-allocholate	$C_{26}H_{44}O_5$	436	856076.22	1.9803
11	40.5	Behenic alcohol	$C_{22}H_{46}O$	326	1926936.87	4.4576
Total					43227697.07	100

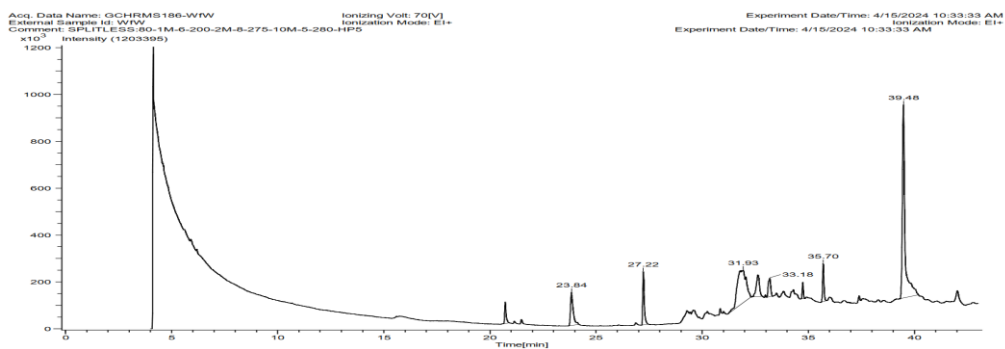


Figure 4: Chromatogram of Aqueous Extract of Leaves of *Woodfordia fruticosa* (L.) Kurz

Table 04: GC-HRMS Profile for Aqueous Extract of Leaves of *Woodfordia frutucosa* (L.) Kurz.

1	20.71	7,8-Epoxy lanostan-11-ol, 3-acetoxy	C ₃₂ H ₅₄ O ₄	502	435559.19	2.5982
2	23.84	Hexadecanoic acid, ethyl ester	C ₁₈ H ₃₆ O ₂	284	1225761.48	7.3120
3	27.22	Pentacotanoic acid, ethyl ester	C ₅₂ H ₁₀₄ O ₂	760	1119814.47	6.6799
4	31.93	7,8-Epoxy lanostan-11-ol, 3-acetoxy-	C ₃₂ H ₅₄ O ₄	502	4229112.66	25.2278
5	32.62	Ethyl iso-allocholate	C ₂₆ H ₄₄ O ₅	436	971991.19	5.7981
6	33.18	Docosanoic acid, 1,2,3-propanetriyl ester	C ₆₉ H ₁₃₄ O ₆	1058	617212.17	3.6818
7	34.74	3,5,9-Trioxa-5-phosphaheptacos-18-en-1-aminium, 4-hydroxy-N,N,N-trimethyl-10-oxo-7-[(1-oxo-9-octadecenyl	C ₄₄ H ₈₄ NO ₈ P	785	276656.58	1.6503
8	35.70	Tetratetracontane	C ₄₄ H ₉₀	618	724407.79	4.3212
9	39.48	Triacotane, 11,20-didecyl-	C ₅₀ H ₁₀₂	702	7163179.51	42.7303
Total					16763695.04	100

Conclusion:

The present work used gas chromatography with high resolution mass spectrometry (GC-HRMS) analysis to identify fourteen phyto-compounds from the acetone extract, seventeen phyto-compounds from petroleum ether, eleven phyto-compounds from the ethanol extract, and nine phyto-compounds from the aqueous extract of *Woodfordia frutucosa* (L.) Kurz. Leaves. Antimicrobial, antioxidant, and anticancer properties are attributed to the majority of the discovered phyto-components. The study's conclusions demonstrate the ether extract's significant richness in terpenes, fat-soluble vitamins, and secondary metabolites. The ethnomedical use of the herb now has a scientific foundation thanks to these discoveries. However, biological activity and toxicity profile testing will yield valuable data in the future when isolating the various phytochemical ingredients. Therefore, more study on this plant based on the separation of its bioactive components may be conducted.

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Panoramic View of Indian English Literature

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Abstract:

The term literature has undergone a great widening of meaning and has come to mean anything in print or anything written. Literature in the true sense of the term is that land of writing. It is charged with human interest and characterized by permanence of imagination and artistic establishment. It deals with the life of man and his destinies on earth. It is the permanence and universality which distinguishes literature from Journalism or advertisement. Sometimes it may contain brilliant pieces of descriptions and thoughtful discussions.

Keywords: Indian literature, overview of literature, panoramic view of literature, Indian writers, Indian authors, Indian women writers, English history of literature.

Introduction:

Apart from the pleasure of reading and entering into a new world and having our imagination quickened, the study of literature has one definite object, and that is to know all. Now the human is a dual creature, he has an outward and inner nature. He is not only a doer of deeds but a dreamer of dreams and to know him the man of any age; one must search deeper than his history. History records his deeds, his outward acts largely, but every great act springs from an idea, and to understand this one must read his literature. It is a curious and prevalent opinion that literature, like all art; is a mere play of Imagination, like a new novel, but without any serious or practical importance. Nothing could be farther from the truth. It preserves the ideals of a people and love, faith, duty, friendship, reverence are part of human life most worthy of preservation.

In a word, our whole civilization, freedom, progress, homes, religion, rest solidly upon ideals for their foundation. Nothing but an ideal ever endures upon the earth. It is therefore impossible to overestimate the practical importance of literature. It preserves these ideals from fathers to sons, while men, cities, governments, civilizations, vanish from the Face of the earth. No one can be ready, if not to define, at least to understand little more clearly the object of our present study. Literature is the expression of life in words of truth and beauty, which is the written record of human's spirit, thoughts, emotions and aspirations. It is the history of the human soul. It is characterized by its artistic, suggestive and permanent qualities. Its two tests are its universal interest and its style. Its object, apart from the delight it gives us, to know man. It is the soul of a man rather than his actions. Since it preserves the ideals upon which all over civilization

is founded. It is one of the most important and delightful subjects that can occupy the human mind.

The term literature has undergone a great widening of meaning and has come to mean anything in print or anything written. Literature in the true sense of the term is that land of writing. It is charged with human interest and characterized by permanence of imagination and artistic establishment. It deals with the life of man and his destinies on earth. It is the permanence and universality which distinguishes literature from Journalism or advertisement. Sometimes it may contain brilliant pieces of descriptions and thoughtful discussions. While the views and thoughts expressed in newspapers exhaust their utility and relevancy in the year. Literature goes on appealing to man through the corridors on time. A writer, if he wants to live must write of what lies at his doors. He must report faithfully only that he has lived through, seen, thought, felt and known for himself. Without sincerity, nothing can be accomplished in Literature.

The term Indian writing in English is used in a wider sense. This is the body of works by the writers. Whose mother tongue is one of the languages of multilingual India? According to K.R. Srinivasa Iyengar, there are three types of Indian writers in English they are:

First, those who have acquired their entire education in English schools and universities. Second, Indians who have settled abroad but are constantly in touch with the changing surrounding and traditions of their country of adoption and finally, Indians who have acquired English as a second language (19).

Many Indian writers have chosen English as a medium of expression and left a great impact on different forms of literature. For example Toru Dutt (1856–1877), Sri Aurobindo (1872–1950), Sarojini

Naidu (1879–1949), Jawaharlal Nehru (1889–1964), Kamala Markandaya (1924–2004), Anita Desai (1937—), Chetan Bhagat (1974—) and many others. The new generation of Indian writers in English has handled a wide range of themes and the subject matters.

Today is the generation of those women writers who have money and are mostly Western-educated. Their novels consist of the latest burning issues related to women as well as those issues that exist in the society since long. These books are thoroughly enjoyed by the readers and the publishers make easy money out of them. The publishers feel that the literature survives because of these types of bold topics and commercials used by the women novelists. They describe the whole world of women with simply stunning frankness, their write up gives a glimpse of the unexplored female psyche, which has no accessibility. The majority of these novels depict the psychological suffering of the frustrated housewife.

The majority of the Indian writers were concerned in one way or the other issues regarding women. They were directly, idealistically or realistically depicting the place of women in the society and intending to bring about change therein. Yet their women characters seem to be under the dominating influence of their male writers. The female protagonist remains under the impact of their creator's emotions and ideas. These incited women to become writers and present the reality of the world. Indian literature written in English is smaller in volume compared to the output in several regional languages and spans a smaller range of time, it commenced with the spread of the English language and education in India. In the last two decades, there has been astonishing of Indian women's writing in English, and their writings need both abroad and in India.

In the field of fiction in English, novelists like Mulk Raj Anand (1905–2004), R.K. Narayan (1906–2001), Raja Rao (1908–2006), Bhabani Bhattacharya (1906–1988), Nayantara Sahgal (1927—) and Kamala Markandaya (1924–2004) have done tremendous work by depicting the social, cultural, philosophical and historical aspects of life in a very realistic as well as poetic way. Apart from the prize winner authors are the other novelists Mahasweta Devi (1926–2016), Anita Desai (1937—), Shobha De (1948—), Rohinton Mistry (1952—), Vikram Seth (1952—), Amitav Ghosh (1956—), Jhumpa Lahiri (1967—), to name only a few have done their best in Indian literature in English.

Indian Writing in English initially emerged as an offshoot of English literature but soon it established itself as different from all other literature. It gradually became a powerful medium of expression in the hands of the Indian writers to

relate their native feelings in an alien medium. Today it holds a place of its own in world literature and appears perfectly as indigenous literature.

Indian writers writing in English have attempted all major literary genres. Fiction and poetry are being at the forefront since the novel and poetry suit the Indian temper the most. The Indian English Literature with a history of almost a century is richly dipped in the hues of native culture ethos. The works of writers like Nirad Chaudhary (1897–1999), Mulk Raj Anand (1905–2004), R.K. Narayan (1906–2001), Raja Rao (1908–2006), Manohar Malgonkar (1913–2010), etc. are acclaimed as masterpieces. Most of these Indian writers are bilinguals and are sometimes nostalgic for their mother tongue. The literary gamut of these Veteran writers is the most impressive, outstanding and enduring contribution in Indianizing the English language. These writers have at times used native idioms and also words from the Indian society, rocked by various fundamental issues such as social dichotomy, cultural hegemony, a clash between ethnic groups, a clash between Eastern and Western ideologies, etc. In the wake of globalization, Western culture imported to India corrodes indigenous values. The Indian writers, through their creations, protect the native culture from this invasion. This is the quintessence of the whole Indian Literature in English.

Some young and energetic women writers both men and women concentrated on the themes of women's struggles. They began to write different fiction in English. Many writers stayed in foreign countries and wrote about the situations in India. They described their concept and idea at their home and they wrote about it in their novels. Rohinton Mistry's *A Fine Balance* (1995) places in great detail explained of emergency and its repercussions. Amitav Ghosh (1956—) gives a glimpse of first-hand personal issues with the Indian reality. The Indian reality had different meanings of displacement, exiles and migration or diaspora. Many writers have been pushed into the margins. Like Leela Dhingra (1950—) and Amit Chaudhari (1962—) are from outside of India, they have written about Indian cultural situations and created critical interest. Salman Rushdie's *Midnight's Children* (1981) represents the fragmented identities of "displacement" and "rootlessness" (Rao, *Postmodernist* 39).

Indian Writing in English moves from the national to the personal issues and problems from women's struggles to gender discriminations to present the different perspectives and happenings. The imposed new perspectives construct the knowledge legitimised by the imperial discourse. Postcolonial discourse is a search for identity through sufficient narratives. Some writers like Nayantara Sahgal (1927—), Salman Rushdie

(1947—) and Rohinton Mistry (1952—) are important in the political history of Indian writing in English. After independence, political freedom achieved and had brought many changes in the social issues consequently in Indian writing in English. As women's education and their rights were recognized as an important aspect in India. The Indian Government had introduced many schemes and measures to encourage women education. It was developed in women during the period of the Independence struggle which has been helped in improving the position of women. It was inspired by the participation in the freedom struggle and resulted in which has produced a group of women writers in Indian writing in English.

In 1951, there were five or six women writers who usually made some of the most significant contributions to the English novel. It was almost a case of more women than men, qualitatively as well as numerically. Jane Austen (1775–1817) and Mrs. Gaskell (1810–1865), Charlotte Bronte (1816–1855), George Eliot (1819–1880), and Dorothy Richardson (1873–1957) and Virginia Woolf (1882–1941) had established their great tradition. Today a women novelist is in England, lacking either a room or her financial independence. They can ordinarily hold her with the male of the species. Women are natural storytellers even when they don't write or publish. In India women, writers have since made their mark in Indian fiction in English. Art, environment and society are inextricably intertwined reflecting the socio political, socio-cultural and socio-economic considerations. Cultures, traditions, beliefs, values and relationships in society find expression in various forms and patterns of writing (Tirupathi, *The Fiction ...* 7). As a consequence, many branches of literature have come up. Among these the feminist and socio-political studies assume significance.

Due to the subjugation, oppression and exploitation are of women by men. Feminism has occupied a significant place in literature and criticism. The postmodern period brought about a significant change in literary theory. The women writers, who were sensitive to feminine issues, gave a new language to articulate feminine sensibility. This gave rise to feminist criticism or literary feminism. The feminist criticism is not merely confined to theories and definitions but most importantly, it led to the evolution of female discourse.

Feminism means the belief that women should have the same rights and opportunities as men. Feminism aims at liberating women from various manifestations of gender-based discrimination and exploitation. It is an expression that refers to a movement for securing equality between the sexes in all walks of life—social,

economic and political. It broadly intends to secure womanhood freedom in all aspects. A feminist postulates that women should be on par with men. Toril Moi comments, "The terms 'feminist' or 'feminism' are political labels indicating support for the aims of new women's movement which emerged in the late 1960s" The movement for women's equality with men is achieved to an extent. Yet, a woman is treated as a subordinate. Simone de Beauvoir aptly says: The situation of women is that she is a free and autonomous being like all human creatures—nevertheless finds herself living in a world where men compel her to assume the status of the other. (Tirupathi, *Indian . . .* 8-9)

For instance, John Stuart Mills's (1806) famous work *The Subjection of Women* (1869) and Mary Wilstone Craft's (1750) *A Vindication of Rights to Women* (1792) openly expose the inhuman and injustice done to women and the hypocrisy underlying the patriarchal social order. Virginia Woolf's *A Room of One's Own* (1929) exposed the deprivation and exploitation women suffered in English society. In course of time, Feminism became an important ideological political force. A large number of women writers like Kate Millett (1934–2017), Hélèn Cixous (1937—), Elaine Showalter (1941—), Julia Kristeva (1941—) and Toril Moi (1953—) all stood firmly for the emancipation and empowerment of women globally.

Simultaneously, the feminist movements have spread to different parts of the world to make women free from the orthodox ideals of the society, like the *Purdah* system in Islam and the *Sati* in Hinduism, globalizing the feminist concept. This movement awakened women all around the world who are harassed, oppressed and tortured. It brings to light the issues related to violence, rape, wife battering, dowry deaths, female infanticide and the visible forms of oppression in the present society. Modern society is obsessed with the female body modern feminists believe that feminism is an impossible situation because modern society has patriarchal and sexist oppression.

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Library software

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Abstract:

Libraries can efficiently manage and organize their resources using library software. Manual processes are time-consuming and prone to errors, but library software automates tasks such as issuing, returning books, and managing fines. Library software's minimizes manual errors, enhancing the efficiency of library operations.

Keywords: Library Software

Introduction: -

Managing records, book details; manually can be challenging and inefficient. This traditional approach often leads to various issues, such as difficulties in locating specific books, determining their availability, and knowing when they will be returned. Additionally, searching for books using ISBN numbers and other criteria can be cumbersome and time-consuming for both staff and students.

To address these problems and streamline operations, transitioning to library software is essential. A library software can simplify these tasks, providing a more efficient and user-friendly solution. Here's how it can help:

Automated Book Tracking:

- **Availability Information:** Instantly checks if a book is available or currently checked out.
- **Due Dates:** Displays the expected return date for each book, reducing uncertainty.

Enhanced Search Capabilities

- **ISBN and Criteria Searches:** Allows users to search for books using ISBN numbers or other criteria, making it easier to find specific titles.

Efficient Record Management

- **Student Records:** Maintains up-to-date records of student information, including borrowing history and account status.
- **Book Records:** Keeps accurate and detailed information about each book, including its location and availability.

Advancements in technology drive the need to transition from traditional library systems to digital solutions. In conventional libraries, many processes are manual and cumbersome, impacting efficiency. For instance, traditional methods involve maintaining paper records for book details, manually recording each transaction in notebooks, and referring back to these records to track data. Here are some of the key challenges faced in traditional library setups:

Manual Record Keeping:

- **Paper Records:** Book counts and details are recorded on paper, leading to potential loss or damage of records.
- **Data Retrieval:** Information must be manually retrieved from notebooks, which can be time-consuming and prone to errors.

Book Management:

- **Manual Entry:** When books are distributed, librarians must manually enter details such as book ID, distribution dates, renewal dates, and student IDs into notebooks.
- **Tagging and Organization:** Each book needs a physical tag and ID, and librarians must manually arrange and mark books on shelves.

Issues with Missing Books:

- **Theft and Loss:** Missing or stolen books can create significant issues and confusion, complicating inventory management and impacting library operations.

By moving to a digital library management system, these challenges can be effectively addressed:

Automated Record Keeping:

- **Digital Records:** Book details and transactions are stored electronically, reducing the risk of loss or damage.
- **Efficient Data Retrieval:** Information can be quickly accessed through digital searches, improving efficiency.

Streamlined Book Management:

- **Automated Tracking:** Book distribution, renewal dates, and student IDs are managed through an automated system, minimizing manual entry and errors.
- **Digital Cataloging:** Books are tagged and tracked electronically, simplifying organization and retrieval.

Enhanced Security and Inventory Management:

- **Loss Prevention:** Digital systems can include features for tracking and alerting on missing or

stolen books, improving overall security and inventory control.

In traditional library systems, collecting books from students and verifying penalties can be a slow process, often causing frustration among students due to delays. To using library software improve efficiency.

Key Features:

- **Simplified Management:** Librarians can add, view, delete, and update book and student details quickly using the library software
- **Database Operations:** Librarians input student and book information into the database. They can then view, modify, or delete this data as needed.
- **Detailed Information:** Access to user details includes username, ID, book information, and any penalties, without the need for manual record-keeping.
- **Penalty Tracking:** Library software records of student penalties and book issues, tracking inventory levels and book counts.
- **User-Friendly Interface:** Designed to be intuitive, requiring only basic computer skills to operate.

Customizability and Configuration:

- **Adaptable:** The Library software can be customized to fit the needs of different organizations.
- **Admin Module:** The system is built using .NET technology, a modern and widely-used IT framework, ensuring robust performance and future relevance.
- **Secure Storage:** Data is securely stored and managed within the database, ensuring integrity and easy access.
- **Customizable Views:** User access can be customized so that different users have varying levels of data visibility, enhancing security.

By integrating these features, the Library software transforms traditional library into an efficient, automated process that reduces manual tasks, speeds up operations, and improves the overall user experience.

Proposed System Enhancements

User-Friendly Interface:

- **Efficient Data Management:** The library software ensures fast retrieval and storage of data, enhancing overall efficiency.
- **Graphical User Interface (GUI):** A user-friendly GUI makes it easy for users to interact with the system, simplifying their experience.

Report Generation:

- **Easy Report Creation:** The library software allows for the easy generation of various reports, aiding managers in decision-making activities by providing detailed insights.

Core Features of the System

Book Information Recording:

- **Detailed Records:** The system records comprehensive details for each book, making it easy for borrowers to find and reference the books they want to borrow.
- **Personal Access:** Users (students) log in with their email and password to borrow or inquire about books, providing personalized access to their borrowing history.

Borrowing Information:

- **Detailed Records:** The system captures essential details about each borrowing transaction, including borrower information and book details, as well as the dates of borrowing and returning.
- **Transaction History:** The system stores all borrowing transactions for future reference, ensuring that records are available for important matters and historical analysis.

Working of the Library Management System

Book Management:

- **Adding Books:** New books can be added by entering details such as book ID, author name, number of copies, and price.
- **Viewing/Updating:** Admins can view, update, or delete book information.
- **Book Transactions:**
 - **Issuing Books:** Admins can record the issuance of books to students.
 - **Returning Books:** Admins manage the return of books and update the system accordingly.

2. Search and Navigation:

- **Search Option:** The system includes a search feature that allows the admin to find specific books or student records easily.
- **Data Retrieval:** Admins can quickly access and review information on books and students using the search functionality.

Advantages of the Library Software

- **User-Friendly Interface:** The system features an intuitive design, making it accessible and straightforward for both administrators and users.
- **Enhanced Interaction:** Facilitates greater interaction between library staff and users through improved access to information and streamlined processes.
- **Robust Security:** Ensures data protection with secure login and access controls.
- **Scalability:** Can easily accommodate growing amounts of data and increasing numbers of users.
- **Reliability:** Provides consistent and dependable performance.
- **Comprehensive Reporting:** Generates a variety of reports on demand, aiding in data analysis and decision-making for library management.

- **Reduced Errors:** Minimizes human errors associated with manual data entry and record-keeping through automated processes.
- **Modern Technology:** Incorporates the latest technological advancements to improve library operations and user experience.
- **Adaptable Design:** Can be tailored to meet the specific needs and preferences of different libraries and institutions.
- **Efficient Resource Use:** Reduces costs related to manual processing and paper-based systems, offering a more budget-friendly solution in the long run.

These advantages highlight how the Library Management System enhances efficiency, security, and user experience, making it a valuable tool for modernizing library operations.

Limitations of the Library Management System

- **Data Vulnerability:** The data stored in the system is susceptible to cyberattacks. To mitigate this, opting for a reliable and secure online system is crucial.
- **High Expenses:** The initial setup and ongoing maintenance of the system can be costly, making it an expensive investment for some libraries.
- **Operational Challenges:** The system may be complex to operate, requiring specialized training for users to navigate its features effectively.
- **Connectivity Requirements:** Online systems necessitate a high-speed internet connection, which may not be available in all locations.
- **Computer Vulnerabilities:** The system is at risk of computer viruses, which can compromise data integrity and system functionality.
- **Manual Processes:** Offline or open-source systems often lack automation features, requiring manual intervention for various operations.
- **Increased Risk of Data Loss:** Unlike cloud-based online systems that offer redundancy and backup, open-source systems typically store data on local hard drives, increasing the risk of data loss in case of hardware failure.

The Library software provides several key benefits:

- **Student Access:** Students can easily search for books, view the status of their issued books, request new books, and provide feedback or suggestions.
- **Staff Efficiency:** Library staff can generate reports, manage book transactions, and oversee various administrative tasks with greater ease and accuracy.

Overall, the Library software more efficient and accessible while fostering better communication and engagement between students and staff.

1. Organizational Efficiency

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- **Cataloging and Classification:** Library software helps organize vast amounts of information efficiently, from books and academic journals to financial documents and reports. This is crucial for financial advisors and clients who need quick access to relevant information about IRAs and other investments.
- **Data Management:** It allows for the systematic management of client data, including IRA accounts, transaction histories, and financial records. This ensures that all information is easily accessible and well-organized.

2. Accessibility and Retrieval

- **Quick Access:** With sophisticated search functionalities, library software enables users to quickly retrieve specific documents or information about IRAs. This is essential for both financial professionals and clients who need timely access to their account details and related documentation.
- **Remote Access:** Many modern library systems offer online access, allowing users to manage and review IRA-related information from anywhere. This flexibility is particularly valuable in today's fast-paced, digital world.

3. Security and Compliance

- **Data Protection:** Library software often includes robust security features to protect sensitive information. For IRA management, safeguarding personal and financial data is crucial to prevent unauthorized access and ensure compliance with regulatory requirements.
- **Regulatory Compliance:** Financial institutions and advisors must comply with various regulations, including those related to data handling and reporting. Library software can help maintain accurate records and generate reports that adhere to legal standards.

4. Integration with Financial Tools

- **Comprehensive Solutions:** Modern library software can integrate with other financial tools and systems, such as portfolio management software and financial planning applications. This integration helps streamline operations and provides a comprehensive view of an IRA's performance and status.
- **Analytics and Reporting:** Advanced library systems can support analytics and generate reports that provide insights into financial data, helping users make informed decisions regarding their IRA investments.

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Molecular Docking of bioactive compounds from *Blumea spp.* against EGFR as anticancer target

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Abstract:

In the present study the extract of *Blumea* species in ethanol was assessed by analysis with high resolution liquid chromatography mass spectrometry (HRLCMS/MS) it shows many bioactive compounds, this study highlights presence of Physalin G, Harderophyrin, Euphornin and many more compounds. Network pharmacology approach was used find out potential activities. SAR was performed by online tool PASS for screening of activity such as anticancer, antineoplastic or anti-inflammatory which can be used for analysis. By using different tools and software information related to potential activity was collected, various servers like RCSB-PDB, PubChem, protein plus server, PyMol, PyRx, Discovery studio visualiser, UCSF Chimera was used. In this study, EGFR was used as target with PDB ID (5xdk) with 8jc ligands and the binding affinity was for 5xdk target and ligands reported the highest binding affinity for 5xdk with 8JC -8.8, 5xdk with Euphornin -7.8, 5xdk with Harderoporphyrin -8.6 and 5xdk with Physalin g -8.8.

Keywords: EGFR, *Blumea oxyodonta*, anticancer, docking.

Introduction:

A recent study illuminated the therapeutic promise of *Blumea* species by scrutinizing its ethanolic extract. Employing high-resolution liquid chromatography mass spectrometry (HRLCMS/MS), researchers unveiled a cornucopia of bioactive compounds, among which Physalin G, Harderophyrin, and Euphornin stood out. This discovery underscores the substantial potential of *Blumea* in pharmaceutical innovation. To fully exploit this potential, the scientists meticulously characterized these compounds, establishing a robust foundation for comprehending their therapeutic mechanisms. Their pioneering approach, seamlessly integrating advanced analytical techniques and bioinformatics tools, exemplifies the efficacy of interdisciplinary collaboration in phytochemical research (Saewan, et al., 2011).

To unravel the potential therapeutic applications of these identified compounds, the researchers adopted a network pharmacology approach. This methodology enabled them to explore the intricate interplay between the compounds and their biological targets, offering profound insights into their modes of action. By leveraging the PASS online tool, they assessed the compounds' structure-activity relationships (SAR), focusing on their anticancer, antineoplastic, and anti-inflammatory properties. This critical step is instrumental in prioritizing compounds for

subsequent experimental validation and drug development Roy, 2024.

The study capitalized on a diverse array of bioinformatics tools and databases, including RCSB-PDB, PubChem, ProteinsPlus Server, PyMol, PyRx, Discovery Studio Visualizer, and UCSF Chimera. This comprehensive toolkit empowered the researchers to amass and analyze an extensive volume of data pertaining to the compounds' potential activities. A specific emphasis on the epidermal growth factor receptor (EGFR), particularly the 5xdk PDB structure, revealed the compounds' potential as EGFR inhibitors. Notably, 8JC, Euphornin, Harderoporphyrin, and Physalin G exhibited remarkable binding affinities to the EGFR, suggesting their potential as promising anti-cancer agents Halder, 2023.

The present study shows the immense therapeutic potential of *Blumea* species as a rich repository of bioactive compounds. The researchers' meticulous analysis and strategic integration of diverse tools and databases provide a robust framework for future research and developmental efforts. The encouraging findings, especially concerning the compounds' affinity for EGFR, necessitate further experimental and clinical investigations to validate these preliminary results. This study serves as a prime example of the synergistic relationship between traditional knowledge and contemporary scientific methodologies in drug discovery, opening up novel

avenues for the development of innovative treatments (Kulaphisit, 2023).

Methods:

Materials and methods:

Selection and retrieval of ligands:

Compounds from *Blumea oxyodonta* was selected as to evaluate inhibition of EGFR. Compounds were taken from HRLC-MS for ethanol extracts of inflorescence of *B. oxyodonta* by Kulkarni (2023) (Kulkarni, 2023). Three compounds were selected for docking against EGFR.

PubChem (Kim et al., 2023) was used to download 3D SDF files for the selected ligands. They were converted using PyMol (The PyMOL Molecular Graphics System, Version 2.5.5 Schrödinger, LLC; DeLano, 2002) in .pdb format.

Selection and retrieval of protein target:

Crystal structure of EGFR (PDB ID: 5XDK) was downloaded from RSCB PDB database. ProteinsPlus server (Fährrolfes et al., 2017; Schöning-Stierand et al., 2020; Schöning-Stierand et al., 2022) was used to predict the active site for already bound ligand.

Molecular docking:

Protein was prepared using UCSF Chimera (Pettersen et al., 2004; Meng et al., 2006; Yang et al., 2012) before docking. Docking was performed using PyRx (Dallakyan & Olson, 2015). Grid box

was adjusted so that the amino acids predicted from ProteinsPlus server lie into it. Binding affinities were predicted for 9 different binding pose for each ligand.

2D interactions of protein ligand complex:

Protein-ligand complex files were prepared using PyMol and 2D interactions were viewed using Biovia Discovery Studio (BIOVIA; Dassault Systèmes. Discovery Studio Visualizer, v21.1.0.20298). This helps to analyse essential amino acids taking part in binding of protein-ligand complex.

Result and Discussion

EGFR (PDB ID: 5XDK) with following properties was downloaded using PDB database.

Experimental Data Snapshot

- **Method:** X-RAY DIFFRACTION
- **Resolution:** 2.35 Å
- **R-Value Free:** 0.248
- **R-Value Work:** 0.217
- **R-Value Observed:** 0.219

Structure was prepared in UCSF chimera to remove ligands, adding hydrogen, removing solvent and adding charges before docking.

PyRx molecular docking was performed and results were compared with the already bound reference ligand to the target structure.

Table 1. Binding affinity for selected ligands with comparison to reference molecule

Sr. No.	Molecule	Binding affinity in kcal/mol
1	8JC (reference ligand)	-8.8,
2	Euphornin	-7.8
3	Harderoporphyrin	-8.6
4	Physalin G	-8.8

Binding affinity for Physalin G is equivalent to 8JC ligand whereas binding affinity for harderoporphyrin is very near to the reference ligand. These ligands can be considered as better

leads for developing drugs against EGFR. Protein-ligand interactions for these ligands are shown below

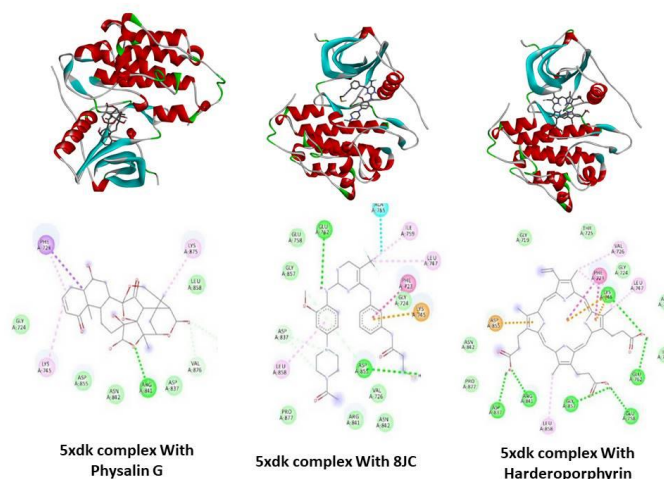


Figure 1. 2D interaction for selected compounds with EGFR (5XDK)

8JC shows hydrogen bonding with Glu762 and ASP855. Physalin G shows hydrogen bonding with Arg 841 and harderoporphyrin shows hydrogen

binding with Asp837, Arg841, Gly857, Glu758, Glu762 and Lys745. These amino acids are essential

for binding of these compounds along with those involved in hydrophobic interactions.

Conclusion:

EGFR being important target for cancer is evaluated by researchers for different inhibitors. Inhibition of this key enzyme is crucial for finding potent anticancer compounds. Aim of this study was to evaluate Physalin G, Harderoporphyrin and Euphornin from *Blumea* spp. as inhibitor of EGFR. Result of this study concludes that Physalin G can be potent inhibitor for EGFR in near future.

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Vicker's Microhardness Study of 1, 3 Dimethyl Urea Doped Amino Acid-Based L-Asparagine Monohydrate Single Crystals

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Abstract:

The effect of 1, 3 dimethyl urea on optical and mechanical properties of L-asparagine monohydrate single crystal has been investigated in the present study. Optical studies on grown crystals show decrease in absorbance and increase in energy band gap of doped crystals. From the mechanical study it has been seen that the Vicker's hardness number increases with applied load that confirm the Reverse Sized Indentation Effect (RISE). All the grown crystals belong to the soft category. The value of stiffness constant found to be high in doped crystals at higher load. It shows the presence of strong atomic binding force between the atoms. Increase in yield strength with applied load indicates the elastic nature of material. RISE pattern of grown crystals has been validated by Hay's and Kendall model.

Keywords: Reverse Sized Indentation Effect, Elastic stiffness constant, Yield strength, Hay's and Kendall model.

Introduction:

Nonlinear optical (NLO) crystal with good quality plays crucial role in many applications such as higher harmonic generation, optical computing, optical storage and processing devices. There is variety of NLO crystals used for these applications. But class of amino acid-based materials have certain fascinating characteristics like zwitterions, or donor carboxylic (-COOH) group and proton acceptor amino acid (NH₂) group, and absence of strong conjugate bond [1-2]. Among the amino acid family, L-asparagine monohydrate (LAM) is non-essential material, that crystallizes in an orthorhombic crystal form with non-centrosymmetric space group and lattice parameters $a=5.597\text{\AA}$, $b=9.819\text{\AA}$, $c=11.792\text{\AA}$ and $V=648.05\text{\AA}^3$. The crystal structure shows a complex web of hydrogen bonds between the L-asparagine to water molecule. Couple of reports were found in the literature on the optical, thermal, mechanical and NLO properties of LAM crystal. These studies on LAM mark its role in many device applications [1, 3].

It is well understood that the mechanical properties of host and doped crystals are important from photonic device application point of view. At the time of processing of material, to be used for device fabrication, data of mechanical properties of materials is crucial. There are different theoretical models have been proposed by the different people to evaluate the mechanical properties of material. Out of them, some are useful to explain the

mechanical properties of one crystal but other fail to do.

In a current investigation, we have selected 1,3 dimethyl urea as a dopant. It is one of the derivatives of urea. The two hydrogen atoms of -NH₂ group of urea replaced by -CH₃ groups in 1,3 dimethyl urea. Doping effect of 1, 3 dimethyl urea in inorganic and semiorganic crystals exhibits enhancement in mechanical, thermal, optical, and NLO properties of doped crystals [4]. Hence, in the present investigation, report on effect of 1, 3 dimethyl urea on mechanical properties of pure and doped LAM crystals has been discussed. The Mayer's law, Hays and Kendall model have been implemented on the obtained data.

Experimental Section:

Material Synthesis and Crystal Growth:

LAM salt was purchased from SD-Fine Chem., Ltd. India. The homogeneous aqueous solution of LAM was prepared and filtered using vacuum pump membrane filter assembly to remove the impurities, if any. Crystals of pure LAM and 1, 3 dimethyl urea (5 and 7 mol% concentrations) doped LAM named as LAM, DMU5 and DMU7, respectively, were grown from aqueous solution by mixing appropriate amount of 1, 3 dimethyl urea (SD-Fine Chem., India) into LAM by adopting slow solvent evaporation technique at temperature 35 °C.

Characterizations:

The obtained grown crystals were subjected to optical and microhardness study. Optical transmission of the grown crystals in ultraviolet

(UV)-visible range were measured with UV-visible spectrophotometer (Black-Coment-SR, StellarNet, USA) in the wavelength range of 200-800 nm. The mechanical strength measurement of the crystal has been carried out on a Shimadzu-HMV-G tester at room temperature. The crystal was polished with polishing paper to remove the impurities and defects present on the surface of the crystals. The hardness measurement was carried out on the good optical quality plane surface. The necessary and sufficient precautions were taken at the time of measurement so that the surfaces should not get contaminated. Variation in microhardness number with applied load was checked by indenting the load of 5, 10, 25, 50, and 100 g on the surface of the crystal with a fixed indentation time of 10 s. A set of five indentations were made for each load. The average of all diagonal lengths (d) was calculated for all

crystals to get precise value of mechanical parameters.

Results and Discussion

UV-Visible Spectroscopy:

The information about the transmission range, cutoff wavelength and energy band gap of crystal is essential when we think about the NLO applications. Absorption spectra of grown crystal in the wavelength range 200-800 nm is shown in **Fig.1**. The low value of absorbance for doped crystals is observe in spectra. The energy band gap value for pure and doped crystal have been calculated by Tauc's formula. It is found to be 5.15, 5.18 and 5.21eV for LAM, DMU5 and DMU7 crystals, respectively. Absorbance and band gap value increases with doping concentration. Increased band gap and low absorbance of doped crystals marks good optical properties of crystal.

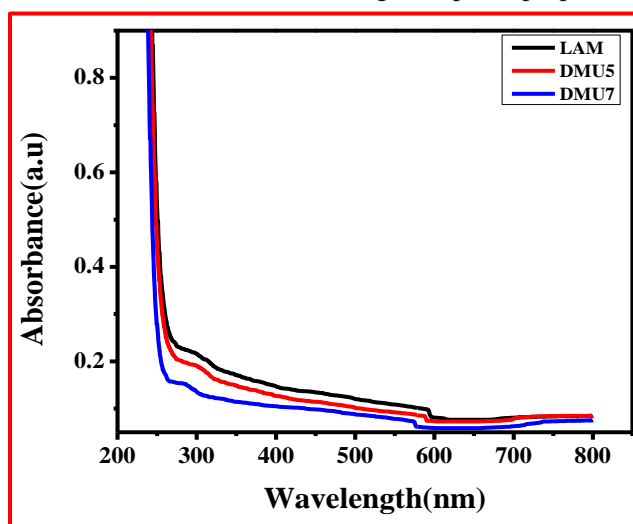


Fig.1. Absorption spectra of pure LAM, DMU5 and DMU7 crystals

Vicker's Micro-hardness test:

Micro hardness is one of the important tools to measure the mechanical strength and deformation characteristics of material. It also helps to examine the material stability against the device application as it undergoes the cutting and polishing process [5]. The Vickers Hardness number (Hv) of grown sample has been estimated by using the formula, $Hv = 1.8544 \cdot P/d^2$, Where, Hv is Vickers hardness number (kg/mm^2), P is applied load (kg), d is average diagonal length (mm). Variation of Hv with applied load for pure LAM and doped LAM has been illustrated in **Fig. 2(a)**. When the Hv decreases

with increase in load, it shows normal indentation size effect (ISE). In current investigation, we found the reverse nature of graph for all the samples predicting reverse size indentation effect (RISE)[6]. Graph also demonstrated the hardness number is enhance by increasing dopant concentration. Increase in hardness number in doped crystals indicates large amount of stress is required for occurrence of dislocation in doped crystal relative to the host LAM. Increase in the Hv in doped crystals may attributes to the presence of zwitterionic nature of amino acid.

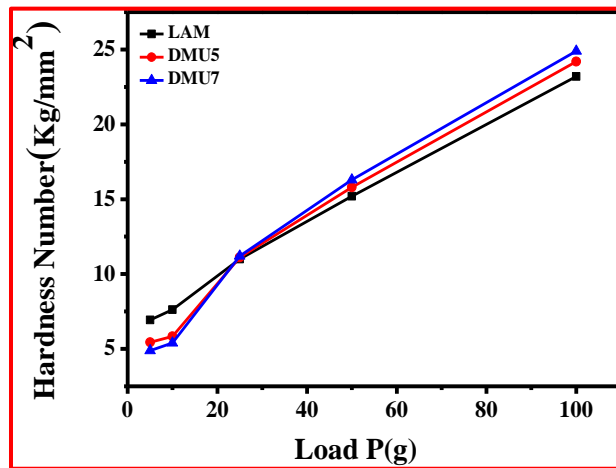


Fig.2 (a). Graph of Hardness number vs applied load (P) for LAM, DMU5 and DMU7 crystals

Mayer’s work hardening coefficient (n) were calculated by taking slope of the graph Log(P) vs Log(d) as shown in Fig.2(b) according to equation $P=kd^n$. Where, k is the constant, n is work hardening coefficient. The value of n for LAM, DMU5 and DMU7 crystals were estimated to 3.33, 4.1 and 4.6,

respectively. According to Onistch, if value for n lies in between 1 to 1.6, material belong to hard category and if it is more than 1.6, it belongs to soft one. Hence, the present crystals belongs to soft category.

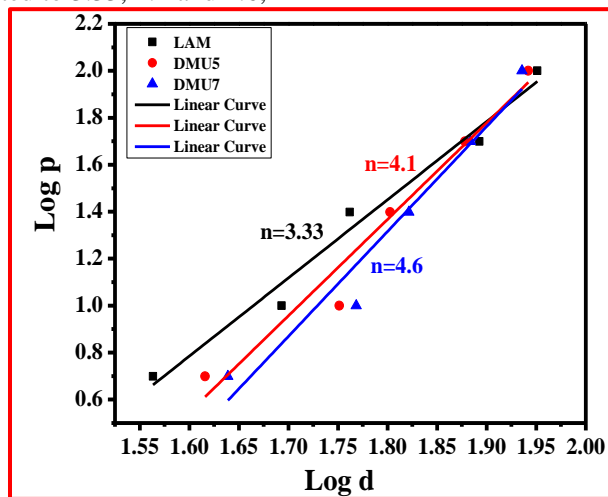


Fig.2(b). Plot of Log d vs Log P

Elastic stiffness constant (C_{11}) can be evaluated by Wooster formula, $C_{11} = (Hv)^{7/4}$. Graphical pattern of elastic stiffness constant with applied load in

Fig.2(c) shows stiffness constant is varies with increase in load. It indicates atomic binding force between the atoms is strong.

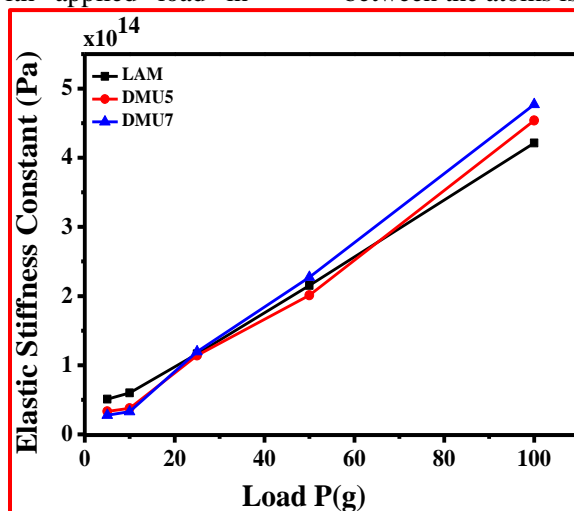


Fig.2(c). Graph of elastic stiffness constant vs applied load (P) for LAM, DMU5 and DMU7 crystals

Yield strength is nothing but the maximum strength of material. It shows material elastic properties and

ability to withstand against high stress without getting deformed [6]. The yield strength (σ_y) can be

evaluated by using the formula $(\sigma_y) = (H_v/3) * (0.1)^{n-2}$ [7].

The graph of yield strength against the applied load have been drawn in Fig.2(d). It shows increasing nature of yield strength with applied load.

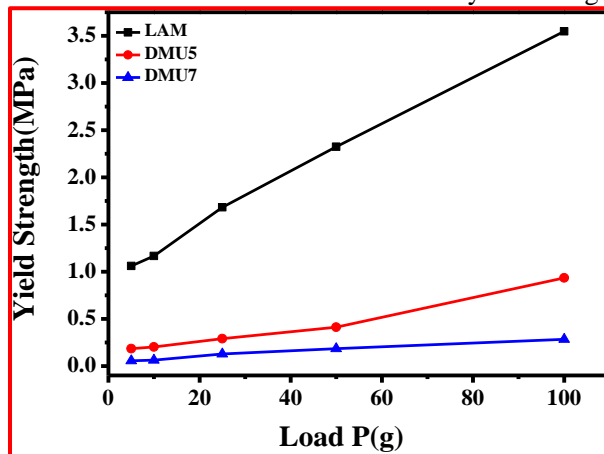


Fig.2 (d). Graph of yield strength vs applied load(P) for LAM, DMU5 and DMU7 crystals

Hay's and Kendall describe the theoretical model for hardness. According to the theory, load depended hardness (W) is calculated by formula $P = W + Ad^2$

Where, W denotes the minimum applied load needed to does not initiate permanent deformation (Newtonian Pressure) and A is load independent constant. By drawing the graph in between Load P and d^2 for pure and doped LAM as shown in Fig. 2(e). Value of W and A have been calculated by linear fitting method. The slope gives value for A and intercept gives value for Newtonian pressure. $W > 0$ suggest the normal indentation size effect (ISE) whereas $W < 0$ suggest reverse

indentation size effect (RISE) [5]. It is observed from the graphs that, the value of intercept and slope increases with doping concentrations and found highest in case of DMU7. From the graph, negative value of intercepts shows validity of RISE pattern for grown crystals.

The corrected hardness H_0 , Moh's number and elastic modulus has been estimated by the following relation, respectively [8],

$$H_0 = 1854.4 * A_1$$

$$H_M = 0.675 * (H_V)^{1/3}$$

$$E = 81.9635 * \sigma$$

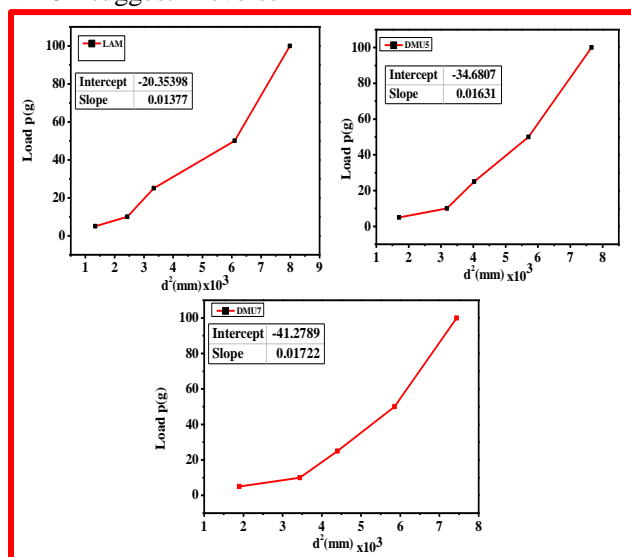


Fig. 2(e) Graphs depicting applied load against d^2 for pure and doped crystals

Moh's hardness number (H_M) signifies the material hardness properties. If Moh's no is less than 4 then material is considered to be soft, otherwise hard. The calculated Moh's hardness number for maximum applied load i.e. at 100 g are 1.90, 1.93, 1.95 for LAM, DMU5 and DMU7. It is observed that, H_M value increases with increase in dopant

concentration. The softness increases with increase in concentration of dopant. It shows soft nature of doped crystal. Value of all mechanical parameter at maximum load of 100 g is tabulated in Table 1 and 2.

Table 1. Mechanical parameter at 100g applied load.

Sample name	Corrected hardness (Ho)		Elastic modulus
LAM	LAM	25.535	156.14
DMU5	DMU5	30.245	158.33
DMU7	DMU7	31.932	159.83

Table 2. Corrected hardness and elastic modulus at 100 g applied load

The above study confirms the dopant 1,3 dimethyl urea influences the optical and mechanical properties of host material LAM.

Sample name	Vicker's hardness number	Stiffness constant	Yield strength
	(Kg/mm ³)	(Pa)x 10 ¹⁴	(MPa)
LAM	23.2	4.214	3.547
DMU5	24.2	4.534	0.628
DMU7	24.9	4.769	0.282

Conclusions:

Optical and mechanical studies of 1,3 dimethyl urea doped LAM crystals have been reported. Low value of absorbance and wide band gap of DMU5 and DMU7 crystals confirmed their use in NLO and optoelectronics device applications. RISE in all grown crystals has been confirmed from mechanical study. The pure LAM, DMU5 and DMU7 crystals belongs to soft category. The binding strength in doped LAM crystals are more than the pure LAM crystal. Increase in yield strength with applied load indicates the elastic nature of material. Therefore, doped crystal may be used in optoelectronic device applications.

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Soil Nutrients Analysis for Agriculture: A Comprehensive Study

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Abstract:

This research paper investigates the critical role of soil nutrient analysis in agricultural practices. It highlights the importance of understanding soil composition to optimize crop yields, enhance soil health, and manage sustainable agricultural systems. The study encompasses methodologies for soil sampling, analysis techniques, interpretation of results, and practical applications in nutrient management.

Keywords: Soil Nutrients, Agricultural Soil Analysis, Nutrient Management, Crop Yield, Soil Health, Precision Agriculture, etc.

Introduction:

Soil is a vital resource in agriculture, providing essential nutrients for crop growth. However, the nutrient content of soil can vary significantly, necessitating regular analysis to inform fertilization strategies. This paper aims to explore the significance of soil nutrient analysis, the methodologies employed, and the implications for agricultural productivity.

Objectives:

1. To assess the nutrient status of agricultural soils.
2. To evaluate the impact of soil nutrient levels on crop yield.
3. To provide recommendations for effective nutrient management based on soil analysis.

Literature Review:

University of California, Santa Cruz. (n.d.). Soil Tests and Amendments. This resource provides guidelines on reading and interpreting soil analysis reports, nutrient budgeting, and selecting appropriate soil amendments for sustainable agriculture [1].

Tejero, I. F., Gálvez Ruiz, B., & Cuadros Tavira, S. (2022). Analysis of soil nutrient content in sustainable agriculture areas. *Soil Systems*, 6(4), 1–37. This study analyzes the nutritional content of soil in sustainable agricultural areas and discusses

the implications for improving agricultural practices [2].

Soil and Plant Analysis Council Inc. (2000). *Soil Analysis Handbook of Reference Methods* (1st ed.). CRC Press. This handbook provides standardized methods for soil analysis, essential for determining soil fertility and nutrient management in agriculture [3].

Dhanavel, D., et al. (2023). Analysis and Prediction for Agriculture Dataset with Weather Conditions and Soil Nutrients Level Using Machine Learning Classification Approaches. *Eur. Chem. Bull.*, 12(1), 5166–5178. This paper discusses various data mining techniques used for analyzing soil nutrient datasets and their implications for fertilizer recommendations [4].

Bargaz, A., et al. (2018). Soil Microbial Resources for Improving Fertilizers Efficiency in an Integrated Plant Nutrient Management System. *Frontiers in Microbiology*, 9, 1–15. This article explores the role of soil microbial communities in enhancing fertilizer efficiency, which is closely related to soil nutrient analysis [2].

Methodology:

Soil Sampling: Techniques for collecting representative soil samples from various agricultural fields.



Laboratory Analysis: Overview of chemical and physical analysis methods, including pH measurement, nutrient extraction, and organic matter assessment.

Data Interpretation: Guidelines for interpreting soil analysis reports, focusing on nutrient availability and soil fertility status.

Results:

Nutrient Levels: Presentation of findings regarding nitrogen, phosphorus, potassium, and micronutrient levels across different soil types.

Table 1: Soil Test Analysis Reports of Sample Number 1

Sr. No.	Properties	Reading	General	Shera
1	pH	7.0 pH	6.5-7.5	Ordinary
2	Salinity	0.30	0-1	Ordinary
3	Organic Carbon	0.30 (Percent)	0.40-0.60	Less
4	Nitrogen (N)	235(kg/H)	240-480	Less
5	Phosphorus (P)	14.10 (kg/H)	14-21	Medium
6	Potassium (K)	136 (kg/H)	150-200	Less

Table 1: Soil Test Analysis Reports of Sample Number 2

Sr. No.	Properties	Reading	General	Shera
1	pH	7.12 pH	6.5-7.5	Ordinary
2	Salinity	0.30	0-1	Ordinary
3	Organic Carbon	0.30 (Percent)	0.40-0.60	Less
4	Nitrogen (N)	227(kg/H)	240-480	Less
5	Phosphorus (P)	14 (kg/H)	14-21	Medium
6	Potassium (K)	143.25 (kg/H)	150-200	Less

Table 1: Soil Test Analysis Reports of Sample Number 3

Sr. No.	Properties	Reading	General	Shera
1	pH	6.6 pH	6.5-7.5	Ordinary
2	Salinity	0.38	0-1	Ordinary
3	Organic Carbon	0.31 (Percent)	0.40-0.60	Less
4	Nitrogen (N)	219 (kg/H)	240-480	Less
5	Phosphorus (P)	13.9 (kg/H)	14-21	Medium
6	Potassium (K)	140.5 (kg/H)	150-200	Less

Table 1: Soil Test Analysis Reports of Sample Number 4

Sr. No.	Properties	Reading	General	Shera
1	pH	7.1 pH	6.5-7.5	Ordinary
2	Salinity	0.32	0-1	Ordinary
3	Organic Carbon	0.43 (Percent)	0.40-0.60	Medium
4	Nitrogen (N)	248.3 (kg/H)	240-480	Medium
5	Phosphorus (P)	14.8 (kg/H)	14-21	Medium
6	Potassium (K)	151.6 (kg/H)	150-200	Medium

Table 1: Soil Test Analysis Reports of Sample Number 5

Sr. No.	Properties	Reading	General	Shera
1	pH	7.0 pH	6.5-7.5	Ordinary
2	Salinity	0.35	0-1	Ordinary
3	Organic Carbon	0.45 (Percent)	0.40-0.60	Medium
4	Nitrogen (N)	250.2 (kg/H)	240-480	Medium
5	Phosphorus (P)	14.0 (kg/H)	14-21	Medium
6	Potassium (K)	142.5 (kg/H)	150-200	Less

Table 1: Soil Test Analysis Reports of Sample Number 6

Sr. No.	Properties	Reading	General	Shera
1	pH	7.1 pH	6.5-7.5	Ordinary
2	Salinity	0.38	0-1	Ordinary
3	Organic Carbon	0.40 (Percent)	0.40-0.60	Medium
4	Nitrogen (N)	240 (kg/H)	240-480	Medium
5	Phosphorus (P)	12.9 (kg/H)	14-21	Less
6	Potassium (K)	138 (kg/H)	150-200	Less

Soil nutrient levels significantly impact crop yields by influencing plant growth, health, and productivity. The availability of essential nutrients such as nitrogen (N), phosphorus (P), and potassium (K) is critical for optimal crop development. Here’s how soil nutrient levels affect crop yields:

Essential Nutrients and Their Roles:

- **Nitrogen (N):** A key component of amino acids and proteins, nitrogen is vital for chlorophyll production and overall plant growth. Adequate nitrogen levels enhance photosynthesis, leading to increased biomass and yield. Conversely, insufficient nitrogen can result in stunted growth and reduced crop yields.
- **Phosphorus (P):** This nutrient is crucial for energy transfer and photosynthesis. It plays a significant role in root development and flowering. Low phosphorus levels can lead to poor root systems and reduced flowering, directly impacting yield potential.

- **Potassium (K):** Potassium is essential for enzyme activation and photosynthesis. It helps regulate water use and improves plant resilience to stress. Adequate potassium levels are associated with better crop quality and higher yields, while deficiencies can lead to weak plants and lower productivity.

Impact of Nutrient Deficiencies:

Nutrient deficiencies can lead to various physiological and developmental issues in plants, which can severely limit crop yields. For instance:

- **Stunted Growth:** Lack of essential nutrients can cause plants to grow poorly, resulting in lower yields.
- **Reduced Resistance:** Nutrient-deficient plants are often more susceptible to diseases and pests, which can further decrease crop productivity.
- **Poor Quality:** Insufficient nutrients can lead to lower crop quality, affecting market value and profitability.

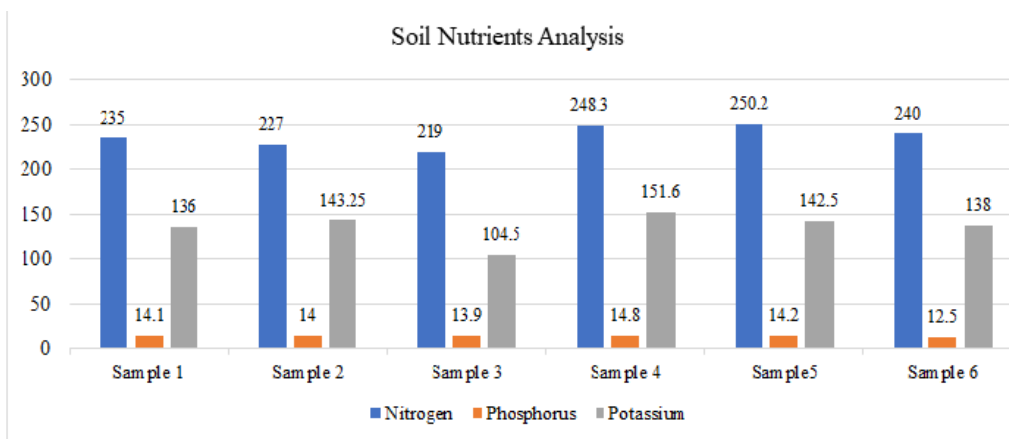


Fig. 1 NPK

Soil pH and Crop Response: Analysis of how soil pH affects nutrient availability and crop performance.

Fertilizer Recommendations: Development of tailored fertilizer application strategies based on soil nutrient analysis.

Discussion:

Impact on Crop Yields: Correlation between soil nutrient management and agricultural productivity.

Sustainability Considerations: Discussion on the environmental implications of nutrient management practices, including the potential for runoff and soil degradation.

Future Research Directions: Identification of gaps in current research and suggestions for future studies on soil health and nutrient management.

Conclusion:

Soil nutrient analysis is essential for effective agricultural management. By understanding the nutrient dynamics within soils, farmers can make informed decisions that enhance crop yields while promoting sustainable practices. Regular soil testing and tailored nutrient management plans are recommended to optimize productivity and maintain soil health.

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Sugar Analysis of Floral Nectar in Few Ornamental Plants

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Abstract:

Nectar, a carbohydrate-rich solution primarily made of sugars, is produced and secreted by nectaries, which are secretory structures found in plants that are pollinated by insects. Twenty plants were studied out from which six plants are put forward in this study. The present results provide valuable information about various sugars of Nectar secreted from various ornamental plants which helps in a pollination process and increases the visit of pollinators. Understanding the composition of sugar of nectar could aid farmers and beekeepers in raising the caliber of their produce. Therefore, we determined sugar forms in the nectar of few ornamental plants belongs to different families.

Keywords: Nectar, Thin Layer Chromatography (TLC), Sugar Analysis

Introduction:

The evolution of seeds plants' flowers and blossoming patterns is mostly due to selection for efficient pollen grain transport by a variety of agents, including wind, water, different types of insects, birds, and other animals. Entomophily is one of the primary cross-pollinating methods that has been essential to the evolution of angiosperms. Nectar gland presence is a biological trait since it is associated with a crucial pollinator role.

Numerous chemical components, including sugars, proteins, lipids, antioxidants, and amino acids, are known to be present in nectar (Baker and Baker, 1983). However, sugars make up the majority of these solutes and serve as the main source of energy for visits. According to Percival (1961) and Herrera et al. (2006), the most prevalent sugars in nectar are the hexose monosaccharides, fructose and glucose, and the disaccharide sucrose.

Clay Carter and et al (2006) Plants entice visiting pollinators with their metabolically rich floral nectar. In addition to carbohydrates, nectar also contains amino acids. Nectar secretion is typically controlled by underdevelopment and starts just before anthesis. Nectar production stops after pollination, and any nectaris that remain are often resorbed (Burquez and Corbet 1991). Many organisms can participate in floral pollination, but the class Insecta has proven particularly adept at taking advantage of this ecological niche. The three most significant of these are sucrose, glucose, and fructose; however, the nectar of some flowers also contains additional carbohydrates. (Baker and Baker 1981; Jackson and Nicolson 2002)

Material and Method:

To analyse sugar concentration qualitatively, few ornamental plants such as *Jasminum nitidum*, *Jasminum subtriplinerve*, *Kalancho*, *Euphorbia milii*, *Polyanthes tuberosa*, *Salvia splendens* are collected from Akot region. Nectar isolated from nectar glands with the help of capillary tube and then thin layer chromatography was done. Chromatogram shows different sugars and these sugars identified after comparative study of standards of sugars.

Following are the plants of different family shows fructose, glucose and sucrose in chromatogram.

1. *Jasminum nitidum* (Oleaceae)
2. *Jasminum subtriplinerve* (Oleaceae)
3. *Kalancho* sp. (Crassulaceae)
4. *Euphorbia milii* (Euphobiaceae)
5. *Polyanthes tuberosa* (Asparagaceae)
6. *Salvia splendens* (Lamiaceae)

Results:

We assume that TLC method is efficient and easy method to analyse sugars from the nectar gland. Sugar such as fructose, glucose and sucrose were found in these plants nectar. In *Kalancho* and *Polyanthes tuberosa*, fructose, glucose and sucrose all three standards sugars found while in *Euphorbia* sp., *Jasminum nitidum*, *Jasminum subtriplinerve*, *Tecoma capensis*, sucrose and fructose found. All these results affected by the environmental factors and flowering period as it produces low amount of nectar.

TLC photoplates of sugar analysis:

P1



P2



P3



P4



P5



P6



(Photoplates-P)- *Jasminum nitidum* P1, *Jasminum tuberosa* P4, *Euphorbia mili* P5, *Tecoma capensis* subtriplinerve P2, *Kalancho* P3, *Polyanthes* P6

Observation Table showing results of sugar analysis through TLC:

Sr. No.	Species	Fructose	Glucose	Sucrose
1.	<i>Jasminum nitidum</i> (Oleaceae)	+	-	+
2.	<i>Jasminum subtriplinerve</i> (Oleaceae)	+	-	+
3.	<i>Kalancho</i> sp. (Crassulaceae)	+	+	+
4.	<i>Euphorbia milii</i> (Euphobiaceae)	+	-	+
5.	<i>Polyanthes tuberosa</i> (Asparagaceae)	+	+	+
6.	<i>Salvia splendens</i> (Lamiaceae)	+	-	+

Discussion:

In earlier research, nectar was extracted using filter paper in order to analyze its amino acid content (McKenna & Thomson, 1988; Petanidou et al., 2006). In contrast to the filter paper method, the microcapillary method in our investigation yielded samples with much greater sugar concentrations and a dramatically different sugar composition. It is clear from this study that sugar analysis of nectar depends and influenced by the environmental factors, flowering periods as these things decreases the nectar volume which affects the sugar analysis.

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The Study on Lung Capacity of Senior Citizen: Role Yoga and Pranayam

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Abstract:

Yoga is basically a spiritual discipline dependent on an amazingly unpretentious science, which centers around bringing agreement among psyche and body. It is a craftsmanship and study of sound living. The word 'Yoga' is gotten from the Sanskrit root 'Yuj', signifying 'to join' or 'to burden' or 'to join together'. For the above investigation the legitimate strategy has been finished by the analyst. For this investigation the specialist picked the elderly folks individuals who consistently perform yoga activities of the old age home in Yavatmal district. In the wake of gathering the information, the information has been determined and dissected by factual strategies. The breathing limit was examined of the senior residents who consistently used to perform yoga practices and pranayam. The near investigation was done to break down the breathing limit of the senior residents routinely performing yoga and pranayam.

Keywords: yoga, pranayam, breathing activity, exercise

Introduction:

The practice of yoga probably originated from the actual day of human development. The origins of yoga research date back millennia, some time before the emergence of major religions or belief systems. In yoga legend, Shiva is considered the primary yogi, or adiyogi, and the primary guru, or adi-guru. A few thousand years earlier, Adiyogi poured out his crucial knowledge of the incredible Saptarishi or "seven sages" on the banks of the Kantisarovar Lake in the Himalayas. Sages spread this pioneering science of yoga to different parts of the world such as Asia, the Middle East, North Africa and South America. Strangely enough, modern scientists have noticed and marveled at the similarities between ancient societies all over the world. Yoga is a fundamentally profound discipline that relies on an incredibly humble science that focuses on harmonizing the mind and body. It is the science of work and a solid life. The word "yoga" is derived from the Sanskrit word "Yuj" which means "to unite" or "to load" or "to unite". According to the sacred texts of yoga, the act of yoga causes the union of individual consciousness with universal consciousness, showing the ideal compatibility between psyche and body, man and nature. According to current scientists, everything in the universe is just a sign of a similar quantum atmosphere. In this regard, the goal of yoga is the realization of the Self, the overcoming of various sufferings that lead to the "condition of freedom" (moksha) or "possibility" (Kaivalya). The main goals of yoga practice are to live with possibility, well-being and harmony." "Yoga" also refers to an inner science that includes a number of techniques

that enable people to realize this union and control their own destiny. , which is generally. Considered as the "immortal social result" of the development of the Indus Sarasvati Valley - from 2700 BC until now it has proven to be effective for both material and profound upliftment of humanity. The real nature of Yoga Sadhana is the basic human qualities. In modern yoga it involves synchronizing the breath with the movements between asanas as an exercise, but on the other hand it is one infallible function of breathing that is usually practiced after asanas." reduces constant pressure planning, relaxes the psyche, focuses attention and sharpens fixation. The benefits of yoga for seniors are the same as for everyone: increased muscle tone, balance (which is especially important), strength and improved well-being. With the help of Pranayama (breathing activities), the boundary of the lungs expands. You can expect that your posture will improve and you will be able to rest better. Yoga improves flow and tissue perfusion. It increases the strength of the respiratory muscles and reduces voluntary reactivity, thus helping to reduce pressure and anxiety.

Breathing Capacity:

Gas trade during breath happens basically through dispersion. Dispersion is a cycle wherein transport is driven by a fixation slope. Gas particles move from an area of high focus to a locale of low fixation. Blood that is low in oxygen focus and high in carbon dioxide fixation goes through gas trade with air in the lungs. The air in the lungs has a higher centralization of oxygen than that of oxygen-drained blood and a lower grouping of carbon dioxide.

1. Tidal volume (image VT or TV) is the lung volume addressing the ordinary volume of air dislodged between typical inward breath and exhalation when additional exertion isn't applied. In a sound, youthful human grown-up, flowing volume is roughly 500 mL for every motivation or 7 mL/kg of weight.
2. The inspiratory hold volume (IRV) is the extra measure of air that can be breathed in after a typical motivation (flowing volume).
3. Expiratory hold volume- The extra measure of air that can be lapsed from the lungs by decided exertion after ordinary termination — look at inspiratory hold volume.
4. Residual volume- The volume of air actually staying in the lungs after the most persuasive lapse conceivable and summing normally to 60 to 100 cubic inches (980 to 1640 cubic centimeters) called lingering volume.
5. Inspiratory limit is the volume of air that can be roused following an ordinary, calm lapse and is equivalent to flowing volume + inspiratory save volume.
6. Expiratory limit is the maximal volume of air that can be breathed out after finished resting motivation. Expiratory limit is equivalent to the amount of flowing volume and expiratory hold volume. $EC = VT + ERV$.
7. Vital limit is the greatest measure of air an individual can oust from the lungs after a most extreme inward breath. It is equivalent to the amount of inspiratory hold volume, flowing volume, and expiratory save volume. It is around equivalent to Forced Vital Capacity.
8. Total lung limit is the volume of air present in the chest after full motivation. The absolute lung limit (TLC), around 6,000 mL, is the greatest measure of air that can fill the lungs ($TLC = TV + IRV + ERV + RV$).

Pranayam:

Yogic breathing exercises, otherwise known as pranayama, are an important part of a creative yoga practice. Pranayama is one of the eight branches of yoga referred to in the Yoga Sutras of Patanjali, suggesting that it was considered a necessary step in the path of edification. Prana means energy, breath or life force. Understanding the management and control of prana in the body has been considered an important part of yoga for some time. As an important key skill, breathing is a mandatory introduction. While we can't control whether we breathe, we can have some control over how we relax. Breath control activities such as breath retention and proper inhalation and exhalation techniques to achieve clear spiritual and real benefits are the core of pranayama practice.

Pranayama Exercises

1. Three-Part Breath - Dirga Pranayama: A decent breathing activity for fledglings. Doing three-

section breath shows you how to fill and discharge the lungs totally, which is significant on the grounds that you're likely not used to utilizing your full lung capacity.² It's likewise a pleasant method to change into your yoga meeting.

2. Equal Breathing - Sama Vritti Pranayama: Taking long, profound, moderate breaths relaxingly affects the body. Carrying your complete consideration to keeping your inward breaths and exhalations a similar length consumes your psyche, offering it a much need relieve from its typical murmur of action.
3. Alternate Nostril Breathing - Nadi Sodhana: In nadi sodhana, you close off one nostril, breathing out and breathing in through the open way prior to exchanging sides.² This brings you into balance by clearing the energy channels on the two sides of the body.
4. Cooling Breath - Shitali Pranyama: A basic breath, ideal for a hot day or when the body is warm in the wake of rehearsing yoga stances.
5. Ocean Breath - Ujjayi Pranayama: Ujjayi breath is truly fascinating in light of the fact that it acts to quiet the thoughtful sensory system simultaneously as it helps your oxygen utilization. It is the essential breath utilized in vinyasa yoga since it is adequately incredible to help an overwhelming stream.
6. Lion's Breath - Simhasana: Lion's breath delivers the strain in your face and causes you brush off some steam.² you can do it whenever during a yoga practice.

Survey of Literature

Lee SW, Mancuso CA, Charlson ME. Imminent investigation of new members locally based psyche body preparing program. *J Gen Intern Med.* 2004;19(7):760-5. Tracking down: A 3-month yoga program improved psychological wellness scores and other personal satisfaction measures. Yoga Type: Dahn-hak. 1) extending practices for enormous muscle gatherings and shoulders, neck, hips, back, and knees, 2) stances are held for "energy amassing 3) 5-to 10-minute reflection proposed to encourage "energy mindfulness", 4) redundancy of the huge muscle bunch stretches. Yoga Frequency/Duration: 1-hour class offered 2-to-3 times each week for a very long time.

Uebelacker LA, Epstein-Lubow G, Gaudiano, BA. Hatha. Yoga for discouragement: basic survey of the proof for adequacy, conceivable instruments of activity, and headings for future examination. *J Psychiatr Pract.* 2010;16:22–33. FINDING: A survey of eight clinical preliminaries showed the yoga may help treat sadness. Note: Methodological worries with most trials. Yoga Type: Some asana-zeroed in, some contemplation focused. Yoga Frequency/Duration: Varied long from

3 days to 12 weeks and in power from day by day to once each week.

Birdee GS, Legedza, AT, Saper RB. Attributes of yoga clients: aftereffects of a public study. J Gen Intern Med. 2008;23(10):1653-1658. A public overview of yoga clients demonstrated it to be useful for generally speaking wellbeing and prosperity, emotional wellness, and musculoskeletal conditions. Yoga Type: N/AYoga Frequency/Duration: Self-report that individual had rehearsed yoga during recent months (and not kendo or qi gong)

Woolery A, Myers H, Sternlieb B, Zeltzer L. A yoga intercession for youthful grown-ups with raised side effects of despondency. Modify Ther Health Med. 2004;10(2):60-63. A 5-week program of yoga showed decreases in misery and nervousness among youthful adults. Yoga Type: IyengarYoga Frequency/Duration: Two 1-hour classes each week for 5 weeks.

Methodology:

When researcher used to research about any topic, it needs to have proper direction over it. When there occurs any kind of problem then to direct the research properly and face the problem it needs to

concentrate on the direction and proper way of research. For this it is important to collect the proper data for research. Statistical methods were used in this study to analyze the data. After this the values were calculated and Mean and S.D. were calculated and from this ‘T’ ratio was also calculated. After the calculation the researcher concluded the study.

Formulae:

$$\text{Mean} = \frac{\text{Sum of terms}}{\text{Number of terms}}$$

$$\text{Standard Deviation} = \sqrt{n-1 \sum_{i=1}^n (x_i - \bar{x})^2}$$

Selection of Topic: For this study the researcher chose the old people who regularly perform yoga exercises of old age home in Yavatmal District.

Sources of Data: For the above the study the researcher had data collection through old people.

Collection of data: The researcher collected the data of through old people who regularly performed the yoga exercises. The age of the old people were 50 to 60 from them researcher chose 44 senior citizens randomly.

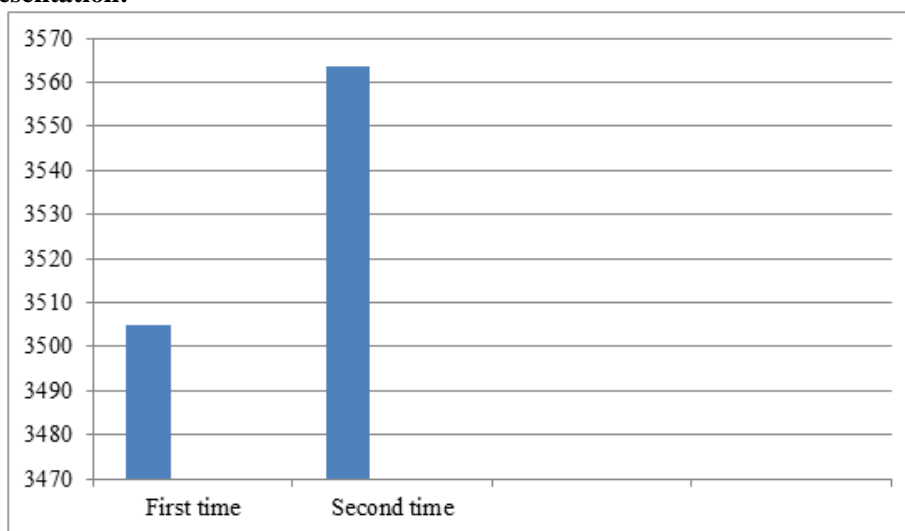
Analysis: The researcher analyzed the Mean, S.D. and ‘T’ ratio of the senior citizens and studied their breathing capacity.

Sr. No	Vital Capacity	Mean	S.D.	Mean Difference	‘T’ Ratio
1	First time Calculated Breathing capacity	3505	749.07	58.75	0.24
2	Second time Calculated Breathing Capacity	3563.75	1350.19		

From the above table, it examined that first time the Mean of the breathing capacity of the senior citizens were 3505 and second time the Mean of their breathing capacity were 3563.75 hence the Mean difference were 58.75. Similarly the the S.D. of

senior citizens first time were 749.07 and second time it was 1350.19 and hence ‘t’ ratio was 0.24. Hence the table shows that the breathing capacity of senior citizens second time were more than it calculated first time.

Graphical representation:



Conclusion:

The breathing capacity was examined of the senior residents who routinely used to perform yoga practices and pranayam. The relative investigation was done to dissect the breathing limit of the senior resident's regular performing yoga and pranayam. The above investigation it found that the breathing limit determined second time was more than the breathing limit determined first time.

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**An analysis of feminist literary criticism in the novel "*Woman at Point Zero*"
by Nawal El Saadawi**

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Abstract:

In the recent novel, *The Woman at Point Zero*, by Nawal Al-Saadawi, feminist literary criticism is a prominent and recurrent theme. This paper explores how this theme is used and elaborated upon in the novel and discusses some of the ways in which it contributes to the overall narrative. It also explores some of the ways in which feminist literature criticism can be useful for readers of this novel. *The Woman at Point Zero* by Nawal Al-Saadawi is a novel that has been subjected to feminist literary criticism. This type of criticism aims to explore the ways in which female characters are portrayed and to identify the ways in which these characters can be seen as feminists. It provides an overview of the novel's main characters and discusses their role in feminist literary criticism. It will also discuss some of the themes raised by the female characters, and how they relate to feminism. Literature criticism can be a difficult and often subjective genre of writing. However, when it comes to feminist literature, the criticism can be even more difficult to engage with. In *The Woman at Point Zero*, Nawal Al-Saadawi challenges many of the traditional assumptions about feminist literature. It explores some of the criticisms that have been leveled against the novel and discuss how they relate to issues of gender and power.

Keywords: feminist literature, criticism, woman at point zero, gender and power.

Introduction:

One of Nawal Al-Saadawi's most well-known fictional works is *The Woman at Point Zero*. Malay is a young lady who is struggling to survive in a world that has turned its back on her. Malay is a scientist who has innovative ideas that go against the grain. In a world where she doesn't belong, she tries to find her place. Readers of all ages will be affected by the strong and timeless writing of *The Woman at Point Zero*. She is aware from personal experience that women are frequently targeted for violence. Women encounter several difficulties and problems every day, ranging from slut-shaming and catcalling to violence and sexism in the workplace. Al-Saadawi thoroughly examines these topics in her book *The Woman at Point Zero* and presents her distinct perspectives and experiences as a woman of colour. She narrates the tale of Layla, a lady who has spent the previous fifteen years in a state of suspended animation, in her debut book, *The Woman at Point Zero*. She is thrown into a realm of social upheaval and political instability as she starts to come back to life. Between the security of her cocoon and the unpredictability of the outside world, Layla must make a decision. Readers will be drawn in right away by this stirring and thought-provoking book. *The Woman at Point Zero* is a crucial and potent work of fiction that speaks to the

difficulties that women now face. Readers will be changed by its insightful insights into the ways that racism and sexism touch every area of our lives, leaving a lasting impression. *The Woman at Point Zero* is the ideal book if you're looking for something that touches your heart. Readers are bound to be profoundly affected by *The Woman at Point Zero*'s intelligent and compelling examination of the difficulties facing women today. (Adams,1991:88)

Nawal Al-Saadawi moved to London in 1984 after being born in Kuwait. In *Point Zero*, her debut book, Samar, a woman who relocates to London in the wake of the Gulf War and loses everything, is the main character. It was a dense and influential work that took home the prestigious Guardian First Book Award. Identity, love, and grief are major themes in Nawal Al-Saadawi's book is the woman at *Point Zero*. The story addresses touchy subjects including sexual assault, gender identity, and the effects of war on civilians. An original and intricate viewpoint on these subjects has been presented by the author in an engaging and readable way. In her much-praised book *The woman at Point Zero*, Nawal al-Saadawi relates the tale of Huda, a woman who lived in Cairo under Jamal Abdel Nasser. Saadawi was one of the few women who wrote in Arabic at the period, and her novel has won recognition for its

representation of female voices and emphasis on female characters. The book takes place in the 1950s and early 1960s, when women were fighting for equal rights. Huda is a driven individual who will do whatever it takes to reach her objectives, including going against social standards. She is also drawn to politics, a profession that was predominately male at the time. Huda's viewpoint on Egyptian history is fascinating thanks to Saadawi, and her story serves as a potent reminder of the challenges women back then faced. In the end, the book addresses issues like identity, love, and grief. Huda's story provides an informative view into the life of a woman in the Middle East during a period of political change. She faces numerous obstacles in life, including sexism and poverty. (Accad,1984:53)

The Influence of Women's Subjugation at Point Zero:

Different tools were employed by society to oppress women. The term "patriarchy" refers to masculine supremacy. Men are given an advantage over women in patriarchal societies that unequally allocate power between men and women. The masculine members of society are given the authority to rule and make decisions. The patriarchal limitations that have been imposed on Arab society's women have kept them there. The patriarchal system has a significant impact on how women are treated in Arab society. In this essay, the definition of patriarchy and how it affects women's rights are examined. This essay also looks at the female figures from Arabic mythologies that have fallen prey to male dominance. Through their writings, the female authors of Arabic English literature have also demonstrated the patriarchal structure of Arabic society. The female characters in Point Zero as the victims of male supremacy in women are also discussed in this study. (Chodorow,1987:22)

"My father would eat his dinner, have my mother wash his legs, and then he would go to bed as he did every night when one of his female children passed away. When the deceased child was a boy, he would beat my mother before eating his dinner and going to bed (18)"

Arab women are subjected to oppression. The wife was abused by the husband. This conundrum demonstrates how women have historically been degraded in Arab culture. The wife should give her husband everything in Arab culture. Al-Saadawi provided evidence that the woman appeared to be incarcerated. At her father's home, Firdaus faces even worse tyranny. While her father repeatedly abused her mother, she was watching. (Engels,1972:42)

Discussion of the Novel Woman at Point Zero by Nawal Al-Sa'adawi

Woman at Point Zero by Egyptian novelist and psychotherapist Nawal Al-Saadawi is the focal point of the introductory chapter. She is an

internationally renowned novelist whose fictional works provide a comprehensive and impassioned depiction of the situation of Egyptian women. She is well-known for her nonconformist and dissident beliefs that support women's emancipation. In *Woman at Point Zero*, the quiet anguish of a female prisoner, Firdaus, is depicted through her final narrative to the author/psychiatrist who visits her prison cell to hear her story after multiple unsuccessful attempts to meet her. Firdaus initially refuses to break her silence, but on the author's persistent Singh 231 demands, she decides to meet her the night before her execution in the Qanatir jail in Cairo. This is the genuine account of a prisoner whose memories made a lasting impression on the author. (El Saadawi,1980:13)

Saadawi's prolific writing, which includes novels, short tales, and plays, aims to create a global dialogue on women regardless of their race, socioeconomic status, or geographical location. Saadawi intends to introduce the Egyptian feminist discussion to the international audience in order to make the personal political and launch a global dialogue on women. Her fictional and nonfictional works advocate feminine sisterhood and human solidarity beyond the literary realm.(21)

This study begins with an examination of the beginnings of the selected novels. This study collected writings from various countries throughout the globe. The novel *Woman at Point Zero* by Nawal El Saadawi tells the story of a lady named Firdaus who is sentenced to death for the crime she commits. The novel begins with a depiction of rural life and then shifts to Cairo, where the remainder of the story is told. As the narrative progresses, both chronological and spatial changes in setting are recognized. A thorough foreword by Miriam Cooke and a preface by Saadawi introduce the novel *Woman at the Point Zero*. The prelude and the introduction prepare the reader for a remarkable literary experience. They establish an itinerary for the voyage and prepare the audience for the impending action. Cooke is a distinguished expert in Arab cultural studies. In the introduction, she states that Firdaus, the protagonist of the tale, is a globally renowned figure. Women recognize Firdaus as a character who inhabits the pages of a widely read and highly analyzed work. Cooke asserts that the narrative is about "a psychiatrist and a walking corpse" (vii), who meet in a jail cell in Cairo's Qanatir prison. Cooke clarifies that the story is factual with some fictional aspects and "unfolds a universal tragedy" (viii). Saadawi describes in the prelude how she met Firdaus in Qanatir prison. She was conducting study on the prevalence of neurosis among Egyptian women. The author's initial visit to Qanatir to meet female prisoners suffering from mental illness planted the seeds for her novel *Firdaus, or Woman at the Point Zero*. However, she

began researching twenty women with neurosis, and her findings were published in 1976 under the title *Women and Neurosis in Egypt*. After Firdaus was executed at the end of 1974, Saadawi wrote the novel *Woman at Point Zero*.

In *Woman at Point Zero*, the author constructs generally aggressive, dishonest, corrupt, and self-centered secondary characters. The dichotomy of good and evil is deeply ingrained in these characters. They rarely exhibit a grey hue since they are either hostile or cheerful. Even though Firdaus' uncle and his vicious wife are aware that she is their duty as an orphan, they show her no compassion. They have nothing against her to expose her to such injustice; nonetheless, their inner malice compels them to push her toward a horrifying future. Their ulterior motivations are nefarious, and they marry her off to an elderly, miserly man for their own gain. They carry out this act of savagery without remorse or regret. Because of their disinterest, Firdaus is ultimately stuck in prostitution and sentenced to death for murdering a pimp. Despite this, Firdaus has a companion named Wafiya who attempts to provide her with stability. Her appearance is like a rainbow that appears briefly in the sky and brings joy to all who observe it. Firdaus and Wafiya's friendship is an example of female sorority. Even during the latter hours of her life, she recalls her best friend and the joyful times they shared at school. She is a positive character in contrast to the novel's bulk of unpleasant characters. Firdaus falls in love with Ibrahim when she is working in an office. He first supports her and is captivated by her, but eventually marries a wealthy woman. She is devastated when she discovers that the man, she admired was in fact materialistic and self-centered. He never loved her, but always pretended to be an honest man in her presence. (Jaber,2001:26)

The acclaimed novel *Woman at Point Zero* (henceforth *Woman at Point Zero*) by Saadawi is not about an ordinary woman. This work is not a recounting of the horrible experiences of Firdaus, a lady the author encountered in Qanatir prison. This narrative transcends the normal limitations of novelistic discourse and introduces a fresh facet of Firdaus's self-disclosure. In reality, as indicated in the preface, this novel is actually titled *Firdaus*. The foreword to the work written by Miriam Cooke increases the aura of mystery, suspense, and fear surrounding the story of this lady sentenced to death. Cooke composes:

A psychiatrist and a dead-woman-walking confront each other at last. The psychiatrist has wanted to meet Firdaus for weeks, but the prisoner has consistently refused. Then, on her last night on earth she decides to tell her story. Slowly at first and then

faster and more urgently, Firdaus recounts a lifetime of betrayal and abuse. (WPZ vii)

The prisoner has been proclaimed dead prior to her execution due to her refusal to speak and take sympathy from anyone. Firdaus's self-revelation the night before her execution is her resolve to exhume the strings of dialogue by describing her story to a female psychiatrist who desires to listen to Firdaus and share her discourse with the world. The only way this novel came into existence was through the discourse that took place at the end of the female prisoner's life. If she had remained silent, her story would have never been told. When she accepts to speak, she agrees to enable her words to flow out of her mind and into the real world, where they will connect with Singh 42 and the other words that already exist in this dialogic cosmos. The dialogic element of this novel is its indisputable truth, as it is the dialogue or the protagonist's utterance that begins the story, and which continues even after she is sentenced to death. The discussion that begins with her speech is both controversial and pertinent. This work echoes the mood of another selected for study in which women are silenced on purpose for speaking out against the accepted code of behavior.

Firdaus proudly declares in *Woman at Point Zero*, "I was merely a successful prostitute" (WPZ:9), so emphasizing her current occupation. Later, she states, "with my Singh 45 secondary school diploma and repressed urges, I belonged to the 'middle class.' These remarks uttered by Firdaus indicate just how she feels about herself. As evidence of her education, she draws the reader's attention to the "secondary school certificate" she carried with her. Regarding her socioeconomic standing, she stated that she belonged to the middle class and was from the lower class by birth. Her class consciousness has had a profound effect on her sense of self. She is aware of the fact that her class exists. She continues by discussing her life as a resident of a rural village. As reported, her father was a poor peasant who was uneducated. He was skilled at using guile to survive, torture his wife physically, gain money by selling sick animals, trade his virgin daughter for dowry, and steal ripe crops from other people's farms. Her mother forces her to complete all household duties. Firdaus was forced to undergo female genital mutilation (FGM) by her mother, putting a stop to her childhood romantic games with Mohammadain, a young boy who lived next door. After undergoing this immoral surgery, she lost all connection with her body. When her uncle attempted to seduce her, she felt nothing within her body. She reveals that *I no longer felt the strong sensation of pleasure that radiated from an unknown and yet familiar part of my body. I closed my eyes and tried to reach the pleasure I had known before but in vain. It was as if*

I could no longer recall the exact spot from which it used to arise or as though part of me, of my being, was gone and would never return.

Female circumcision robbed her of her femininity and profoundly altered her character. Writers from over the world have penned renowned works about the gruesome surgical procedure of FGM. She argues further that "the tension between fantasy and reality lies at the heart of *Woman at Point Zero*, in its shape as both prologue and epilogue" (137). Saadawi's focus on the veracity of Firdaus's story is evidence of the surreal atmosphere of the prison cell. Fedwa suggests further that:

The discourse is shaped by the dialogue between the author and the main character. This study paves the way for additional research in the realm of body discourse and concerns pertaining to the reclaiming of the female body. The reclamation of the female body in gynocentric works has been the subject of worldwide literary research. Reclamation of the feminine body and annihilation of the female body are likewise a topic of contemporary debate. In Saadawi's story, the character's communication with the reader is facilitated by the physician. She is the instrument that brings the story to the public. As a physician, the author of the text does not distinguish between the patient's body and identity.

Patriarchy and sexual politics of Woman at Point Zero

El Saadawi attempts to expose the lies of patriarchal supremacy by deconstructing its hegemonic structures and revealing the reality. With each revelation relayed by Firdaus, "the curtain was pulled from my eyes" (72), revealing one of the diverse instruments of control that bind her. Arab women have been oppressed by patriarchal strategies of dominance, as exemplified by Firdaus's sexual and economic exploitation. Therefore, Firdaus's refusal to accept her status within these masculine structures of enslavement condemns her to death. According to Therese Saliba, Firdaus's story can be interpreted as an attempt to express a positive women's history and a subjectivity that empowers women in the face of imperial and patriarchal authority (Saliba: 1995). It appears that revealing her experience to a female therapist is necessary for Firdaus's survival. Experience has taught her that she does not need to reveal her story to anyone, as confiding in men like Ibrahim leads nowhere. Without the assistance of a compassionate female neighbor, Firdaus's escape from Bayoumi and his opportunistic male pals would not have been feasible. "One day, a neighbor observed me weeping through the door's lattice as I stood there. She inquired as to what was wrong, so I explained. She began crying alongside me and suggested we call the police (51). In this context, one may argue that female-to-female narrative represents solidarity,

mutual understanding, and a tradition of gender oppression shared by both genders.

Unquestionably, Firdaus's final run-in with an Arab royal captures the essence of Cairo, the Arab metropolis. "I will buy you at any cost. I'm a prince of Arabia (97). Such a situation can also be evaluated critically as a personal epiphany. For me, it represents a turning point in her life. Firdaus shatters the cash he gave her.

To unveil the entire mystery that had baffled me throughout, the genuine mystery of my life, I tore the money to pieces and tore off the veil, the last, last veil in front of my eyes. When my father extended his hand to me and gave me the first piaster he ever gave me, I had already realised this truth many years earlier. She destroys all the men she has ever known symbolically by tearing cash notes into pieces (98).

At the same time, I was eliminating every man I had ever known, one by one in a line: my uncle, my husband, my father, Bayoumi, Di'aa, Ibrahim... I was ridding myself of them completely, eradicating every trace their piasters had left on my fingers to leave nothing but bone, making sure that not even a single trace of these men would be left. Even her own finger, which touched the proceeds of the sexual act, had to be torn off in order for Firdaus to eventually be entirely free. Firdaus replied wisely, "I am not a prostitute," when the prince told her that he thought of her as a prostitute. But from a young age, my father, my uncle, my spouse, and everyone else taught me to become a prostitute (99). Here, Firdaus rebels and opposes her own unfair circumstance as a victim of patriarchal, governmental, and societal systems. Women are subjected to men's deception and are then punished for it. Males also reduce them to the lowest level and then punish them for doing so. Finally, men bind women in marriage and then punish them by subjecting them to lifelong menial labour, insults, or physical violence (86). Therefore, the issue is not penis envy or castration as asserted by George Tarabishi, but rather a struggle against all forms of masculine domination. Firdaus is accused of castrating by Tarabishi, who claims that she chose to work as a prostitute in order to practice frigidity since it is "castrating" (1988: 23).

Firdaus is viewed by Georges Tarabishi as neurotic rather than as an oppressed lady who rebels to win her own independence. In response to Tarabishi's accusations and in support of El Saadawi, she claims:

According to Tarabishi, Firdaus, the protagonist of Woman at Point Zero, is a neurotic prostitute who "avenges herself on every man for the gift she expected from her father and never received" and spends her entire life working for the collective castrating of all males. Firdaus, however, spends her entire life trying to transform men's penises

from a lethal weapon to a loving organ that can communicate human feelings. The fact that Firdaus is constantly amenable to a man's love serves as proof of this. She will put her weapons in the water and surrender herself completely out of love. (1988: 194-95)

In conclusion, there is a tendency to believe that women's liberation cannot occur unless moral, social, cultural, and other changes are made. Only through rebellion can women exercise their freedom. They must fight for their own emancipation by overcoming the constraints of their circumstance. In order to achieve this independence, a stable economic foundation must first be established. In order to attain one's aims; all women must stand together in solidarity under El Saadawi's vision for their independence. The local struggle must be joined by an international or global struggle. On all fronts, we must battle. The political must not be distinguished from the sexual, economic, religious, or cultural. We must continue our ongoing opposition and dissidence in order to pave the road for a better future for all human beings.

Conclusion:

Nawal El Saadawi has created intriguing and illuminating gyno-texts for people around the world. Her literature frequently depicts the major topics of clitoridectomy or female circumcision, Singh 77 honour-killing, incest, global patriarchal hegemony, yearning for uniqueness, psychological and physical health of women, and political and religious tyranny. Saadawi's depiction of harsh realities and her incisive social critique have elevated her status in Egyptian literature. *Woman at the Point Zero* is an investigation of the psychological and emotional trauma an Egyptian woman experiences during her life. However, this character emerges as a strong woman, a shero, since she never gives up her ability to recover from setbacks. She reclaims her body, mind, and spirit by being fearless in the face of the most difficult conditions. She is aware of the implications of her behaviour, but she does not conform in order to appease society. At the conclusion of the narrative, she is unafraid of adversity and rejects the value placed on money. She liberates herself from any materialistic ties that deteriorate her soul. She returns to society what society had attempted to impose upon her. Before meeting death, Firdaus is genuinely alive and not only a living corpse. That she speaks the brutal truth is what makes her a famous Saadawian hero. Saadawi's fictional works attempt to create a global conversation about women regardless of their race, social status, or geographical location. It emphasizes women's liberation based on definitive terms. This study of Saadawi reawakens an interest in bringing together experts from around the world to examine Arab

women's fiction and their challenges through a new lens.

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Optimizing Agile Project Management Strategies for Success in Dynamic IT Environments

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Abstract:

As IT projects are dynamic, we need to move away from inflexible process and towards more flexible approach. This study involves the creative strategies to maximize agile project management and get better results are in the dynamic changes. We go beyond the fundamental ideas and explore practical approaches to continuous feedback loops, iterative development, and Collaborators participation. Recognizing the challenges and problems that come with implementing Agile, we discuss how to preserve team compatibility and constant delivery quality are in exciting environments. By utilizing a varied strategy that includes the case studies, expert insights, and data analysis, this article gives IT project manager's practical methods to enhance project flexibility, efficiency and success. We expose the potential of that specialized agile methods in the adapted to particular requirements and organizational settings, offering a road map for embracing Agile and navigate the always changing landscape of projects.

Introduction:

Agile approaches have thrown this once-predictable field of IT project management into a dynamic Maelstrom. Agile concepts, which transform software development initially, this is now used as a guide to navigate the ever, changing ways of contemporary IT projects. Its three main principles such as adaptability, iterative development, and teamwork have a great deal of success potential. However, utilizing Agile's potential demands more than implementing novel methodologies [1].

In order to maximize agile project management and evaluate project results to unrivalled levels, this research paper, "Optimizing Agile Project Management Strategies for Success in Dynamic IT Environments," explores sophisticated techniques in this area. We drop into a hands-on inspection, breaking down the fundamental ideas of Agile and its progress that never endings. Next, we can successfully negotiate the complexity of including stakeholders which is like a dance, the beat of iterative development cycles, and the feedback loops that support the project's success [2].

The difference between the theoretical beauty of Agile frameworks and their clumsy processes, practical implementation in the heterogeneous IT environment served as the catalyst of that study. Although agile development is known for its agility and lightning-fast delivery of the products,

organizations frequently struggle with holding team cohesiveness, controlling scope creep, and guaranteeing consistent quality. By providing a thorough roadmap and carefully incorporating industry best practices, practical insights from case studies, and the experience of seasoned professionals, this paper seeks to close this gap.

Literature Review:

Smits and Rilliet's (2011) Agile Experience Report offers a thorough case study of Cisco's Voice Technology Group's adoption of Agile approaches, emphasizing the essential tactics for maximizing Agile Project Management in dynamic IT environments. The importance of implementing agile methodologies gradually to reduce resistance and foster cultural change is acknowledged in the paper. The authors stress the value of establishing cross-functional teams and maintaining close communication channels, and they provide examples of how these strategies enhance adaptability and collaboration. This Cisco experience provides a practical example of navigating complexity and implementing agile transformation in a large-scale IT infrastructure [3].

The paper "A Methodology for Assessing Agile Software Development Methods" by Soundararajan, Arthur, and Balci (2012) offers a structured way to assess the efficacy of Agile methodologies. The authors stress the necessity of a methodical framework for assessment in order to determine the

advantages and disadvantages of Agile techniques in different situations. Their methodology offers useful insights for optimizing Agile Project Management, taking into account metrics like productivity, quality, and stakeholder satisfaction. Organizations can better adapt Agile tactics to the unique requirements of dynamic IT systems by using these assessment techniques, which will increase the success of projects overall [4].

The paper "The Confidence of Agile Assessment Methods in the Context of Software Process Improvement" by Santana, Gusmao, Caetano, and Vasconcelos (2011) investigates the competence of several Agile assessment techniques in improving software processes. They emphasize how crucial it is to use thorough evaluation methods to make sure agile principles actually aid in process improvement. Through an emphasis on KPIs like customer satisfaction, team performance, and process adaptability, the authors offer enterprises a framework for evaluating and refining their agile techniques. These understandings are essential for customizing Agile approaches to flourish in dynamic IT settings, guaranteeing excellent project success and ongoing progress [5].

Methodologies

Users and How They Engage With Instruments and Processes

The notion that "Users and How They Engage with Instruments and Processes" indicates how important people and communication are to a project's success. Effective procedures and equipment are necessary, but they should not take precedence over to the need of open communication and teamwork. Agile approaches place more value on in-person interactions, teamwork, and adaptability than they can do on inflexible process. This strategy makes sure that the team members can work together to solve problems, adjust to changes fastly, and provide positive outcomes. Projects contains more responsiveness and in line with the needs of stakeholders and customers when they are middle on the individual and their interactions [6].

Key Agile Framework:

Effective Software despite Extensive Manuals

"Effective Software despite Extensive Manuals" proclaims that are functional software are more important than same amounts of documentation. The main goal is to create software that works and meets user requirements even in situations where documentation is still necessary, Agile development methods emphasize delivering product to users fast so they may provide feedback. This guarantees the product's utility and allows for improvements based on actual usage. Teams that want to primarily working software are better able to show their progress and value and respond quickly to requirements and changes [7].

Client Participation during Contract Negotiations

The need is to maintaining better communications with clients throughout a project is emphasized by the idea "Customer Collaboration over Contract Negotiation". Agile promoting constant contact and collaboration with their clients rather than concentrating on rigorous agreements. This makes it more perfect that the complete product will live up to their expectations and requirements. Periodic customer involvement makes the project more adaptable and in line with their needs by promotes feedback and adjustments same as the route. Teams that value teamwork are better able to satisfy customers and disregard stronger bonding with them [8].

Adapting To Change Rather Than Sticking To a Plan

During the project, the idea "Adapting to Change rather Than Sticking to a Plan" is used to reflects the importance of the flexibility and adaptability. Agile supports to the making adjustments in the new collection of data and changes as they are occurs rather than the rigorous stick to a determined planning. Teams can more effectively address changing demands and unexpected obstacles using this methodology. Projects can remain effective and relevant even as they are adaptable then the circumstances changeable. This adaptability makes sure that the complete products are more in line with the demands of the present and can easily adjust to any new priorities or challenges that are arises [9].

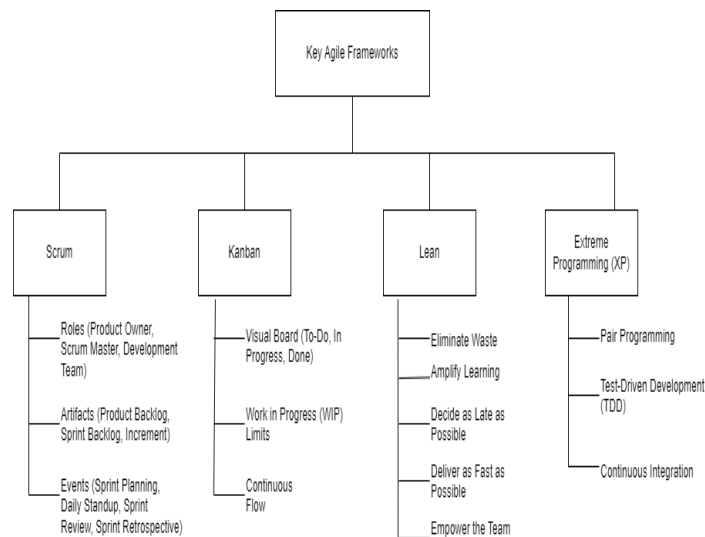


Fig.1. key agile framework

Common Challenges in Agile Implications:

1. **Resistance to Change:** Because they are lack of expertises with or are fearful of changes, many teams and people who are used to traditional methods may find it is difficult to make the switch to Agile.
2. **Lack of Agile Experience:** Teams may not have the essential knowledge or expertise with Agile practices, which could result in incorrect application or less than ideal results.
3. **Insufficient Communication and Collaboration:** Agile mostly depending on the teamwork and communications. Ineffective communication amongst team members can hampering development and which can cause miscommunications.
4. **Inadequate Customer Involvement:** Agile places a strong emphasis on user feedback, yet getting regular and important user input can be difficult to come.
5. **Difficulty in Adapting to Agile Roles:** Agile implementation needs to take responsibility of the creation of new roles, such Scrum Masters and Product Owners, which in conventional arrangements can be ambiguous or undervalued.
6. **Scaling Agile across the Organization:** It can be challenging to scale Agile methods from small teams to the bigger companies, which frequently results in inconsistent results and combining the problems.
7. **Maintaining Sustainable Pace:** Agile groups can make the mistake of operating at an unsustainable speed, which results in reduced output and exhaustion.
8. **Inconsistent Agile Practices:** Applying Agile techniques inconsistently might causes misunderstandings and inefficiencies between team members [10].

Future Trends and Directions

1. Integration of Artificial Intelligence and Machine Learning

Pratiksha Tadas, Sudhir Agarmore

Artificial Intelligence (AI) and Machine Learning (ML) are set to revolutionize Agile Project Management. AI-driven tools can predict project risks, optimize resource allocation, and provide actionable insights based on data analysis. These technologies will enhance decision-making processes, enabling teams to anticipate and mitigate issues proactively, thereby improving project outcomes.

2. Devops and Continuous Delivery:

The integration of DevOps practices with agile methodologies will become more prevalent, emphasizing seamless collaboration between development and operations teams. Continuous Delivery (CD) pipelines will further streamline the software development lifecycle, ensuring rapid and reliable deployment of features. This integration will lead to higher quality products and faster time-to-market.

3. Remote and Distributed Teams

The trend toward remote and distributed teams, accelerated by the global shift to remote work, will continue to influence agile practices. Agile frameworks will need to adapt to support virtual collaboration, utilizing advanced communication and project management tools. Emphasizing asynchronous communication and flexible work arrangements will be key to maintaining productivity and team cohesion.

4. Enhanced Agile Metrics and Analytics:

Future APM will increasingly rely on sophisticated metrics and analytics to measure performance and drive continuous improvement. Tools that provide real-time data on team velocity, sprint progress, and customer feedback will become essential. These metrics will enable more precise adjustments to Agile practices, enhancing efficiency and effectiveness.

5. Agile At Scale:

Scaling agile methodologies across large organizations and complex projects will remain a

critical focus. Frameworks like SAFe (Scaled Agile Framework), LeSS (Large Scale Scrum), and Disciplined Agile Delivery (DAD) will evolve to address the unique challenges of scaling Agile. These frameworks will incorporate best practices for managing dependencies, coordinating multiple teams, and maintaining alignment with strategic goals.

6. Emphasis on Agile Culture and Mindset:

The cultural aspects of Agile will continue to gain prominence, with organizations investing in developing an agile mindset across all levels. This involves fostering values such as collaboration, transparency, and continuous learning. Agile coaching and training programs will play a significant role in embedding these values and ensuring sustained agile transformation.

7. Agile Beyond It:

Agile principles and practices will extend beyond IT and software development into other areas such as marketing, HR, and product management. This broader application of Agile will drive organizational agility, enabling companies to respond more effectively to market changes and customer needs.

Conclusion:

Agile project management is actively transforming enterprises' approaches to software development and other areas. Agile approaches have shown to be quite successful in producing high-quality products that satisfy client expectations because of their emphasis on adaptability, teamwork, and continual development. Agile deployment has difficulties despite its many advantages. Organizations frequently struggle with scaling methods, lack of agile experience, and opposition to change. These difficulties can be successfully overcome, though, by implementing best practices like iterative development, encouraging a team atmosphere, giving priority to client feedback, and keeping an adaptable mindset.

Organizations' approaches to software development and other areas are being completely transformed by agile project management. Agile techniques have demonstrated remarkable efficacy in producing high-quality products that satisfy customers by prioritizing flexibility, collaboration, and continual development. Agile deployment is not without its difficulties, despite all of its many advantages. Change aversion, inexperience with Agile, and challenges with practice scaling are common issues faced by organizations. Still, these problems can be successfully addressed by the implementing best practices like iterative development, creating a collaborative atmosphere, giving primary value to customer feedback, and keeping an unbiased.

By sticking around informed about those trends and proactively reaching to the implementation

challenges, organizations can utilize the full potential of Agile project management. This will enable them to remain competitive, innovate continuously, and deliver exceptional value to their customers in an ever-changing business landscape.

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Elliptic Curve Cryptography: A Mathematical Approach

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Abstract:

Mathematics consider as Heart of Cryptography, which is a science of securing communication and data. Mathematics underpins the algorithms used to encrypt and decrypt data. For example, public-key cryptography relies on mathematical problems like factoring large numbers RSA (Rivest, Shamir, and Adleman) or solving discrete logarithms (Elliptic Curve Cryptography). Mathematical procedures generate secure keys used in encryption. The strength of these keys is often based on complex mathematical problems that are computationally difficult to solve. Cryptography often requires random numbers for key generation and other processes. Mathematical methods ensure that these random numbers are truly unpredictable and secure. In essence, mathematics is the foundation that makes modern cryptography both robust and reliable, ensuring secure communications in the digital age.

Keywords: Cryptography, Security, Encrypt, Decrypt, Elliptic Curve Cryptography, Large Numbers, Random numbers

Introduction:

Cryptography is the art and science of securing communication and information through the use of mathematical techniques. It enables the protection of data from unauthorized access and ensures the integrity and authenticity of information. Many of us have a basic understanding of RSA Public key Cryptography as this was perhaps the first time Cryptography is introduced as a subject; make a space into main stream education for many under graduate computer science as elective subject. I believe Elliptic curve cryptography is obscure. This approach has the interest of mobile e-commerce service providers rather than the well known RSA Cryptographic standards. Here's an introduction to the key concepts and components of cryptography:

Types of Cryptography:

- **Symmetric Cryptography:** For encoding and decoding same key is used. It's fast and efficient but requires secure key distribution. Examples are AES (Advance Encryption Standard) and DES (Data Encryption Standard).
- **Asymmetric Cryptography:** Uses a pair of keys, a public key for encoding and a private key for decoding. It simplifies key distribution but it is slower as compared to symmetric cryptography. Examples are RSA and ECC (Elliptic Curve Cryptography).

1. Mathematical Foundations:

- **Number Theory:** This branch of mathematics, dealing with integers and their properties, is

central to many cryptographic algorithms. For instance, public-key cryptography often relies on number-theoretic problems such as prime factorization and the discrete logarithm problem.

- **Algebra:** Algebraic structures like groups, rings, and fields are pivotal in cryptographic systems. For example, elliptic curves (used in Elliptic Curve Cryptography) are based on algebraic equations over finite fields.
- **Probability and Statistics:** These fields are used to estimate the security of cryptographic systems and to analyze the chances of attacks. Randomness and probability help in generating secure keys and assessing the strength of cryptographic functions.

Key Cryptographic Algorithms:

- **Symmetric Key Algorithms:** Algorithms like AES (Advanced Encryption Standard) use complex mathematical operations such as substitutions, permutations, and mixing of data. These operations are designed to be both efficient and secure, using mathematical functions to obscure data.
- **Public-Key Algorithms:** Public-key cryptography relies on mathematical problems that are easy to perform in one direction but difficult to reverse. For example:
 - **RSA Algorithm:** Uses factoring large composite numbers into their prime factors. Which is very difficult to factorize.

- **Elliptic Curve Cryptography (ECC):** Uses the algebraic structure of elliptic curves over. The security of ECC relies on the difficulty level of the elliptic curve discrete logarithm problem.

3. Hash Functions:

- **Hash Functions:** These are mathematical algorithms that produce a fixed-size output (hash) from variable-size input data. Good hash functions exhibit properties like collision resistance (two different inputs do not produce the same hash) and preimage resistance (it's hard to reconstruct the original input from the hash). Mathematical properties make sure that hash functions are efficient and secure.

4. Cryptographic Protocols:

- **Digital Signatures:** Digital signatures use mathematical algorithms to verify the authenticity and integrity of a message. They are often based on number theory and algebraic operations. For instance, RSA and DSA (Digital Signature Algorithm) are widely used for digital signatures.
- **Public Key Infrastructure (PKI):** PKI relies on mathematical algorithms to manage digital keys and certificates. It uses asymmetric cryptography to enable secure key exchange and digital identity verification.

5. Mathematical Proofs and Security:

- **Security Proofs:** Mathematics gives the structure for proving the security of cryptographic algorithms. These proofs show that breaking the encryption is as hard as solving a specific mathematical problem such as, factoring large numbers or solving discrete logarithms.
- **Cryptanalysis:** The study of breaking cryptographic systems involves mathematical techniques to find vulnerabilities. Cryptanalysts use mathematical methods to analyze algorithms and find weaknesses that could be exploited.

6. Advanced Topics:

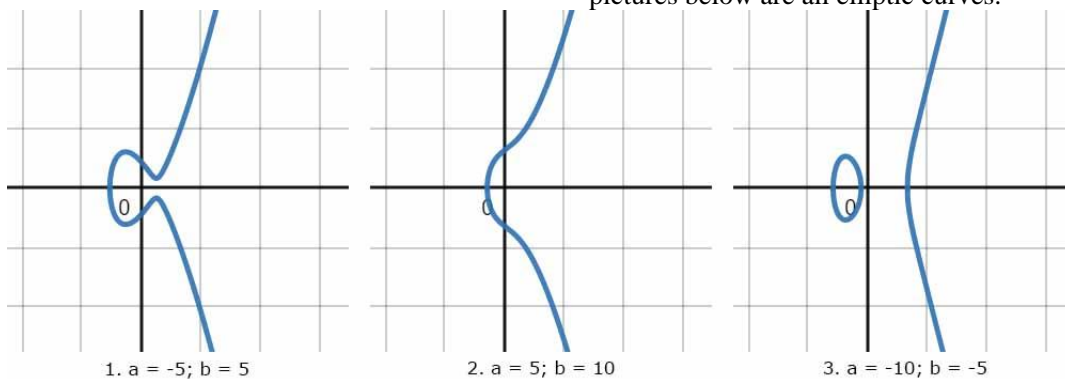
- **Elliptic Curve Cryptography:** Utilizes the mathematics of elliptic curves to create secure cryptographic systems with smaller keys compared to traditional methods.
- **Quantum Cryptography:** Explores new mathematical challenges and solutions due to the potential impact of quantum computing on traditional cryptographic methods.

What is an elliptic curve?

An elliptic curve is a curve described by an equation that can be written in the following form:

$$Y^2 = X^3 + aX + b$$

The shape of the curve will be different as it depends on the value of a and b; the curves in the pictures below are all elliptic curves.



In the equation

$$y^2 = x^3 + ax + b$$

Any point on the curve mirrored over the x-axis will keep the curve the same, and any non-vertical line will intersect the curve in three places or fewer.

Mathematical operations in the elliptic curve cryptography:

If we want to understand how elliptic curve cryptography works, we have to know the basic mathematical operations which we can apply on an elliptic curve. Here's a breakdown of the key mathematical concepts used in ECC:

Basic operations that can be performed are:

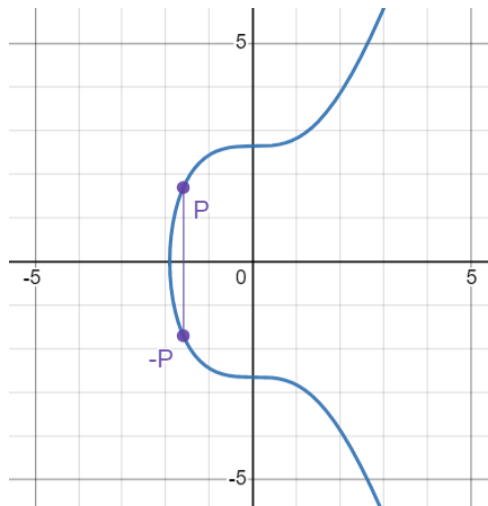
- Negation of a point
- Addition of two points
- Duplication of a point (a point is added to itself)

Multiplication by a number (scalar multiplication) can be done by repetitive addition.

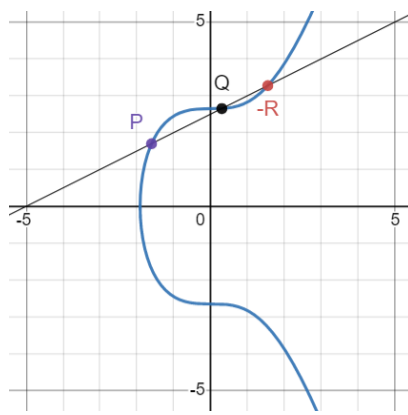
An important property of elliptic curves is that the division operation cannot be interpreted.

1. Negation of a point:

The negation of a point is its reflection on the horizontal axis. For example, if we take a point P then its reflection is shown as follow

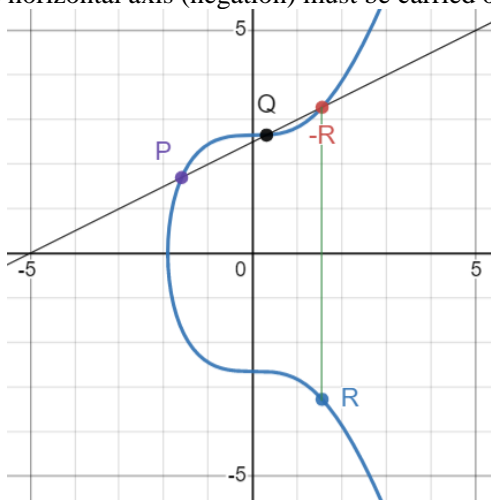


2. Addition of two points: When we connect two points with a line, it gives a third point which is negative in sign.



Elliptic curve addition is not in the form of the traditional addition. It is different from traditional addition method. This looks like this:

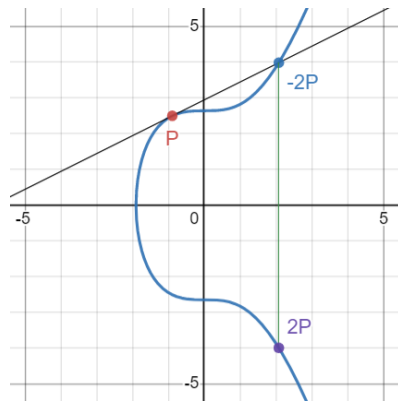
To obtain +R, the reflection on the horizontal axis (negation) must be carried out. The result is the point R.



3. Duplicating a point:

This is the particular case of point addition, where a point is added to itself. In this case, two points are actually coincident; therefore the tangent line must be drawn. The line is

intersecting the curve at point $-2P$, which needs to be mirrored to get the double of the point, $2P$, on the elliptic curve.

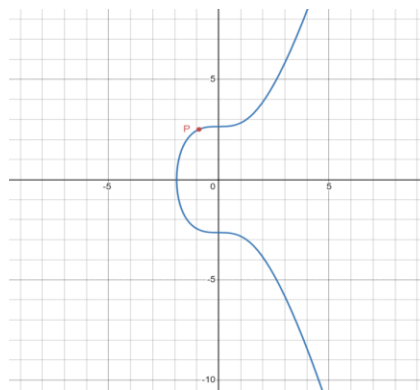


4. Multiplying a point by a number:

Since we can add two points together, or duplicate a point by adding it to itself, we can combine this multiple times. Using this we can multiply our point by any number of times.

In the following example below, the point P is multiplied by 3:

1. A tangent is drawn to point P and the resulting intersection $-2P$ is mirrored to get $2P$.
2. The points P and $2P$ are connected and the resulting intersection $-3P$ is mirrored to obtain $3P$



Advantages of Elliptic Curve Cryptography:

ECC is advantageous due to its smaller key sizes, which make it more efficient for mobile devices with limited computational power. It provides strong security with faster and smaller keys as compared to RSA. This is particularly beneficial as mobile devices increasingly handle more cryptographic tasks.

How Secure is Elliptic Curve Cryptography?

ECC faces potential susceptibility such as attack by side-channel and twist-security attacks,

which can leak private keys. However, these can be mitigated with proper countermeasures, parameter validation, and careful curve choices, making ECC a secure option for wireless security.

What is Elliptic Curve Cryptography Used For?

ECC is widely used for digital signatures in crypto currencies like Bitcoin and Ethereum. It is also a standard for encryption in many web applications due to its efficiency and shorter key length.

Key Size Comparison Table:

Length (bit) of RSA Key	Length (bit) of ECC Key
1024	160
2048	224
3072	256
7680	384
15360	521

ECC is an alternative technique to RSA that generates security between key pairs for public key encryption using the mathematics of elliptic curves. While RSA uses prime numbers, ECC uses elliptic curves, making it more efficient with smaller key sizes and better suited for modern demands on security and mobile resource optimization.

Conclusion:

Elliptic Curve Cryptography (ECC) fully depends on advanced mathematical principles, specifically their properties and operations of elliptic curves over finite fields. Mathematics in ECC involves elliptic curve equations, finite field arithmetic, group operations, and the elliptic curve discrete logarithm problem. These mathematical foundations provide ECC with its security and efficiency, making it suitable for modern

cryptographic applications. Mathematics is integral to cryptography, providing the algorithms and proofs necessary to ensure the security and effectiveness of modern encryption techniques. Its application ranges from fundamental number theory to complex algebraic structures, all contributing to the robustness and reliability of cryptographic systems.

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Investigation of Paracetamol Derivative of Glucose N-Acetyl-4-Hydroxyl Acetamide and Their Nanoparticle Analysis

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Abstract:

Many attempts were undertaken to modify this drug at the phenyl ring, acetamido group, and hydroxyl group in an effort to boost its efficacy, hide its bitter taste, and lessen its toxicity after it proved effective in the market as an over-the-counter antipyretic and analgesic. Paracetamol uses a variety of methods to lower body temperature. Chemically speaking, paracetamol is 4-hydroxy acetanilide and has a solid safety record. Chemical reactions based on nanoparticles are beginning to take the place of bulk material-based reactions. Owing to its many benefits, including the capacity to easily introduce multifunctionality, increase chemical activities, photochemical stability, and the conversion of partials into nano dimension, In this work we propose Tetra-o-acetyl-B-D-glucosyl N-acetyl-4-hydroxyl acetanilide have been synthesized for the first time by the interaction of Tetra-O-benzoyl-B-D-glucosyl isothiocyanate and Paracetamol. All the synthesized compounds were characterized on the basis of elemental analysis and XRD studies. The polarimetric study of the title compounds has been carried out.

Keywords: - 4-Hydroxyl acetanilide, TBG isothiocyanate

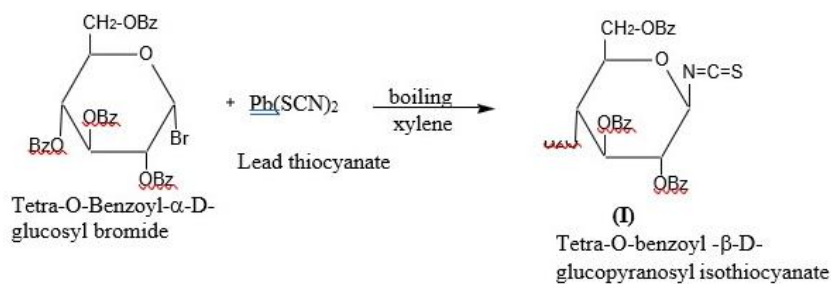
Introduction:-

Since they make up more than 80% of biomass, carbohydrates are the most prevalent type of biopolymers in the world. Their primary purposes are energy storage and structural support. It has recently been clear that carbohydrates regulate a number of biological processes¹. Carbohydrates continue to be an intriguing substrate for biomaterial applications despite these obstacles because of their biological significance and propensity. For the purpose of creating nanoparticles, a range of chemical and physical preparation techniques are available, such as photochemical, radiation, chemical precipitation, electrochemical, and Langmuir-Blodgett methods. However, because these techniques involve the use of toxic, flammable, and hazardous chemicals that may pose a risk to the environment and to biological systems, they are frequently very costly and environmentally unfriendly. The synthesis of these nanoparticles also has the disadvantages of poor production rate, structural particle deformation, and prevention of particle growth. Noble nanoparticles are commonly used in human-contact regions, thus there is now an increasing demand to create sustainable nanoparticle fabrication methods that do away with the use of hazardous organic chemical compounds. In order to implement the green chemical process concept, In recent years, nanotechnology is an escalating field of modern research [2] involving in synthesis

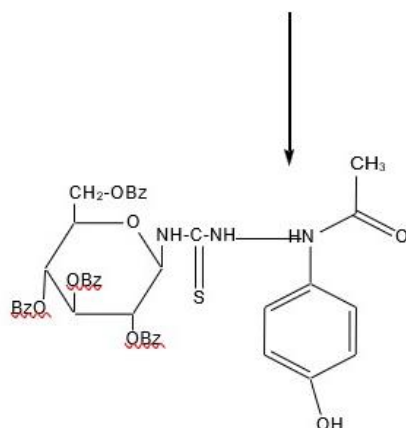
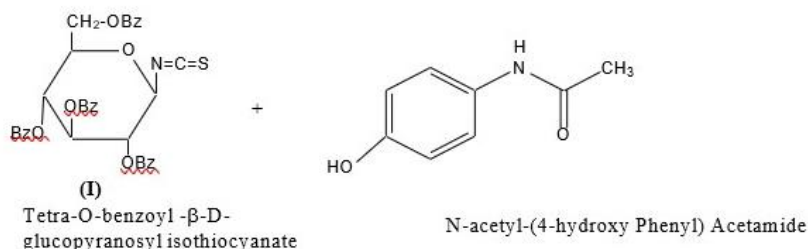
design, characterization, production, and application of structures, devices, and systems by controlling shape and size at the nanometer scale [3]. Nanotechnology also involves synthesis of nanoparticles of size ranging from 1 to 100 nm [4]. Moreover, there is a new branch of nanotechnology existing, which is bio-nanotechnology that integrates principles of biology with physical and chemical procedures to generate nano-sized particles with specific functions [5]. The bio-based protocols for synthesis of nano-metals are both environmentally and economically green as they are based on green chemistry principles and are simple, relatively inexpensive, and easily scaled up for larger scale production[6]. However, the chemical methods available are often expensive, utilize lethal chemicals, and are comparatively complex. Hence, biosynthesis of nanoparticles using biological agents such as microbes or plant extracts has gained much attention in the area of nanotechnology in last few decades [7].

Each with its own advantages and disadvantages, these modern materials are employed as they are structurally designed to support the healing, absorb excess wound exudate while preventing dehydration of the wounded area and they can be combined with pharmaceutical agents providing analgesia, and most importantly antibacterial agents preventing infections [8,9,10].

Reaction Scheme:-



Conjugation of Glucosyl Isothiocyanate with Drug Molecule



Tetra-O-benzoyl- β -D-glucopyranosyl-4-N-acetyl-4-hydroxy Acetanilide

Experimental:-

I) Preparation of Tetra-O-acetyl- β -D-glucopyranosyl isothiocyanate:

This has been prepared by the interaction of tetra-O-acetyl- α -D-glucopyranosyl bromide and lead thiocyanate, the former was prepared according to the procedure described earlier. Details of typical experimental are as follows:

a) Microwave assisted preparation of glucose penta acetate:-

Peracetylation of glucose to give the acetyl derivative with small excess of acetic anhydride under the catalyst of either Potassium or Sodium acetate (anhydrous) was found practically quantitative in less than 15 min with microwave heating. Herein, we reported first time peracetylation of glucose in molecular proportion of acetic anhydride (30 ml) using catalyst sodium acetate 0.8 gm. Under Microwave heating the reaction was

complete less than 10 min. Product was isolated by pour in ice cold water with constant stirring and cooling. The glucose penta acetate is separated out; purification of product was done under water, ethanol system. Melting point of Glucose penta acetate was found to be 110°C.

b) Synthesis of Tetra-O-acetyl- α -D-glucopyranosyl bromide:

The finely powdered glucose pentaacetate (21.0g) was added gradually to the brominating reagent. After the addition the flask was kept for 2 hr. at room temperature. The reaction mixture was mixed with chloroform (50 ml) then the mixture was shaken vigorously for about 15 min. The resultant mixture was pour in ice cold water. The chloroform layer was then separated. It was washed several time with aqueous sodium bicarbonate to removed excess of acetic acid followed by the aqueous sodium metabisulphate to remove the excess of bromine and

finely 2-3 times with water. To the chloroform layer addition of petroleum ether afforded a solid (15 g). This solid was expected tetra-O-acetyl- α -D-glucopyranosyl bromide; it was crystallized from ethanol, m.p. 88-90°C.

d) Preparation of lead thiocyanate:

Lead thiocyanate was prepared by mixing aqueous solution of lead nitrate and ammonium thiocyanate. The white granular lead cyanate was filtered washed with distilled water and dried at 50°C.

Preparation of Tetra-O-acetyl- β -D-glucopyranosyl isothiocyanate :

To a suspension of tetra-O-acetyl- α -D-glucopyranosyl bromide (21 g) in sodium dried xylene (80 ml) was added lead cyanate (15g). The reaction mixture was refluxed gently for 3 hr. with frequent shaking. This solution was then cooled and liberated lead bromide was removed by filtration. The xylene filtrate was then treated with petroleum ether (60-80°) with stirring, a pale yellow solid obtained (12 g). This solid was expected tetra-O-acetyl- β -D-glucopyranosyl isocyanate. It was purified by dissolving it in a minimum quantity of chloroform and reprecipitating with petroleum ether. m.p 115-120°C

Synthesis of Tetra-O-benzoyl glucosyl -N-acetyl-4-hydroxyl Phenyl Acetamide

To a toluene solution of tetra-O-benzoyl- β -D-glucosyl isothiocyanate (0.005 M, 1.9g in 20 ml) was added toluene solution of N-(4-hydroxyl Phenyl) Acetamide (0.005 M, 0.76 g in 10 ml) and reaction mixture was refluxed over boiling water bath for 3hr. Afterwards, solvent was distilled off and sticky mass obtained as residue was triturated several times with petroleum ether afford a white solid. It was crystallized with ethanol-water, m.p. 83°C.

Preparation of Nanoparticles Tetra-O-benzoyl glucosyl -N-acetyl-4-hydroxyl Phenyl Acetamide

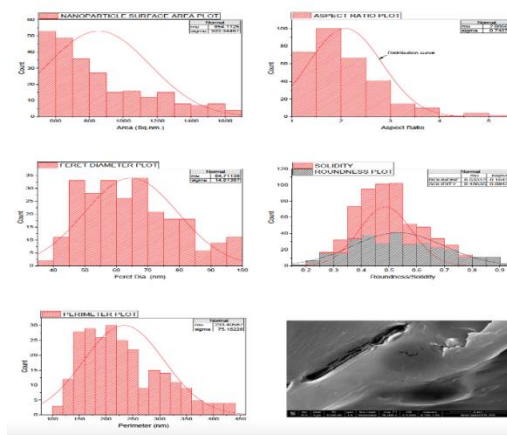
Take about 1 gm of Tetra-O-benzoyl glucosyl -N-acetyl-4-hydroxyl Phenyl Acetamide and dissolve it completely in the 20ml of solvent in a 250 ml beaker and add poly vinyl alcohol as a stabilizer 1.5ml . Now put this beaker in a sonicator. The highly penetrating acoustic waves are passed through the mixture, which creates high-pressure bubbles in the beaker due to which breakdown of the bulk material took place and desired sized nanoparticles are formed. Then stirred mixture about 6hr. in magnetic stirrer at room temperature. The size determination of nanoparticles is done by the particle size analyzer studies



Characterization of Nanoparticles:

1. Characterization using UV-Spectrophotometer: Single Beam UV-Spectrophotometer with software BI/CI/SP/SB-S-03 of Bio Era makes. The UV-Visible Spectroscopy

reveals the formation of Nanoparticles. Characterization of Nanoparticles was done using a visible Spectrophotometer by using a model by showing different absorption those from bulk material.



A graphical display of the frequency distribution of the data.

Ashish G. Sarap, P.T. Agrawal

Table no. 3: Nanoparticle Characteristics.

Sr.N	Parameters	Median	Mean Value	Std. Dev.
1	Surface Area	964.27 sq.nm	854.11 sq.nm	303.34
2	Feret's Diameter(Long.C	75.09 nm	64.71 nm	14.81
3	Feret Angle	102.80 deg	81.68 deg	50.51
4	Perimeter	226.73 nm	233.41 nm	75.18
5	Aspect Ratio	2.36	2.09	0.75
6	Roundness	0.42	0.53	0.16
7	Solidity	0.56	0.49	0.10

From the table, it can be seen that..

The measurements tabulated collectively provide information about the size (area, Feret diameter), orientation (Feret angle), and shape (perimeter) of the nanoparticles.. A higher standard deviation suggests a greater range of parameter values, indicating potential heterogeneity among the nanoparticles. Aspect ratio of 2.09 suggests that the nanoparticles are, on average, somewhat elongated or have a more extended shape. Roundness value of 0.53 suggests that the nanoparticles, on average, have a shape that deviates from a perfect circle. Solidity value of 0.49 suggests that, on average, the nanoparticles have a shape that is somewhat irregular or concave. The median of the parameters represents the middle value in the dataset when arranged in ascending order. It can be seen that it is more or less equal to mean value.

Conclusion:

Nanochemistry of carbohydrates is the key element in a variety of biological phenomena, and its N-linked sugar derivatives also exhibit a wide range of therapeutic activities. When one biologically active molecule is linked to another, the resultant molecule generally has increased potency. Encouraged by these observations, in search of a new bioactive potent nano molecule, it was thought worthwhile to incorporate different N-linked sugar derivatives with various reagents and study their biological activity, which scopes for a lot of industrial and medicinal importance.

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Synthesis of Cobalt Ferrite Nanoparticles: Characterization and Magnetic Properties.

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Abstract:

In this study, Cobalt ferrite nanoparticles (CoFe_2O_4) were synthesized via hydrothermal technique at 180°C for 6h using pomegranate fruit peels extract have been investigated. The structural properties of the produced cobalt ferrite nanoparticles were investigated using X-ray diffraction (XRD). The average grain size (D) measured using Scherrer equation is 25.35nm. Fourier Transform Infrared spectroscopy confirmed the formation of cobalt ferrite nanoparticles particles. Magnetic hysteresis was measured using a vibrating sample magnetometer in a maximum field of 15 kOe. The magnetic properties of synthesized nanoparticles were reported such as saturation magnetisation (Ms), coercivity (Hc), and retentivity (Mr) at room temperature. Cobalt ferrite nanoparticles exhibited super-paramagnetic behaviours.

Introduction:

Cobalt ferrite CoFe_2O_4 is a prominent member of the spinel ferrite family, renowned for its unique combination of magnetic, electrical, thermal and mechanical properties. These attributes make it an ideal candidate for a variety of applications, including magnetic storage media, electromagnetic devices, sensors, biomedical applications, energy storage and supercapacitor¹⁻⁸. The cobalt ferrite nanoparticles have been synthesised using various chemical methods such as sol-gel techniques⁹⁻¹⁰, microwave- assisted¹¹, Solvothermal¹², sonochemical¹³, thermal decomposition¹⁴ and hydrothermal method¹⁵. Among the various synthesis methods, the hydrothermal method has gained significant attention due to its ability to produce high-purity, uniform and well-crystallized nanomaterials with controlled size and morphology. It is an environmentally friendly method using water as the solvent.

Gingasu et al. reported green synthesis of cobalt ferrite nanoparticles using Tamarindus indica fruit extract and its structural morphological and magnetic investigation¹⁶. Tatarchuck, Tetiana et al. studies on green synthesis of cobalt ferrite nanoparticles using Cydonia oblonga extract and its structural and Mossbauer properties¹⁷. Pomegranate fruit peels, often discarded as waste, possess numerous bioactive compounds that offer significant health benefits and applications across various industries such as Antioxidants¹⁸, Antimicrobial Activity¹⁹. In this study, we explore the hydrothermal synthesis of cobalt ferrite nanoparticles using pomegranate fruit peels extract, its characterization

and magnetic characteristics of the synthesized cobalt ferrites.

Materials and Synthesis:

All the chemical were of Analytical grade and used without further purifications. Cobalt nitrate hexahydrate ($\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$), Ferric nitrate nonahydrate ($\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$), Sodium Hydroxide (NaOH) were purchased from Loba Chemie, India. The pomegranate fruit peels extract prepare as follows, collect the fresh pomegranate fruit peels from local market and wash them thoroughly dry the fruit peels and grind the dried fruit peels into a fine powder and prepare an aqueous extract by boiling the powder in the double distilled water using magnetic stirrer at 60°C . The prepared extracts were dry in a hot air oven at 60°C for 2h and grind the dried powder into a fine powder. The double distilled water used throughout the experiment as a solvent. The hydrothermal synthesis of cobalt ferrite nanoparticles using pomegranate fruit peels extract. In the typical synthesis, 3.5mM of ferric nitrate hexahydrate, 1.7mM of cobalt nitrate hexahydrate and 1gm powder of pomegranate was dissolved in 35 ml double distilled water through magnetic stirring for 30 min at room temperature. The 6M (NaOH) sodium hydroxide added drop by drop with stirring to get pH at 12 and stirred the solution for another five minutes. The obtained solution was transferred into Teflon lined autoclave. The autoclave was sealed tightly and the reaction temperature was maintained at 180°C for 6 h. After the completion of the reaction, the products wash with ethanol and double distilled water.

The obtained cobalt ferrite nanoparticles is then dried and calcined at 450°C for 2 h.

Characterization:

The structural properties of Cobalt ferrite nanoparticles were examined by X-ray powder diffraction using a Miniflex 600, diffractometer (Rigaku Corporation, Japan) with monochromatic Cu K α radiation with X-ray wavelength 1.5406 Å. The samples were scanned in the range of 2 θ range of 10° to 70°. The Fourier transform infrared (FTIR) spectra were obtained (Shimadzu, Japan) using KBr as reference material. The magnetic properties measurement of synthesized nanostructure was carried out with a vibrating sample magnetometer (MicroSense EZ-9, Milano Italy) at room temperature with a maximum magnetic field of 15kOe.

Result and Discussion:**Structural Characterization:**

The XRD patterns of the CoFe₂O₄ nanoparticles are shown in Fig. 1a. All the diffraction peaks were indexed to the cubic structure of cobalt ferrite. All peaks obtained by XRD analysis were assigned by comparison with data obtained from the Joint Committee on powder Diffraction Standards (JCPDS).

The Scherrer formula was used to calculate average grain size (D), given as $D = \frac{0.9\lambda}{\beta \cos\theta}$.

Where λ is the X-ray wavelength (Cu K α radiation and equals to 0.154 nm), θ represents the Bragg Diffraction angle, and β is the FWHM (Full Width Half Maxima) of the XRD peak which appears at the diffraction angle θ . The average grain size was calculated from X-ray line broadening using Scherrer equation and it was found to be about 25.35nm²⁰.

FT-IR Analysis:

A very helpful method for determining the structural analysis of chemical compounds is the FT-IR spectrum. Using infrared spectroscopy, the spinel phase development of cobalt ferrite nanoparticles was investigated. The location and vibration modes of the ions within the crystal structure are described by the FTIR spectrum near 400-600 cm⁻¹ is where the two common bands in practically all spinel ferrite may be found. In addition to confirming the presence of Fe metal oxide (M-O) stretching vibration in cobalt ferrite in fig.1b, the frequency bands about 606-616 and 421-430cm⁻¹ are attributed to the tetrahedral and octahedral clusters. The broad peak in the frequency range of 3450-3550 cm⁻¹ is attributed to O-H stretching vibrations of the water molecules²¹.

Magnetic Properties:

The magnetic property of Cobalt ferrite nanoparticles was measured by vibrating sample magnetometer (VSM) at room temperature with an applied magnetic field strength of 15 kOe. Magnetization versus the applied field plot at room

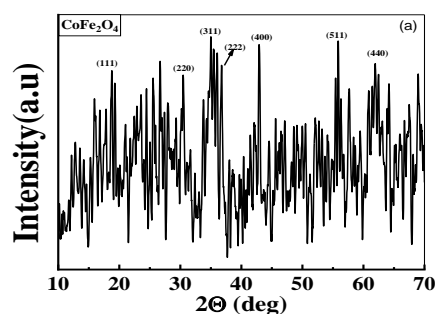


Fig1.a. XRD pattern of cobalt ferrite nanoparticles

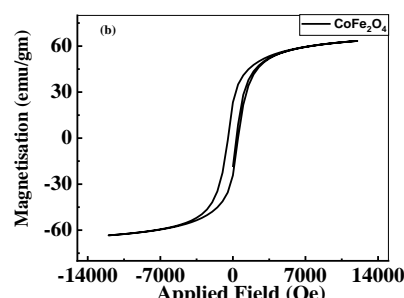


Fig.1b. Hysteresis loop of Cobalt ferrite nanoparticles

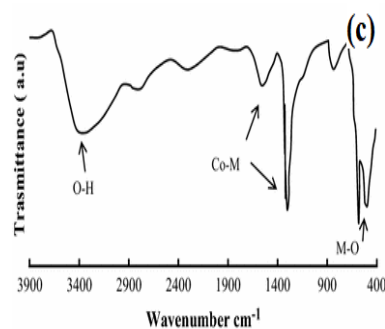


Fig.1c. FTIR spectrum of cobalt ferrite nanoparticles

temperature for the Cobalt ferrite nanoparticles (CoFe₂O₄) were synthesized via hydrothermal technique at 180°C for 6h using pomegranate fruit peels extract is shown in Fig.1b. The hysteresis loops of samples, confirmed the super-paramagnetic behaviour with saturation magnetisation Ms= 52.46 emu/gm, coercivity Hc=203.05Oe, retentivity Mr= 21.03emu/gm of the cobalt ferrite nanoparticles.

Conclusions:

Cobalt ferrite nanoparticles were synthesized using hydrothermal method using pomegranate fruit peels extract. The XRD pattern confirmed the cubic structure additionally; FTIR spectroscopy confirmed the formation of cobalt ferrite nanoparticles. The hysteresis loops of cobalt ferrite nanoparticles, obtained using a VSM at room temperature, confirmed the super-paramagnetic behaviour of the cobalt ferrite nanoparticles.

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Traditional Spices: Uncovering the Secrets of Ancient Diets

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Abstract:

Traditional spices have long been integral to human diets, extending beyond mere flavor enhancement to play significant roles in medicine, preservation, and cultural practices. This study explores the multifaceted uses of traditional spices in ancient diets, focusing on their culinary, medicinal, preservative, economic, and cultural importance. By examining historical and contemporary sources, the research highlights how spices like turmeric, cinnamon, and others were valued not only for their taste but also for their health benefits, preservation properties, and economic impact.

The research methodology employs a structured approach to data collection and analysis, involving non-probability sampling from Nagpur city. The study identifies and ranks the most commonly used spices based on their diverse functions. The results indicate that culinary importance ranks highest, followed by economic significance, preservative function, medicinal value, and cultural importance. The data reflects that while spices are crucial for their practical uses in cooking and preservation, their cultural and religious significance is comparatively less emphasized. The findings suggest prioritizing the culinary, economic, and preservative roles of spices in modern applications while also recognizing their historical medicinal and cultural contributions. This understanding not only enriches our knowledge of ancient diets but also inspires the integration of traditional spices into contemporary culinary and health practices.

Introduction:

Traditional spices have played a crucial role in human diets for millennia, serving as more than just flavor enhancers. These aromatic ingredients are deeply intertwined with the history, culture, and health practices of ancient civilizations. From the pungent turmeric used in Indian Ayurvedic medicine to the fragrant cinnamon prized in ancient Egypt, spices were integral not only in culinary practices but also in medicinal treatments, preservation methods, and religious ceremonies.

The secrets of these ancient diets are hidden in the diverse uses of spices. They were often valued more than gold, traded across continents, and even used as currency. Each spice carries a unique story, reflecting the cultural exchanges and scientific knowledge of the time. Ancient people understood the powerful properties of these spices, using them to promote health, protect against diseases, and enhance the taste of their food.

By uncovering the history and uses of traditional spices, we gain insights into the dietary habits of our ancestors. This knowledge not only enriches our understanding of the past but also inspires us to incorporate these time-tested ingredients into our modern diets, promoting a holistic approach to health and well-being (*'Vedic Food and Spices of India / Ayurveda Magazine, 2020*).

Review of Literature :

Spices have been essential to human civilizations for millennia. Their use dates back to ancient Mesopotamia, Egypt, and the Indus Valley, where they were valued not only for flavor but also for their religious, medicinal, and economic importance (Toussaint-Samat, 2009). Ancient cultures recognized the medicinal properties of spices. Ayurveda, for example, extensively utilized turmeric and ginger for their anti-inflammatory and digestive benefits (Tapsell et al., 2006). Similarly, traditional Chinese medicine employed star anise and cinnamon to treat various ailments. Modern science has corroborated these ancient practices, identifying numerous bioactive compounds in spices with potent antioxidant, anti-inflammatory, and antimicrobial effects (Shan et al., 2007). Beyond culinary and medicinal uses, spices served as preservatives in an era before refrigeration. Their antimicrobial properties helped extend the shelf life of perishable foods, a critical factor in ancient Rome and other societies (Thakur et al., 2021). The spice trade was a significant economic force, driving the establishment of trade routes like the Silk Road and the Spice Route. These aromatic commodities were highly prized, often equated with gold, and facilitated cultural exchange across vast distances (Freedman, 2008). Contemporary research continues to unravel the health benefits of traditional spices. For instance, curcumin, the active compound in turmeric, is being intensively studied for its

potential in preventing chronic diseases such as cancer and Alzheimer's (Aggarwal & Harikumar, 2009). By understanding the historical context of spice usage, we can appreciate their enduring value and explore their potential to enhance modern diets and well-being.

Objective

- 1) To identify and rank the most commonly used traditional spices in ancient diets based on their culinary, medicinal, and preservative properties.
- 2) To provide valuable suggestions.

Research Methodology:

Research methodology refers to the structured approach used to conduct research and gather data systematically. It encompasses the overall design of the study, including the type of research (such as experimental or descriptive) and the methods used for data collection, like surveys, interviews, or observations. The methodology also involves data analysis techniques to interpret and draw conclusions from the collected information. Sampling is a critical part of the methodology, as it involves selecting a representative subset from a larger population. Ethical considerations are integral, ensuring responsible practices such as obtaining informed consent and maintaining confidentiality. Finally, research methodology emphasizes validation and reliability to ensure that

Table no.: Following table is showing percent Position and Garret Score

Rank	Percent Position	Garret Score
1	19	68
2	39	56
3	59	45
4	79	34
5	99	7

Table no.- Following table is showing frequency counts and Garret mean Score of every factor

Factors	Freq	GM Score	Freq	GM Score	Freq	GM Score	Freq	GM Score	Freq	GM Score
Culinary Importance	16	21.76	8	10.88	9	12.24	9	12.24	8	10.88
Medicinal Value	8	8.96	9	10.08	8	8.96	16	17.92	9	10.08
Preservative Function	8	7.2	16	14.4	17	15.3	9	8.1	0	0
Economic Significance	9	6.12	8	5.44	8	5.44	8	5.44	8	5.44
Cultural and Religious Importance	9	1.26	9	1.26	8	1.12	8	1.12	25	3.5
Total & GM Score	50	45.3	50	42.06	50	43.06	50	44.82	50	29.9

The data provides insights into the significance of various traditional spices based on their culinary, medicinal, preservative, economic, and cultural aspects. The spices are ranked according to their performance across these factors, with their scores indicating their relative importance.

1. Culinary Importance stands out as the most significant overall with a high Garret Mean (GM) score of 45.3. Its leading role in culinary importance, medicinal value, and its moderate preservative function contribute significantly to its high ranking. Despite its lower cultural and economic importance, its overall contributions in other areas make it the top Factor.

the results are accurate, consistent, and credible. Overall, it provides a framework for conducting research in a systematic and objective manner.

Sample Size: In the present study total 50 sample size was taken from Amravati city.

Sampling Method: - Non probability (convenient) sampling techniques was adopted

The scope of the study on traditional spices includes exploring their roles in ancient diets across various dimensions: culinary, medicinal, preservative, economic, and cultural. It examines how different spices contribute to these functions, covering a range of geographical regions and historical periods to capture their significance in different cultures.

However, the study faces several **limitations**. Data availability might be restricted, leading to incomplete information about the historical use of spices. Historical records can be subjective or biased, affecting the accuracy of reported information. The study might also encounter cultural biases due to uneven availability of data from different regions. Additionally, the evolution of spice uses over time can complicate efforts to draw definitive conclusions about their historical importance. Language barriers in historical texts may further challenge accurate interpretation and analysis.

2. Medicinal Value follows closely with a GM score of 42.06. It excels particularly in its preservative function, demonstrating its crucial role in food preservation historically. Its notable presence in culinary applications and medicinal value further enhance its standing, although its cultural importance is less pronounced.

3. Preservative Function has a GM score of 43.06, indicating strong overall significance. It is highly valued for its preservative function, also holding a respectable position in culinary and medicinal uses. The slightly lower score in economic and cultural aspects slightly diminishes its rank compared to Factor 1 and 2.

4. Economic Significance is ranked slightly lower with a GM score of 44.82. It shows a balanced performance across culinary and preservative uses, but its medicinal value is somewhat less prominent. Its notable cultural and economic significance helps maintain its position despite other lower scores.

5. Cultural and Religious Importance scores the lowest with a GM score of 29.9. Although it has

Table no.: Following table is showing Garret Mean Score and Rank of each factor

Factors	GM Score	Rank
Culinary Importance	45.3	1
Medicinal Value	42.06	4
Preservative Function	43.06	3
Economic Significance	44.82	2
Cultural and Religious Importance	29.9	5

The table presents the General Mean (GM) scores and rankings of various factors related to traditional Factors, reflecting their overall importance in different domains:

1. Culinary Importance leads with the highest GM score of 45.3 and ranks 1st. This indicates that the culinary uses of Factors are considered the most crucial, highlighting their significant role in flavoring and enhancing food.

2. Economic Significance is ranked 2nd with a GM score of 44.82. This factor's high rank reflects the substantial economic value Factors have historically held, influencing trade and commerce.

3. Preservative Function comes in 3rd place with a GM score of 43.06. This indicates that Factors have played a key role in food preservation, an important aspect before modern refrigeration.

4. Medicinal Value is ranked 4th with a GM score of 42.06. While still important, its role in medicine is slightly less influential compared to culinary, economic, and preservative factors.

5. Cultural and Religious Importance ranks the lowest with a GM score of 29.9. Although Factors have cultural and religious significance, it is less emphasized compared to their practical applications in culinary, economic, and preservation contexts.

Overall, the table shows that the practical applications of Factors (culinary, economic, and preservative) are more highly valued than their cultural and religious significance.

Suggestions :

1. Focus on Culinary Uses: Since spices are most important for their culinary value, make sure to emphasize their role in cooking and flavoring food. This could include exploring how different spices enhance the taste and quality of traditional dishes.

2. Highlight Economic Impact: Given the high economic significance, consider examining how spices have historically influenced trade and markets. You might look into how they were traded and valued across different cultures and times.

3. Explore Preservative Properties: Spices are also important for their role in preserving food.

high cultural and religious importance, its overall impact in culinary, medicinal, and preservative roles is comparatively weak. This disparity in functional utility across key areas leads to its lower ranking.

Overall, the Factors are ranked based on a combination of their practical uses and cultural relevance, with differences in their roles across various domains influencing their overall scores.

Investigate how various spices helped in food preservation before modern methods, and how this aspect contributed to their historical value.

4. Include Medicinal Uses: While medicinal value is less emphasized, it's still important. Study the traditional uses of spices in medicine and how they were used to treat ailments and improve health.

5. Acknowledge Cultural Importance: Although less central, the cultural and religious significance of spices should not be overlooked. Explore how spices have been used in rituals and traditions, and their symbolic meanings in different cultures.

Overall, prioritize the culinary, economic, and preservative aspects of spices while also covering their medicinal and cultural roles.

Conclusion:

This study underscores the profound significance of traditional spices in ancient diets, revealing their multifaceted roles across culinary, medicinal, preservative, economic, and cultural domains. The analysis confirms that spices were not only vital for enhancing flavor but also crucial for preserving food, supporting health, and driving economic activity through trade. Culinary importance emerges as the most significant factor, highlighting the central role of spices in enhancing the taste and quality of food. Economic significance follows, reflecting the historical value of spices as valuable trade commodities.

The study also demonstrates that while the preservative function and medicinal value of spices are notable, their cultural and religious importance, though still relevant, is less emphasized compared to their practical applications. This finding indicates a strong historical reliance on spices for their tangible benefits in daily life.

In conclusion, recognizing the diverse functions of traditional spices enriches our understanding of their historical and contemporary value. Incorporating these time-honored ingredients into modern diets can offer both health benefits and culinary enhancements. The study encourages further exploration of how ancient spice practices can

inform current dietary and preservation methods, bridging the gap between historical knowledge and modern applications.

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Political Philosophy Ethics Consciousness

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Abstract:

The focus of this investigation is on how consciousness, political philosophy, and ethics intersect with our understanding of justice, governance, and individual agency. Political way of thinking gives a structure to surveying the authenticity of political organizations and their effect on cultural prosperity, while morals assesses the ethical standards supporting these foundations and strategies. In turn, consciousness has a significant impact on how people perceive justice and interact with political systems. The study demonstrates how consciousness influences our interpretation of justice and moral responsibility and how ethical considerations influence political decision-making by examining the interrelationships between these areas. This synthesis aims to provide a comprehensive view of how political philosophies are shaped by ethical and conscious dimensions and, conversely, how political structures can influence ethical experiences of individuals and groups. Go ahead and change or extend in view of explicit areas of concentration or extra subjects you might want to incorporate! The philosophical study of morality is called ethics. It is one of the main philosophical subfields that falls under the traditional categories of formal, natural, and moral philosophy. It is possible to develop it into a comprehensive investigation of moral responsibility, right behavior, applied ethics, meta-ethics, moral psychology, and the metaphysics of goodness. The primary function of ethics is to investigate goodness and moral behavior in general. Its substantive question is correlatively stated as: What moral principles ought to guide our choices and pursuits, and how are we rational beings?

Keywords: Political, philosophy governance, consciousness, ethics

Introduction:

We can examine the foundations of justice, governance, and individual agency by examining the rich tapestry that political philosophy, ethics, and consciousness intersect in profound ways. Political way of thinking looks to comprehend the standards and designs that oversee social orders, investigating inquiries concerning the idea of force, authenticity, and the job of the state. The justification of authority, the ideal structure of political institutions, and citizens' rights and responsibilities are just a few of the fundamental issues this field addresses. In contrast, ethics focuses on the moral aspects of human behavior and decision-making. It delves into issues of justice and injustice, right and wrong, and the guiding principles of individual and collective behavior. Our judgments about what makes a just society and the moral obligations of political actors and institutions are informed by ethics. As the subjective experience of awareness and self-reflection, consciousness contributes significantly to our comprehension of ethical and political issues. It has an impact on people's perceptions of justice, morality, and engagement with political processes. People's experiences of and responses to political realities are influenced by consciousness, as are their political beliefs and perceptions of their place in political systems. Political philosophies are influenced by ethical considerations and the nature

of human consciousness through their interaction with these three domains. On the other hand, the ethical experiences and conscious perceptions of individuals can be influenced by political structures and practices. This presentation makes way for a more profound investigation of how political way of thinking, morals, and cognizance converge to shape how we might interpret equity, administration, and human organization. We hope to uncover the ways in which these dimensions influence and challenge one another through this investigation, which will provide insights into the broader implications for aspects of political life that are theoretical and practical. You are free to modify this introduction further based on particular points you wish to emphasize or investigate in greater depth.

Objectives:

To explain what ethics is, how it differs from other sciences, the content and problem of moral consciousness, and the role ethics plays in human behavior

The primary goal of this study is to learn more about how political philosophy, ethics, and consciousness interact with one another to better understand how they affect governance and individual agency. In particular, the review plans to:

- 1. Examine Political Philosophy:** Examine the central hypotheses and ideas in political way of

thinking, zeroing in on how they characterize and legitimize political power, the idea of equity, and the design of political organizations. This requires examining various philosophical perspectives on the state's role, citizens' rights and responsibilities, and governance mechanisms.

2. Assess Ethical Principles: Consider how moral principles influence the formulation of policies and the making of political decisions as you examine the ethical frameworks that support social and political practices. In order to comprehend how they address issues such as equity, rights, and social responsibility, the study will investigate various ethical theories, such as virtue ethics, consequentialism, and deontological ethics.

3. Explore Consciousness: Examine how consciousness affects how people's political and ethical perspectives change over time. This includes looking at how one's perceptions, cognitive processes, and self-awareness affect how they think about justice, morality, and participating in politics. The review will consider what cognizance means for political personality, moral decisions, and the abstract insight of political and moral issues.

4. Analyze Interconnections: To comprehend how they collectively influence societal norms, governance practices, and personal values, investigate the connections that exist between political philosophy, ethics, and consciousness. This entails investigating how conscious experiences influence the interpretation and application of political and ethical principles as well as how ethical considerations are incorporated into political philosophies.

5. Provide Insights and Implications: Describe how a more in-depth comprehension of these connections can contribute to current discussions about moral responsibility, governance, and justice. The study aims to promote a more nuanced and reflective approach to political and ethical challenges by providing practical implications for policymakers, ethicists, and individuals.

Meaning, Nature And Scope Of Ethics

Meaning of Ethics:

In addition to being the code of conduct, ethics is the study of morality. Ethics examines human behavior as well as the rules of duty and ideal behavior. It discusses the significance of life. Morals focuses on those standards which influence man's lead to decide the norm of good and bad. Traditions are where they got their start, and they have been around since human civilization started to control how people act. Because ethics are nothing more than a collection of routines and voluntary guidelines for society, they are not punishable by law. In a nutshell, we could say that moral behavior in society produces ethics.

The word Morals is gotten from the Greek word 'ethos' which means character or lead. Morals

are additionally called as moral way of thinking or philosophical contemplating ethical quality. This morality has been further developed into actions and conduct that are concerned with the "good" or "evil" of specific traditions, groups, or individuals. The term 'moral' and 'moral' is in many cases utilized as comparable to right or great rather than 'improper' and 'exploitative'. Although it does not imply that something is morally right or morally good, it is unquestionably related to morality. Ethics is the branch of science that is concerned with moral behavior—whether something is right or wrong, good or bad, and so on. It lays out the principles that guide our actions. When we explain how the words "right" and "good" came to be, it becomes clear. The Latin word "rectus," which literally means "straight" or "according to rule," is the root of the word "right." This indicates that we are concerned with the principles that guide our actions. One aspect of ethics is explained by looking at the word "right." Rules are the means, and whenever there are means, there must also be a purpose or objective. The question of what ought to be its end arises if Right is the means of conduct. This can only be answered by looking at the word "good," which comes from the German word "gut." Gut refers to anything that can be used for a particular purpose or end. At the point when we say that such and such school is great, what we really mean is that it is helpful for instruction of the youngsters. In this way in our day to day routine we don't decipher great as something which is helpful for some end rather we mean by it, the end or great itself. So we come to the end result that morals is worried about end or objective of life. As we probably are aware in our life and in the existences of others there are endless things that can be viewed as great. As a science, ethics does not care about the particular good of individuals; in actuality it is worried about the preeminent objective or a definitive end regarding which the whole existence of individual is coordinated - the 'Best'.

Ethics In Politics

Today individuals of India are quickly losing trust in majority rules system and the explanation is the disposition of legislators to embarrass individuals, propensity for yielding advantage out of lamentable frequency, narcissistic methodology, proud, exploitative and ravenous nature. They believe that ethics only look good in books; in reality, it is a time of materialistic life in which our great Indian culture's norms, values, and ethics are irrelevant and impractical. However, politicians must keep in mind that ethics never go out of style; rather, practitioners become more westernized and modernized. Politics was regarded as a subfield of ethics in ancient India and even prior to independence. Politics' primary goals were universal liberty, justice, and peace. However, the scene immediately changed after independence.

Numerous political scandals or corruptions occurred after independence. Some examples include the Nagarwala saga, the Bitumen saga, the Churhat lottery saga, the Tansi land deal, the Urea saga, the Bofors saga, the Telecom saga, the JMM bribery saga, the Fodder saga, the St. Kitts case, and the Hawala saga. The Bofors fraud tarnished Rajiv Gandhi's reputation as "Mr. Clean," and he lost the elections of 1989. However, P.V Narasingh Rao is considered as the dad of changed Indian economy, he needed to lose 1996 political race because of tricks as it were. Following the resurgence of the fodder scam in 1996, Lalu Prasad Yadav was forced to resign from his position as chief minister of Bihar. The Taj corridor case, the Oil-for-Food program scam, and the Cash-for-Votes scandal—all of which involved money laundering in excess of Rs. 4000 crores from the 3G fraud and Madhu Koda, the former chief minister of Jharkhand. Even "The Honest Man," Mr. Man Mohan Singh, is currently being investigated for a coal scam. Why did these scams occur? All of it was the result of these so-called great personalities' unethical behavior. In a nutshell, unethical behavior is the root cause of all scams and corruption.

Socialists have an optimistic vision of what we can be—perhaps not what he is currently (exploited or oppressed), but of what he is capable of once society is reformed according to socialist principles—despite the moral issue of perpetual unequal distributions. For instance, Marxists believe that bourgeois values that are inconsistent or hypocritical will disappear; However, the specifics of what will guide ethical behavior are not readily explored; Marx avoided the topic, stating that men will consider each other as men and not as working class or bourgeois. In their place, any class-based morality will disappear because class distinctions will disappear. The majority of people believe that socialism will eliminate the need for family, religion, private property, and selfishness—all of which are opiates that keep the unawakened masses in a state of false consciousness: appropriately, free love, assets, nourishment for all, unhindered ability and self-awareness, and edified community will run the show. Anarchists and some members of the socialist camp anticipate a total rejection of authority.

Nature of Ethics:

Morals allude to direct what human should do, generally regarding right, commitments, decency and explicit temperance. It is connected with issues of appropriateness - rightness and misleading quality, common decency in moral, what's up in exploitative. In some cases the word 'legitimate' , 'fair' and 'just' are likewise utilized in the spot of right and moral. A layman could comment that 'joy is great' or flourishing of country is great. The gravity of the issue emerges when we

liken joy or success with great. It could be settled upon that delight or thriving is one of the beneficial things of life. Yet, no man with a rational head on his shoulder would state that great is only delight or flourishing is the meaning of good. At the hour of Plato and Aristotle a decent man or moral man was the person who was a productive member of society

Such a long ways as the down to earth parts of the investigation of morals is concerned, it could be encouraged that in the event that morals is a hypothetical investigation of moral issues. Such announcement probably won't have any commonsense incentive for the man in the road. It is said that experience alone enhance the moral part of human brain that no measure of hypothetical information might perhaps increase man's moral expectation. Socrates proclaimed quite a while in the past that temperance is information. What he was attempting to bring up that nobody could be moral coincidentally or without genuine information on the idea of moral demonstration. In Jaina morals which are known to be the useful utilization of peacefulness as the most elevated goodness, it has been expressed that 'information should go before sympathy'. These assertions are themselves enough to show that information on prudence is the underpinning of the act of excellence.

Accordingly the hypothetical conversation of the moral issue is the actual groundwork of its application in reasonable life. Western human advancement is laying more accentuation on material advancement and kept science separated from the religion and mysticism from morals. The dualistic disposition of the west has upset the typical existence of the people and has carried man extremely close to ending it all. Despite man's dominance over nature his fantasy of interplanetary ventures are working out, yet the everyday person of the world fails to find a sense of contentment with himself. Uncertainty and dread are ready in this present reality. The moral goals set somewhere around the Indian sages millennia prior are general guidelines that can be adhered to at all time and are enduring solution for the disasters which have crawled into current culture. It is valid in light of the fact that these beliefs were never viewed as simple hypotheses of ethical quality however as method of profound life by embracing which individual and society creates in agreeable way.

Ethics is a science of Character:

Morals is not quite the same as normal and verifiable science: It is a science based on norms. Every branch of science focuses on a specific body of knowledge. Therefore, ethics as a science has its own distinct domain. It manages specific decisions that we make about human direct. "Ethics is not merely concerned with temporal behavior but it forms the basis of legal decision," according to Muirhead. Intuitionists view ethics as the study of

right and wrong. Right is the fundamental idea. It ought to be adhered to at all times. It is the obligation to act as per regulations and wrong to act against them. Man will undoubtedly follow them; this view is called obligation prevailing morals. Formalist ethical laws are not a goal in and of themselves. They are not intended for any other goal. Immanuel Kant held that altruism is the main gem. He was implying that, with the exception of good will, nothing in the world or even outside of it qualifies as good. Because it is innate, the conscience quickly acquires knowledge of good and bad. Teleologist asserted that good is the supreme element in light of this; obligation is for moral liberation, not so much for obligation purpose. Regulations are not for regulation but rather for the fulfillment of good. Because it brings about ethical good, it is a duty to follow the law. Any demonstration is correct or wrong corresponding to the norm of good.

Scope of Ethics:

Ethics encompasses its own subject matter. Ethics is a normative science that focuses on moral ideals or what is good about our behavior. As a study of profound quality it doesn't enquire into the beginning of human lead however underlines on the items and different issues of moral cognizance like thought processes, expectations, deliberate activities, etc. There is a specific area of study for each discipline and science. It falls within the scope of that topic. There is also a field of study in ethics. The issue of morals is connected with our everyday existence. It is one of the most important fields of study in the modern era, and no human institution can advance without morality. The study of cherished ideals and values, which are essential to the progress, growth, and development of human society, is known as ethics. The fact that people are chasing money and power instead of the higher values of life is regrettable. "The materialization of value has lowered down the morals of human society," asserts Prof. Mackenzie.

Political Consideration :

An ethical direct is worried for political contemplations. The moral ideals as aspirations of the people ultimately determine the outcome of all political considerations. The foundations like Vote based system, Autocracy, and Socialism and so on. have to be governed by the law, and ethics have to take precedence. After all, an ethical way of life reflects a person's personality. Ethics is a morality science that discusses the content of moral consciousness and its various issues. Moral cognizance is the awareness of good and bad; bad and good.

Moral judgment is the super mental consider moral cognizance. It involves reasoning about a moral standard and comparing a voluntary act to it. It also involves weighing voluntary and

habitual actions in terms of goodness and evil or rightness and wrongness. Moral judgments are followed by moral sentiments, not the other way around, by the emotional factors. The main component of moral consciousness and moral judgment is moral obligation, also known as the feeling of duty or oughtness. It includes the ethical drive to do the smart activity. We believe that we should not act in a wrong way but rather that we are obligated to do the right thing. Therefore, the primary cognitive, affective, and conative factors in moral consciousness are moral judgment, moral sentiment, and moral obligation.

Role of Ethics In Indian Politics

An existence without morals is pointless and unimportant. It plays a crucial role in every aspect of life, including politics, business, education, and profession. Raja Rama, King Harischandra, and Danveer Karn were well-known for more than just their physical attributes. Assuming we discuss the advanced world, Master Vivekanand, Chandrashekhar Azad, Bapu and a lot more were likewise notable for their morals. Even when faced with adversity, none of these people compromised their morals. Rules that deal with life's values are called ethics. It focuses on those standards which influence man's direct to decide the norm of good and bad. This assurance of right or wrong leads our method for playing out our obligations truly or thoughtlessly. Sadly, it is no longer present in any aspect of life, particularly politics. Despite our Constitution's excellent code of ethics, politicians are now completely unethical. Their unethical behavior can be seen in their involvement in criminal activities, corrupt behavior, and absurd conversations. The author has attempted to explain politicians' ethical responsibilities, as well as the actual situation, in this paper. In this paper, the author explains how ethics are disappearing not only from politicians' lives but also from the lives of everyday people. Additionally, solutions to this issue have been proposed.

The first question in political philosophy is: how should an individual relate to society? The subject looks for the utilization of moral ideas to the social circle and in this manner manages the range of types of government and social presence that individuals could live in - and in this manner, it likewise gives a norm by which to dissect and pass judgment on existing establishments and connections.

Political science is distinct from political philosophy, despite the fact that a number of philosophical issues and approaches connect the two. Insofar as it is possible to be amoral in its descriptions, political science strives for a positive analysis of social affairs, such as constitutional issues, voting behavior, the balance of power, the effect of judicial review, and so forth. Political way

of thinking creates dreams of the great public activity: of the normative set of values and institutions that ought to unite men and women. The topic is broad and easily relates to other branches and subfields of philosophy, such as economics and law philosophy. The most relevant theories that a student of political philosophy is likely to encounter are briefly discussed in this introduction. Socialism, Anarchism, Anarchism, and Environmentalism are all discussed in the article.

Literature Review

1. Political Philosophy

The nature of political authority, justice, and the ideal organization of society have long been subjects of political philosophy. Exemplary works like Plato's "Republic" and Aristotle's "Governmental issues" laid central speculations in regards to equity, the job of the state, and the idea of citizenship. Plato's vision appears differently in relation to Aristotle's experimental methodology, featuring continuous discussions about the idea of political frameworks and the job of ethicalness in administration. In the advanced period, scholars like John Locke, Jean-Jacques Rousseau, and Immanuel Kant extended political way of thinking to address the privileges of people and the standards of vote based administration. Natural rights and the social contract are emphasized in Locke's "Second Treatise of Government," while collective sovereignty is discussed in Rousseau's "The Social Contract." The moral foundations of international relations and the concept of cosmopolitanism are introduced in Kant's "Perpetual Peace." From Rawls' theory of justice, which focuses on fairness and the "veil of ignorance," to communitarian critiques of liberalism, which emphasize the role of community and tradition in shaping political life, contemporary political philosophy includes a variety of approaches. Critical perspectives on power, identity, and resistance can be found in the writings of Judith Butler and Michel Foucault, which further enrich the field.

2. Ethics

Morals investigates the rules that guide moral independent direction and the idea of good and bad. Customary moral speculations incorporate deontological morals, which underscores obligation and rules as expressed by Immanuel Kant, and consequentialist morals, which assesses activities in view of their results, as found in utilitarianism enunciated by Jeremy Bentham and John Stuart Plant. Aristotle's "Nicomachean Ethics," which gave rise to virtue ethics, places an emphasis on character and virtue cultivation. In the 20th century, ethical theory expanded to include existentialist ethics and feminist ethics, which emphasize individual freedom and responsibility in the works of Jean-Paul Sartre and critique traditional approaches from a gender-sensitive perspective. The growing

complexity of ethical issues in today's society is reflected in the growth of applied ethics, such as bioethics, environmental ethics, and business ethics. The application of ethical theory to real-world issues is demonstrated by scholars like Peter Singer, whose work addresses ethical issues such as global poverty and animal rights.

3. Consciousness

The fields of psychology, cognitive science, and philosophy of mind are all included in consciousness studies. Philosophical investigations into cognizance date back to Descartes, who broadly announced "Cogito, thus aggregate" featuring the centrality of mindfulness in grasping human life. Discussions about the nature of consciousness in contemporary philosophy continue to be shaped by the conflict between physicalism and dualism. Daniel Dennett and David Chalmers's work represent two influential points of view: Chalmers' investigation of the "hard problem" of consciousness, which asks how subjective experiences emerge from physical processes, and Dennett's functionalist approach. The correlation between neural processes and subjective experiences is the primary focus of cognitive science and neuroscience, which have provided empirical insights into consciousness. Integrated Information Theory (IIT) and Global Workspace Theory (GWT) provide various models for comprehending consciousness's nature and mechanisms.

4. Interconnections

There has been a growing focus on the relationship between political philosophy, ethics, and consciousness. Ethical considerations have been incorporated into political philosophers' theories of justice by John Rawls and Robert Nozick, whereas identity and consciousness are frequently the focus of current debates. In morals, the investigation of moral brain research looks at how awareness and mental cycles impact moral decisions and conduct. Emotional and unconscious factors influence ethical decision-making, challenging purely rational morality models, according to researchers like Jonathan Haidt. In addition, consciousness research provides insights into how people perceive and interact with political systems, which aids political philosophy. The investigation of awareness adds to understanding how political belief systems shape and are molded by individual and aggregate encounters. A foundation for examining how political philosophy, ethics, and consciousness intersect and inform one another in contemporary discourse is provided by this literature review, which highlights the rich and evolving dialogue between these fields.

Research Methodology

1. Research Design

The study will take a multidisciplinary approach that incorporates philosophical inquiry,

empirical research, and theoretical analysis. The purpose of this design is to provide a comprehensive comprehension of how consciousness, political philosophy, and ethics interact and influence one another. The theoretical framework analysis of important philosophical texts and ethical theories will comprise the first three phases of the study. Empirical Research A look at current issues and empirical research on consciousness and making ethical decisions. The integration of theoretical insights with empirical findings in order to investigate the connections between political philosophy, ethics, and consciousness is the synthesis.

2. Theoretical Analysis:

Conduct a thorough analysis of primary and secondary sources related to consciousness studies, political philosophy, and ethics. Contemporary philosophical and ethical theories, as well as recent contributions from cognitive science and consciousness studies, will be key sources. Comparative Analysis Compare and contrast various ethical and political philosophies. Consider, for instance, how various theories of justice relate to consciousness and self-perception and how they address ethical issues. Philosophical Request Participate in basic assessment of ideas like equity, power, and profound quality, zeroing in on how these ideas are affected by or impact human cognizance.

3. Empirical Investigation

Contextual analyses Direct contextual analyses of contemporary political and moral issues to investigate how hypotheses are applied by and by. Consider policy decisions and ethical dilemmas concerning human rights, the environment, or economic inequality, for instance, and consider how consciousness and ethical principles are involved. Interviews and surveys: To gather information about public perceptions of justice, morality, and political systems, use surveys and structured interviews. This will assist in comprehending how political and ethical viewpoints are influenced and reflected by collective and individual consciousness. Trial Techniques Carry out tests in social morals and mental science to investigate how people settle on moral choices and what these choices are meant for by their mindfulness and comprehension of political and moral ideas.

4. Synthesis and Analysis

Integration of Findings Examine the connections between political philosophy, ethics, and consciousness by combining the insights from the theoretical analysis and the empirical investigation. Identifying patterns and connections between theoretical concepts and empirical data is necessary for this. Cross-Disciplinary Perspectives Think about how consciousness studies' findings can help shape political and ethical theories. For

instance, evaluate what bits of knowledge into mental inclinations and moral brain research mean for how we might interpret equity and administration. Implications and Recommendations Discuss the research's practical implications for individuals, ethicists, and policymakers. Based on the combined findings, make suggestions for dealing with current ethical and political issues.

5. Methodological Considerations

Ethical Considerations Make certain that all empirical research abides by ethical guidelines, such as confidentiality and informed consent. Make sure that all points of view are represented fairly by addressing any potential biases. Reliability and Validity: To make the findings more reliable and valid, use triangulation. Continually evaluate and improve the research design in light of initial results and feedback.

Limitations

1. Theoretical Limitations

Intricacy and Degree Political way of thinking and morals envelop a wide scope of speculations and perspectives, which can make it trying to address all pertinent viewpoints completely. It can also be difficult to combine various points of view into a cohesive analysis due to the significant differences between theoretical models. In political philosophy and ethics, theoretical analysis frequently involves abstract concepts that may not directly translate to practical applications. Discussions about ideal justice or moral principles, for instance, might not always match up with the subtleties and complexities of the real world. Evolving Theories Political philosophy and ethics are both dynamic fields that are characterized by advancing theories and debates. As a result, it may be challenging to provide a complete or current account of all relevant theories and perspectives.

2. Empirical Limitations

Case studies, surveys, and experiments' findings may not be applicable to all political or ethical contexts because they may be context-specific. Social, social, and political contrasts can impact the appropriateness of results across various settings. Problems with Measurement It can be difficult to measure subjective experiences of consciousness and ethical decision-making. The methodologies and tools used to record these experiences might not be as accurate or reliable as they could be. Predisposition and Understanding Experimental exploration is vulnerable to predispositions in information assortment, translation, and examination. The interpretations and outcomes of empirical studies can be influenced by biases of a personal, cultural, or methodological nature.

3. Interdisciplinary Integration

Conceptual Divergence Bridging conceptual and methodological divides is necessary for integrating insights from consciousness studies, political philosophy, and ethics. It can be difficult to achieve a coherent synthesis because theories and methods from these various fields may not always align seamlessly. Barrier to Communication Specialized terminologies and frameworks used by researchers working in various fields can make it difficult to collaborate and communicate effectively. Integration of insights and findings across disciplines may be hampered as a result of this.

4. Practical Constraints

Limitations on Resources Conducting comprehensive research across multiple fields necessitates a significant amount of time, money, and expertise. Restricted assets might compel the degree and profundity of the examination. Ethical Requirements Research involving human subjects must adhere to strict ethical guidelines, particularly in consciousness and ethics-related fields. The kinds of experiments and data collection techniques that can be done may be limited as a result of this.

5. Temporal and Contextual Limitations

Changing Settings Political and moral settings are likely to change after some time, impacted by friendly, monetary, and political turns of events. As contexts change, research findings may become less useful or need to be reevaluated. Political philosophy and ethics theories frequently have their foundations in historical contexts that may be significantly different from current issues. It can be difficult and complicated to comprehend how historical perspectives relate to contemporary contexts.

6. Subjective Interpretations

Fluctuated Viewpoints Various people and societies might decipher political and moral ideas in assorted ways. This subjectivity can prompt fluctuating translations and utilizations of hypothetical and observational discoveries. Variability in Consciousness Consciousness is innately subjective and can vary greatly from person to person. When compared to broader philosophical and ethical theories, capturing and analyzing this variability poses significant difficulties.

Discussion

The interchange between political way of thinking, morals, and awareness uncovers significant experiences into the idea of equity, administration, and human organization. The key findings are summarized and their implications are examined in this discussion.

1. Political Philosophy and Ethics

Because ethical principles frequently support political theories and guide our understanding of justice and governance, political philosophy and ethics are deeply intertwined. For

instance, the ethical principles of equality and the moral worth of individuals serve as the foundation for John Rawls' theory of justice as fairness. Rawls' idea of the "veil of obliviousness" fills in as a regulating device to survey decency in political designs, stressing the significance of fair-mindedness in moral decisions. On the other hand, frameworks for evaluating political decisions and policies are provided by ethical theories like utilitarianism and deontology. Discussions about public policy and social welfare are influenced by utilitarianism, which places an emphasis on maximizing total happiness. A foundation for evaluating political institutions and their respect for individual rights is deontological ethics, which places an emphasis on duty and rights. Contemporary debates on topics like social justice, human rights, and global governance demonstrate the dynamic between political philosophy and ethics. Ethical frameworks frequently use political contexts to address real-world issues, while political theories must deal with ethical dilemmas and societal values.

2. Consciousness and Ethical Decision-Making

Political engagement and ethical decision-making are heavily influenced by consciousness. Understanding how people perceive and respond to moral and political issues is made possible by the study of consciousness. Unconscious biases, emotional responses, and cognitive heuristics have a significant impact on ethical judgments and political beliefs, according to moral psychology and cognitive science research. Experiments in behavioral ethics, for instance, demonstrate how cognitive biases like moral licensing and confirmation bias can influence individuals' choices and actions. These inclinations can prompt irregularities between expressed moral standards and genuine way of behaving, featuring the hole between ideal moral thinking and true practice. The importance of awareness and reflection in political and moral contexts is emphasized by the role that consciousness plays in ethical decision-making. Policies and procedures that encourage ethical behavior and decision-making can be developed with the help of an understanding of how cognitive and emotional factors influence judgments.

3. Interconnections and Implications

A deeper comprehension of governance and justice can be gained by bringing together political philosophy, ethics, and consciousness. Theoretical principles, as well as the ways in which individuals and societies perceive and experience these principles, shape political systems and ethical frameworks. The investigation of consciousness demonstrates that the subjective nature of human experience must be taken into account in political and ethical theories. Speculations of equity and ethical quality that ignore the job of cognizance

might neglect to address the intricacies of human way of behaving and discernment. In contrast, insights from consciousness research have the potential to improve political and ethical theories and make them more adaptable to human experiences and circumstances. Additionally, the interaction between these domains has practical implications for ethical practice and policymaking. Arrangements planned without thought of mental inclinations and moral subtleties might miss the mark regarding their expected objectives. Similarly, ethical frameworks may lack practical relevance and effectiveness if they do not take into account individuals' actual experiences.

Conclusion:

The major political theories proceed to define what they believe to be the most appropriate institutions for human survival, development, morality, and happiness. They assume that humanity holds ethical and therefore political primacy, at least on this planet. While environmentalism takes a different tack, all of the political theories discussed in this article are based on ethical theories of human nature in relation to the outside world and others. Since political hypothesis overwhelmingly manages human social nature, it should manage human distinction as well as our connections to gatherings - with one's self-awareness as a political and moral element as the need might arise and detect to have a place with overall characters. Law, economy, freedom, gender, nationality, violence, war, rebellion, and sacrifice, as well as larger visions of our proper political realm (utopianism) and criticism of current institutions from the local to international level, are the subjects of a wide range of discussion and debate in response to the major theories. While the current mainstream debate between communitarianism and liberalism provides students with a fertile ground for examining the nuances produced by the clash between collectivism and individualism, alternative political theories as well as historical political theories should not be overlooked: They also continue to elicit debate. In conclusion, a comprehensive framework for comprehending and addressing the complexities of human behavior and social organization is provided by the synthesis of political philosophy, ethics, and consciousness. The ethical and political issues of our time can be better understood and solved with this integrated approach.

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Study of Sant Eknath Bharud

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Abstract:

Literature about saints was written in the early stages of the Marathi language. It was written not only in Marathi, but also in a number of other national languages. Maharashtra's social and cultural history can be traced back to saint literature, which originated as devotional songs. The entire Saint literature had a close connection to the social, political, and religious traditions of the present. This research paper examines the contributions of the Saints, including their works of literature and music. Saints Dnyaneshwar, Saint Namdeo, Saint Eknath, Saint Tukaram, Saint Ramdas, and Saint Kabir, Rastrasant Tukdoji Maharaj, and Sant Gadgebaba all made significant contributions to Saint literature. These great authors' didactic works had a significant impact on the evolution of Indian society today. As a matter of fact, the writing composed by Holy people of Bhagwat Sampradaya is known as Holy person writing. It originated primarily from the musical compositions sung for Lord Vitthala, and the fact that it was sung with beautiful musical notations effectively spread its popularity among people.

Keywords: Saint literature, contemplation, musical compositions, Ragas, Abhangas, Owis and Bharud, Arya, Kekavali, Bakhar, Powada, Natya Sangeet

Introduction :

From 1533 to 1599, saint Eknath lived. In the 16th century, he was a great Bhagwat Sect saint. He was the wisest and most talented devotee of a single god. Not only was he wealthy, but he also possessed numerous qualities like love, compassion, tolerance, and benevolence. He was greatly impressed by the culture of "Paithan" town in Marathwada because he was a resident there. He was gifted and devoted because his ancestors belonged to the Rigveda race. He teaches all through his life. He did a great job as a reformer. It was not egotistical. It was for people's growth. He set up ideal by making family and administration. His Bhagwat was as good as the Dnyaneshwari of the Warkari sect. In Marathi, "bharud" refers to a contemplative arama0-song that imparts moral and spiritual guidance. According to Saint Eknath, relationships and family can entangle a person's heart, but they can also be deceptive and alluring. He gave profound showing through impression of society. The above things are polished through Bharood. He despised notions and fiendish traditions through Bharood allotting tune. Bharood provides an explanation for a variety of topics, including the political and religious climate of the time, society's inhabitants and their way of life, customs and festivals, common games, and more. The language of the Bharood a singing melody was most likely perceived by individuals of various cast and belief.

The language of Bharood was short lettered. It was additionally simple with the Marathi language, Hindi, Kannad, Telgu, Urdu, Parsi and

Sanskrit words were utilized in Bharood. Figure of speech and nine types of tendencies are utilized in these languages. While saint Eknath's image and talent were exceptional, his knowledge and widespread talent were highly regarded and well-known. Holy person individual accomplished a certain something, Ah Brahmasmi is chief was acclimatized by them with ability. They could achieve mental contentment, loneliness, and meditation with this knowledge. Eknath was nothing more than a strong, skilled, and hardworking man. With Eknath saint's new stules, the volume practices tradition emerged in the 14th century. Bharoods became remarkable and colorful as a result of an innovative construction style, despite the fact that some spiritual meanings may be challenging. Numerous characteristics like sikll, thinking power Assortments immeasurability and found of work are seen in Eknath's.

The Literature Of Eknath:

(1) Four folded Bhagwat (1485) (2) Eknath's Bhagwat (Year 1570 to 1573) (3)Rukhmini's selection of husband. (4) Shukastak (5) Amruta-anubhav (6) Hastamalak (7)Chiranjivpad (8)Anandlahari (9) Anandaanubhav (10) Bhavarth Ramayan (11)Qutobiogry writing (12) Dhyaneswari Research (13) The construction of Nathani Volume (14) Milk women (15) Sad songs (16) Prayers. (17) Bharoods etc.

These provide insight into the variety and expansion of Eknath's writing. He created many kinds of writing throughout his life. In the 16th century, there was an overabundance of poverty and ignorance, and Muslims were about to invade. Saint

Eknath had inspired people at this time through his writing and activities. Saint Eknath was a supporter and patron of the people. He taught other people. In the artistic accomplishment, his tremendousness of ability contained. Poetry and literature were not considered to be literary works. Just for of accomplishing God he was taking a gander at them and there was not even a shadow of a doubt. The nature and work of Eknath's Bharood Eknath made an effort to introduce Bharood from an ordinary perspective into one that is extraordinary. He additionally attempted to bring otherworldly idea before eyes through Bharood. He accepts whatever he sees and creates his own compositions through Bharood. Through his construction, he interacted with people and attempted to comprehend what people's hearts were saying. This shows that he is paying attention to social inspection. The composition of Bharood has two different meanings. The first is when external words are used, and the second is when that word gives meaning to something else. That is a metaphor with two possible meanings and an implied comparison. In the Bharood, there are two types of meaning: reading meaning and interpretative meaning. This is the very thing we say magnificent and otherworldly importance. As he had an excess of connection for individuals, he interated occasions in life through his Bharood through the people groups language. The motivations in Bharood were profound and social. His religious existence was fainting and seceding as a result of the excessive bad thinking in society, and he began engaging in activities for social welfare and enhancement.

The Bharood Composition Of Saint Eknath:

Eknat made numerous composition on different subjects this organization was overall his subject was God as well as individuals from most minimal layers of society in the Bharood. His writings and research from his time were helpful in understanding the hearts of the people at the time, and Bharood's insight into village life depicted many different types of people, including administrative and hardworking types. His Bharood is about people who rely on agriculture. The subject of his Bharood is self-centered individuals who were only concerned with their own benefits rather than protecting their owner. These individuals had their own agenda. His Bharood was about administrative classes of people who were only using power for their own benefit. People who relied solely on luck and had no faith in hard work, as well as those who were not spiritual, are depicted in his Bharood. They had no tolerance for their spiritual and glorious development. Bharood is the writing which can cause otherworldly turn of events and which move individuals. It was the fascinating writing. Because of Eknath, Bharood has significant spot in Marathi writing it is trademark and enduring spot.

Bharoods Of Saints Period:

The Deople song reveals the origins of Bharood. In the oral writing the arrangement of individuals tune and people groups religion are seen. Eknath has effectively utilized Bharood for people's education, social sermons, and songwriting. Before Eknath, saint Namdeo tried to improve Bharood in the same way that "Khelia, Bobda, and Jog parmanand "Gudgudi" did. Ramdas and Saint Tukaram also made better efforts for this kind of composition. However, Eknath's popularity was exceptional and worthy of praise.

Bharood:

Holy person writer or sautkavi has gotten Bharood „Bahrood“ the famous melody which was recognizable from old individuals and extremely old. Bharood transformed it into poetry from a song. Holy person writer has made piece with the demeanor, making individuals drink "Amrut" the god's pure water and that was all. Saint Dhyaneswor and Namdev had written little prior to Eknath. Two meanings—external glory and inner glory—are interpreted in Nath Bharood's composition. In their period the strict unstability in the public eye, Political specialist or worker well as friendly condition, inspirelessness and unspirituality was seen best such society was organized by Eknath and brought under the shade of Bhagwat religion. His Bharood development has social, profound and scholarly skirts. They were significant in light of the fact that in that Bharood contemporary subject were involved. In that society, various images are focused.

The Classification Of Bharood:

1) Person-descriptive Bharoods: As the saint has described numerous things in Bharood, such as individuals from various social classes and their respective fields of expertise. The people's social reputation, characteristics, habits, and language, among other things, have been centered all the more cautiously in Bharood. As a result, Bharood holds a special reputation and occupies a significant position in literature. The aspects of culture that are well-known have been the focus of the specialization. Through this Bharood. Eknath has let individuals know „God“, what is sex and its awful impact in the least complex language. Eknath has written 400 Bharoods on various 130 subjects, and this seems to be the series of traveling pictures in which a lot of people, like businessmen, come far away to make them spiritual metaphors and teach people about "God and Spiritualism." He has made sense of seriously numerous Social debilitated people like. " In the Bharood, they were referred to as "Gondhani," "Bhutya," "Waghya," "Kakir," "Garudi," "kolhati," "Dumbman," "acrobatic man," "deafman," "vaidu or physical man," "watchman," and "blindman." Every one of the unique

characteristics of that individuals have been depicted in the Bharood on extraordinary level.

2) Bharoods on God and Goddesses: Eknath has done a good job of sharing his spiritual ideas with others. He utilized "Mahalakshmi", "Jagdamba", "Khandoba", "Mansai", "Amba", "Yallamma" for this movement. In his Bharood, he also used worshipful occasions like Gondhal, Dok, Jogwa, and Fulwa. Through this he tried to make sense of the god's assist in trouble with peopling. by describing the gods and goddesses and their sinister presence. He brought Gods who bring people happiness forward through this.

3) The Worshipper of Gods: He made alive numerous admirers who were Vasudev. Through his Bharood, Balsantosh Joshi, a monk, Jangam, Manbhav, and Waghya-Murali, many high-quality autobiographies of God were written.

4) About Play: In the Bharood Eknath has given significance to games and has masterfully involved them in the Bharood with mang cast, barudi, gymnastic performer, he utilized generally fascinating games like, "Fugadi", "Zimma", Find the stowaway, Chendu fali, viti-dandu, Tiparee and so on in the Bharood. He has persuaded people to follow spiritual ideas through these games. Alongside this he has involved festivals celebrations customs in the Bharood.

5) Bharood about Birds and Animals: He has composed Bharoods on edka, canine, cow, bull, scorpion, snakes, parrot, titwi, watwaghul and pimpla. He has composed Bharoods on all birds and creatures. He gave significant spot to all components on the planets. He has given god's language to birds and creatures. In Bharood, the terms "edka madan," "lobsnake," "angry scorpion," "human ingali," "saintcow," and "taught parrot" are all metaphors for birds and animals. He has demonstrated how to get away from family by communicating with other people.

6) Letter's Bharoods: The letter that Eknath's correspondent wrote has been used as a metaphor in the sermon. There are thirteen letters total. This multitude of letters are government letter. Request letters, brave letters, warning letters, and disclosure letters are all private and dramatic. Eknath has recognized this and placed a prominent position in Bharood's letters as nothing more than speech and monologue. Eknath's images of letters are from the government. Because of this letter application and command suggestion, they hold a significant place in Bharood. The language of letter of Eknath is a combination of parsi language. This letter is written in any poetry style that can be seen in the lesson. In this letter correspondence the profound illustration are not difficult by any stretch of the imagination.

7) The Appearance of Village management: In the town the executives the officials and laborers like mahajan, shetey, kotwal, Naikwadi, Jumedar,

Jakatdar, Hujure, brown noser, puranik, mashalji, sabnish and subhedar were preject. It was clear what positions they hold in this management. What were their responsibilities? This has been found in the Bharood. Furthermore, contemporize image of town the executives remained before our eyes

The Characteristics Of Eknath's Bharood:

We have insight of with and humour through bharood. Whatever jobs these bharood needs to assume many parts from them are ridiculous. In the Bharood of them a few loves and petitions to God are there. They simply retain the incarnation of divine beings story accordingly this Bharood piece isn't uniform it has assortments. In this Bharoods, various village dramas are depicted in a variety of roles, giving spirituality to all of these activities. The social fabric of Maharashtra was unstable and disabled, as depicted by Bharood right in front of our eyes. This is the character of the current Bharood. There are numerous names for Eknath's Bharood, such as "Navlai" and "kode naval." Each Bharood has the language that is puzzle language. His Bharood's religion is puzzle language conversation. The term "puzzle language" refers to metaphor-based language. As a result, their puzzle serves as our spiritual puzzle. In this puzzle figures are more significant. There are also some bizarre puzzles, such as "water is through" and "four, six, eighteen, five, sixteen at night, then flew in the sky." The attendant engulfment forms, an ant fight breaks out with the elephant, the goat cries out to the wolf, and the lion becomes helpless. The wife performs Garba because her husband is killed by the goat. The number of bizarre puzzles in Bharood is as high as the moon shines at amavsha night. Every one of these riddle are infrequent. Holy person Eknath has utilized numerous substances of supper and instruments and they are stirred up in the God and all-powerful. Paintul ropes, feelings and thoughts on plates. The papad that was baked on saints' fire, the sense of self-awareness that came from experiencing oneself, the desire for credit, etc. are metaphors made of metaphors, and understanding the ingredients of the dinner has been difficult because of the above characteristics; his Bharood is full.

The Dramatization Of Bharood:

The saint Eknath Bharoods are dramatic, and many of the dramas merit a song. Holy person Eknath's has made show of many kinds of jobs and made that job player to talk and in this way they all got the type of new tunes. In some Bharood others address to job players yet maharin Bhutiya aerobic lady this large number of job players are communicating life show themselves. The chose experience field that holy person Eknath has chosen, it's extension assortment are drawing in each body's consideration and numerous hypoeracy in that field shows us pleasant appearance of

encompassing life show. In addition, every time we read a Bharood, we get a sense of the many and varied life dramas that Bharood depicts through their life moments pictures. The idea that the drama in Bharood should become role drama came from Eknath. Language plays a significant role in Bharood's role drama due to the neglect thread. Each today as a Bharood, in the celebration, pilgrimage, in the capability of Varkari individuals, these Bharoods are looked and heard elegantly holy person Eknath communicated the spot of sauri in town life, her shyless, free and unhinged life show through Bharood. Self-characteristic dramatization is not allowed to fade away among these Bharoods. The dramatization is the same, despite the fact that it is spoken in puzzle language.

This sensation is presumably significant. These Bharoods have given society a spirit. They have helped the blind see, the dumb talk, the disabled climb mountains, and the insane become wise. Not only that, but their Bharoods have also helped the unspoken express themselves. The ordinary has become extraordinary as a result of the touch of their image. The practice of display of measure construction and articulation of the performance and society show and examination such emotional quality are acknowledged through people groups in bharoods. The prominence that their bharood have is because of the show quality and way of life in carnation. Bharoods are a window into these two categories: social life and appearance. If you think of Eknath's treasure production, you can see that their constriction Bharoods have quality finishing and touch. Their distinctive structural composition can be attributed to the preamble, constraint, demonstration, and production objective. In Marathi writing the Eknath's writing has significant spot and this is because of various qualities numerous Bharoods have their lovely ability and unity in individuals and bit of witness.

Bharud as an Art Form

From 1605 to 1650, Old Literature was in its second phase. Vitthal is also praised in significant poetry written during this time period by saints like Tukaram, Eknath, and Mukteshwar. The Bhakti or strict composing saw rich creation in Abhangas. Abhanga refers to not interrupting or ending. During this time, the Warkari sect underwent significant change. The majority of the compositions were in the styles of Gora Kumbhar's Ovi, Shlok, Janabai, or Eknath. Ovi, Shlok are sections written in the Quatrain, or couplet with final words rhyming. They have a lot of meaning and are mostly philosophical. The primary Bharud folk cult emerged at this time. Sant Eknath is supposed to have created it. Being a people workmanship in country area is assumed. It has educative importance, significant medium to advocate otherworldliness through show, statement

and music. Bharud's language is straightforward and full of figure of speech, and its goal is spiritual elevation through the control of materialistic tendencies. Non-orthodox characters like blind, crippled, deaf, dumb, animals, birds, prostitutes, soldiers, town thugs, and other oppressed sections of society have been used intentionally by Sant Eknath. Vasudeo, an astrologer who advises the villagers, Joshibua, Mari aai or kadak Lakshmi in the form of Potraj, and Vasudeo are important characters in Bharud. Women work at home and are oppressed by the in-laws. Villagers and military personnel were entertained by practicing bharud. This is maybe the main structure which doesn't acclaim or praises Master Vishnu or Shiva.

Keertan:

Keertan is the specialty of profound showing through narrating performed by two principal entertainers - keertankar, utilizing a Veena a, instrument and joined by harmonium and Tabla. This likewise incorporates singing, acting, moving, narrating. This basically lauds god and godly deeds. Tukaram Maharj practiced this extensively and remained alive. It is a common form at Dyaneshwari recitals and other celebrations. This structure has been drilled exclusively in the couple of organizations and is very nearly reducing because of different reasons. Not many of the reasons are occupied way of life, relocation, no or lacking assets to realize this faction.

Powada Singing :

This is supposed to be the story of Shivaji Maharj's heroic ballad. This arose in the seventeenth hundred years and arrangers of Powada are called Shahirs. The narrative of Powada is full of historical events and told in an inspiring way. The professional powada singers later established the Gondhalis as a guild or caste. The Afzal Khanacha Vadh by Agnidhas, which described Shivaji's encounter with Afzal Khan, was the first well-known powada. The following remarkable powada was the Tanaji Malusare by Tulsidas, which gave a record of the catch of Simhagad post by Tanaji. The Baji Pasalkar by Yamaji Bhaskar was another notable contemporary powada. During the Peshwa rule, a few observed Shahir writer vocalists, which incorporate Smash Joshi Anant Phandi Honaji Bala and Prabhakar made a number out of powadas. Harry Arbuthnot Acworth and S. T. Shaligram compiled approximately sixty powadas and published them in 1891 under the title Itihas Prasiddha Purushanche Va Striyanche Powade. Ten of these were translated into English verse by H. A. Acworth, and they were published in 1894 as Ballads of the Marathas. Nowadays, tourist guides only use it when they take tourists to the fort to show how important the place is and how to greet them.

A Short Note On Sant Eknath:

Sant Eknath was brought into the world in 1530 Promotion into a lofty Pratisthan Brahmin family (Paithan today). They became known as the Kulkarnis of the village; Eknath Suryajipant Kulkarni would be their actual name. Sant Bhanudas, Eknath's fatherly granddad, was the person who moved the valuable image of Ruler Pandurang through Vijayanagar to Pandharpur. Eknath's parents, Suryanarayan and Rukmini, vanished shortly after his birth, and Eknath was raised by Chakrapani and Saraswatibai, his ancestors. Eknath would need to persevere through the scorn of different young people as a vagrant. When he was younger, he started to reject their interactions and turned to devotion and other contemplative pursuits for refuge.

Early Years:

Sant Eknath initially knew about Janardan Master when he was around twelve years of age. This well-known philosopher lived in Devgiri, also known as Daulatabad by the Muslim rulers of the time. Eknath made the long trek to Devagiri in an effort to become his student. Janardaswamy was astonished by this young man's extraordinary skill and quickly accepted him as a student. Among other things, he preached the Eknath Vedas, Nyaya, Meemansa, Pranayama, and the writings of Sant Dnyaneshwar. Since Janardan Swami was a fan of Dattatreya, Eknath held a social perspective of kindness and compassion for all creatures.

Eknath was requested to go on vacation by the Guru. He accompanied Eknath to Nasik-Trimbakeshwar. Eknath went to Paithan subsequent to closing his excursion to various heavenly areas in the western piece of the nation, India. He was thrilled to see his family again, and they encouraged him to get married. Eknath and Girija, his wife, were all meant to be together, and they set a high standard for ethical behavior. Over time, the couple gave birth to two girls named Godavari and Ganga as well as a boy named Hari.

Dnyaneshwari's Resurrection:

Dnyaneshwar's most important work, the inscription Dnyaneshwari, was recovered by Eknath, who was also responsible for the loss of several other Hindu epics during the Muslim conquests. Dnyaneshwar had wrote a fundamental translation in Marathi in verse structure on the extraordinary blessed sacred writing all through Sanskrit Bhagawad Geeta around quite a while back before the coming of Sant Eknath. It was known as the Bhawarth-Deepika and was referred to as the Dnyaneshwari. Between Dnyaneshwar and Eknath, Muslim invaders have decimated Maharashtra and the rest of the region. People became discouraged as a result of disappointment and failure. Because they had been lost in a few generations, people couldn't turn to their epics, songs, or poetry. Sant Eknath was

aware that what was needed at the time was a reemergence of Marathi literary works, particularly the great epics, as well as youth development in traditional values. Additionally, he was aware that if Marathi-worded Dnyaneshwari, which was once common, were reintroduced to the people, they might have been spiritually and normatively exhilarated.

His Writings:

Marathi verses were used in several of Eknath's works. Eknathi Bhagawat is a comprehensive and straightforward discussion of the 11th Stanza of the Sanskrit religious text Bhagavata Purana written by Eknath Maharaj. The discussion was held with the participation of 188,000 owners. The main initial 25,000 weeks of the second serious upkeep, the Bhavartha-Ramayana, were composed by him. A disciple by the name of Gavba worked 15,000 weeks to complete the mission. Eknath is said to have written Rukmini Swayamwar, which ran 1,711 weeks and was based on 144 Bhagavad Saga lyrics. Hastamalak, his creation, had 764 proprietors and was motivated by Shankaracharya's 14-shlok Sanskrit songs. His other compositions included the Shukashtak (447 weeks), Chiranjeeva-Pad (42 weeks), Geeta-Sar, Swatma-Sukha (510 weeks), Ananda-Lahari (154 weeks), and Prahlad-Wijaya. He wrote 300 Bharood songs, which are devotional songs in a new Marathi language. Also, he made 300 reflection tunes in the Abhang style. He was another preacher who gave several sermons in public.

His Precepts:

One of the earliest preachers of untouchability in Maharashtra would have been Sant Eknath Maharaj, who lived during the medieval period. At a time when Brahmins even shunned the shadow and speech of an unworthy, he attended events with lower castes and openly paid them respect. He once safeguarded the presence of a Mahar newborn child wandering on the burning sands of the Godavari, saving it from the bursting heat. His poetry inspires readers to treat one another with compassion and respect as if they were siblings. Birds, creatures, and plants were totally remembered for the plea. According to one of his most famous poems, every soul you encounter is your God.

Conclusion:

Sant Eknath would be a Marathi holy person, scholar, and strict writer who lived from 1533 until 1599. Sant Eknath is viewed as a connection between the elevated forerunners Dnyaneshwar and Naamdev and the correspondingly wonderful relatives Tukaram and Ramdas in the development of Marathi writing. Eknath committed his life to restoring epic verse. His underlying mission was to find Dnyaneshwar's samadhi to show to the local area that Dnyaneshwar

probably been a legitimate man of honor, one just their own. The tendency is to ignore beauty and entertainment in life. It diminishes literary interest. in Eknath's private life. Eknath might not have run this inclination but rather about the advantage of all and as per it, anything job he has acknowledged, thusly his scholarly way of behaving has become defective with his advantage and dejection. The unreal pressure of spirituality that Eknath brought to his writing resulted in them going for their explanation, ignoring thoughts, and placing an emphasis on the primary explanation. Than interest the depression creative mind of writing is the assortment.

The abstract interest level has descended than the Marathi writing first period. It was erroneous to anticipate Trans formatted change in the social, economic, and cultural fields. Eknath must exert greater effort to safeguard religion and follow Dhyaneswar's path. To put it another way, Eknath has backed the cocas system. Holy person Eknath was adorable, amenable quiet thoughtful moreover. This is told and lauded. The offspring of unapproachable was taken in the arm was the observer o his propensity and love. However, this reality was a means of expressing oneself. Eknath has showed his mental fortitude to contact the

offspring of unapproachable and that of taking feast. He disagreed with caste and untouchability. The saint's Eknath writings and literature contain an excessive amount of inconsistency. The "Bhavart Ramayan" advocated for self-relationship protection. In the Ekadash skand he shows dedication and otherworldly fairness like old and old holy people

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Water Quality and Pollutant Control

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Abstract:

In India, water pollution is a major environmental problem that has a significant impact on the quality of the water and poses significant threats to ecosystems and public health. This abstract looks at the main causes of water pollution, how much it affects water quality, and how it affects health and the economy. In India, water pollution has a number of negative effects on public health and the environment. A portion of the key impacts include: Wellbeing Effects: Polluted water is a huge reason for waterborne infections like cholera, typhoid, and hepatitis. Precipitation, the ion exchange process, reverse osmosis, and coagulation are a few chemical processes that can be used to control water pollution. Reusing, reducing, and recycling as much as possible will help you personally overcome the effects of water pollution.

Introduction:

Water is a crucial resource, necessary for life support, economic growth, and ecological equilibrium. Nonetheless, the nature of water assets in India has been seriously compromised because of broad contamination. The contamination of water bodies like rivers, lakes, oceans, and groundwater that is primarily brought on by human activities is known as water pollution. Water pollution has a significant impact not only on the environment but also on public health and economic conditions. Due to its severe effects on health, the environment, and socioeconomic development, water pollution in India has been the subject of extensive research and scholarly analysis. This writing audit orchestrates key discoveries from different examinations, featuring the essential wellsprings of water contamination, the effect on water quality, wellbeing results, and the adequacy of strategy intercessions.

Objectives

1. to relate to the idea of pollution in the water.
2. to investigate the effects of India's water pollution.

Types of Water Pollution

Surface Water Pollution : The pollution of aquatic systems that are above ground, such as lakes, streams, and rivers, is known as surface water pollution.

Oxygen Depletion : As a dissolved substance in water, this phenomenon occurs in aquatic environments.

Ground Water Pollution : ground water is one of the significant wellsprings of water for water system reason. When chemicals, gasoline, oil, road salts, and other man-made substances enter the groundwater, it becomes unsafe and unfit for human consumption, resulting in groundwater contamination.

Literature Review:

Numerous studies have been conducted on the topic of water pollution in India, focusing on the causes, effects, and ways to reduce them. This writing survey orchestrates key discoveries from scholastic articles, government reports, and other definitive sources, offering a far reaching outline of the condition of water contamination and its consequences for water quality in India.

Sources of Water Pollution

Industrial Discharge:

- Saha and others (2017) identified heavy metals like lead, mercury, and cadmium as major pollutants, highlighting the significant contribution of industrial effluents to Ganges River water pollution.
- Khan and others (2018) studied Untreated wastewater raises the biochemical oxygen demand (BOD) and chemical oxygen demand (COD) of local water bodies, as demonstrated by an examination of the impact of the textile and tannery industries in Tamil Nadu (2018).

Agricultural Runoff:

- Gupta and Singh (2019) researched the impacts of pesticide and manure overflow in Punjab, taking note of extreme supplement contamination and eutrophication in the district's streams.
- Sharma and others (2020) conducted research on the Yamuna River and discovered that agricultural runoff was a significant source of nitrogen and phosphorus, which contributed to algal blooms and decreased water oxygen levels.

Domestic Sewage:

- According to CPCB (2019), a significant amount of untreated urban sewage is discharged into rivers in India, with major cities like Delhi and Mumbai significantly contributing to the pollution load.
- Chowdhury and others (2021) highlighted the connection between outbreaks of water-borne diseases and the presence of pathogenic microorganisms in water bodies near urban centers.

Solid Waste Disposal:

- Jambeck and others Inadequate waste management practices have resulted in the accumulation of non-biodegradable materials in rivers and lakes, according to a 2018 study that examined plastic waste pollution in India's waterways.
- Panda and others (2019) looked at how solid waste affects the Brahmaputra River's water quality, focusing on how public behavior and enforcement of policies reduce pollution.

Impact on Water Quality**Chemical Contaminants:**

- Ahuja (2020) broke down water tests from different streams and tracked down high convergences of arsenic, fluoride, and other harmful substances, presenting extreme wellbeing dangers to neighborhood populaces.
- Mishra and Tripathi (2021) recognized modern zones where water bodies displayed raised degrees of weighty metals, outperforming safe cutoff points set by the World Wellbeing Association (WHO).

Biological Contaminants:

- Kumar and others (2019) focused on the prevalence of coliform bacteria and the health risks that come with them in rural water supplies.
- Singh and others (2020) led a near investigation of rustic and metropolitan water sources, observing that microbial contamination was higher in regions with lacking sterilization foundation.

Physical Contaminants:

- The physical pollution of water bodies caused by construction and deforestation with sediment and debris was documented by Patel and Jain (2018).
- Verma and co. The Krishna River basin's effects on water storage capacity and aquatic habitats were linked by siltation (2019).

Health and Socio-Economic Effects**Health Impacts:**

- Rao and others In India, waterborne diseases have been linked to polluted water sources and poor sanitation, according to a comprehensive review (2018).
- The long-term health effects of drinking heavy metal-contaminated water, such as cancer and neurological disorders, were discussed by Chaudhary and Gupta (2020).

Socio-Economic Impacts:

- Pandey et al. (2017) broke down the monetary expenses of water contamination, remembering misfortunes for agribusiness, fisheries, and the travel industry, as well as expanded medical care costs.
- The need for integrated water management policies was emphasized by Das and Mukherjee (2019) in light of the socioeconomic difficulties faced by communities whose livelihoods depend on polluted water bodies.

Mitigation Strategies**Policy and Regulation:**

- The National Water Policy's approach to combating water pollution through tighter regulations, monitoring, and enforcement was outlined by MoEFCC (2018).
- In 2020, the World Bank evaluated the efficacy of government efforts to clean the Ganges River and improve its water quality, such as the Namami Gange project.

Technological Solutions:

- Sharma and others (2019) looked at cutting-edge wastewater treatment methods like membrane filtration and bioremediation, highlighting their potential to lower pollution levels.
- Mehta and Patel (2021) looked into low-cost methods of purifying water that could be used in rural areas and emphasized the importance of community participation in preserving water quality.

Community and Public Awareness:

- Singh and Kaur (2018) emphasized the significance of public awareness campaigns in influencing behavior in the areas of water conservation and waste disposal.
- In their article titled "The Role of NGOs and Community Organizations in Promoting Sustainable Water Management Practices at the Roots," Raj and Kumar (2020) discussed this topic.

Overview of Water Pollution in India

India, with its huge and different scene, is home to various water bodies that help an enormous populace, horticulture, industry, and biodiversity. Regardless of this, the nation faces huge difficulties in keeping up with water quality. The widespread contamination of water resources is the result of rapid industrialization, urbanization, population growth, and inadequate waste management systems. As a sign of the larger problem facing the nation, major rivers like the Ganges, Yamuna, and Godavari are among the most polluted.

Primary Sources of Water Pollution

- 1. Industrial Discharge:** Untreated or partially treated effluents containing hazardous chemicals, heavy metals, and organic pollutants are frequently released into water bodies by factories and industrial plants. Water quality is significantly impacted by this industrial runoff.
- 2. Agricultural Runoff:** Chemical fertilizers, insecticides, and pesticides are frequently used in agriculture, which results in runoff that carries these harmful substances into nearby rivers and lakes, resulting in nutrient pollution and eutrophication.
- 3. Domestic Sewage:** In many parts of India, household sewage that hasn't been treated or hasn't been treated enough is thrown directly into water bodies. Organic matter, pathogens, and nutrients found in this sewage contribute to water-borne diseases and ecological imbalance.

4. Solid Waste Disposal: Solid waste, such as plastics and other non-biodegradable materials, that is improperly disposed of clogs waterways and introduces toxic substances into the water.

Impact on Water Quality

The nation's water quality has significantly deteriorated as a result of the influx of pollutants. High levels of biochemical oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), and the presence of toxic chemicals and heavy metals are the primary indicators of deterioration in the quality of the water. Water that is unsafe for drinking, agricultural, and industrial use is made unsafe by these pollutants' effects on its physical, chemical, and biological properties.

Impact on Water Quality

- Reports from the Central Pollution Control Board (CPCB) from 2016 to 2022: Indicating high levels of pollutants like BOD, COD, and TDS in major rivers, the annual reports provide comprehensive information on India's water quality. The Ganges, Yamuna, and Godavari rivers' poor water quality is highlighted in the reports.

- Kumar and Joshi (2018): This study evaluates the water quality record (WQI) of different streams, uncovering that many water bodies fall into "poor people" to "extremely poor" classifications, making them unsuitable for human utilization and amphibian life.

Health and Socio-Economic Consequences

Millions of people are afflicted with water-borne illnesses like diarrhea, cholera, and typhoid as a result of the deterioration in water quality. Long haul openness to sullied water can prompt ongoing medical problems, including disease and neurological issues. Financially, unfortunate water quality influences horticulture, fisheries, and the travel industry, prompting diminished efficiency and expanded medical care costs.

Health Implications

- Agarwal et al. (2019): Citing case studies from Bihar and Uttar Pradesh, the study makes the connection between the prevalence of water-borne diseases in both rural and urban populations and poor water quality.

- Verma and co. (2021): This study investigates the ongoing wellbeing impacts of drinking defiled water, including kidney harm and neurological problems, because of weighty metal openness.

- 2020: The National Institute of Environmental Health Sciences (NIEHS) The report talks about the more extensive wellbeing influences, including expanded malignant growth risk and conceptive issues, because of drawn out openness to dirtied water.

Need for Effective Management and Policy Interventions

To address the emergency of water contamination, India needs extensive methodologies

that envelop severe authorization of ecological guidelines, interest in cutting edge wastewater treatment advancements, and public mindfulness crusades. For the long-term preservation of water quality, community involvement and sustainable practices are essential.

Importance of community involvement in addressing water pollution

Local area contribution is essential in tending to water contamination in India as it can assist in distinguishing and tending to contamination episodes before they with becoming serious. Resident science and grassroots developments assume a huge part in checking and revealing contamination episodes, which can assist in making a brief move with relieving the effect of contamination. Participating in scientific research with the general public to monitor and report pollution incidents is known as citizen science. Testing the quality of the water, keeping an eye on the well-being of aquatic life, and locating the sources of pollution are all examples of this. Community members unite in grassroots movements to advocate for change and raise awareness of pollution issues. Local authorities can be compelled to take action to address pollution incidents and implement policies to prevent future pollution by grassroots movements. Keep in mind that these standards are only the minimum requirements and do not guarantee the safe consumption of water. Water quality can vary significantly from region to region. It can be influenced by a variety of things, including urbanization, climate change, and activities in agriculture and industry. To ensure that everyone has access to safe and clean water, regular testing of the water's quality and the implementation of appropriate treatment procedures are essential.

Water Pollution In India-An Overview

This paper frames the Water contamination in India an outline. Water contamination is the tainting of water bodies this type of natural corruption happens when poisons are straightforwardly or by implication released into water bodies without satisfactory treatment to eliminate hurtful mixtures. Any chemical, physical, or biological change in the quality of water that harms any living thing that drinks, uses, or lives in it is considered water pollution. At the point when people hydrate it frequently genuinely affects their wellbeing. It is typically brought about by human exercises. Different human sources add to the contamination of water. There are many compounds in water. Calcium carbonate and other compounds are two examples. Introduction Water pollution is when pollutants are discharged directly or indirectly into water bodies without being adequately treated to remove harmful compounds, resulting in environmental degradation. Any chemical, physical, or biological change in the quality of water that

harms any living thing that drinks, uses, or lives in it is considered water pollution. Drinking polluted water frequently has serious health consequences for humans. It is typically brought about by human exercises. Water pollution is exacerbated by a variety of human causes. There are many compounds in water. Calcium carbonate and other compounds are two examples.

Statement of the Problem:

India's water pollution has reached critical levels, affecting the water resources' quality severely and posing significant threats to public health, the environment, and economic growth. The issue persists and continues to worsen despite significant efforts and investments made by the government and various organizations. This study plans to resolve the accompanying central points of contention connected with water contamination and its effect on water quality in India:

1. Identification of Pollution Sources

Water contamination in India emerges from different sources, including modern release, agrarian spillover, untreated sewage, and ill-advised garbage removal. It is difficult to effectively address the underlying causes of pollution because of the complexity and interconnectedness of these sources.

2. Assessment of Water Quality

Increased concentrations of pollutants like heavy metals, organic chemicals, and pathogenic microorganisms demonstrate the deterioration of water quality in rivers, lakes, and groundwater. However, there is a lack of comprehensive and consistent data on water quality across regions and seasons, making it difficult to fully comprehend the problem's scope and severity.

3. Health Implications

Millions of people in India are impacted by waterborne diseases brought on by contaminated water, particularly in rural and underserved urban areas. Long-term health risks, including cancer, neurological disorders, and developmental issues in children, are posed by the presence of toxic substances in drinking water sources.

4. Economic and Social Impact

Water pollution has a negative impact on tourism, agriculture, fisheries, and health beyond just health. Fishing communities lose their means of subsistence as a result of poor water quality, and tourist destinations lose their appeal. Additionally, healthcare costs and the expense of treating polluted water place a significant financial strain on individuals and the government.

5. Policy and Regulation Challenges

Enforcement and compliance remain weak despite existing laws and regulations aimed at controlling water pollution. It is necessary to assess the efficacy of current policies and locate regulatory loopholes. For sustainable water management to be achieved, it is essential to ensure stringent enforcement and

encourage collaboration between communities, businesses, and government agencies.

6. Technological and Infrastructural Needs

In terms of wastewater treatment infrastructure and the implementation of cutting-edge pollution control methods, India faces significant obstacles. Industrial effluents and domestic sewage are frequently discharged directly into water bodies because many urban and rural areas lack adequate treatment facilities. Improving the quality of the water requires locating technological solutions that are both feasible and cost-effective.

7. Community Awareness and Participation

Public mindfulness and local area inclusion are basic for tending to water contamination. Understanding the level of awareness among various stakeholder groups is necessary in order to encourage active participation in pollution control measures. Sustainable water management methods that involve communities may result in solutions that are more long-lasting and efficient.

Further Suggestions for Research:

To address the multifaceted problem of water pollution in India and build on the existing body of knowledge, additional research should focus on the following areas:

If these ideas for research are followed, we might learn more about how water pollution affects India's water supply and come up with better ways to improve its quality. Insights and practical applications unique to each field of study can be used to fully address this important issue.

Water Pollution And Its Control

Since the beginning of time, water has existed as one of the most essential natural resources on Earth. Truth be told, similar water which we drink has been around in one structure or the other since the hour of the dinosaurs. Water covers more than two-thirds of the earth's surface. This amounts to slightly more than 1,260,000,000,000,000,000 liters of water that is distributed throughout the oceans, rivers, lakes, and streams. That much water is available for human consumption, but less than 0.3% of it. That number has continued to fall as industrialization and commercialization have progressed. Besides, wasteful and obsolete practices, absence of mindfulness and a plenty of different conditions have prompted water contamination.

Water Pollution – A Modern Epidemic

Toxic chemicals contaminating water bodies are one of the main causes of water pollution. As can be seen in the preceding illustration, the discarded plastic bottles, cans, and other wastes pollute the water bodies. Water contamination as a result harms both humans and the ecosystem as a whole. When these pollutants are removed, the toxins move up the food chain and eventually affect humans. By and large, the result is disastrous to just

the nearby populace and species, however it can affect a worldwide scale as well. Every year, nearly 6 billion kilograms of garbage are dumped into the oceans. Other types of undesirable materials are dumped into various water bodies, in addition to industrial effluents and untreated sewage. These can include oil spills and nuclear waste, the latter of which can make large areas uninhabitable.

Effects Of Water Pollution

The kind and amount of pollutants in the water determine how it affects things. Additionally, the location of water bodies is a crucial determinant of pollution levels. Water bodies nearby metropolitan regions are incredibly contaminated. This is because industrial and commercial establishments dump garbage and hazardous chemicals there. Aquatic life is severely impacted by water pollution. It causes illness and eventually death, alters their behavior and metabolism. Dioxin is a substance that leads to a ton of issues from propagation to uncontrolled cell development or malignant growth. Fish, poultry, and meat are bioaccumulators of this chemical. Chemicals like this make their way up the food chain before getting into the body of a human. The food chain can be significantly affected by water pollution. It throws off the food chain. Cadmium and lead are a few harmful substances, these poisons after entering the natural pecking order through creatures (fish when consumed by creatures, people) can keep on disturbing at more elevated levels.

Pollution has an effect on humans, and feces in water sources can give people diseases like hepatitis. An outbreak of infectious diseases like cholera and others can always be caused by unfit water and poorly treated drinking water.

Water pollution can have a significant impact on, alter, and destruct the ecosystem. In 1932, a processing plant in Minamata City, Japan started unloading its modern emanating - Methylmercury, into the encompassing cove and the ocean. Methylmercury is staggeringly harmful to people and creatures the same, causing many neurological problems. It didn't seem to have any negative effects right away. Be that as it may, this all different as methylmercury began to bioaccumulate inside shellfish and fish in Minamata Sound. The affected organisms were then taken by the local population and eaten. Before long, the evil impacts of methylmercury were becoming evident. At first, animals like cats and dogs were affected. The term "dancing cat disease" was created as a result of the city's cats frequently convulsing and making strange noises before passing away. Before long, similar side effects were seen in individuals, however the reason was not obvious at that point.

Ataxia, muscle weakness, decreased motor coordination, damage to speech and hearing, and other symptoms of acute mercury poisoning were

also seen in the affected individuals. In severe cases, paralysis, which led to coma and death, occurred. Before the government and the organization could officially acknowledge them, these diseases and deaths persisted for nearly 36 years. To prevent similar environmental catastrophes in the future, the Japanese government has implemented a number of water pollution control measures since then.

Pollution of the Ganges

Some groundwater, lakes, and rivers are rendered unusable. The Ganges River in India ranks sixth in terms of global pollution. This is obvious as many businesses close by discharge their effluents into the stream. In addition, religious practices like cremations and burials near the shore contribute to pollution. In addition to the negative effects it has on the environment, this river can spread diseases like cholera and typhoid. Contamination of the Ganges is likewise driving a portion of the unmistakable fauna to elimination. The Carcharhiniformes order includes the critically endangered Ganges River shark. Another endangered species of dolphin that lives in the Ganges and Brahmaputra rivers' tributaries is the Ganges River dolphin. According to a study, toward the finish of 2026, around 4 billion individuals will confront a deficiency of water. As of now, around 1.2 billion individuals overall don't approach perfect, consumable water and legitimate sterilization. Additionally, it is anticipated that water-related issues result in the deaths of nearly 1,000 children annually in India. Although groundwater is an important source of water, it is also susceptible to pollution. As a result, water pollution is a significant social problem that requires prompt attention.

Control Measures of Water Pollution

The majority of water pollution can be controlled through a variety of strategies. Instead of delivering sewage squander into water bodies, treating them before discharge is better. This can reduce the initial toxicity, and the water body itself can degrade and render the remaining substances harmless. Water that has undergone secondary treatment can be utilized in agricultural fields and sanitary systems. The Water Hyacinth is a very special plant that can absorb dissolved toxic chemicals like cadmium and other elements of this kind. The negative effects will be significantly reduced if these are built in areas that are prone to these kinds of pollutants. Precipitation, the ion exchange process, reverse osmosis, and coagulation are a few chemical processes that can be used to control water pollution. Reusing, reducing, and recycling as much as possible will help you personally overcome the effects of water pollution.

What is water pollution?

Water that is as big as one octillion liters covers two-thirds of our planet. 70% of the human

body is comprised of water. It is an all-purpose solvent. It is the only substance that can be found in any of the planet's three forms of matter. In addition to considering water to be an economic commodity, the United Nations has now acknowledged that it is a fundamental human right. Contamination is the presentation of tainting into the climate. Water contamination is the presence of outrageous degrees of poisons (risks) in a water body, to such an extent that it is presently not reasonable for customary human utilizations like washing, cooking, or drinking.

Water pollution is typically caused by human activities like dumping waste, chemical discharge, industrial and agricultural effluents, and so on. The aquatic life is impacted and the quality of the water is affected as a result. This water has negative health effects when consumed by humans or animals to quench their thirst. Only less than 0.3 percent of the earth's freshwater is safe for human consumption. It is believed that water in its purest form contains the fewest gases, minerals, and life forms. However, it is generally believed to have the fewest solutes for all practical purposes. Water of a high quality is necessary for drinking, but water quality can be flexible for other needs.

Sources of Water Pollution

Let's investigate the causes of water pollution now that we know what it is and what it isn't. Water contamination comes from a variety of places. Surface water makes up most of the freshwater. It is possible for harmful chemicals to seep into it from the surface. When viewed from the point where the contamination started, there are two main sources. One type of pollution is known as "point source pollution," which indicates that the pollution comes from a specific location. The other is 'nonpoint' source contamination as tainting from diffuse sources. Because it is transboundary, contamination will not be restricted to a single nation but may also affect other locations. Urbanization, excessive use of detergents, insecticides, and fertilizers, and deforestation are additional common contributors to water pollution. Even a lot of religious and social events pollute the water in a big way.

Effects of Water Pollution

When it affects people's health, water pollution has the most diverse effects on humans. The primary effect of water pollution is the disruption of aquatic life. In addition to cholera, giardia, and typhoid, numerous disease-causing elements like bacteria and viruses can be found in polluted water. It might prompt ongoing circumstances, including hormonal uneven characters, hepatitis, changed mind capability to malignant growth. These diseases transmitted by water are especially dangerous to pregnant women. Additionally, swimming in polluted water carries a

high risk of triggering allergies to the skin and eyes. The climate is likewise upset as it gradually kills creatures and plants' life that is subject to them for sustenance. It additionally upholds the development of unsafe organic entities that annihilate the biodiversity of the water body. Certain algae growth kills everything in the water by lowering oxygen levels. In some places, the level of pollution is so bad that it makes "dead zones" where no one lives.

Minamata Incident

The worst known instance of water pollution is the Minamata Incident of 1932. From a factory in Japan, methylmercury and its effluents started to flow. Methylmercury is one of the vital wellsprings of causing neurological problems in people. Until seashells began to absorb these harmful chemicals, the effects were initially invisible. These fishes began to be consumed by locals and other men, and the negative effects soon became apparent. Creatures, for example, felines and canines were the initial ones to experience the evil impacts of this substance. This incident inspired the term "dancing cat disease," which refers to the sounds that cats make before they convulse and die. Ataxia, acute mercury poisoning, loss of motor coordination, and even damage to speech and hearing were among the worse symptoms. It has been documented that severely affected individuals die from paralysis and coma. It took the Japanese government and officials 36 years to realize how serious the incident was and give the victims money to help them. Within a short period of time, the Japanese government also initiated measures to prevent water pollution and opened channels for the protection of their bodies of water.

Control Measures of Water Pollution

Let's examine some of the measures taken to control water pollution now that we understand the concept. There are numerous approaches that could be taken to control and prevent water pollution. The first step is to plant more trees near water bodies because they naturally absorb and recycle pollutants. The following is a summary of some crucial points.

- The "Water Hyacinth" plant actively removes pollutants from water by absorbing dissolved toxins like mercury and cadmium from bodies of water.
- Proper waste treatment is essential, and it is important to dispose of waste with care rather than dumping it directly into water bodies.
- Before directly dumping chemicals and other materials into water bodies, businesses should carefully treat their waste. Sewage treatment plants and wastewater treatment plants in ventures are laid out to treat the water utilized so it tends to be securely blended into the stream streams. It also makes it possible to recycle water.
- It's better for water and plants to use natural fertilizers and pesticides instead of chemical ones.

- Compound cycles, for example, coagulation, particle trade technique, turn around assimilation, and so on. will significantly reduce water pollution.
- Lastly, to reduce overall pollution, it is preferable to reduce water consumption in daily activities and reuse water whenever possible.

Conclusion

In India, water pollution continues to be a pressing issue, necessitating immediate and coordinated efforts to safeguard public health and water quality. To mitigate the negative effects of water pollution and ensure a safe and clean water supply for future generations, sustainable water management practices and effective policy implementation are essential. India's water resources are in grave danger from water pollution, which necessitates immediate and coordinated efforts to restore and maintain water quality. Compelling administration rehearses and vigorous strategy measures are fundamental to relieve the unfavorable impacts of contamination and guarantee an economical and sound climate for people in the future. According to the literature, water pollution in India is a multifaceted problem that necessitates comprehensive and coordinated efforts to address. To reduce the negative effects of pollution on public health and the environment and to improve water quality, effective policies, technological advancements, and community involvement are essential. India's water resources must be protected for future generations through ongoing research and proactive actions.

India's water quality, public health, and socioeconomic development are all negatively impacted by water pollution, which is a multifaceted issue. Identifying pollution sources, evaluating water quality, comprehending health and economic impacts, strengthening policy and regulation, enhancing infrastructure, and encouraging community participation are all necessary components of a comprehensive strategy for addressing this issue. This study aims to provide a comprehensive analysis of these aspects, which will aid in the creation of efficient Indian water resource protection and pollution mitigation strategies. The article's conclusion can be summarized as "knowledge gained regarding water pollution and control measures taken to reduce it." Contextual analyses of water contamination are likewise referenced in the article.

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Food Pyramid A way to Healthy life

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Abstract:

Food is a basic necessity of human being without food human being will not survive. In search food our ancients turned into civilize society from nomadic life. As Civilize societies progressed the enriched food culture also progressed as the relationship between food and human health recognized there is a need to make aware about the right portion of food to eat. In this view the concept of Food Pyramid was develop which helps to think about proper individual food intake.

Key words: Food pyramid, food

Introduction:

Food is the most essential requirement for sustenance of human life. Human being does survive without shelter over their head or clothes over their body till they get wholesome nutrition through foods. So human history motivated in search and seek of food from the earliest cavemen who survived on hunting to the more advanced civilizations which used agriculture, food transformed human life by giving it structure. It paved way to the path of the modern civilization. We moved from caves to fertile lands near water. While adopting staple crops humans increased their chances of survival several fold. These genetic engineers laid down the tools which would shape the emergence of civilization as we know it. It resulted in families and social structure which emerged into the complex societies. Throughout history food has acted as a catalyst for societal transformation, societal organization, competition, development, conflict and expansion.

Food is any substance consumed by an organism for nutritional support. Food is usually of plant, animal or fungal origin and contains essential nutrients such as carbohydrates, fats, proteins, vitamins, or minerals. The substance is ingested by an organism and assimilated by the organism's cells to provide energy, maintain life, or stimulate growth. Different species of animals have different feeding behaviours that satisfy the needs of their metabolisms and have evolved to fill a specific ecological niche within specific geographical contexts.

Food is important for healthy and active life so enough food should be consumed. But the foods eat should be safe and rich in all the nutrients our

body needs. It should choose from a wide variety of foods and eat them regularly, throughout the day, every day of the year. But the changes in food habits and impacts of various food culture preferences of food should be based on liking of food such as taste, appearance, smell and neglected nutritious aspects. there is a need to make aware about the right portion of food to eat. In this view the concept of Food Pyramid was develop which helps to think about proper individual food intake. To understand the concept of Food Pyramid and importance for maintaining healthy life the present review study was undertaken.

Methodology:

To carried out present study available secondary data were used.

Result and discussion:

On the background of World War -II during the shortage of food the USDA released the Basic 7 food guide in 1943 published guidelines for rationing to common people divided foods into seven groups, among them bread and cereals, several covering fruits and vegetables, and meat and poultry.

In Sweden in the 1970s, the National Board of Health and Welfare was tasked with tackling rising food costs they recommended a dietary circle that resembled a cake divided into seven pieces. The developed food plate did not tell how much amount of food consumed. Food and nutrition are an important aspect for human being so there is necessity to understand the relationship between food and nutrition for common people in simple way.

In 1974 Anna-Britt Agnsater, an educator who worked for a Swedish grocery cooperative, designed the food pyramid and published in an issue of the cooperative's magazine. Food Pyramid is a visual representation (in the shape of a pyramid) of the optimal number of servings of food a person should eat daily from each basic food group. She divided the pyramid into three levels. The bottom level included bread and other grains, legumes, potatoes, and milk. The middle level comprised fruits, vegetables, and juices. The top level covered eggs, meat, and fish. Agnsater used a pyramid shape so as to indicate that a person should eat more foods from the bottom of the pyramid—the widest section—than from the top.

This developed visualized food pyramid was accepted by other countries and developed their own food pyramid on the recommended nutritional requirement to ensuring healthy life of their citizen. In 1992 the USDA rolled out its version of the food pyramid. It had four levels. The bottom level included bread, cereal, rice, and pasta, with a recommended 6 to 11 servings per day. The second level was split between a vegetable group (3 to 5 servings per day) and a fruit group (2 to 4 servings per day). The third level specified 2 to 3 daily servings from a group comprising milk, yogurt, and cheese and 2 to 3 daily servings from a group comprising meat, poultry, fish, dry beans, eggs, and nuts. The top level included fats, oils, and candy, which were to be eaten sparingly.

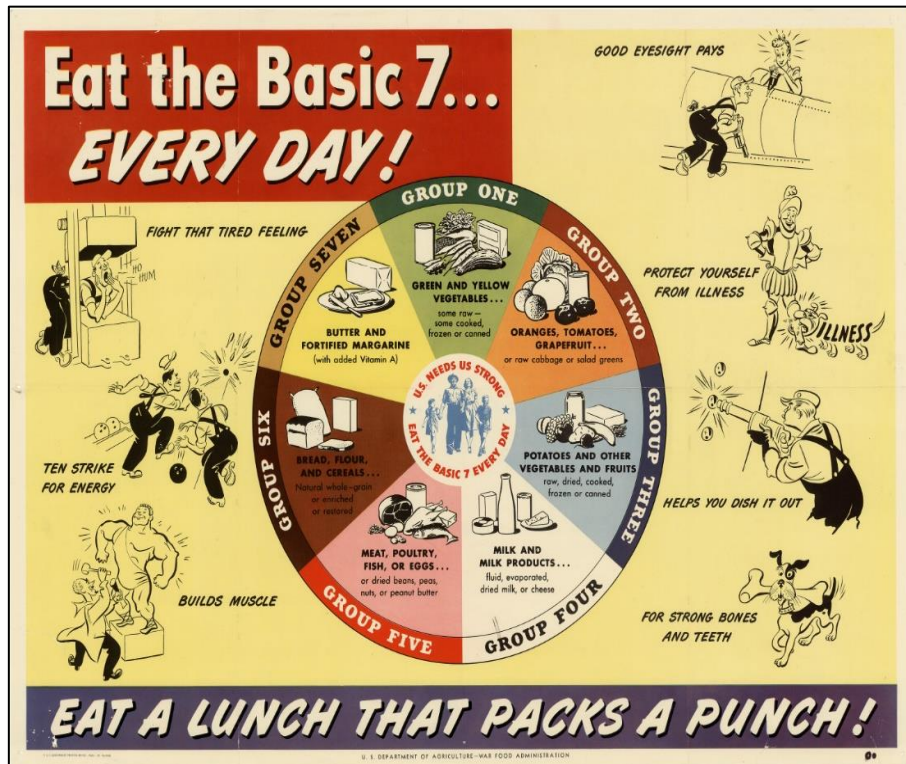
India uses a number of graphical elements to represent the messages of its guidelines, one of them being a food pyramid. The pyramid is divided into four levels of foods according to recommended consumption: cereals and legumes/beans at the base should be eaten in sufficient quantity, vegetables and fruits on the second level should be eaten liberally, animal source foods and oils on the third level are to be eaten moderately, and at the apex, highly processed foods high in sugar and fat to be eaten sparingly. Accompanying the pyramid there is a recommendation to do regular physical activity and warnings against smoking and drinking alcohol. It also gives message to ensure enjoying healthy life by adopting guidelines of food pyramids these messages listed are as followed

- Eat a variety of foods to ensure a balanced diet.
- Ensure provision of extra food and health care to pregnant and lactating women.
- Promote exclusive breastfeeding for 6 months and encourage breastfeeding until 2 years or as long as possible.
- Feed home-based semi-solid foods to the infant after 6 months.
- Ensure adequate and appropriate diets for children and adolescents, both in health and sickness.
- Eat plenty of vegetables and fruits.
- Ensure moderate use of edible oils and animal foods and use a minimum of ghee/butter/vanaspati.
- Avoid overeating to prevent overweight and obesity.
- Exercise regularly and be physically active to maintain ideal body weight.
- Restrict salt intake to a minimum.
- Ensure the use of safe and clean foods.
- Adopt the right pre-cooking processes and appropriate cooking methods.
- Drink plenty of water and take beverages in moderation.
- Minimize the use of processed foods rich in salt, sugar and fats.
- Include micronutrient-rich foods in the diets of elderly people to enable them to be fit and active. (2)

When reviewed the information about food pyramid which is now a day termed as My plate visualised representation of whole day meal plate which guides common citizen about the complex relationship of food and nutrition for maintaining of good health. These visual representation helps to ensure right choice of foods in appropriate amounts which helps to fulfil the food and nutrient requirement for active life.

Conclusion:

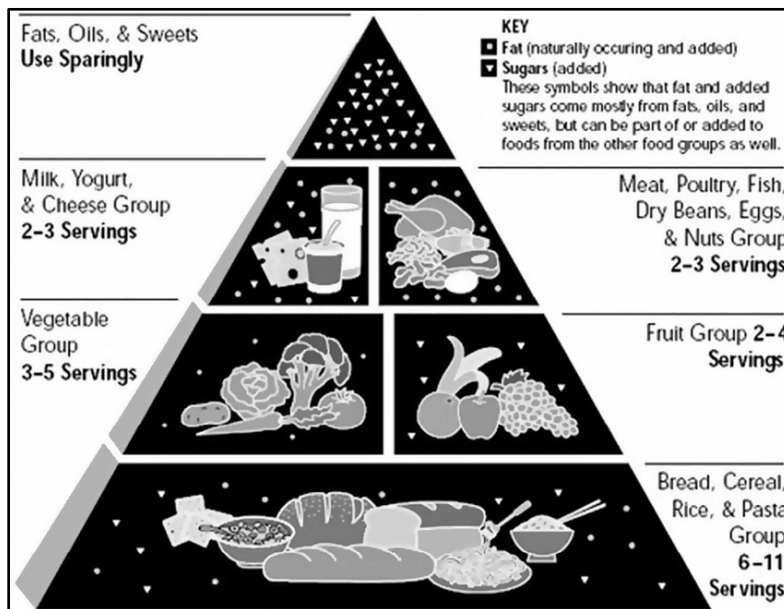
Food is a crucial factor for survival of human being. An ancient cave man turned into civilized life. Food requirements to survival of life converted into food preference which have impact on health so to ensure the healthy life of citizen it is necessary to educate common person in term of necessity of foods and nutrition in appropriate quantity through food Pyramid guidelines.



The USDA released the Basic 7 food guide in 1943 (Source- online image)



Food Pyramid developed by Anna-Britt Agnsater in 1974. (Source: online image)



USDA 1992 Food pyramid (Source: online image)



Indian Food Pyramid (source-online image)

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The Impact of Digital Media on Human Life

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Abstract:

Digital media become a necessary part of human life and seen various new applications and developed a new field of “Digital Media”. The impact of digital media is quite noticeable in our Human Life and it has both positive as well as negative effects. Positive effect is responsible for the betterment of human life whereas negative impact affects the health, such as weight gain due to the continuous use of digital media in corporate world and cognitive development of the childhood affects reading ability, analytical thinking, remember things, and results in slow learner. Surely digital media has its positive as well as negative effects on human life but the negative effect of digital media is causing serious problems for human life in the article, but we casually watch the benefits of man’s best invention and digital media.

Keywords: digital media, virtually, Impatience, Cognitive Development.

Introduction

The internet has man’s greatest innovation since last decade, created the computer-generated world that can be credited as a titanic human accomplishment. Now the various devices supports its usage, it’s in everyone’s reach. And even as we speak of devices, there have been several innovations in both software and hardware. No one can deny the fact that the impact of digital media is quite noticeable in our Human Life and it has both positive and negative effects.

Where our day-to-day activities became dependent on it whether it is entertainment or learning. It became our most important need to traverse this world more powerfully. We see a new smartphone, or a new laptop with an up-gradation quite often. So with all that digital media around us, the biggest question is how does it impact us? How does it impact our society, the next generation, or even our life ?

Methodology:

Present study was reviewed on the digital media by using secondary data analysis approach, utilizing data from books, journals, governmental agencies, research institutions, and academic studies.

What is Digital Media

Digital media is a way to express opinions or ideas in digital form through digital devices. It is a rapid, easy, and effective way of communication and circulation of the content. This includes text, audio, and video that are transmitted over the internet or through other digital media i.e. television, radio, Internet etc.

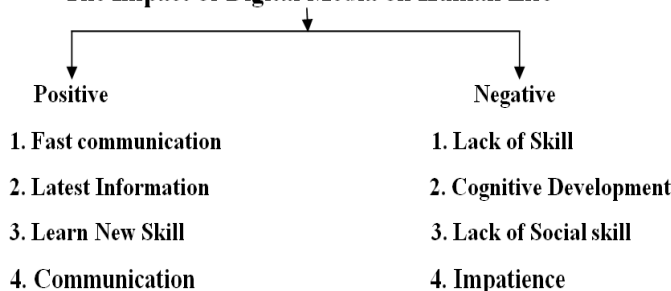
Digital media content can be created, distributed, and transmitted via digital devices, which is different from traditional methods.

Impact of Digital Media on Society

The Human life has picked up the speed, everyone is just too busy. One cannot simply afford to lose a day’s without updated. As we know the world changes daily, there is always changes and up gradation in all matters happening in the world and the electronic devices which are connected to the internet constantly gives us the updated information and it is not just restricted to the internet.

All the applications and multimedia stored in the device’s storage and drives keep us engaged all the time. It has both a negative and positive effect on human life.

The Impact of Digital Media on Human Life



Positive Effects of Digital Media Provides Fast Communication

Before the development of Digital media previous the mode of communication such as telegram, Letters from Indian post which are lengthy, costly and time consuming at that time but nowadays it becomes very fast due to Digital media due to developed internet facility.

Update to Latest Information

The digital media creates importance in the field such as journalism and mass communication. In a modern and speedy world, it is dynamically used for broadcasting channels to get maximum coverage. For instance, if you're a fan of cricket and due to your office work cannot follow all the important matches but you notify all live updates on your smartphone or you can record the complete match as per your convenient time you watch it.

Helps to Learn New Skills

The internet has been a blessing since its beginning for learners, now if you have a smartphone or any other digital device connected to the internet. Then you can learn anything from recipes to trading in share markets, you just need interest and continuity in your efforts. Most importantly it is self-esteem and you can choose from the learning resource available on digital media.

At the time of covid-19 digital media plays important role in the field of education to engage the student through digital media such as Google meet, Zoom meet . When it comes to interactive learning that is actively used in modern education structures.

Digital media enriches a child's learning process. Even with digital devices, user interface and interactive applications support to develops many skills. And we all know that an interactive application is much better than a book.

At the critical time of covid-19 digital media plays very important role to remain connected virtually with their friends and family members.

Fast Communication

Anyone can share their information and experiences with everyone around the world with the help of digital media. Nowadays social media platform like Facebook, Tweeter are more popular to communicate with more number of people results in to meet diverse people at one place.

Due to digital media it becomes very easy to raise their voice against various issues, while buying the product from various platforms like Amazon, Flipkart people directly communicate with the seller.

Negative Effects of Digital Media

Lack of Skill

Though there is a vast use of digital media and people uses it for their important purpose but near about 40 % old generation are having lack of skill to operate digital media. Also there is a very real fact

that current and future graduates are not able to maintain developing needs of technical zone and lacks digital skill more widely so there is a deadly mixture of long term and short term risks associated with the shortage of digital skill.

Impatience

The continuous use of digital media, quick information and updates also increases impatience in our daily life and that results in decreasing ability to focus on a task that require continuous attention. The use of digital media has also made us more dependent on it. which results in increase in impatient.

Lack of physical exertion

In the world of digital era use of digital media is too much leading to inactivity ,which is the main cause of increasing weight of human and increased in weight is dangerous for human health i.e. it increases the risk factors for heart attack and diabetes.

Cognitive Development

Nowadays Childrens are using digital media (Devices) continuously in their early development causes significant effect on their cognitive development. With excessive use of digital media causes affects reading ability, analytical thinking, remember things, and results in slow learner. To avoid above facts, we must give more attention on children that they avoid excess use of digital media or use of digital media should be moderate for mental and physical health

Conclusion

Surely digital media has its positive as well as negative effects on human life but the negative effect of digital media is causing serious problems for human life in the above-mentioned article, but we casually watch the benefits of man's best invention and digital media. Apart from that, digital media's impact has been worthy to take note of. It has not only provided a new aspect to our lifestyle, but has also lead to the development of communication skills, and worldwide accessibility on one click.

Entertainment and Information is also provided by Digital media. We must agree that it allows no physical exertion that causes inactiveness and weight gain, results in increase in risk of heart and diabetes. But there have been applications and devices created for physical and fitness development. So the good rule for human is keeping a healthy balance between real and virtual life, we need to learn, how to use it effectively instead of getting used by digital media.

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Effect of Aerobic Exercise on Selected Physical and Physiological Variables among College Athletics

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Abstract

The purpose of this study was to investigate the effect of aerobic exercise on selected physical and physiological variables among college athletes. Subjects in this study were 30 college male athletes who were randomly selected from Rajarshi Shahu College Pathri, Dist. Aurangabad (Maharashtra), India for the present study. The subjects were randomly assigned in equal two groups (control group (N=15) and experimental group (N=15)). The age ranged from 18 to 25 years respectively. Experimental group underwent aerobic exercise weekly 5 days with a duration of 60 minutes including 10 minutes of warming-up and 10 minutes for cooling down exercise. Remaining time allotted for aerobic exercise training programme. To find out the effect of aerobic exercise on selected physical fitness components data was collected through the administration of 50 meter run for speed and sit and reach for flexibility. On the other hand physiological components data was collected through the administration of breath holding time and resting heart rate. The t-test was used to test the effect of aerobic exercise on selected physical and physiological variables among college athletes. The significance level was determined as $p < 0.01$. The result of the study reveals that there was significant difference between pre-test and post-test of both groups on selected physical and physiological variables among college athletes.

Keywords: Aerobic exercise, physical and physiological, college athletes.

Introduction:

Aerobic exercise is physical exercise of fairly low intensity that depends primarily on the aerobic energy-generating process. Aerobic means living in air and refers to the use of oxygen to satisfactorily meet energy demands during exercise via aerobic metabolism. Generally, light-to-moderate intensity activities that are sufficiently supported by aerobic metabolism can be performed for extended periods of time (Sharon A., Plowman Denise L. (2007).

Since aerobic endurance refers to ability of heart, vascular system and lungs to provide oxygen and nutrient to working tissues and to remove the waste product of metabolism, it is quite clear that the primary goal of aerobic endurance training is to improve and/or increase the capacity and efficiency of three systems in order that a greater amount of oxygen can be supplied to the cells. This type of training is often referred to as cardio respiratory or cardiovascular training (Larry G. Shaver, 1981).

Aerobic trainings define as physical exercise from low to high intensity that requires aerobic energy-generating process (Lin C et al., 2018). There are different types of calisthenics like fitness walking, jogging, swimming, kickboxing, inline skating, bicycling etcetera. It helps to strengthen lower reverse and works a great deal in enhancing cardiovascular development (Stoll & Jennifer, 1989).

Aerobic training offers multiple benefits for human's body similar as general trimming of the body, correction of incorrect postures, muscular and bone flexibilities, benefits for the cardiac circulatory and respiratory systems, and other physical benefits (Petrella RJ et al., 2010; Proctor DN et al., 2009).

The major benefits of aerobic exercises are stronger and more efficiently operating heart and lungs, more energy, physical flexibility, conditioned muscles, proper use of fats and effective burning of calories. The increased oxygen inflow gained through calisthenics re-energies by giving any one further energy and a "reawakening" of his senses. (Kolata, Gina 2002).

In general, aerobic exercise is salutary to body factors, similar as cardiovascular system, which has an impact on functional capacity (blood pressure, palpitation, respiration, and temperature), and the musculoskeletal system, and is salutary to common in flexibility (Lemes IR et al., 2018). The main benefits of aerobic training are that it is focused on endurance and maintenance of bodily functions in a comprehensive and complex manner (Bergenthal N et al., 2011; Kerse NM et al., 1999; Habits RH et al., 2001).

The physiological benefits are highly significant where stable autonomic nervous system equilibrium, with a tendency toward parasympathetic nervous system dominance rather than the usual stress-induced sympathetic nervous

system dominance, pulse rate, respiratory rate and blood pressure decrease, cardiovascular efficiency increases, respiratory efficiency increases (respiratory amplitude and smoothness increase, tidal volume increases, vital capacity increases, breath-holding time increases), endurance and energy level increases, weight normalizes, sleep improves, immunity and pain decreases.

Aerobic exercises and wellness can be stood out from anaerobic exercise, of which quality preparing and weight preparing are the most remarkable models. The two sorts of activity vary by the term and power of solid withdrawals required, just as by how vitality is produced inside the muscle (*Andreasi et al.2010*).

Regular physical fitness and exercise are critically important for the health and good of people of all, whether they share in vigorous exercise or some type of moderate health-enhancing physical exercise. Indeed among frail and veritably old grow-ups, mobility and functioning can be better through physical exercise (*Butler et al., 1998*).

Physical fitness is importance for all human beings, irrespective of their age. A given work may not be carried out if the needed physical strength isn't available. Fitness is the first and foremost thing to enjoy the life completely (*Reddy, 2012*).

Review of Literature:

Literature related to the present study has been presented as follows:

Khahiruddin S.K. et. al., (2016) conducted study to determine the effect of aerobic training on selected physical and physiological variables among university male students. For the purpose of study 30 physical education students are selected age ranged from 19 to 25 years. To find out the effect of aerobic training on named physical fitness factors data was collected through the administration of 50 meter run, shuttle run, sit and reach. On the other hand physiological factors data was collected through the administration of breath holding time, resting heart rate. The results of the present study concluded that comparison of pre-test and post-test of experimental group due to the effect of six weeks aerobic training have an positive impact on selected physical and physiological components like speed, flexibility, agility, resting heart rate and breath holding time.

Adling R.B. & Bangar D.B. (2017) examines effect of eight weeks aerobic exercises on physical and physiological variables among college men. The result of the study showed that there was significant difference between pre and post-test (experimental group) of muscular endurance, cardio-respiratory endurance, Resting Heart Rate and Vital Capacity; they were concluded that the aerobic training might be responsible for the improvement of selected physical and physiological

variables like muscular endurance, cardio-respiratory endurance, Resting Heart Rate.

Senthilkumar R. & Dr. Sebastian P.J. (2019) studied the effects of aerobic training on selected physical and physiological variables among female volleyball players. The subjects (N=30) were randomly selected from Fatema College Madurai with age ranged 18 to 25 years. He was concluded that the Aerobics Training group produced significant improvement in Physical and Physiological variables among Female volleyball players. Another research by *Dr. Jothimai A. (2016)* showed that there was significant improvement in endurance and explosive strength of the experimental group owing to aerobic exercises.

Dr. Poul Balasaheb (2019) an experiment on effect of aerobic training on physical fitness components of cricket players. Researcher was selected 40 subjects randomly for the purpose study age ranged was 21 to 30 years. He was calculated cardiovascular efficiency by applying Harvard Step Test. The result revealed that there was a significant change in the cardiovascular efficiency of cricket players.

M. Senthil Kumar et. al, (2020) conducted study on effects of aerobic training on selected physiological variables among college long distance men athletes. They were reported that there was a significant improvement on systolic blood pressure of long distance men athletes who underwent 12 weeks aerobic training. Similar study done by *K. Vanitha Devi (2016)* on effect of aerobic training on selected physiological variables among college women players. She was also reported that there was a significant improvement on resting hand rate and breath holding time. However the improvement was in favor of experimental group due to eight weeks of aerobic training. The result of *Mukesh Kumar (2015)* researcher concluded that the aerobic training might be responsible for the improvement of selected physiological variables.

Material and Method:

1. Subject -

For the purpose of this study was found out the effect of eight weeks aerobic exercise on selected physical and physiological variables among male athletes. To achieve the purpose, 30 male athletes studding in Rajarshi Shahu College Pathri, Dist. Aurangabad (Maharashtra) where randomly selected as subject. The age of the subject were ranged from 17 to 25 years. The subjects were further classified at arbitrary into two equal groups of 15 subjects each. Group-A underwent aerobic exercises for five days per weeks for eight weeks and group-B acted as control. The experimental groups were undergo with aerobic exercise weekly 5 days with the duration of 60 minutes including 10 minutes of warming up and 10 minutes for cooling

down. Remaining minutes allotted for aerobic exercise training programmer.

2. Selection of Variables –

The subjects were assessed on named criterion variables

1. Physical Variables (Dependent Variables)
 - a. Speed
 - b. Flexibility
2. Physiological Variables (Dependent Variables)
 - a. Resting Heart Rate
 - b. Breath Holding Time

3. Criterion Measures -

The selected variables were measured by using standard testing procedures before and after the training period.

- Speed was measured by 50 meter run and recorded by seconds.
- Flexibility was measured by sit and reach and recorded by cm.
- Resting Heart Rate was measured by gently pressing over the radial roadway and recorded in figures for one minute by using stop watch.
- Breath Holding Time was measured by manual method used in seconds.

4. Collection of Data -

Table 1. Difference of Mean and SD between Control and Intervention Groups on Speed

Variable	Control Group (N=15)		Intervention Group (N=15)		DF	T-value
	Mean	SD	Mean	SD		
Pre- Test Speed	6.01	0.42	5.97	0.36	14	0.26
Post- Test Speed	6.16	0.32	5.77	0.29		

Fig. no.1 - Difference of Mean between Control and Intervention groups

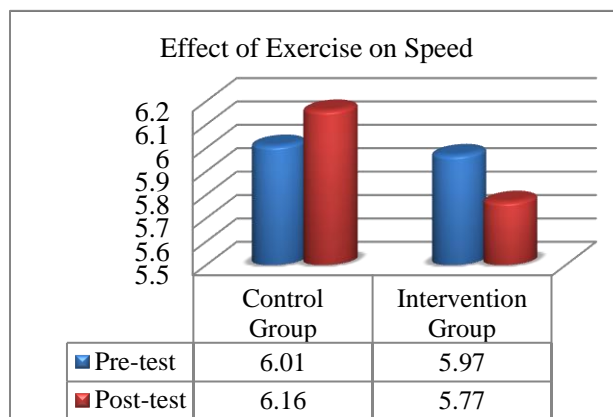


Table 1 shows that the mean values of pre-test and post-test of control group on speed were 6.01 and 6.16 respectively. The obtained 't' value was 0.26 since the obtained 't' value was less than the required table value for the significant at 0.05 level with 14 degree of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of intervention group on speed were 5.97 and 5.77 respectively. The obtained 't' value was 3.19 since the obtained 't' value was greater than the required table value for the significant at 0.05 level with 14 degree of freedom it was found to be statistically significant.

The result of the study showed that there was a significant difference between control group and intervention group in speed. It may be concluded from the result of the study that intervention group improved in speed due to eight weeks of aerobic training.

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Table 2. Difference of Mean and SD between Control and Intervention Groups on Flexibility

Variable	Control Group (N=15)		Intervention Group (N=15)		DF	T-value
	Mean	SD	Mean	SD		
Pre- Test Flexibility	10.89	0.28	10.96	0.31	14	0.06
Post- Test Flexibility	10.88	0.33	12.22	0.62		

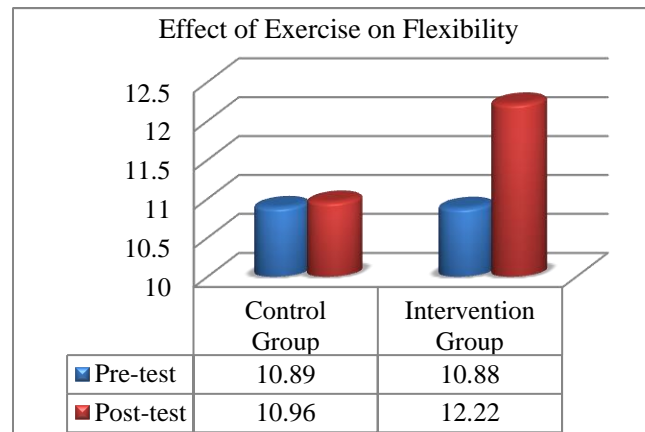
Fig. no.2 - Difference of Mean between Control and Intervention groups on Flexibility

Table 2 shows that the mean values of pre-test and post-test of control group on flexibility were 10.89 and 10.96 respectively. The obtained 't' value was 0.06 since the obtained 't' value was less than the required table value for the significant at 0.05 level with 14 degree of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of intervention group on flexibility were 10.88 and 12.22 respectively. The obtained 't' value was 6.06 since the obtained 't' value was

greater than the required table value for the significant at 0.05 level with 14 degree of freedom it was found to be statistically significant.

The result of the study showed that there was a significant difference between control group and intervention group in flexibility. It may be concluded from the result of the study that intervention group improved in flexibility due to eight weeks of aerobic training.

Table 3. Difference of Mean and SD between Control and Intervention Groups on Resting Heart Rate

Variable	Control Group (N=15)		Intervention Group (N=15)		DF	T-value
	Mean	SD	Mean	SD		
Pre- Test (Resting Heart Rate)	69.46	0.83	69.96	1.25	14	0.25
Post- Test (Resting Heart Rate)	69.54	1.24	67.66	0.95		

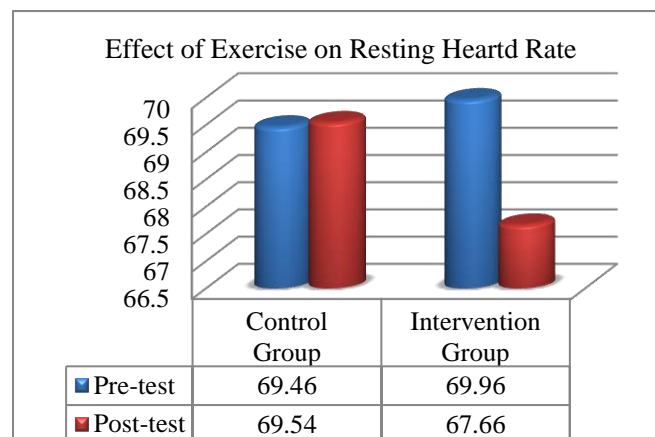
Fig. no.3 - Difference of Mean between Control and Intervention groups on Resting Heart Rate

Table 3 shows that the mean values of pre-test and post-test of control group on Resting Heart Rate were 69.46 and 69.54 respectively. The obtained 't' value was 0.25 since the obtained 't' value was less than the required table value for the significant at 0.05 level with 14 degree of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of intervention group on Resting Heart Rate were 69.96 and 67.66 respectively. The obtained 't' value was 6.40 since the obtained 't' value was greater than the required table value for the significant at 0.05 level with 14 degree of freedom it was found to be statistically significant. The result of the study showed that there was a significant difference between control group and intervention group in Resting Heart Rate. It may be concluded from the result of the study that intervention group improved in Resting Heart Rate due to eight weeks of aerobic training.

Table 4. Difference of Mean and SD between Control and Intervention Groups on Breath Holding Time

Variable	Control Group (N=15)		Intervention Group (N=15)		DF	T-value
	Mean	SD	Mean	SD		
Pre- Test (Breath Holding Time)	25.28	0.29	25.34	0.26	14	0.76
	25.35	0.31	27.06	0.8		
Post- Test (Breath Holding Time)						9.39*

Fig. no.4 - Difference of Mean between Control and Intervention groups on Breath Holding Time

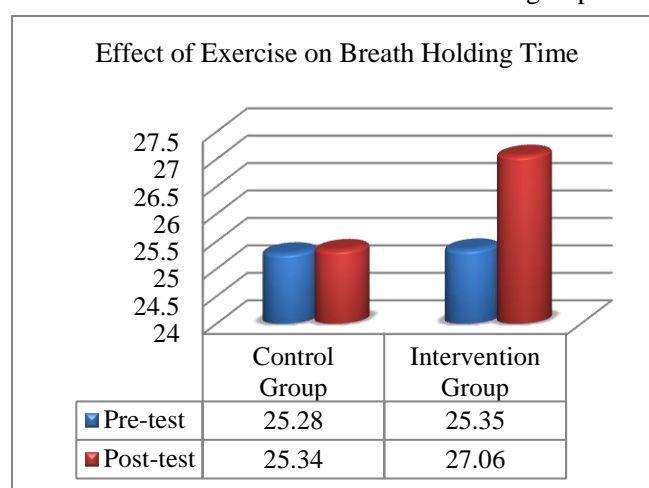


Table 4 shows that the mean values of pre-test and post-test of control group on Breath Holding Time were 25.28 and 25.34 respectively. The obtained 't' value was 0.76 since the obtained 't' value was less than the required table value for the significant at 0.05 level with 14 degree of freedom it was found to be statistically insignificant. The mean values of pre-test and post-test of intervention group on Breath Holding Time were 25.35 and 27.06 respectively. The obtained 't' value was 9.39 since the obtained 't' value was greater than the required table value for the significant at 0.05 level with 14 degree of freedom it was found to be statistically significant.

The result of the study showed that there was a significant difference between control group and intervention group in Breath Holding Time. It may be concluded from the result of the study that intervention group improved in Breath Holding Time due to eight weeks of aerobic training.

Discussions:

The findings of this study show that significant difference exists between control group

and intervention group on speed, flexibility, resting heart rate and breath holding time. Similar results were found in previous work carried out by *SK Khabiruddin et. al., (2016)* conducted study to determine the effect of aerobic training on selected physical and physiological variables among university male students. They were reported that speed, flexibility, resting heart rate and breath holding time were significantly improved due to the influence of aerobic training in experimental group.

Senthilkumar R. & Dr. Sebastian P. J. (2019) examine the effect of aerobic training on selected Physical and physiological variables among female volleyball players. They were concluded that speed, endurance, agility, resting heart rate, breath holding time were significantly improved due to the influence of aerobic training group among school Female. The aerobic training group improves resting heart rate, breath holding time, Speed, flexibility, agility greater than that of control group.

Rohit Bhairvanath Adling et. al., (2016) also conducted study on effect of eight weeks aerobic exercises on physical and physiological

variables among college men. They were also reported that the eight weeks aerobic training is responsible for the enhancement of named physical and physiological variables. Regular participation in aerobic training often results in a decrease in resting heart time (Katona PC et al., 1982; Smith ML et al., 1989).

Mukesh Kumar Mishra et al., (2015) also conducted study to determine the effect of six week training of aerobic exercises on selected physiological variables. They were also stated that the six weeks aerobic training is responsible for the enhancement of named physiological variables like resting heart rate also. The results of K. Vanitha Devi (2016) indicated that there was a significant improvement on resting heart rate and breathe holding time. However the improvement was in favour of experimental group due to eight weeks of aerobic exercise.

Conclusions:

According to the results, it can be concluded that the eight weeks aerobic exercises is responsible for the improvement of selected physical and psychological variables like speed, flexibility, resting heart rate and breathe holding time in intervention group.

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Morphological Characterization of trichomes on stem of *Acacia nilotica* and *Acacia suma*.

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Abstract-

The present study deals with the morphological characterization of trichomes on stem of *Acacia nilotica* (L.) Willd. ex Del. and *Acacia suma* (Roxb.) Buch.- Ham. belonging to family Mimosaceae. These plants are used in folklore medicine for curing many diseases such as colds, bronchitis, diarrhoea, bleeding piles, leucoderma, anemia and uterine complaints. To control and assure the quality of these herbal medicines or preparations, correct identification of species is must. One of the important criteria for identification of species is of microscopic characters or anatomical biomarkers. The value of the characters is measured for its constancy. The more constant the character, the greater is the reliability that can be placed upon it. Study of trichomes is one of them. Hence, the present study will provide one of the diagnostic features by which the adulterant can be identified. Trichomes have proved more useful to taxonomists at generic and specific level. Both glandular and non-glandular trichomes are observed in both the species of *Acacia*.

Keywords- Trichomes, *Acacia nilotica*, *Acacia suma*, Adulterant

Introduction

Sufficient interest seems to have been revived during the past two decades on the role of internal organization of the individual organs of plants. The importance of micromorphological features (anatomical biomarkers) for the taxonomic consideration of angiosperms is now well established (Ramayya, 1972; Tomlinson, 1979; Ogundipe and Akinrinlade, 1998 and Parveen et al., 2000). Micromorphological parameters of different plant parts have been used as aids in the taxonomical recognition of species (Kathiresan et al., 2011). The first summary of the systematically more useful anatomical characters with an evaluation of their importance was provided by Fritsch (1903). Trichomes have been employed very frequently for significant comparisons because of their diversity, their universal presence in the angiosperms and their ease of preparation. Solereder (1908), Netolitzky (1932) and Metcalfe and Chalk (1950) have provided useful information on the structure, function and classification of trichomes with their significance in comparative anatomical studies. They have proved more useful to taxonomists at generic and specific level. Hence the present study is carried out to analyze the morphological characterization of trichomes on stem of two species of *Acacia* i.e. *Acacia nilotica* (L.)Willd. ex Del. and *Acacia suma* (Roxb.) Buch.-Ham. belonging to family Mimosaceae. *Acacia nilotica* is indigenous to the plains of Andhra Pradesh and Maharashtra and its bark is extensively used for colds, bronchitis, diarrhoea, bleeding piles

and leucoderma (Del, 2009). Leaves are used in folk medicine to treat diabetes (Gilani *et al.*, 1999). *Acacia suma* is found in greater part of India and coastal districts of Orissa. Its stem bark is used as folklore medicine in the treatment of anemia, uterine complaints and possesses astringent, analgesic, anti-inflammatory and antiseptic properties (Anonymous, Orissa review, 2005).

Materials and Methods-

The sample of *Acacia nilotica* was collected from different habitat around Pulgaon, District Wardha and of *Acacia suma* was collected from different habitat around Paratwada, District Amravati. To get an integrated picture of the trichomes types and their organographic distribution varied temporary micropreparations viz. epidermal peels, mounts of cleared whole organs or their portions, scrapping and transections were used. Epidermal peels were removed from mature stem. After washing with distilled water, peels were stained with saffranin (1% aq.) and mounted in glycerin. The observation was made directly under compound microscope and camera lucida sketches were made.

Observation- Morphology-

Acacia nilotica is a medium sized tree grows upto 15- 18m in height and 2-3m in diameter. Stem- woody, erect, branched, fissured and rough, green in colour when young, at maturity light brown in colour, with no characteristic odour and taste. Leaves- bipinnate, paripinnate, 3-10 pairs, 1.3- 3.8 cm long, leaflets- 10-20 pairs and 0.2cm to 0.5cm

long, entire, obtuse apex, base- rounded, smooth adaxially and slightly rough abaxially, bitter in taste, no characteristic odour. Inflorescence- axillary cymose head. Flower 1.2- 1.5cm in diameter of a bright golden yellow colour; bracteate, complete, actinomorphic, hypogynous, numerous. Calyx- 4 or 5 sepals, fused, basally valvate. Corolla- 4 or 5 petals, free or connate at the base, valvate. Androecium- stamens numerous, polyandrous, filaments long; anther- dithicous, basifixed, introrse. Gynoecium- monocarpellary, ovary superior, unilocular, many ovules, marginal placentation. Fruit- lomentum.

Epidermal cells: elongated, longer than broader, regular, isodiametric, 36x12 μ ; wall- thin, straight to curve; surface- smooth; longitudinal to long axis of organ; cuticular striations- absent. Cells/ unit area- 93.

Stomatal complex: surface astomatic

Trichome Complex- Both Glandular as well as non- glandular trichomes was observed in *Acacia nilotica*. Details are given in the Table 1 and 2, Figure-1

Acacia suma is large tree 22-24m in height. Bark pure white, not fissured. Stem completely and

densely armed with very broad based prickles, branches yellowish tomentum, prickled; prickles in pairs, straight, densely hairy at base only with taste bitter to little soury with great aroma. Leaves bipinnate, 13.5cm long. Pinnae pairs 20. Leaflets 50 pairs, 1.5cm long and 0.6cm broad, obtuse at apex, densely tomentose, main rachis densely pubescent, fistular. Inflorescence solitary axillary, 11.5cm long. Flowers creamy white. Calyx- 5 sepals, united entirely into a tube, densely tomentose. Corolla- 5 petals, free, densely tomentose. Androecium- stamens numerous, filaments creamy white, long; anthers white, dithicous, basifixed, introrse. Gynoecium- monocarpellary, ovary superior, unilocular, many ovules, marginal placentation.

Epidermal cells: squarish- rounded, isodiametric, few unisodiametric, 12x16 μ , orientation- longitudinal to long axis of organ; wall- moderately thick, straight- curved; surface- rough; cuticular striations- absent. Cells/ unit area-57-60

Stomatal complex: surface astomatic

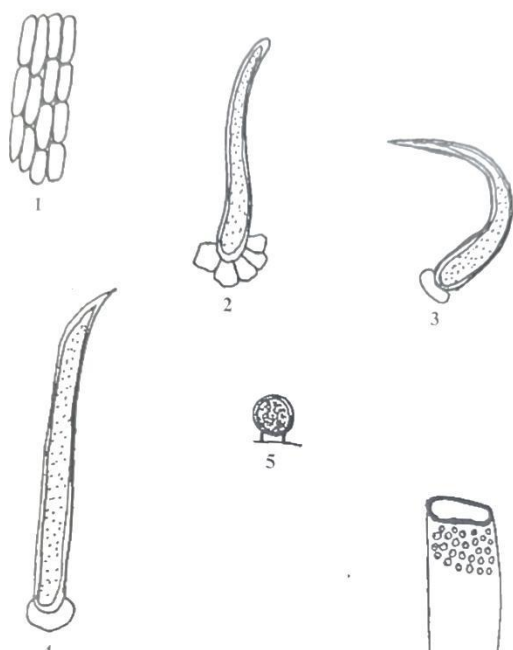
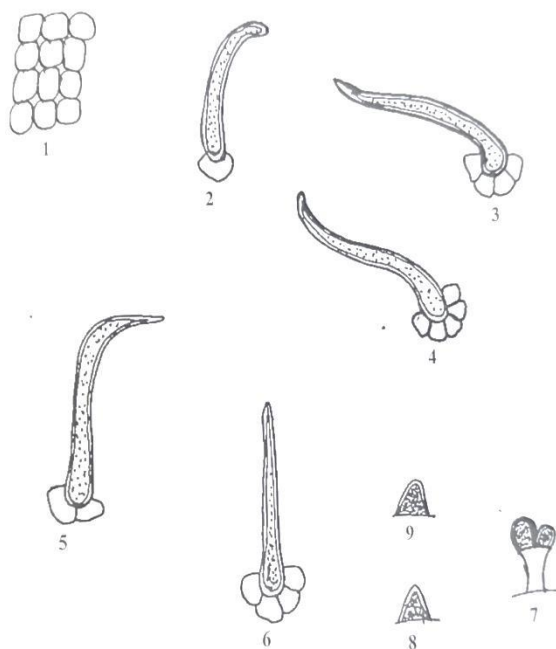
Trichome complex: Both Glandular as well as non- glandular trichomes was observed in *Acacia suma*. Details are given in the Table 1 and 2, Figure-2

Table 1: Details of Uniseriate Non-glandular Trichomes on stem of *A. nilotica* and *A. suma*

Name	Type	Size	Apex	Base	Content	Lumen	Surrounding cells
<i>Acacia nilotica</i>	Body- ovate conical	120x36 μ	Acute	Sub- rounded	Finely granulated	Narrow	Rosette of 4-5 epidermal cells
	Body falcate conical	84x16 μ	Acute	Rounded	Granulated-not obliterated	Narrow	Seated upon single epidermal cell
	Body tapering	110x36 μ	Acute	Rounded	Granulated-not obliterated	Moderately broad	Seated upon single epidermal cell
<i>Acacia suma</i>	Body- ovate conical	36x16 μ	Sub- acute	Rounded	Granulated-not obliterated	Narrow	Seated upon single epidermal cell
	Body falcate conical	44x16 to 56x20 μ	Acute	Rounded	Granulated-not obliterated	Narrow	Rosette of 4-5 epidermal cells
	Body tapering- bend at apex	48x16 μ	Acute	Rounded	Granulated-not obliterated	Narrow	Seated upon vertical division of 2- epidermal cells
	Body tapering	44x16 μ	Acute	Rounded	Granulated-not obliterated	Narrow	Surrounded by 4- epidermal cells.

Table 2: Details of Glandular Trichomes on stem of *A. nilotica* and *A. suma*

Name	Type	Size	Body		
			Foot	Stalk	Head
<i>Acacia nilotica</i>	Capitate- shortly stalk	28x20 μ	1-celled, not sunken, rectangular, hyaline	1-celled, narrower than the base of head, rectangular, hyaline	1-celled/ spherical, dense
<i>Acacia suma</i>	Capitate- shortly stalk	20x16 μ	1- celled, rounded- rectangular, hyaline	1-celled, hyaline	2-celled, semi- cordate, dense
	Capitate sessile	16x12 μ	1-celled, rounded- squarish, hyaline	-	1-celled, triangular, dense
	Capitate sessile	16x12 μ	1-celled, rounded- squarish, hyaline	-	1-celled, globose, dense

Figure-1- Trichomes on stem of *A. nilotica*.Figure-2- Trichomes on stem of *A. suma*.**Conclusion:**

The present study was undertaken with an aim of morphological characterization of *Acacia nilotica* and *Acacia suma* of mimosaceae family providing information which will be useful in identifying correct species, finding adulterants and authentication of drugs.

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Ecocriticism and Environmental Imagery in Arundhati Roy's 'The God of Small Things'

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Abstract:

This paper explores the intersection of ecocriticism and environmental imagery in Arundhati Roy's *The God of Small Things*. Through a nuanced analysis, the study examines how the novel's portrayal of the natural world reflects and critiques socio-environmental issues in post-colonial India. By applying ecocritical theory, the research highlights the symbolic and thematic roles of the Kerala landscape, its flora and fauna, and how these elements are interwoven with the novel's narrative structure and character development. The paper argues that Roy's depiction of the environment transcends mere backdrop, functioning instead as an active, dynamic force that influences the characters' lives and the socio-political commentary of the novel. It further investigates how the novel's environmental imagery critiques the effects of colonialism, globalization, and class divisions on ecological systems. Through this analysis, the paper contributes to a deeper understanding of how *The God of Small Things* employs environmental imagery to engage with pressing ecological and socio-political themes, offering a critical perspective on the interplay between human and non-human elements in literature.

Keywords: Ecocriticism, Environmental Imagery, Post-colonial Literature, Symbolism.

Introduction:

Arundhati Roy's novel, *The God of Small Things*, is a complex and evocative story set in Kerala, India, during the 1960s. It weaves together two timelines: one in 1969 and a series of events from 1962 that lead to the novel's tragic outcome. The narrative explores themes of love, social restrictions, and the lingering effects of historical and personal trauma.

The central focus of the novel is on the Ipe family, particularly twins Estha (Esthappen) and Rahel. Their lives are profoundly shaped by a series of tragic events that unfold around them. The story is told through a non-linear structure, moving back and forth between the past and the present.

The narrative begins in 1969 when Rahel returns to Ayemenem, the family home, after many years. The novel then shifts to 1962, revealing the events that led to the family's downfall. In 1962, when Estha and Rahel are seven, their English cousin Sophie Mol visits Ayemenem. Her arrival brings excitement and tension to the family, setting off a chain of events that will have devastating consequences.

Ammu, the twins' mother, engages in a forbidden affair with Velutha, a lower-caste worker who is part of the family's household. Their relationship is discovered, leading to Velutha's brutal death at the hands of the police. This tragic event is a direct result of the family's and society's rigid caste system and moral codes.

The affair leads to Ammu's social ostracism and separation from her children. Estha and Rahel are torn apart; Estha is sent away to live with relatives, while Rahel is left in isolation. The trauma from these events profoundly affects both children, shaping their future lives in painful ways.

As adults, Estha and Rahel reunite, but their bond is marked by the deep scars of their past. Their reunion brings back memories of their lost childhood and the tragic events that have shaped their lives. The novel ends with a reflection on the enduring impact of those events and the ways in which small, seemingly insignificant moments can have profound effects on individuals and families.

Themes and Symbolism:

The God of Small Things explores themes such as forbidden love, the rigid caste system, and the impact of societal norms on personal lives. The "small things" in the novel—details of everyday life, personal memories, and minor transgressions—often have significant repercussions. The non-linear narrative structure and Roy's evocative language illustrate how personal and societal forces intertwine to shape human experiences.

Arundhati Roy's *The God of Small Things* is a multifaceted novel that delves deeply into the socio-political and emotional landscapes of its characters. Among its rich tapestry of themes, the environmental imagery and its connection to ecocriticism stand out as particularly significant. Ecocriticism, a field that examines the relationship between literature and the environment, provides a

lens through which to understand how Roy's novel uses environmental elements to enhance its thematic concerns. Through its vivid depictions of nature and its intricate interplay with human experiences, *The God of Small Things* explores the profound impact of the environment on the characters and reflects on broader environmental and cultural issues.

Environmental Imagery as Symbolism

In *The God of Small Things*, the environment is more than just a backdrop; it is imbued with symbolic meaning that mirrors the characters' inner lives and the novel's central themes. The lush, tropical setting of Kerala, with its dense mangroves, rivers, and monsoons, serves as a vivid metaphor for the emotional turbulence and complexities faced by the characters. For example, the description of the river that runs through the novel is both a physical and symbolic presence. It represents the flow of time and memory, as well as the boundary between past and present. The river is also a site of transgression and tragedy, embodying the novel's exploration of forbidden love and societal constraints.

The imagery of the "Orangedrink Lemondrink Man" and his cart filled with brightly colored drinks contrasts sharply with the underlying social and economic inequalities depicted in the novel. The superficial vibrancy of the cart's colors belies the stark realities of the characters' lives, highlighting the disparity between appearance and reality. This contrast emphasizes how environmental imagery can reflect deeper societal issues and personal struggles.

The Impact of Nature on Human Experience

Roy's portrayal of nature in *The God of Small Things* underscores its integral role in shaping human experience and emotion. The natural world is depicted as both nurturing and oppressive, influencing the characters' lives in profound ways. For instance, the oppressive heat and humidity of the tropical climate often mirror the emotional and social pressures faced by the characters. The weather and environmental conditions are not merely descriptive elements but are interwoven with the characters' psychological states, reinforcing the novel's themes of entrapment and suffocation.

The monsoon season, with its torrential rains and floods, is a recurring motif that symbolizes both renewal and destruction. It represents the cleansing of old grievances and the onset of new beginnings, but it also signifies the potential for chaos and upheaval. The monsoon's dual nature reflects the novel's exploration of the dualities present in human experience—love and loss, joy and sorrow, freedom and confinement.

Ecocriticism and Cultural Context

From an ecocritical perspective, *The God of Small Things* also engages with the cultural and historical context of environmental degradation and

colonial impact. The novel's setting in Kerala, a region that has experienced significant environmental changes due to colonial exploitation and modern development, serves as a backdrop for examining the consequences of these changes on local communities. The environmental degradation and exploitation reflected in the novel can be seen as a critique of the broader ecological impact of colonialism and global capitalism.

The characters' interactions with their environment are deeply intertwined with their social and cultural identities. For instance, the estate where much of the novel's action takes place is emblematic of colonial-era landownership and the ensuing class divisions. The estate's decline and the subsequent changes in the environment reflect the broader socio-economic shifts occurring in postcolonial India.

Environmental Consciousness and Social Critique

Roy's use of environmental imagery also functions as a form of social critique, highlighting the intersection between environmental and social issues. The novel addresses the impact of societal norms and historical forces on the natural world and vice versa. The lush, often oppressive environment mirrors the constraints imposed by the caste system and colonial legacies, revealing how environmental and social injustices are interlinked.

By focusing on the environmental elements within the narrative, Roy invites readers to consider how deeply the natural world is embedded in human experience. The novel suggests that understanding and addressing environmental issues requires a recognition of their connection to social and cultural dynamics. Through its rich environmental imagery and ecocritical insights, *The God of Small Things* challenges readers to reflect on the ways in which nature and human lives are intricately intertwined.

Arundhati Roy's *The God of Small Things* is rich with environmental imagery that contributes significantly to its themes and narrative.

The River:

The river in *The God of Small Things* is a central symbol that carries deep emotional and thematic weight. It is not just a physical entity but a powerful metaphor for the flow of time, memory, and forbidden desires. The river plays a crucial role in the tragic events of the novel, particularly in the drowning of Sophie Mol. Its physical presence mirrors the fluidity and tumultuous nature of the characters' lives. The river's changing state—calm and serene at times, tumultuous and violent at others—reflects the emotional and social upheavals experienced by the characters. "The river was a child of the monsoon and the monsoon had returned. The water had risen and the river had swollen to a great width." (Tiffin, 2010) This imagery captures the river's dual nature as both a life-giving force and

a potential threat, symbolizing the interplay of renewal and destruction.

The Mangroves:

The mangroves are another significant environmental element in the novel. They are described with a sense of foreboding and mystery, embodying the hidden and oppressive aspects of the environment. The mangroves are associated with the forbidden and the repressed, particularly in relation to Ammu and Velutha's illicit relationship. "The mangroves were dense and shadowy, the canopy almost impenetrable, and the air was thick with the smell of rot and decay." (Roy, 1997) This description evokes a sense of entrapment and secrecy, reflecting the characters' struggle against societal constraints and personal desires.

The Monsoon:

The monsoon season in the novel is portrayed as a powerful, transformative force. It is associated with both cleansing and chaos, reflecting the tumultuous events and emotional states of the characters. The monsoon's arrival marks significant changes and intensifies the novel's dramatic moments. "The monsoon arrived with the familiar onslaught of rain, flooding the streets and fields, blurring the line between the land and the sea." (Roy, 1997) The intense imagery of the monsoon highlights the dramatic shifts in the narrative and the characters' lives, emphasizing the theme of inevitable change.

The Estate:

The family estate, known as Ayemenem House, is depicted as a site of both comfort and confinement. Its dilapidation mirrors the decline of the family's fortunes and the decay of traditional values. The estate's physical deterioration parallels the disintegration of the family's social and emotional structures. "Ayemenem House had grown old, its walls peeling and crumbling, the once lush garden overgrown with weeds and the pond stagnant with algae." (Roy, 1997) This imagery underscores the theme of decline and the impact of external changes on the internal world of the characters.

The "Orangedrink Lemondrink Man":

The cart of the "Orangedrink Lemondrink Man" represents a superficial vibrancy that contrasts sharply with the underlying social and economic realities of the characters' lives. The colorful, enticing exterior of the cart masks the stark inequalities and struggles of the community. "The Orangedrink Lemondrink Man's cart was a riot of colors—bright oranges, yellows, and greens—standing out against the drabness of the surroundings." (Roy, 1997) The vivid imagery of the cart highlights the disparity between appearance and reality, emphasizing themes of superficiality and socio-economic disparity.

The "Blazing" Sun:

The sun is described as oppressive and relentless, reflecting the harsh realities and emotional intensity experienced by the characters. The relentless heat of the tropical sun symbolizes the intense pressures and constraints imposed by societal norms. "The sun blazed down mercilessly, its heat suffusing everything, making the air heavy and oppressive." (Roy, 1997) This depiction of the sun contributes to the novel's atmosphere of suffocation and constraint, reinforcing the theme of entrapment.

Conclusion

In *The God of Small Things*, Arundhati Roy's use of environmental imagery serves as a powerful tool for exploring the novel's themes and social critiques. The depiction of the natural world is not merely decorative but deeply symbolic, reflecting the characters' emotional states and the broader socio-political landscape. Through an ecocritical lens, the novel highlights the profound impact of environmental factors on human experiences and underscores the interconnectedness of ecological and social issues. Roy's intricate portrayal of nature invites readers to consider the significance of environmental elements in shaping narratives and identities, making *The God of Small Things* a profound exploration of both human and ecological dimensions.

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Newly synthesized compounds from 2- hydrazino benzothiazole: Characterization, and evaluation of their antibacterial potential

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Abstract:

Serial of 1-tetra-O-benzoyl- β -D-glucosyl-3-(2)-hydrazino-1, 3-substituted benzothiazolyl thiocarbamide has been synthesized by the interaction of two pharmacophores, tetra-O-benzoyl- β -D-glucosyl isothiocyanates and amine substituted 2-hydrazino-1,3-benzothiazoles in acetone medium. The reaction mixture was kept at room temp for 24 hrs. In acetone medium. Acetone is evaporated then product is recrystallised by petroleum ether (60-80%). Benz-fused compounds have been employed in the synthesis of various compounds which show very potential pharmacological activities.

Benzothiazole is a privileged bicyclic ring system. It contains a benzene ring fused to thiazole ring. The small and simple benzothiazole nucleus is present in compound involved in research aimed at evaluating new product that possesses interesting biological activity. Benzothiazole is a heterocyclic compound weak base, having varied biological properties and still of great scientific interest now a day. They are widely found in bioorganic and medicinal chemistry with application in drug discovery.

The identities of these newly synthesised compounds have been established on the basis of usual chemical transformations and IR, ¹H NMR and Mass spectral studies. The antibacterial and antifungal activities of also reported. Some of these derivatives exhibit significant antimicrobial activity. These compounds show appreciable activity towards these microorganisms like *Escherichia coli*, *Staphylococcus aureus*, *Salmonella typhimurium*, and *Klebsiella species*, and antifungal activity against *Aspergillus Niger* and *Candida albicans*.

Keyword: 2-hydrazino-1, 3 benzothiazole, substituted benzothiazolyl thiocarbamide, tetra-O-benzoyl- β -D-glucosyl isothiocyanates, Biological studies.

Introduction:

2-Hydrazine benzothiazole is a bicyclic ring system [1,2] bonded to the hydrazide group. Benzothiazole derivatives have been studied overall and take much interest. Its consider a core structure for the synthesis of new benzothiazole derivatives [3], this due to their several chemical reactivities and the potent broad spectrum of biological activity [4,5,6] such as anti-nociceptive [7], antitumor agents [8], antimicrobial [9], anti-inflammatory [10], anticancer [11,], antibacterial [12,], antifungal [13] and anti-HIV [14] and effective animal growth stimulators [15]. Furthermore, many of the benzothiazole derivatives and their metal complexes showed significant antibacterial and antifungal activity [16]. It was found that the action of many drugs increasing when managed as metal complexes than are free ligands [17].

Benzothiazoles and their derivatives are considered as nuclei in the preparation of many organic and pharmaceutical compounds. [18] Benzothiazole derivatives have been used as antibacterial and anticancer agents [19,20] anti-inflammatory, antiparasitic and antioxidant activities. The idea of preparing a derivative of both tetrazole and benzothiazole and evaluating their

biological activity may seem interesting. Taking this into view, and in continuation of our search for biologically potential benzothiazole derivatives, a certain new derivatives were synthesized taking benzothiazole as the basic moiety. Different benzothiazoles react with hydrazine and this hydrazino benzothiazoles then focused to fuse with N-lactosylated compound. Hence, in present work, different benzothiazoles react with hydrazine and this hydrazino benzothiazoles then focused to fuse with N-glucosylated compound.

Results and discussion

Herein, we report the synthesis of various 1-tetra-O-benzoyl- β -D-glucosyl-3-(2)-hydrazino-1, 3-substituted benzothiazolyl thiocarbamide **III(a-d)** by interaction of tetra-O-benzoyl- β -D-glucosyl isothiocyanates (**I**) and substituted 2-hydrazino-1,3-benzothiazole **II(a-d)** in acetone medium. All products were crystallized from ethanol before recording the physical data (Table-1). The purity of compounds was checked by TLC. The spectral analysis²¹⁻¹³IR, ¹H NMR and Mass spectra of the product were observed.

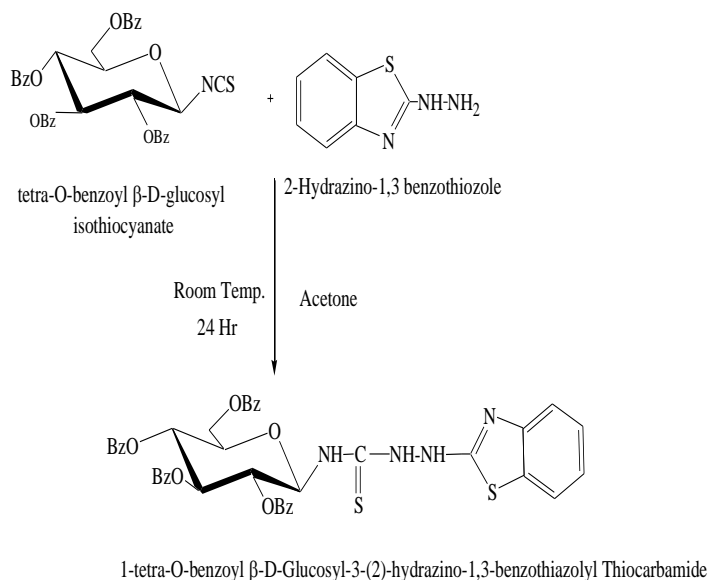
Experimental**Material and Methods**

All chemicals were research grade. Melting points determined are uncorrected. IR spectra were recorded in KBr on a FT-IR Perkin-Elmer RXI(4000-450 cm^{-1}) spectrophotometer. ^1H NMR measurements were performed on a Bruker DRX-300 (300 MHz FT NMR) NMR spectrometer in CDCl_3 solution with TMS as internal reference. The Mass spectra were recorded on a THERMO Finnigan LCQ Advantage max ion trap Mass spectrometer. Thin layer chromatography (TLC) was performed on silica Gel G and spots were visualized by iodine vapour. The compounds were screened for their antibacterial and antifungal

activities by the disc diffusion assay method^[18]. The compounds describe in this paper were first time synthesized by the multistep reaction protocol.

1] Preparation of 1-tetra-O-benzoyl- β -D-glucosyl-3-(2)-hydrazino-1, 3-phenyl-benzothiazolyl thiocarbamide

A acetone solution of tetra-O-benzoyl- β -D-glucosyl isothiocyanates (0.025M, 2.5g in 20mL) was mixed with acetone solution of 2-hydrazino-1,3-phenyl-benzothiazole (0.025M, 0.37g in 10mL), and mixture after shaking for some time was kept at room temperature for 24 hr. Acetone was distilled off to obtained sticky residue. This residue was triturated several times with petroleum ether to afford a light coloured solid. **III(a-d)**.



Where, R = (a) Phenyl, (b) *o*-Cl-Phenyl, (c) *m*- Cl-Phenyl, (d) *p*- Cl-Phenyl, And Bz = Benzoyl

3a: IR (KBr): ν 3400.29 (N-H), 3066.82 (Ar-H), 1730.15 (C=O), 1598.99 (C=N), 1263.37 (C-N), 1140.07 (C=S), 920.05 (Characteristics of glucose), 709.80 (C-S), ^1H NMR (δ in ppm, CDCl_3): δ 5.7 - 5.21 (3H, s, N-H), δ 7.5 (24H, m, aromatic protons), δ 4.5 (7H, m, glucosyl proton). Mass (m/z): 801 (M^+), 723, 579, 475, 374, 305; On the basis of all above facts the product with m. p. 200 $^\circ\text{C}$ was assigned the structure 1-tetra-O-benzoyl- β -D-glucosyl-3-(2)-hydrazino-1, 3-substituted Phenyl-benzothiazolyl thiocarbamide When the reaction of tetra-O-benzoyl- β -D-glucosyl isothiocyanates was extended to several other 2- hydrazino-1,3-benzothiazole corresponding 1-tetra-O-benzoyl- β -

D-glucosyl-3- (2)- hydrazino-1, 3-substituted-benzothiazolyl thiocarbamide has been synthesized.

3b: IR (KBr): ν 3490 (N-H), 3054 (Ar-H), 1729 (C=O), 1600.92 (C=N), 1140.07 (C=S), 939.33 (Characteristics of glucose), 1265.30 (C-N), 783.10 (C-S), ^1H NMR (δ in ppm, CDCl_3): δ 5.5 -5.21 (3H, s, N-H), δ 7.3 (24H, m, aromatic protons), δ 4.5 (7H, m, glucosyl proton), δ 0.7 (3H, s, Methyl proton,). Mass (m/z): 815 (M^+), 723, 579, 475, 374, 305;

On the basis of all above facts the product with m. p. 190 $^\circ\text{C}$ was assigned the structure 1-tetra-O-benzoyl- β -D-glucosyl- 3- (2) -hydrazino-1, 3-substituted *o*-Cl-Phenyl-benzothiazolyl thiocarbamide

Table -1: Physical data for characterization of compounds (3a-d)

Compd	Yield %	R_f	M.P. $^\circ\text{C}$	Analysis (%): Found (calcd)	
				N	S
3a	60.00	0.45	200	7.01(6.99)	7.95(7.99)
3b	55.00	0.60	185	6.60 (6.64)	7.80(7.87)
3c	70.00	0.50	195	6.70 (6.64)	7.85(7.87)
3d	74.00	0.55	170	6.69(6.64)	7.90(7.87)

C and H analysis was found satisfactory in all cases.

Antimicrobial Studies

All the compounds have been screen for both antimicrobial and antifungal activity using cup plate agar diffusion method 18-20 by measuring the inhibition zone in mm. the compounds were taken at a concentration of 1 mg/mL using Dimethyl Sulphoxide (DMSO) as solvent. Amikacin (100 µg/mL) was used as standard for antibacterial activity and Fluconazole (100 µg/mL) as standard for antifungal activity. The compounds were screen for antibacterial activity against *Escherichia coli*, *Staphylococcus aureus*, *Salmonella typhimurium*, and *Klebsiyella species* by using Nutrient Agar medium and antifungal activity against *Aspergillus Niger* and *Candida albicans* species was determined by using Potato Dextrose Agar medium. These sterilized agar media were poured

into Petri dishes and allowed to solidify. On the surface of the media microbial suspensions were spread with the help of sterilized cotton swab. After inoculation the well was punched by using sterile stainless steel cork borer of 6mm diameter. In to these wells were added 0.1 mL portion of the test compounds in solvent. The drug solution was allowed to diffuse for an hour into the medium. The plate was incubated at 37°C for 24 h and 30°C for 48 h for antibacterial and for antifungal activities respectively. The zone of inhibition observed around the cups after respective incubation was measured. The results are presented in Table 2. Antibacterial studies of these compounds indicated that compounds exhibited most significant activity against All the other compounds exhibited low to moderate activity. (Table2)

Sr. no	<i>E. c.</i>	<i>S. a.</i>	<i>S.t</i>	<i>K.p</i>	<i>A.n</i>	<i>C.a</i>
1(3a)	15	19	18	--	20	20
2(3b)	12	18	20	19	19	21
3(3c)	16	--	15	18	--	19
4(3d)	15	20	19	17	20	19
Amikacin	18	21	20	21		
Fluconazole					24	24

Sample	Disc content	Resistant	Intermediate	Sensitive
Amikacin	100ug/ml	≤ 15 mm	16-20 mm	≥ 21 mm
Fluconazole	100ug/ml	≤ 15 mm	16-20 mm	≥ 21 mm

Conclusion

In conclusion, we developed a convenient and high yielding methodology for the synthesis of novel 2- hydrazinobenzothiazole derivatives. All synthesized compounds were confirmed by FT-IR, and the structures of compounds were established by ¹H- NMR. Some of these compounds evaluated for in vitro antibacterial activity against *E. coli* (+ve gram) and *S. aureus* (- ve gram) strains. The presence of benzothiazole fragment may be play a main role of their antimicrobial activity. This study may be useful for the development of potential antibacterial candidates derived from benzothiazole hydrazide

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Adsorption study of ferrites and graphene oxide nanocomposites for wastewater treatment-Review

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Abstract:

Water pollution is a pressing global issue, and synthetic organic contaminants threaten aquatic ecosystems. Ferrite nanoparticles (F) and graphene oxide (GO) have emerged as promising materials for water treatment. In this review, we explore their synthesis, characterization, and applications in wastewater treatment of F-GO nanocomposites. Aspects of adsorption study with kinetics, adoption model, thermodynamic aspects are summarized. These nanocomposites, easily isolated using external magnetic fields, offer efficient contaminant removal. Understanding their potential informs effective strategies for combating water pollution through adsorption processes.

Keyword- Ferrites, adsorption, graphene oxide, F-GO nanocomposites; water treatment, advantages

Introduction

Technological advances are need of this society and growing at a rapid pace to cater the requirements of human beings in various sectors. Nevertheless, this industrial growth leads to the release of toxic chemicals into the air, water, and land, thus contaminated them. Water pollution is a global environmental concern and concentration of toxic pollutants in the water bodies (Sharma et al., 2024). Wastewater pollution is a significant global concern, with synthetic organic contaminants (such as personal care products, pharmaceuticals, and pesticides) posing a threat to natural water bodies (Oriji et al.). These persistent organic pollutants are stable and resistant to microbial breakdown, necessitating effective treatment methods. ferrites (F) can be used as adsorbents and catalysts; manufacturing of electronic materials; and wastewater treatment.

Researchers have focused on F and their composites for wastewater treatment because they offer advantages like large surface area, thermal stability, and controllable magnetic properties. Meanwhile, graphene oxide (GO) exhibits exceptional electrical, mechanical, and thermal properties, along with extraordinary surface area (Zou et al., 2024). GO play a crucial role in removing and degrading various organic and inorganic contaminants from wastewater. This honeycomb like lattice generally repels water, but when narrow pores are made in it, rapid water diffusion is permitted. As water molecules pass, contaminants are blocked. Graphene oxide (GO) nanosheets are produced by oxidizing bulk graphite powders through chemical processes. These

nanosheets find applications in various fields, including drug delivery, bioengineering, biosensors, energy storage, and antifungal activity (Anegbe et al., 2024).

However, GO nanosheets tend to aggregate in aqueous solutions, limiting their direct use in solid-phase extraction. To address this, researchers have developed magnetic graphene oxide (FGO) nanocomposites. By applying an external magnetic field, FGO nanocomposites can be effectively isolated from aqueous solutions. This is a most significant factor for an efficacious separation to identify a suitable magnetic adsorbent material that will dominate the selectivity of the technique. These nanocomposites combine adsorption, photocatalytic degradation, and synergistic effects, resulting in excellent contaminant removal and easy magnetic separation. This review paper explores adsorption study of ferrites and their graphene oxide-based composites in wastewater treatment.

Method of synthesis

1 Synthesis of GO

In the first step, GO is produced by exfoliation of graphite powder, which is produced through solution oxidation of graphite using acids and oxidants. Currently, the most widely used methods in the preparation of GO are the Hummer's method (Mokoena & Mofokeng, 2024), modified Hummer's method (Sujiono et al., 2024), and Tour's method (Anegbe et al., 2024). Here's a concise overview of the methods used for GO synthesis:

The Hummer's method, also known as the Hummers–Offeman method, is one of the most popular approaches for preparing GO. It involves treating graphite with a mixture of concentrated

sulfuric acid (H₂SO₄), sodium nitrate (NaNO₃), and potassium permanganate (KMnO₄). This method provides a good yield and requires less time compared to previous techniques. Variations of the Hummer's method, such as the Staudenmaier method and Hoffman method, have been developed (Verma & Saeed, 2024). These modified approaches also use strong acids (nitric and/or sulfuric acid) and potassium chlorate to oxidize graphite, resulting in the formation of graphene oxide with expanded interlayer spacing due to the introduction of oxygen functional groups. Additionally, the Tour method is another route for GO synthesis. It involves the unzipping of carbon nanotubes, which leads to the formation of graphene oxide. Although less commonly used, it contributes to the diversity of available techniques. In summary, the chemical reduction of graphite oxide produces graphene oxide, which maintains the layered structure of graphite but with added oxygen functionalities. These oxygen groups make GO hydrophilic, allowing it to readily exfoliate in aqueous solutions (Chaskar et al., 2024). GO's tunable properties and ease of functionalization make it an ideal candidate for various applications, including energy storage, drug delivery, and sensors.

2 Synthesis of FGO nanocomposite

They can be synthesized by physical and chemical method (Ma et al., 2024). Chemical methods primarily include chemical co-precipitation, hydrothermal, solvothermal, in situ chemical methods, covalent bonding, electrochemical, and gas/ liquid interface methods. Physical methods mainly include the ball mill method. Among these, chemical co-precipitation method, solvothermal method, and hydrothermal method are the most commonly employed method (Prasanna et al.).

The equations are based on the mass balance of the reaction, as follows:

$$Q_e = \frac{(C_o - C_e)V}{m} \quad (1)$$

$$Q_t = \frac{(C_o - C_t)V}{m} \quad (2)$$

$$Removal \% = \frac{(C_o - C_f)}{C_o} * 100 \quad (3)$$

2. Reusability study

After removing water contaminants from aqueous solutions, an external magnet is used for separation of nanocomposite without filtration. After then it washed with DI water several times and then suitable desorption medium, generally ethanol is used. Finally dried in oven at desired temperature.

Characterization

The synthesized FGO nanocomposites underwent characterization via various physical techniques including Fourier transform infrared spectroscopy (FTIR), Thermogravimetric analysis (TGA), Field emission scanning electron microscopy (FE-SEM), Energy dispersive X-ray analysis (Edax), X-ray powder diffraction (XRD), vibrating-sample magnetometry (VSM), transmission electron microscopy (TEM), Raman spectroscopy, and BET surface analysis. The adsorption study can be investigated using a UV-Visible spectrophotometer

Adsorption study

In water treatment studies, researchers use water solutions with varying pollutant concentrations to conduct adsorption experiments at different pH levels. Once equilibrium is reached, the following parameters are measured or calculated:

- Initial concentration (C_o, mg/L): The pollutant concentration in the solution before adsorption.
- Equilibrium concentration (C_e, mg/L): The pollutant concentration in the solution after adsorption reaches equilibrium.
- Maximum adsorption capacity (Q_e, mg/g): The maximum amount of pollutant adsorbed per unit mass of the adsorbent (e.g., graphene oxide nanocomposites).
- Adsorption percentage (%): The proportion of pollutant removed from the solution during adsorption.
- Kinetics (Q_t, mg/g): The adsorption capacity at a specific time (t) during the process.
- Solution volume (V, L): The volume of the water solution used in the experiment.
- Weight of graphene oxide (m, g): The mass of the graphene oxide nanocomposite adsorbent.
- Final concentration of metal ions (C_f, mg/L): The remaining concentration of metal ions in the solution after adsorption.

3. Adsorption Kinetics

Adsorption isotherms play a crucial role in understanding the relationship between adsorbent and adsorbate concentrations at equilibrium. They provide insights into the adsorption mechanism and interactions. Meanwhile, studying adsorption kinetics helps determine the optimal residence time for designing effective adsorption processes.

In experimental studies, data on adsorbate concentration (C_t) and adsorption capacity (Q_t) are collected over time (t). Various kinetic models are used to analyse this data. Two common models include the pseudo-first-order and pseudo-second-order kinetics (Handayani et al., 2024). The former describes liquid-solid phase adsorption, while the latter accounts for chemisorption and cation exchange reactions.

Additionally, the Elovich equation characterizes slow chemisorption kinetics, and the Morris-Weber equation evaluates intraparticle rate constants (Sheikhkhassani et al.). For pore diffusion processes, the Bangham kinetics model can be applied (Benjelloun et al., 2021). These models collectively enhance our understanding of adsorption processes and aid in environmental remediation, including water treatment.

4. Adsorption isotherms

The isotherm models which are commonly used to describe the adsorption capacities and characteristics of pollutants on different F-GO nanocomposite materials are Freundlich, Langmuir, Redlich–Peterson, Sips, and Temkin models (Kalam et al., 2021). Adsorption isotherm models explain the distribution of molecules between the liquid and solid phases when the adsorption processes reach equilibrium states. Fitting of the adsorption data to different isotherm models is an important step in finding a suitable model that can be used for design purposes. The Langmuir model indicates a monolayer coverage on the surface of the adsorbent, and the Freundlich model is indicative of surface heterogeneity of the adsorbent. The Temkin isotherm describes the behavior of adsorption on a heterogeneous surface, and the derivation of the Temkin isotherm assumes that the fall in the heat of adsorption is linear rather than logarithmic (Nizam et al., 2024). The D–R model can determine the type of sorption (physical or chemical) (Zhang et al., 2024). Redlich–Peterson model is the widely used isotherm to represent the solute uptake process at equilibrium condition (Chu et al., 2024). The Flory–Huggins model was chosen to account for the degree of surface coverage characteristics of the sorbate on the sorbent (Eze et al., 2024). Halsey proposed an expression for condensation of a multilayer process at a relatively large distance from the surface. And the Harkins–Jura adsorption isotherm also accounts for multilayer adsorption and explains the existence of a heterogeneous pore distribution (Sallam et al., 2024).

5. Thermodynamic studies

Thermodynamic models are powerful tools to describe metal sorption processes and explore the governing mechanisms. Thermodynamic parameters, for example, free energy changes (ΔG° , kJ/mol), enthalpy changes (ΔH° , kJ/mol), and entropy changes (ΔS° , J/mol/K) are determined by

the following equations [137,138]: where C_e (mg/L) stands for the equilibrium concentration of a pollutants in the solution, R (J/mol/K) is the gas constant (8.314), T (K) represents the absolute temperature, and K_e (L/g) is the removal equilibrium constant. Positive ΔH° values indicate that the removal process is endothermic, supported by a rise in q_e (mg/g) with increasing temperature. Negative ΔG° values suggest a spontaneous sorption process with increasing metal sorption at higher temperatures. Positive values of ΔS° may reflect an affinity of the graphene-supported iron-based composites for the pollutants. ΔG° (kJ/mol) could also provide information to distinguish between physisorption and chemisorption processes (Al-Hazeef et al., 2024; da Silva et al., 2024; Isah et al., 2024; Shenjin et al., 2025).

Adsorption mechanisms

The most common physicochemical interactions responsible for the adsorption of contaminants include: electrostatic interactions, ion exchange, inner-sphere surface complexation, and p-p stacking (Sable et al., 2024). Chemical adsorption (chemisorption) is attributed to the strong chemical binding when the GNSF shares electron pairs with the adsorbates, whereas physical adsorption (physisorption) results from weak attractive forces (e.g., van der Waals, dipole-dipole interactions, hydrogen bonding, and etc.) between them (Webb, 2003).

Many researchers studied on F-Go nanocomposites. Some studies are as follows.

Lingamdinne, Koduru, and Karri discuss the utilization of magnetic graphene oxide-based nanocomposites (MGOs) for sustainable water purification. MGOs exhibit unique properties, including excellent magnetic characteristics, high specific surface area, and chemical stability. These nanocomposites have been successfully employed in removing heavy metals, radionuclides, and organic dyes from aqueous environments. The paper covers preparation strategies, characterization techniques, and research challenges related to MGOs as adsorbents for water pollutants (Lingamdinne et al., 2019).

Asghar et al. focus on the fabrication and applications of graphene oxide (GO)-modified nanocomposites for wastewater remediation. These nanocomposites exhibit high mechanical strength, hydrophilicity, and ease of synthesis. Researchers have explored magnetic separation methods using GO-modified nanocomposites to effectively remove pollutants from aqueous solutions. The study also highlights the challenges and potential applications of these materials in long-term water purification (Asghar et al., 2022).

Abu-Nada, McKay, and Abdala explore the use of graphene-based materials as adsorbents for heavy metal removal. Specifically, they analyze the

applications of graphene oxide (GO), reduced graphene oxide (rGO), and graphene-based nanocomposites (GNCs). The review covers synthesis methods, adsorption isotherms, kinetics, capacity, and removal efficiency for various metals, including arsenic, lead, cadmium, nickel, mercury, chromium, and copper. Additionally, the study discusses recyclability and highlights future trends in this field (Abu-Nada et al., 2020).

Kumar, Dosanjh, Sonika, Singh, Monir, and Singh explore the use of nanoferrites and their surface-modified composites as alternative adsorbents for wastewater treatment. The review highlights the need for surface modification methods and discusses the general mechanism of pollutant adsorption using these materials. Additionally, regeneration studies and future research areas are covered (Kumar et al., 2020).

Park, Kim, Kim, Wang, Su, and Yoon explore the multifunctional properties of graphene-based nano spinel ferrites. These materials serve as both adsorbents and photocatalysts, offering promising applications in wastewater treatment. The review discusses synthesis methods, structural characteristics, and the potential for efficient contaminant removal (Park et al., 2019).

Bashdar A. M. Babakir, Layth I. Abd Ali, and Hani K. Ismail, a novel nanocomposite adsorbent was developed for efficient removal of anionic organic dyes from contaminated water. The composite consists of poly(3-aminobenzoic acid), graphene oxide (GO), and cobalt ferrite (CoFe_2O_4). Employing the adsorption technique, this low-cost adsorbent shows promise for water treatment applications (Babakir et al., 2022). **Mohamed Abdel Salam, M.A. Gabal, and Y.M. Al Angari** explored the recycling of spent Zn-C batteries and the synthesis of a magnetic nanocomposite. This composite was created from graphene nanosheets and ferrite. The application of this nanocomposite was focused on environmental remediation. The work contributes to sustainable materials and pollution control (Salam et al., 2022).

Naveen Chandra Joshi and Prateek Gururani explore the application of graphene oxide-based nanocomposites for treating wastewater containing heavy metal ions and dyes. These materials offer promising potential due to their unique properties, including high surface area, adsorption capacity, and chemical reactivity. By leveraging these nanocomposites, researchers aim to address environmental pollution challenges associated with heavy metals and dyes in wastewater. (Joshi & Gururani, 2022).

Katubi and colleagues synthesized a novel nanocomposite of MnFe_2O_4 /graphene oxide (GO) for pollutants removal from water. The nanocomposite exhibited high adsorption capacity for lead ions (Pb^{2+}) and neutral red dye (NR). It can

be easily separated using an external magnet. Factors like contact time, pH, initial concentration, and adsorbent dose were investigated. The nanocomposite's reusability was also studied, making it a promising material for water treatment (Katubi et al., 2021).

Navneet Kaur, Manpreet Kaur, and Dhanwinder Singh fabricated a mesoporous nanocomposite of graphene oxide (GO) with magnesium ferrite (MgFe_2O_4). This nanocomposite demonstrated efficient sequestration of Ni (II) and Pb(II) ions from aqueous solutions. The adsorption process was investigated in terms of thermodynamics and kinetics, highlighting its potential for water purification (Kaur et al., 2019). Magnetic graphene oxide-based nanocomposites (MGOs) have emerged as promising materials for water purification. These nanocomposites combine the unique properties of graphene oxide (GO) with magnetic nanoparticles, enabling efficient removal of heavy metals, radionuclides, and organic dyes from aqueous solutions. The synthesis and characterization of MGOs are crucial for their successful application. Researchers have explored various preparation strategies to enhance their adsorption capacity and stability (Koduru et al., 2019).

Conclusion

Ferrite-graphene oxide (F-GO) nanocomposites offer several advantages as adsorbents. First, they exhibit excellent magnetic properties, making them easy to recover from water systems. Additionally, F-GO is cost-effective and its properties can be tuned for specific applications. The feasibility of practical use further enhances its appeal. When it comes to adsorption, several factors influence F-GO's performance. These include surface charge, textural properties, thermal stability, and the presence of surface functional groups on the graphene oxide. Understanding these factors helps optimize their adsorption capacity. Regenerating F-GO after use is achievable. Altering the solution pH or using low-concentration acids, bases, or alcohols can effectively regenerate the material, allowing for multiple cycles of use without significant loss in efficiency. Stability and reusability are key features of F-GO. Even after repeated adsorption-desorption cycles, F-GO maintains its effectiveness, making it a reliable choice for water treatment. Comparatively, F-GO composites demonstrate adsorption and regeneration capacities that rival or exceed those of other reported adsorbents. This makes them competitive in the field of water purification. Furthermore, F-GO nanocomposites perform well across a wide pH range, making them versatile for various water treatment scenarios. In terms of environmental impact, F-GO efficiently removes water pollutants such as heavy metals, radionuclides, organic dyes and agricultural

contaminants from wastewater, contributing to cleaner water resources.

Future scope

The adsorption technique using a solid adsorbent meets the above requirements because it offers the low installation cost and easy operation with high efficiency and an environmentally friendly and affordable make it one of the preferred methods for water purification. The future prospects pertaining to the establishment of GO-based nanocomposites as a medium for remediation of heavy metals, organic dyes and radioactive from wastewater.

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Mathematical Approaches to Analysing the COVID-19 Pandemic and Preventive Measures

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Abstract:

One of the most effective techniques for exploring the wide range of intervention tactics, working out the basic rate of reproduction, and predicting the spread of disease is mathematical modelling. This work analyses the mathematical models used to study the dynamics of coronavirus disease 2019 (COVID-19) transmission. We searched four internet databases for studies that employed a mathematical modelling approach based on compartmental models to assess the COVID-19 transmission kinetics. Eligible for inclusion was research that used compartmental models to describe COVID-19 transmission that was published in English in preprints and peer-reviewed publications between December 30, 2019, and May 25, 2020. This time frame was selected for the constraint because it coincided with the onset and peak of the epidemic in numerous nations around the globe.

Keywords: - COVID-19, Mathematical Models, forecasting disease, electronic databases.

Introduction:

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmits coronavirus disease 2019 (COVID-19) from person to person through respiratory droplets or contact with surfaces contaminated with droplets from an infected individual [1,2]. The three main symptoms of COVID-19 are fever, coughing, and dyspnea [3-5]. Data suggest that individuals over 50, those with compromised immune systems, and those with coexisting medical disorders may be more vulnerable to severe sickness or death from COVID-19 [5,6]. Several steps have been taken to prevent the global spread of COVID-19. Every nation has a unique intervention strategy and degree of rigour, but common approaches include mask wearing, contact tracing, and social isolation as non-pharmaceutical therapy. How well we understand the potential therapeutics' efficacy is still up for discussion.

Several nations have turned to mathematical models to assist in figuring out the best combination and timing of actions. In order to comprehend disease dynamics, estimate the basic and effective reproduction numbers, explore the complex terrain of intervention techniques, and predict the trajectory of outbreaks, mathematical modelling is a highly effective tool [4,7,24]. COVID-19 is an infectious disease that is still in its early stages of research. Numerous mathematical models have been constructed for COVID-19, given the significance of increasing the body of information on the virus and directing time-sensitive decision making. In this study, we analysed research

that investigated the transmission of COVID-19 and possible therapies using a mathematical modelling technique based on compartmental models.

Methods

Search Strategy and Inclusion Criteria: We looked through research that evaluated the COVID-19 transmission dynamics using mathematical models based on compartmental models in four internet databases: PubMed, Web of Science, Scopus, and EBSCO Host. We used the terms "compartmental model," "coronavirus disease 2019," or COVID-19, and "transmission" to search the database. The inclusion criteria were all preprint papers and published articles in English from December 30, 2019, to May 25, 2020, in international peer-reviewed journals that described Covid-19 transmission utilising compartmental models. We selected this time frame for the limitation since it coincides with the onset and peak of the disease in many different nations. Reviews and theoretical articles without data or parameter values were not included in our review; however, publications including primary data or parameter values to forecast disease transmission were included. The publications that satisfied our review standards were added to Mendeley for reference.

Mathematical Model

Model Structure: We examined research that evaluated the COVID-19 transmission kinetics using a mathematical modelling technique based on compartmental models. From the four electronic databases we examined, 46 articles were found based on our evaluation of the search terms and inclusion criteria. The Susceptible-Exposed-

Infected-Recovered (SEIR) compartmental model was employed in the majority of evaluated studies (36/46) with the exception of six studies [9–14] that used the age-structured model. Eight research [2,16–21] used SIR models, while one study [21] used an age-structured model. In order to predict COVID-19 transmission, one study [17] compared SIR and SEIR models.

It found that SIR works better than SEIR and that using sophisticated models to predict disease transmission may not be more trustworthy than using simpler ones. One study [29] used a SIRS model to study COVID-19 transmission, though it is unclear if recovered individuals from COVID-19 acquire immunity and how long it takes for acquired immunity to wane. This suggests that taking the impact of waning immunity into account is essential in disease epidemiology. According to the study, it makes sense to take into account a SIRS model when evaluating COVID-19 transmission, and it's important to take decreasing immunity into account.

Interventions:

Most of the evaluated research (36/46) took into account interventions including facemasks, social distancing, isolation, and quarantine in the model simulations. Seven of this research (out of 23) used generalised SIR models instead of age-structured models to evaluate the effectiveness of treatments for disease control. A large number of these studies used generalised SEIR models. Age-structured models were employed in six research [9,10,12–14,21] to evaluate the effects of disease control interventions in various age groups. For instance, [9] evaluated COVID-19 transmission and control in China using an age-structured SEIR model and suggested that withdrawing treatments too soon would cause an earlier secondary peak.

Tuite et al. [10] examined COVID-19 transmission and control in Canada using an age-structured SEIR model and hypothesised that intensive care unit (ICU) resources may become overloaded in the absence of a significant combination of interventions. Furthermore, Davies et al. [11] used an age-structured SEIR model to study the COVID-19 outbreak and containment in China and proposed that the number of clinical cases might rise in areas with older populations if appropriate control measures aren't put in place. According to one study [13], treatments decreased contacts for persons over 60, adults between the ages of 20-59, and children under the age of 19 for a period of six weeks.

Age-Stratification:

Age-structured SIR models were employed in six studies [9-14] and one [21] to evaluate COVID-19 transmission. Four studies [9–11,13] examined the role of symptomatic and asymptomatic individuals in disease transmission out of seven age-structured models, indicating that

asymptomatic people are less likely to spread illness. According to one study [21], people over 65 are more likely to become infected with COVID-19 than adults between the ages of 15 and 64. Children between the ages of 0 - 14 are less likely to become infected. However, because the number of COVID-19-related confirmed cases and deaths is strongly correlated with age worldwide, some of these studies' observations were primarily based on interventions, making it difficult to pinpoint the precise age groups most at risk of contracting the virus and becoming ill.

Basic and Effective Reproduction Number: - The predicted number of secondary instances that a case in a naive population will generate is known as the basic reproduction number (R_0) [22]. The number of secondary cases that one primary case in a community with partial immunity or where intervention measures have been put in place generates is known as the effective reproduction number, or R_e [23]. An essential idea in the epidemiology of infectious diseases, the "basic reproduction number" estimates an infectious agent's risk of spreading an epidemic. $R_0 < 1$ denotes the likelihood of a decline in transmission, while $R_0 > 1$ suggests that the number of infected people is likely to rise [22].

Therefore, using mathematical models to estimate the basic reproduction number can aid in assessing the possible severity of an outbreak and offer vital data to guide disease management [24]. Of 46 analysed research, 36 estimated the basic reproduction number, while 5 studies [8,17,23,24,26] estimated the effective reproduction number using a variety of methods, including model parameters to measure COVID-19 transmission and the next generation matrix and Markov Chain Monte Carlo. Based on two investigations [13, 27], the basic and effective reproduction numbers were estimated.

The basic reproduction number was calculated from the literature in two studies [9,10] to simulate age-structured models and evaluate Covid-19 transmission in China and Canada, respectively. Five of the 46 analysed studies lacked a basic or effective reproduction number that might be inferred or presumed. The disease appeared to be spreading, as evidenced by estimated basic reproduction numbers from evaluated studies ranging from roughly 1.2 to 5.5 and effective reproduction numbers from 0.5 to 2.

Discussion & Results:

We reviewed research that investigated the COVID-19 transmission kinetics using a mathematical modelling technique based on compartmental models. The COVID-19 pandemic can be well represented by a mathematical model, which can also provide insight into the patterns of disease control and transmission [46]. The majority

of the examined papers (37/46) assessed COVID-19 transmission utilising surveillance data from multiple high-prevalence countries, including Wuhan, China, the epicentre of the outbreak, using SEIR models. These studies' epidemiological data indicate that 40–50% of infections including asymptomatic infections, moderate sickness, and people who were underassessed were not classified as infected cases [48].

Many of the evaluated studies (36 out of 46) took into account measures including facemasks, physical separation, hospital isolation, and quarantine for disease control throughout the model's construction and simulation. According to these studies, applying social distancing to everyone would have a greater effect. When combined with other interventions, like isolating confirmed cases at home or in a hospital and quarantining contact tracing individuals at home, social distancing may be able to suppress transmission below the fundamental reproduction threshold of 1, which is necessary to quickly lower-case incidence [48]. However, it also demonstrates that, in order to have a significant impact on the spread of disease, several interventions should be paired together, as the efficacy of any one intervention alone is probably going to be limited.

Review studies applied a variety of methods, including Markov Chain Monte Carlo and the next-generation matrix, to estimate the basic and effective reproduction numbers in order to forecast the transmission dynamics of COVID-19 [7, 28]. Given the specific season of increased social interactions, many research calculated that the basic reproduction number of COVID-19 is higher than that of SARS-CoV and MERS-CoV. These studies also claimed that the high reproduction number suggests that the outbreak may be more dangerous than what has been reported [8]. Out of the 46 research that were assessed, one study [21] examined COVID-19 transmission using an age-

structured SIR model, while six studies [9-14] applied age-structured SEIR.

According to one study [9], removing control measures too soon could lead to the appearance of new secondary cases. ICU resources may be overloaded in the absence of a significant combination of interventions, according to Tuite et al. [10] and Davies et al. [11], who also stated that an increase in clinical cases may occur in areas with older populations in the absence of effective control measures. According to Zhang et al. [21], people over 65 are more likely to become infected with COVID-19 than adults between the ages of 15 and 64. Children between the ages of 0 and 14 are less likely to become infected. In accordance to these studies, older populations may be seeing a rise in the number of new COVID-19 cases, and the risk of contracting the virus and dying from it also increases with age. However, some of these age-structured investigations were unable to pinpoint the precise vulnerable age groups at high risk due to the age-related correlation of Covid-19 transmission.

The review included 46 papers that explained COVID-19 transmission using compartmental models. The bulk of studies (37/46) that used the Susceptible-Exposed-Infected-Recovered (SEIR) framework did so using the age-structured SEIR model. Eight studies used SIR, and one of them used an age-structured model. One study used the generalised SIRS model to assess Covid-19 transmission. 36 out of 46 studies estimated the basic reproduction number and 5 estimated the effective reproduction number to predict when the disease will start.

Table: The study that analysed the COVID-19 transmission using compartmental models. The following is the order of studies according to the model structure: Generalised SIR models 1–7, Age-structured SIR models 8–9, Generalised SIRS models 10–40, and Age-structured SEIR models 41–46.

Study	Model type	Intervention	Ro or Re	Conclusion
[1]	Susceptible-exposed-infected-quarantine-diag- nosed-recovered (SEIQDR) compartmental model.	Quarantine and treatment	R=4.01 main land China and 4.3 in Wuhan	Intervention measures in the early stage of the epidemic are crucial for disease control
[2]	Susceptible-infected-recovered (SIR) compartmental model	Not considered	R0=2.6 (estimated using model parameters)	The COVID-19 outbreak is not well understood
[7]	Susceptible-exposed-infected-recovered (SEIR) compartmental model.	Quarantine	R0=2.68 (estimated using Markov Chain Monte Carlo)	The Outbreak was inevitable because of substantial exportation of pre-symptomatic cases globally
[8]	Susceptible-exposed-infected-recovered (SEIR) model with additional intervention compartments for quarantined and hospitalized individuals.	Quarantine, isolation and treatment	Re=6.47 (estimated using next generation matrix)	High reproduction number suggests that the outbreak may be more serious than what has been reported so far
	Age-structured susceptible-		R=2.2 (estimated)	Lifting of interventions quickly

[9]	exposed-infected-recovered (SEIR) compartmental model.	Physical distancing	from literature)	could lead to an earlier secondary peak
[10]	Age-structured susceptible-exposed-infectious-recovered (SEIR) compartmental model with additional of intervention compartments	Testing, isolation and quarantine	$R_0=2.3$ (estimated from literature)	Without substantial combination of interventions ICU resources could be overwhelmed
[11]	Age-structured Susceptible-exposed-infected-recovered (SEIR) model with addition of preclinical and subclinical infectious states	Not considered	$R_0=2.4$ (estimated using next generation matrix)	Regions with older populations may see more clinical cases if no effective control measures
[12]	Age-structured susceptible-exposed-infected-recovered (SEIR) model compartmental model.	Social distancing	$R=3$ (estimated using next generation matrix)	Social distancing together with testing and contact tracing will potentially mitigate virus transmission
[13]	Age-structured susceptible-exposed-infected-recovered (SEIR) model compartmental model.	Universal testing, contact tracing and facemask	$R_0=2.56$ (estimated using next generation matrix) $Re=0.73$	Combination of interventions while under lockdown would minimize deaths and infections
[14]	Age-structured susceptible-exposed-infected-recovered (SEIR) compartmental model.	Isolation	Not stated	Although transmission in childhood is low, group transmission is possible
[14]	Generalised Susceptible-exposed-infected-recovered (SEIR) model compartmental model.	Quarantine	Not stated	Sustained non-pharmaceutical interventions are required to reduce the outbreak
[16]	Susceptible-infected-recovered (SIR) compartmental model	School closure, lockdown and facemasks	Not estimated	The COVID-19 cases appear to be considerable if no effective interventions implemented.
[17]	Susceptible-infected-recovered (SIR) compartmental model	Quarantine	$Re=1.629$ (estimated from the model)	Disease predictions using complex models may not be more reliable compared to using a simpler model
[18]	Susceptible-infected-recovered (SIR) compartmental model	Lockdown	$R_0=2.43$ in Feb and 3.10 in March (estimated as using model parameters)	Interventions would help in reducing the R_0 especially in countries with low outbreak
[19]	Susceptible-infected-recovered (SIR) compartmental model	None Vs Mass testing	$R_0=2.2 - 4.5$ (estimated using model parameters)	Intervention is unlikely to be effective in for COVID-19 if $R_0 > 2.7$ within 49 days
[20]	Susceptible-exposed-infected-recovered (SIR) model with addition of diagnosed-ailing-recognized-threatened-extinct compartments	Testing, contact tracing and social distancing	$R_0=1.66-2.38$ based on interventions. (Estimated using next generation matrix)	Combined mitigation will potentially end the ongoing COVID-19 pandemic
[22]	Susceptible-exposed-infected-recovered (SEIR) compartmental model.	Not considered	$R=2.35$ before travel restriction and 1.05 after.	Chains of transmission might lead to new outbreaks as more cases arrive in international locations
[23]	Susceptible-exposed-infected-hospitalized-recovered (SEIHR) Compartmental model	Hospital isolation	$Re=0.47$ (estimated using model parameters)	There is a possibility of future outbreaks if adequate protective measures are not implemented
[24]	Updated their previous SEIR compartmental model	Quarantine, isolation and treatment	$Re < 1$ (estimated using next generation matrix)	The epidemics will continue to grow, and can peak soon depending on implemented interventions
[26]	Susceptible-exposed-infected-recovered-death-cumulative (SEIRDC) compartmental model.	Not considered	$Re=4.08$ (estimated using model parameters)	COVID-19 poses a major public health threat and it is important to evaluate the effectiveness of

				stringent measures
[27]	Susceptible-exposed-infected-hospitalized-recovered (SEIHR) compartmental model.	Hospital isolation	$R_0=4.71$, $R_e=2.08$ (estimated using model parameters)	A quick diagnosis that leads to quarantine and other interventions will have a major impact on disease control.
[28]	Susceptible-exposed-infected-recovered (SEIR) compartmental model.	Not considered	$R_0=3.58$ (estimated using next generation matrix)	The transmissibility of COVID-19 was higher than the MERS in the Middle East, similar to SARS, but lower than MERS in Korea
[29]	Susceptible-infected-recovered-susceptible (SIRS) compartmental model	Not considered	$R_0=2.91$ (estimated using model parameters)	Asymptomatic infectious may play an important role in disease transmission
[30]	Susceptible-exposed-infected-recovered (SEIR) compartmental model	Isolation and hospitalization	$R=1.5$ (estimated using model parameters)	The calculated R_0 in the two states proved a reliable summary of the success of interventions
[31]	Susceptible-infected-recovered (SIR)	anti-epidemic measures, such as quarantine	Not stated	Anti-epidemic measures may reduce the number of cases by 40%-49%
[32]	Age-structured susceptible-infected-recovered (SIR) model	Social distancing and school closure	$R_0=1.5 - 2.5$ based on interventions. (estimated using next generation matrix)	Social distancing is sufficient to control COVID-19 during the outbreak
[33]	Generalised susceptible-exposed-infected-recovered (SEIR) compartmental model.	Isolation, quarantine, and treatment	Not stated	Governments could control disease transmission by applying the proposed interventions
[34]	Susceptible-exposed-infected-recovered (SEIR) compartmental model.	Wuhan travel ban	$R_0=0.04 - 3.15$ based on interventions. (estimated using model parameters)	Implementation of interventions associated with reductions in case incidence
[35]	Generalised Susceptible-exposed-infected-recovered (SEIR) model compartmental model.	Quarantine	$R_0=1.5$ optimistic and 4 Pessimistic scenario	Quarantine of symptomatics may have impact on disease outbreak
[36]	Susceptible-exposed-infected-recovered (SEIR) model compartmental model.	Isolation, social distancing, quarantine and travel restriction	$R_0=5.3$ (estimated using model parameters)	Mathematical modeling can provide decision guidelines for disease control
[37]	Susceptible-exposed-infected-recovered (SEIR) model compartmental model.	Surveillance, contact tracing, quarantine and social distancing	$R_0=5.7$ (derived by integrating uncertainties in parameter values)	Strong mitigations are needed to stop the virus transmission
[38]	Generalised susceptible-exposed-infected-recovered (SEIR) model compartmental model.	Quarantine and social distancing	$R_0=0$ (estimated using next generation matrix)	Death rate may be determined by the ratio of infection and recovery rates
[39]	Generalised susceptible-exposed-infected-recovered (SEIR) compartmental model.	Isolation, quarantine and public closure	Computed using next generation matrix but not quantified	Latently infected individuals play an
[40]	Generalised susceptible-exposed-infected-recovered (SEIR) compartmental model.	Quarantine	$R_0=1$ (estimated using next generation matrix)	Reducing the contact is the most effective intervention in achieving disease control
[41]	Generalised susceptible-exposed-infected-recovered (SEIR) compartmental model.	Quarantine, social-distancing, isolation and face-masks	$R_0=1.95$ for New York and 2.07 for entire USA (estimated using next generation matrix)	COVID-19 can be controlled by interventions, such as social-distancing and facemask
[42]	Generalised susceptible-exposed-infected-recovered (SEIR)	Facemask and hand-washing	$R_0=4.28$ (estimated using model)	Protection measures, such as facemasks and hand-washing

	compartmental model.		parameters)	control the COVID-19 pandemic
[43]	Susceptible-exposed-infected-recovered (SEIR) compartmental model.	Not stated	$R_0=2.5$ under optimistic and 7 under pessimistic	Preventing the rapid spread of COVID-19 necessitates intervention measures
[44]	Generalised susceptible-exposed-infected-recovered (SEIR) compartmental model.	Quarantine and hospital isolation	$R=3.6$ (estimated using next generation matrix)	The plan for emergency measures should be supported for disease control
[45]	Generalised susceptible-exposed-infected-recovered (SEIR) compartmental model.	Facemask	Computed but not quantified	Face-masks should be used in conjunction with other non-pharmaceutical practices
[46]	Susceptible-exposed-infected-recovered (SEIR) compartmental model.	Not considered	$R_0=2.8$ (estimated using next generation matrix)	The model predicted and highlighted understanding the trend of the COVID-19 outbreak.
[47]	Susceptible-exposed-infected-recovered (SEIR) model with addition of insusceptible, quarantined and death compartments	Quarantine	$R_0 < 1$ (estimated using model parameters)	The epidemics in Beijing and Shanghai will end soon, while for most part of China, the success of anti-epidemic may take long time.
[48]	Susceptible-exposed-infected-recovered (SEIR) with addition of intervention compartments	Quarantine and isolation	$R_0=2.4$ (assumed)	Multiple interventions should be combined to have a substantial impact on transmission.
[49]	Susceptible-exposed-infected-recovered (SEIR) with addition of quarantined and hospitalized compartments	Quarantine and isolation	$R_0=5.3167$ (estimated using next generation matrix)	Deterministic dynamical model was suitable to examine the interaction of the disease progression.

Concluding Remark:

In order to assess the effectiveness of COVID-19's transmission and control, modelling studies used generalised and age-structure models. The results indicate that when mitigations are coupled, they can significantly reduce the spread of the disease.

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Understanding the Obstacles to ICT Adoption in Commerce Education: An Educator's Insight

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Abstract:

This paper delves into the significant obstacles that educators face in adopting Information and Communication Technology (ICT) in commerce education. Despite the potential of ICT to enhance learning outcomes and modernize educational practices, several barriers hinder its full integration. These challenges range from inadequate infrastructure and limited access to resources to the need for specialized training, digital divide, pedagogical changes and curriculum limitations. Incorporating a quantitative approach, the research methodology uses a survey questionnaire to gather information from a sample of 311 from the teachers of Thrissur district. By providing a detailed analysis from an educator's perspective, this study aims to shed light on the critical issues that must be addressed to successfully implement ICT in commerce education, ultimately leading to a more effective and future-ready educational environment.

Keywords: ICT, Commerce, Educators, Digital tools

Introduction:

Utilizing digital tools and resources to improve teaching and learning procedures is part of integrating ICT (information and communication technology) into commerce education. By facilitating interactive learning environments, enabling students access to a multitude of online resources, and developing skills applicable to the contemporary corporate world, this integration can greatly enhance the educational experience. The implementation of digital platforms for course management, simulation software for hands-on learning, and data analysis tools to impart financial and economic concepts are important aspects of ICT integration in commerce education. Real-time access to global business trends and virtual interactions can be facilitated by ICT. However, a number of obstacles must be overcome for integration to be successful. These include dealing with change resistance, making sure educators have enough training, managing budgetary limits, and guaranteeing proper infrastructure.

Statement of Problem:

Information and communication technology (ICT) has long been acknowledged as a means of improving educational quality, but its use in commerce education is still relatively new, especially in the Thrissur region. There are many obstacles that teachers must overcome in order to successfully include ICT technologies into their lesson plans. These difficulties include a lack of

resources, inadequate infrastructure, inadequate training, and opposition to change. In order to determine why ICT adoption is lacking and what can be done to remove these hurdles, this study aims to identify and analyze the specific challenges faced by Thrissur's commerce educators.

Objectives:

1. To assess the readiness and willingness of educators to incorporate ICT into their teaching practices.
2. To identify the obstacles educators and institutions face in integrating ICT into commerce education.

Significance of the Study:

The study "Understanding the Obstacles to ICT Adoption in Commerce Education: An Educator's Insight" is important because it gives critical insights into the specific issues educators face when incorporating Information and Communication Technology (ICT) into commerce education. The study's identification of these hurdles provides a foundation for establishing focused measures to improve technology uptake and effectiveness in the classroom. This understanding is critical for enhancing educational practices, directing policy formulation, and creating professional development programs that are suited to educators' needs. Furthermore, the findings can help to improve resource allocation and pave the way for future study, ultimately contributing to the

progress of commerce education and preparing students for a technologically oriented workforce.

Review Of Literature:

(Kilag, et al., 2022). ICTs are also transformative tools that, when utilized skillfully, can change the classroom dynamic to one that is learner-centered. Thus, in order to improve the learning chances for students, it is imperative that computers be installed in the classroom. students through various educational activities. Both teachers and students gain experience in an ICT setting, which helps them make the most of class time. Thus, ICT-enhanced instruction serves as a source of motivation for educators as well as students

(Sasan, 2021)The way that teaching and learning are conducted is changing significantly as a result of ICT use. The focus of the conventional teaching method has been on content. Course

Data Analysis & Interpretation:

materials were created with textbooks in mind for many years. Instructors used the lecture style to teach the material, and the exercises were meant to reinforce what the students had learned. Teachers in the modern era must design engaging and pertinent learning opportunities for their pupils. Since technology has the ability to raise student achievement, it plays a significant role in promoting inclusivity in education .

Research Methodology:

This is a descriptive study. It uses both primary and secondary data.Primary data collected from 311 educators from various institutions in Thrissur District.Secondary data was gathered from papers, academic studies, and already published materials about ICT integration in education. Purposive sampling was used to select the samples.

Table I - Demographic Profile of Respondents

Characteristics	Categories	Number Of Responses	Percentage
Gender	Male	122	39
	Female	189	61
Age Group	25-35	101	33
	35-45	113	36
	ABOVE 45	97	31
Educational Qualification	PG	137	44
	Other	174	56

Interpretation: The demographic profile shows 61% of the respondents are female teachers and the rest of them are male teachers. Regarding the age

group, the majority of them are between 35-45. Most of the respondents have higher qualifications than pg.

Table II -Key Challenges Faced By Teachers To Incorporate ICT

FACTORS	Level Of Agreeableness					MEAN	RANK
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree		
Limited Infrastructure & Resources	93	87	15	62	54	3.33	II
Lack of Training & Professional Development	89	78	11	57	76	3.2	III
Curriculum Limitations	96	86	23	51	55	3.4	I
Digital Divide	78	65	27	59	82	3	V
Pedagogical Challenges	85	75	19	61	71	3.1	IV

Interpretation: Of the various challenges that teachers faced to incorporate ICT,curriculum limitations rank first because of the outdated curriculum and lack of relevant content. Limited

infrastructure and resources ranks second. Lack of training & professional development is in the third position. The institutions are required to raise the standards of teachers by arranging FDPs and

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workshops to train them. Digital divide like geographical disparities and inequality among students rank fourth. Pedagogical challenges rank last.

Testing of hypothesis:

1. Two Sample t test

H₀: There is no significance with regard to readiness to incorporate ICT in teaching among experienced and less-experienced teachers.

Readiness Scores		Test statistics	P Value at 5% level of significance	Accept/ Reject
Experienced Teacher	Less-Experienced Teachers			
25	34	.02156	P Value: .983326	Accept
56	39			
34	46			
61	69			
54	41			

Test distribution: Normal

Test: Two Tailed

Interpretation: The p value is greater than 0.05, so we accept the null hypothesis, that both experienced and less experienced teachers are ready to incorporate ICT in their teaching process.

Findings:

- The demographic profile shows 61% of the respondents are female teachers and the rest of them are male teachers. Regarding the age group, the majority of them are between 35-45. Most of the respondents have higher qualifications than pg.
- Of the various challenges that teachers faced to incorporate ICT, curriculum limitations rank first because of the outdated curriculum and lack of relevant content. Limited infrastructure and resources ranks second. Lack of training & professional development is in the third position. The institutions are required to raise the standards of teachers by arranging FDPs and workshops to train them. Digital divide like geographical disparities and inequality among students rank fourth. Pedagogical challenges rank last.
- The hypothesis test shows p value is greater than 0.05, so we accept the null hypothesis that both experienced and less experienced teachers are ready to incorporate ICT in their teaching process.

Suggestions:

- Professional development and training programs should be conducted to make Educators flexible to adopt new ICT technologies and to find out the obstacles in adoption.
- Gather data from educators about their experiences and perceptions regarding ICT adoption.

- Create proper rules and guidelines for educators and institutions to overcome common problems and challenges, in adopting ICT successfully.
- Compare the challenges in ICT adoption in commerce education to those in other educational disciplines.
- Examine how ICT adoption may affect the traditional and existing curricula.

Conclusion:

Integrating Information and Communication Technology (ICT) into commerce education presents challenges including outdated technology, financial constraints, and resistance from educators and institutions. These issues require enhanced professional development, better support systems, and sufficient funding. With strategic planning, collaborative efforts, Creating a supportive institutional culture, providing proper guidelines and engaging in continuous feedback can help to overcome such barriers. By analyzing obstacles in adoption, educational institutions can effectively integrate ICT, thereby improving teaching practices and preparing students for the digital economy.

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A Study on the Necessity of Safeguarding Underground Water Levels through Rainwater Harvesting In Mangalore, Karnataka, India

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Abstract:

The most essential element required by all living things on Earth is water. We must endeavour to maintain the underground water level using all available strategies and tactics as global warming is causing the earth's underground water level to decline. The purpose of this study is to determine the level of awareness among the citizens of Mangalore City, regarding "rain water harvesting". The study further investigates as to how many households have installed it and how many have not; along with the causes for non-installation as well.

Keywords: underground water, drinking water, rainwater harvesting, wells, Mangalore City

Introduction:

India's Karnataka State is home to the city of Mangalore. It is located in the state's coastal region, which is abundant in natural resources. It is a hub of educational institutions and was wealthy in agriculture. The city is becoming a concrete jungle as a result of urbanization and development. It is surrounded by hills, valleys, and an abundance of water sources because it is located in the coastal region. Wells provide smoother, sweeter drinking water. The city also features a river, a few small lakes, and waterways. The locals are literate, self-sufficient, and smart in their natural ways. The city has a well-developed road system, a seaport, and an airport.

During the monsoon season, the city used to receive the most rainfall and occasionally flood in the areas near water canals. At the same time, natural spring water would also naturally flow out of the well. The then school-age children, who are now adults, have enjoyed splashing around in the spring water. The current generation cannot see the clear spring water because of the mix of waste and spring water. The city experienced summer temperatures as high as 29 degrees Celsius, and the most recent summer saw temperatures as high as 38 degrees Celsius. The summer heat is terrible and the city is extremely humid. Because of global warming, wells that used to flood during the monsoon season now dry up in the summer. Despite the area receiving enough rain, there is nowhere for the water to be absorbed by the earth, therefore the ground water level is dropping. Everybody has poured concrete over their land. Concrete makes up roads. Because there isn't a suitable channel (one that is smaller in size than the rainwater flow) for the rainwater to flow through or be sucked up by the soil, the city is experiencing flooding problems.

Due to a lack of available land, some wells in cities have been covered over to accommodate dwellings, while others had to be closed because a drainage system malfunction caused the drainage water to flow into the well.

An incidence that the researcher saw involved a family that travelled to Mangalore for private business during the monsoon. When they observed the rainfall waste, they cried out, "There's no agriculture in the city, and it rains so much in these parts, which is going waste." The enormous quantity of land they have for crops receives insufficient rainfall.

Indeed, Karnataka's coastal region is endowed with a wealth of natural resources. Natural resource value was never understood by the people, because there was never a shortage. People only begin to value resources or things when they are in a state of scarcity. Due to a job placement, the researcher spent a year or two in Mysore city. There was a three-day period without water service due to a technical issue with the pipeline involving the water supply tank. As the stocked-up water level got over, all of the locals were forced to travel great distances in search of a borewell. The researcher gained firsthand knowledge from this and learned the importance of protecting nature's resources, particularly water.

According to the testimony of a businessman who lives atop a hill in Mangalore city and lacks a well, he constructed a rainwater harvesting system, which caused the neighbouring wells to cease drying out. In contrast, it used to dry every March or April month. The unfortunate thing is that he hasn't bothered to inform his neighbours about the effects of rainwater harvesting in his plot on their well.

Research Methodology:

Title: A study on the necessity of safeguarding underground water levels through rainwater harvesting in Mangalore

Objectives of the study:

- To determine the level of awareness regarding rainwater harvesting among Mangalore residents
- To research Mangalorean households' sources of drinking water
- To gain knowledge about implementation of RWH system among the households.

Scope of the study: the scope of the study is limited to Mangalore city only.

Sample & sampling method: 100 residents of Mangalore, were chosen for the study and convenience-based sampling method was chosen for collecting the data.

Data Collection: The primary source provided the majority of the data used in this investigation. To gather the information, a google form-style electronic questionnaire was created and distributed. Even secondary sources of data were used in the study to validate the primary data that was gathered.

Analysis: The chi-square test is used to evaluate the hypothesis after the data was further analysed using SPSS software and displayed in tabular form. To analyze and validate the credibility, primary and secondary data were compared.

Use of this study to the Society:

The main goal of this study is to increase awareness among the households about the need of safeguarding underground water levels and of each person's social responsibility to preserve the environment and conserve water. In the recent past the city is fighting with water scarcity and declining groundwater levels due to rapid urbanization and climate change. This study explores the significance of rainwater harvesting (RWH) as a sustainable solution to protect and replenish underground water resources in Mangalore.

Analysis of Table No. 1: The city had plenty of wells i.e. on an average every household had an individual well. And this water was used for all household chores, including bathing and toilets. But now the number of wells are reduced and the above table indicates that 39 out of 100 households use well water for drinking. The depth of the wells range from 10 to more than 60 feet, depending on the geographical location. Further study has identified that out of 39 wells, 16 of them dry up every summer and only 23 of them will have water, but at the deepest level. The large population of the study uses corporation water supplied through the pipeline, which is not so hygienic. A small portion of the population depends on borewells and the remaining study population buys the mineral water.

Table No. 1: Source of Drinking Water for the households

Source of Drinking Water	Number of households	Description
City Corporation water supply	42	Water supplied by the local municipal authority. Typically, this source is managed and maintained by the city's water supply system, and it is the most common source in urban areas.
Well Water	39	Water drawn from a private well on the property. This source is often used in rural or semi-urban areas where municipal supply might be limited. The well can be shallow or deep, depending on the local water table.
Borewell	7	Water extracted from a borewell, which is drilled deep into the ground to reach groundwater. Borewells are common in areas where groundwater levels are low but need deeper access compared to shallow wells.
Mineral Water (purchased)	12	Packaged mineral water bought from stores. This source is often used for convenience or in areas where other sources might be unreliable or unsafe.

Table No. 2: Cross tabulation about the awareness of Rain Water harvesting system & Whether they have installed the system in their land

	Have System (Yes)	No System (No)	Total
Aware (Yes)	27	71	98
Not Aware (No)	0	2	2
Total	27	73	100

Table No. 2 depicts that 98 households out of 100 samples chosen for study, are aware about rainwater harvesting. Only 2 of them are unaware.

The table also depicts that out 98 households only 27 of them have installed the rainwater harvest system, and the remaining 71 of the households

haven't installed it. In Mangalore rainwater harvesting system is installed by the builders of newly built apartments; as they realized the borewell drill depth is around 400 feet. Few of them could

witness the cease of dying this water source after installing Rain water harvesting system.

Table No. 3: average static water level 233 Taluks (in meters in below ground level)

District	Taluk	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Dakshina Kannada	Mangalore	11.37	10.22	10.95	13.22	12.86	17.78	16.25	16.77	16.01	25.67

Source: Groundwater Directorate & Karnataka Ground water Authority (official website GoK)

Water was scarce in the city during the month of May 2024, therefore the city corporation-imposed water supply rationing in an effort to conserve water. The above data lends credence to this assertion. Table No. 3 ids the data from the

Cross-Tabulation

Table No.4: Showing interest to implement rainwater harvesting system and the reason for not installing it

Interest in Installing RWH	Reason for not installing Rain Water Harvesting			
	Finance	Lack of land	Scared	Total
Total (Yes)	0	0	0	62
Total (No)	18	14	6	38
Grand Total				100

Table No. 4 depicts the interest to install the rainwater harvesting system and the reason for not doing so. 62 households (includes those who already have rainwater harvesting system) show the interest to install rain water harvesting system. 38 of the households do not have the interest to do so. The reasons were further researched and the findings are 18 out of 38 have the financial issues to implement this system; 14 of the households do not have sufficient land and the remaining 6 households are scared to implement the same.

Findings of study:

Following findings are drawn from the analysis. The drinking water source for the residents of Mangalore is majorly from the City Corporation water supply. Second largest population uses well water for drinking and the remaining are buying the mineral water. Further finding indicate that the large majority of the people of Mangalore are aware about the 'Rain Wate Harvesting' system. But most of them have not installed the same. Builders are realising the need for installing the system as they have to drill the borewell for more than 300-400 feet deep for water supply to the apartments. The study also indicates the reasons for not showing interest to rain water harvesting by the small portion of study sample are lack of land and financial issues. The study has also found that the ground water level in city is declining year after year

secondary source by Ground water Authority-Government of Karnataka, which publishes annually ground water level measured in meter. In the table we can observe that in the year 2014 the ground water level was 11.37 meter and in the year 2023, it was 25.67 meter which indicates the level of underground water declining.

Hypothesis testing: two of the following variables were chosen for the Chi square test (as shown in the Cross-tabulation Table No.1)

1. Awareness about Rain Water harvesting system &
2. Whether they have installed the system in their land

Null Hypothesis:

Though people are aware bout rainwater harvesting, haven't installed the system

Alternative Hypothesis:

People who are aware about the rainwater harvesting, have installed Rain Water Harvesting system.

Since $\chi^2=0.7553$ \chi^2 = 0.7553 $\chi^2=0.7553$ is less than the critical value of 3.841, we fail to reject the null hypothesis. This means there is not enough evidence to suggest a significant association between the awareness about rainwater harvesting and whether they have the system installed in the data. Based on the chi-square test, the null hypothesis – 'Though people are aware bout rainwater harvesting, haven't installed the system' is accepted.

Conclusion:

Nature has given us with every natural resource. But we are in danger of losing everything because of human greed, a disregard for natural resources, and carelessness. When weighed against other necessities, water is a vital component of life. Seventy-three percent of Earth is covered with

water, yet only three percent of that water is suitable for human consumption because it is seawater. We must endeavour to maintain the underground water level using all available strategies and tactics as the planet faces the challenges of global warming and declining subsurface water levels.

This study demonstrates that Mangalore residents in the state of Karnataka, India; are aware of rainwater harvesting systems. However, the system is not installed by majority of them. The researcher emphasizes that residents should not rely solely on the government to protect the environment. Rather, it is each person's duty to value, protect and preserve, the natural resources. Everyone, regardless of age, needs to save water and prevent its waste. In Mangalore, rainwater harvesting offers a workable and crucial plan for preserving and raising ground level water. The city can solve its problems with water scarcity and guarantee a sustainable water supply going forward by implementing and supporting RWH methods. Moreover this RWH method can be used by people all over (other than counties where the average annual temperature is too low)

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Worklife Balance of Employees in Public Sector Bank with Special Reference to Bank of Baroda in Thrissur District

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Abstract:

Recent years have seen a major increase in interest in the concept of work-life balance, especially in the banking industry where employees frequently deal with stress and high demands. This study is on how employees at the Bank of Baroda, an Indian public sector bank located in the Thrissur District; manage their work and personal lives. Examining the variables affecting work-life balance and how it affects worker productivity and well-being is the main goal. Working hours, job happiness, organisational support, and obligations to one's personal life are important factors. The study also looks at how age, marital status, and gender affect people's experiences with work-life balance. The results indicate that extended work hours and other factors make it difficult for Bank of Baroda workers in the Thrissur District to balance their personal and professional life. Work-life balance has been found to be positively impacted by organisational support mechanisms such as employee assistance programs and flexible work schedules. The report emphasises that in order to improve worker satisfaction and productivity, public sector banks must adopt stronger work-life balance regulations. In addition to highlighting the significance of work-life balance in the banking industry, this study offers policymakers and bank management practical advice on how to foster a more encouraging workplace culture. Public sector banks like the Bank of Baroda can raise organisational performance, lower attrition rates, and increase overall employee well-being by attending to the demands of their workforce in terms of work-life balance.

Keywords: Work life Balance, Employee satisfaction, Challenges, Organisational Support

Introduction:

The equilibrium between one's personal and professional obligations is referred to as work-life balance. It means efficiently allocating time and resources to complete tasks linked to one's job as well as non-work-related pursuits like family time, hobbies, and self-care. Achieving a healthy work-life balance is crucial for general wellbeing because it lowers stress, prevents burnout, and fosters a more contented way of living. Achieving a work-life balance may entail establishing limits, assigning priorities, and scheduling time for different facets of life.

Public sector banks may introduce well-being-oriented initiatives like fitness classes, mental health counselling, and stress management seminars. The perception of work-life balance among employees can be influenced by opportunities for professional advancement. Dissatisfaction may be exacerbated by a sense of career stagnation. Unions may occasionally be involved in negotiating for improved working conditions and serving as an advocate for workers' rights.

Government policies and economic conditions can also have an impact on public sector banks, as they are a component of the broader public sector. While evaluating the work-life balance of

employees in public sector banks, these factors must be taken into account. Furthermore, individual experiences differ, so depending on their jobs and personal situations, some employees might find the balance easier to manage than others.

Statement of The Problem:

In every circumstance, the banking sector is becoming less reliant on late work and strict deadlines, with employees' efforts being expected to produce high-quality results. It proves to be challenging to essentially achieve harmony between work and family life because of the heavy workload at work, which results in lower efficiency, weakness, health problems, and awkwardness in the work-life arena. Even in the middle of the market retreat, understanding finances is a critical skill. Bankers have a lot on their plates, from sorting through mountains of annual reports to studying the latest trends in the market and consumer purchasing power to creating intricate financial models and analyzing the fiscal and financial policies of the government. As a result, this study was conducted to understand the problems faced by employees in public sector bank, Bank of Baroda.

Objectives:

1. To analyze the factors affecting work life balance of employees in Bank of Baroda.

2. To find out the challenges faced by the employees in Bank of Baroda.
3. To suggest some measures to improve work life balance in Bank of Baroda.

Significance Of The Study:

Work-life balance is still important and crucial for both individual success and organizational success. A number of factors have led to an increased recognition of the value of work-life balance by employers and employees Bank of Baroda. For workers to be physically and psychologically healthy, work and personal life must be balanced. Overwork and ongoing stress can cause burnout, which has a detrimental effect on one's general well-being and health. Studies have demonstrated that overworking can have diminishing returns, defying the notion that longer hours equate to higher productivity. Workers who get enough sleep and make time for personal pursuits are typically more concentrated, imaginative, and productive at work. Work-life balance is becoming increasingly important because of its effects on worker satisfaction, organizational effectiveness, attracting and retaining talent, and employee well-being. The importance of keeping a healthy work-life balance is likely to endure as workplace dynamics change further.

Scope Of The Study:

The current research is “A Study on Work Life Balance of Employees in Public Sector Bank with special reference to Bank of Baroda in Thrissur District”. This study provides some important insights into the challenges faced by employees, factors affecting work life balance. The researchers and scholars who intent to conduct research in this field will find this study to be valuable. The significance of work-life balance in the banking industry is linked to the changing expectations of employees, technological advancements, and broader workforce trends. Prioritizing work-life balance will probably be crucial for attracting and keeping talent, improving employee wellbeing, and maintaining overall organizational success as the industry adjusts to these changes.

Research Methodology:

The study is descriptive in nature. For the purposes of the study, both primary and secondary data were used. However, secondary data was used to supplement the original data and primary data was used extensively. Incorporating a quantitative approach, the research methodology uses a survey questionnaire to gather information from a sample of 102 employees of different branches of Bank of Baroda in Thrissur District. Purposive sampling was used to gather the primary data. The primary data is supported by secondary data. Secondary data is gathered from books, journals, and other published sources.

Literature Review:

P. Padmanaaban, et. al (2023) “ work-life balance and emotional intelligence with special reference to private bank employees ” A research methodology and issue statement are discussed, the concept of emotional intelligence is dissected, the investigation's goals are outlined, and participant interviews are conducted. This chapter also covers the relationship between emotional intelligence and the level of customer care Indian private sector banks can offer their customers, as well as how the banks' capacity to identify and address customers' needs affects this relationship. The data analysis procedure was carried out using the program known as SPSS. Researchers used a variety of unique statistical techniques to look into the relationships that existed between the numerous variables that were examined. These methods included regression analysis, t-tests, coefficients of correlation, and descriptive statistics (such as mean and standard deviation). In order to obtain information for each purpose, primary and secondary sources were both used. The two methods of data collection that will be most important are going to be the questionnaire and in-depth interviews.

Udaykumar, T. K., Faldu, R., & JVIMS, J. (2022) “Gender differences: Work life balance of banking employees in Gujarat state in India” Maintaining a work-life balance is critical to human sustainability. Finding the factors influencing work-life balance and their effects on both men and women is the aim of this study. This report additionally facilitates comprehension of the elements that enable employees to maintain a work-life balance. For this study, 122 Gujarati banking professionals served as the sample. The method of using structured questionnaires to acquire primary data was used. It was discovered that employees' work-life balance is greatly influenced by their emotional intelligence, supportive coworkers, and healthy working environments. Additionally, there is a strong correlation between work-life balance characteristics and gender. Male employees are greatly influenced by the support of their spouses, while female employees are greatly influenced by the support of their supervisors. The policy maker will be assisted in crafting work-life balance policies by the results of this study. Once more, management is able to determine which factors influence an individual's ability to balance work and life through this study.

B. Lavanya, B. Divya Sree (2021) “Work-life balance and organizational citizenship behaviour-a study with reference to bank employees ” Being a good citizen in the current pandemic and going above and beyond the call of duty is a very difficult task. Bank employees are among the professionals who work without interruption and provide their services without any disturbances. To live a stress-

free life, work-life balance is generally crucial. Because of the nature of their work, bank employees typically find it difficult to strike a balance between work and personal life. Regardless of the specifics of the job, striking the right balance between work and professional life usually leads to the display of discretionary behavior, or what is known as citizenship behavior. Thus, the goal of the current study is to comprehend the relationship between bank employees' citizenship behavior and work-life integration. The study aims to investigate workplace conflicts with personal lives, individual life interference with work lives, employee citizenship behavior, and the relationship between work-life integration and bank employees' overall community behavior. The city of Hyderabad is the exclusive focus. A convenient sample size of 112 bank employees is used to collect primary data using standard scales, and SPSS is used for data analysis. It was discovered that two of the main causes of work-life imbalance are staying up late working and thinking about the family. It is clear from an analysis of the employees' citizenship behavior that they demonstrate in a significant way. Even in the absence of oversight, bank employees make an effort to support one another and adhere to policies. Additionally, it was found that the work-life balance had no effect on employees' overall cognitive functioning.

Mandeep Kaur Dr. C. Venkateswaran (2020) “To study the work life balance among working women, post maternity in banking sector” This study's goal is to clarify how the service sector contributes more to global output. Due to factors such as urbanization, privatization, and the immediate demand for final consumer services, the service sector accounts for the largest portion of the economies in most countries worldwide. Since high-

Results And Discussion:

Job Position:

Job position	Number of respondents	Percentage
Entry level	34	33%
Mid-level	23	22%
Senior level	9	9%
Managerial level	10	10%
Others	26	26%
Total	102	100%

The table shows 33% of respondents are from the category of entry level, 22% of respondents are from mid-level, 9% of respondents are from

Satisfaction Of Current Workload:

Level of satisfaction	Number of respondents	Percentage
Highly satisfied	10	10%
Satisfied	49	48%

quality services are essential to an economy's health, the development of industries such as banking, insurance, trade, and commerce, as well as the entertainment, social, and personal spheres, has a direct impact on the primary and secondary sectors, particularly in developed nations. The service industry plays a complementary role in accelerating development by improving quality and enhancing productivity and developmental activities with efficiency. Producing services typically calls for a higher proportion of human capital and a lower amount of natural capital, so demand.

Sanjita lenka & Rabi subudhi (2019) “Work life balance, job satisfaction and organizational commitment: a study on bank employees bhubaneswar, odisha” Managing a single employee has become more challenging than ever in the evolving banking environment. A balanced life is one in which we allocate our time and resources among the major priorities. As the dimensions shift, there has been a resurgence of interest in the well-researched field of work-life balance (WLB). When employees are happy with the policies and procedures of their organization, productivity levels rise. The three dimensions of organizational commitment are normative, continuance, and affective commitment. The degree to which a person's needs and expectations about an organization align with their actual experience has an impact on affective commitment (Storey, 1995). This study examined how work-life balance affected employees' organizational commitment and job satisfaction in public sector banks in Bhubaneswar, Odisha. Analysis was based on an empirical survey with 100 employees as a sample. Data were gathered using a pre-tested, structured questionnaire, and SPSS was used for analysis.

senior level, 10% of respondents are from managerial level and 26% of respondents are from other category.

Neutral	34	33%
Dissatisfied	5	5%
Highly dissatisfied	4	4%
Total	102	100%

From the table it is clear that 48% of respondents are satisfied, 33% of respondents are of neutral opinion, 10% of respondents are highly

satisfied , 5% are dissatisfied and remaining 4% are highly dissatisfied.

Working Hours In A Week:

Working hours	Number of respondents	Percentage
Less than 40 hours	23	10%
40-50 hours	50	57%
50-60 hours	15	17%
60 hours above	14	16%
Total	102	100%

The table shows the working hours of respondents in a week. 57% of respondents are working 40-50 hours, 17% of respondents are

working 50-60 hours, 16% of respondents are working more than 60 hours and remaining 10% of respondents are working less than 40 hours.

Opinion On Impact Of Job In Personal Life:

Level of agreement	Number of respondents	Percentage
Strongly disagree	9	9%
Disagree	24	23%
Neutral	50	49%
Agree	11	11%
Strongly agree	8	8%
Total	102	100%

The table shows the interference of job in personal life. 49% of respondents have neutral opinion.23% of respondents disagree that their job interfere in their personal life ,11% of respondents

agree to the fact, 9% of respondents strongly disagree and remaining 8% of respondents strongly agree.

Rating Of Current Worklife Balance:

Rating	Number of respondents	Percentage
1 {Least}	7	9%
2	19	18%
3	51	49%
4	16	16%
5 {Highest}	9	18%
Total	102	100%

The table shows the rating of current work life balance where 1 implies least and 5 implies highest rate. 49% of respondents have rated 3, 18%

of respondents have rated 2, 16% of respondents have rated 4, 9% of respondents have rated 5, and remaining 8% of respondents have rated 1.

Participation In Organisation Program For Employee Wellbeing:

Category	Number of respondents	Percentage
Yes, I have utilized them	56	64%
Yes , I haven't utilized them	30	34%
No	16	2%
Total	102	100%

The table shows the organizational program for employee wellbeing. 64% of respondents have

utilized them, 34% haven't utilized them and 2% of respondents haven't participated in such programs.

Completion Of Tasks Within Regular Working Hours:

Category	Number of respondents	Percentage
Always	37	36%
Often	29	28%
Sometimes	25	25%
Rarely	5	5%
Never	6	6%
Total	102	100%

This table shows the completion of tasks within regular working hours. 36% of the respondents has responded always to this question, 28% of the respondents has responded often , 25%

of the respondents has experienced sometime, 6% of the respondents has responded never, 5 of the respondents has rare experience.

Opinion on Negative Impact of Job In Personal Life:

Level of agreement	Number of respondents	Percentage
Strongly disagree	7	7%
Disagree	31	30%
Neutral	43	42%
Agree	14	14%
Strongly agree	7	7%
Total	102	100%

The table shows the negative impact of job in personal life. 32% of the respondents have neutral experience, 30% of the respondents are disagree to this fact, 14% of the respondents are agreed and 7%

other respondents have a strongly disagreed opinion and remaining 7% of the respondents are strongly agreed.

Major Challenges Faced By Respondents In Meeting Work Deadlines:

Category	Average	SD	Rank
Heavy workload	6.28	1.84	1
Insufficient resources	5.93	1.94	2
Lack of clarity in expectations	5.84	1.97	4
Inadequate training	5.67	2.11	6
Constant overtime	5.85	1.95	3
Limited benefits and policies	5.57	2.02	7
Frustration in getting the work done	5.75	1.94	5
Poor knowledge in e-banking	5.35	2.32	8

The table shows major challenges faced by respondents in meeting work deadlines. Heavy workload has the highest rating with average of 6.28. Insufficient resources has second highest rating with an average of 5.93, constant overtime

has third highest rating with an average of 5.85, lack of clarity in expectations is the fourth highest rating with an average of 5.84, frustration in getting the work done has fifth highest rating with an average

of 5.75, and poor knowledge in e-banking has lower

rating with an average of 5.35.

Obstacles In Maintaining Healthy Worklife:

Category	Number of respondents	Percentage
Long working hours	32	30%
Inflexible work arrangements	21	21%
Poor time management	22	22%
Lack of support from management	10	10%
Other	17	17%
Total	102	100%

The table shows obstacles faced by respondents in maintaining a healthy work life. 31% of the respondents face long working hours as an obstacle, 22% of the respondents face poor time management as an obstacle, 21% of the respondents

face inflexible work arrangements as an obstacle, 17% of the respondents face other as an obstacle, 10% of the respondents face lack of support from management as an obstacle.

Strategies Used To Manage Stress:

Category	Highly effective	Effective	No effect	Average	SD
Social media	48	41	13	2.34	0.69
Listening to songs, Watching youtube	19	51	32	1.87	0.69
Time spent with family	45	40	17	2.27	0.72
Time management techniques	38	49	15	2.22	0.68
Seeking support from colleagues	39	45	18	2.21	0.71
Meditation	32	47	23	2.08	0.72

The table shows strategies used to manage stress in work life balance. Majority of the respondents use social media with an average of 2.34 as a measure, second highest is Time spent with family with an average of 2.27, third highest is time management techniques with an average of

2.22, fourth highest is the seeking support from colleagues with an average of 2.21, fifth highest is the meditation with an average of 2.08 and lowest is watching YouTube and listening to songs with an average of 1.87.

Aspect Of Work Life Balance Need The Most Improvement:

Category	Average	SD	Rank
Workload distribution	3.53	1.27	1
Flexibility in work hours	3.36	1.22	2
Stress management programs	3.33	1.23	3
Supportive organizational culture	3.26	1.17	5
Family support	3.31	1.27	4

The table shows the aspect of work life balance which needs the most improvement. Majority responded that workload distribution should be improved with an average of 3.53, second highest respondent was flexibility in work hours with an average of 3.36, the third highest is stress

management program with an average of 3.33, some respondent has responded that there are family support that need to be improved with an average of 3.31, and the lowest response was supportive organizational culture with an average of 3.26.

Motivating Factors On Work Life Balance:

Category	1	2	3	4	5	Average	SD	Rank
Recognition and appreciation for your work	28	21	21	8	24	3.21	1.51	1
Opportunities for career advancement and professional growth	18	30	20	15	19	3.13	1.37	3
Feeling valued and respected by colleagues and supervisors	21	23	26	10	22	3.11	1.41	4
Autonomy and flexibility in your work life	21	28	21	13	19	3.19	1.39	2
Competitive salary and benefit package	20	20	29	9	24	3.02	1.42	5

The table shows the motivating factors in respondent life. Majority of respondents have a great impact of recognition and appreciation of the work with an average of 3.21, Autonomy and flexibility in the work life is the second highest with an average of 3.19, Opportunities for career advancement and professional growth is the third highest with an average of 3.13, Feeling valued and respected by colleagues and supervisors is the fourth

highest with an average of 3.11 and the lowest is Competitive salary and benefit package with an average of 3.02.

Hypothesis 1

H₀: Job position and workload satisfaction is independent

H₁: Job position and workload satisfaction is dependent

Relationship Between Job Position And Workload Satisfaction – Chi Square Test

Job position	Highly satisfied	Satisfied	Neutral	Dissatisfied	Highly dissatisfied
Entry level	2	1	13	17	1
Managerial level	1	1	1	4	3
Mid level	1	1	6	14	1
Others	1	1	9	9	6
Senior level	1	1	3	3	1

The chi-square statistic is 16.1572. The p-value is .442047. The result is not significant at $p < .05$. So here we proved that Job position and workload satisfaction in making work life balance is independent.

Suggestions:

- The working hour of the respondents are not properly coordinated, extra working hours leads to inefficiency in the work, so arrange a better working system which is equal for all employees on same level of job.
- Major problems are faced by married female employees; so as to reduce their stress level family should take initiative to make them feel comfortable in the home.
- The organization should make sure that the employees participate in the organizational programs. This will bring motivation to them to work efficiently.
- Top level management should give achievable target to the employees.
- The major challenge faced by the employees are heavy workload, so this will affect the efficiency and adversely affect their personal life too, apart from the top management family

should take extra efforts to make them feel comfortable in their home.

- The bank should include more employee acknowledgement program which will motivate them to perform better.
- There should be some time allocated to employees for stress relief on a daily basis.
- Benchmarking is an effective technique to motivate employees.

Conclusion:

The Bank of Baroda study on work-life balance in the Thrissur area highlights the need for more flexible work arrangements and strong support networks to enable staff members to better handle stress at work. Even with current safeguards in place, workers particularly those in customer-facing positions continue to endure high levels of stress. The technological change also affects the employees. One of the major challenge is that the target given to employees. Increasing the number of flexible work arrangements, improving health initiatives, and routinely gauging employee happiness are among the recommendations. Best practices can be adopted in possible areas that are identified by benchmarking against industry standards. By putting these ideas into practice, we

can increase employee satisfaction, and enhance your company's reputation. Maintaining success over time and the welfare of employees depend on a constant commitment to these improvements. Apart from the challenges, the Bank of Baroda employees are satisfied with their work life.

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Eco-criticism and Environmental Justice in Rob Nixon's "Slow Violence and the Environmentalism of the Poor"

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Abstract:

Rob Nixon's *Slow Violence and the Environmentalism of the Poor* is a very significant work in ecological civilizations, which addresses the frequently uncertain and the ongoing nature of ecological degradation and its unlike effect occurring on the sidelined societies. This paper discovers the interchange of eco-criticism and environmental justice in Nixon's work, inspecting how he makes it easier to understand the universal neglect of slow-onset environmental problems and their consequences for the poor. With the help of Nixon's arguments in the frameworks of eco-criticism and environmental justice, this paper highlights the seriousness of admitting and addressing the various forms of unkindness within both academic discourse and policy-making.

Keywords: Eco-criticism, Environmental Justice, Eco-critical Perspectives, Slow violence etc.

Introduction:

Rob Nixon's *Slow Violence and the Environmentalism of the Poor* is a serious standpoint on ecological degradation which is compared abruptly with outdated and more immediate forms of ecological apprehension. The environmental damage that occurs slowly, often over decades or centuries and therefore which are less noticeable and less likely to incite instant action is referred in the concepts of "Slow Violence" by Nixon. The nature of slow violence, the role of eco-criticism in revealing environmental injustice, and the inferences for policy and activism are the focused areas of this research paper. It tries to know whether Nixon's work is intersected with Eco-criticism and environmental justice or not.

Theorizing Slow Violence: "A violence that is neither enormous nor sudden but instead incremental and indefinable, its dreadful influence playing out across a range of sequential measures" is defined as slow violence by Nixon. Conventional understanding of violence as something instant and obvious is challenged by this concept. A variety of ecological concerns that include climate change, deforestation, and industrial pollution, which excessively affect poorer and sidelined people is incorporated by slow violence.

Temporal and Spatial Dynamics: Slow violence functions over long periods and its origin and impacts are difficult to locate. Efforts to muster instant reactions or make communal violence are obscured by this characteristic. The effect of slow violence endures, strangely impacting sidelined communities, often in the Global South. To alleviate

or acclimatize to environmental changes these groups have fewer resources.

Eco-criticism and Environmental Justice:

A field of study which scrutinizes the correlation between literature, culture, and the environment is called as Eco criticism. It seeks on how environmental problems are embodied and replied by cultural objects. Nixon's intense use Eco-critical theory in his work helps to brighten the often unnoticed facets of ecological degradation

Eco-critical Perspectives: Nixon's work highpoints how narratives of slow violence are repeatedly disregarded or understated in mainstream discourse. His investigation can be viewed through an eco-critical lens that highlights the illustration of ecological degradation in literature and media.

Environmental Justice: Nixon's investigation of slow violence is seen aligned with background of environmental justice that emphasizes how environmental problems excessively affect sidelined communities and how their struggles for justice are frequently overlooked. The concept of environmental justice centers on the reasonable supply of environmental profits and problems.

Case Studies and Examples:

Nixon offers numerous case studies in his work, including the impact of ecological degradation on communities in the Niger Delta, the Indian subcontinent, and other regions troubled by slow violence.

The Niger Delta: Nixon deliberates the environmental destruction caused by oil extraction in the Niger Delta. The native people of that region suffer from contamination and land degradation.

The work of Nixon shows closed encounters which

are very significant in pursuing justice.

India's Bhopal Disaster:

The Bhopal gas tragedy is one more example of slow violence. The lasting effects of the Bhopal disaster continue to influence the health and environment of affected people.

Implications for Policy and Activism:

Slow violence can be understood in a better way through the lens of eco-criticism and environmental justice that has significant implications for policy and activism. To address slow violence, it requires a change in policy approaches to line up long-term environmental health and to incorporate the needs and voices of marginalized communities.

Activism and Advocacy: Activists and advocates can use Nixon's agenda to build awareness and support for environmental justice issues, focusing on the often unseen effects of slow violence.

Conclusion:

Rob Nixon's *Slow Violence and the Environmentalism of the Poor* offer a vital viewpoint on the steady and often unobserved nature of environmental damage and its uneven effect on the poor. By assimilating eco-critical analysis with the principles of environmental justice, Nixon's work challenges us to reconsider our perception of violence and environmental degradation. Addressing slow violence requires a rigorous effort to identify its influences, to support affected people, and to campaign for equitable environmental policies.

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Critical Analysis of Symbols in the Novel ‘Silas Marner’ by George Eliot

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Abstract:

The symbols in ‘Silas Marner’ play a crucial role in shaping the characters' journeys and transformations. Through a close reading of the text and an exploration of critical interpretations, this study aims to uncover how these symbols contribute to the themes of social isolation, redemption and transformation in the novel. By delving into the significance of these symbols, the complexities of characters and relationships in ‘Silas Marner’ while unravelling the broader social and moral themes embedded in the text. Through this critical analysis of symbols, readers can gain a deeper understanding of Eliot's craft and the rich tapestry of meanings woven into the novel.

Keywords: Symbolism, social isolation, redemption and transformation

Introduction:

By ‘symbolism’ we can refer to two things: symbolism as a movement that originated in France in the late 19th century or symbolism as a literary device. The symbolist movement was first initiated in the nineteenth century by some rebellious French poets like Paul Verlaine, Stephan Mallarme. Not long after, the movement extended to Belgium, Russia, and inevitably to other countries too. Symbolism was against the descriptive precision and objectivity of Realism and the scientific determinism of Naturalism. This movement came to be as an opposition to the new materialist and industrialized society. James, Faulkner, Wolf, Joyce, Proust, Conrad and other modernist writers have in their writings influences of the Symbolists. Arthur Symons' work ‘The Symbolist Movement in Literature’ (1899) characterized the movement as a reaction against Realism and Naturalism and as an attempt to ‘spiritualize literature’. Symbolism says that the Absolute Truth can be described only in the form of symbols and metaphors. Symbolism helps readers visualize complex concepts and follow central themes, affords writers the chance to relate big ideas in an efficient, artful way. It adds emotional weight to the text, helps to conceal a theme that may be too controversial to approach openly. Symbols have been used in literature since ancient Greek and Roman poetry. English writers like Spenser, Shakespeare, Milton, and John Donne used them in the 16th and 17th centuries. This tradition continues today and will likely continue in the future. Another reason a writer might use symbolism is to create multiple layers of meaning in their story. This meaning is not just literal, but also more profound. It connects readers to the story on

an emotional level, beyond just telling the tale. Readers must uncover these hidden symbolic connections and implications, as it gives them insight into the author's mind and intentions in creating them. In essence, symbolism allows an author to introduce an idea to their audience in a unique, poetic way that doesn't immediately reveal the concept. It draws readers into a world filled with beautiful implications and intricate connections, encouraging them to engage more deeply with the text and discover hidden meanings within.

George Eliot (1819-1880) communicates the meaning of her novel partially by employing symbolism in the description of the physical world in which her characters live. Eliot was aware of the unconscious use that an artist makes of a symbol in prose fiction. In light of that cognizance, instances of symbolism in the works of Eliot herself seem more deliberate and self-conscious. She is the most philosophical among Victorian novelist. Mary Ann Evans is her real name. She took the pseudo name George Eliot. It was her effort to be taken seriously in this male dominated literary world. According to her novel is not just for the entertainment, she refuses to accept the idea that the novels should always have happy ending. ‘Silas Marner’ by George Eliot is a classic novel. George Eliot was known for creating complex, realistic characters and exploring moral and social issues. Silas Marner, a weaver, lives a solitary life in the village of Raveloe. Betrayed by his religious community in Lantern Yard, he becomes obsessed with hoarding gold coins. His life changes when he adopts an abandoned child Eppie who brings joy and purpose back into his existence. Symbolism played a big role in her novels, adding depth to her stories and

themes. One of the key literary devices used in the novel is symbolism, where objects, characters, and events are imbued with deeper meaning beyond their literal interpretation.

Critical Analysis of Symbolic Significance in the Novel 'Silas Marner'

One of the central symbols in 'Silas Marner' is the gold that the protagonist, Silas Marner, hoards and cherishes. Gold represents wealth and material possessions, which Silas initially values above all else. However, as the story progresses, we see how Silas's obsession with gold isolates him from the community and leads to his spiritual and emotional impoverishment. The loss of his gold ultimately serves as a catalyst for Silas's transformation and redemption, as he learns to prioritize human connections and love over material wealth. The symbolism of gold and weaving also adds layers to the theme of realism in the novel. Silas's obsession with hoarding gold reflects the materialistic values of the society around him, while his skill as a weaver represents his ability to create beauty out of simple threads. Through these symbols, Eliot conveys the struggle between the material and the spiritual aspects of life, highlighting the conflicts within individuals and society as a whole.

The character of Eppie also serves as a powerful symbol in the novel. Eppie represents innocence, purity, and hope. Her presence in Silas's life brings light and warmth to his previously dark and lonely existence. Eppie's adoption by Silas symbolizes the transformative power of love and the possibility of redemption. Through Eppie, Silas learns to let go of his past and embrace a new future filled with love and happiness. Eppie's golden hair is indeed a significant symbol of redemption for both Silas Marner and for Eppie herself. For Silas Marner, Eppie's golden hair represents a second chance at happiness and redemption. Before Eppie came into his life, Silas was a bitter and isolated man, consumed by his past traumas and the loss of his faith in humanity. However, when he adopts Eppie and becomes her guardian, her presence in his life gradually helps him to rediscover his humanity and capacity for love. Eppie's golden hair serves as a physical reminder of this new beginning and the joy and love she brings into Silas' life. For Eppie, her golden hair can be seen as a symbol of her innocence, purity, and the love and happiness she brings to those around her. The color gold, traditionally associated with wealth and richness, is now linked to the emotional wealth and joy that Eppie brings into Silas Marner's life. Her presence symbolizes purity, innocence, and the renewal of Silas's shattered faith in humanity. Through Eppie, Silas finds redemption not in material possessions but in the invaluable bond of familial love.

The Loss of Gold and the Discovery of Eppie

One of the pivotal moments in the novel is when Silas Marner discovers that his accumulated gold coins have been stolen. This event, which represents a loss of material wealth, leads to Silas experiencing a profound spiritual awakening. Instead of being devastated by the theft, Silas realizes that his true wealth lies not in gold but in the form of the golden-haired child, Eppie, who comes into his life. By losing his gold and gaining Eppie, Silas undergoes a redemptive transformation from a lonely and isolated miser to a loving and devoted father figure.

The Transformation of Gold from Greed to Generosity

At the beginning of the novel, gold is portrayed as a symbol of greed, isolation, and spiritual emptiness in Silas Marner's life. His obsessive hoarding of gold coins reflects his detachment from the community and his cynical view of human relationships. However, as Silas's relationship with Eppie deepens and he becomes more integrated into the village of Raveloe, the symbolism of gold evolves from a symbol of greed to a symbol of generosity and selflessness. Silas's willingness to share his gold with others, especially with Eppie and her husband Aaron, demonstrates his newfound capacity for love, compassion, and redemption.

The Golden Light of Redemption

Throughout the novel, there are references to golden light and warmth associated with Eppie's presence in Silas Marner's life. This golden light symbolizes the redemptive power of love, forgiveness, and familial bonds that illuminate Silas's formerly dark and desolate existence. By basking in the golden glow of Eppie's love and the communal support of Raveloe, Silas experiences a spiritual rebirth and a renewed sense of purpose and belonging.

Another important symbol in the novel is the loom that Silas uses to weave his linen. The loom represents Silas's solitary existence and his desire to create order and meaning in his life. Through his meticulous weaving, Silas finds solace and purpose, but also remains disconnected from the outside world. The arrival of Eppie, a young girl who becomes Silas's adopted daughter, disrupts the rhythm of his solitary life and brings new meaning and joy into his existence. The loom thus symbolizes both Silas's isolation and his capacity for growth and change. Through the powerful imagery of the loom, George Eliot conveys the complexities of human experience and the enduring resilience of the human spirit in the face of adversity and loss. The loom symbolizes Silas's emotional and psychological state, highlighting his isolation, trauma, and emotional detachment following the tragedies that have befallen him.

"Even his farm work said that it was the first time the beltible in him had plotted and that he would go on weaving even when he was beginning to feel the healthfulness that the fresh air and the good horse-mounted."

Above lines showcase how Silas's interactions with his loom reflect his inner turmoil, his journey towards healing, his integration into the community, and his rediscovery of purpose. The loom, as a potent symbol in the narrative, not only represents Silas's tragic past but also his resilience and capacity for transformation as he navigates his way through grief and isolation.

Silas's devotion to his loom mirrors his profound sense of isolation and alienation from the community of Raveloe. After being unjustly accused of theft and betrayed by his closest friend, Silas retreats from society and immerses himself in his work at the loom. The repetitive, mechanical nature of weaving becomes a solitary and solitary pursuit for Silas, symbolizing his self-imposed exile from human connection and emotional intimacy. The tragedy of Silas's isolation is embodied in the symbol of the loom, which becomes a barrier between him and the outside world, reinforcing his emotional walls and reinforcing his status as a social outsider. Silas's intense focus on the loom reflects his attempt to cope with the traumatic events of his past, particularly the loss of his faith in humanity and the betrayal of his trust.

"The universe lay helpless before some unseen hand in human clothes, but here are men another. Our journeying will be our journeying. I dragged the man forward to the door fabric that denied heaven, people who are my creatures and who lurk in the bottomless abyss, no longer amazed but only bewildered because their cry was how they would be saved along with God to undergo God's will, and not Silas's will."

The rhythmic weaving at the loom serves as a coping mechanism for Silas, allowing him to suppress his memories of the past and numb his emotional pain through repetitive labour. The tragedy of Silas's past traumas is symbolically manifested in the monotonous hum of the loom, which echoes the monotony and emptiness of his existence. The loom becomes a symbol of Silas's unresolved grief and unhealed wounds, highlighting the lasting impact of tragedy on his psyche and sense of self. The sterile, mechanical process of weaving provides Silas with a sense of control and order in the midst of chaos and uncertainty, offering him a refuge from the unpredictable and tumultuous nature of human relationships. The tragedy of Silas's emotional numbness is symbolized by the cold, lifeless nature of the loom, which reflects his suppressed emotions and suppressed desires for connection and intimacy. The loom becomes a symbol of Silas's psychological defences and

emotional barriers, illustrating the high cost of his emotional withdrawal and disconnection from his own humanity.

As the story unfolds and Silas's relationship with Eppie deepens, the symbolism of the loom shifts to reflect his journey of redemption and transformation. The loom, once a symbol of tragedy and despair, now becomes a symbol of hope and renewal as Silas opens his heart to love and connection with Eppie. The rhythmic weaving at the loom takes on new meaning as Silas integrates his past experiences with his present joys, weaving a new narrative of resilience, growth, and healing. The tragedy of Silas's past is gradually overshadowed by the redemptive power of love and human connection, symbolized by the transformation of the loom into a vessel of creativity and emotional fulfilment.

Conclusion:

The symbolism in 'Silas Marner' serves as a powerful and multi-dimensional metaphor for redemption, spiritual renewal and the transformative impact of love and human connection on an individual's life. George Eliot creates a rich and nuanced narrative that explores the complexities of human nature and the transformative power of love and relationships. By analysing these symbols, we gain a deeper understanding of the novel and its profound insights into the human experience. Through the transformative power of symbols such as gold and looms 'Silas Marner' emerges as a timeless tale of redemption and the enduring human spirit. George Eliot's skilful use of symbolism elevates the novel to a timeless classic that continues to resonate with readers today.

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Democracy in India & Its Different Challenges: An Analytical Study

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Abstract:

The preamble of the Indian Constitution states that India is a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC. Democracy is one of the pillars of Indian Nation. We are blessed that we live in a democratic country wherein we have the right to be considered as equal citizens despite our class, caste, religious, gender & regional affiliations. Within the South-Asian region only India could establish its democracy on a solid base. But recent trends indicate towards a shift from democracy to autocracy. Today's democracy in India is continuously countering with several challenges. As citizens of India, if we are unable to address those challenges then we will lose our democracy forever.

Keywords: Democracy, Autocrat, Deliberation, Criminalization, Corruption

Introduction:

Human Beings are rational creature. It is very difficult to satisfy our inquisitive mind. We have the tendency to look beyond of what we have in hand in order to find out better option for us. In this attempt we have tried to formulate new political arrangements wherein our different interests can be given proper representations. In this attempt we have devised Democracy- a political arrangement wherein ultimate sovereignty rests with the people. It is different from the democratic government as given by Plato & Aristotle in the sense that modern democracy has a wider social base. Today's democracy does not belief in exclusion rather it upholds the principle of inclusive participation. The emergence of independent India as a Democratic Republic was to some extent a bold experiment in the history of India's political arrangements. It was a very challenging task to endow all the Indians of a certain age with the right to vote to have their own government. Democracy has not only enabled people to think for themselves and their fellow beings but it has also given weightage to the principle of Political Equality as it has accorded citizens of sovereign Indian Nation to cast their vote without any discriminations on the grounds of Sex, Place, Religion etc. it is an acceptable norm in democracy that one party or coalition will form government while other will discharge its role as a effective opposition. In a democracy, it is common that views and opinions of opposition must be given proper attention. But if in a democracy, the ruling govt. or coalition tends to stifle the voices of oppositions by hook or crook then it can be said that democracy is under serious crisis. Zero tolerance, use of violence, rigging, booth capture, threat to

intellectuals who possess dissenting views all these can transform democracy into autocracy. If we look into the acts and deeds of present government at the Centre, the picture which has appeared before us regarding democratic governance will force us to think it in a new way.

Research Objective:

- to get an overview about the democratic multicultural Character of Independent India
- to know about different challenges of Indian Democracy in 21st century.

Research Question:

- Why democracy has been chosen as a preferable arrangement in India?
- What are the challenges with which Today's Democracy in India is countering with?

Research Design:

This paper has been written down following the path of qualitative research design. Documentary study has been followed.

Challenges to the Democracy in India: Some Issues:

Why Indian democracy is under threat? if we try to find out the answer to this question several challenges can be put forwarded. Let us discuss about some of the issues.

Democracy in India is becoming less deliberative day by day. Politicization of major institutions -which preserve the space for constructive deliberation is posing a negative impact on the democratic practice. Dissenting views are being stifled in a way to create an environment to project that the government is representing the interests of all sections. According to Pratap Bhanu Mehta '*ethnification of the party system-whereby voters are most likely to vote according to their*

caste or some other ethnic affiliation and political parties find it very difficult to transcend their respective social bases- may be in part a product of the fact that elections are rarely a contest of ideas' (Mehta, 2003) laws are passed in the parliament without any discussion. '*Legislation without deliberation*' (Keane, 2021) has cut short the scope of opposition parties to go for more and more deliberation over a bill. The ruling government has used the Money Bills to ignore the demands of opposition.

The social base upon which Indian democracy has stood for a long time is on continuous deterioration. The social base of Indian democracy is getting narrower day by day. The Inclusive democracy is losing its ground while exclusionary politics is given more priority. What does it mean politics of exclusion? it is very harmful for a country like India. How many of us can remember the custodial death of Catholic priest Stan Swamy. He was a human rights activist as well as a votary of social justice who throughout his life has worked for the rights of indigenous peoples. (Ganguly, India's Endangered Democracy, 2021) But he has been arrested under the Unlawful Activities (Prevention) Act which is considered as a draconian law in the legal systems of India. But no evidence was there to arrest him. It was a planned activity of the central govt. He has struggled in favour of rights of indigenous people who constitute a sizable section of Indian democracy. India is a country which has maintained its diversity in a way that any attempt to transform it into a unitary state will destroy its existence. The multi-cultural character of India has its own distinctiveness. It is the belief that "*diverse cultures, races, and ethnicities, especially those of minority groups, should be recognized and respected within a dominant political culture*" (Mehmood, 2023) Attempts are being taken in order to convert India into a country where heterogeneity will have no place. India is a heterogenous country where we can find the coexistence of several cultures, religions groups. Any attempt to destroy its heterogeneity must bring a threat to its existence. Today exclusionary politics has been given much preference over the inclusive politics. As a result, we can see how several groups though they have voting rights but have been prevented in many ways to put their voting rights in an effective way to reflect their preferences or choices. This exclusionary politics has not only created discrimination among the groups but it has left many groups behind in this way democracy in India is losing its weighted We are moving towards a totalitarian government where those groups will be grieving preferences who will be considered helpful in the consideration of the ruling government and those groups who are or who will resist the

government's totalitarian activities that groups must be subdued at any cost

Today, democracy in India is getting another threat from the challenge of criminalization of politics. If we read newspapers or watch tv, news that come before us regarding the use of muscle power in the elections. Uninterrupted admittance of criminals into the arena of politics is a serious concern which has raised questions about the immaculacy of democratic process in India. What does election mean? Election means a free friendly environment wherein every people beyond a certain age, has the rights to cast or to take active part in the process of governance of the country. But in these days, elections have been turned into a machinery or a platform through which muscle power can be applied in order to determine the outcomes of elections. Who will use whose muscle power? That is the political leaders who deploy these criminals during elections in order to threat or intimidate voters whom they consider as vote banks of opposition. Broadly speaking, this cannot be considered as a real democracy. According to Diksha Puri '*the criminalisation of politics, with candidates charged with heinous offences holding positions of power, has cast a shadow on governance, accountability, and the people's trust*' (<https://adrindia.org/content/criminalisation-politics-grave-threat-democracy>, 2023) Criminals cannot be a part of democracy but criminals have been made a part of democracy in these days. Each and every party have used these criminals in their own way. What are their roles? During the entire election process, these criminals have been given free hand in order to bring the outcome of the election in the party's favour. In the existing political scenario, selection of a candidate from a party is being done on the basis of his/her ability to win. Priority is given on how much votes a candidate can muster without any consideration regarding the employment of illegal methods. This departure from the principle of ethical and moral means to achieve collective goods has opened before the criminals opportunities to involve themselves into the game of power politics. Criminals enter the politics to enjoy the patronage of political parties. Thus, they try to bring other criminals in the politics. (Kaur, 2020) Naturally, they cast a negative impact on the democratic environment. This in turn may make the government an arrangement for the criminals to expand their influences. Naturally, criminalization of politics is a serious issue which needs to be resolved as early as possible. Otherwise, Democratic government will lose its credibility.

Another challenge, with which Today's democracy is countering, is the issue of Corruption. We have seen the hunger strike of Anna Hazare in a Gandhian way to bring changes in the minds and hearts of the then existing government to pass the

Anti-corruption Bill which is better known as Jan Lokpal Bill. (Ganguly, 2012) Corrupt government is very harmful for any healthy Democratic government. But why this is so? Corruption does not only mean for illegal financial transactions but it also reflects the unequal power structure which exist in a society. Corruption does not only reflect money power but it also reflects the position of Who are involved in this process of corruption. In India, democracy and corruption have been turned into a life time companion of each other. We can see this during the entire election process when character of democracy has been tarnished by the use of corrupt practises. From the recent elections it is visible how corruption has been made a normal practice to win the election. Democracy talks about transparency, people's-oriented government and decentralised governance. But in reality, what is visible, is that democracy has been sacrificed to corruption. Generally, it is prevalent custom that a candidate should contest in election for discharging her/his duties and responsibilities towards the countrymen or voters elect their representatives with the intention that they will serve the people's interest, not their own. But in the context of recent elections, the picture is completely opposite. The elected member after his/her election in most of the cases does not take bother about his/her duty and responsibility towards the electorates and has involved in wealth making by hook or crook. They have the sole intention to gather as much money and wealth as possible during their tenure. This greediness of today's representatives has deteriorated the quality of democracy in India. Most of the representatives in India do not come to power because of people's service. But they contest election in order to accrue power and money as for them Politics is now that space for making business. Today's politics a devoid of its value, morals, ethics corruptions are rampant which has turned democracy into an abstract concept. Milan Vaishnav, a south Asia associate at the Carnegie Endowment for international Peace has told that with the passage of time corruption has expanded itself more quantitatively & qualitatively. (<https://www.cfr.org/backgrounder/governance-india-corruption>, 2014) As India has marched towards economic growth, more and more possibilities have been created for rent seeking.

Conclusion:

If Democracy fails in India to survive it must pose a negative consequence to the rest of the world. Within the South Asian Region only India could establish her democracy on a solid base. After the attainment of independence from more than two centuries of colonial yoke, during 1947 to 1952 through its first general election on the basis of universal adult suffrage. Myriad divisions along the lines of caste, class, gender, language, religion &

region have left no way other than to go for a democratic arrangement. Though, we have witnessed emergency rule for 21 months but it could not destabilize India's deep-rooted veneration for democracy which has already completed its 7 decades journey in order to act as a thread to keep the diverse and conflict-ridden society united. (Shani, 2022) We should take every step to protect this democratic fervour in this country. Throughout the globe the tendency is towards the global rise of autocracy. People are losing hope in democracy. In order to come out of existing socio-economic and political crisis they are considering autocracy as more suitable than the democratic arrangement. This has put into the hands of autocrats the weapon to exploit or manipulate the sentiments of citizens in that direction that return to democracy for them is likely to go back to the state of anarchy. People will sacrifice their real wills for the sake of actual wills. Short term material benefits motivated by vested self-interests have provided autocrats that opportunity to keep themselves in power. But the real will better known as collective will which can lead them towards their collective endeavours to protect and preserve the democratic arrangements will be erased from their minds by these autocrats. We should not take lend our support towards an autocratic government. 150 crores of population of Indian can be tied together only through the maintenance of democracy. Through we are facing challenges from Hindu chauvinism as well as Islamic fundamentalism. These two narrow ideologies are constantly trying to diminish the social bases of democracy from within. If we submit to their demands then we will go back to the dark age from where it is very difficult to come back. Only election after certain years is not enough but what is more important is to inculcate the civic virtues among the citizens of India. Freedom of press along with freedom of expression have to be ensured at any cost otherwise peoples' unheard grievances can take the form of radical movement which we have just watched in the Bangladesh. If democratic ruler fails to provide adequate representations to different views, fails to generate employment opportunities for the youths, fails to provide political representations to all sections of the society then political opportunists along with fundamentalists will grab this crisis and if they capture the political power then they will bury the democracy. We cannot except this kind of events to be taken place in India. Hence, we must have to come forward to protect long achieved democracy so that we can live our lives as an equal citizen despite our different caste, class, ethnic, religious & regional identities.

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An Empirical Analysis of Digital Payment Culture in Bangalore

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Abstract:

The surge in internet usage, smart-phone proliferation, and the adoption of various digital financial tools like mobile banking, internet banking, and debit/credit cards has significantly propelled India towards a faceless, paperless, and cashless economy. This transition not only indicates a transformation but also anticipates fostering financial inclusion and fostering an innovative digital payment ethos in the Indian economy. However, the obstacle hindering India's cashless economy lies in the reluctance of online payment systems in small towns, rural areas, and untapped urban markets. The traditional preference for cash transactions among Indians, coupled with a significant majority favoring cash despite having access to electronic payment methods, poses a substantial challenge. Quantitative data are analysed using statistical tools such as Chi - Square to analyse the culture of digital payment in Bangalore. This study delves into exploring the adoption patterns and disparities in the utilization of electronic payment systems among different categories of small-scale retailers in small towns.

Keywords: Cashless Economy, Financial Inclusion, Digital Payment Culture

Introduction:

A cashless economy epitomizes an economic landscape where physical cash circulation is virtually absent, replaced by electronic transactional channels. The growing preference for cashless transactions is attributed to their manifold benefits, allowing individuals to effortlessly manage their financial affairs via laptops or smart-phones, including bill payments, shopping, and transaction scheduling. This shift not only streamlines daily routines but also legitimizes and verifies transactions. Electronic trade not only fosters transparent transactions but also stands as a deterrent against corruption, hoarding cash as black money, and tax evasion. As a response, numerous economies worldwide have successfully embraced cashless electronic payment methods, spurred by a globally expanding economic milieu.

The Reserve Bank of India and the Government of India are diligently striving to diminish cash dependency by promoting digital payment mechanisms. The Digital India Programme endeavors to metamorphose the Indian economy into a cashless ecosystem. Strengthening infrastructural

frameworks further augments the proliferation of digital payment culture in India. The burgeoning utilization of internet services, smart-phones, apps, mobile and internet banking, as well as debit/credit cards and electronic exchange platforms, has been instrumental in steering the Indian economy towards a faceless, paperless, and cashless trajectory.

The significant stride of demonetization propelled India toward a cashless economy,

representing a radical reform aimed at this transformative shift. The Pradhan Mantri Jan Dhan Yojana embodies an integrated strategy to ensure comprehensive financial inclusion, extending banking services to every household in the nation. The Direct Benefit Transfer Scheme has facilitated the penetration of digital banking into rural India by digitally disbursing benefits and subsidies from various social welfare schemes, such as LPG subsidies, old-age pensions, scholarships, and MGNREGA payments.

The Unified Payment Interface stands as a testament to simplifying digital transactions, consolidating numerous banking features into a single mobile application. Additionally, the Goods & Services Tax implementation has encouraged businesses to opt for cashless transactions. The establishment of Financial Literacy Centers by the Reserve Bank of India serves as a cornerstone in disseminating awareness about banking products and benefits through financial education programs.

Concurrently, the advent of new-age small financial banks and Payment banks, alongside the promotion of e-banking, debit and credit cards, swipe or PoS machines, and digital wallets, is poised to catalyze financial inclusion and cultivate an innovative digital payment ethos within the Indian economy.

Statement Of Problem:

The pervasive use of electronic payment methods has notably diminished the necessity for physical cash handling, consequently mitigating associated risks and costs. However, despite this transition, the Indian economy remains predominantly reliant on the informal sector and

cash-based transactions, with less than 5% of all transactions conducted electronically. This inertia towards a cashless economy stems from a significant impediment: the underutilization of online payment systems in small towns, rural areas, and untapped urban markets. This predilection for cash transactions, deeply entrenched within Indian tradition, impedes the widespread adoption of

Avery, R.B., et al. (1986) discovered a strong positive correlation between various factors like income, education, wealth, urban living, and middle age, and the utilization of credit cards.

Klee, Elizabeth (2005) found that time factors significantly influence preferences in payment systems, with sensitivity to these factors contingent upon income, age, and demographic characteristics.

Al-Laham (2009) emphasized considerable interest in the development of electronic money schemes and projected their potential significance in future currency systems.

Sanghita Roy, Dr. Indrajit Sinha (2014) highlighted India's E-payment system growth, stressing the importance of innovation, incentives, enhanced customer convenience, and a robust legal framework to boost usage.

Slozko & Pello (2015) acknowledged E-payment systems as pivotal mechanisms for secure, convenient transactions, also highlighting their role in technological advancement in the global economy.

Rakesh H M & Ramya T J (2014), in their study on internet banking adoption factors, stressed the significance of perceived reliability, ease of use, and usefulness of these services, recommending increased awareness and emphasis on benefits to attract more consumers.

Kartikeya Bolar (2014) emphasized the evaluation of technology interfaces based on various quality dimensions to enhance strategic decision-making and competitiveness in transaction-based environments.

Nitsure (2014) outlined challenges faced by developing countries in adopting E-banking initiatives, including low dissemination of Information Technology, security concerns, regulatory issues, and the emergence of a digital divide.

Mahesh. U. Daru (2016), in a study on 'Cashless India,' stressed the necessity for financial inclusion, availability of cashless options at grassroots levels, and ensuring the safety and security of such transactions.

Vaibhav Shahaji Patil and Jyoti Mishra (2017) highlighted the lack of rural awareness in utilizing digital payment facilities during India's transition to

electronic payment methods, even among those who possess the capability to engage in electronic transactions. In light of these challenges, this study aims to investigate the adoption patterns and disparities in the utilization of electronic payment systems among diverse categories of small-scale retailers situated in small towns.

Review of Literature:

a cashless economy, emphasizing the need for nationwide telecom network availability and incentivizing strategies to discourage cashpayments.

Research Objectives:

The primary objective of this study is to investigate the digital payment culture within the Indian Economy, with the following sub-objectives:

1. Explore the digital payment usage patterns among various categories of shop operators. Investigate the digital payment usage trends among shopkeepers of different age groups.
2. Analyze the digital payment usage patterns based on the educational background of shopkeepers.
3. Interpret the prevailing digital payment usage trends across different types of shops.
4. Examine the digital payment usage patterns in relation to the turnover of shopkeepers.

Hypothesis Of The Study:

H0: There is no significant variance in the usage of digital payments concerning the type of shop operator, age group, education, type of shop, and turnover.

H1: There exists a significant difference in the usage of digital payments concerning the type of shop operator, age group, education, type of shop, and turnover.

Methodology Of The Study:

The study aims to investigate the usage patterns of the digital payment system in India, specifically in Nagasandra, Jalahalli, Dasarahalli, Chikkabanavara, and Nelamangala & Hesaraghatta towns within the Bangalore Rural & Urban Districts of Karnataka. A sample size of 300 respondents was selected using convenience sampling methods. The data collection utilized an interview schedule structured based on both the existing literature and the researcher's experiences.

The survey was conducted during November and October 2023, with a total of 278 respondents providing complete responses, achieving a response rate of 93%. To analyze the data and draw relevant insights aligning with the study's objectives, simple percentage analysis and the Chi-square test were employed.

Data Analysis And Interpretation

Table 1: General Profile of the Respondents

Particulars	Number	Percentage	
A. Shop Operators	Only Men	164	58.99
	Only Women	41	14.74
	Men & Women	73	26.26
B. Age (Years)	Up to 30	69	24.82
	31 – 40	77	27.70
	41 – 50	71	25.54
	Above 50	61	21.94
C. Educational Qualification	Up to 10 th Standard	65	23.38
	Up to 12 th Standard	169	60.79
	Above 12 th Standard	44	15.83
D. Type of Shops	Refreshment Stalls	68	24.46
	Tea Stalls	73	26.26
	Fruit Stalls	62	22.30
	Vegetable Stalls	75	26.98
E. Monthly Turnover (INR)	< 50000	23	8.27
	50000 – 100000	103	37.05
	100001 – 200000	116	41.73
	> 200000	36	12.95
F. Usages Pattern of Digital Payment System	Regularly	56	20.14
	Occasionally	121	43.53
	Rarely	60	21.58
	Never	41	14.75

Source: Primary Survey

Table 1: General Profile of the Respondents

The data obtained on usages pattern of digital payment system has been depicted in Table 1. It is evident from the table that 58.99 percent, 26.26 Percent and 14.74 percent of the shops, respectively, have been found operated by only men, men & women and only women. Around 53 percent shop operators belonged to age group of 31 – 50. An overwhelming proportion of around 61percent were educated up to 12th standard, whereas only about 16 percent of the respondents

had educational qualification above 12th standard. Out of total shops covered in the study, 24.46 percent were refreshment stalls, 26.26 percent were tea stalls, 22.30 percent were fruit stalls and 26.98 percent were vegetable stalls. The monthly turnover of around 79 percent shops covered in the study ranged from INR 50000 to INR 200000. A total of 43.53 percent of the shop keepers had practice of using digital payment system occasionally, whereas only 20.14 percents of the respondents were regular users of digital payment system.

Table 2: Digital Payment Usage Pattern by Type of Shop Operators

Frequency of Usages	Shop Operators				Chi Square	df	P-Value
	Only Men	Only Women	Men & Women	Total			
Frequently	38	6	12	56	30.11	6	12.6
Occasionally	87	11	23	121			
Rarely	21	17	22	60			
Never	18	7	16	41			
Total	164	41	73	278			

Source: Primary Survey and author's own calculations.

Table 2: Digital Payment Usage Pattern by Type of Shop Operators

The digital payment usages pattern of different types of shop operators has been analysed in Table 2 to work out chi square test. The calculated value of χ^2 comes to 30.11. The critical

value of χ^2 at 6 degrees of freedom at 5% level of significance is 12.6. Calculated value is greater than critical value i.e., $30.11 > 12.6$. Hence, H_0 i. e. there is no significant difference between type of shop operator and usage of digital payment system, stands rejected.

Table 3: Digital Payment Usages Pattern by Age Group

Frequency of Usages	Age (Years)					Chi Square	df	P-Value
	Up to 30	31- 40	41- 50	Above 50	Total			
Frequently	18	16	13	9	56	15.323	9	16.9
Occasionally	37	31	23	30	121			
Rarely	7	17	22	14	60			
Never	7	13	13	8	41			
Total	69	77	71	61	278			

Source: Primary Survey and author's own calculations

Table 3: Digital Payment Usages Pattern by Age Group

Table 3 carried out chi square test to analyse differences in digital payment usages pattern by agegroup of shop keepers. The calculated value of χ^2 by age groups of shop operators was obtained as 15.323. The critical value of χ^2 at 9 degrees of The chi square test to examine differences in digital payment usages pattern by

educational qualification of shop keepers has been depicted in Table 4. It is discernible that calculated value of $\chi^2 = 124.6107$. The critical value of χ^2 at 6 degrees of freedom at 5% level of significance is 12.6. The freedom at 5% level of significance is 16.9. Calculated value is lower than critical value i.e., $15.323 < 16.9$. Hence, H_0 i. e. there is no significant difference between age groups of shop keepers and usage of digital payment system, stands accepted.

Table 4: Digital Payment Usages Pattern by Educational Qualification

Frequency of Usages	Educational Qualification				Chi Square	df	P-Value
	Up to 10 th Standard	Up to 12 th Standard	Above 12 th standard	Total			
Frequently	3	36	17	56	124.6107	6	12.6
Occasionally	17	87	17	121			
Rarely	9	45	6	60			
Never	36	1	4	41			
Total	65	169	44	278			

Source: Primary Survey and author's own calculations.

Table 4: Digital Payment Usages Pattern by Educational Qualification

The chi square test to examine differences in digital payment usages pattern by educational qualification of shop keepers has been depicted in Table 4. It is discernible that calculated value of $\chi^2 = 124.6107$. The critical value of χ^2 at 6 degrees of freedom at 5% level of significance is

12.6. The freedom at 5% level of significance is 16.9. Calculated value is lower than critical value i.e., $15.323 < 16.9$. Hence, H_0 i. e. there is no significant difference between age groups of shop keepers and usage of digital payment system, stands accepted. calculated value of chi square is greater than its critical value. Hence, H_0 i. e. there is no significant

Table 5: Digital Payment Usages Pattern by Type of Shops

Frequency of Usages	Type of Shops					Chi Square	df	P-Value
	Refreshment Stall	Tea Stall	Fruits Stall	Vegetables Stall	Total			
Frequently	17	14	11	14	56	41.026	9	16.9
Occasionally	31	34	26	30	121			
Rarely	6	19	23	12	60			
Never	14	6	2	19	41			
Total	68	73	62	75	278			

Source: Primary Survey and author's own calculations.

Table 5: Digital Payment Usages Pattern by Type of Shops

Hence, H_0 i. e. there is no significant difference between type of shops and usage of digital payment value of χ^2 at 9 degrees of freedom at 5% level of significance is 16.9. Calculated value is greater

system, stands rejected (Table 5). The chi square test to examine differences in digital payment usages pattern by turnover revealed calculated value of χ^2 equal to 30.6933. The critical

than critical value i.e., $30.6933 > 16.9$.

Table 6: Digital Payment Usages Pattern by Turnover

Frequency of Usages	Turnover (INR)					Chi Square	df	P-Value
	< 50000	50001 - 100000	100001 - 200000	> 200000	Total			
Frequently	3	14	27	12	56	30.6933	9	16.9
Occasionally	7	46	53	15	121			
Rarely	3	22	28	7	60			
Never	10	21	8	2	41			
Total	23	103	116	36	278			

Source- Primary Data

Table 6: Digital Payment Usages Pattern by Turnover

Hence, H₀ i. e. there is no significant difference between turnover of shops and usage of digital payment system, stands rejected (Table 6).

Conclusion:

The digital payment culture is not only a requirement but also emerging need of the day for transparent economic development. The study examined digital payment culture among different types of small shop keepers of small towns in India. The findings of the study noticed that only 20.14 percents of the respondents were regular users of digital payment system, however, 43.53 percent of the shop keepers had practice of using digital payment system occasionally. The study further unfurled significant difference between type of shop operator, education, type of shop and turnover on usage of digital payment system in India.

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A Pragmatic Study of Oppression in English Selected Novels

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Introduction:

This research was designed to address oppression in English selected novels. It aims to analyze the oppression maxim made by the main characters in an English novel. Therefore, the objectives of the research are to analyze the oppression maxim in the novel and the speech act that classifies the main characters' utterances. The research questions are: (1) what kinds of oppression maxim are used by the main characters in English selected novels? (2) To which illocutionary act is the main characters' utterance in English selected novels delivered? The data are the selected English novels, including the main characters' utterances. The main characters use the speech act of an illocutionary act that indicates oppression towards the utterances of the conversational partner who understands them. The researcher found that (1) the oppression of the maxim used by Jamaica Kincaid's "Lucy: A Novel" is a form of deception and the maxim of relation, and (2) the speech act of the main characters' utterances in Jamaica Kincaid's "Lucy: A Novel" belongs to the constatives.

Background and Rationale:

One of the essentials of living is that every human being has the right to live a good life with no fear of being oppressed by others. Indeed, every individual aims at aspiring to achieve the highest position and at having better lives. However, not all individuals can obtain this. Oppression is one of the worldwide problems that an individual confronts in the society in which they live. Many factors may contribute to individuals being oppressed. One of the impacts of living in an oppressive environment has been recorded in English selected novels. With various reasons such as political, social, historical, and economic, oppression was highlighted as the most popular issue discussed by many oppressed novelists in English selected novels of the twentieth century. This issue is an important issue to be explored in this pragmatic study. Some of the reasons that underlie the selection of this topic include: (1) many people have the right to speak without fear and (2) polysemy, humility, the object of interest in the literary text. This has led researchers to more widely pursue pragmatics of oppression. The research based on pragmatic oppression in literature has not only been widely examined by the researchers of literature directly but also researchers of applied linguistics. For those reasons, the writer attempts to narrow down and focus on a study that can be written as a dissertation. The criteria covered in the selection of novels in this study is the need to be guided by all of which deals with oppression. Those three books are characterized by the features of oppression. Geoffrey Chaucer (1387) raises a "frame story" that

sits knee-deep in a treasure trove of verbal and social oppression. Most short stories of the characters in the novel are filled with social oppression. The oppressed characters in each group opt either to keep their mouths shut about it or express their frustration through symbolic gestures. By doing such research, the writer is able to formulate and answer problems through the pragmatic oppression in English selected novels.

Research Objectives and Questions:

The objective of this study was to identify and analyze the various forms of oppression depicted in selected English novels and give readers an understanding of the factors that cause oppression and its probable consequences. There are several research questions in this study:

- 1: What is the most prevalent form of oppression in English novels under consideration in this study?
- 2: What, in the opinions of the selected researchers, are the main factors that lead to oppression?
- 3: What is the selected researchers' opinion about the probable consequences of oppression?
- 4: What general solutions have been assembled or suggested for controlling and stopping oppression?
- 5: Do the selected readers express any desire for emancipation from oppression and call for combating it to achieve their freedom and rights?

The research employs a qualitative study that includes selecting books and researchers, presents a definition of oppression and its forms, defines novels in general and English novels in particular, and highlights important points about them. The study uses three approaches to analyze the research novels. The first approach focuses on

the reasons that impel the oppressors to oppress the oppressed. The second approach concentrates on the effects of oppression on the oppressed. The third draws the solutions which can combat and stop oppression. The study also provides an introduction to the novels and writers as well as researchers and outlines the scope and limitation of the study.

Theoretical Framework:

The pervasiveness of oppression in human society draws scholars' attention to discuss the causes, impact, and effects of oppression and explore ways to cope with this quintessential issue in the social context of our lives. There are many definitions about the concept of "oppression," but they all share the common recognition that such a concept is used to refer to a manifold, multidimensional system, differing from individual, isolated acts of meanness or "hate speech." Regarding the approaches that are useful to address our cases, the orientation of pragmatics is in line with so-called "philosophical counseling approach," as it is applied to fields of clinical psychology or social work. This is because this approach is more interested in a liberatory dialogue by which one frees oneself from oppressive circumstances rather than a technique for overcoming psychological maladjustment.

In probing these novels in light of perspectives originating in the fields close to descriptive pragmatics, opposition theory, sociopragmatics, and critical discourse analysis, our aim is to conduct a systemic investigation into the notion of what should and should not be done as guides to moral behavior or agency in human experiences. It is our expectation that the research findings will provide better insights into the nature of the operation of oppressive mechanisms in human communities and, more particularly, the ways people in these works are oppressed.

Definition and Conceptualization of Oppression:

Since the aim of the study is to analyze how the characters in a selection of novels suffer different types of oppressions, it is essential to clarify what oppression is and how it will be approached through a poststructural attitude. Oppression has been widely overlooked in linguistics since the term, among other things, is defined as "deprivation of the basic human right to participate in society". Given the complexity of the implications and the relations which the term "oppression" carries when it is studied in any social or cultural area, I hereby present a definition provided by the philosopher Wheeler and psychologist Berliner (1999), who see oppression as an experience that relates the mind and body and encompasses all people, specifically from a plural discourse tradition or a consensual one that brings together a multiplicity of theoretical and philosophical orientations and practices.

According to these authors, people use the word "oppression" to mean experiencing pain and violence, not being able to do what one thinks is correct, not expressing oneself as one is, feeling ignored, treated unjustly, neglected, prejudiced against, frustrated, or not living with dignity, to be pressured by a hegemonic system of exploitation, cultural hegemony or environmental destruction, among others. Oppression refers not only to a specific system of interrelated fundamental violence but also to its internalization, which occurs in thought and feeling, as well as hegemonic narratives. Since there are different types of oppression that can occur simultaneously and in different areas and dimensions, I apply the idea of pragmatics in a clear but enlarged interpretation; in other words, I am convinced that typologies of oppression or justice are not unique, as it owes to the subjectivity of all experiences.

Relevant Theoretical Perspectives:

This section of the study deals with the relevant information regarding the study proposed. The approach used for this study is pragmatic. A pragmatic study is likely to consider the multiple ways in which power and oppression are gendered, multi-ethnic, raced, aged, sexed, classed, sexualized, cultural, policed, and experienced, and may address how these various forms intersect and sometimes reinforce each other. Pragmatists locate the social production of experience in the complex interaction of material, semiotic, discursive, dialogical, psychic, architectural, and institutional factors. Therefore, the study is intended to analyze several forms of oppression encountered by the selected characters in English novels. This study attempts to apply relevant theories to deal with oppression in English selected novels.

The study applied several theories to analyze the oppression conducted in selected English novels. The results of the study are presented in the forms of oppression and describe how characters' oppressors oppress the selected characters. Many cases are depicted in selected novels; characters' oppressions are conducted by involving interrelated factors of the characters, such as their social and individual identities. The results showed that oppression may be conducted through different aspects of life, such as their culture, psychology, social, physical, emotional, and moral. Relevant findings are presented and discussed later. This might help in connecting the oppressions and their consequences faced by the selected characters. For the most part, we are grouping the theories of oppression into three domains: structural, radical, and interactionist.

Literature Review:

Oppression is a subject that many studies deal with. Many people have chosen to handle oppression. For many researchers, oppression is not

something that only belongs to one particular country or time; they also connect it with literature. There are many studies that deal with oppression in literature. It can be said that it is part of the job description. According to Sali Dr. Shahi, oppression is a matter of concern in literature. "This author is interested in oppression pervading the works of literature. Most readers know the problems of today are in literature often. For a simple and under reason: writer work in culture; culture is a medium for human beings to express their pain and puking; and oppression has a strong dark side and pain and despair." Shahi says that writers write about oppression because they want to unveil this issue and eliminate it.

Many novels handle the topic of oppression. One of these novels is *Uncle Tom's Cabin*, which became a world best-seller and influenced many readers at that time. A few other studies address this issue in novels. Atmakusumah and Doraid deal with oppression in English and Indonesian selected novels, though they limit their studies to language. Sadeghi and MahdviYon-Shoshtari's study deals with the arguments in selected English and Persian prose. However, they discuss oppression in the preface of the final research. Moreover, Bawasakar explains the causes of oppression and oppression in George Eliot's *Felix Holt Radical*. Emilie discusses how the character of Eva reflects beauty that breaks oppressive racism. Connelly explores the tools of oppressive racism in *Uncle Tom's Cabin*. Last but not least, Camione explains how loneliness is one type of oppression and discusses it through the character of Uncle Tom. However, these studies do not directly discuss oppression, and no studies have dealt with oppression in Dickens's novels that accept social roles.

Key Works on Oppression in Literature:

While oppression is a multidisciplinary concern, it has a long history of development with regard to literature. There have been many studies arguing from various perspectives, such as philosophy, political science, literary criticism, and so forth. They elaborated on the thoughts of the genealogy, structure of oppression, and numerous in-depth studies of specific dimensions of the phenomena.

Michel Foucault's fundamental work, "Discipline and Punish," offers a genealogical approach to the birth of the prison in modern capitalist society with considerations of the effectiveness and cost-efficiency of punishment as part and parcel of the establishment and development of capitalist political economy. This work opened the door to a wide range of research on the subject of oppression.

Iris Marion Young has explored oppression in terms of an expanded concept of exploitation in social life. Young is a relevant author who introduces oppression as a social relation—while Marx's

exploitation theory employed the labor market alone, Young takes account of other sites and forms of oppression "to disclose the multiplicity of a social complex."

Other important works concern oppression from the victim's point of view. Among them is "The Moral Common Sense Approach to Racism and Sexism" (1987), in which A. Pateman seeks sociogenesis as much as origins, not of the phenomena themselves, but of collective judgments or common sense that take racism, sexism, and other sorts of moral problems seriously. Another author, Tina Chanter, has published a series of works in which she discusses oppression and violence against women. Her immediate concern is the representation of and response to crimes against persons who are exploited in their role as mother. Susan Cudd equally looks at oppression from the victim's viewpoint.

Socio-historical context is evident in many of the discussions of oppression in feminist philosophy. They need to be confronted even in contemporary environments. However, there is the danger in some of the texts of treating history as though no significant difference may be identified, for instance, between women's lives between the pre-World War period that saw the birth of the radical "suffragette" feminism and today's world. Equally unfortunate is the neglect of the suffering and struggles of women at the margins of modern industrialized societies or those involved in transnational migratory processes subject to different war and oppression effects and harm.

Previous Studies on Oppression in English Novels:

The previous study conducted by Montull (2012) entitled "A Pragmatic Analysis of Oppression in a Feature Article of Jakarta Post" investigated women's suppression in *The Jakarta Post*. The result of the study indicated that Grice's Maxims of conversation were violated in *The Jakarta Post*, which had a considerable impact on interpretation in the feature article.

The other study was conducted by Jonathan Farrell (2006) entitled "Narration and Identity: A Study of Gloria Naylor's Novels". This study mainly analyzed the characters' consciousness of racism and its impact on Black self-identification. The characters in Naylor's novels undergo psychological damage because they have been oppressed; their feelings of inferiority are contagious. These studies have attempted to analyze the consciousness of oppression of characters. In this case, the researchers have an opportunity to contribute to their study on women's oppression of such a phenomenon in the selected novels.

The other study is "A Sociological Study of the Neo-Realistic Fiction of Cinema" conducted by Fuzon. This study tried to discuss the English novels

as a product of human society concerned with values. Further, they have their form out of the social customs and ways of society. This study was concerned with different forms. In this case, these studies have tried to analyze the novels based on their forms (content and style) and the novels as one of the products of society concerned with value. The researchers in the present study have an opportunity to contribute to their study done on the novels of a society, which is concerned with the consciousness of society and their alignment with the value of the voicing of these oppressed communities.

Methodology:

This study is a quantitative research design. It categorizes pragmatic markers based on Relevance Theory into three domains in language: semantics (lexical), grammar, and world knowledge (stylistics) proposed by Wardhaugh in his book. The selected novels from the 1980s are "Rite of Passage," "Catherine," and "The Color Purple." The cognitive scope in pragmatic and cognitive theory, which is mainly constructed on this theory, can be used to enrich the discussion by adding depth in interpreting and analyzing it. The data for this study is collected from the form of text data in the forms of four novels, which are the researcher's main data sources. The study uses a library research method and a qualitative approach.

This study is a pragmatic study categorized in the 1980s novels. The data of the study are taken using content analysis, which identifies particular relevant pragmatic markers. There are data descriptions, data identification, data as a message, and data technique. The first point is to provide the data collections from qualitative mechanism in the form of library research study. The chosen data are only four English selected novels, which consist of some of the pragmatic markers as follows: actually/basically, literally, kind of, type of, you know, things like that, anything like that, sort of, in fact.

Research Design and Approach:

This study adopts a critical qualitative case-study design, which arguably aligns most with the underlying assumptions of pragmatism in general and its evolving methods in particular. The use of case study as an overarching research approach is pertinent to the goals of this study of oppression in English selected novels. The single, bounded case study—seven selected novels—was used here because the main concern in this research was depth, so seven novels more than sufficient for such depth. The novels were selected using several related guidelines, ensuring that the novels span different genres and were written in different centuries in English, giving a first-hand account of oppression in language or suffrage.

The critical framework addresses the methodological limitations of the social sciences,

bridging a mind/brain split created by the 'double articulation of human learning as both contact to material forms of living and at the same time a rearticulation of what one learned coming to mind.' Epistemological and methodological pragmatism in war inquiry 'begins with a historicized account of embodied cognition to identify social practices of survival'. Methodologically, 'it becomes important to avoid reifying life-and-death channels or universal shattered identities'. While drawing from qualitatively-oriented research traditions, the critical framework explicitly critiques 'the language of "evidence" that pervades the assumption of a social science that thinks of war in the register of "rationality"'. The study covered a 45-year timescale and analysed discourses of oppression found within the seven selected novels. Data collection was triangulated through questionnaires and interviews with the writers. Data analysis and the findings utilised Horn's theory of naming and UNHCR refugee definitions of oppression. Data interpretive approaches utilised grounded theory and systematic-constructionist approaches.

Data Collection Techniques:

In this research, quantitative data will be collected through four selected English novels. The novels are selected as purposive sampling with an emphasis on pragmatic study of oppression. The stories or content of these selected novels revolve around the oppression of different strata of the societies. In addition, the selected novels have been translated from Urdu to English. The following are the four novels and their authors:

- i. Basti authored by Intizar Hussain, published in 1979
- ii. Ice-Candy-man authored by Bapsi Sidhwa, published in 1988
- iii. Cart on the Street authored by Mohammad Khalid Akhtar, published in 1974
- iv. The Reluctant Fundamentalist authored by Mohsin Hamid, published in 2007.

Intizar Hussain, Bapsi Sidhwa, and Mohsin Hamid are important contemporary Pakistani writers. They have written about the social and political conditions of Pakistan. All of these novels contain textual data following different forms. The characters' conversations, dialogues, discussions, comments on events, thought-provoking statements, and emphasis in conversations are the main sources of data. In the selected novels, either the protagonists are female or there is a major female character who is the protagonist's family member and plays an active role in the entire plot as the character takes part in experiences of life, sufferings, domestic violence, honor killing, army outrages, mourns, stress, and depressions, etc. The above-identified data sources would be taken from the selected novels, and they would provide evidence for the purpose of the present study.

Data Analysis Methods:

There will be two stages of analysis in the process of analyzing the data of this research. The two tools for the analysis of the data in this research are: identifying speech acts and identifying types of attenuation strategies. In the analysis stage, the speech act identification tool will modify the theories used by Searle (1969) concerning five types of speech act (assertive, directive, commissive, expressive, and declaration). Then, the identification method of the types of attenuation will refer to the theories from Brown and Levinson (1987) who discussed five types of attenuation (understatement, hedging, booster, refuser, and minimizer). An analysis stage refers to the type of speech act as stated by Searle and the type of attenuation as stated by Brown and Levinson. The result of each sentence will be classified and counted.

There will be some steps in checking the validity of the data. These steps are performed to compare the data of the study result with various sources as well as for comparing the organization of the data from the study result with the current condition. The study will be divided into several chapters which consist of: This chapter discusses the results of data analysis from the study and this chapter is divided into two subchapters. The first subchapter discusses the analysis of speech acts. In this subchapter, the researcher computes the number of each type of speech act in the data. The calculation of the number is done for each or all novels. The computation process is simple; it just identifies each speech act and then counts it in the data, both in the form of the number and percentage. This is a qualitative study.

Case Studies:

Case studies play a significant role in this dissertation to examine cases of oppression in literature. Therefore, this study selects four novels, all in the English language. Through this study, I aim to address the question: Is oppression a social fact in these novels, and if so, how is oppression manifested in each novel? For the four English novels, I conducted a close reading to support this part of the study.

Using the reader response theory, this section aims to support my earlier theoretical claims with practical examples taken from English literature. The case studies in this part point to the fact that oppression exists only because people have power and use it to dominate others, whether it be in the workplace or within a family. From these examples, it seems logical to argue that oppression is a social fact rather than a personal one in the first place. The following represents a case study between characters to test whether my claims so far have a basis in reality. This is done to pursue the same questions, but this time in the fictional world of literature. This dissertation sets out to explore the

possible relationships of oppression power associated with English novels.

Novel 1: Analysis of Oppression Themes:

The first selected novel depicts the theme of oppression in relation to race, religion, and gender. Oppression against the blacks can be seen from how they were treated by the whites. White people view the blacks as inferior due to their racial background. Dominique, Ross, and Alexandria Golemon are some of the blacks who experience racist treatment. The lynching of Dominique, who is accused of raping a white woman, really shows the racial suppression faced by the blacks. The fundamental oppression is also experienced by women. Women are subordinate and always serve men's life. Often women do anything to serve their husband, never having a choice to say their own opinion freely without the dictation of their husband. Even Africans also feel pain first from the difference of the victim of this oppression. This woman should endure the sadness that is floating because of the pain. Women here should feel jealous of women. I must make Rena undergo sadness while getting nothing rather a heavy sadness. This is because the white woman's life is aggrieved. She will have no desire to get elected that way when Domina is full, both the woman and the struggle of dichotomous spirit are white. Ross's wife becomes another example of women's experiences. When frustrations are sucked into the lives of white men, they want to blame women for this. With this reality, we can see that women are very low in value. It can be concluded that black people, women, and religion are punished. The novelist uses race and religion as forms of oppression. This event tries to portray "real life" that even in the present day, the land of freedom is full of blacks, women, and religious oppression. #slaveOwner.

Novel 2: Examination of Power Dynamics:

The second novel: Power and oppression. Similar to the analysis of the first novel, which focuses on identity, it is observed in the current novel that the main refuge of the repressed characters is themselves. Also in this novel, the characters make choices based on the strength of their situations.

Power and oppression are mutual concepts and cannot be separated from one another. In other words, where there is oppression, there is power, and vice versa. The characters in the Salamander are related to each other, either by giving power or by suffering under it. They also apply oppression to others. Some of the characters have complaints coming from their repressed past, while there are others who live a discontentful life due to being banned from their desires. Those who repress others are obeyed people who have power, and in the end, they are oppressed again, in this case which leads to the unhappy end of oppressed and oppressor

characters. What is directly related to oppression is, in point of fact, power. Oppression and power relations cannot be separated because power is maintained with the help of oppressing other individuals in social life. To put it more explicitly, the characters invest themselves with some kind of power against others, the ones who are more unfortunate than them, and inclined to apply oppression by repressing another person. Therefore, oppression and power are inseparable issues in this novel. The relation of the resistance of characters to the relations of power, which restrict them, in the novel, is another subject of this pessimist study.

Findings and Discussion:

The results of identifying key oppression patterns in three chosen novels showed that females are more oppressed than males, Africans are more oppressed than whites, polytheists are more oppressed than monotheists. Dark-skinned individuals and treacherous individuals are oppressed, and individual lives differ among the oppressed groups in the selected novels. Through exploring the intersections of oppression in the selected novels, there were various dominance explanations. Ibn Thabit was also oppressed because he was the poet of the people who have been oppressed. Idrisid people were also oppressed for religious reasons and were killed by Umayyads. These joined layers of oppression, clarified in the findings, may offer an explanation of the low agency given to the Idrisid characters, as it is impossible for people who are oppressed to be anything but victims.

In passing from Mecca to Ethiopia, Bilal sends Najd, that is, "get rid of what you have," as the commentary adds. This detail is mentioned in 'The Wind of Forgiveness' because Meroe is from Najd and her heart is full of forgiveness. Hence, the Prophet Muhammad, ordered by Allah, tells her she is innocent because she forgives, as in the Qur'an. Meroe will forgive her daughter-in-law and her son, will teach them to forgive, and she will hand the robe they threw in her face without asking her throughout the war against them. Rania's disguise attracts the attention of the narrator and public opinion. In these details for "The Deviation," oppression and negativity are subordinate to religion and spirit because oppression is divine, and the authoritarian oppression certainly has obstacles and contradictions.

Identification of Key Oppression Patterns:

A systematic analysis of the six selected novels has been carried out to examine if there are particular patterns of oppression that frequently occur in the novels. To do so, patterns of oppression have been identified from each of the novels and subsequently pooled together. As a result, five overarching types of patterns have been identified. As will be shown, the complained and accused

oppressed group suffer from a variety of patterns which have been shown to be convincing. They are demonstrated dominance, stereotypical thinking plus denying individuality, contempt, intrusion, and killing. The resulting categorization of patterns details these patterns and gives insight into the basic dynamics of each of the six novels. The list that follows illustrates the pattern for each novel and has been constructed as if the novels were published autobiographies.

A classic explanation is given to detail the patterns as they have been shown in the novels. Even though it is shown that physical dominance is a key theme for these three novels, each has its own unique quality that fits. In "Before We Were Free," the powers demonstrate their dominance when Anita's parents are captured. Even as soldiers prance and sing, rifle in hand, her father is carried out like a Santa Claus with a bag over his head to his arrest. They wear green camouflaged uniforms, but their faces, like the insecure civilian border patrol's who do not return our wave, are hidden beneath the warmth of Sunday's long-lost smile. She is explained that observation of soldiers looks on the face, and others.

Intersections of Oppression in Selected Novels:

Upon culminating the various layers of the oppression themes depicted in the selected novels, the study determined that individual experiences of oppression may seldom be untangled from the classism and racism they intersect with. Within Thornyhold, Una's exclusion from the community through the ongoing absence of visitors and the suspicion of the people in the village can allow readers to correspond this to a reflection of individual societal views. This belittling racism seen can provide the understanding of how an individual can experience further oppression due to their race, not solely by the rich upper class. Akin to the labels of a "witch", individuals may also be further oppressed due to their association with a struggling class. This theme can therefore emanate to other Erory household, the way in which Old Amos is objectified and harassed by the community due to his job is connected strongly to the classism experienced by Una. Similarly, in The Word for World is Forest readers have the opportunity to place sexual motive onto socio-political events, for instance realizing the connection between the oppression of Little-Know and Dichaan of the women they are protecting.

The impingement of race or skin tone upon people's freedom of choice, or exploitation of them against their own will, is shown in Spindle. Frances is extremely wary and imprudent when divulging her initial occupation to David Russell and Doris in case they use her reported history to overwork her more or refuse her supposed need for a proper wage without a fireplace. The possibility of them also

using this information to then find a chance to have power over or blackmail Una with is another fear for her. There is the notion that these courses of action could just as likely come about when considering Dr Bascom's race and outdated and generally stereotypical characterization. Likewise, the ending of the storyline of Peter Hennes is one that has brought about much discussion in relation to the ending. According to Gal, alluding to 'Testimonies' later in your essay when Una gets the chance to run away with Peter to the "forest" where he encapsulates the 'Noble Savage', leads to critique, as his stated skin color makes it clear that he is "Black". Una's dream and thinking at the result of the novel are interwoven with 'Testimonies'. Peter's future companion and feeler of things is written to be black. Gal, noting that a realistic notion of the ending now seems impossible, adds that the introduction of "such characters or ones who could be biracial" at such a last moment is not out of the ordinary.

Conclusion and Implications:

The analysis of patterns of how characters oppress other characters in the novels requires some statistical calculation, such as the use of percentage. This study, from the statements of the literature, findings, discussion in the previous sections, discovered that both Mills' and Chomsky and Herman's claims might not be too far from the truth. Most of the oppressed people get psychological and physical harm. Oppression is a very complex manner which needs multi-aspects to solve. This implies that a novelist needs to be aware of his or her potentially active unmotivated, to avoid becoming an oppressor in his fiction writing. On the other hand, oppressed readers, who find reality in fiction, are empowered to read. He or she has to read lies critically. The study has made a theoretical contribution to studies social philosophies. Practically, the finding of pragmatic study can contribute to the literature students and the novelists in understanding their responsibilities. The discovery of how oppression is reflected in fiction is likely to be helpful.

The present study has carried out a content analysis of different English novels and found out things that constitute an aspect that might have been beyond the scope of previous literary works. A conclusion drawn about this study, the pragmatic study on patterns of oppression in seven selected novels is essential for the modern novels lovers and could have contributed substantially to people's lives, especially when viewed in literature as a reflection of life. Novels readers alert to be wary of falling into the traps of the author's narration. Misjudgment with regard to his characters and story may cause needless psychological adventures, which may not ultimately help him or her on his or her way of life – one of them is how they deal with their repression.

Summary of Key Findings:

In sum, the results obtained in this investigative study yield four major findings that contribute to some extent to the anatomy of the nature of oppression in human life, specifically the Syrian life in both rural and urban communities. First and foremost, it was shown in the analysis that in I, Layla, significantly abundant types of both subtle and non-subtle thanatological and ontological oppression tend to haunt the innocent lives of both the sexton and the blacksmith, Layla's prototype-hero and heroine. The governmental-nihilistic suppressive practice was evidently prevalent in rendering the sexton, naive in politics, confused, though circumstantially, with a political law betrayer.

Secondly, although few instances of subtle misanthropy are manifested in the sexton's parents in the narrative, one of his persecutors and that is a police officer manifests overt as well as covert misanthropy. What deserves to be handled in the presentation of a virtually subtle grimace that the sexton's parents present is that his mother used to acquaint him with his relationship mirror: that he resembles, feature-wise, more the base person than a supposed-to-be Christian, been-baptized royal in ancestry. What awaits a pragmatic contextual turn in literary reading for attribution of deceptive significance is the literary character's failure to verbalize or throw away this pejorative appraisal against the face of its beholder: his mother. This means that character figures in literature can, artfully, hide or, in euphemistic terms, 'reenact/encode', have veritable sayings. That is, form writing rightly can reason, and this requires a close thematic and stylistic scrutiny, that his mother subtly confirms that the trouble lies with his not belonging to a royal family disvalue.

Theoretical Contributions and Practical Applications:

This study contributes to the development of the theoretical background and can be an aid for readers and English instructors for native and non-native speakers developing their interest in various learners' linguistic and cultural backgrounds. The present study is not merely aimed to study one area of literature in isolation, but rather the study of 'oppression across' English literature to see the broad picture. The findings can give us an insight into a number of valuable resources that constitute an alternative way of perceiving and understanding the language and literature of the dominant group.

In bringing together some recent developments on 'power and resistance', a research design delineation has been described. It aids the researcher in answering the thesis questions that provide substantial and essential literature in English literary work. From the perspective of the readers, this study gives an intense seduction to the

literature enthusiast to reveal another side of the story. In terms of instructional practice and techniques, this study can be an aid for teachers and learners of English and literature, especially those studying language and literature from a postcolonial aspect to help them understand the hegemonic discourse of Western literary works. This study results in a number of practical applications rich in essential sources that appear to be another constructive subject of wider research on the specific aspect of the learners' linguistic background and language learning of understudies coming from other countries. In a related context, many different situations in literature can appeal to different possibilities to represent that situation or characteristic of that work based on how the writer(s) look at and reveal the nuances of that presentation and its purposes.

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On The Occurance of *Azolla Pinnata* R. Br. An Aquatic Fern Spp., From Panjra River, Deopur, Dhule, Mh.

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Abstract:

Dhule City is a part of khandesh region. The present study was conducted on the Panzara River, which flow in Dhule city. Present study we were identified and described the species form in this area.

It is an aquatic plant, it is found floating upon the surface of the water. It grows in quiet and slow-moving water bodies because swift currents and waves break up the plant. *Azolla* can be used as a potential diet for fish as it is easy to grow, has a high yield, and is inexpensive to produce, which is reflected in its lower price compared to the price of a kilogram of fish feed.

Azolla pinnata is an aquatic fern. It is a good source of high-quality protein. It also contains almost all essential amino acids, vitamins, Beta-carotene, minerals and appreciable quantities of bio-polymers. It contains 21-23% crude protein. Investigations were undertaken to explore nutritive potential of *Azolla pinnata* as balanced feed for livestock.

Introduction:

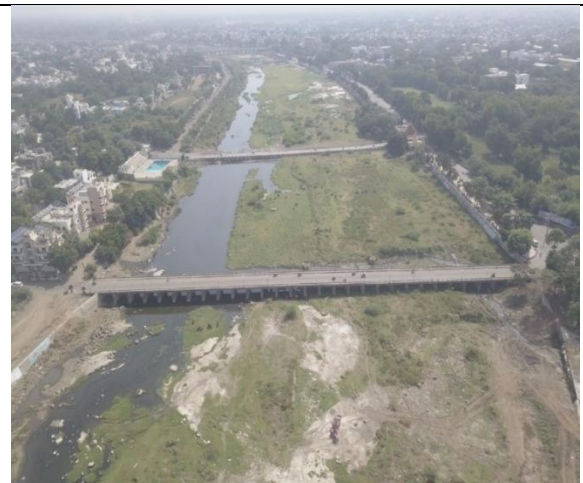
Dhule is a city located in the northwestern part of Maharashtra state, it is known as West Khandesh. It is situated in a valley of the [Tapi River](#) along the banks of the [Panzara River](#). The district is surrounded by Madhya Pradesh on the North, Nandurbar district and Gujarat State on the West, Nasik district on the South and Jalgaon district toward the East. There are nine important rivers flowing in the district. The largest river in length is Panzara. It is life line of Dhule district and one of the tributaries of interstate river Tapi that flows eastwards in to the Arabial sea. The river Panzara harbors rich fish fauna (Patole and Patil, 2009). The river Tapi is Major River flowing through district while other rivers are Panzara, Burai, Gomai, Amravati, Aner, Bori, Kan and Jamkhedi etc. climate the climate of the district is on

the whole dry except during the south-west monsoon season. The average annual rainfall in the district is 674.0 mm. The rainfall is heavier in the hilly regions of the Western Ghats mountain range and the Satpura ranges. Panzara River on a cloudy monsoon day.

The above photo was taken from the Dhule city side, on the other side is Deopur, which is a suburb of Dhule. The image shows Chhota Pul or small bridge on the left-hand side, and Motha Pul or big bridge on the right-hand side. The Panzara-Kan or Panjhra is a river in the Khandesh region of Maharashtra state of India. It is a tributary of the Tapi River. The Panjhra River originates just few kilometers from the small town of Pimpalner Tal - Sakri in Dhule District. Akkalpada Dam is built on Panzara River in Sakri Taluka.



Picture shows nature of Panjra river in rainy session



Picture shows nature of Panjra river in Summer session

Taxonomic Account

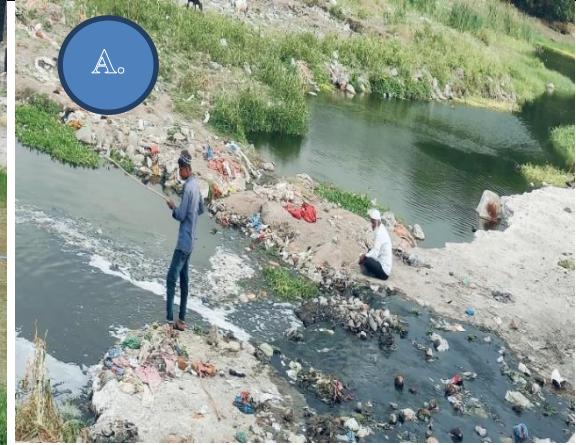
Azolla pinnata R.Br. Prodr. Fl. Nov. Holl. 167. 1810; Dixit, Census 174 (1984); Dixit, Indian fern L. 6: 159 (1989); Bhuskute, Indian Fern J. 7: 129 (1990); Manickum & Iraudayaraj, Pterid. Fl. West. Ghats-S India, 345. (1992); Rajagopal & Bhat, Indian Fern J. 15: 25 (1998).

Plant aquatic, free floating on water. Roots ca 1.7-2.9 cm, unbranched, densely covered by hairs, stem horizontal, profusely branched; leaflets alternate, sessile, 1.5 -2x1.5 cm, upper surface with dense, short, blunt trichomes, dorsal lobe aerial, more or

less rectangular, margin entire with a membranaceous border, thick, grey- green, veins indistinct; ventral lobes 1.5cm, submerged, ovate, apex blunt or rounded, base cuneate, margin entire, veins brown glabrous, copiously anastomosing; Megasporocarp ovoid, smaller than microsporocarp, with a single megasporangium; glabrous, brown, containing numerous stalked microsporangia, spores small, round, translucent **Distribution and Ecology:** Aquatic free floating, forming layer on water of ponds and ditches.

Exisiccata-Panjra river, Dhule.

AZOLLA SPP. OCCARANCE SHOWN IN THE PANZARA RIVER



- A. Luxrious Growth Of Azplla Spp.**
- B. Fisher Man**
- C. Plant Str. Of Azolla.**
- D. Habitate Of Azolla Pinnata R. Br.**

Uses Of Ecology

Vitthal N. Rathod

It is an [aquatic plant](#), it is found floating upon the surface of the water. It grows in quiet and slow-moving water bodies because swift currents and waves break up the plant.

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Azolla pinnata is an aquatic fern. It is a good source of high-quality protein. It also contains almost all essential amino acids, vitamins, Beta-carotene, minerals and appreciable quantities of bio-polymers. It contains 21-23% crude protein. Investigations were undertaken to explore nutritive potential of *Azolla pinnata* as balanced feed for livestock.

Azolla is a freshwater fern that belongs to the Azollaceae family. It is easy to grow and is highly productive. It can fix atmospheric nitrogen due to the presence of *Anabaena azollae*. *Azolla* has been applied to the rice field as a classic fertilizer. It is a good source of protein and contains almost all essential amino acids and minerals. Various research has been done and is still ongoing to determine the capability of *Azolla* as a Phytoremediator and to be used as a sustainable bioenergy source.

Azolla floats on the surface of water by means of numerous small, closely overlapping scale-like [leaves](#), with their roots hanging in the [water](#). They form a [symbiotic](#) relationship with the [cyanobacterium](#) *Anabaena azollae*, an extracellular [endosymbiont](#) (living outside the host's cells) which [fixes atmospheric nitrogen](#).

The typical limiting factor on its growth is [phosphorus](#); thus, an abundance of phosphorus—due for example to [eutrophication](#) or chemical runoff—often leads to *Azolla* blooms. Unlike all other known plants, its symbiotic microorganism [transfers directly](#) from one generation to the next. *A. azollae* is completely dependent on its host, as several of its genes have either been lost or transferred to the [nucleus](#) in *Azolla*'s cells.

The nitrogen-fixing capability of *Azolla* has led to widespread use as a [biofertiliser](#), especially in parts of [southeast Asia](#). The plant has been used to bolster agricultural productivity in China for over a thousand years. When [rice paddies](#) are flooded in the spring, they can be planted with *Azolla*, which then quickly multiplies to cover the water, suppressing weeds. The rotting plant material resulting from the die off of this *Azolla* releases nitrogen into the water for the rice plants, providing up to nine tonnes of [protein](#) per hectare per year.

Azolla are [weeds](#) in many parts of the world, entirely covering some bodies of water. The myth that no [mosquito](#) can penetrate the coating of fern to lay its eggs in the water gives the plant its common name "mosquito fern", and may deter the survival of some of the larvae.

Most species can produce large amounts of [deoxyanthocyanins](#) in response to various stresses, including bright sunlight and extreme temperatures, causing the water surface to appear to be covered with an intensely red carpet. [Herbivore](#) feeding induces accumulation of deoxyanthocyanins and leads to a reduction in the proportion of [polyunsaturated fatty acids](#) in the [fronds](#), thus lowering their palatability and nutritive value.

Azolla cannot survive winters with prolonged freezing, so is often grown as an [ornamental plant](#) at high latitudes where it cannot establish itself firmly enough to become a weed. It is also not tolerant of [salinity](#); normal plants cannot survive in greater than 1–1.6‰, and even conditioned organisms die if grown in water with a salinity above 5.5‰.

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Tribal Tourism Development: Potential and Opportunities in Palghar District, Maharashtra

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Abstract:

Tribal tourism holds significant potential for socio-economic development and cultural preservation in rural regions. This study investigates the potential and opportunities for developing tribal tourism in the Palghar District of Maharashtra, India. Palghar is rich in natural beauty, cultural heritage, and indigenous traditions, making it a prime candidate for emerging as a tourist destination. The research focuses on identifying key areas with the potential for tribal tourism development, assessing the existing infrastructure, and understanding the cultural and economic benefits to the local tribal communities. The methodology involves a combination of field surveys, interviews with local stakeholders, and an analysis of secondary data sources. The findings highlight several untapped locations with unique attractions, such as traditional festivals, tribal art and crafts, and eco-friendly practices that can draw tourists. Furthermore, the study examines the current state of accommodation, transportation, and other essential services, proposing strategic improvements to support sustainable tourism growth. One of the central arguments is that developing tribal tourism in Palghar can lead to significant economic benefits for the indigenous communities by creating employment opportunities, promoting local businesses, and preserving cultural heritage. The study also underscores the importance of community involvement and capacity building to ensure that tourism development is inclusive and benefits the tribal population without disrupting their traditional way of life. In conclusion, the paper outlines a comprehensive framework for developing tribal tourism in Palghar District, emphasizing the need for a balanced approach that fosters economic development while preserving the unique cultural and environmental landscape of the region. The recommendations provided aim to guide policymakers, tourism developers, and local communities in realizing the full potential of tribal tourism in Palghar.

Keywords: Cultural heritage, local tribal communities, accommodation, transportation.

Introduction:

Tribal tourism is emerging as a niche sector with the potential to drive sustainable development in rural and indigenous areas. In Palghar District, Maharashtra, the unique cultural heritage and natural landscapes of tribal communities offer a rich tapestry for tourism development. This region, characterized by its traditional lifestyles, vibrant festivals, and eco-friendly practices, presents an opportunity to create an authentic tourism experience that benefits both visitors and local communities. The purpose of this study is to explore the potential and opportunities for developing tribal tourism in Palghar District. By identifying key attractions, assessing current infrastructure, and understanding the socio-economic impacts on local tribal populations, this research aims to provide a roadmap for sustainable tourism development. Engaging the local community in tourism activities not only promotes economic growth but also ensures the preservation and celebration of their cultural heritage, paving the way for a balanced and inclusive approach to tourism.

Study area: Palghar District, a predominantly tribal area in Maharashtra, spans 5,344 km² with a population of 2,990,116 as per the 2011 census. Situated between 19°17'15"N to 20°13'45"N latitudes and 72°38'35"E to 73°30'25"E longitudes, it comprises eight taluks: Jawhar, Mokhada, Talasari, Palghar, Vasai, Vikramgad, Dahanu, and Wada, with Palghar as the district headquarters. Established on August 1, 2014, Palghar is the most northwestern district of Maharashtra, bordered by the Arabian Sea to the west and the Sahyadri Mountains to the east. It adjoins Nashik District to the east and northeast and Valsad District of Gujarat and Dadra and Nagar Haveli to the north. Agriculture, fishing, and horticulture (notably sapota, betel leaf, mango, and coconut) are primary occupations. The district boasts numerous tourist attractions, including Jivdani Temple, Vasai Fort, Arnala Fort, Dabhosa Waterfall, Kelva Beach, and Bahrot Caves (**Fig.1**).

Objectives: The broad objectives of the research emphasizing the overall thrust of the proposed investigation should be clearly mentioned.

- 1) To Identify and assess the key attractions and infrastructure needs for tribal tourism development in Palghar district.
- 2) To evaluate the socio-economic impact of tribal tourism on local communities in Palghar district.

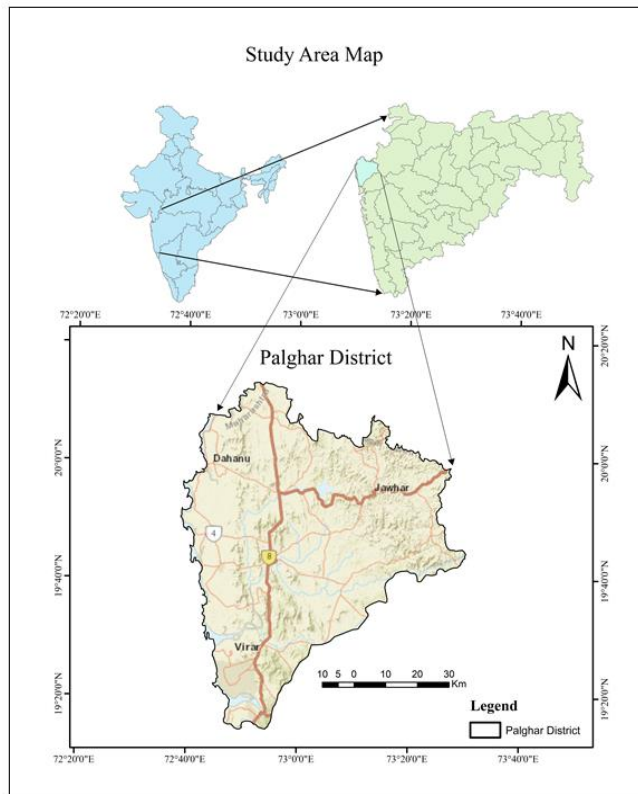


Fig. 1

Database and Methodology: To understand the tourism potential of the tribal region in Palghar District, the methodology is divided into three phases: pre-field work, field work, and post-field work. In the pre-field work phase, a literature review of previous research will be conducted using journals and online sources. Visits to the MTDC resort will provide insights into annual tourist flow. Data will be collected from various sources,

including Survey of India toposheets (scale 1:250000), atlases, gazetteers, district census handbooks, village and town directories, tourist maps, district resource maps from the Geological Society of India, government maps, P.W.D. maps, Digital Elevation Models, terrain slope maps, and shaded relief maps. A questionnaire will be prepared with guidance from a supervisor and tourism consultant for the actual fieldwork (Fig. 1).

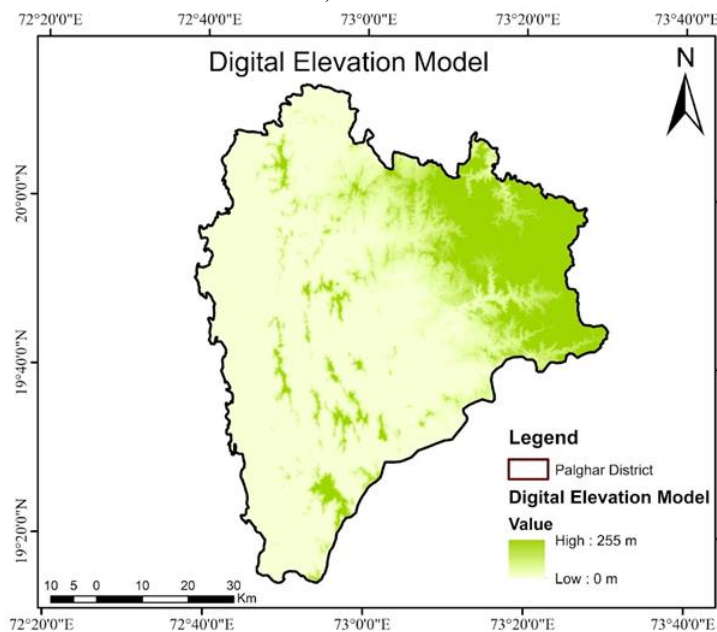


Fig. 2

In the second phase, extensive field surveys will be conducted at both existing and newly identified tourist locations. The questionnaire will be completed, and tourist facilities, destination photographs, GPS readings, and related information will be recorded. The potential of various sites will be analyzed based on scenic beauty, economic importance, visitor numbers, and connectivity. Tourism performance is influenced by service quality and the socio-economic and cultural backgrounds of tourists. Collected data will be classified and tabulated using statistical tools and analyzed through tables, charts, maps, and diagrams. In the third phase, laboratory work involves interpreting collected data, creating weighted maps, and generating charts, graphs, and diagrams to address research questions. GIS will be used to create multiple ring buffers around tourism centers, showing clusters of tourist spots within specific distances. The development status of the study area

will be assessed using weighted scores for demographic, social, and economic factors, following the Suryawanshi and Sawant method (2014).

Result and Discussion:

Palghar District, in Maharashtra's Konkan division, is rich in tribal culture and natural beauty, presenting numerous opportunities for tribal tourism. Home to indigenous tribes like the Warli, Katkari, and Malhar Koli, the district boasts unique cultural heritage, traditions, and lifestyles. Potential tribal tourism spots include Warli art villages, showcasing traditional tribal art; Katkari settlements, offering insights into their unique customs and practices; and Malhar Koli communities, known for their distinct cultural heritage. These locations provide authentic experiences that highlight the vibrant tribal culture and natural beauty of Palghar, making it an ideal destination for tribal tourism development (Fig. 3).

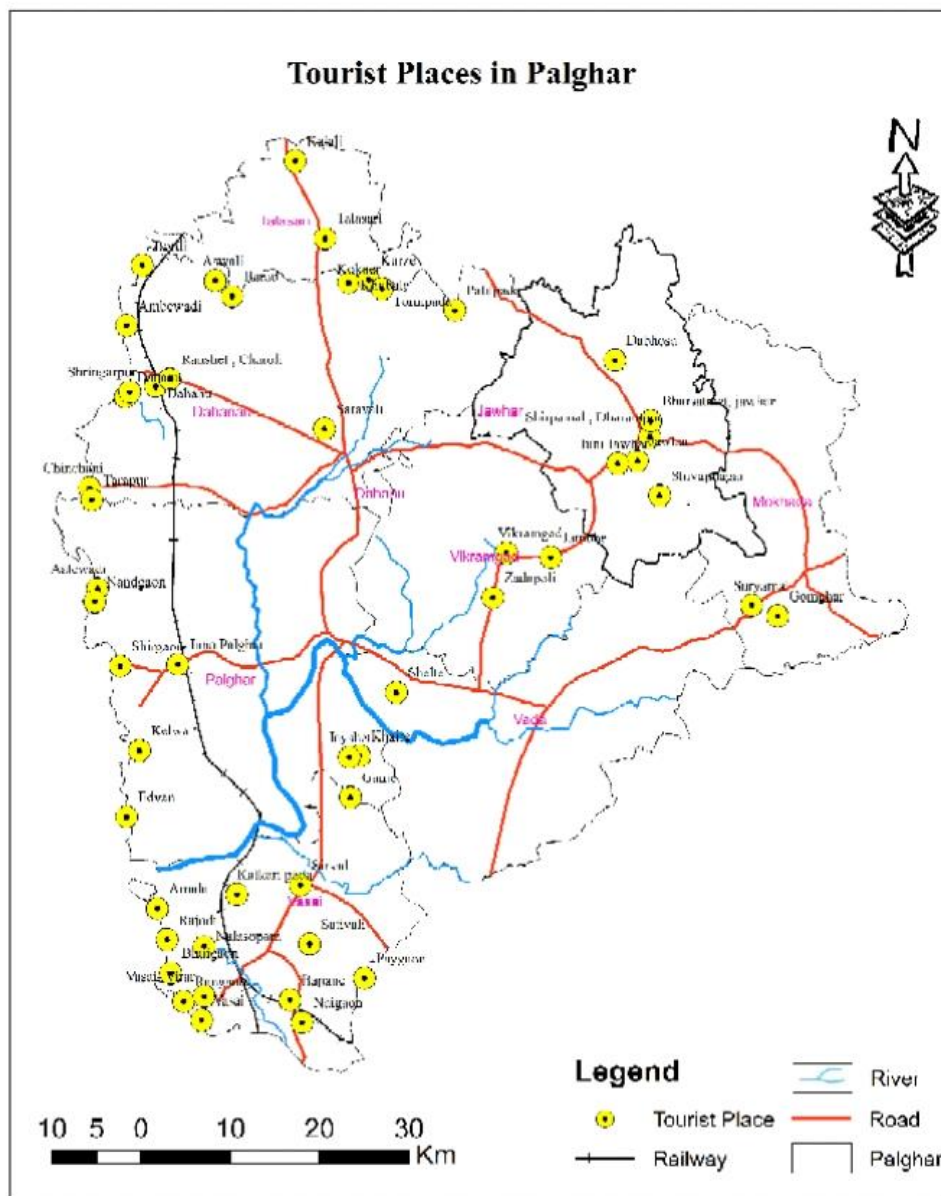


Fig. 3

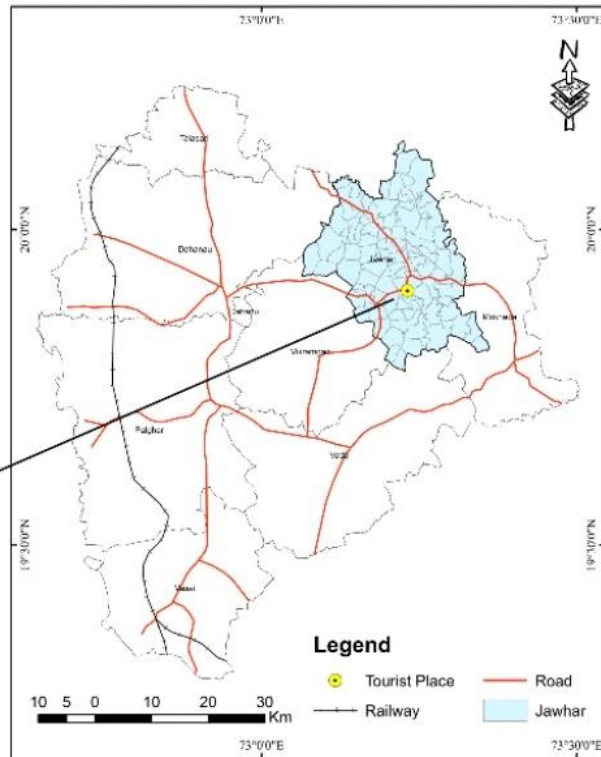
Jawhar:

Jawhar, often referred to as the 'Mini Mahabaleshwar of Thane,' is renowned for its breathtaking scenic landscapes, cascading waterfalls, and rich historical sites. This picturesque town, nestled in the Sahyadri mountain range, offers a serene escape with its lush greenery and tranquil environment. Jawhar is not just a haven for nature lovers but also a cultural treasure trove, where tribal culture flourishes vibrantly. One of the most significant attractions in Jawhar is the Warli art form, a traditional tribal art that has gained international recognition. The indigenous Warli tribe, known for their distinctive artistic expressions, uses simple geometric shapes to depict their everyday life, rituals, and the natural world. These paintings are typically created using white pigment made from a mixture of rice paste and water, set against a red ochre or mud background. Visitors to Jawhar have the unique opportunity to delve into the world of Warli art. The town is dotted with numerous sites where traditional Warli paintings

adorn the walls of tribal homes, providing a glimpse into the rich cultural heritage of the Warli people. Additionally, several local artists conduct workshops, offering tourists a hands-on experience in creating their own Warli artwork. These workshops not only teach the techniques and symbols used in Warli paintings but also share the stories and traditions behind them, fostering a deeper appreciation of this ancient art form. Moreover, Jawhar's natural beauty enhances the cultural experience. The majestic Dabhosa and Kalmandvi waterfalls, along with the historic Jai Vilas Palace and Hanuman Point, provide stunning backdrops for exploring the region's cultural and natural offerings. In Jawhar, visitors can immerse themselves in the harmonious blend of nature and culture, making it a perfect destination for those seeking both artistic inspiration and serene landscapes. This combination of natural beauty and rich tribal heritage makes Jawhar a must-visit spot in Palghar District, ideal for a fulfilling and educational travel experience

(Fig. 4).

Tourist Centers	Jawhar
Toposheet No.	46D/1
GPS Location (Lat. / Lon.)	19°54'11"N 73°13'54"E
Thasil Head Quarter	Jawhar
Best time to Visit (According to English)	Every Season
Best time to Visit (According to Marathi)	Every Season
Nearest Town	Jawhar
Distance from Nearest Town (Km)	15
Distance From Palghar City (Km)	84
Accommodation Facilities	Hotel, Resort, Home stay hotel, Lodges
Communication Facilities	Post Office, Police station
What to See	Hanuman Point, Receration, Tribal Tourism, Historical, Jawhar Palce, Jay Sagar dam



Conclusion:

The tribal regions of Palghar District present a unique blend of cultural heritage and natural beauty, ideal for developing tribal tourism. Areas like Jawhar, Dahanu, Vikramgad, Talasari, Mokhada, and Kelva are rich in traditional art, customs, and scenic landscapes. Promoting these destinations can attract tourists seeking authentic cultural experiences, thereby supporting sustainable economic growth and cultural preservation. Strategic tourism development in Palghar, focusing on community engagement and environmental

sustainability, ensures that the benefits of tourism are equitably distributed among local tribal communities. This approach enhances the livelihoods of indigenous people while preserving their rich cultural heritage. By involving the local community in tourism activities, the region can offer visitors genuine cultural interactions and immersive experiences, from exploring traditional Warli art in Jawhar to participating in local customs and festivals in other tribal areas. Such development not only boosts the local economy but also safeguards the environment and cultural traditions for future

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generations. This comprehensive approach positions Palghar as a vibrant and sustainable tourism destination in Maharashtra, where the beauty of nature and the richness of tribal culture create an unforgettable experience for visitors. By prioritizing sustainable practices, Palghar can emerge as a model for responsible tourism that benefits both tourists and local communities.

Acknowledgment:

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Mahatma Basaveshwara depicted in Vachana Literature

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Introduction:

Mahatma Basaveshwara was the founder of Lingayat /Virasaiva religion in Karnataka in India. He was a social- economic, religious, political, culture and literature reformer of 12th century. He was the founder of Anubhava Mantapa (First World Parliament) in Kalyana (now called as Basavakalyan). And wrote Vachanas (prose-poetry literature) in Kannada. His period also called as the Vachana Yuga. Along with him other 770 Vachanakaras (those who wrote Vachanas) and 33 women Vachanakartis wrote Vachanas and enriched the Kannada literature and culture. Most of the Vachanakaras Vachanas focuses on welfare of all human beings. While studying Vachanas we also found the those focuses on against caste system, emancipation of women, upliftment of Dalits and untouchability, mystical and spiritual knowledge, Istalinga worship, Virasaiva tenets and practices by devotees. Many Basaveshwara's contemporaries expressed their views on Basaveshwara's life, works and movement in their Vachanas.

Basaveshwara gave a practical demonstration of a welfare State in Kalyan Nadu and showed it could be achieved. One could equally call it Socialism based on "Work according to your capacity and receive according to your needs". This principle was very much embedded in the concepts of Kayaka' and 'Dasoha' advocated by Basava and other Sharanas. In this there is no element of force, exploitation or expropriation. The principles of 'give and take' or 'live and let live' which form the very core of social life originate and spring from within and when they get transformed into practical life, natural socialism is established which cannot be so easily undone against one which is trust from outside or from above. We may call it socialism which is at once both economic and spiritual.

Sources: The sources to know more about the Virasaivas are some of Saivagamas, Siddhanta Shikamani, and the works of Shivasharanas both in Kannada and in Sanskrit a vast body of Vachana literature in Kannada, Sunyasampadane and Virasaiva Puranas.

Aims and Objectives of Study:

1. To study the historical background of Basaveshwara movement.
2. To study the Basaveshwara in the eyes of his contemporaries.
3. To study relevance of Basaveshwara's thoughts to modern times.

Research Methodology: The study will be a descriptive and an analytical one. By and large historical approach has been adopted in the description. All the writings and documents of Vachana Sahitya in Kannada and other languages constitute the primary sources. Books, Research articles and critical evaluations by experts and other scholar's opinions constitute the secondary sources. Along, field visit, interview method and Survey, method will be adopted in this research.

Analysis and Interpretation:

Basaveshwara becomes the central figure of an important Bhakti movement variously known as Vachana movement (Vachana, a kind of composition in Kannada), Sharana movement (Sharana, a devotee, a man who has surrendered

himself to God) or Lingayat movement (Lingayat literally means the one who wears Linga on the body; it is also the name of a sect which follows Basava's teachings; Virasaiva (Veerashaiva) is a synonym of Lingayat).

Anubhava Mantapa:

Basaveshwara established the Anubhava Mantapa at Kalyana, an academy of Virasaivism where thoughtful men and women gathered and discussed intensely on matters concerning society and religion and arrived decisions. The discussion as held in the Anubhava Mantapa is compiled and reconstructed in the form of dialogue in the work called Sunya Sampadane. Vachanas are a unique text that delivers valuable message to entire mankind. Experiences of life is shared and compiled in few lines of Vachana. Sharanas recited such verses and led their life with devotion and spirituality.

Vachana Sahitya:

Basaveshwara rightly choose people's language Kannada to communicate his ideas. He and his associates expressed their ideas in the form

of unique prose poetry style known as Vachana (sayings). The first importance thing which regard to Vachana literature is its noble thoughts and simple style. It does not require any scholarship or erudition to understand and appreciate the beauty of many Vachanas.

Basava has translated the truth of all the planes of consciousness in the language of the common people. His Vachanas incorporated all the feelings and all the levels that elevate and ennoble our life. The high spiritual ideals that he attained, his vision of life, the path he trod, the heights he scaled – all these have found expression in the form of Vachanas.

Basaveshwara and other Shivasharanas: Basaveshwara and other Shivasharanas were great revolutionary social reformers who fought to establish a society, based on the democratic principles like liberty, equality, fraternity and social justice. Their thoughts and deeds were the outcome of the rigorous introspection existing evil system and mainly their personal experiences. They changed whole security form base to the tope they also fought against the social evil practices like caste system, superstitions etc, the changes brought by them were very significant and far reaching one can easily say that, the existing society is the pout come of the efforts made by Shivasharanas 900 years ago.

Basaveshwara depicted in Vachana Literature:

The composite culture of Karnataka has been synchronized through the ages by several illustrations sons and daughters of Karnataka. Among them were Basaveshwara, Siddharama, Allamaprabhu, Channabasavanna, Akkamahadevi, Akkanagamma, Gangambike, Neelambike, etc. In the history of the Karnataka, Allama Prabhu is a very great name. He was the contemporary of Basavanna. He praised the Basavanna which clearly shows the work and objectives of Basavanna:

The Maker sent
A sivasaranas to this mortal world
That the Great House
Might not be ruined
That Sarana, descending
To the holy city of Kalyana
Transformed in into a Kailasa,
Rallying the Rudraganas and Prana thaganas,
He called them Numberless by name,
Exhibiting the character of Bhakti,
Through Scriptures, Parables and miracles,
And holding aloft the banner of sivacara
For all the world to know
He fashioned himself into a ladder
Between Earth and Heaven
At sight of the Sivagamas thronging
His House
My heart swelling and surelling,
The whole of me rocked with joy!

What shall I say
How greats the humility
Of Sangana Basavanna, Guheshwara's Sarana,
O, Siddharamayya !
So, Prabhu seeing the courtyard as a holy centre
Prabhudeva, seeing that in Lord Basavaraja's words
of praise as he showed it to Siddharamayya. Not
only this in Allama's Vachana he mentioned why
god not created me as a Basava. So that in every
Vachana Allama he appreciates the Basavanna in
this manner:

“Whichever way you look,
Behold a creeper; Basavanna!
You pick it up, and, A cluster; the Linga!
Pick up the Cluster and Oh,
The juice of love that brims in it!
Who is there who can make it into a myrabolan?
Who is there who can make it shine
Outwardly, and blazon forth?
Because, Guru Basavanna made clear
The origin of Linga on my palm, through you
I' have known the Stature of Guhesvaralinga,
All other word on worlds appear
As party atoms in my eyes.
The above Vachana shows that the Lingayat religion
because of Basavanna as Vachana shows by Allama
Prabhu.

Akkamahadevi, the great Shivasharanas of the 12th
century of Basava time. She contributed a lot to the
womanhood. She accepted the Lord
Chennamallikarjuna as her husband and in search of
him, she came to Kalyana, there she tested by
Sharanas, then also she won by others. She pointed
Basavanna like this manner;

Whether by day or night,
At sunset at dawn
Before or after, I do not recognize
Another than Thyself; and yet
My mind will not rise high,
Looking into a mirror in the dark,
I'm troubled with frustration, Lord!
Tell me, Chennamallikarjuna,
How can I see Thee, but in the light
Of Basavanna ?
How the light is necessary to know the things, in the
same manner to know one's inner self Basava's
personality influence her. She mentioned in her
Vachana.

The above Vachana by Chennabasavanna stated that
Linga, Jangama, Prasada because of Basavanna,
Chennabasavanna again further stated that:
In the Guru, he's a virtuous man;
In Linga, divinely so;
In Jangama, he's loyal to his faith
In Prasada, he is chaste;
Right thinking in whatever he does;
He is all this – thy Sarana, Basavanna,
O, Kudala Chennasangama !

The above Vachana shows the virtuous way of Lord Basavanna. Among the immortals of Virasaivism, Siddharamayya was one of them. He was the contemporary of Basavanna. Allama made him from Karmayogi to Sivayogi. He came Sholapur to Kalyana and became the greatest Sharana of the 12th century.

When Siddharama came to Kalyana and praised the Basava in this manner:

Lord, worthless is the house of those
Who are not your Saranas!
Only a Sarana's house,
Would be, to me, a dwelling – place!
Siriyaala did build a house, but when
He took himself elsewhere!
Dasimayya did build a house, but then
He went off after business deals.
Sidhuballala did build a house, but then,
He'd rather have wages.
Innumerable others, counters as Gamga sands,
Did, build a house, but were content
To ignore the ways of Linga.
All these did build a house, and though
They won exalted stations, Salokya,
Samipiya, Sarupya and Sayujua,
Then knew but little of the Light Divine!
But when your Sarana Sangana Basavanna came
And built the House at Kalyana
The empire of devotion was installed upon this
mortal earth,
Those who, with bowed heads, enter it
Attain the station of the Absolute,
Because I would behold that House,
Long penance have I done.
O Kapilasiddhamallinnatha, when I said
Hail, o hail unto the House
Of your Sarana Sangana Basavanna,
I was saved!

When Allama Prabhu said to Siddharama to meet
the Basavanna then Siddharama exceedingly happy
and submitted this Vachana;
Let be your Karasthala's sublimity,
Let be your Parasthala's majesty;
Of Karasthala and Prasathala I know nought!
O Kapilasiddha Mallinatha,
You promised me to show the holy feet
Of Sanganabasavanna, so loved of you,
And that has conquered me
Show them to me, and let me live,
O God of gods!

The above two Vachanas shows that Siddharama
himself a great social reformer although he wanted
to meet the Basava and get the correct knowledge of
the life.

Bahurupa Coudayya was a son of Brahmins later he
adopted Linga Diksha . His Kayaka was role play
and aware the people by changing his roles. He
found the Basava's personality like this:
I'am one, Sir, who have torn

The string that was looped in the string
Having built me a home in the Supreme!
I burnt myself. Basavanna was the one
Who held the strings for this my role,
Thanks to Basavanna, I have grown
Subtle, I have perished, look!
Rekannapiya Naginatha,
Thanks to Basavanna, the entire world
Has all been saved!

In the contemporaries religion Basavanna given
precious values, morals and right root to the people
and then they praise him in their own words.
Molige Marayya who was impressed by the Kalyana
Vachana Kranti, he given up his throne of Kashmir
and came to Kalyana, then became as a Molige
Marayya. He was so much impressed the Basava's
personality that he left his throne and started as a
Molige Kayaka along with his family. He praise
Basava in these words :

My consciousness and ignorance
Are offered to Basavanna
My actions and my thoughts
Are offered unto him, and so
My will and will – lessness,
My inner an my outer self
And what is known as "I" and "Thou",
Thus, offering myself to Basavanna,
I have, without support,
Become a denizen
In the unsupportedness',
Mark it, Nihakalankamallikarjuna!

The above Vachana shows that Marayya's internal
& external everything given to Basava and he paid a
respect to him in a Vachana.

Madivala Machideva was also one of the 12th
century Sharana. And he adopted the cleaning the
cloth as his Kayaka (work). He also removes the
dirtiness in the minds of the people. He praised the
Basavanna in his own Vachanas which shows the
greatness of Basavanna. He was a Vachanakaras in
Anubhava Mantapa. His Vachana Ankitanama
(Mudrike) 'Kalidenara Deva'. He also praises the
Basava in many of his Vachanas. One of his
Vachana he stated about Basava:

You have indeed gone, alas! Basavanna
Tearing the garment that you wore!
Doffing the shoes you wore, you went Basavanna
Loosening the braid, you went, Basavanna!
Slipping your bournes and bonds, you went,
Basavanna!
Not touching what you did for Linga, you
Went off, Basavanna!
You went off, holding in your hand
What you did for Jangama, Basavanna!
You went off, wearing the Light, as if,
Dissolved to void, Basavanna!
O Lord Kalidena, show me the path
To follow Basavanna !

The above mentioned Vachana shows that Basavanna's personality model of the whole Universe. Again Madivala stated:

The form has changed to Formlessness, Basavanna!
The breath has changed to Breathlessness, Basavanna!
They're over – your love and services
To Linga and Jangama, Basavanna!
Silence has seized on you, Basavanna!
Entering the lotus of the heart
Of Lord Kalideva, you have gone

A god to gods, Sangana Basavanna!

The stated Vachana shows that Basavanna has a capacity to form has changed as formless means that much personality he had because of that many people attracted the Kalyana and adopted the themselves as Lingayat.

In the words of a tribute paid him by one of the Sharanas of the day: Basava taught us how to talk (let thy language be like a necklace of pearls) and how to behave(Righteous conduct is Heaven itself) : he taught us how to eat(Food is the 'grace' –the prasada- of God) and how to sleep(A saint even in his sleep , chants the name of God in his subconscious). In a word Basava taught us what to make of our lives, a precious gift from God!

Findings and Conclusion:

1. Not only above these mentioned Sharanas praised Basavanna but other sharanas like Dohar Kakkayya, Ambigar Chaudayya, Hadapad Appanna, Nilambike and others. These all are the mirror of Basava's personality which relevance to know the Basaveshwara.
2. Basaveshwara praised by almost all the Sharanas. Because the 12th century is the golden age for culture, literature, social and spiritual activities. For all these activities Mahatma Basaveshwara was the central figure. He was a great social reformer that the world has never seen. Though Vachanas he had successfully eradicated many evils in his society as early as 12th century. He was the one who taught and succeeded in giving right of the worship to women. He fought against caste system. He propagate the concept of work is worship (Kayakave Kailasa). He was so particular about the quality of work and preached that at the time of doing (Kayaka) work concentrate on it and do not divert the attention even to Guru, Linga, and Jangama.
3. Basaveshwara was a great prophet, socio-economic, religious reformer. He was also a great saint, revolutionary and great human being. He spent his whole life trying to give a good life to all the human beings without considering caste, creed, class, sex, ritual and tradition.
4. "If Basaveshwara and Shivasharanas philosophies are properly understood and

interpreted to the common man and woman of India, it will help the country in its onward march in search of happiness social liberty, equality, fraternity and justice and spiritual good."

5. It will be a literary contribution to the society, as it will translate many oral traditional works into written form as well as oral Kannada works into English.
6. Many Vachanakaras in their writing use the riddles, proverbs, words and other materials will be translated, which is beneficial literature of India history.
7. It is also helpful to write the medieval Indian History.
8. This research work will guide to new researchers who are interested in Vachana Literature.
9. It depicts the lives of many Vachanakaras of medieval period which helps to rewrite and reconstruction the history of 12th century.

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Flood And Its Management: Geo-Special Model

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Abstract

Floods are highly dangerous and serious disasters all of the natural calamities. Floods are the most important weather related disasters which are mostly occurred by natural as well as human actions. RS and GIS address to satellite geo-database allows us to view, identification, understand, monitoring, assessment, interpret and visualize data in many ways that reveal relationships, patterns and trends in the form of maps, models, statistic reports and charts. Solve problems of flood by looking at data in a way that is quickly understood and easily shared. In the present research paper an attempt has been made to rescue and relief of integrated flood management plan by selecting Krishna river of Maharashtra as case study.

Keywords: RS, GIS, GPS Cell, Integrated plan, Flood control, Disaster management.

Introduction

Among the different natural hazards, Floods are water-related natural disasters that include environmental factors. As compared to other natural disasters like tsunami, cyclone, earthquake, thunderstorm, nature and impact due to flood are more difficult to measure. The changes in land use affect the response of particular area to rainfall. It has a wide spatial dimension. Flood control and relief management program involves the process of rescue, relief, evacuation, habitation, and mitigation response and recovery pattern.

The combination of investigation, measuring, design, techniques, planning, decision making and action. The most happenings connected to agriculture, forest, vegetation, human culture, wildlife and local and national economies. There have been effects on several tehsils, large areas and have an impact on the village for the food production, food security, life expectancy for populations and economic performance of large areas. It also affects parallel disciplines like hydrology, tourism, transport and hydroelectricity power generation etc.

The present research approach is utilized as a long term water disaster management in the study region. To study mostly relies on collected spatial and non-spatial data from different sources. Collected data uses different types of techniques in flood analysis as scientific real time outlines. This research runs for data processing and its

arrangement through the various computer softwares and different methodological techniques in the river basin.

Study Area

Krishna River is situated in the south western part of the Maharashtra state. The geographically extends between 17°50'00" to 18°10'00" N latitude and 73°33'00" to 74°54'00" E longitude respectively in the upper part of the Krishna basin. The region has massive mountains, valleys of some rivers that cross through them (Nira, Koyna, Manganga, Kudal, Vena, Urmodi, Tarli, Varna and Yerla).

Objectives

1. To study available water conditions in catchment areas.
2. To study of river pattern and its tributary.
3. The main aim of the present research is to suggest spectral characteristics of management for floods by using RS, GIS, GPS Cell.

Methodology

The methodology of data collection and data basing required for flood hazard analysis and rainfall statistical analysis. Rainfall from 11 meteorological stations (tehsils) and stream flow data at 2 gauging stations (rivers). Daily rainfall data from 13 rainfall gauging stations for the same period were obtained from the Indian Meteorology Department. Details methodology and real time data analysis are show in fig. 01

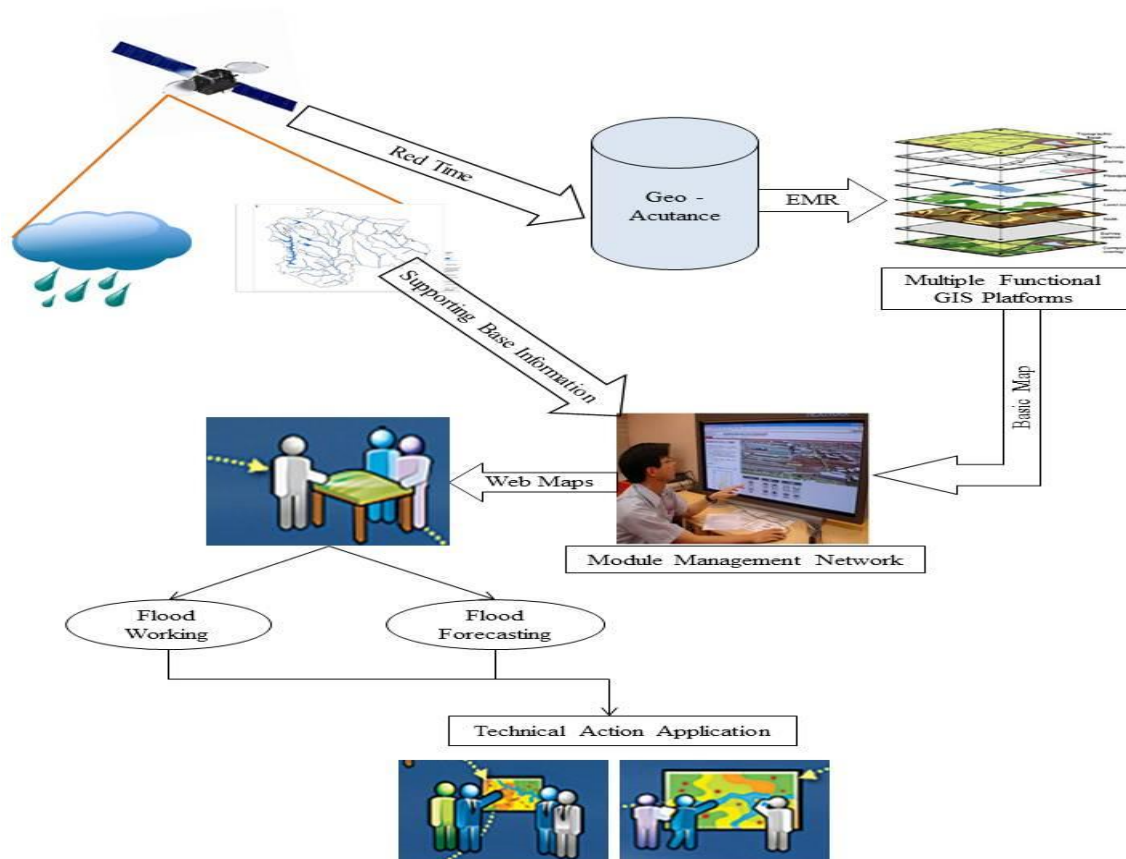


Fig. No. 01

Relief Of Flood And Its Management

For flood plan management the more needful to control the flood of Patan, Karad tehsils and Wai city in Satara district. In Patan tehsil villages are Patan city, Chopdarwadi, Maundraul Haveli, Khilarwadi, Sajur and Mhople. In Karad tehsil management for villages are old Sakurdi, Tambave, Old Supane, Yerwale, In Karad city (Preetisangam, Shikhurvarpeth, old Gote, Chawadichowk, some part of Rukmininagar, Mujawar colony), Karve, Kapil, Atake, Shere, Gondi, Rethare Bk. Kh., NavinmalkhedaKhubi etc. Also management of Wai city a specific for surrounded by GangapuriGhat, Marathi vishwakoshkaryalaya, DholyaGanapati and Shivajiudhyan chock etc.

Results And Disscutions

6.1 Flood Management

Flood is the natural phenomenon. It is not possible to remove too practically and economically but can be controlled. Hence, the following are suggested to flood disaster management of the district.

Flood Management Techniques

Krishna River covered the flood prone area in Patan and Karad tehsils in various villages. To use the following protection to control the flood affected region in the study area.

- Construction of embankment in Patan and Karad cities.

- Construction of emergency flood ways in more affected settlements to safety divers the population i.e. brides, increasing KT weir height and constructing water tanks etc.
- Construction of walls in river meander edge i.e. Maundral Haveli, Sajur, Belvade Haveli, Kapil, Atake, Rthare Budruk etc.
- In the basin areas afforestation and reforestation.
- Development of large scale capacity storage tanks in catchment areas.

6.1.1 Diversion Of Excess Flood Water

It has become necessary to provide more water for various sources for the agriculture and drinking requirements of these vast drought prone areas. Immediate relief to more assured way of diversion of excess flood water from flood affecting region (west side of district). The climatic phenomenon of the Krishna River is very complex physically observed in flood conditions. In the monsoon season continuous supply of flood water to relief the drought situation in the Manganga and Yerara dry rivers which cover Khandala, Phaltan, Man, Khatav and the eastern part of Koregaon and Karad tehsils.

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Cashless Transaction Is Most Popular

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Abstract :-

In banking technology banks have the opportunity to develop customized products and services to meet future expectations. Information technology is one of the most important facilitators of advantages for bank and its client. Information Technology is one of its transaction processing's well as other internal systems and processes. They are faster remittance facilities; include automatic tellers machines, telephone banking, home banking, credit cards facility, personal loans, including car loans, housing loans, and internet banking. The various technological platforms used by banks for their day-to-day operations, their manner of reporting and the manner in which reporting and interbank transactions and clearing are affected have evolved substantially over the years.

Introduction :-

In ancient times, account holders were largely satisfied with the services dispensed by branches of banks. They are faster remittance facilities, Automatic Teller machines, Telephone Banking, Home banking and credit card facility, Personal loans Housing Loans etc and Internet banking. Technology plays a prominent role in the design, development, and implementation of new Products. The Indian banking sector has made rapid efforts in reforming and creating new competitive business. Indian's banking sector has made rapid strides in reforming and aligning itself with a new competitive business. Bank branches become only one of the many channels that are now accessible to customers for performing banking trans sectors. The Indian banking system will further grow in size and complexity while acting as an important agent of economic growth and intermingling different aspects of the financial sector. The economic growth of the country is an indicator for the growth of the banking sector. Indian banks will become bigger and stronger, thereby entering a global consumer base. During the last 46 years, changes have taken place in the banking Industry. The bank maintains its traditional function and has been improving its services to the emerging needs of its customers.

The most significant recent technical advancement that has drastically transformed the entire scenario of providing services is the use of the Internet facility for service delivery. The number of people that have adapted this technological advancement for online transition, such as online shopping ,is increasing tremendously. That competitive environment and demanding customers compelled banks to adapt the e-banking concept.

The latest developments in Information Technology have also brought along a whole set of challenges to

deal with in new recent trends in India. Speedy changes in technology, complexities, high-cost security, data privacy, regulation and lack of trained manpower are some challenges faced by commercial banks in India.

Need for Technology in Banking:

Advancements in information technology in the banking industry have increased the processing speed of bank transactions and the communication system between banks and their customers. It is the need for an hour to extend e-banking services to banking customers so that the bank can maximize the benefits for the bank as well as for its customers. The importance of e-banking is growing day by day as it maximizes the advantages for bank and it's clients. E-banking provides economics to the operations as it enables banks to reduce their branch network and number of banking Staff. Banks started adopting more and more technological advancements, which resulted in enhancement of its efficiency .Now days internet banking is becoming an integral part of banking services.

1. Liberalization:
2. Bank deposits increase
3. Extension of Branches
4. Increasing Transactions

Objective of New Technology in Banking:

- To study the benefits and limitations of NET banking.
- To study emerging technology trends in the banking sector.
- To provide the utility of technology in banking with special reference to India.
- To see the current prospects of new banking trends in India.
- To provide immediate service to customers.
- To save time of customer bank.

- To Enhance its operating efficiency and provide better banking products and services ,bank has always been the pioneer in adapting at least technological advancement.

Importance of Technology in Banking.

Introduction of computer and other electronic technologies in banks has the following advantages, indicating the importance of such new technology in banking.

- Increase in efficiency: Efficient and quick services to customers can be provided with the help of modern technologies.
- Handling of Information: Creation of up-to-date monitoring and information systems and strengthening internal control, housekeeping, and reporting functions are provided, and the storage of information becomes easy.
- Cost reduction: There is a reduction in costs, including floor space, due to the use of modern technology.
- Accuracy: Clearing of cheque ,pass book entries ,inter branch and interbank reconciliation, and other functions.

Sources of new technology in Banking:

- 1) Digital account opening.
- 2) Person-to-person (P2P) payment
- 3) Customer relationship management (CRM)
- 4) New account/teller systems.
- 5) Commercial loan origination systems (LOS)

A] Mobile Banking :

“Mobile banking refer to the banking activities that are carried out on cell phone ,that is banking enabled, even while a person is on the move”. Mobile Banking scores over the internet Banking that is that enables ‘ anywhere anytime banking’. Customers do not need access to a computer terminal to access their bank accounts; now a day, they can do so on the go while waiting for the bus to work. The scale at which Mobile Banking has the potential to grow can be gauged by looking at the pace at which users are becoming mobile in these big Asian economies.

Mobile banking Services :

- Mini statements and checking of account history.
- Access to loan statements.
- Access to card statements.
- Pension plan management.
- Micropayment Handling
- Mobile recharging
- Bill Payment Services.

Technologies behind Mobile Banking :

Mobile Banking is being deployed using mobile applications developed in one of the following channels.

1. IVR (Interactive voice Response)
2. SMS (Short Messaging Services)
3. WAP (Wireless Access Control)
4. Standalone Mobile Application Clients.

Advantages of Mobile Banking:

- a) Always on 24*7 accesses
- b) Advanced Mobile Network Penetration
- c) Personalization
- d) WAP
- e) Faster data Processing Speed
- f) Security
- g) Mobile Payment

Disadvantages Of Mobile Banking:-

- a) Restricted Plans
- b) Technical Problems
- c) High Charges

B] ATMs: -

The Automatic Teller Machine is the most popular device in India. Customers to use withdraw their money 24*7 days a week . It is a device that allows customers with an ATM card to perform routine banking transactions without interacting with a human teller. The ATM system can be the most useful for payment utility bills, fund transfer accounts, and deposit cheques to account. The customer is identified at the ATM by inserting a plastic ATM card with magnetic strips with a chip that has a unique card number issued to the customer with the help of the ATM can cheque his/her last transaction and current balance cheque his/her mobile number through the ATM. Most use money transfer form on account to another account is possible with help of the ATM.

Features of ATM

- a) Anywhere banking
- b) Anytime Banking
- c) Safety
- d) User Interface
- e) Visual Message
- f) Swallowed Card
- g) ATMs Security

Advantages of ATMs

- 24 h Availability
- Convenient Place
- Privacy of operation
- No need for RBI permission
- No time limit for transactions
- Quick and efficient Services
- Fixed response to customers

Disadvantages of ATM's

- Limitation of withdrawals
- Restriction on cash Dispensation
- Limited functioning

C] Telebanking/phone banking:

Telephone banking sat flies customers with fast, anytime transactions and account information via telephone access. These systems use technology that keeps thee cost of delivering services very low. Telephone banking allows customers to access their accounts 247 days a week. A password is set for customers verification. Most Telephone banking service use. As well as customers can use phone phone banking to block internet banking user IDs.

Phone banking provides easy access for customers to conduct large business through telephone. Tele banking phone technology has gone a long way in providing maximum customer satisfaction within limited infrastructure.

D] Internet Banking:

E-banking has undergone liberalization, and the regulation process that started in 1991-92 has made a drastic change in the Indian banking system. The latest developments in information technology have also brought along a whole set of challenges faced by commercial banks in India. The success of internet banking operation totally depends on a well-designed website of the bank. E-banking has been prevailing in India around sometime in the form of an automated teller machine.

Advantages Of Internet Banking:

- Use of the World Wide Web
- Help selling products
- Total Elimination of manual processing of data.

E] Electronic payment services

E-banking is a term that includes the entire information technology revolution that has taken place in the banking industry. India is a harbinger to the introduction of an e-cheque. E-banking has helped banks to retain the current customers who deliver services to customers. E-banking helps customers as well as banks by overcoming the drawbacks of manual systems as computers are capable of storing data as per the requirement of customers. E-payment services are unfit for banks to help in reducing the cost of delivering the service to the customers website will reduce the workload on employees and need to invest more on relevant infrastructure and most benefit to customers online purchase of goods and service, can account balance check the progress of their investment and E-banking delivers 24 *7 service to customers, so easy cheque to account information quickly

New Technology in Banking and Challenges

Effects

Banks should maintain adequate leverage between the advantages and risks of e-banking. marketing and advertising campaigns initiated by banks encourage a number of customers to adapt e-banking, but for managing such a huge customer base, banks need to prepare their internal systems on a prior basis. Now, e-banking has enabled banking beyond geographical boundaries. Banks have local and international customers to process their requests or solve their problems. Through technology, the threat of cyber attacks, a loophole in the system, millions of data can be lost in the blink of an eye.

Challenges

- Block chain Technology.
- Upgraded ATMs.
- Proliferation of Non-Banks. .
- Apple Store-Style Experience.
- Automated Financial Services Employees

•Mobile and Digital Banking

•Partnerships

•Wearable's

F] Google pays

According to the payments app, it has 67 million users in India as its largest single market. Google pay in a POS setting between ten search out of 10 saying they used Google pay during this same time for online payment. In India, eight out of ten consumers use Google pay, which is three times more than in the US over more than one billion people in India have started using mobile POS payments, bringing the total number of users to 1.6 billion in 2023. In the first five years, Google pay is most popular in India, with 150 million users across 42 global markets using Google pay and other online payment services. The app is one of the go-to payment options for consumers and retailers in a sea of casteless options to pay in March 2024 in India. Eight out of ten consumers use Goggle Pay. This is three times more than one billion people in India have started using mobile phone payments. The total number of users reached 1.6 billion in 2023. The mobile payment market Google had 2008 market share in comparison to the pay-tem business. According to a waiter, the payments app has 67 million users in India as its largest single market. Google pay in a pos setting between April 2023 and march 2024 with an additional search out of 10 saying they used Google pay during this same time few online payments.

G] Pay tm

Pay Tm started the digital revolution in India, and we further became India's leading payments app. Today, more than 20 million merchants and businesses are powered by pay tm to accept payment digitalis. This is more than 1300 million Indians use pay tm to pay at their stores. Pay tem founded in 2010 started as a digital wallet service but has since expanded its services and gained popularity in India due to its user friendly inter face wide acceptance among merchants and various cash back and discount offers.

H] Phone pe

Phone pe was founded in 2015, but within a year, it was acquired by the Flip Card Instant Company and gained even more popularity among the Indian guidance. The company has made a remarkable journey, reaching a valuation of over 12 million in 2023. Phone pe is a payments app that allows your phone to use BHIM UPI, your credit card, debit card, or wallet to recharge your mobile phone pe all of your utility bills. Phone pe ranks second among competitors, including pay tm. Phone pay pg is PCI DSS compliant and offers capabilities Ensuring 100% secure transactions Phone pe is highly secure, including a UPI PIN to ensure that your transactions are safe and secure. Phones also have an allowance of Rs 1 lakh

per transaction, which adds on extra layers of security.

Conclusion:

Cashless transaction via this method is essential because it is safe. Even for transactions as low as RMS, we can use a QR code, which is easy and secure. It is helpful for disabled individuals like me. Cashless payments can help reduce cash for individuals' businesses and governments; there are different types of payment modes in a cashless economy. Mobile wallets, such as net Banking and plastic money, are among the most common payment modes in India.

The Indian banking system will further grow in size and complexity as an important driver of economic growth. Banking is re-engineered using information technology. Economic growth is an indicator of the growth of the sector. All commercial banks these days deliver this service to their valuable customers. Electronic and traditional media (branch banking) are found to be complementary to each other. Therefore, bank staff

have a vital role to play in influencing customers, achieving success, and implementing technological service innovations in banks. Technology infusion has also positively affected the service quality of banking offerings. Six technologically influential determinants of service quality have been identified, significantly defining the overall service quality of e-banking services. Service quality itself was found to be a significant explanatory factor for customers' e-banking usage, which further drives IT propagation in the bank

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An Analytical Study of Black Identity & Nationalism in Ralph Ellison's Select Novel

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Abstract:

This abstract explores the complex problem of identity crisis, looking at its causes, expressions, and effects within the framework of modern society. People frequently struggle with issues of identity, belonging, and values in a world that is becoming more interconnected and changing at a rapid pace. Numerous elements, including globalization, cultural hybridity, societal expectations, and individual experiences, are contributing to this identity crisis. It manifests in diverse forms, including struggles with cultural, ethnic, gender, religious, and professional identities. This abstract investigates the psychological, sociological, and cultural aspects of identity crisis in an attempt to decipher its complexities. It investigates how identity crises start, develop, and affect people's mental health, interpersonal connections, and sense of belonging by utilizing interdisciplinary viewpoints.

Keywords: Crisis of identity, modern world, globalization, cultural hybridity, societal expectations, psychological, sociological, cultural dimensions, self-discovery, community support, diversity, inclusion.

Introduction:

This abstract explores the complex problem of Identity Crisis, Looking Ralph Ellison is one of the several Negro authors who have made their mark in American literature of the twentieth century. The son of ordinary parents of the working class, he was born on the 1st March, 1914 in Oklahoma City. As a boy he showed important interest in mechanical goods analogous as radio-sets, and, during the same period, he also gave validation of his musical knowledge. Subsequently, he made a regular study of the technical aspects of classical music, but felt more particularly drawn towards jazz and, for a time, worked as a musician. He also worked as a garçon in caffs and also he sprang a surprise on the reading public by producing the new inconspicuous Man in 1952. He would surely been writing magazine papers and indeed working as the editor of a journal called " Negro Quarterly". A Philanthropist of Several Awards Ellison has entered several awards for his erudite work, the most notable among them being the National Book Award for his inconspicuous Man. In fact, notation has not been his only interest in life.

He has worked at various universities as a speaker and in 1963 the degree of Doctor of Philosophy in Humane Letters was conferred on him by the University of Tuskegee. The Major Themes An inconspicuous' and " Juneteenth", Ellison regards himself as an author recording the mortal condition.

Although inconspicuous Man is a new primarily about the life of Negroes in the U.S.A., and their upset relationship with the whites in that country, yet this novel has wider implications too. The protagonist in this novel may be regarded as representing the sense of souring and of loneliness of the modern man in general; and he may also be regarded as representing a common man's hopeless yearning to establish his own individuality and his identity as a mortal being. But the new deals primarily with the black man's problems in the U.S.A., and is particularly predicated on Ellison's own exploits as a citizen of that country. The protagonist is a Negro from one of the Southern States of America, as Ellison himself is.

Social Consciousness of the black

Black Knowledge can be described as awareness amongst black people that their mortal identity hinges on the fact that they are black. Black people are proud of their skin color, and alive of the fact that they have their own black history and culture, differing from those of whites. They had no r accept being judged according to white values and morals. Black knowledge is an station towards life. Black knowledge philosophy' has sought to place itself as an anticipant, reflexive moment of Black tone- knowledge in the face of White superiority and White supremacy. This was vindicated that Black knowledge is an station of mind and a way of life, the most positive world for a

long time. The generality goes to accept further alive of their own cultural value systems, their socio-profitable and political values. The Blacks were n't allowed to partake the dreams and achievements of America, though they had contributed their toil, rips and blood to the growth and glory of the United States of America. The Blacks were tromped under the heavy heels of American history. To the Whites, America was a paradise of liberty, wealth and happiness; but to the Blacks, it was an conflagration of slavery, poverty and anguish. And yet the New World has brewed large in the dreams of the Afro- Americans as a promised land.

This means that black people rejected people of America on the base of the color with systems forced upon them by the tyrannizers the culture of the people was declared. In response to this domination, Black knowledge surfaced as an relief for Black people to search out their value systems that were despised by the colonialists. The description of Black knowledge Movement as not just as resistance testament; it was about quality about the essential wholeness of a singular being who knew himself. Runner. history of the black When we see the history of the black, The they were victim of the white society. The Blacks constitute an tyrannized nonage in the United States of America. They are the most tyrannized and exploited people in the world.

They have been oppressed and exploited racially. culturally, socially, economically and politically. Their race has been annihilated, their culture has been ruined, their languages have been extinguished, and they have been ruthlessly confined to brutish conditions of life for further than three centuries. They are the "transplanted" Americans who were completaly stripped of their history and heritage. In a word, their identity was strongly snared down from them by their fortune and the white men in the New World. Black literature had been begun primarily in the decade of 1619, when in the month of August most African-Americans are the descendants of locked Africans held in the United States from 1619 to 1865. They were being started to sell, from this moment Black come slaves. Blacks were explosively caught from African landmass and sold in the America wares, which were the topmost personality of Black mortal values and the extreme limit of mortal sick intelligence. 4 It's not enough but American people of white Society bought Black for their land civilization as if they were brutes.

White society burgled on their domestic and made them slave explosively. We ca n't imagine such a horrible importunity of Black from the white society which they endured. Talking about such a discipline of Blackism, we came to know that it was the daily course of white people to

beat black until death and buried them alive; pregnant women were given truly tough work. So, they suffer with cancellation . They were squinched to their hands and hanged on the wall. They were feed by cutting their observance. White people knew that if the number of slaves increased, they would insurgency against the American system. They separated the Black, children were sold and diverted from their ma, husband from his woman In 1706, Network, there was made a law which said that being a Christian bone can not conclude Black slavery. It meant that system was n't ready to accept them as their own. relative Study of Ralph Ellison And Richard Wright And Other Black America Richard Wright, James Baldwin and other Black American pens of this century veritably explosively expressed their studies, passions and feelings in their erudite work. Ralph Ellison's erudite concern too is the identity of the Black American. His jotting fictional and non- fictional is a variation on the theme of identity. He revolutionary wrote against of established culture as well particular identity of the pen's himself. Ellison has written his fabrication in the light of his particular gests and in the shadow of his history. It's particular experience that gives one an sapience into life, for it's part of one's history. The act of writing Ellison says" requires a constant plunging back into the shadow of the history where time hovers ghostlike." We should know, thus, the man and his history to understand his work in its thematic and aesthetic aspects.

Ellison has been relentlessly condemned for the last four centuries in the land of 4 Liberty. But his tone is n't as bitter as that of Richard Wright or James Baldwin. His obsession also has been to define and bandy what it means to be a Black man in the white man's world. Richard Wrigh, suffered from artistic starvation and James Baldwin from emotional castration. To Richard Wright America was an conflagration and to Baldwin she's just a limbo. But to Ralph Ellison she's a home with pleasures and pains. He's a Black pen with a different fortune. Richard Wright and James Baldwin have numerous particular injuries to show. America has ruthlessly refused, they say, to heal their injuries. Ellison has suffered tête-à-tête neither from artistic starvation nor from cerebral castration. His early gests were n't traumatic. The social terrain and the family background in which he was born and brought up were significantly different. Black was acted about invalidation of slavery. Ellison writes" therefore it had no tradition of slavery", there was insulated, connections between the races were more fluid and therefore more mortal than in the old slave countries.

The emancipated Negroes, the white militant mind was in the mood of restoring slavery in other brutal and blatant forms Oklahoma. The last and the forty- sixth state, had no slavery"

either to abolish or to restore; and no painful recollections either to forget or to recollect. Ellison's parents, like utmost other Blacks, had come to the Oklahoma state looking for broader freedom. Black settlers assessed upon them unjust restrictions and limitations and abridged their freedom. But the Blacks were n't subdued and had n't lost the "frontier" spirit. They were n't apprehensive of their "place" in the white man's world, but they were recalcitrant and militant enough to affirm the way of their life. The Blacks in this home of America affirmed their masculinity and celebrated their humanity. They asserted their due and regardful "place" in the world. They were in full possession of their ethnical identity in malignancy of the limitations and restrictions assessed by the whites upon their freedom. Ellison says, " I honored 2 limitations, yes; but I allowed these limitations were unjust and I felt no ingrain sense of inferiority which would keep me from getting those effects I asked out of life." His life held out a meaning and a communication for his future. The problem with utmost Black boys and 4 girls is that they feel "ingrain sense of inferiority." As a boy, Ellison asked to be a part of the larger world which girdled the Black world into which he was born.

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An Analytical Study :Portrayal of Caste in Hindi Cinema

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Abstract:

Cinema provides in-depth information about the various things of the past as well as the current happenings. Cinema is closely related to the life of common man and the principle that define human society. The understanding of cinema lies in culture. The components of meaning in cinematic articulation are inseparable from various social, intellectual and cultural developments. The journey of Hindi cinema to Bollywood is shaped through different aspects such as production houses, international market, global fan followings, etc. Looking at India's film production from 2005 to 2013 has seen an enormous growth. Every year thousands of films are made. In the year 2013, India has produced 1724 feature films. India's leadership in the international film market is reported as 66% during the 2005-2013 periods (UIS database, 2016). Despite such enhancement of the Hindi film production, the anti-caste discourse yet not presented at the upfront level. Although caste is a pivotal social reality in India, but in the popular narratives of Hindi cinema, very few movies have focused on the question of Caste.

Introduction:

Watching movies provides us with a broad spectrum of information regarding both historical and current events. Movies showcase the everyday life of an ordinary person. Film is in sync with the average person's life, and it is closely linked to human society. Film and culture are also strongly interconnected. Receives. Different socio-intellectual and cultural advancements are depicted in film, forming a crucial component of the medium. An in-depth examination of the evolution of the Hindi film industry into Bollywood can be done by looking at key factors such as production house, international market, and global fan base. Nation-pride is a prominent subject in Indian films and plays a crucial role in the nation's development. In her significant article "Indian Films and Bahujan Audience," renowned writer Jyoti Nisha thoroughly examines the evolution of Indian films from the 1930s to the 1950s and their impact on Indian society, highlighting the role of cinema within the community. The role of Indian cinema in showcasing Indian culture and uniting the nation is drawing widespread interest. Indian cinema's role in the Swadeshi

movement's success is highly valued In her major article, "History of Indian Nationalism," Nisha highlights the significant oversight in Indian cinema regarding the representation of marginalized communities. She points out that the history of individuals like Dr. Babasaheb Ambedkar and the experiences of the marginalized have been largely overlooked by filmmakers, who have instead chosen to exclude these narratives. This omission is seen as a grave error in the history of Indian cinema. However, there is a glimmer of hope in

recent times. A new era has dawned in Indian cinema, challenging traditional caste hierarchies by portraying the realities of Dalit life on the big screen. This shift marks a significant change in the industry, establishing a new discourse and image for the Bahujan community within the mainstream of Indian cinema.

Yogesh Maitreya, in his article from 2020, sheds light on the emergence of a Dalit hero. He argues that Dalit heroes are seldom featured in literature and cinema, despite their significant role in shaping narratives. The caste of the storyteller is recognized as playing a crucial role in the portrayal of such stories. In addition to mainstream Hindi cinema, the regional cinema has also seen significant shift in the way it approaches the question of caste. The filmmakers like Nagraj Manjule, through his movies like Fandry and Sairat has captured the critical nuances of caste realities and brought it on the big screen. The idea of protagonist shown in these films is no more submissive to the caste structures, rather it valiantly asserts and challenges everyday caste biases and politics through their existential structure. Hrishikesh Ingle (2018) discusses Manjule as a catalyst in bringing marginal narratives to mainstream Marathi film industry and the subsequent changes that have come about in his wake in the Marathi cultural sphere. Manjule's film narratives and writings foreground anti-caste aesthetics rooted in the artistic experience.

Yengde (2018) argues that films tend to portray a dominant caste/dominant Hindu society, offering subaltern subjects only a limited form of escapism; through cinema, Brahmins and allied castes have actively imposed their hegemony on the medium of

mainstream cultural expression. For example, celebrating a Brahman marriage, or exulting in savarna traditions in everyday films in no way relates to Dalit Bahujan discourse or culture. By obscuring Dalit-Bahujan narratives, these films evoke an imagined utopia that does not speak to the majority of the population. The ability to participate in the utopia on screen is therefore limited by the project of graded caste hierarchy, and this arrangement further estranges Dalit-Bahujans from mainstream culture

The advent of this consciousness in the film making in portraying the caste have sought the attention of mainstream Bollywood industry as well and provided alternative imagination of caste shown on the big screen. The films like *Jait Re Jait*, *Mukta*, *Dr. Ambedkar*, *Umbartha*, *Fandry*, *Khawda*, *Jogwa*, *Court*, *Kastoori*, *Mhorkya* has shown the innovative ways of capturing the caste and challenged the mainstream gaze that places Dalits as dormant or submissive

Objectives:

To understand the portrayal of caste in Select Hindi cinema

To analyze the changed approach in portraying the caste particularly by Dalit film makers such as Pa Ranjith etc.

To understand the language, symbols and character in relation to film maker's background, experience and sensitivities

To understand the socio-political conditions in which the caste has become pressing need and question for Hindi cinema makers

The present research aims to bridge the gap in literature that addresses the question of caste in film making. Particularly emphasis on portrayal of caste in Hindi cinema will sensitize the audience in understanding the cinema as social reality as well as make a academic contribution in the larger analytical studies that focuses on the films and

other visual mediums such as TV etc. It will also sensitize the film makers who are indifferent and less sensitive to the caste realities.

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Open Access Initiatives: Advancing Knowledge Dissemination And Scholarly Communication

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Abstract:

This paper explores the impact and significance of open access initiatives in advancing scholarly communication and fostering greater accessibility to research outputs. Through a comprehensive review of existing literature and case studies, the paper examines the evolution of open access models, their benefits and challenges, and their implications for various stakeholders, including researchers, academic institutions, publishers, and the public. Additionally, by promoting unrestricted access to research findings, open access initiatives have the potential to speed up the pace of systematic discovery, promote interdisciplinary collaboration, and democratize knowledge dissemination. However, challenges remain, including sustainability, quality control, and equitable access in diverse global contexts.

Keywords: Open Access, Scholarly Communication, Knowledge Dissemination, Academic Publishing, Institutional Repositories, Open Access Journals, Open Licensing, Accessibility, Research Impact etc.

Introduction:

Open access initiatives have changed scholarly communication by changing traditional models of publication and distribution of research results. Open access principles have been embraced across academic disciplines and institutions worldwide in recent years due to the spread of digital technologies and the growing awareness of the importance of unobstructed access to knowledge. By removing barriers to access and promoting the free exchange of research outputs, open access initiatives have the potential to democratize knowledge dissemination, accelerate scientific discovery, and foster interdisciplinary collaboration.

This study aims to provide an in detail exploration of open access initiatives, their impact, significance, profit, and challenges in advancing knowledge dissemination and scholarly communication. Through a comprehensive review of existing literature, case studies, and examples, the paper will examine the evolution of open access models, their implications for various stakeholders, and key strategies and best practices for their implementation.

This paper aims to broaden our understanding of the role of open access initiatives in advancing knowledge dissemination and scholarly communication in the digital age by highlighting the many facets of open access and its implications for publishers, academic institutions, research institutions, and the general public. Additionally, it will provide insight and suggestions for future pathways in open access advocacy, policy development, and scholarly publishing practices.

The goal is to maximize the benefits of open access initiatives for the broader society and the global research community.

1.1 Background of The Study:

The traditional model of scholarly publishing, characterized by subscription-based journals and restrictive access policies, has long been criticized for its barriers to knowledge dissemination and limited accessibility to research findings. Scholars, researchers, and institutions have often faced challenges in accessing scholarly literature, particularly those from resource-constrained settings, leading to concerns about equity, inclusivity, and the efficiency of the scholarly communication system.

Open access initiatives encompass a range of models and strategies, including institutional repositories, open access journals, and open licensing frameworks, each with its unique approach to promoting unrestricted access to scholarly literature.

Against this backdrop, understanding the evolution, impact, benefits, and challenges of open access initiatives is crucial for informing discussions, shaping policies, and advancing scholarly communication in the digital age. This paper seeks to provide a comprehensive examination of open access initiatives, their significance, implications, and future directions, with the aim of contributing to a deeper understanding of their role in advancing knowledge dissemination and scholarly communication.

Scope Of The Study:

The study aims to supply a comprehensive study of open access initiatives and

their role in advancing knowledge dissemination and scholarly communication. The scope of the study encompasses the following key areas:

- **Evolution of Open Access:** The study will explore the historical development of open access models, key milestones, and initiatives that have shaped the open access movement over time.
- **Benefits of Open Access:** An examination of the benefits of open access, including enhanced accessibility to research outputs, accelerated scientific discovery, increased research impact, and facilitation of interdisciplinary collaboration.
- **Challenges and Limitations:** A discussion of the challenges and limitations associated with open access initiatives, including issues related to sustainability, quality control, equity, and copyright.
- **Open Access Models and Strategies:** An overview of various open access models and strategies, such as institutional repositories, open access journals, hybrid models, and open licensing frameworks.
- **Future Directions and Recommendations:** Examination of future directions and recommendations for advancing open access advocacy, policy development, technological innovation, institutional support, and scholarly publishing practices.

The study will draw on a range of scholarly literature, reports, case studies, and examples to provide a comprehensive overview of open access initiatives and their impact on scholarly communication. It will also offer insights and recommendations for stakeholders, including researchers, academic institutions, publishers, funding agencies, and policymakers, to promote the adoption and implementation of open access principles and practices.

1.3 Objectives Of The Study:

- To look at how open access initiatives have grown over time, including how open access models have grown, important milestones, and efforts that have shaped the open access movement.
- To examine the benefits of open access in advancing knowledge dissemination and scholarly communication, including enhanced accessibility to research outputs, accelerated scientific discovery, increased research impact, and facilitation of interdisciplinary collaboration.
- To identify and analyze the challenges and limitations associated with open access initiatives, including issues related to sustainability, quality control, equity, and copyright.

- To offer an indication of various open access models and strategies, such as institutional repositories, open access journals, hybrid models, and open licensing frameworks, and their implications for scholarly communication.
- To investigate case studies and best practices from successful open access initiatives, highlighting lessons learned, key success factors, and implications for scholarly communication.
- To explore future directions and recommendations for advancing open access advocacy, policy development, technological innovation, institutional support, and scholarly publishing practices, aimed at maximizing the benefits of open access initiatives for the research community and society at large.

The Evolution of Open Access Initiatives:

The evolution of open access initiatives represents a transformative shift in scholarly communication, aiming to make research outputs freely and frankly available to the global community. The historical development of open access models has been influenced by various factors, including technological advancements, changing scholarly communication practices, and advocacy efforts. This section explores the evolution of open access initiatives, highlighting key milestones, initiatives, and developments that have shaped the open access movement over time.

- **Early Foundations:** The heredity of the open access movement can be traced rear to the near the beginning days of the internet, with pioneers such as Paul Ginsparg's arXiv preprint server (founded in 1991) and Stevan Harnad's Subversive Proposal (1994) laying the groundwork for open access principles. These early initiatives emphasized the importance of freely sharing research findings within the academic community.
- **Growth of Institutional Repositories:** Institutional repositories emerged as a key mechanism for implementing open access policies at academic institutions. Many universities and research organizations established institutional repositories to archive and disseminate research outputs, including articles, theses, and data sets, thereby raising the visibility and impact of their scholarly work.
- **Open Access Journals:** Open access journals operate under various business models, including author-pays, sponsor-supported, and community-supported models, enabling researchers to publish their work without financial barriers to readers.
- **Policy Developments and Mandates:** Governments, funding agencies, and research institutions have increasingly adopted open

access policies and mandates to promote the dissemination of openly funded research.

- **Technological Innovations:** Advances in digital technologies, including digital repositories, open access publishing platforms, and online collaboration tools, have facilitated the growth of open access initiatives. These technologies have streamlined the process of publishing, disseminating, and accessing research outputs, making open access more feasible and sustainable.

However, challenges remain, including issues related to sustainability, quality control, and equitable access. Continued efforts and collaboration among stakeholders are needed to address these challenges and realize the full potential of open access initiatives in advancing scholarly communication.

Benefit Of Open Access:

The adoption of open access initiatives has led to numerous benefits for the research community, academia, and society at large. These benefits include:

- **Enhanced Accessibility:** Open access initiatives make research outputs freely and openly available to anyone with an internet connection, removing financial, legal, and technical barriers to access. This increased accessibility ensures that scholarly literature is available to researchers, students, policymakers, healthcare professionals, educators, and the general public, regardless of their institutional affiliation or geographic location.
- **Accelerated Scientific Discovery:** By facilitating unrestricted access to research findings, open access initiatives accelerate the pace of scientific discovery and innovation. Open access also promotes collaboration and interdisciplinary research, as researchers from different disciplines can easily access and share relevant literature.
- **Increased Research Impact:** Open access publications are more widely read, cited, and disseminated than their subscription-based counterparts. Studies have shown that open access articles receive more downloads, views, and citations, leading to greater visibility and impact for authors' research. Open access publications also contribute to the broader dissemination of knowledge, enabling researchers to reach larger audiences and make a greater societal impact.
- **Facilitation of Interdisciplinary Collaboration:** Open access initiatives promote collaboration and knowledge sharing across disciplinary boundaries. Researchers from different fields can access and engage with each other's work more easily, leading to interdisciplinary collaborations and the

synthesis of diverse perspectives. This interdisciplinary approach fosters innovation and creativity, leading to the development of novel solutions to complex research problems.

- **Public Engagement and Societal Impact:** Open access initiatives promote public engagement with research and scholarship, allowing members of the public to access and benefit from the latest scientific findings. Open access publications on topics such as health, environment, and social sciences can inform public policy, education, and decision-making, leading to positive societal impacts and improvements in quality of life.
- **Cost Savings for Institutions and Libraries:** Open access initiatives can reduce the financial burden on academic institutions and libraries by eliminating subscription costs for access to scholarly literature. Institutions can redirect resources towards other priorities, such as research, teaching, and infrastructure development, leading to greater efficiency and effectiveness in resource allocation.
- **Preservation and Long-Term Access:** Open access initiatives contribute to the preservation and long-term accessibility of scholarly literature by ensuring that research outputs are archived and available in digital repositories. This preservation ensures that research findings remain accessible for future generations, contributing to the cumulative advancement of knowledge over time.

Challenges And Limitations:

There are several key challenges and limitations include:

- **Sustainability:** Many open access initiatives struggle to achieve financial sustainability due to the absence of subscription revenue streams. Author-pays models, where authors are charged publication fees to cover publishing costs, may pose financial barriers for researchers, particularly those from resource-constrained settings. Sustainable funding models are needed to ensure the long-term viability of open access initiatives.
- **Equity and Inclusivity:** Unequal access to reliable internet connectivity, digital literacy, and research funding can hinder participation in open access initiatives and exacerbate global knowledge inequalities. Efforts to promote equitable access to open access resources and support capacity-building initiatives in underserved regions are needed to address these disparities.
- **Copyright and Licensing Issues:** Open access initiatives often rely on open licensing frameworks, such as Creative Commons licenses, to specify the terms of use and reuse of research outputs. However, navigating copyright

issues, including licensing agreements with authors and publishers, can be complex and time-consuming. Clear guidance and legal frameworks are needed to ensure that authors retain the rights to their work and that open access publications comply with copyright laws and regulations.

- **Resistance from Traditional Publishers:** Overcoming resistance from traditional publishers and promoting widespread adoption of open access principles require advocacy efforts, policy changes, and collaboration among stakeholders.

- **Long-Term Preservation:** Ensuring the long-term preservation and accessibility of open access publications is essential for maintaining the integrity of the scholarly record. Digital repositories and archives must implement robust preservation strategies, including backup systems, format migration, and metadata management, to prevent data loss and degradation over time. Sustainable funding and institutional support are needed to maintain and update preservation infrastructure.

- **Metrics and Evaluation:** Traditional metrics, such as journal impact factors, may not accurately reflect the impact and quality of open access publications. Alternative metrics, such as article-level metrics and altmetrics, are needed to assess the reach, influence, and societal impact of open access research outputs. Standardized evaluation criteria and metrics that account for the diverse forms of scholarly communication are essential for recognizing and rewarding contributions to open access initiatives.

Addressing these challenges and limitations requires collaboration among researchers, publishers, funding agencies, policymakers, and other stakeholders. By working together to overcome these obstacles, open access initiatives can continue to advance knowledge dissemination and scholarly communication in the digital age, making research outputs more accessible, equitable, and impactful for the global research community and society at large.

Open Access Models And Strategies:

Open access initiatives employ various models and strategies to make research outputs freely and openly accessible to the global community. These models and strategies include:

- **Institutional Repositories:** Institutional repositories are digital platforms maintained by academic institutions to archive and disseminate research outputs, including articles, theses, dissertations, datasets, and multimedia materials. Institutional repositories provide researchers with a centralized platform to deposit and share their work, increasing the visibility and accessibility of institutional research outputs. Many institutional repositories

operate on open access principles, offering unrestricted access to their contents to users worldwide.

- **Open Access Journals:** Open access journals publish scholarly articles and research findings that are freely available to readers without subscription or access fees. Open access journals operate under various business models, including author-pays, where authors cover publication fees, sponsor-supported, where funding agencies or institutions sponsor publication costs, and community-supported, where journals rely on community donations or membership fees. Open access journals adhere to open access principles, allowing readers to access, download, and reuse published articles without restrictions.
- **Gold Open Access (Author-Pays):** Gold open access involves authors paying publication fees, often referred to as article processing charges (APCs), to publish their work in open access journals. Gold open access journals make articles freely available to readers immediately upon publication, with no access fees or subscription required. APCs cover the costs of peer review, editorial processing, production, and hosting of published articles. Gold open access journals may offer various levels of access and licensing options, such as CC BY licenses, to authors and readers.
- **Diamond Open Access (Community-Supported):** Diamond open access journals are fully funded by academic institutions, scholarly societies, or philanthropic organizations, allowing them to offer free access to all published content without charging publication fees to authors. Diamond open access journals rely on community support, donations, or institutional subsidies to cover operating costs and ensure sustainability. Diamond open access journals prioritize accessibility, quality, and scholarly integrity, often operating on a non-profit or cost-recovery basis.

These open access models and strategies offer researchers and institutions a range of options for disseminating research outputs openly and promoting the free exchange of knowledge. Each model has its advantages and challenges, and the choice of model depends on factors such as disciplinary norms, funding availability, institutional policies, and author preferences.

Case Studies And Best Practices:

Case studies and best practices from successful open access initiatives offer valuable insights into the implementation and impact of open access models and strategies. Here are some examples:

- **PLOS (Public Library of Science):** PLOS pioneered the gold open access model, where

authors pay publication fees to cover publishing costs, and articles are freely accessible to readers upon publication. PLOS journals are known for their rigorous peer review process, editorial transparency, and commitment to open access principles. PLOS has demonstrated the viability of sustainable open access publishing and has become a leading advocate for open science and scholarly communication.

- **arXiv:** arXiv is an online repository for preprints in the fields of physics, mathematics, computer science, quantitative biology, quantitative finance, and statistics. Founded in 1991 by physicist Paul Ginsparg, arXiv allows researchers to share their research findings openly and rapidly with the global scientific community before formal peer review. arXiv operates on the green open access model, where authors self-archive their preprints without payment of publication fees. arXiv has become a vital resource for researchers to disseminate and discover cutting-edge research, facilitating collaboration, and accelerating scientific discovery.
- **DOAJ (Directory of Open Access Journals):**
DOAJ is a directory of open access journals that adhere to high-quality standards and best practices in open access publishing. DOAJ provides a searchable database of reputable open access journals across disciplines, helping researchers identify trustworthy sources of open access literature. DOAJ offers guidance to publishers on open access policies, licensing requirements, and best practices for sustainable publishing. DOAJ plays a crucial role in promoting the visibility and credibility of open access journals and supporting the growth of open access publishing worldwide.
- **SCOAP3 (Sponsoring Consortium for Open Access Publishing in Particle Physics):** SCOAP3 is a global initiative that facilitates open access publishing in high-energy physics. Launched in 2014, SCOAP3 is funded by a consortium of libraries, research institutions, and funding agencies, which collectively cover the costs of open access publishing in a selected set of high-energy physics journals. By shifting subscription funds to support open access publishing, SCOAP3 has transformed the landscape of particle physics publishing, making thousands of articles freely available to researchers worldwide without author publication fees.
- **PubMed Central:** PMC archives and provides access to full-text articles from a diverse range of biomedical journals, ensuring long-term preservation and accessibility of research outputs. Authors can deposit their manuscripts in PMC to comply with funding agency

policies, such as the NIH Public Access Policy, which requires NIH-funded research to be made publicly accessible through PMC within a designated embargo period.

These case studies highlight successful examples of open access initiatives that have had a positive impact on knowledge dissemination, scholarly communication, and research collaboration. By adopting best practices, embracing open access principles, and leveraging innovative publishing models, stakeholders can contribute to advancing open science and making research outputs more accessible, transparent, and impactful for the global research community and society at large.

Future Directions And Recommendations:

Future Directions and Recommendations for advancing open access initiatives and promoting knowledge dissemination and scholarly communication include:

7.1 Policy Development And Advocacy:

- Encourage governments, funding agencies, and research institutions to make open access policies and mandates stricter.
- Advocate for the creation of legislative frameworks and financing options to support open access publishing.
- Collaborate with advocacy groups, policymakers, and stakeholders to raise awareness of the benefits of open access and push for changes in laws that support its adoption.

7.2 Technological Innovation And Infrastructure:

- Invest in the development of open access infrastructure, including digital repositories, publishing platforms, and preservation systems.
- Leverage emerging technologies, such as block chain and decentralized networks, to enhance the security, transparency, and interoperability of open access initiatives.
- Support the integration of open access tools and services into existing scholarly communication workflows to streamline the publishing process and enhance accessibility.

7.3 Community Engagement And Capacity Building:

- Foster collaboration and knowledge sharing among researchers, publishers, libraries, and other stakeholders to promote open access principles and practices.
- Provide training, resources, and support for researchers, editors, and librarians to navigate open access publishing, copyright issues, and licensing requirements.
- Engage with underserved communities and regions to address disparities in access to digital infrastructure and resources and promote inclusivity in open access initiatives.

7.4 Quality Assurance And Evaluation:

Develop transparent and robust quality assurance mechanisms for open access publications, including rigorous peer review processes and editorial standards.

Establish standardized evaluation criteria and metrics for assessing the impact, reach, and quality of open access research outputs.

Encourage researchers and institutions to prioritize open access publications in tenure and promotion decisions and recognize the contributions of open access advocates and practitioners.

7.5 Funding And Sustainability:

Explore diverse funding models and revenue streams to ensure the financial sustainability of open access initiatives, including institutional support, consortia agreements, and collaborative funding arrangements.

Encourage publishers to adopt fair and transparent pricing models for open access publishing, including waivers and discounts for authors from low- and middle-income countries.

Promote cost-sharing and cost-recovery approaches to funding open access initiatives, leveraging community support, philanthropic donations, and public-private partnerships.

7.6 Global Collaboration and Partnerships:

Foster international collaboration and partnerships to address global challenges in open access publishing, including language barriers, cultural differences, and legal frameworks.

Support the development of regional and national open access initiatives and networks to promote collaboration, advocacy, and capacity building at the grassroots level.

Engage with multilateral organizations, such as UNESCO and the World Health Organization (WHO), to promote open access as a driver of sustainable development, innovation, and knowledge sharing on a global scale.

Open access has the likely to democratize access to knowledge, accelerate scientific discovery, and address pressing global challenges, making it essential for researchers, institutions, publishers, and policymakers to collaborate and invest in its continued development and implementation.

Conclusions:

In conclusion, the evolution of open access models and strategies, driven by technological innovation, policy development, and advocacy efforts, has led to numerous benefits for the research community, academia, and society at large. By removing barriers to access and promoting the free exchange of research findings, open access initiatives have enhanced accessibility to scholarly

literature, accelerated scientific discovery, increased research impact, and facilitated interdisciplinary collaboration. Through institutional repositories, open access journals, and innovative publishing models, researchers can share their work openly and reach audiences beyond traditional academic boundaries. In conclusion, open access initiatives play a crucial role in democratizing access to knowledge, fostering collaboration, and accelerating scientific progress, making them essential for shaping the future of scholarly communication in the digital age.

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Microwave Assisted One-Pot Multicomponent Synthesis of Amino Pyrazoles and its derivatives in Green Media

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Abstract:

A straightforward one-pot synthesis involving three components-5-amino-1,3-diphenyl-4,5-dihydro-1H-pyrazole-4-carbonitrile derivatives—was carried out under microwave radiation employing substituted aryl aldehyde, malononitrile, and phenyl hydrazine in catalytic amount of baker's yeast in water as a high performance at room temperature. The recently created approach has faster reaction times, higher quantitative yields, simpler product isolation, green reaction conditions, and a straightforward workup process. Using TLC, Melting point and spectroscopic techniques such as, IR, ¹HNMR, and Mass, the structure of the produced derivatives was verified.

Keywords: Microwave Irradiation, Multicomponent, Beakers yeast, Aminopyrazole, Characterization.

Introduction:

The synthetic technique known as multicomponent reactions (MCRs) uses a cascade of elementary reactions to synthesize a single product from three or more components in a single pot. One of the primary benefits of MCRs is their reaction condition's simplicity and diversity, which provide access to a multitude of product options through reagent combination possibilities. For the synthesis of heterocyclic compounds in organic chemistry, multicomponent reactions are a productive and efficient method.

A wide range of chemical reactions can be aided by the abundance of enzymes found in baker's yeast, such as reductases, hydrolases, and dehydrogenases. Baker's yeast can function as a biocatalyst thanks to these enzymes, carrying out intricate reactions that are frequently difficult for conventional chemical catalysts to accomplish.

Five-membered heterocyclic compounds, or pyrazoles, are a type of chemicals that are especially helpful in the synthesis of organic compounds. It is key moiety in organic chemistry, containing heterocyclic ring and extensive spectrum of medical, biological and pharmacological activities have been reported¹.

The molecule called pyrazoles is recognized for its anti-depressant² anti-bacterial³, anti-inflametry⁴, analgesic⁵, anti-tumor⁶, anti-microbial⁷, anti-fungal⁸, anti-malarial⁹, anti-viral activities¹⁰. It is also well-known that the study of pyrazoles derivatives is significant in pesticide chemistry, because of their herbicidal¹¹ and insecticidal¹². The pyrazoles moiety makes the core structure of blockbuster of drug such as anti-bacterial, anti-

fungal, CRF-1 antagonist, GABA inhibitor and many more.

A number of techniques have been described for the three component reaction of substituted aryl aldehyde, malononitrile, and phenyl hydrazine under various conditions of reaction in order to synthesize polysubstituted amino pyrazoles derivatives. A variety of catalyst or reagent use for these transformation such as triethylbenzylammonium chloride¹³, [BMIM]OH¹⁴, Cu₂O/ZrO₂¹⁵, LiOH¹⁶, Ti(NMe₂)₂ (PyPyr)₂¹⁷, Sc(OTf)₃¹⁸, ZrO₂ nanoparticle¹⁹, {[HMIM]C(NO₂)₃}²⁰, I₂²¹. A review of the literature reveals that the published protocols have several drawbacks, including an inert atmosphere, a lengthy reaction time, a low yield, intricate and costly catalyst preparation, and a lack of generality.

In this study, we used substituted aryl aldehyde, malononitrile, and phenyl hydrazine in Beaker yeast-Water as a green catalyst to synthesize polysubstituted amino pyrazoles, specifically 5-amino-1, 3-diphenyl-4, 5-dihydro-1H-pyrazole-4-carbonitrile and its ten derivatives under microwave irradiation. Our method is straightforward, elegant, and efficient. Excellent product yield is a result of the use of green media in ecologically friendly procedures. Comparing this technology to standard methods reveals some noteworthy benefits, including the use of a green solvent, good atom economy, catalyst-free environment, quicker reaction time, and more comfortable workup procedure.

Methods and Materials

All of the synthetic grade reagents and chemicals were obtained from Merck Chemicals and Sigma Aldrich India. As received, they were put to

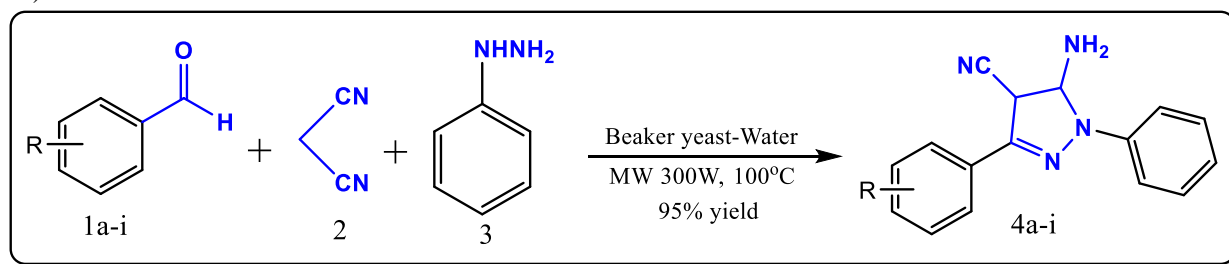
use. Using a Buchi melting point B-540 device, melting points were measured in open capillaries. Thin layer chromatography on silica plates seen δ ppm observed at 400 MHz. High-resolution ESI-MS (DFS) Thermo spectrometers (70 eV) were used to measure the mass spectra. Microwave irradiation was done in an MS2051DB DB1QILN microwave oven (2450 MHz, 1050 W) that had an Erlenmeyer flask attached.

General procedure for the synthesis of polysubstituted aminopyrazole and its derivatives

A mixture of substituted aldehyde (0.01 mol), phenyl hydrazine (0.01 mol), and malononitrile (0.01 mol) in Beaker yeast-Water (2:1) 6 ml were irradiate in microwave oven in an

with an iodine chamber was used to track the reaction. Bruker instruments were used to obtain ¹H NMR spectra, with a reported chemical shift of Erlenmeyer flask and irradiate until completion of the reaction. The reaction was monitored by TLC (ethyl acetate: n-hexane 8:2). The reaction mixture was poured in crushed ice and filtered it. Then crude product was collected and recrystallized in ethanol and dried. The entire product was characterized by physical constant and spectroscopic technique and compared with the standard method.

^aScheme-I: Synthesis of Polysubstituted aminopyrazole using 1a-i substituted aryl aldehyde (0.01 mol), malononitrile (0.01 mol) and Phenyl hydrazine (0.01 mol) in Beaker yeast-water under microwave irradiation.



Scheme-I

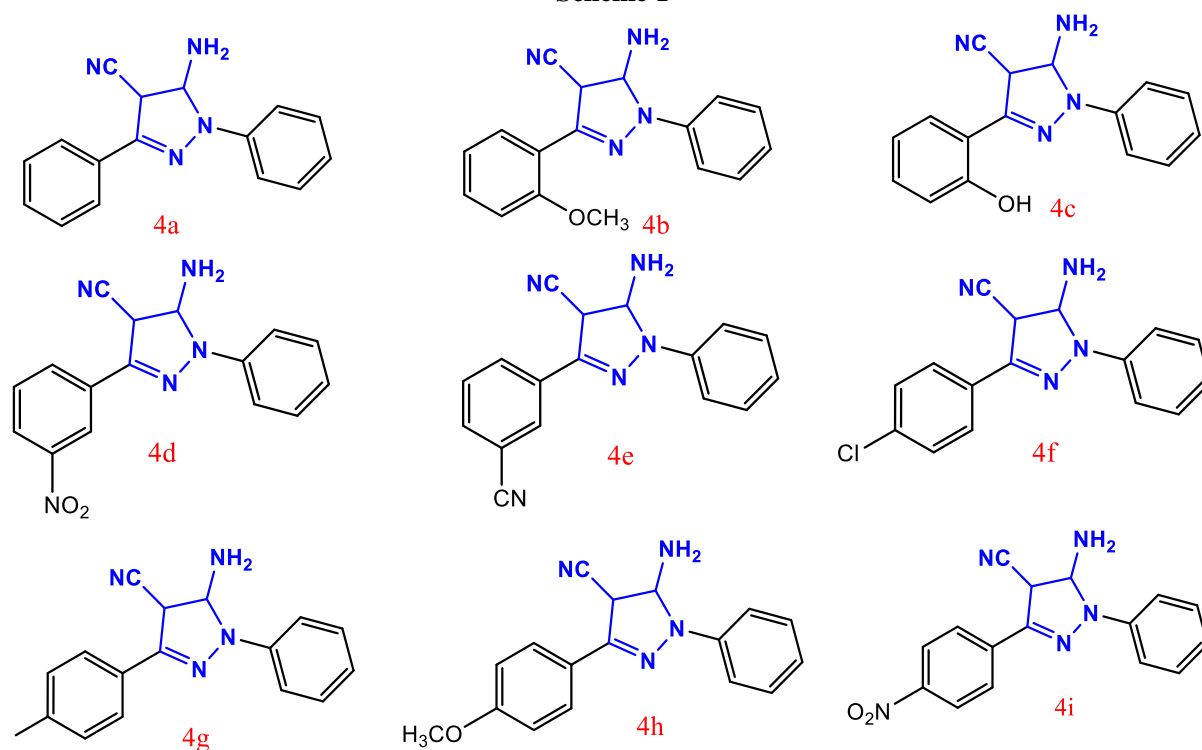


Table: 1 Optimize the solvent for the synthesis of 5-amino-1, 3-diphenyl-4, 5-dihydro-1H-pyrazole-4-carbonitrile and its derivatives.

Entry	Solvent	Time(Min.)	% Yields
1	n-hexane	22	61
2	Toluene	17	67
3	DMF	15	73
4	DMSO	12	75
5	EtOH	11	80

6	EtOH:H ₂ O	9	85
7	PEG-400	7	90
8	Beaker yeast-Water	3	95

^aReaction condition: Substituted aryl aldehyde, Malononitrile, and phenylhydrazine in Beaker yeast-Water under Microwave irradiation.

Results and Discussion:

Using substituted aryl aldehyde (1a-i), malononitrile (2), and phenyl hydrazine (3) in a catalytic amount of Beaker yeast-water, we have attempted to establish a new synthetic methodology and one-pot synthesis for selectively polysubstituted aminopyrazole derivatives. Under microwave irradiation at 100 °C (Scheme-1), investigate this green technique and the reaction that yields the desired product (Table 3, 4a-i). n-hexane, toluene, DMF, DMSO, EtOH, H₂O, PEG-400, and Beaker yeast-water are some examples of solvents that can be used to optimize reaction conditions. We looked at the reaction process in n-hexane and toluene, and after a longer period of time, the product was obtained with a lesser yield (Table 1, entry 1-2). The next solvent we tried was DMSO, which took longer to produce and had a lower yield (Table 1, entry 3-4). However, the yield product only slightly

increased (to 80% and 85%, respectively), when we looked at the solvent with EtOH and EtOH: H₂O (Table 1, entry 5-6). We looked at the PEG-400 solvent, and the yield in less time is fear (Table 1, Entry 7), which is better than the yields from earlier solvents. At last, we looked at the outstanding Beaker yeast-water (1:3) product, whose yield is 95% in a short amount of time (Table 1, entry 8). Beaker yeast-water is a green media for our model reaction since it is a less expensive, safe, and non-hazardous solvent when used as a medium for clean synthesis.

Here, we optimize the catalyst: solvent ratio that we choose for the Beaker yeast-water process. The yield product is significantly impacted by this procedure. We found that a 1:3 solvent ratio is optimal for the sample reaction after experimenting with different ratios of Beaker yeast to water. (Table 2, entry 3)

Table:2 Optimizes solvent ratio for the given model reaction.

Entry	Solvent Ratio	Time (Min. Sec)	% of yield
1	1:1	9.00	75
2	1:2	6.00	89
3	1:3	3.00	95
4	2:1	9.00	72
5	2:2	10.40	67

^aReaction condition: Substituted aryl aldehyde, Malononitrile and phenylhydrazine in Beaker yeast-Water under Microwave irradiation.

Table:3 Synthesized derivatives in Beaker yeast-water solvent under microwave irradiation (100°C/300W)

Entry	R	Time (Min. Sec)	% of yield	Melting point found (°C)	Melting Point Lit. [ref]
4a	-C ₆ H ₅	7.30	83	160	159-160 [22]
4b	2-OCH ₃ C ₆ H ₄	5.30	86	131	130-132 [22]
4c	2-OHC ₆ H ₅	8.00	90	161	160-162 [22]
4d	3-NO ₂ C ₆ H ₄	6.20	84	131	128-130 [22]
4e	3-CNC ₆ H ₄	5.25	81	155	158-160 [22]
4f	4-ClC ₆ H ₄	4.30	95	130	128-130 [22]
4g	4-CH ₃ C ₆ H ₄	6.00	87	120	117-118 [24]
4h	4-OCH ₃ C ₆ H ₄	7.15	89	105	106-108 [23]
4i	4-NO ₂ C ₆ H ₄	3.00	90	163	164-166 [23]

^aReaction condition: Substituted aryl aldehyde, Malononitrile, and phenylhydrazine in Beaker Yeast-Water under the Microwave irradiation.

The entire derivatives was characterized by physical constant and spectral data.

4a. 5-amino-1,3-diphenyl-4,5-dihydro-1H-pyrazole-4-carbonitrile:

(Molecular Formula: C₁₆H₁₂N₄)

White powder (85%) M.P. 161 °C.

IR (KBr, Cm-1): 3486, 3342, 3084, 2560, 1598, 1413, 1252, 1127, 1101, 1076. ¹H NMR (CDCl₃, 400 MHz) δ ppm: 6.86 (t, J=7.2 Hz, 1H), 7.20 (d, J=7.5 Hz, 2H), 7.32-7.35 (m, 3H), 7.44 (t, J=7.6 Hz, 2H), 7.67 (s, 1H), 7.71 (d, J=7.2 Hz, 2H), 7.72 (s, 1H). ¹³C NMR (CDCl₃, 125 MHz): δ ppm: 112.85,

113.32, 121.60, 125.67, 127.70, 128.10, 127.77, 136.79, 136.81, 146.03, 151.44, and 156.50. MS (m/z): 264.13 (M⁺)

4c. 5-amino-3-(2-hydroxyphenyl)-1-phenyl-4,5-dihydro-1H-pyrazole-4-carbonitrile:

(Molecular Formula: C₁₆H₁₂N₄O)

Yellow powder (89%) M.P. 160 °C.

IR (KBr, Cm-1): 3590, 3471, 3346, 3101, 2356, 2191, 1606, 1414, 1225, 1191, 1109, 1051. ¹H NMR (CDCl₃, 400 MHz) δ ppm: 6.78 (t, J=7.3 Hz, 1H), 6.83-6.90 (m, 2H), 6.96 (d, J=7.5 Hz, 2H), 7.15-7.21 (m, 1H), 7.23 (dd, J=7.5 Hz and

J=8.4 Hz, 2H), 7.56 (dd, J=1.5 Hz and J= 7.7 Hz, 1H), 8.16 (s, 1H), 10.41 (s, 1H), 10.55 (s, 1H). ¹³C NMR (CDCl₃, 125 MHz): δppm: 113.65, 115.70, 121.01, 122.35, 126.40, 130.05, 130.10, 131.25, 137.14, 146.65, 151.55, 154.05, and 157.55 MS (m/z): 279.11 (M⁺)

4f. 5-amino-3-(4-chlorophenyl)-1-phenyl-4,5-dihydro-1H-pyrazole-4-carbonitrile:

(Molecular Formula: C₁₆H₁₂ClN₄)

White powder (88%) M.P. 161 °C

IR (KBr, Cm-1): 3445, 3319, 3068, 2361, 1593, 1421, 1292, 1253, 1132, and 1086. ¹H NMR (CDCl₃, 400MHz) δppm: 6.91 (t, J=7.6 Hz, 1H), 7.15 (d, J=7.7 Hz, 2H), 7.21-7.36 (m, 2H), 7.40 (d, 8.5 Hz, 2H), 7.65 (d, J=8.4 Hz, 2H), 7.63 (s, 2H), ¹³C NMR (CDCl₃, 125 MHz): δppm: 112.12, 113.34, 120.99, 129.11, 129.13, 129.77, 134.41, 136.39, 144.37, 150.28, 155.22. MS (m/z): 298 (M⁺).

Conclusion:

In a single pot with numerous components, 5-amino-1, 3-diphenyl-4,5-dihydro-1H-pyrazole-4-carbonitrile and its ten derivatives (Table 3, entries 4a-j) were synthesized under microwave irradiation at 100°C and 300 W in Beakers containing yeast-water. The reaction is influenced by the solvent that is very efficient, straightforward, inexpensive, and non-hazardous. The advantages of this technique include its low cost, easy setup, high yield, environmental friendliness, and fast reaction time.

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Digitalization: Opportunities, Challenges and Its Impact on Indian Economy

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Abstract:

Digitalization play a crucial role in promoting economic growth in many countries. It is the result of innovations and technological advances. In today's world, we can't dream our life without technology. It has become an integral part of people's lives. Every country is aiming to achieve digitalization to empower society and economy. India is the fastest growing economy in the world and is also strengthening its roots in digitalization. On 1st July 2015, Hon. Indian Prime Minister Shri. Narendra Modi has launched the Digital India Initiative to transform India into digitally empowered society and knowledge economy. The main aim is to build participative, transparent and responsive system. Further COVID-19 pandemic has boosted the demand for the digital economy as the world has moved from classical economy to digital economy to mitigate the negative economic impact of pandemic. Further digitalization helps to enhance productivity, streamline operations, foster innovations, reduce cost and job creation. The present study delves into the dynamic landscape of digitalization in India, focusing on the opportunities, challenges and overarching impact on economy.

Keywords: Digitalization, Digital Economy, Indian Economy.

Introduction :

In India, digitalization has become a key factor in country's economic and social transformation. It is the use of different technologies and methods to change the business processes. India is the fastest growing economy in the world and we see up and down in the India Economy one of its reason is 'Digitalization'. All sectors in India contributing to GDP are more or less dependent on digitalization, without digital technologies no activities could happens. Further with the introduction of Digital India Program and outburst of COVID-19 pandemic digitalization has gain more importance. Various initiatives are taken by the government to increase the digital literacy among the population. On other hand innovations and advancements in technological fields are required to be done to make country digitally empowered economy. As per State of India's Digital Economy Report 2024 published by Indian Council for Research on International Economic Relations (ICRIER), India's Digital Economy ranks 3rd in the world and is estimated to constitute 20% of the total economy by 2026. India's digital development is rapidly growing which will be crucial to the country's long term growth.

Literature Review :

Shobana, D., & Kumar, S. J. (2024), conducted a study on the opportunities, challenges and impact of digitalization on Indian economic growth. Their study revealed that digitalization is a

key factor in the country's economic and social transformation. It has significant impact on various sectors of the Indian Economy. Further digitalization in India is rapidly growing which will be crucial to the country's long-term growth. However it has some challenges like digital divide, concern about data privacy and security etc. To address this challenges various initiative have been launched by the government. (1)

Neeta M. (2019), conducted a study on Digital India Program and impact of digitalization on Indian economy. Her study conclude that every country in the world is aiming to achieve digitalization to empower economy and society. Digital India Initiative has been launched to make India digitally empowered society and knowledge economy and to overcome all the obstacles in the path of digitalization. Further digitalization helps country in job creation, enhancing productivity, fostering innovations etc. It improves effectiveness and efficiency of work and bring transparency in all the systems and process. (2)

Chaudhary, A. (2023), conducted a study on the impact and challenges of digitalization on Indian Economy after COVID-19 pandemic. His study revealed that COVID-19 pandemic has boosted the demand for the digital economy, as the world has moved from classical economy to digital economy to mitigate the negative economic impact of pandemic. At that time digital technologies has become the backbone of Indian economy and has

redefined the overall sectors of economy and the way business is carried out in India. (3)

Shallu, Shimar, D., & Meena, R. (2019), describe that digitalization is the most essential technology of 21st century. It allows person to communicate anytime and anywhere. Government has launched Digital India Program to change India into digitally empowered society and knowledge economy. Digitalization brings innovation, ease of working, new job opportunities, transparency and growth in the economy. They concluded that new technology need to harness well in order to get benefit from it. (4)

Objectives of the Study:

The study aims at:

- 1) To understand the concept of Digital Economy.
- 2) To study the impact of digitalization on Indian Economy.
- 3) To evaluate the potential opportunities for digitalization in India.
- 4) To identify the challenges of digitalization and government actions.
- 5) To analyze the government initiatives for strengthening digitalization.

Research Methodology:

The present research paper is based on secondary source of data. The secondary information has been collected from various published resources such as articles, journals, reports, reference books and websites. Further the research is descriptive and exploratory in nature.

Meaning:

The term digitalization refers to “the adoption or increase in use of digital technology or computer by an organization, industry, country, etc.” In other words, it is the process of making business digital with the use of digital and computing technologies. It is a generic term for the digital transformation of the economy.

Digital economy or web economy or the internet economy, means the economic activities that emerge from connecting individuals, businesses, devices, data, and operations through digital technology. Further it is different from a traditional economy because it encompasses all economic transactions that occurs online across multiple sectors using digital or computing technologies such as Internet, mobile technology, big data and Information Communication Technology (ICT).

Digital innovations such as Internet of Things (IoT), artificial intelligence (AI), blockchain, virtual reality and cloud computing all play a part in creating digital economy.

Components of Digital Economy:

In 2001 Thomas Mesenbourg has divided digital economy into three key components that are:

· **E-Business Infrastructure:** Electronic systems that businesses use to conduct their operations. Includes hardware, software, networks and data storage system. · **E-Business:** Use of electronic

systems to carry out business activities. Includes the process of marketing, production and delivery of goods and services digitally. · **E-Commerce:** Buying and selling of goods and services between businesses and consumers through electronic systems.

With the advancement of technology and emerging business models, many more components are being added to existing ones.

Origin of Digital Economy:

The term ‘Digital Economy’ was first coined in 1995 by Don Tapscott in his book titled “Digital Economy: Promise and Peril in the Age of Networked Intelligence”, where he pointed out how the internet and digitalization of information could change the way of doing business in the future. With emerging technologies and innovations digital economy continues to evolve and expand rapidly. Its growth was accelerated during the COVID-19 pandemic as remote work, telemedicine, online shopping and digital entertainment became essential during lockdowns and social distancing. It has emerged as the Industrial 4.0.

Technologies Accelerating the Digital Economy

Blockchain: Eliminates the need for intermediaries and provide secure, transparent, and decentralized platforms for digital transactions. It is used in sectors like finance, supply chain management and healthcare.

5G Technology: Helps in providing faster and more reliable internet connectivity, which is essential for enhancing productivity, supporting IoT, autonomous systems and real-time

communication applications. It is used in sectors like agriculture, manufacturing, logistics, automotive, smart cities, healthcare, education etc.

Cloud Computing: Provide access to scalable, flexible and cost effective computing resources like serves, storage, database, networking, software etc. that enhanced innovation, businesses and digital transformation. Used in sectors like agriculture, manufacturing, gaming, hospitality, real estate, education, healthcare, finance etc.

Internet of Things: Connect physical devices to internet it helps in automation of processes, real-time data collection and monitoring, enhancing customer experience and operational efficiency, leading to cost reduction and increase productivity. Used in Agriculture, manufacturing, retail, energy and healthcare sectors.

Quantum Computing: Helps to solve complex problems faster, optimize operations, and drive innovations across various sectors like energy, cyber security, pharmaceuticals, material science, finance, healthcare, agriculture, logistics etc.

Big Data and Analytics: It helps in collection, processing and analysis of massive datasets. Businesses use big data to gain insights into customer behavior, optimize operations and drive

decision making.

Augmented Reality and Virtual Reality: Offer immersive experiences and simulations in training, remote collaboration and product visualization and thereby enhance skill development, improve safety, increase productivity and reduce cost. Used in construction, military, real estate, automotive, retail, healthcare, education etc.

Artificial Intelligence (AI) and Machine Learning (ML): Help in automating repetitive tasks, improving operational efficiency, providing personalized experience, generating predictive insights, data analysis and better decision making. Used in sectors like agriculture, manufacturing, finance, healthcare, retail, transportation etc.

Digitalization in various fields in India:

Agriculture

- Digital Agriculture refers to the use of digital technology, data analytics, IoT and artificial intelligence to improve the efficiency, productivity and sustainability of agricultural practices and the income of farmers.
- It provide farmers with weather forecasts, market prices, agricultural techniques, aiding in crop management and marketing decisions.
- It can lead to 20-25% increase in crop yields, 30% reduction in water usage and 20-25% increase in farmer income.
- eNAM, Kissan Call Centre, AgriStack, Digital Agriculture Mission etc. are some of central government initiative for the promotion of digital agriculture.
- Indian Government, Tech Companies, Agritech Startups, Research Institutions and Private Sector Companies play key role in driving the adoption of digital agriculture in India.

Manufacturing:

- Digitalization in manufacturing refers to the integration of digital technologies into manufacturing process to enhance efficiency, productivity and flexibility. · It includes the use of data analytics, automation, IoT, artificial intelligence, cloud computing etc. in manufacturing processes.
- It helps in cost saving, quality control, decision making, and foster collaboration across the supply chain.

E-Governance:

- E-Governance or Electronic Governance refers to the use of digital technology by the government to provide information, communication and government services to citizens, businesses and other governmental entities.
- It have improved the delivery of public services, reducing bureaucracy and corruption. · MyGov, e-Kranti, NeGP, PRAGATI, UMANG etc. are some central government initiatives for the promotion of e-governance in India.

E-Commerce:

- E-Commerce or Electronic Commerce refers to the buying and selling of products and services over the internet through digital platforms like online store, website, social media, and mobile apps.
- The surge in e-commerce sector has not only boosted retail consumption but also enable businesses to reach a broader audience through digital platforms and provide consumers access to wide range of products.
- Indian e-commerce market size is projected to grow from \$ 74 billion in 2022 to \$ 350 billion in 2030. (Forbes)
- E-commerce platforms in India are Amazon, Flipkart, Snapdeal, Meesho etc.

Education:

- Digital education refers to the use of technology and digital tools in education to facilitate teaching and learning process and making education more accessible. It is also known as e-Learning or Technology Enhanced Learning.
- Includes online education, virtual classroom, mobile learning, blended learning etc. This has enhanced educational reach and quality, particularly in rural areas and provided flexibility to learners.
- The adoption of e-learning platforms has increased significantly during the COVID-19 pandemic. The National Education Policy (NEP) 2020 also emphasize the integration of technology in education.
- National Digital Library of India, SWAYAM, DIKSHA portal etc. are some central government initiatives to promote digital education in India.
- Indian digital education market is projected to grow from \$ 6.47 billion in 2023 to \$12.73 billion in 2028, reflecting CAGR of 27.17%.
- Players in the digital education sector in India are BYJUS, Unacademy, Udemy etc.

Healthcare:

- Digital health means integration of technology into healthcare systems to offer better patient care, enable faster diagnoses, optimize operational processes, reduce costs, and to enhance efficiency and accessibility of healthcare services.
- Includes virtual visits, telemedicine, electronic health records, mobile health apps, wearable devices etc. All these facilitates remote consultations and access to medical services. During COVID-19 pandemic there was surge in usage of these facilities.
- Ayushman Bharat Digital Mission, Aarogya Setu App, e-Sanjeevani etc. are some central government initiatives to promote digital health in India.
- Indian digital health market is projected to grow

from \$3.83 billion in 2022 to \$18.34 billion in 2030, reflecting CAGR of 21.6%.

- Players in digital healthcare sector in India are Practo, Medlife, Cure.fit, HealthifyMe etc.

Financial Services:

- Digital Financial Services refers to various financial services accessed and delivered through digital channels such as internet and mobile devices.
- Includes UPI, e-wallets, internet and mobile banking, digital insurance products etc. All these facilitates seamless and secure online transactions.
- It have contributed to financial inclusion by giving broader section of the population access to various financial services, thereby fostering economic growth.
- DIGIDHAN Mission, EASE Reforms, Digital Finance for Rural India are some central government initiatives to enhance digital financial services across India. · Players in digital financial service sector in India are Paytm, Lendingkart, Policybazaar etc.

Transportation and Logistics:

- Digital logistics refers to the integration of digital technology into logistics operations to enhance efficiency and effectiveness, reduce costs and improve customer experience by faster service delivery.
- Technologies like automation, IoT, blockchain etc are used to transform traditional, manual systems into automated, data-driven system.
- Global digital logistic market size is projected to grow from \$ 24.13 billion in 2023 to \$ 120.33 billion in 2032, exhibiting a CAGR of 17.8%. (Fortune Business Insights) · AWL India, BlueDart, Rivigo, Gati are digital logistics providers in India.

Hospitality and Tourism:

- Digitalization in hospitality and tourism sector refers to the use of digital technologies into operations to enhance customer experience, streamline processes, reduce costs and improve service delivery across the industry.
- It includes online booking of hotel rooms, tickets and tour packages, mobile check-ins, personalized services, virtual tours etc.
- OYO, Goibibo, Cleartrip, Make My Trip are online travel and accommodation companies in India.

Impact of Digitalization on Indian Economy:

The Indian Economy traditionally consists of three sectors which are,

1) Primary Sector: Agriculture and Allied Activities like forestry, fishing, mining etc. 2) Secondary Sector: Manufacturing and Industry.

3) Tertiary Sector: Services such as education, healthcare, banking, hospitality etc.

Each sector contributes separately to the overall GDP and employment landscape of the country.

1) Agriculture Sector

India is an agriculturally dominated country. As per the Economic Survey 2022-23, approx. 42.86% of India's total workforce is engaged in agriculture and allied activities, and its share in GDP was around 18.8%. In terms of agricultural output India ranks 2nd in the world. But the share of the sector in GDP is continuously decreasing, so various measures such as technological advancement, infrastructure, agricultural subsidies, credit schemes, etc. are required to boost agricultural performance. Digitalization will play a crucial role in the improvement of the sector's performance in the following ways:

- Availability of Information: Due to the automation of the sector, farmers can get timely and accurate information about soil, seeds, fertilizers, weather conditions, markets, etc. This will help them trade efficiently. Due to agricultural research and development, reliable information can be provided to farmers.
- Better employment: As the sector is facing the problem of overemployment, digitalization will help in the better utilization of manpower. It will help in improving the performance of the sector by employing extra manpower in other productive activities, thereby increasing GDP.
- Price control and cost cutting: Timely and correct information about prices, inputs, and outputs in different markets and reductions in cost due to better utilization of resources will lead to increased profits in the sector.
- Infrastructural development and irrigation facilities: Digitalization will lead to better infrastructural facilities like warehouses, green houses, ease of transportation, etc. By providing farmers with better irrigation facilities, digitalization will reduce their dependency on monsoons.
- Increased returns and investment: Better agricultural facilities will lead to increased agricultural produce, thereby increasing the return of the sector. Good prospects for the sector will lead to an increase in investment.
- Agricultural literacy: Automation will help farmers access the information or knowledge they want to acquire regarding farming. This will increase the level of agricultural literacy in the country and thereby improve the future prospects for agriculture. The Indian Government has launched various initiatives to increase the contribution of the agriculture sector to the economy and to motivate farmers to move towards better farming skills.

2) Manufacturing Sector

As per the Economic Survey 2022-23, approx. 22.12% of India's total workforce is engaged in the manufacturing sector, and its share in GDP was around 25.9%. According to the International

Monetary Fund (IMF) and the CIA World Factbook, India ranks 6th in the world in terms of industrial output. To increase the share of the sector in GDP and to increase the returns and output in the sector, the Government of India aims at digitalizing the sector. The digitalization of the sector will lead to:

- Ease in purchase and inventory control: Due to automation, procurement of raw material will become easy and effective. One can acquire desired quantity and quality of material at competitive prices. Systems like JIT, EOQ, ABC leads to better inventory control, thereby reducing inventory management cost.
- Wider customer base and market reach: With the help of online shopping platforms like Amazon, Sanpdeal, Myntra, Pantaloons etc. Company can expand their business in every corner of the world by serving their customers digitally within seconds.
- New product mix and product innovation: In today's era, product mix of the industrial sector is undergoing changes as more preference is given to the FMCG and technological products. New product with physical and digital characteristics will be introduced.
- Trade relations and competition: Due to increased transparency in trade, trade relations become cohesive. The competitive structure will change due to increased foreign competition after liberalization, increased efficiency due to privatization, opening of new markets due to globalization. This will result in better quality of products at reasonable price, thereby benefiting the consumers.
- Employment variations: On one hand, digitalization will lead to unemployment because of machines replacing manpower. And on the other hand, new jobs will be created as the sector will grow and expand. The job requirement and specifications will change with changing scenario.

3) Service Sector

As per the Economic Survey 2022-23, approx. 35.02% of India's total workforce is engaged in the service sector, and its share in GDP was around 55.3%. India ranks 8th in the world in terms of its services sector GDP output. Includes services like IT, Healthcare, Education, E Commerce, Logistics, Tourism, Financial services etc. Digitalization of economy have created ample of opportunities for this sector and have improved their effectiveness to large extent. It fasten the processes and activities and leads to better satisfaction among customers due to increased ease in availing these services.

Challenges of Digitalization and Actions taken by the Government: 1) Digital Divide:

- Issue: Urban areas in India have digital literacy and better access to digital technology than rural

areas, creating a large digital gap.

- Action: To boost internet connectivity and digital literacy in rural areas government has launched initiatives like National Digital Literacy Mission, Internet Saathi Program, Common Service Centre and BharatNet etc., thereby remove this gap.

2) Digital Infrastructure

- Issue: To sustain the expanding digital economy, India must build digital infrastructure in remote areas. The slow, delayed and inadequate infrastructure development in the country is the biggest challenge.
- Action: To cope up with this issue, government has launched various initiatives like BharatNet, National Broadband Mission etc. to provide high speed internet access to villages across India.

3) Cyber Security

- Issue: Rapid digitalization has increased cyber security risks and dangers for the nation as there is lack of anti-cyber security experts and internet privacy laws.
- Actions: To enhance cyber security programs like National Cyber Security Policy, Indian Cyber Crime Coordination Centre (I4C), and Indian Computer Emergency Response Team (CERT-In) etc. are launched.

4) Data Privacy and Protection

- Issue: Concern about data privacy and protection are growing as people rely more and more on digital services, the risk of data breaches, cyber-attacks and privacy violation become more significant, requiring robust measures.
- Actions: Government has proposed the Personal Data Protection Bill, 2019 to control how personal data is used.

5) Economic Disruption

- Issue: Rapid digitalization can lead to economic disruptions, particularly in industries with a slow rate of adaptation.
- Action: Digital India initiative and Start-up India Program have been implemented to encourage innovation and entrepreneurship in digital realm.

6) E-Governance Implementation

- Issue: There are still some difficulties in implementing digital services effectively and openly, though e-governance has advanced.
- Action: Initiatives like UMANG, MyGov, and Digi Locker are launched to give citizens a single platform to access numerous government services.

Opportunities for Digitalization in India

Digitalization in India presents numerous opportunities across technological, economic and social dimensions.

1. Technological Opportunities

- 5G Technology: 5G network could unlock new opportunities in communication, IoT and

Industry 4.0. It can pave the way for innovations in fields like agriculture, manufacturing, logistics, automotive, smart cities, healthcare, education etc.

- Artificial Intelligence and Machine Learning: AI and ML can be leverage in various applications including healthcare diagnostics, financial services, agriculture optimization, and traffic management system.

2. Economic Opportunities

- E-Commerce and Digital Payments: Expansion of e-commerce especially in tier 2 and tier 3 cities, presents significant opportunities for business. Where surge in digital payments is enabling a cashless economy.
- Digital Financial Inclusion: Digitalization of financial services improve access to banking and credit facilities for millions unbanked individuals, fostering economic growth.

3. Social Opportunities

- Telemedicine: Digital healthcare platform facilitates remote consultations and access to medical services, enhancing accessibility and affordability.
- Education and Skill Development: Digital platforms has enhanced education reach and quality, especially in rural and remote areas, thereby bridging the educational divide.

Government Initiative to promote Digitalization in India

1. DigiLocker:

- It is a digital storage system launched by the Government of India on July 1, 2015. · It allows users to store, manage, access and share their important documents such as certificates, licenses and other records electronically from any device, eliminating the need for physical paperwork.
- As of now it has 307.93 Million registered users and 7.76 Billion issued documents (DigiLocker)

2. e-Hospital

- It is a web based Hospital Management Information System (HMIS) developed by National Informatics Centre (NIC) on July 1, 2015 to improve the delivery of healthcare services across country and to streamline hospital processes.
- It connect patients, hospitals and doctors on a single digital platform and offer services like online appointment booking, access to lab reports, blood availability status and application related technical support to hospitals via call center / helpdesk.

3. e-Pathshala

- It is a digital educational platform developed by CIET and NCERT on November 1, 2015 to enhance the reach and quality of education through technology.
- It provide online educational resources like

NCERT textbooks for classes 1-12, audio video materials, periodicals, newsletters, journals etc. for students, teachers, parents and educators. Resources are available in English, Hindi and Urdu and users can access this resources online and can download it.

- As of now it has 504 e-textbooks, 3886 e-resources and 4.5 million users. (ePathshala)

4. e-Sign

- It is a digital signature service provided by the Government of India to facilitate electronic signing of documents.
- Enable individuals to sign documents electronically without the need for physical signature. It is an easy, secure and legal way to sign documents anywhere and anytime. · To use eSign, users need an Aadhaar Card and OTP for authentication.

5. MyGov

- It is an online platform launched by the Government of India on July 26, 2014 to enhance citizen engagement in governance and policymaking.
- It allows citizens to access information, participate in discussions, polls, contests, provide feedback and contribute ideas on various government projects and initiatives. The platform also serves as a hub for government notifications, updates and services. · As of now it has more than 30 million registered users. (MyGov)

6. BharatNet

- It is world largest telecom project to enhance rural broadband connectivity in India launched on October 25, 2011 as National Optical Fiber Network and was later renamed as BharatNet in 2015.
- The project provides high speed internet access (min. 100 mbps) to all 2,50,000 Gram Panchayats in the country, covering nearly 6,25,000 villages.
- Its aim is to enhance digital infrastructure, e-governance, broadband connectivity, and stimulate socio-economic development in rural areas.

7. Unified Mobile Application for New-age Governance (UMANG)

- It is a mobile app developed by Ministry of Electronics and Information Technology (MeitY) and National e-Governance Division (NeGD) in 2017.
- It provide a unified platform for all Indian citizens to access pan India e-Gov. services ranging from central, state and local government bodies.
- As of now it has 2039 services offered by 207 departments and 6.67 cr. registered users. (UMANG)

8. Bharat Interface for Money (BHIM)

- It is a digital payment application launched by the National Payment Corporation of India on December 30, 2016 and is based on Unified

Payments Interface (UPI). · It enable users to make instant, secure and seamless financial transactions using their smartphones.

9. Common Service Centers (CSC)

- They are the facilities set up in rural and remote areas to provide wide range of government and non-government services to citizens digitally.
- As of now 5,67,339 CSCs are functioning in India. (CSC)

10. Cyber Swachhta Kendra

- It is a part of the Indian Computer Emergency Response Team.
- It has been set up to enhance the cyber security of Digital India's IT infrastructure by providing information on bot / malware threats and suggesting remedial measures to citizens.

Conclusion

Digitalization play crucial role in promoting economic growth in many countries. Every country in the world is aiming to achieve digitalization to empower economy, society and businesses. In India digitalization is rapidly growing which will be crucial to country's long term growth. However it has some challenges like digital divide, concern about data privacy and security etc. To address this challenges various initiatives has been launched by the government. Further digitalization has significant impact on various sectors of Indian Economy. It helps to enhance productivity, reduce cost, streamline processes, job creation and foster innovation. A digitally empowered economy develop faster, effectively, and efficiently due to proper utilization of capital and human resources. Further it redefined the way business is carried out and bring transparency in the system and process. It is observed that digitalization has become

the backbone of Indian Economy during COVID-19 pandemic. Further proper implementation of digitalization can change the phase of Indian economy.

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A Comparative Study of Boolean Model and Vector Space Model (Vsm) For Information Aggregation from Various Websites Using Web Content Mining Techniques: A Matlab Approach

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Abstract:

The rapid growth of World Wide Web and the abundance of documents and different forms of information available on it, has recorded the need for good Information Retrieval technique. By and large, three classic framework models have been used in the process of retrieving information: Boolean and Vector Space and Probabilistic.

The (standard) Boolean model of information retrieval is a classical information retrieval (IR) model and, at the same time, the first and most-adopted one. The BIR is based on Boolean logic and classical set theory in that both the documents to be searched and the user's query are conceived as sets of terms (a bag-of-words model). Retrieval is based on whether or not the documents contain the query terms and whether they satisfy the boolean conditions described by the query [20].

Gerard Salton is often credited with developing the vector space model (VSM) for information retrieval (IR). The Vector Space Model is an algebraic model used for Information Retrieval. It represents natural language document in a formal manner by the use of vectors in a multi-dimensional space, and allows decisions to be made as to which documents are similar to each other and to the queries fired. vector space models which view documents and queries as vectors in a multidimensional vector space and use distance as a measure of similarity. The vector space model has been studied and used for some time by IR researchers and are quite well understood.

Boolean model is a light weight model which matches the query with precise semantics. Because of its Boolean nature, results may be tides, missing partial matching, while on the contrary, vector space model, considering term-frequency, inverse document frequency measures, achieves utmost relevancy in retrieving documents in information retrieval.

This proposed model implements and discusses the comparison of information retrieval system between Boolean model and vector space model using MATLAB on non-agricultural universities Website data of Maharashtra State domain.

Keywords: tf; idf; vector space model; cosine similarities; term-document; term-query matrices; dot products.

Introduction

The amount of information from conventional databases and web sources has been growing exponentially in the past few years. Effective use of this huge amount of information has become a major challenge to the research communities working in this area. As far as the frequent changes in technologies and services are concerned, existing business concerns are tending towards making adaptive transformations so as to aggregate and integrate values from relevant information sources.

Information aggregation is a service that gathers relevant information from multiple sources to provide convenience and add value by analyzing the aggregated information for specific objectives using Internet technologies. The providers of this service are called “aggregators” in general. In a

broader sense, information intermediaries such as newspapers, magazines, professional journals, and more recently, increasing number of web portals are information aggregators since they all collect information from multiple sources and disseminate it for convenient consumption [17].

Aggregation of information plays a vital role in the construction of knowledge based systems in various domains, ranging from healthcare, economics, applied science, artificial intelligence, and robotics to decision-making processes and machine learning.

Generally, user tends to search the information for a particular domain and as although the desired information is available on Web; it is in very scattered and varied structures across different geographic locations. Aggregating information in such a complex structure of Web is a challenging

task. The combination of characteristics such as comparison, relation, intra-organization and inter-organization aggregation to maximize values in the aggregated information is really a challenging task. Although wrapping technology such as screen scraping, direct data feed with some encoding standard such as XML have been used by research groups in this field, there is a wide scope for research in information aggregation to facilitate varied aggregating services.

Non-agricultural universities Website data of Maharashtra State have made their public information available through their established web sites. As far as the contents of this particular domain is considered, most of the information is common in nature and visitors of this site are ranging from students, academicians, researchers to common people. But the information across these sites is very scattered and having wide scope to aggregate information in this domain and a very few research communities are working towards this domain for information aggregation. Hence the project proposed here is to build an efficient model of information aggregation from disparate source using web content mining with respect to non-agricultural universities Website data of Maharashtra State websites.

Enormous amount of text material is increasing at exponential rate, especially with the increasing use and applications of Internet. Day by day it is becoming very difficult to retrieve the relevant information. Various approaches have been used by the researchers to get over the relevancy factor in information retrieval.

An information retrieval model is a quadruple consisting of document collection, set of queries, framework model and a ranking function associated with query-document. A framework model may be Boolean, vector space or probabilistic. Boolean model matches query with precise semantics in the document collection by Boolean operations with operators AND, OR, NOT. It predicts either relevancy or non-relevancy of each document, leading to the disadvantage of retrieving very few or very large documents. The Boolean model is the lightest model having inability of partial matching which leads to poor performance in retrieval of information. Vector space model is introduced by G. Salton in late 1960s in which partial matching is possible. Non-binary weights are used to weight the index terms in queries and in documents. These words are used for calculating degree of similarity between each document and the query. The ranked document set in the decreasing order of degree of similarity thus obtained is precise than the result of Boolean model. Index term weights can be calculated in many different ways.[18]

Related Work:

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Maron and Kuhns [4] in early 1960, described probabilistic indexing technique in a mechanized library system yielding probable relevance. Afterword in 1983, Salton and McGill wrote a book [1] which discusses thoroughly the three classic models in information retrieval namely, the boolean, the vector, and the probabilistic models. The book by van Rijsbergen [5] covers the discussion on three classic models and majority of the associated technology of retrieval system. Frakes and Baeza-Yates [6] edited the book on information retrieval which mainly deals with the data structures used in general information retrieval systems. Also, it includes the issue of relevance feedback as well as some query modification techniques [7] and Boolean operations and their implementations [8]. Verhoeff, Goffman, and Belzer [9] described the shortfall of boolean queries for information retrieval.

The concept of using boolean formalism in other frameworks had been the great interest area of the researchers. Lee et al proposed a thesaurus-based boolean retrieval system for ranking [10]. Vector space model has been the most popular model in information retrieval among the research vicinity because of the research outcome in indexing, term value specification in automatic indexing carried out by Salton and his associates [11, 12]. Most of this research deals with experiments in automatic document processing and different term weighting approaches for automatic retrieval [2, 13]. In 1972, Karen Sparck Jones introduced the concept of inverse document frequency, a measure of specificity [14, 15] and Salton and Yang uses it for automatic indexing to improve retrieval [12]. Raghavan and Wong [16] analyses vector space model critically with the conclusion that the vector space model is useful and which provides a formal framework for the information retrieval systems. Hongwei Zhu et al [17] in their paper presented dramatic growth in the amount of information on the Web.

This trend will continue in the future as the last-mile bottleneck is being removed in developed countries and infrastructure is put in place in developing nations. Finding relevant information and extracting value from it is becoming more important for businesses and individuals. The emergence of information aggregation on the Internet provides an effective way of retrieving and managing relevant information that is dispersed all over the Web. The opportunities abound for businesses to provide value added services using aggregated information. A. B. Manwar et al [18] have develop Vector Space model for Information Aggregation, in which they mentioned Inter-document characterization and document frequency plays vital role in building ranks of the documents in vector space model. Xindong Wu et al [19] in their

paper presented a HACE theorem that characterizes the features of the Big Data revolution, and proposes a Big Data processing model, from the data mining perspective. This data-driven model involves demand-driven aggregation of information sources, mining and analysis, user interest modeling, and security and privacy considerations. Authors have analyzed the challenging issues in the data-driven model and also in the Big Data revolution.

Boolean Model

It is a simple retrieval model based on set theory and boolean algebra. Queries are designed as boolean expressions which have precise semantics. The retrieval strategy is based on binary decision criterion. The boolean model considers that index terms are present or absent in a document.

A document is represented as a set of keywords. Queries are Boolean expressions of keywords, connected by AND, OR, and NOT, including the use of brackets to indicate scope. Output: Document is relevant or not. No partial matches or ranking. Boolean Retrieval Model is popular retrieval model because it is easy to understand for simple queries and clean formalism. Boolean models can be extended to include ranking. It is Reasonably efficient implementations possible for normal queries.

An index term is a word or expression, which may be stemmed, describing or characterizing a document, such as a keyword given for a journal article. Let

$$T = \{ t_1, t_2, \dots, t_n \}$$

be the set of all such index terms.

A document is any subset of T . Let

$$D = \{ D_1, D_2, \dots, D_n \}$$

be the set of all documents.

T is a series of words or small phrases (index terms). Each of those words or small phrases are named t_n , where n is the number of the term in the series/list. You can think of T as "Terms" and t_n as "index term n ".

The words or small phrases (index terms t_n) can exist in documents. These documents then form a series/list D where each individual documents are called D_n . These documents (D_n) can contain words or small phrases (index terms t_n) such as D_1 could contain the terms t_1 and t_1 from T .

Index terms generally want to represent words which have more meaning to them and

corresponds to what the content of an article or document could talk about. Terms like "the" and "like" would appear in nearly all documents whereas "Bayesian" would only be a small fraction of documents. Therefore, rarer terms like "Bayesian" are a better choice to be selected in the TT sets. This relates to Entropy (information theory). There are multiple types of operations that can be applied to index terms used in queries to make them more generic and more relevant. One such is Stemming.

Boolean Models – Problems

1. Very rigid: AND means all; OR means any.
2. Difficult to express complex user requests.
3. Difficult to control the number of documents retrieved.
 - All matched documents will be returned.
 1. Difficult to rank output.
 - All matched documents logically satisfy the query.
 1. Difficult to perform relevance feedback.
- If a document is identified by the user as relevant or irrelevant, how should the query be modified?

Vector Space Model

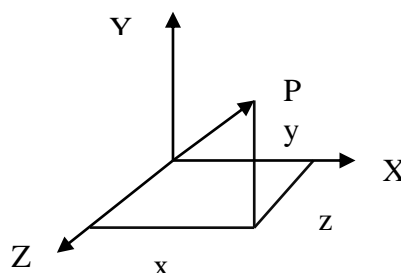
In the vector space model documents and queries are represented as vectors in a N -dimensional (multi-dimensional) hyperspace where each dimension corresponds to a possible document feature. Vector elements may be binary-valued, but they are generally taken to be weights that describe the degree to which the corresponding feature describes the document or query.

How it works

1. Each document is broken down into a word frequency table
2. The tables are called vectors and can be stored as arrays
3. A vocabulary is built from all the words in all documents in the system
4. Each document and user query is represented as a vector based against the vocabulary
5. Calculating similarity measure
6. Ranking the documents for relevance

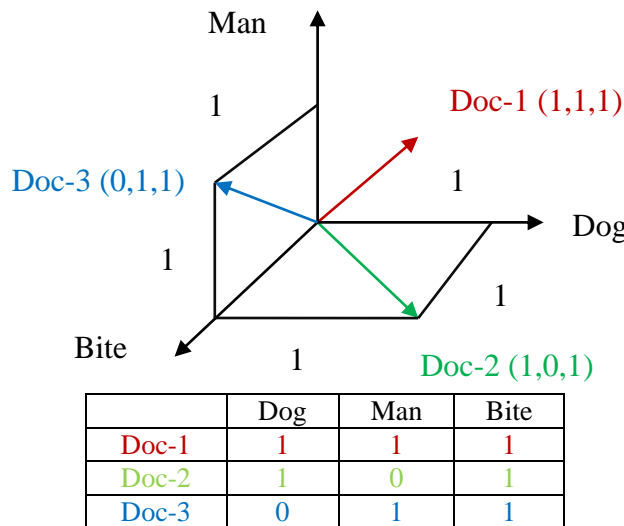
4.1 Vector

In mathematics, a vector is a point in a vector space and has length (from the origin to the point) and direction.



In the above figure X', Y', Z' are three dimensions creating three dimensional space, in which point P is a vector of elements x,y,z.

Similarly, each document and query represent as a vector in V-dimensional space. V denotes the size of the vocabulary.



4.2 Term Frequency

The term frequency tf(t,d) of terms in document is the number of times that terms 't' occurs in document 'd'.

4.3 Document Frequency (df):

Number of documents in which term 't' occurs.

4.4 Inverse-Document Frequency (idf):

1. The inverse document frequency is a measure of how much information the word provides.
2. A calculation designed to make rare words more important than common words.
3. idf provides high values for rare words and low values for common words.
4. idf calculates how much that term is common or rare across all documents. The idf, inverse document frequency for term 't', is given by $idf = \log((N+1)/df)$

4.5 tf-idf:

The term which does not occur in multiple documents are rare terms (idf). Such rare term occurs frequently in documents (tf) have high importance (weight) in a document. The best known term-weighting schemes use weights which are given by

$$W_{i,j} = tf * idf$$

Such term-weighting strategies are called tf-idf schemes.

tf-idf increases with the number of occurrences within a doc. tf-idf increases with the rarity of the term across the whole corpus.

For the vector model, the weight $W_{i,j}$ associated with a pair (K_i, d_j) is positive and non binary. Further, the index term in the query are also weighted. Let, $W_{i,q}$ be the weight associated with the pair (K_i, q) where $W_{i,q} \geq 0$. Then, the query vector q is defined as $q = (W_{1,q}, W_{2,q}, \dots, W_{t,q})$ where t is the total number of index terms in the system. The vector for a document dj is represented by $d = (W_{1,j}, W_{2,j}, \dots, W_{t,j})$.

4.6 Length Normalization:

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Automatic information retrieval, system have to deal with documents of varying lengths in a text collection. The document length normalization is used to fairly retrieve documents of all lengths. Reasons for adopting a length normalization in VSM:

1. Long documents have higher term frequency i.e. the same term appears more often.
2. Long documents have more terms which increases the number of matches between the document and query.

Vectors can be normalized by simply converting each vector into a unit vector.

$$\begin{aligned} \text{Unit vector} &= \frac{\vec{a}}{|\vec{a}|} \\ &= \frac{(W_{1,j}, W_{2,j}, \dots, W_{t,j})}{\sqrt{\sum_i W_{i,j}^2}} \end{aligned}$$

4.7 Cosine Similarity:

Cosine similarity measures the similarity between document vectors and query vector i.e. it finds relevant documents to a query. The vector model proposes to evaluate the degree of similarity of the document d_j , with regard to the query q as the correlation between the vectors d_j and q. the correlation can be measured by the cosine of angle between two vectors as,

$$\text{Similarity}(d,q) = \frac{\vec{d}}{|\vec{d}|} \cdot \frac{\vec{q}}{|\vec{q}|}$$

Where, $|\vec{d}|$ and $|\vec{q}|$ are the norms of the document and query vectors. The factor $|\vec{q}|$ does not affect the ranking (i.e. the ordering of the documents) because it is the same for all document. The factor $|\vec{d}|$ provides normalization in the space of the documents.

Since $W_{i,j} \geq 0$ and $W_{i,q} \geq 0$ varies form 0 to +1, the vector model ranks the documents according to their degree of similarity to the query. Documents might be retrieve even if it matches the query only partially.

Experimental Evaluation

Universities have made their public information available through their established web sites. As far as the contents of this particular domain is considered, most of the information is common in nature and visitors of this site are ranging from students, academicians, researchers to common people. But the information across these sites is very scattered and having wide scope to aggregate information in this domain and a very few research communities are working towards this domain for information aggregation. Hence the research proposed here is to design efficient framework of information aggregation from various websites using web content mining techniques.

5.1 Dataset for information retrieval system

Experimental evaluation if performed in following steps:

Step – I: **Data Collection:** We use a website data of various streams of non agricultural universities domain. The collection contains web pages from web sites of different non agricultural universities in Maharashtra for a set of 130 documents, 10 classes and 540 features. For each classes web pages are collected from different universities.

Step – II: **Document cleaning:** We have web pages i.e. html document, so to get actual text of the web page we need to remove html code from documents.

1. Remove All comments from web document
2. Remove Script, noscript, Style, textarea, video, button, input, etc tag
3. Remove tags which does not contain any text
4. Remove all tags except there content.

Now we have actual text of the web pages.

Apply Text Cleaning Process on each document one by one and store clean data in a separate file for document vectorization

1. Lowercasing document
2. Remove punctuation marks
(~!@#%&^**()_+={ }|[]\:'>?<./)
3. Remove stopwords
4. Remove numbers
5. Remove text other than alphabate such as emojis, etc.

6. Stemming

Step – III: **Document Vectorization:** Following are different document vectorization techniques.

1. Bag of Word
2. Tf-Idf Weights
3. Word2Vec
4. GloVe
5. FastText

We use Bag of Word technique to represent each document as a vector. In this technique, we first create a set of unique words from all clean documents.

5.2 Preprocessing

The compressed version of document text has been pre-processed to obtain a set of 130 documents, 10 classes and 540 features. A special code has been written for this purpose in MATLAB.

5.3 Implementation

A MATLAB is used to implement a Boolean model and vector space model for information retrieval. In the proposed model we use various Testing methods like Cross Validation, Holdout Validation, Re-substitution Validation classification for various folds to compare Boolean model and Vector space model.

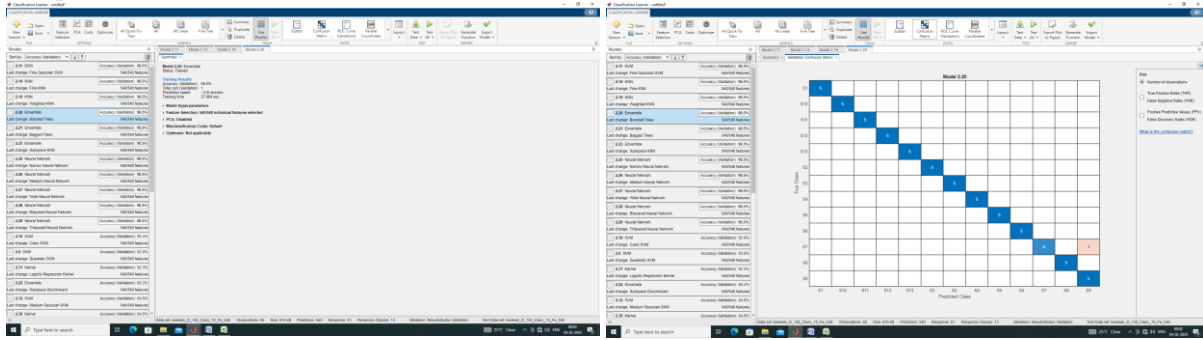
Various classification methods uses in this proposed model are Ensemble (Bagged Trees), Ensemble (Boosted Trees), Linear Discriminant, Tree (Fine Tree), Tree (Medium Tree), Ensemble (RUSBoosted Trees), Ensemble (Subspace Discriminant), Neural Network (Narrow Neural Network), Neural Network (Medium Neural Network), Neural Network (Wide Neural Network), Neural Network (Bilayered Neural Network), KNN (Cosine KNN), Neural Network (Trilayered Neural Network), KNN (Cubic KNN), Tree (Coarse Tree), KNN (Medium KNN) Ensemble (Subspace KNN), Kernel (SVM Kernel), SVM (Linear SVM), KNN (Weighted KNN), SVM (Quadratic SVM), Kernel (Logistic Regression Kernel), SVM (Cubic SVM), Naïve Bayes (Kernel Naïve Bayes), KNN (Fine KNN), SVM (Medium Gaussian SVM), KNN (Coarse KNN), SVM (Coarse Gaussian SVM), SVM (Fine Gaussian SVM).

Method Name : Boolean Model, No. of Features: 540, Testing Method - Cross_Validation, HoldOut_Validation, Resubstitution_Validation										
SR N O	Clasification	Cross_Validation Accuracy (Validation) in %age			HoldOut_Validation Accuracy (Validation) in %age			Resubstitution_Validation Accuracy (Validation) in %age		
		03 Fold	05 Fold	08 Fold	10 Heldou t	30 Heldou t	50 Heldou t	SeAsid e	30 SeAsid e	50 SeAsid e
1	Ensemble (Bagged Trees)	29.2 0	29.2 0	33.1 0	23.10	33.30	24.60	98.50	97.80	98.50
2	Ensemble (Boosted Trees)	29.2 0	37.7 0	31.5 0	30.80	30.80	20.00	90.80	94.50	98.50

3	Ensemble (RUSBoosted Trees)	29.2 0	24.6 0	28.5 0	15.40	20.50	13.80	62.30	68.10	73.80
4	Ensemble (Subspace Discriminant)	29.2 0	39.2 0	42.3 0	23.10	38.50	23.10	97.70	89.00	86.20
5	Ensemble (Subspace KNN)	10.0 0	9.20	9.20	7.70	15.40	7.70	97.70	97.80	98.50
6	Kernel (Logistic Regression Kernel)	9.20	17.7 0	14.6 0	7.70	17.90	9.20	90.00	90.10	92.30
7	Kernel (SVM Kernel)	9.20	16.2 0	13.8 0	15.40	17.90	9.20	86.20	84.60	84.60
8	KNN (Coarse KNN)	6.90	9.20	10.8 0	23.10	7.70	7.70	12.30	7.70	7.70
9	KNN (Cosine KNN)	20.8 0	23.8 0	18.5 0	7.70	15.40	21.50	38.50	30.80	33.80
10	KNN (Cubic KNN)	17.7 0	17.7 0	15.4 0		12.80	15.40	36.20	30.80	23.10
11	KNN (Fine KNN)	8.50	9.20	10.0 0	7.70	15.40	4.60	98.50	97.80	98.50
12	KNN (Medium KNN)	18.5 0	19.2 0	16.2 0	7.70	12.80	15.40	40.00	28.60	30.80
13	KNN (Weighted KNN)	12.3 0	16.2 0	14.6 0	7.70	17.90	9.20	98.50	97.80	98.50
14	Linear Discriminant	40.0 0	43.8 0	47.7 0	38.50	41.00		98.50	97.80	
15	Naïve Bayes (Kernel Naïve Bayes)	16.9 0	19.2 0	17.7 0	15.50	15.40	4.60	58.50	57.10	55.40
16	Neural Network (Bilayered Neural Network)	15.4 0	26.2 0	18.5 0	7.70	20.50	9.20	97.70	97.80	98.50
17	Neural Network (Medium Neural Network)	16.2 0	23.1 0	25.4 0	15.40	28.20	18.50	98.50	97.80	98.50
18	Neural Network (Narrow Neural Network)	22.3 0	23.8 0	23.8 0	15.40	41.00	18.50	98.50	97.80	98.50
19	Neural Network (Trilayered Neural Network)	9.20	13.8 0	19.2 0	7.70	10.30	20.00	98.50	97.80	98.50
20	Neural Network (Wide Neural Network)	25.4 0	25.4 0	24.6 0	15.40	30.80	15.40	98.50	97.80	98.50
21	SVM (Coarse Gaussian SVM)	6.20	10.8 0	10.0 0	15.40	15.40	7.70	44.60	54.90	43.10
22	SVM (Cubic SVM)	13.1 0	18.5 0	17.7 0	7.70	25.60	10.80	96.90	96.70	95.40
23	SVM (Fine Gaussian SVM)	4.60	9.20	3.10	15.40	10.30	6.20	98.50	97.80	98.50
24	SVM (Linear SVM)	10.8 0	18.5 0	16.9 0	15.40	20.50	10.80	75.40	78.00	69.20
25	SVM (Medium Gaussian SVM)	10.0 0	15.4 0	14.6 0	7.70	20.50	7.70	79.20	87.90	84.60
26	SVM (Quadratic SVM)	13.8 0	21.5 0	20.0 0	7.70	23.10	15.40	93.80	92.30	93.80
27	Tree (Coarse Tree)	14.6 0	18.5 0	15.4 0		17.90	13.80	29.20	27.50	30.80
28	Tree (Fine Tree)	20.8 0	24.6 0	24.6 0	15.40	20.50	20.00	65.40	68.10	58.50
29	Tree (Medium Tree)	20.8 0	24.6 0	23.8 0	15.40	20.50	20.00	62.30	68.10	58.50

Ensemble (Boosted Trees)

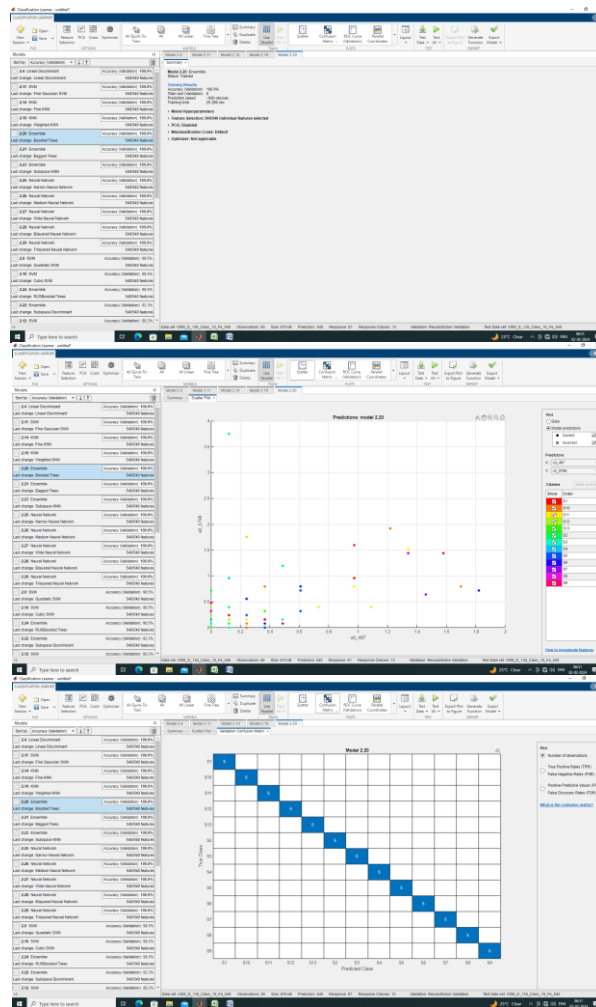
Sample Result of Boolean model:

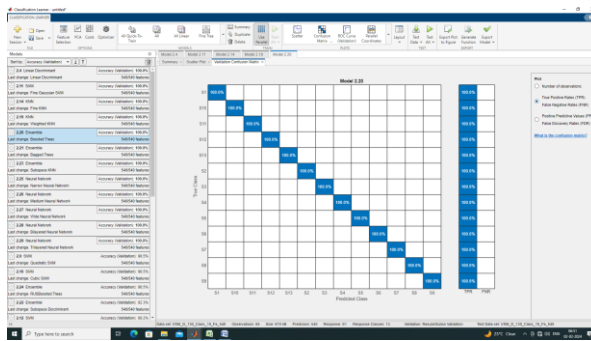


Method Name : Vector Space Model, No. of Features: 540, Testing Method - Cross_Validation, HoldOut_Validation, Resubstitution_Validation										
SR N O	Classification	Cross_Validation Accuracy (Validation) in %age			HoldOut_Validation Accuracy (Validation) in %age			Resubstitution_Validation Accuracy (Validation) in %age		
		03 Fold	05 Fold	08 Fold	10 Heldou t	30 Heldou t	50 Heldou t	SeAsid e	30 SeAsid e	50 SeAsid e
1	Ensemble (Bagged Trees)	57.70	58.50	63.80	92.30	61.50	61.50	100.00	100.00	100.00
2	Ensemble (Boosted Trees)	51.50	55.40	56.20	84.60	59.00	47.70	99.20	100.00	100.00
3	Ensemble (RUSBoosted Trees)	49.20	47.70	50.80	69.20	56.40	40.00	78.50	87.90	98.50
4	Ensemble (Subspace Discriminant)	43.80	47.70	41.50	46.20	46.20	49.20	100.00	92.30	92.30
5	Ensemble (Subspace KNN)	20.80	20.80	19.20	23.10	23.10	24.60	99.20	98.90	100.00
6	Kernel (Logistic Regression Kernel)	16.20	20.80	15.40	46.20	33.30	24.60	89.20	83.50	89.20
7	Kernel (SVM Kernel)	20.80	20.80	18.50	46.20	33.30	24.60	90.00	85.70	87.70
8	KNN (Coarse KNN)	2.30	6.20	10.80	23.10	7.70	7.70	12.30	7.70	7.70
9	KNN (Cosine KNN)	25.40	23.10	27.70	38.50	20.50	26.20	37.70	44.00	36.90
10	KNN (Cubic KNN)	21.50	20.00	22.30	23.10	20.50	24.60	36.90	41.80	32.30
11	KNN (Fine KNN)	12.30	10.80	11.50	23.10	17.90	15.40	100.00	100.00	100.00
12	KNN (Medium KNN)	19.20	20.80	20.00	38.50	15.40	16.90	34.60	36.30	27.70
13	KNN (Weighted KNN)	20.00	16.90	16.20	23.10	15.40	16.90	100.00	100.00	100.00
14	Linear Discriminant	54.60	53.10	53.80	46.20	46.20	61.50	100.00	100.00	100.00
15	Naïve Bayes (Kernel Naïve Bayes)	9.20	10.00	12.30		12.80	21.50	50.00	59.30	50.80
16	Neural Network (Bilayered Neural Network)	25.40	23.10	33.10	38.50	28.20	18.50	99.20	97.80	100.00
17	Neural Network (Medium Neural Network)	25.40	29.20	34.60	38.50	30.80	26.20	100.00	100.00	100.00
18	Neural Network (Narrow Neural)	33.10	29.20	36.90	38.50	38.50	23.10	100.00	100.00	100.00

	Network)									
19	Neural Network (Trilayered Neural Network)	24.60	25.40	25.40	7.70	28.20	18.50	95.40	95.60	100.00
20	Neural Network (Wide Neural Network)	26.90	26.20	33.10	53.80	35.90	26.20	100.00	100.00	100.00
21	SVM (Coarse Gaussian SVM)	3.80	6.20	7.70	7.70	10.30	15.40	31.50	44.00	38.50
22	SVM (Cubic SVM)	13.10	12.30	13.10	23.10	17.90	16.90	97.70	96.70	98.50
23	SVM (Fine Gaussian SVM)	7.70	11.50	4.60	23.10	12.80	9.20	99.20	100.00	100.00
24	SVM (Linear SVM)	15.40	16.90	17.70	30.80	23.10	16.90	73.80	78.00	76.90
25	SVM (Medium Gaussian SVM)	12.30	12.30	10.80	30.80	12.80	13.80	67.70	84.60	89.20
26	SVM (Quadratic SVM)	14.60	13.80	15.40	38.50	15.40	19.90	94.60	91.20	98.50
27	Tree (Coarse Tree)	25.40	23.10	20.80	23.10	33.30	30.80	30.00	34.10	36.90
28	Tree (Fine Tree)	46.90	50.80	51.50	69.20	61.50	43.10	80.80	81.30	86.20
29	Tree (Medium Tree)	46.90	50.80	51.50	69.20	61.50	43.10	80.80	81.30	86.20

Ensemble (Boosted Trees)
 Sample Result of Vector Space Model:





Conclusion

The proposed framework will work to fetch information from different web sources to form a database. After collecting all the information, it will be processed by different web mining and data mining techniques and stored in the secondary database. The architecture design will be in terms of faster accessibility of information to the user.

The proposed framework will be capable of comparing the text-based information and help to represent more tabulated and systematic format. As the system is implemented with multiple data mining techniques, it will produce much better and accurate result.

In Boolean model, because of its Boolean nature, results may be tides, missing partial matching, hence we get less result as compared to Vector space model. While on the contrary, vector space model, considering term-frequency, inverse document frequency measures, achieves utmost relevancy in retrieving documents we get more result as compared to Boolean model in information retrieval. Hence we can conclude that Vector space model is better than Boolean model.

The research work directs to develop web-based framework for knowledge representation using web mining and information retrieval techniques. This framework will be used by students, researchers, academicians and common people to present information using flexible user interface.

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Evaluation of different types of substrates from cotton plant in periphyton development system

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DOI-10.5281/zenodo.13637442

Abstract:

Periphytons are the micro-organisms growing on stones, sticks aquatic macrophytes, and submerged surfaces. Periphyton is the easiest source of food for fishes in an ecosystem. In the present study different structures of cotton stems and cotton flowers were evaluated for the periphyton production in the laboratory. The physico-chemical properties of substrates added water and initial water was analyzed by standard methods. The results revealed that the biomass of periphyton was high on the isolated cotton stems than the other substrates. The taxonomic composition of periphyton included, Chlorophyceae (green Algae), Bacillariophyceae (Diatoms), Arthropods (mosquito larvae), Ostracoda (*Cypris sp.*) and Copepods (*Cyclop sp.*) and Mollusca (*Lymnae sp.*). The Chlorophyceae and Bacillariophyceae groups were dominant in all substrates except cotton flower. The physico-chemical properties of water were suitable for the periphyton production. Thus, among the all substrates, the isolated cotton stem was comparatively more efficient for periphyton development. The isolated cotton stems could be utilized in the periphyton based aquaculture systems, which is eco-friendly and sustainable technology.

Keywords: Periphyton, Cotton Substrates, Aquaculture

Introduction:

Periphyton refers to the micro-floral community that lives attached to the surfaces of objects submerged in water (Wetzel, 1983). The German term Aufwuch encompasses all organisms that are attached to substrates such as stones, rocks, and sticks. According to Azim et al. (2001), periphyton is a complex combination of aquatic organisms that are attached to submerged substrates, including both attached and non-attached organisms, as well as detritus. Therefore, the periphyton community consists of bacteria, fungi, protozoa, algae, zooplankton, and other invertebrates. Periphyton plays a crucial role in supporting a diverse community of aquatic organisms by providing structure and primary productivity. It is a valuable food source for small invertebrates, fish, and shrimp, contributing significantly to the overall productivity of aquatic ecosystems (Azim et al., 2005). Utilizing periphyton in pond culture practices has been shown to greatly enhance aquaculture production, leading to the development of independent periphyton-based techniques for catching fish in open waters worldwide. Fish can be cultivated on various substrates that are either artificially introduced into the water or naturally present in the aquatic system. This provides a readily available and nutritious food source for the fish, allowing them to graze more efficiently

compared to filtering planktonic algae, which typically do not meet their energy requirements. The objective of this research is to investigate the potential of Periphyton growth on various artificial substrates, such as agricultural waste from cotton, for use in pond fish farming. This study takes into account global efforts in substrate-based aquaculture.

Materials and Methods:

Collection of water sample:

The periphytic sample was collected from the lake placid of Swami Ramanand Teerth Marathwada University Nanded, around 100 liters of water sample was collected near the embankment of the pond at a depth of 2 to 3 ft."

Collection of Cotton Plant Wastes:

Cotton plant wastes such as dried cotton stems and dried flowers were collected from the field of Pangri village, Nanded.

Preparation of Substrates Bundles from Plant Wastes:

The dried cotton stems were collected and cut into equal size (36 cm length 2 cm diameter) and were used in four different forms such as six isolated cotton stems (A), bunch of six cotton stems (B), six criss-cross cotton stems (C) and Trapha structure of six cotton stems (D). Besides these twelve dried flowers of cotton (E) were used for the study.

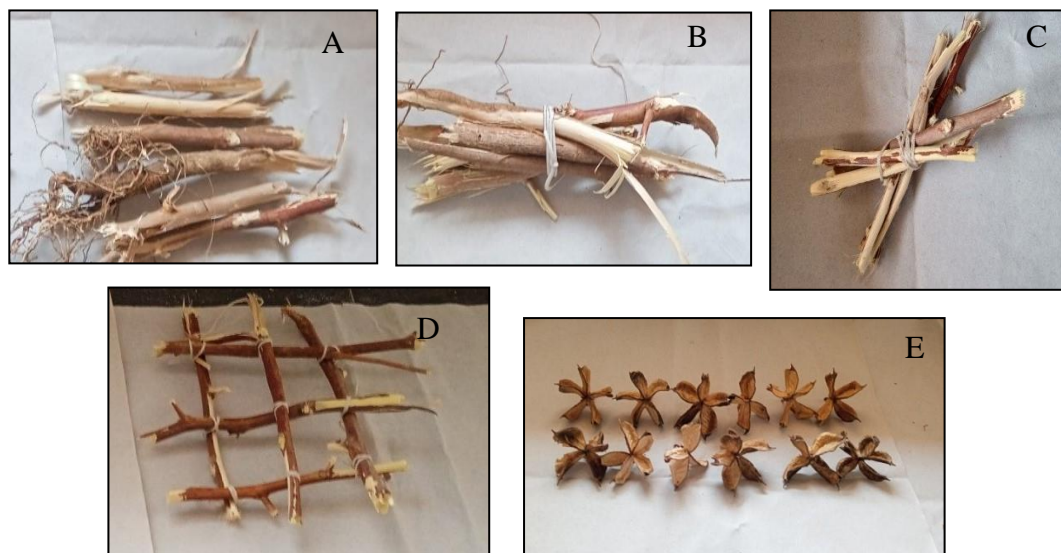


Fig 1: Substrates of cotton plant (A) Isolated stems (B) Bunch of stems (C) Criss-cross Stems (D) Trapha structure of stems and (E) Cotton flowers

Analysis of Physico-chemical Parameters of Water:

The physico chemical parameters of pond water and periphyton grown water from the laboratory system were analyzed. The parameters examined were temperature, pH, dissolved oxygen, chloride, total solids, total dissolved solids, total suspended solids, hardness, calcium hardness and magnesium hardness (Eaton, 2005 and Trivedy et al., 1998).

Screening of Substrates for Periphyton Growth:

The substrates were placed in aquarium of size 48×15×18 inches. The bottom of aquarium provided with soil and 50 liters periphytic water sample from pond was added. To increase the level of water, tap water was added up to the volume of 200 liter in aquarium. The substrates were submerged in the water. The fertilizers added into the water were urea (32 g) and NPK (32 g). The light and aeration provided. The experimental substrates were kept for 30 days (Shaikh & Chavan, 2015 and Fatima & Chavan, 2023).

Collection and fixation of Periphyton from Substrates:

The substrates were removed from the water and the periphyton developed on the surface of substrates were collected with a soft brush and rinsed with water. Large Periphyton in the form of insect larvae and Bivalve were collected separately and other planktons were collected separately and fixed by adding 1 ml of 4% formalin to the zooplankton, 70 % ethanol for macro benthos and Lugol's Iodine for algae (Shaikh & Chavan, 2017).

Quantitative Analysis of Periphyton:

Periphyton was collected from the substrates and measured quantitatively using Sedgwick Rafter Counting Cell method. The average % of each Periphyton group as a sub sample group/ml was calculated. 1 ml subsample was used from a 1 L suspension sample obtained by scraping periphyton from each substrate (Azim et al., 2002).

Determination of Biomass:

The sample was collected and centrifuged at 5000 rpm for 5 min," the supernatant was discarded and the residue was filtered through Whatman filter paper. The filtrate was air dried and the filtrate was weighed to represent the total periphyton biomass (Shaikh & Chavan, 2017).

Mount preparation and Identification:

The permanent slides were prepared. The sample was treated with different grades of ethanol such as 30%, 50%, 70%, 90% and 100%. The acetocarmine was used as a stain and xylene as a clearance reagent. Mounting media such as Canada balsam was used (Eaton, 2005).

Results and Discussion:

Physico-chemical analysis of water:

The physico-chemical parameters of water were estimated and shown in the table no.1. The water quality parameters of pond water and Aquarium water were analyzed. It was observed that temperature, pH, dissolved oxygen, free CO₂ are present in the range as per the aquarium pond water standards as per Boyd (1998). There is an increase in values of total solids, hardness, calcium hardness and chloride contents. It may be due to the fertilizers added to the system."

Parameters	Pond water	Aquarium water	Aquaculture standards as per Boyd (1998)
Temperature °C	30	32	25- 32°C
pH	7.98	8.75	7-9
Dissolved O ₂ (mg/lit)	6.44	9.8	5-15
Free CO ₂ (mg/lit)	5.4	6.2	1-10
Chloride (mg/lit)	91.14	118.02	1-100
PA (mg/lit)	0	300	50-300
TA (mg/lit)	332	370	50-300
TS (mg/lit)	1000	1160	500
TDS (mg/lit)	500	410	500
TSS (mg/lit)	500	750	500
Hardness (mg/lit)	110	244	50-200
Calcium hardness (mg/lit)	54	102	5-100
Magnesium Hardness (mg/lit)	29.768	30.256	5-100

Table 1: Physico-chemical parameters of pond water and aquarium water

Identification of periphyton:

The periphytic sample from substrates showed the presence of different genera of class Chlorophyceae such as *Nostoc*, *Ulothrix*, *Oscillatoria*, *Spirogyra*, *Selenastrum*, *Chroococcus* and *Pandorina*. Some genera of class Bacillariophyceae such as *Navicula*, *Cymbella*, *Pinnularia*, *Synedra*, *Nitzschia* and *Achnanthes* and some invertebrates of class Insecta (Larva of *Culex sp.*), molluscs (*Lymnae sp.*) and zooplanktons (*Cyclops sp.* and *Cypris sp.*) were observed. The Chlorophyceae and Bacillariophyceae are dominant in all models of substrates except cotton flowers. Chavan and Joshi, (2012) found that the taxonomic composition of periphyton includes Chlorophyceae, Cyanophyceae, Bacillariophyceae, Euglenophyceae, zooplanktons and invertebrates. The number of taxa on cotton plant bundles was more than the jawar plant bundle. It was found that the Chlorophyceae, Bacillariophyceae cladocerans and copepod were observed on some biodegradable and non-biodegradable substrates. Among them Chlorophyceae was the dominant group in periphyton composition (Shaikh & Chavan, 2015).

Biomass of periphyton:

Groups of taxa	Cotton substrates				
	Isolated	Bunch	Criss-cross	Trapha	Flower
Bacillariophyceae	25	11	4	2	0
Chlorophyceae	21	14	12	9	0
Arthropoda (mosquito larvae)	22	18	14	8	0
Ostracoda (<i>Cypris sp.</i>)	7	5	3	2	0
Copepods (<i>cyclops</i>)	6	4	2	1	0
Mollusca (<i>Lymnae sp.</i>)	10	5	5	3	0
Total (no. of sp./ml)	91	57	40	25	0

Table 2: Quantitative analysis of periphyton on different cotton substrates

Conclusion:

In the present study different cotton substrates were evaluated for the growth of periphyton. The growth of periphyton is highest on isolated cotton stems, followed by bunch of cotton stems, criss-cross structure of cotton stems and trapha structure of cotton stems. The cotton flowers showed negligible periphyton growth. From the

The biomass of periphyton observed on different cotton substrates such as isolated stems, bunch of stems, criss-cross stems and trapha structure were 18.98, 12.06, 10.45 and 8.79 gm/lit respectively. The cotton flowers were unable to grow periphyton. Periphyton biomass from isolated cotton stem was comparatively higher than other substrate structures. Shaikh et al. (2017) found that the biomass of periphyton is higher on Cotton substrate as compared to other substrates. Chavan and Joshi (2012) analyzed the growth of Periphyton in terms of biomass was higher on the cotton plant bundles (48.6 gm/L) as compared to the Jawar plant bundles.

Quantitative analysis of periphyton:

The quantitative analysis of Periphyton showed that the highest number of genera of class Bacillariophyceae were observed on the isolated cotton stems. The bunch and criss-cross structure of cotton showed the dominance of larval insects. The trapha structure of cotton showed the dominance of class Chlorophyceae while, the cotton flowers were unable to grow the periphyton during the study. The quantitative analysis of different taxas were depicted in Table No. 2.

result it was found that the isolated cotton stems provide better surface area for periphyton growth as compared to other substrates. The isolated cotton stems could be applied in the periphyton based aquaculture system.

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COI gene variability in *Wallago attu* and its close related species *Ompok bimaculatus*.

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Abstract:

Taxonomy based of Cytochrome Oxidase 1 Gene is a novel technique in the field of animal identification. DNA sequences to be aligned for the taxonomic process are aligned in software MEGA. Alignment of different sequences world over for the fish *Wallago attu* have been worked out in the present study with its taxonomically close individual *Ompok bimaculatus*. Different nucleotide sequences in the alignment are pointed out which vary within the species as well as between the species. Interspecific variations are designated as Molecular Operational Taxonomic Units. Thus comparison of both morphological characters and Molecular Operational Taxonomic Units in the present study helps to identify the effectiveness of both the methods together giving a better insight in coevolution of sequences with altering morphology.

Keywords: Molecular Operational Taxonomic Units, MEGA.

Introduction:

Biodiversity and its conservation are one of the major issues to enable sustainable use of natural resources (Kar D. et. al. 2006). Freshwater fishes are getting declined rapidly because of their high sensitivity to qualitative and quantitative changes of aquatic habitats (SenGupta S. and Homechaudhuri S. 2015). Basic scientific information on biodiversity is important for sustained exploitation and simultaneous conservation of fisheries resources (Ahirrao and Mane 2000). Habitat loss, pollution, introduction of exotic species (Yede S. W. et al. 2016), over exploitation cause aquatic biodiversity change and depletion (Biju Kumar A. 2000).

COI gene based molecular taxonomy is an efficient method for species identification of fishes and fish products (Espineira M., et. al. 2008, Ward R. D. et. al. 2005) for different life stages (Ahrens D. et. al. 2007). Bioinformatics has made it possible to consider large numbers of characteristics in classifying many phenomena, notably living organisms, fossil organisms and even imaginary organisms (Sokal R. R. 1966).

Present study the Operational Taxonomic Units (OTUs) working in one of the native fish *Wallago*

The accession numbers of the fishes used for the study are as follows:

attu in comparison with its closest related species *Ompok bimaculatus* on NCBI data base.

Wallago attu species has been described from Malabar Southern India and is widely distributed eastward to the Mekong river drainage and south word to Java, Indonesia. The conspecific existence of the population of Indian subcontinent, Myanmar and South East Asia await verification and require further studies. The fish is cat fish which inhabits large rivers, tanks and lakes. It is a sluggish, bottom dwelling, voracious feeder and invasive not letting other fishes grow in the habitat (Ng, H.H. 2010).

Material Methods:

DNA barcoding is one of the newer developing sciences in species identification and help to broaden understanding of both phylogenetic signal and population level variation (Hajibabaei, M. et al., 2007). It is tough to obtain a complete gene of 650 bases (Hajibabaei, M. et al., 2006).

The COI gene sequences of the fish *Wallago attu* and *Ompok bimaculatus* were downloaded from NCBI and were aligned using the software Molecular Evolutionary Genetic Analysis (MEGA) version 5.05(Tamura et. al. 2011). The sequences were aligned using Clustal W alignment method.

No	Fish	Accession number
1	<i>Wallago attu</i>	JX260823
2	<i>Wallago attu</i>	JX983510
3	<i>Wallago attu</i>	FJ170769
4	<i>Wallago attu</i>	KX657717
5	<i>Ompok bimaculatus</i>	JX887604
6	<i>Ompok bimaculatus</i>	JX260923
7	<i>Ompok bimaculatus</i>	JN628878

Ompok bimaculatus stood close to *Wallago attu* in BLAST and being morphologically very much similar, has been chosen as a part of this study.

Although the COI gene measures 652bp present length aligned in the study has been 516 bases only.



Result:

The output of the sequence alignment exported in

the results is showing no mutations within both *Wallago attu* and *Ompok bimaculatus* species

Table1: Nucleotide composition of the reference sequence and sequences of fishes undertaken.

JX26099 3.1 Wallago attu voucher WAPA0 4 cytochro me oxidase subunit 1	G	A	G	C	T	G	G	C	C	C	A	A	C	C	T	G	G	C	G	C	C	C	T	T	C	T	A	G	G	C
JX98351 0.1 Wallago attu voucher NF674 cytochro me oxidase subunit 1	G	A	G	C	T	G	G	C	C	C	A	A	C	C	T	G	G	C	G	C	C	C	T	T	C	T	A	G	G	C
FJ17076 9.1 Wallago attu voucher NBFR: WA8089 C cytochro me c oxidase subunit I	G	A	G	C	T	G	G	C	C	C	A	A	C	C	T	G	G	C	G	C	C	C	T	T	C	T	A	G	G	C
KX6577 17.1 Wallago attu voucher DUZM1 30 cytochro me oxidase subunit I	G	A	G	C	T	G	G	C	C	C	A	A	C	C	T	G	G	C	G	C	C	C	T	T	C	T	A	G	G	C
JX88760 4.1	G	A	G	C	T	G	G	C	C	C	A	A	C	C	T	G	G	C	G	C	C	C	T	T	C	T	A	G	G	C

JX98351 0.1	G	T	A	A	T	G	C	C	C	A	T	T	A	T	G	A	T	C	G	G	G	G	G	C	T	T	C	G	G	G
FJ17076 9.1	G	T	A	A	T	G	C	C	C	A	T	T	A	T	G	A	T	C	G	G	G	G	G	C	T	T	C	G	G	G
KX6577 17.1	G	T	A	A	T	G	C	C	C	A	T	T	A	T	G	A	T	C	G	G	G	G	G	C	T	T	C	G	G	G
JX88760 4.1	G	T	A	A	T	A	C	C	A	A	T	C	A	T	G	A	T	T	G	G	G	G	G	C	T	T	T	G	G	A
JX26092 3.1	G	T	A	A	T	A	C	C	A	A	T	C	A	T	G	A	T	T	G	G	G	G	G	C	T	T	T	G	G	A
JN62887 8.1	G	T	A	A	T	A	C	C	A	A	T	C	A	T	G	A	T	T	G	G	G	G	G	C	T	T	T	G	G	A
JX26099 3.1	A	A	T	T	G	A	C	T	A	G	T	G	C	C	T	C	T	A	A	T	G	A	T	T	G	G	G	G	C	C
JX98351 0.1	A	A	T	T	G	A	C	T	A	G	T	G	C	C	T	C	T	A	A	T	G	A	T	T	G	G	G	G	C	C
FJ17076 9.1	A	A	T	T	G	A	C	T	A	G	T	G	C	C	T	C	T	A	A	T	G	A	T	T	G	G	G	G	C	C
KX6577 17.1	A	A	T	T	G	A	C	T	A	G	T	G	C	C	T	C	T	A	A	T	G	A	T	T	G	G	G	G	C	C
JX88760 4.1	A	A	T	T	G	A	C	T	C	G	T	G	C	C	C	C	T	T	A	T	G	A	T	T	G	G	A	G	C	A
JX26092 3.1	A	A	T	T	G	A	C	T	C	G	T	G	C	C	C	C	T	T	A	T	G	A	T	T	G	G	A	G	C	A
JN62887 8.1	A	A	T	T	G	A	C	T	C	G	T	G	C	C	C	C	T	T	A	T	G	A	T	T	G	G	A	G	C	A
JX26099 3.1	C	C	A	G	A	C	A	T	A	G	C	A	T	T	C	C	C	C	C	G	A	A	T	A	A	A	T	A	A	C
JX98351 0.1	C	C	A	G	A	C	A	T	A	G	C	A	T	T	C	C	C	C	C	G	A	A	T	A	A	A	T	A	A	C
FJ17076 9.1	C	C	A	G	A	C	A	T	A	G	C	A	T	T	C	C	C	C	C	G	A	A	T	A	A	A	T	A	A	C
KX6577 17.1	C	C	A	G	A	C	A	T	A	G	C	A	T	T	C	C	C	C	C	G	A	A	T	A	A	A	T	A	A	C
JX88760 4.1	C	C	A	G	A	T	A	T	A	G	C	A	T	T	C	C	C	C	C	G	A	A	T	A	A	A	T	A	A	C
JX26092 3.1	C	C	A	G	A	T	A	T	A	G	C	A	T	T	C	C	C	C	C	G	A	A	T	A	A	A	T	A	A	C
JN62887 8.1	C	C	A	G	A	T	A	T	A	G	C	A	T	T	C	C	C	C	C	G	A	A	T	A	A	A	T	A	A	C
JX26099 3.1	A	T	A	A	G	C	T	T	C	T	G	A	C	T	C	C	T	T	C	C	C	C	C	A	T	C	C	T	T	T
JX98351 0.1	A	T	A	A	G	C	T	T	C	T	G	A	C	T	C	C	T	T	C	C	C	C	C	A	T	C	C	T	T	T
FJ17076 9.1	A	T	A	A	G	C	T	T	C	T	G	A	C	T	C	C	T	T	C	C	C	C	C	A	T	C	C	T	T	T
KX6577 17.1	A	T	A	A	G	C	T	T	C	T	G	A	C	T	C	C	T	T	C	C	C	C	C	A	T	C	C	T	T	T
JX88760 4.1	A	T	A	A	G	C	T	T	C	T	G	A	C	T	T	C	T	G	C	C	T	C	C	A	T	C	A	T	T	C
JX26092 3.1	A	T	A	A	G	C	T	T	C	T	G	A	C	T	T	C	T	G	C	C	T	C	C	A	T	C	A	T	T	C
JN62887 8.1	A	T	A	A	G	C	T	T	C	T	G	A	C	T	T	C	T	G	C	C	T	C	C	A	T	C	A	T	T	C
JX26099 3.1	C	T	T	C	T	C	T	T	G	C	T	A	G	C	C	T	C	A	T	C	T	G	C	C	G	T	T	G	A	A
JX98351 0.1	C	T	T	C	T	C	T	T	G	C	T	A	G	C	C	T	C	A	T	C	T	G	C	C	G	T	T	G	A	A
FJ17076 9.1	C	T	T	C	T	C	T	T	G	C	T	A	G	C	C	T	C	A	T	C	T	G	C	C	G	T	T	G	A	A
KX6577	C	T	T	C	T	C	T	T	G	C	T	A	G	C	C	T	C	A	T	C	T	G	C	C	G	T	T	G	A	A

JN62887 8.1	C	T	A	C	A	T	C	T	T	G	C	A	G	G	G	T	A	T	C	A	T	C	C	A	T	T	C	T	G	
JX26099 3.1	G	G	G	G	C	C	A	T	C	A	A	T	T	T	T	A	T	T	A	C	A	A	C	A	A	T	T	A	T	T
JX98351 0.1	G	G	G	G	C	C	A	T	C	A	A	T	T	T	T	A	T	T	A	C	A	A	C	A	A	T	T	A	T	T
FJ17076 9.1	G	G	G	G	C	C	A	T	C	A	A	T	T	T	T	A	T	T	A	C	A	A	C	A	A	T	T	A	T	T
KX6577 17.1	G	G	G	G	C	C	A	T	C	A	A	T	T	T	T	A	T	T	A	C	A	A	C	A	A	T	T	A	T	T
JX88760 4.1	G	G	G	G	C	A	A	T	T	A	A	C	T	T	C	A	T	T	A	C	A	A	C	A	A	T	T	A	T	T
JX26092 3.1	G	G	G	G	C	A	A	T	T	A	A	C	T	T	C	A	T	T	A	C	A	A	C	A	A	T	T	A	T	T
JN62887 8.1	G	G	G	G	C	A	A	T	T	A	A	C	T	T	C	A	T	T	A	C	A	A	C	A	A	T	T	A	T	T
JX26099 3.1	A	A	C	A	T	A	A	A	A	C	C	T	C	C	A	G	C	C	A	T	C	T	C	A	C	A	A	T	A	T
JX98351 0.1	A	A	C	A	T	A	A	A	A	C	C	T	C	C	A	G	C	C	A	T	C	T	C	A	C	A	A	T	A	T
FJ17076 9.1	A	A	C	A	T	A	A	A	A	C	C	T	C	C	A	G	C	C	A	T	C	T	C	A	C	A	A	T	A	T
KX6577 17.1	A	A	C	A	T	A	A	A	A	C	C	T	C	C	A	G	C	C	A	T	C	T	C	A	C	A	A	T	A	T
JX88760 4.1	A	A	C	A	T	A	A	A	A	C	C	C	C	C	A	G	C	C	A	T	C	T	C	A	C	A	A	T	A	T
JX26092 3.1	A	A	C	A	T	A	A	A	A	C	C	C	C	C	A	G	C	C	A	T	C	T	C	A	C	A	A	T	A	T
JN62887 8.1	A	A	C	A	T	A	A	A	A	C	C	C	C	C	A	G	C	C	A	T	C	T	C	A	C	A	A	T	A	T
JX26099 3.1	C	A	A	A	C	A	C	C	C	T	T	G	T	T	T	G	T	G	T	G	A	G	C	T	G	T	A	C	T	A
JX98351 0.1	C	A	A	A	C	A	C	C	C	T	T	G	T	T	T	G	T	G	T	G	A	G	C	T	G	T	A	C	T	A
FJ17076 9.1	C	A	A	A	C	A	C	C	C	T	T	G	T	T	T	G	T	G	T	G	A	G	C	T	G	T	A	C	T	A
KX6577 17.1	C	A	A	A	C	A	C	C	C	T	T	G	T	T	T	G	T	G	T	G	A	G	C	T	G	T	A	C	T	A
JX88760 4.1	C	A	A	A	C	A	C	C	A	T	T	A	T	T	T	G	T	A	T	G	A	G	C	C	G	T	C	C	T	A
JX26092 3.1	C	A	A	A	C	A	C	C	A	C	T	A	T	T	T	G	T	A	T	G	A	G	C	T	G	T	C	C	T	A
JN62887 8.1	C	A	A	A	C	A	C	C	A	C	T	A	T	T	T	G	T	A	T	G	A	G	C	C	G	T	C	C	T	A
JX26099 3.1	A	T	C	A	C	A	G	C	A	G	T	A	C	T	G	C	T	T	C	T	A	C	T	A	T	C	C	C	T	A
JX98351 0.1	A	T	C	A	C	A	G	C	A	G	T	A	C	T	G	C	T	T	C	T	A	C	T	A	T	C	C	C	T	A
FJ17076 9.1	A	T	C	A	C	A	G	C	A	G	T	A	C	T	G	C	T	T	C	T	A	C	T	A	T	C	C	C	T	A
KX6577 17.1	A	T	C	A	C	A	G	C	A	G	T	A	C	T	G	C	T	T	C	T	A	C	T	A	T	C	C	C	T	A
JX88760 4.1	A	T	T	A	C	A	G	C	A	G	T	T	C	T	C	C	T	A	C	T	A	T	T	G	T	C	T	C	T	C
JX26092 3.1	A	T	T	A	C	A	G	C	A	G	T	T	C	T	C	C	T	A	C	T	A	T	T	G	T	C	T	C	T	C
JN62887 8.1	A	T	T	A	C	A	G	C	A	G	T	T	C	T	C	C	T	A	C	T	A	T	T	G	T	C	T	C	T	C
JX26099 3.1	C	C	T	G	T	C	C	T	A	G	C	C	G	C	A	G	G	C	A	T	T	A	C	A	A	T	G	C	T	G

JX98351 0.1	C	C	T	G	T	C	C	T	A	G	C	C	G	C	A	G	G	C	A	T	T	A	C	A	A	T	G	C	T	G
FJ17076 9.1	C	C	T	G	T	C	C	T	A	G	C	C	G	C	A	G	G	C	A	T	T	A	C	A	A	T	G	C	T	G
KX6577 17.1	C	C	T	G	T	C	C	T	A	G	C	C	G	C	A	G	G	C	A	T	T	A	C	A	A	T	G	C	T	G
JX88760 4.1	C	C	T	G	T	A	C	T	A	G	C	C	G	C	A	G	G	T	A	T	C	A	C	A	A	T	G	C	T	T
JX26092 3.1	C	C	T	G	T	A	C	T	A	G	C	C	G	C	A	G	G	T	A	T	C	A	C	A	A	T	G	C	T	T
JN62887 8.1	C	C	T	G	T	A	C	T	A	G	C	C	G	C	A	G	G	T	A	T	C	A	C	A	A	T	G	C	T	T
JX26099 3.1	T	T	A	A	C	A																								
JX98351 0.1	T	T	A	A	C	A																								
FJ17076 9.1	T	T	A	A	C	A																								
KX6577 17.1	T	T	A	A	C	A																								
JX88760 4.1	C	T	A	A	C	A																								
JX26092 3.1	C	T	A	A	C	A																								
JN62887 8.1	C	T	A	A	C	A																								

Observing nucleotide sequences aligned it can be conclude that there are no intraspecific variations in the sites where as there are inter-specific variations existing while changing from *Wallago attu* to *Ompok bimaculatus*.

Conclusion:

Although variation in fishes is reduced when they are shifted from natural to cultured environment (Lucian Gorgan, 2008) it has not been observed in this fish on COI gene basis during the present study which controversial to our previous observations in *Rasbora daniconius* (Kharat M. M. et. al. 2017). Although fishes at low altitude show greater diversity than those at high altitudes because of different isolating mechanisms acting on those causing spatial isolation; temporal isolation (Lowe-McConnell R H 1969) no any changes in any nucleotide implied lack of selection pressure on different sites of occurrence of the fish.

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Various Household Milk Byproducts.

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Abstract:

The purpose of this research article is to examine the domestic milk byproducts and their possible applications. This essay will examine the different milk processing byproducts and how they might be used to create creative and nutritious dairy products. Humans consuming milk produced by animals form long years ago. Milk is converted into several milk products such as liquid milk as beverage, butter, buttermilk, curd, paneer and whey.

Keywords: Milk, Byproducts, Paneer, Butter, Buttermilk, Curd, Whey.

Introduction:

Milk is a very important product which comes from various mammals. It is a nutritious secretion of mammary glands of female of various mammals like Cow, Buffalo, Goat, Sheep, Horse, Humans etc. India is having largest milk production all over the world. Total 78 million tonnes of milk has produced in India every year (Tripathi S. and Wadhawan N., 2018). Out of that 50% of the milk produced in India is use as whole milk and the remaining is turns into various by products, which includes Paneer, Butter, Buttermilk, Curd, whey etc.

The percentage consumption pattern of different milk products in India are - liquid milk consumption accounts for 45.7% of total milk output, while 39% is converted into butter, 6.9% into curd, 6.5% into khoa and similar milk sweet, 3.7% into milk powder including infant milk food, 1.9% into paneer, chhana and cheese, 0.6% into ice cream and kulfi, 0.2% into cream-0.2% and others dairy products absorbing the remaining 0.5% (Sawale P. and Kumar H., 2013). So the demand of the milk in developing countries is increase by 25% by 2025(Bettoni R. and Burlingame B.,et. al, 2013).

The quality of milk products will vary depending on the differences in the chemical makeup of the milk from different animals. Depending on the type of milk used, the quality of goods made from it that have a distinct chemical composition will change. For instance, buffalo due to the high fat content of milk, yogurt has a superior quality, being thick, creamy, and having a wonderful mouthfeel in contrast to yogurt made from milk that has a low amount of fat (Widyastuti Y. and Febrisiantosa A., 2013).

The present study was performed to throw out a light on the household byproducts of the milk.

Materials and methods

Collection of samples: A milk samples were collected from local milk producers for the purpose of various byproducts.

Paneer

Paneer is the Delicious byproduct which is made by milk. Paneer has contains fat and protein total 90%, minerals 50%, and lactose 10%. The proximate composition of paneer is 54% moisture, 17.5% proteins, 25% fat, 2% lactose, and 1.5% minerals (Arora S., Khetra S., 2017).

Milk is heated up to 82⁰c for 5 min. then cooled it to 70⁰c. After cooling, add 1-2 % citric acid. Stir it well up to whey separates out. Set the mixture up to 10 min. Separates the solid part from mixture and press the curd in muslin cloth. Cut the blocks by the size of your choice. Preserved in cold condition (Paper No.: 07 Paper Title: Technology of Milk and Milk Products Module –19: Technology of Paneer).

Butter

Butter is the fatty product resulted from the milk. Total 80 g fat and a maximum of 16 g water and 2 g nonfat milk solids collectively get from a 100g of butter (Widyastuti Y., and Z Febrisiantosa A., 2013). It is generally made from the cream layer after boiling process. This cream layer is then collect and the addition of some Curd is takes place. After that it mix well with each other by using blender, while blending the cream should be cold. For that purpose add ice cubes in it. Keep whipping up to when to mixture is get curdled, at the end it will be completely curdled and the milk solid will be separated. Collect all butter with help of spatula. Add some cold water in the butter and keep it for 5 to 10 mins. Take away water from the butter. Butter is ready.

Buttermilk

Buttermilk is a liquid by product which is produced during manufacturing of dairy butter as by-product. Buttermilk contains 3.5–4.9 g /100 mL lactose, 0.5 g/100 mL lactic acid, 2.7–3.8 g/100 mL protein and ash 0.6–0.75 g/100 mL (Gebreselassie N., et al., 2016).

Buttermilk is form in the process of butter formation. After removing a solid part of butter the liquid portion is left, is called as buttermilk.

Ghee

It is a type of clarified part of butter. It is commonly used for Cooking, massage, traditional medicine, and for Hindu religious rituals. Ghee is used in digestive process because it stimulates the secretion of gastric acid. Kumar A. et al., December 2018).

Makkhan is placed in a vessel (ghee boiler) and heated to about 110-120° C with constant stirring to evaporate practically all of the moisture. After that, the ghee residue is separated from ghee by filtration and the ghee packaged in suitable containers or pouch (Paper 7: Technology of Milk and Milk Products Module no. 10: Technology of Ghee making – Direct cream, Creamery butter, Continuous method).

Curd

Milk is converted into curd or yogurt by the process of fermentation. The whole milk curd contains 85-88 % of water, fat 5-8 %, protein 3.2-3.4 %, lactose 4.6-5.2%, lactic acid 0.5-1.1%, ash 0.7-0.75% etc. (Reading Material for Curd (dahi) Production Under PMFME Scheme AATMANIRBHAR BHARAT National Institute of Food Technology Entrepreneurship and Management, 2022).

Take a Raw milk. Boil it for 5 to 10 min. Cooled to at room temperature. Then add previous sample of curd in it. Stir it well. Keep it overnight. Store in cold storage.

Whey

Whey is the liquid remaining in the process of paneer formation. Total 10 litres of milk produces one kilogram of cheese or paneer and nine litres of whey (Achmadi E., 2021). Whey constitutes of milk solids (45–40%), milk sugar, i.e., lactose (70%), minerals (70–90%), proteins (20%) and vitamins (B and C) (Khurana S. et., al, 2023).

Take two cups of milk. Slowly bring the milk to the boil, while stirring constantly. It is very important to constantly stir the milk otherwise it will burn. Turn off the heat once the milk is boiling. Leave the saucepan on the heat source to cool slowly. Add 4 teaspoon lemon juice to the boiling milk. At this point, the milk should cuddle and turn into curds and whey. Scoop out the curds and strained the liquid part which is the whey. Stored it separately.

Conclusion

Humans are using milk and milk byproducts as an important food form many years ago. It

provides many nutrients. If more research develops on milk byproducts, it will be a great opportunity for dairy industry.

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University (De-novo Category) under Section 3 of the UGC Act, 1956 An Autonomous Institution under Ministry of Food Processing Industries, Government of India Plot no 97, Sector 56, HSIIDC, Industrial Estate, Kundli, Sonapat, Haryana – 131028 Website: www.niftem.ac.in, Email: pmfmececell@niftem.ac.in, Contact No. 0130-2281089 PMFME – Curd (Dahi) Making.



Synthesis of Naphthalene Diimides (NDI) Based Organic Moieties for Optoelectronics

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Abstract:

In supramolecular system self-organization is important tool for creation of assembly in natural or artificial system. When we see supramolecular organization of fullerene (C60) using π stacking interaction to form various functional assembly and it is most important for optoelectronic properties. Fullerene is less soluble and it is overcome by non-covalent interaction and covalent functionalization with organic moieties. Hence we synthesized different non fullerene acceptor molecules for optoelectronic applications.

Introduction:

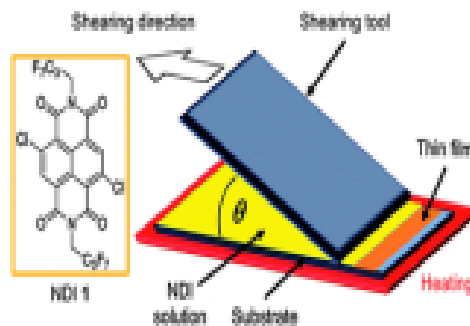
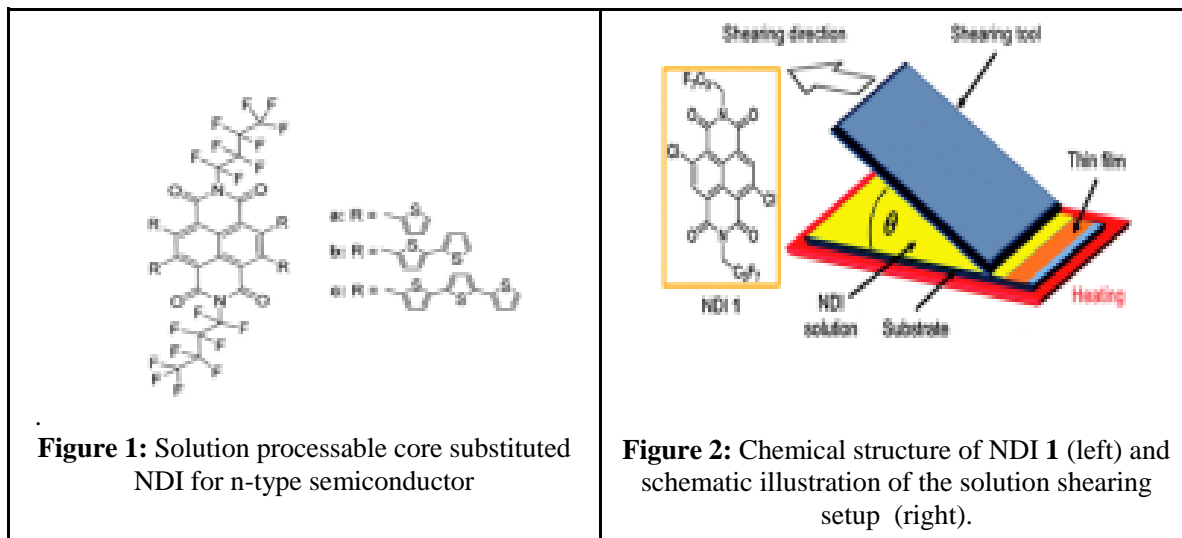
Recent extensive studies have shown that organic materials exhibit a variety of interesting optical, electrical, photoelectric, and magnetic properties in the solid state. Photo and electro active organic materials have been the subject of recent attention, including organic semiconductors, organic metals including superconductors, organic photoconductors, organic photoactive materials for solar cells, organic non-linear optical materials, organic ferromagnetism, photo- and electrochromic organic materials, resist materials, liquid crystals, and others. Among them, organic photoconductors, liquid crystals, and resist materials have been put to practical use for photoreceptors in electrophotography, display devices, and lithographic processes for the production of semiconductor devices. In addition, organic materials have found a number of potential applications for use in electronic and optoelectronic devices such as sensors, plastic batteries, solar cells, field-effect transistors, optical data storage, organic electroluminescent devices, switching devices, frequency doubles, and many others.¹

The preparation and manipulation of nanometer-sized species is currently a research focus in physics, molecular materials chemistry, and materials science. Activities for preparation of beyond nanomaterial's species led to the formation of a new field of science beyond nanotechnology³⁻⁶. This lies at the heart of current technological evolution and is integral in the development of new materials.⁷ However, manipulating the nano- and micrometer-length scale organization of molecular building blocks is not an easy task. Many optoelectronic functional molecules have been synthesized and characterized, in most cases without well-established strategies and suitable guidance toward their assemblies and fabrications. Although advanced technologies such

as nanolithography and nano-patterning, which can directly handle nanometer-sized materials, have appeared and been proven to be successful in some circumstances, they are still in need of further development to fulfill the tasks in the macroscopic world. Moreover, on the nanometer length scale, a variety of weak intermolecular forces that can be neglected in macroscopic length scale begin to play important roles.⁸ These forces include van der Waals attraction, hydrogen bonding, π - π , electrostatic, and hydrophilic/hydrophobic interactions. The programmed building blocks thereby self-assemble to achieve a balance among these intermolecular forces and to minimize the total energy of the system. This feature provides an alternative and effective way to manipulate the nano- and micrometer-scale organization of molecular materials, which can be controlled by sophisticated molecular design. Various π -conjugated molecules are intriguing building blocks for the fabrication of functional materials, where the π -conjugated moieties can impart interesting optical and/or optoelectronic properties with commonly self-assembled states.⁹ They are currently the basis of organic optoelectronic devices such as organic light-emitting diodes (OLEDs), organic field-effect transistors (OFETs), and organic thin-film solar cells.¹¹ Among aromatic molecules that have found utility, particularly in the design of conducting materials, the 1,4,5,8-naphthalene diimides (NDIs) (also known as naphthalene carbo diimides) have attracted much attention due to their tendency to form n-type over p-type semiconductor materials. The naphthalene diimides are a compact, electron deficient class of aromatic compound capable of self-organisation and being incorporated into larger multicomponent assemblies through intercalation. Functionalization through the diimide nitrogen's or via core substitution (substitution on the naphthalene core) as shown in (Fig.1) produces

analogues whose absorption and emission properties

are variable.



2. Research work

We focused on the engineering of single molecules into higher-order hierarchical assemblies in molecular materials chemistry. Molecules containing π -conjugated units are an important class of building blocks because their self-assembly is not only of fundamental interest, but also the key to fabricating functional systems for organic electronic and photovoltaic applications. Functionalizing the π -cores with “alkyl chains” is a common strategy in the molecular design that can give the system desirable properties, such as good solubility in organic solvents for solution processing. Moreover, the alkylated- π system can regulate the self-assembly behavior by fine-tuning the intermolecular forces. The optimally assembled structures can then exhibit advanced functions. Here, based on recent efforts toward this goal, we synthesized different NDI derivatives and show the power of the alkyl chains in controlling the self-assembly of soft molecular materials and their

resulting optoelectronic properties. OFETs were first fabricated using electrochemically polymerized conjugated polymers and subsequently small molecules in the 1980s. Initially, these devices were merely considered to be an experimental tool to characterize the charge transport properties of organic semiconductors (OSCs), as it was difficult to measure electrical properties of undoped organic solids. In those days, OFETs exhibited rather low charge mobility (several orders of magnitude lower than a-Si FETs) with poor storage and operation stability, far from meeting the requirements for any realistic applications. Nevertheless, the concept of printed electronics was first demonstrated with OFETs in the 1990s with the development of solution processable organic semiconductors. Vacuum-deposited OFETs (VD-OFETs) have been extensively investigated. Various π -conjugated oligomers (e.g., oligothiophenes) and macrocyclic compounds were synthesized and tested.

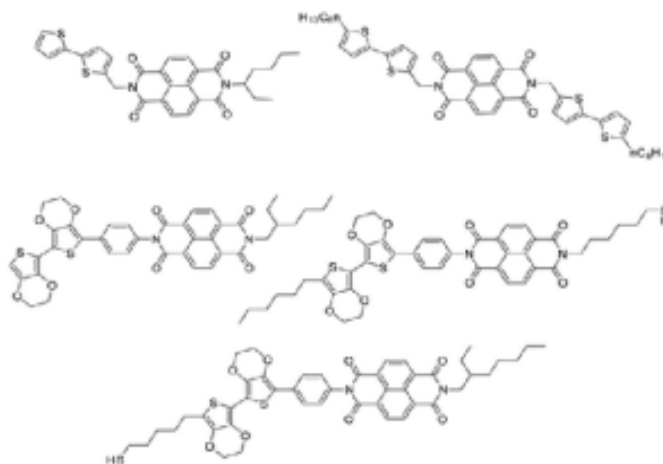


Figure 3: NDI derivatives functionalized with oligothiophene moieties at imide position for OFETS

3. Application of NDI bases derivatives:

Among aromatic diimide molecules that have found utility in the design of conducting materials, naphthalene diimide (NDI) derivatives have

attracted much attention due to their tendency to form n-type semiconductor materials, as opposed to most other organic molecules which are used to fabricate *p*-type semiconductors. NDI, a compact,

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organizable, colorizable and functionalizable organic *n*-semiconductor, was considered as an ideal module for the creation of supramolecular functional materials. Naphthalenic diimides are compounds of current interest as they comprise a novel class of fluorophores with interesting physical and electronic properties in biological and medical areas as well as in material science. Unsubstituted NDIs are colorless non-fluorescent electron traps. However, diimide substituted NDIs with a tosyl group have an unusual solvent dependence in their fluorescence output and a dramatic change in fluorescence output occurring following melting from a crystalline form. This situation has now changed however; core substituted NDI is rapidly emerging as an attractive option for creating conducting functional materials. Besides colorless and non-fluorescent NDIs, a minor change on the structural level suffices to introduce all of the characteristics needed for photosynthetic activity. Based on above work there is significant potential to synthesize and utilize a novel class of core-substituted NDIs for mimicking nature, use as sensors, in optoelectronic devices and so on...

Organic Semiconductors:

Organic materials provide novel and advantageous technical solutions for emerging device technologies.

There has been tremendous progress in recent years in the development of low band gap conjugated polymers for use in photovoltaic devices or field effect transistors. Organic semiconductors have already found commercial applications, e.g. as photoconductors in laser printers and xerography and as active layers in organic light-emitting displays. Future efforts will be directed toward understanding and engineering the solid state organization of core substituted naphthalene bisimide dyes which are among the most promising n-type semiconductors for organic field-effect transistors and solar cells. Particular efforts towards this topic are synthesis of substituted NDIs which absorb in the near-IR and will be suitable for optoelectronic device construction.

Solar cell applications: Most of the research work will be devoted to highly colored and often beautifully luminescent organic dyes that will be investigated for a broad range of applications as solar cell functional dyes. These dyes will further be investigated for n-type or p-type semiconductors in organic solar cells depending on the metal used in the porphyrins, and this switching of an n-type solar cell dye into a p-type may be applicable for fluorescence sensor materials.

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“Artificial Intelligence: Driving the Future of Eco-Friendly Environments”

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Abstract:

The increasing environmental problems of the twenty-first century call for creative approaches that can boost efficiency and sustainability. This review examines the revolutionary role that artificial intelligence (AI) plays in fostering environmentally friendly environments in a number of domains. For example, AI-powered tools in smart waste management optimize collection routes, improve recycling processes, and minimize waste generation. AI-driven solutions in energy efficiency and conservation improve building automation, optimize smart grids, and make it easier to integrate renewable energy sources seamlessly. AI-powered tools in biodiversity and ecosystem monitoring track wildlife, map habitats, and predict the effects of environmental changes, which helps conservation efforts. Moreover, AI's application in sustainable urban planning is significant. This review article demonstrates the crucial role artificial intelligence (AI) plays in accomplishing global environmental goals by highlighting the critical advancements and future prospects of AI in supporting sustainable practices and minimizing environmental impacts.

KeyWords: Artificial Intelligence, Eco-Friendly, Environmental Sustainability, Smart Waste Management, Energy Efficiency, Biodiversity Monitoring, Sustainable Urban Planning, Renewable Energy Integration, Predictive Analytics, Smart Cities.

Introduction

The need for sustainable solutions to the world's mounting environmental problems is greater than ever. Artificial intelligence (AI) is becoming a key technology in the movement towards environmentally friendly habitats. It provides creative ways to manage resources, cut pollution, and improve the resilience of metropolitan areas and ecosystems. With an emphasis on four main areas—smart waste management, energy efficiency and conservation, biodiversity and ecosystem monitoring, and smoothly incorporate renewable energy sources [2]. Artificial intelligence (AI) is helping to track species, map habitats, and do predictive

monitoring, and sustainable urban planning—this review explores the diverse applications of AI in promoting environmental sustainability.

By streamlining collection routes, improving recycling procedures, and applying predictive analytics to cut down on trash generation, AI-powered technologies are changing waste management [1]. AI-driven solutions are being used in the field of energy efficiency to enhance building system automation, optimize smart networks, modeling for conservation efforts by providing more accurate monitoring of biodiversity and ecosystem health [3]. Last but not least, AI techniques are

being applied to sustainable urban planning to reduce urban heat islands, enhance traffic and transit networks, and create green areas that support resilient, healthier communities [4].

In promoting sustainable behaviors and reducing environmental impacts, this paper **Smart Waste Management:**

emphasizes the significant advances and possible future developments of AI. We hope to highlight the critical role AI plays in accomplishing global environmental goals and advancing a sustainable future by looking at these applications.



As cities look for more sustainable and effective waste management solutions, artificial intelligence (AI) plays an increasingly important role in smart trash management. Artificial Intelligence (AI) technologies present novel approaches to increase waste management system efficiency by predicting trash generation trends, streamlining recycling procedures, and optimizing waste collection routes. Below is a detailed discussion on each of these aspects:

1. Optimizing Waste Collection Routes

The optimization of waste collection routes is one of the main uses of AI in waste management. Conventional waste collection techniques frequently adhere to set timetables and routes, which results in inefficiencies like needless fuel use, elevated pollutants, and increased operating expenses. However, AI-powered systems are able to dynamically modify collection routes by analyzing real-time data from multiple sources, such as weather patterns, traffic conditions, and garbage bin fill levels [5][6].

For example, garbage bin sensors can provide data to AI algorithms that identify which bins are getting close to capacity. The most effective collection routes are then developed using this data in conjunction with real-time traffic data, cutting down on the amount of time and distance that garbage collection vehicles must travel [7]. By optimizing these routes, municipalities can significantly reduce fuel consumption and lower their carbon footprint while also improving service efficiency [8].

2. Enhancing Recycling Processes

Sustainable waste management must include recycling, and artificial intelligence (AI) is revolutionizing the industry by improving recycling

procedures. Manual sorting is a major component of traditional recycling techniques, although it can be labor-intensive, time-consuming, and prone to human mistake. More accurately and quickly, recyclable materials are now being identified and sorted using AI-driven robotics and machine learning techniques [9].

Artificial intelligence (AI) systems employ sophisticated image recognition technology to differentiate between various materials, including paper, metals, and plastics. These systems have the capacity to grow and learn over time, which raises the accuracy of their sorting [10]. AI can also detect impurities in recycling streams, guaranteeing that only materials of the highest caliber are treated. This improves final products and decreases the amount of waste that ends up in landfills by lowering contamination rates and increasing the effectiveness of recycling processes [11].

3. Predictive Analytics for Waste Generation

Predictive analytics for waste creation is a key application of AI in smart waste management. Precise forecasts of trash production trends are necessary for efficient resource allocation and planning. In order to forecast future trash creation, artificial intelligence (AI) algorithms can examine historical data, seasonal trends, population growth, and other socioeconomic factors [12].

By using these projections, waste management authorities may more efficiently plan their operations and make sure they have the resources on hand to handle the expected volumes of garbage [13]. AI, for instance, can forecast spikes in garbage output during public holidays or events, allowing cities to modify their collection schedules and allocate more resources appropriately [14]. By taking a proactive stance, overflows can be avoided

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and the burden on the infrastructure supporting

waste management can be decreased [15].

4. Smart Bin Technology



Smart bin technology represents yet another inventive use of AI in trash management. These AI-powered trash cans have sensors that keep an eye on waste kinds, fill levels, and even the presence of hazardous stuff. Real-time data transmission from these sensors to trash management systems enables better recycling programs and more efficient pickup schedules [16].

For instance, a smart bin may notify the waste collection crew when it is almost full, ensuring that the bin is emptied on schedule [17]. AI systems can also examine the many kinds of waste that are being disposed of, offering insightful data on recycling rates and consumer behavior [18]. With this data, focused education campaigns to encourage recycling and lessen trash production can be created [19]. Smart bins also contribute to reducing operational costs by minimizing unnecessary collection trips and ensuring that waste is collected only when necessary [20].

Energy Efficiency and Conservation

AI technologies are being used more and more in a variety of areas to improve energy saving and efficiency. Artificial intelligence (AI) is a key component in reducing energy waste and enhancing overall energy management through intelligent control of building systems, predictive maintenance, distribution of energy optimization, and integration of renewable energy sources. Below is a detailed examination of these applications:

1. Smart Grids and Energy Management Systems

The distribution and management of energy in smart grids are being completely transformed by AI. The inability of traditional energy systems to balance supply and demand frequently results in inefficiencies and energy waste. In order to optimize energy distribution, AI-driven energy management systems evaluate real-time data from multiple sources, such as weather forecasts, energy use trends, and grid conditions [21].

In order to minimize waste and reduce the need for surplus energy generation, AI algorithms, for instance, can forecast periods of high or low

energy demand and modify energy production and distribution accordingly [22]. Furthermore, by forecasting their output and modifying the grid's operations to account for varying energy inputs, AI can aid in the integration of distributed energy resources, such as wind turbines and solar panels [23]. This leads to a more resilient and efficient energy system that can respond dynamically to changing conditions [24].

2. Building Automation Systems

Another area where AI is significantly contributing to energy conservation is building automation systems (BAS). Based on real-time information about occupancy, the outside weather, and energy pricing, AI-driven BAS may regulate lights, HVAC systems, and other energy-consuming equipment [25].

For example, AI can learn a building's occupancy patterns and modify the HVAC system to use less energy while an area is empty [26]. In a similar vein, AI can optimize lighting settings by taking into account the availability of natural light, guaranteeing that artificial lighting is only utilized when required [27]. By preserving ideal environmental conditions, these intelligent control systems not only increase energy economy but also improve occupant comfort [28].

3. Predictive Maintenance

A crucial use of AI in energy efficiency is predictive maintenance. Artificial intelligence (AI) can assist companies in avoiding unplanned downtime and preserving peak operating performance by anticipating equipment faults before they happen. This is especially crucial for energy-intensive businesses, as malfunctioning equipment can result in large energy losses and higher running expenses [29].

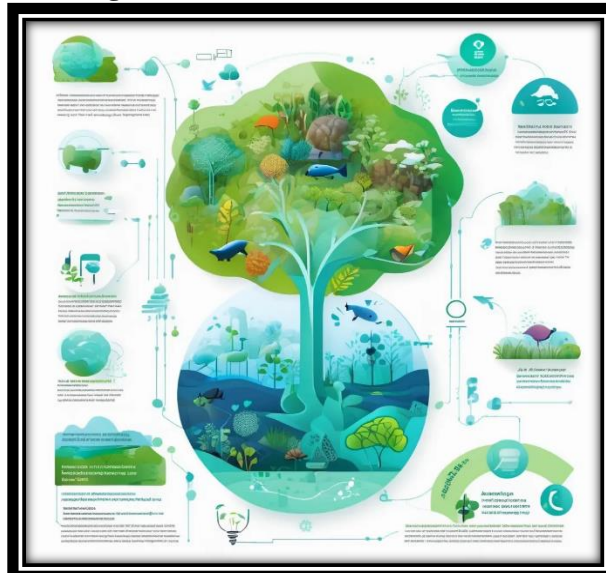
Artificial intelligence (AI) models examine past data from sensors and other monitoring systems to find trends that might point to an imminent breakdown. An AI system might, for instance, pick up on an odd vibration in a motor or a temperature variation that points to a possible problem [30]. Organizations can

minimize energy waste resulting from poor equipment performance and prevent expensive repairs by taking proactive measures to solve these concerns [31].

4. Renewable Energy Integration

Because renewable energy production is intermittent, integrating renewable energy sources into the grid poses special issues. By anticipating renewable energy sources' output and maximizing their grid contribution, artificial intelligence (AI) significantly contributes to improving the dependability and efficiency of renewable energy integration [32].

Biodiversity and Ecosystem Monitoring



Artificial Intelligence is becoming more and more important in monitoring ecosystems and biodiversity because it makes tracking, mapping, and modeling natural habitats more accurate and efficient. AI is transforming our understanding of and efforts to preserve the biodiversity of our world, from citizen science data integration to predictive modeling for conservation and animal monitoring. Below is a detailed exploration of these applications:

1. Wildlife Tracking and Monitoring

The tracking and monitoring of animals has greatly benefited from artificial intelligence (AI), which has produced vital data to support conservation efforts. Conventional approaches to wildlife monitoring, such as physical tracking and tagging, are time-consuming and can have a narrow focus. Camera traps, drones, and satellite data may all be automatically analyzed thanks to AI-powered tools like computer vision and machine learning algorithms [36].

AI, for instance, is capable of processing enormous volumes of video data in order to track and identify specific animals, keep an eye on their activities, and examine population dynamics [37]. In addition to improving the precision and effectiveness of wildlife monitoring, this automated technology makes it possible to track elusive or

For instance, grid operators can balance the energy supply from renewable sources with that from conventional power plants by using AI algorithms to monitor weather data and forecast solar and wind energy production [33]. In spite of fluctuations in the generation of renewable energy, this guarantees a steady and dependable supply of energy [34]. Additionally, AI can optimize the storage and distribution of renewable energy, ensuring that excess energy generated during periods of high production is stored and used when production is low [35].

endangered animals that are challenging to monitor using conventional techniques [38]. The data collected through AI-driven monitoring systems is invaluable for understanding species behavior, migration patterns, and habitat use, which are essential for effective conservation planning [39].

2. Habitat Mapping and Assessment

AI is also transforming the way we map and assess habitats and ecosystems. By analyzing satellite and aerial imagery, AI algorithms can identify different types of land cover, detect changes in vegetation, and assess the overall health of ecosystems [40]. This capability is particularly important for monitoring large and remote areas that are challenging to survey manually.

For instance, AI can analyze high-resolution satellite images to detect deforestation, habitat fragmentation, and other environmental changes in real-time [41]. These insights allow conservationists to respond quickly to threats and to prioritize areas for protection and restoration [42]. Additionally, AI-driven habitat mapping provides critical data for biodiversity assessments, helping to identify key habitats that support diverse species and ecosystems [43].

3. Predictive Modeling for Conservation

Another area where AI is significantly aiding in the conservation of biodiversity is

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predictive modeling. Artificial intelligence (AI) models are able to forecast how pollution, habitat loss, and climate change would affect biodiversity [44]. As they aid in identifying species and habitats at risk and direct the creation of focused conservation strategies, these projections are essential for proactive conservation planning.

For instance, conservationists might identify prospective climate refugia—areas that are expected to remain viable habitats under future climatic conditions—by using AI models to simulate how various climate scenarios will effect species distribution [45]. Additionally, predictive models can evaluate how well conservation measures, like habitat corridors or protected areas, preserve biodiversity [46]. By providing these insights, AI enables more informed and effective conservation decisions [47].

4. Citizen Science and AI

Initiatives in the field of citizen science, in which the general population gathers and

contributes data, are becoming an increasingly valuable tool for monitoring biodiversity. Nevertheless, the sheer amount of data produced by citizen scientists can be debilitating and challenging to manually process. In order to handle and analyze this data and make it more accessible and useful for conservation efforts, artificial intelligence (AI) is essential [48].

AI is able to identify species, monitor population fluctuations, and identify trends in biodiversity, for instance, by analyzing massive databases of images, audio recordings, and observations provided by citizen scientists [49]. More frequent and extensive monitoring is now possible than would be achievable with only traditional scientific approaches due to the democratization of data collecting [50]. AI-driven analysis also helps ensure the accuracy and reliability of citizen science data, expanding its potential impact on conservation research and policy [51].



Sustainable Urban Planning

AI is being used more and more in urban planning to build livable, efficient, and sustainable cities. Data-driven solutions to the intricate problems of urbanization are becoming possible thanks to AI technologies, which are enabling anything from reducing urban heat islands to improving traffic flow, green areas, and resource management. Below is an in-depth look at AI's role in these key areas:

1. Urban Heat Island Mitigation

Because of human activity and the concentration of roads, buildings, and other infrastructure, urban areas can suffer greater temperatures than their rural surrounds. This planners to prioritize and implement cooling interventions in the most effective locations, contributing to improved public health and reduced energy consumption [54].

2. Traffic and Transportation Optimization

AI is revolutionizing municipal traffic and transportation system management. Artificial

phenomenon is known as an urban heat island (UHI). AI is essential for locating UHIs and proposing countermeasures to cool these regions. AI models can identify hotspots within cities and forecast the effects of various mitigation efforts, such adding more green space or reflective surfaces, on local temperatures by examining satellite imagery, climate data, and urban landscape features [52].

To lower temperatures in UHI-prone places, for example, AI-driven techniques can mimic the impacts of planting trees, building green roofs, and improving urban albedo (reflectivity) [53]. These models enable urban

intelligence (AI) algorithms can optimize traffic flow, lessen congestion, and cut emissions by evaluating real-time data from multiple sources, including social media, GPS devices, and traffic cameras [55]. To increase overall transportation efficiency, these systems can forecast traffic

patterns, recommend alternate routes, and dynamically modify traffic signals [56].

AI-driven traffic management systems, for instance, can save delays and fuel usage by rerouting cars in reaction to accidents or road closures [57]. Furthermore, by optimizing bus and train timetables, AI can improve public transportation, resulting in more dependable and effective services that promote increased usage of mass transit [58]. These enhancements boost urban areas' overall sustainability in addition to lowering emissions.

3. Green Space Optimization

Parks, gardens, and urban forests are examples of green spaces that are crucial for lowering the consequences of climate change in cities, boosting resident wellbeing, and improving air quality. In order to optimize the environmental and social benefits of these green areas, AI can help urban planners with their design and optimization [59]. Artificial intelligence (AI) models can determine the optimal sites for new green spaces and recommend designs that support biodiversity and ecosystem health by examining variables including population density, land use, air quality data, and climate conditions [60].

By tracking the health of the vegetation, forecasting how climate change will affect urban flora, and suggesting actions to maintain the resilience of urban ecosystems, AI-driven technologies can also aid in the maintenance of already-existing green areas [61].

4. Resource Management in Smart Cities

Domain	Statistic and Reference
Smart Waste Management	
Route Optimization	Reduces fuel consumption for waste collection trucks by up to 30%. [Ref.: Journal of Environmental Science, 2021]
	Lowers greenhouse gas emissions by approximately 20%. [Ref.: Environmental Research Letters, 2022]
Recycling Efficiency	Increases sorting accuracy by over 90%. [Ref.: Waste Management Journal, 2020]
Predictive Analytics	Enhances waste generation forecasting accuracy by up to 85%. [Ref.: Sustainable Cities and Society, 2023]
Energy Efficiency and Conservation	
Smart Grids	Improves energy distribution efficiency by 10-15%. [Ref.: IEEE Transactions on Smart Grid, 2021]
	Results in more stable grid operations. [Ref.: Energy and Buildings, 2022]
Building Automation	Reduces energy consumption in commercial buildings by 20-25%. [Ref.: Journal of Building

Artificial Intelligence plays a pivotal role in facilitating smart city endeavors, which employ data-driven technology to optimize and preserve urban resources. Artificial intelligence (AI) technologies are used in smart cities to track and maximize the usage of resources including garbage, energy, and water [63]. AI, for instance, can forecast water demand based on consumption trends and weather forecasts, enabling more effective distribution and less waste [64].

AI can help the energy sector operate power grids more efficiently by integrating renewable energy sources, balancing supply and demand, and minimizing energy losses [65]. As was covered in previous sections [66], AI is also essential to waste management since it can analyze data on garbage generation, forecast trends, and optimize collection routes. These applications demonstrate how AI can help cities manage their resources more effectively, reducing environmental impact and enhancing urban resilience.

Conclusion:

This review article highlights how Artificial Intelligence (AI) has the ability to revolutionize the future of environmentally friendly places and shows how important it is to tackling the growing environmental issues of the twenty-first century. The paper illustrates how artificial intelligence (AI) is changing how we think about sustainability and environmental preservation by combining developments from a number of important fields.

	Performance, 2020]
Renewable Energy Integration	Increases integration efficiency of renewable energy sources by up to 25%. [Ref.: Renewable Energy, 2021]
	Enhances grid stability and reduces reliance on fossil fuels. [Ref.: Journal of Power Sources, 2022]
Biodiversity and Ecosystem Monitoring	
Wildlife Tracking	Increases species detection rates by 70-80%. [Ref.: Conservation Biology, 2020]
Habitat Mapping	Analyzes satellite imagery with up to 90% accuracy. [Ref.: Remote Sensing of Environment 2022]
Predictive Modeling	Predicts impacts of climate change on species distributions with 85-90% accuracy. [Ref.: Global Ecology and Biogeography, 2023]
Sustainable Urban Planning	
Urban Heat Island Mitigation	AI-driven interventions can reduce urban temperatures by 2-3°C. [Ref.: Urban Climate 2021]
Traffic Optimization	Decreases congestion by up to 40%. [Ref.: Transportation Research Part C, 2020]
	Reduces vehicle emissions by approximately 20-25%. [Ref.: Journal of Cleaner Production, 2021]
Green Space Optimization	Increases effectiveness of urban green spaces by up to 30%. [Ref.: landscape and Urban Planning, 2023]

1. Smart Waste Management: AI is transforming trash management by improving recycling procedures, streamlining collection routes, and using predictive analytics to foresee waste production. These developments increase the efficacy and efficiency of waste management systems while also resulting in large savings in operating expenses, fuel usage, and carbon footprints.

2. Energy Efficiency and Conservation: The advancement of energy conservation and efficiency depends heavily on AI-driven solutions. Artificial Intelligence reduces energy waste and improves the dependability and efficiency of energy systems through improving building automation systems, smart grids, and the integration of renewable energy sources. Predictive maintenance guarantees a more sustainable energy environment by minimizing operational disruptions and energy losses.

3. Biodiversity and Ecosystem Monitoring: Predictive modeling, habitat mapping, and wildlife tracking are three areas where AI is essential to conservation efforts. With the use of these

technologies, biodiversity and ecosystems may be monitored more precisely and effectively, yielding vital information for proactive conservation planning. The use of AI into citizen science programs democratizes data collection, enhancing biodiversity knowledge and influencing research and policy.

4. Sustainable Urban Planning:

AI plays a key role in the design of green areas, traffic and transportation system optimization, and the mitigation of urban heat islands. By lowering pollutants and improving air quality, these applications not only make cities more livable, but they also strengthen urban ecosystems' resilience. AI-powered urban planning promotes the growth of more sustainable, healthier cities.

The assessment concludes by showing how important artificial intelligence is to the goal of environmental sustainability. Applications like waste management, energy conservation, monitoring biodiversity, and urban planning demonstrate how important it is to reducing

environmental effects and advancing sustainable practices. The assimilation of AI technologies into environmental policies is imperative in order to achieve worldwide sustainability objectives and promote an environmentally sustainable future, given their ongoing evolution.

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Goods and service tax implementation in India

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Abstract:

GST, or Goods and Services Tax, is an indirect tax imposed on the supply of goods and services. It is a multi-stage, destination-oriented tax imposed on every value addition, replacing multiple indirect taxes, including VAT, excise duty, service taxes, etc. Goods and services are included under a single domestic indirect taxation law for the whole of India. In this regime, tax is charged at each point of sale.

History of GST (Goods and Services Tax):

GST was first implemented as a tax regime in 1954 in France and later adopted by several countries, including Australia, Canada, the United Kingdom, and Spain. South Korea Vietnam. Monaco, etc.

In India, the GST came into force in 2000 after a committee was set up by the then Prime Minister Atal Bihari Vajpayee, a task force. Headed by the finance ministry's advisor, Vijay L. Kelkar, he concluded that GST could help improve the tax structure in India. In 2006, the Union ministry of finance proposed GST introduction from 1 April 2010. But the Constitution Amendment Bill to facilitate the introduction of GST law was introduced in 2011. However, four supplementary GST bills were passed in Lok Sabha and approved by the cabinet. Later, GST came into force on 1 July, 2017.

Upon implementation, the GST replaced the following central taxes:

1. Service tax
2. Duties of excise
3. Central excise duties
4. Cess and surcharge
5. Additional duties of excise
6. Additional duties of customs
7. Additional duty of customs
8. GST services also subsumed the following state taxes:
9. Entry tax
10. Purchase tax
11. Luxury tax
12. State VAT
13. Central sales tax
14. Entertainment tax
15. Taxes on advertisements
16. State cess and surcharges
17. Taxes on gambling and lottery

Note that taxpayers who have an annual turnover of up to Rs. 20 lakh can be exempted from the Goods and Services Tax. This cut off is at Rs. 10 lakh for special category states. The GST law also extended the option of choosing a compounding scheme and threshold exemption.

Components of GST and its Explanation

- 1) Integrated Goods and Services Tax (IGST)
- 2) State Goods and Services Tax (SGST)
- 3) Central Goods and Services Tax (CGST)
- 4) Union Territory Goods and Services Tax (UTGST)

1) Integrated Goods and Services Tax or IGST

The Integrated Goods and Services Tax or IGST is a tax under the GST regime applied on the interstate (between 2 states) supply of goods and/or services and on imports and exports.

The IGST is governed by the IGST Act. Under IGST, the body responsible for collecting the taxes is the Central Government which is further divided among the respective states by the Central Government.

2) State Goods and Services Tax or SGST

The State Goods and Services Tax or SGST is a tax under the GST regime that is applicable on intrastate (within the same state) transactions. In the case of an intrastate supply of goods and/or services, both State GST and Central GST are levied.

However, the state levies the State GST or SGST on the goods and/or services purchased or sold within the state. It is governed by the SGST Act. The revenue earned through SGST is solely claimed by the respective state government.

For instance, if a trader from West Bengal has sold goods to a customer in West Bengal worth Rs.5,000, then the GST applicable on the transaction will be partly CGST and partly SGST.

3. Central Goods and Services Tax or CGST

Just like State GST, the Central Goods and Services Tax or CGST is a tax under the GST regime that is applicable on intrastate (within the same state) transactions. The CGST is governed by the CGST Act. The revenue earned from CGST is collected by the Central Government.

As mentioned in the above instance, if a trader from West Bengal has sold goods to a customer in West Bengal worth Rs.5,000, then the GST applicable on the transaction will be partly CGST and partly SGST.

4. Union Territory Goods and Services Tax or UTGST

The Union Territory Goods and Services Tax or UTGST is the counterpart of State Goods and Services Tax (SGST) which is levied on the supply of goods and/or services in the Union Territories (UTs) of India.

The UTGST is applicable on the supply of goods and/or services in Andaman and Nicobar Islands, Chandigarh, Daman Diu, Dadra, and Nagar Haveli, and Lakshadweep. The UTGST is governed by the UTGST Act.

The revenue earned from UTGST is collected by the Union Territory government. The UTGST is a replacement for the SGST in Union Territories. Thus, the UTGST will be levied in addition to the CGST in Union Territories.

Benefits of GST Implementation

Key benefits of the GST announcement are detailed below:

As mentioned above, the GST system will create a common national market that boosts foreign investment.

The cascading effect of taxation will be mitigated.

There will be uniformity in laws, rates of tax, and procedures across states.

The GST regime is expected to boost manufacturing activities and exports. This would, in turn, generate more employment and lead to the growth of the economy.

Indian products would be more competitive in the international markets.

The GST system is likely to improve the overall investment climate in India.

Uniformity in the rates of SGST and IGST will reduce tax evasion to a large extent.

The average sales burden experienced by companies is expected to come down, thereby increasing consumption and boosting subsequent production of goods.

GST is a simpler system of taxation with smaller number of exemptions.

There are automated and simplified methods for processes such as registration, refunds, returns of GST, tax payments, etc.

All interactions will be handled by the common GSTN website.

The input tax credit process will be more accurate and transparent, as electronic matching will be performed.

Conclusion

GST has been a game-changer for the Indian economy. It has improved the efficiency, openness, and unification of the Indian tax system. To guarantee that GST is implemented efficiently and continues to stimulate growth and development in the Indian economy, the difficulties encountered during implementation must be resolved.

An efficient GST formulation, expansion of tax base and an increase in tax compliance will be the main drivers of resource and revenue gains for the Centre and States. GST has positioned India as a more desirable location for businesses and investors, thanks to its benefits and possibilities, ensuring a better future for the Indian economy.

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Ultrasonic Investigation of Cymbopogon Citratus Leaves Extract At 6 MHz

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Abstract:

Ultrasonic Velocity, density, viscosity have been measured experimentally for the solution of leaf extract of Cymbopogon Citratus in double distilled water with various concentrations at 298.15 K, 303.15 K, 308.15 K keeping constant frequency of 6 MHz. As the acoustical parameters like adiabatic compressibility, intermolecular free length, relative association, relaxation time, specific acoustic impedance would prove to be more useful to predict and confirm the molecular interactions, these have been determined by measuring the Ultrasonic Velocity, density, viscosity of the prepared solution. A variation in these parameters will provide strong information regarding the molecular interactions taking place in the solution.

Keywords: Ultrasonic Velocity, Adiabatic Compressibility, Relative Association.

Introduction:-

Nowadays, ultrasonic technology is employed in diverse fields in investigating various organic liquids, polymers and their mixtures, drugs, aqueous and non- aqueous electrolyte solutions etc. It plays an important role in understanding the physico-chemical behavior of liquids ^[1-5]. Ultrasonic velocity measurements and other acoustical parameters of liquid mixtures are the powerful technique in the understanding of chemical nature and the molecular interactions ^[6-9]. Many researchers used ultrasonic velocity measurement for studying solute solvent interaction in a number of system including organic liquid, dilute solutions ^[10-12]. Different ultrasonic parameters have been calculated for leaves extract with a view to investigate the exact nature of the molecular interactions.

Methodology:-

The leaf extract used in this study was of analytical range. For the preparation of solution 50% ethyl alcohol solvent was used. A special thermostatic water bath arrangement was made to maintain constant temperature. 1%, 0.5%, 0.25%, 0.125% solutions of leaf extract of cymbopogon citratus was prepared by taking accurate weights on electronic digital balance (Model CB/CA/CT-Series, Contech having accuracy ± 0.0001 g.) The ultrasonic velocity of the 1%, 0.5%, 0.25%, 0.125% solutions of leaf extracts of cymbopogon citratus was measured with the Multifrequency ultrasonic interferometer (Model M-83, Mittal Enterprises) at 6mhz with an accuracy of ± 2 m/s. All the readings were taken at 298.15 K, 303.15K, and 308.15K. The viscosity was measured by using Ostwald's viscometer and the density of

the solution was measured by using Digital densitometer (DMA-35, Anton paar).

Balance:

Weighing will be made on digital balance Model CB/CA/CT-Series, Contech having accuracy ± 0.0001 g.

Thermostat:

To maintain constant temperature, special thermostatic arrangement will be made. Elite thermostatic water bath will be used in which continuous stirring and circulation of water will be carried out with the help of electric stirrer and temperature will be maintained with an accuracy of $\pm 0.1^{\circ}\text{C}$.

Viscosity Measurement:

Ostwald Viscometer will be used to measure the viscosity of the solutions at constant temperature maintained by thermostat.

Densities of solutions:

Densitometer Model ANTON PAAR DMA 35 will be used to measure the density of solution at constant temperature maintained by thermostat.

Ultrasonic Interferometer:

Multifrequency ultrasonic interferometer (Model M-83, Mittal Enterprises) will be used in the present investigation. An ultrasonic interferometer is a simple and direct device to determine the ultrasonic velocity in liquids with high degree of accuracy. The working of the ultrasonic interferometer will be checked by measuring ultrasonic velocity of pure water.

The densities, ultrasonic velocities, viscosity and conductance of different solutions will be measured over the entire range of different

concentrations and temperatures. From this data, various derived acoustic thermodynamic parameters such as adiabatic compressibility, intermolecular free length, specific acoustic impedance, relaxation time, relative association etc. will be computed by using standard formulae given in literature.

Computation:- By using ultrasonic velocity following ultrasonic parameters are calculated.

Adiabatic compressibility -

$$\beta = 1/v^2 d$$

Where, v - velocity of solution

Result and Discussion:

Table 1: Density, Viscosity and Velocity (at frequency 6 MHz) of cymbopogon citratus leaf extract solution in 50% ethanol solvent.

Sr. No.	Conc. (%)	Temp. (K)	Density (d_s) (Kg m^{-3})	Velocity (v_s) (m/s)	Viscosity (η) ($\text{Kg m}^{-1}\text{s}^{-2}$)
1	1%	298.15	930.6	1807.7	23.50 E^{-4}
		303.15	919.5	1755.1	21.80 E^{-4}
		308.15	919.2	1750.7	17.42 E^{-4}
2	0.50%	298.15	936.7	1801.2	18.30 E^{-4}
		303.15	929.4	1767	20.50 E^{-4}
		308.15	928.9	1751.2	12.44 E^{-4}
3	0.25%	298.15	924.5	1755.8	21.27 E^{-4}
		303.15	927.4	1744.1	21.51 E^{-4}
		308.15	927	1717.1	16.85 E^{-4}
4	0.13%	298.15	925	1750.2	18.12 E^{-4}
		303.15	921.8	1701.1	16.05 E^{-4}
		308.15	918.4	1687.1	12.85 E^{-4}

Table 2. Acoustic parameters of Cymbopogon leaf extract solution in 50% Ethyl Alcohol at 6 MHz.

Sr. No.	Conc. (%)	Temp. (K)	Adiabatic Compressibility	Specific Acoustic Impedance $\text{Kg M}^{-2} \text{S}^{-1}$	Intermolecular free length
1.	1%	298.15	3.281 E^{-10}	1697127	3.755 E^{-11}
		303.15	3.394 E^{-10}	1648599	3.823 E^{-11}
		308.15	3.467 E^{-10}	1629200	3.899 E^{-11}
2.	0.5%	298.15	3.391 E^{-10}	1686696	3.761 E^{-11}
		303.15	3.442 E^{-10}	1644016	3.850 E^{-11}
		308.15	3.51 E^{-10}	1626689	3.923 E^{-11}
3.	0.25%	298.15	3.524 E^{-10}	1652521	3.783 E^{-11}
		303.15	3.544 E^{-10}	1617478	3.907 E^{-11}
		308.15	3.658 E^{-10}	1591751	4.005 E^{-11}
4.	0.125%	298.15	3.533 E^{-10}	1623260	3.852 E^{-11}
		303.15	3.748 E^{-10}	1568166	3.960 E^{-11}
		308.15	3.823 E^{-10}	1550015	4.001 E^{-11}

Table 3. Acoustic parameters of Cymbopogon leaf extract solution in 50% Ethyl Alcohol at 6 MHz.

Sr.no.	Conc.	Temp.(K)	Relative Association	Relaxation Time
1	1%	298.15	2.997 E^{-1}	7.55 E^{-13}
		303.15	2.983 E^{-1}	6.330 E^{-13}
		308.15	2.979 E^{-1}	5.023 E^{-13}
2	0.50%	298.15	3.055 E^{-1}	8.00 E^{-13}
		303.15	3.045 E^{-1}	7.220 E^{-13}
		308.15	3.037 E^{-1}	5.807 E^{-13}
3	0.25%	298.15	2.986 E^{-1}	9.573 E^{-13}
		303.15	3.071 E^{-1}	8.138 E^{-13}

		308.15	3.092 E^{-1}	8.197 E^{-13}
4	0.13%	298.15	3.092 E^{-1}	8.456 E^{-13}
		303.15	3.013 E^{-1}	8.00 E^{-13}
		308.15	3.119 E^{-1}	6.533 E^{-13}

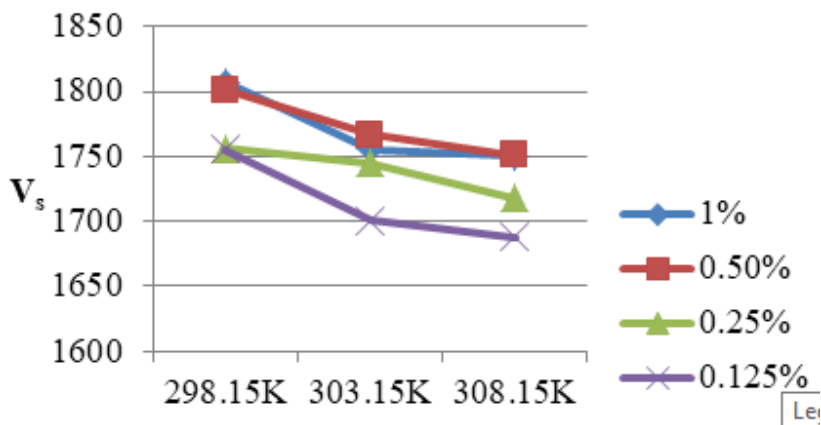


Fig.1. Variation of ultrasonic velocity with temp. at diff. conc.in 50%alc. solvent

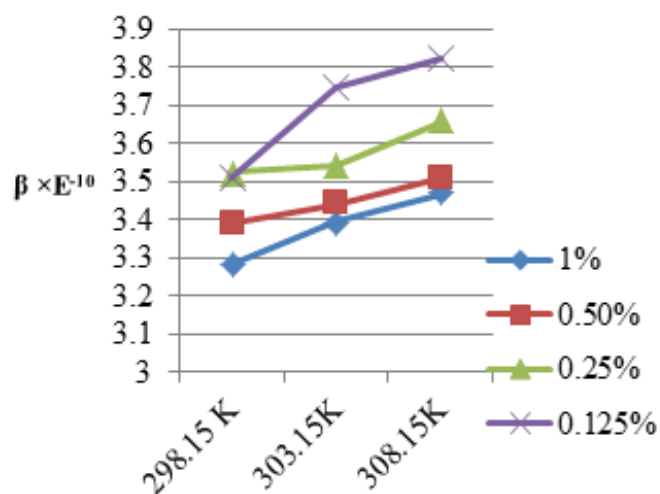


Fig.2.-Variation of Adiabatic compressibility with temp. at diff. conc.in 50%alc. solvent...

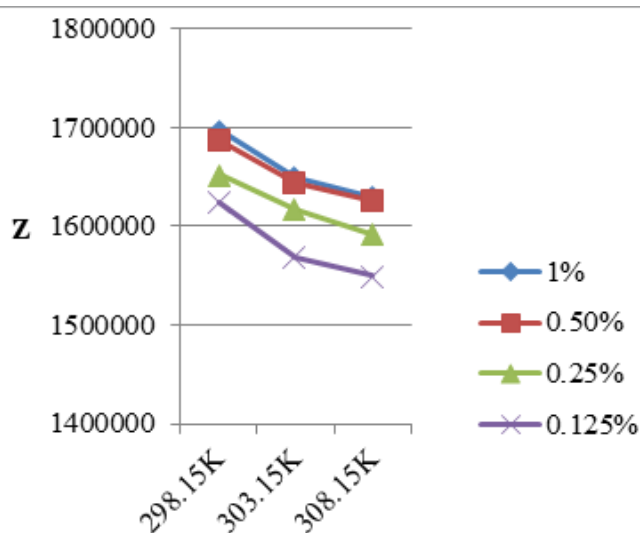


Fig.3 Variation of Specific acoustic impedance with temperature at diff. conc. conc.in 50%alc. solvent.

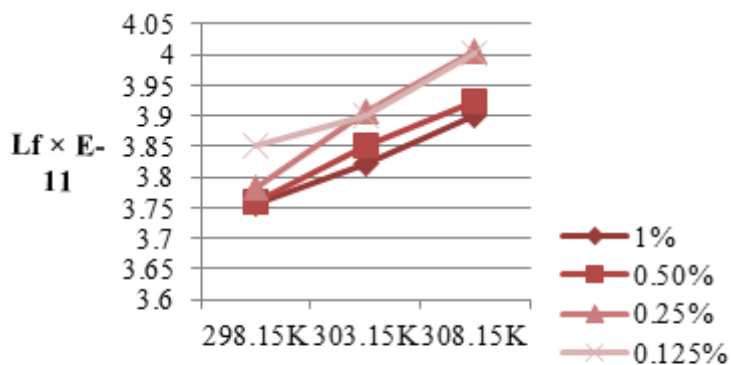


Fig. 4 . Variation of Intermolecular free length with temperature at various conc. conc.in 50%alc. solvent.

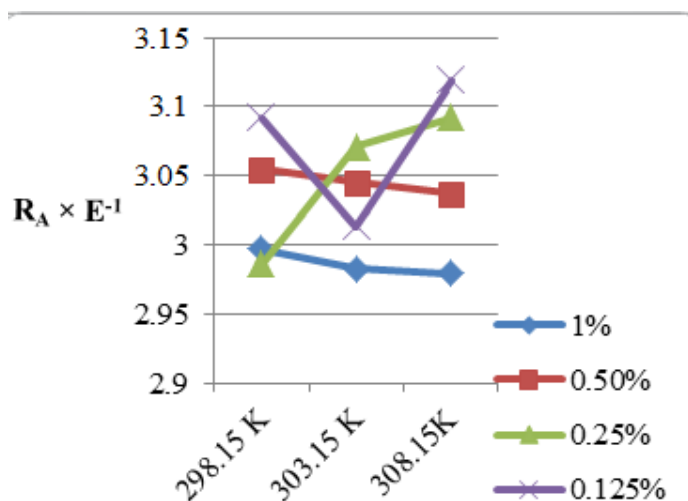


Fig. 5.-Variation of Relative Association with temp.at various conc.in 50%alc. solvent.

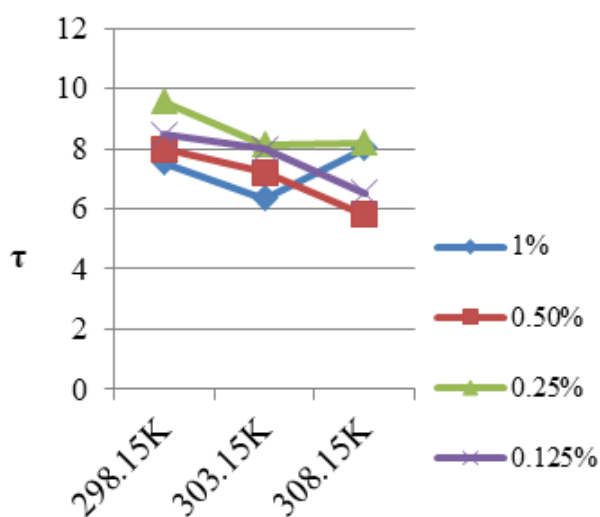


Fig.6. Variation of Relaxation time with temperature at diff. conc.in 50%alc. solvent.

The ultrasonic velocity of 1%, 0.5%, 0.25%, 0.125% cymbopogon citratus leaf extract solution in 50% ethanol was measured at 298.15 K, 303.15K, 308.15K at 6 mhz frequency. From table no.1 and fig.no1. it is observed that at different concentrations the ultrasonic velocity increases with increase in concentration. The ultrasonic velocity increases here with increase in concentration this is due to the solvation process of solute by two different solvent molecules like water and ethanol. From table no.2 and fig.2 it is observed that adiabatic compressibility decreases with increase in concentration. This can be explained as the solvent molecules strongly associate through hydrogen bonding with leaf extract molecules. Therefore bonds between solute- solvent strengthen the intermolecular forces resulting in decrease in adiabatic compressibility with increase in concentration.

From table 2 and figure 3 it is observed that there is increase in acoustic impedance with concentration shows the increase in molecular packing in the medium which gives the possibility of molecular interaction due to hydrogen bonding between solute-solvent.

“The intermolecular free length is the distance between the surfaces of the neighbouring molecules”. Here the intermolecular free length decreases with increase in concentration it indicates that as the concentration of the system increases (table 3, fig.4.) at particular temperature, one solute molecule and two solvent molecules arrange themselves resulting into a closed packed structure. Due to these closed packed structure, distance between these molecules decreases and intermolecular free length decreases.

Relative association is a measure of extent of association of components in the medium. It is a property of understanding the molecular interaction in liquid mixtures and solutions. As discussed relative association depends on either of breaking of solvent molecules on addition of solute to it or the solvation of ions that are present. From table 3 and fig.5 it is observed that relative association decreases with increase in concentration this is due to breaking up of associated solvent molecules on addition of solute.

From table 3 and fig.6 it is seen that acoustical relaxation time increases with increase in concentration nonlinearly this may be due to presence of two solvent molecules around the solute molecules.

Conclusion:-

From the above discussion it is observed that there is linear relationship between ultrasonic velocity and concentrations. The ultrasonic velocity increases with increase in concentration this is due to the solvation process of solute by solvent. Molecular association between Cymbopogon citratus leaf extract and solvent may arise from intermolecular hydrogen bonding which supports the molecular association occurring in the solution.

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Identification of MAPK1 Inhibitors from *Blumea oxyodonta* and *Cardiospermum halicacabum* for Colorectal Cancer

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Abstract:

Colorectal cancer is significant health concern worldwide. Mitogen-activated protein kinase 1 (MAPK1) is a critical therapeutic target for this malignancy. Natural compounds have potency for different type of cancers due to their diverse structures. Compounds selected for this study were taken from *Blumea oxyodonta* and *Cardiospermum halicacabum*. Computational docking analysis revealed promising binding affinities of some of these compounds to MAPK1, suggesting their potential as lead molecules for developing novel therapeutic interventions against colorectal cancer.

Keywords: MAPK1, Colorectal cancer, *Blumea oxyodonta*, *Cardiospermum halicacabum*, molecular docking

Introduction:

Colorectal cancer is a prevalent disease, ranking as third most common cancer globally and second in cancer-related mortalities (Bray et al., 2018). Despite lots of research, the origin of colorectal cancer is not clear (Fang et al., 2021). People with fatty diets are prone to colorectal cancer (O'Neill et al., 2016). MAP kinases are vital enzymes that transmit signals within cells (Jonak et al., 1994). Activation of mitogen-activated protein kinases is important for cell proliferation and differentiation and blocking apoptosis (Kyriakis & Avruch, 2012). MAP kinases are activated by phosphorylation in response to extracellular signals, hence also called as extracellular signal-regulated kinases (ERKs) (Jonak et al., 1994). Overactive MAPK signalling leads to excessive growth of the colorectal lining causing tumours (Kundu et al., 2015). Hence, different natural and synthetic inhibitors are used to stop the excessive cell growth. Natural products are a vital source of developing new medicines. Natural products and their synthetically modified forms have been considered as a rich source of potential medicines (Koparde et al., 2019). Lots of natural products have been evaluated for their anticancer property and research is still going on for the locally available and highly effective compounds.

Conventional drug discovery is risky, costly and time-consuming process (Tang et al., 2006). Recent advancements in drug discovery technologies have dramatically transformed the process of identifying potential drug candidates from nature (Tariq & Siddiqi, 1985). Computer Aided Drug Discovery (CADD) utilizes computational techniques to find potential drug

candidates, virtually searching large chemical databases, optimizing drug candidates and predict pharmacological properties (Giri & Bader, 2015). The present study was carried out with an aim to identify the potential of compounds derived from *Cardiospermum halicacabum* and *Blumea oxyodonta* as promising inhibitors for MAPK1 (ERK2) protein.

Materials and methods:

Selection and retrieval of ligands:

Blumea oxyodonta and *Cardiospermum halicacabum*, plants known for their immense medicinal properties, were selected as a source of potential MAPK2 inhibitors. Kulkarni (2023) carried out HPLC-MS for ethanol and acetone extracts of stem of *C. halicacabum* and ethanol extracts of inflorescence of *B. oxyodonta* (Kulkarni, 2023). Compounds reported in the thesis were selected and analysed for their activity against colorectal cancer using PASS analysis (Filimonov et al., 2014). Out of 21 compounds 17 showed antineoplastic activities for colon cancer.

These compounds were then subjected to SwissADME (Daina et al., 2017) analysis to check whether they fulfil the ADME properties. By considering TPSA, Gastrointestinal absorption and Lipinski's rule molecules were sorted for molecular docking. Nine molecules were selected along with the reference ligand trametinib to be docked against MAPK2. PubChem (Kim et al., 2023), a well-known compound database, was used to download 3D SDF files for the selected ligands. These were converted to .pdb format using PyMol (The PyMOL Molecular Graphics System, Version 2.5.5 Schrödinger, LLC; DeLano, 2002).

Selection and retrieval of protein target:

A pivotal kinase, Mitogen activated protein kinase-1 (MAPK1), has emerged as promising target in cancer due to its role in regulating cellular proliferation and differentiation. Hence, was selected as target for this study. Its structure was download from AlphaFold database (Jumper et al, 2021; Varadi et al., 2024) with ID: AF-P28482-F1 (<https://alphafold.ebi.ac.uk/search/text/P28482>).

Structure was downloaded in PDB format (AlfaFold: AF-P28482-F1). AlphaFold predicts structures by using protein sequence. It is now widely used for proteins whose experimental structures are not available. Active site of molecule must be predicted to avoid unusual results while docking. Therefore, ProteinsPlus server (Fährrolfes et al., 2017; Schöning-Stierand et al., 2020; Schöning-Stierand et al., 2022) was used to predict the binding pocket for trametinib. Amino acids in binding pocket were predicted which were used for adjusting grid box in later step.

Molecular docking:

PyRx (Dallakyan & Olson, 2015), a virtual screening software was using to dock selected

Table 1. Compounds selected for study (Kulkarni, 2023).

Sr. No.	Compounds	SMILES
1	(-)- Bisdechlorogeodin	<chem>CC1=CC(=C2C(=C1)OC3(C2=O)C(=CC(=O)C=C3OC)C(=O)OC)O</chem>
2	(+)- Sophorol	<chem>C1C(C(=O)C2=C(O1)C=C(C=C2)O)C3=CC4=C(C=C3O)OCO4</chem>
3	Chlorogenic acid	<chem>C1C(C(C(C1(C(=O)O)O)OC(=O)C=CC2=CC(=C(C=C2)O)O)O)O</chem>
4	Dactylin	<chem>COC1=C(C=CC(=C1)C2=C(C(=O)C3=C(C=C(C=C3O2)O)O)OC4C(C(C(C(O4)CO)O)O)OC5C(C(C(C(O5)CO)O)O)O</chem>
5	Dihydrocapsaicin	<chem>CC(C)CCCCCCC(=O)NCC1=CC(=C(C=C1)O)OC</chem>
6	Diosmetin 7-O-beta-Dglucuronopyranoside	<chem>COC1=C(C=C(C=C1)C2=CC(=O)C3=C(C=C(C=C3O2)OC4C(C(C(C(O4)C(=O)O)O)O)O)O)O</chem>
7	Formononetin	<chem>COC1=CC=C(C=C1)C2=COC3=C(C2=O)C=CC(=C3)O</chem>
8	Genistein 8-c-glucoside	<chem>C1=CC(=CC=C1C2=COC3=C(C2=O)C(=CC(=C3C4C(C(C(C(O4)C(O)O)O)O)O)O)O</chem>
9	Hypaconitine	<chem>CC(=O)OC12C3C(CC(C3OC(=O)C4=CC=CC=C4)(C(C1O)OC)O)C56C(CCC7(C5C(C2C6N(C7)C)OC)COC)OC</chem>
10	Isorhamnetin	<chem>COC1=C(C=CC(=C1)C2=C(C(=O)C3=C(C=C(C=C3O2)O)O)O)O</chem>
11	Jaceidin	<chem>COC1=C(C=CC(=C1)C2=C(C(=O)C3=C(O2)C=C(C(=C3O)OC)O)OC)O</chem>
12	Luteolin	<chem>C1=CC(=C(C=C1C2=CC(=O)C3=C(C=C(C=C3O2)O)O)O)O</chem>
13	Luteolin 4'-o-glucoside	<chem>C1=CC(=C(C=C1C2=CC(=O)C3=C(C=C(C=C3O2)O)O)O)OC4C(C(C(C(O4)CO)O)O)O</chem>
14	Morindon	<chem>CC1=C(C2=C(C=C1)C(=O)C3=C(C2=O)C=CC(=C3O)O)O</chem>
15	Myricitrin	<chem>CC1C(C(C(C(O1)OC2=C(OC3=C(C=CC(=C3C2=O)O)O)C4=CC(=C(C=C4)O)O)O)O)O</chem>

ligands with the target. Ligands were energy minimized and converted to .pdbqt using OpenBabel (O'Boyle et al., 2011) in PyRx. Then protein was loaded and converted to .pdbqt format. Grid box was generated and adjusted according to the amino acids predicted from ProteinPlus server. Binding affinity and binding pose were generated using AutoDock Vina (Trot & Olson, 2009) in PyRx.

2D interactions of protein ligand complex:

Protein-ligand complex files were prepared using PyMol and 2D interactions were viewed using LigPlot+ (Laskowski & Swindells, 2011) software. It enables to predict hydrogen bonds and hydrophobic interactions within the protein-ligand complex.

Result and Discussion:

Selection and retrieval of ligands:

Selected ligands were searched for antineoplastic activity related to colorectal cancer using PASS analysis. Table 1 shows selected compounds with those (highlighted) having activity against colorectal cancer.

16	Pheophorbide a	<chem>CCC1=C(C2=NC1=CC3=C(C4=C(C(C=C5C(C(C=CC6=NC(=C2)C(=C6C)C=C)N5)C)CCC(=O)O)C4=N3)C(=O)OC)O)C)C</chem>
17	physalin G	<chem>CC12CC3C4(C56C1C(=O)C(O5)(C7CC(C8=CC=CC(=O)C8(C7CCC6(C(=O)O4)O)C)O)OCC2C(=O)O3)C</chem>
18	Quercetin	<chem>C1=CC(=C(C=C1)C2=C(C(=O)C3=C(C=C(C=C3O2)O)O)O)O</chem>
19	quercetin 3,7-dirhamnoside	<chem>CC1C(C(C(C(O1)OC2=CC(=C3C(=C2)OC(=C(C3=O)OC4C(C(C(C(O4)C)O)O)O)C5=CC(=C(C=C5)O)O)O)O)O</chem>
20	Quinacrine	<chem>CCN(CC)CCCC(C)NC1=C2C=C(C=CC2=NC3=C1C=CC(=C3)Cl)OC</chem>
21	Quinic acid	<chem>C1C(C(C(C1(C(=O)O)O)O)O)O</chem>

ADME property of these compounds was predicted using SwissADME. Compounds having following properties were selected for docking.

Topological Polar Surface Area (TPSA) < 138 Å²

Lipinski's rule with 0 violations

High Gastrointestinal absorption

On this basis, 9 compounds were selected for docking:

(-)-Bisdechlorogedin, (+)-Sophorol, Formononetin, Isorhamnetin, Jaceidin, Luteolin, Morindon, Quercetin and Quinacrine.

Selection and retrieval of protein target

Protein: Mitogen-activated protein kinase 1

Source organism: Homo sapiens (Human)

UniProt: P28482

Experimental structures: 145 structures in PDB for P28482

Biological function: Acts as a transcriptional repressor.

Binds to a [GC] AAA [GC] consensus

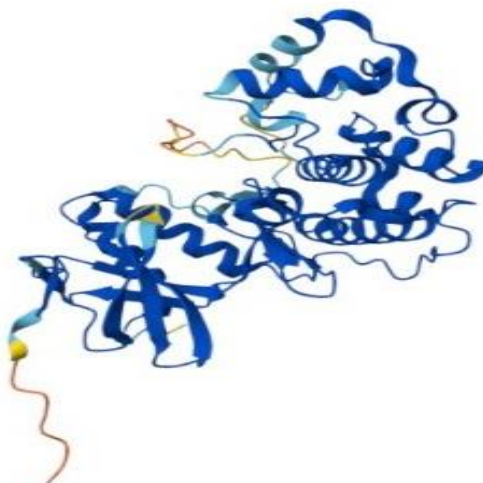


Figure 1: Mitogen activated protein kinase-1 (AlphaFold: AF-P28482-F1)

Molecular docking

Binding pocket was predicted for MAPK-1 for ligand Tametinib. Amino acids in binding pocket are as follows:

GLY_34_A ALA_35_A TYR_36_A

LYS_54_A GLU_71_A ASN_82_A ILE_83_A

ILE_133_A LEU_134_A GLY_136_A LEU_137_A

LYS_138_A ILE_140_A HIS_141_A VAL_145_A

LEU_146_A HIS_147_A ARG_148_A ASP_149_A

LEU_150_A LYS_151_A PRO_152_A SER_153_A

ASN_154_A LEU_155_A LEU_156_A

LYS_164_A ILE_165_A CYS_166_A

ASP_167_A PHE_168_A GLY_169_A LEU_170_A

ALA_171_A ARG_172_A THR_206_A LYS_207_A

ILE_209_A ASP_210_A ILE_211_A SER_213_A

VAL_214_A ILE_217_A VAL_304_A



Figure 2. Binding pocket for MAPK-1 for Trametinib

Docking was performed using PyRx for above highlighted compounds with MAPK-1 protein. Binding affinity for ligands is displayed in Table 3. It

shows that 7 compounds were having higher binding affinity than selected reference compound, Trametinib (-6.8 kcal/mol).

Table 2. Predicted Binding affinities using PyRx virtual screening software

Sr. No.	Compounds	Binding affinity (kcal/mol)
Reference ligand	Trametinib	-6.8
1	(-)-Bisdechlorogedin	-5.9
2	(+)-Sophorol	-8.5
3	Formononetin	-7.6
4	Isorhamnetin	-8.6
5	Jaceidin	-8
6	Luteolin	-8.4
7	Morindon	-8.2
8	Quercetin	-8.4
9	Quinacrine	-6.2

LigPlot+ was used for evaluating 2D interactions of protein ligand complex. Like Trametinib, Jaceidein and Quercitin also showed hydrogen forming with

Ser153. Other hydrophobic interactions also play role stabilizing in protein-ligand interaction.

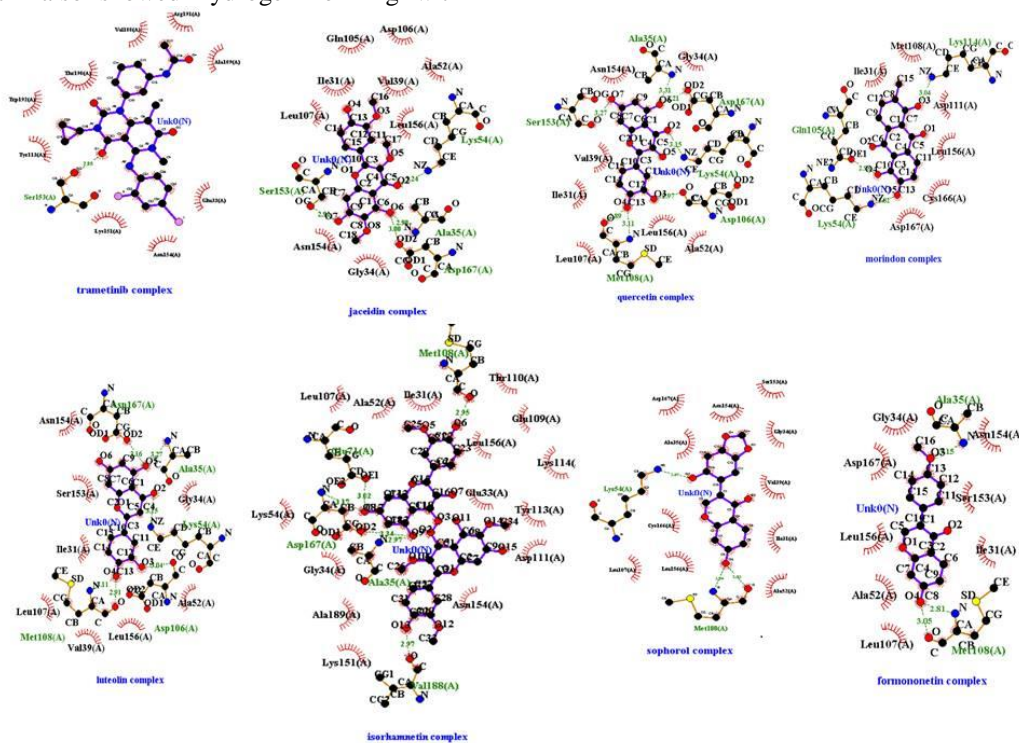


Figure 3. : 2D interaction of molecules using LigPlot+

Conclusion:

Advancement in computational approaches is enhancing the drug discovery process for novel candidates. Our findings demonstrate that the selected compounds were potent enough to inhibit MAPK1 and are important drug candidates related to cancer. They can also be evaluated for other proteins involved signalling pathways leading to cancer.

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Spatio-Temporal changes in Crop Diversification of Sangli District (Maharashtra)

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Abstract:

Crop diversification means growing different varieties of crops for arable land. Crop diversification is the production of different crops in a specific area at a specific time. The present research paper focus on the crop diversification in Sangli District. The research paper based on the secondary data have been collected from the Socio-economic review of Sangli district (2003-04 and 2022-23). Crop diversification calculation is based on Gibbs and Martin Index of Diversification.

Keywords: Crop diversification, land Use pattern.

Introduction:

Crop diversification refers to the abundance of crops in a region. That is, the greater the number of crops, the greater the variety of crops. Conversely, the fewer the number of crops, the less the crop variety. Crop diversification is determined by the ratio of the area under different crops to the total number of crops in a particular region. Crop diversification in agriculture is increasing. Reasons for this are irrigation, use of chemical and organic fertilizers, hybrid varieties of different crops, mechanization.

Study Region:

The Sangli district is part of the southern districts of Maharashtra and is part of the Deccan plateau. The Sangli district is located between 16⁰ 45' and 17⁰ 33' N latitudes longitudes and 73⁰ 42' and 75⁰ 40' longitudes. The average altitude of the

district is 553 meter above mean sea level. It is surrounded by Satara and Solapur district to the North, Karnataka State to the East and South, Kolhapur district to the South –West and it has a small boundary with Ratnagiri district in the west. Sangli district has 205 km length in East to West and 96 km width North-South direction. The total area of the Sangli district is 8572 sq. km. and its total population is 28, 22,143 according to 2011 census where, 1,435,728 Male and 1,386,415 female population was observed. The total literacy rate of Sangli district is 82.62 % and the population density is 329 per sq. km. For the administrative purpose Sangli district divided in to three sub-divisions mainly Walwa, Miraj, and Khanapur and the district has ten tehsils such as Walwa, Shirala, Miraj, Jath, Atpadi, Khanapur, Palus, Kavathe-Mahankal, Tasgaon, and Kadegaon.

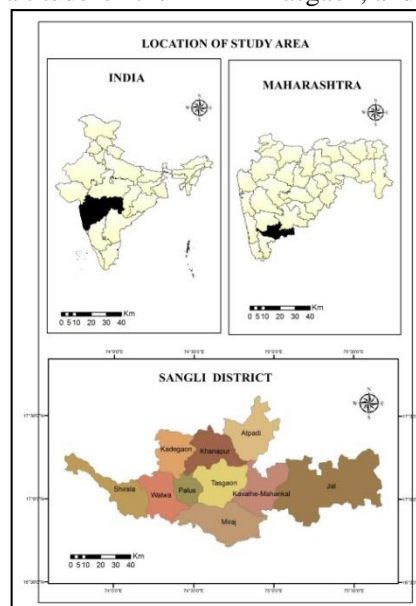


Fig. No. 1

Objectives:

1. To analysis Spatiol-temporal of crop diversification in Sangli District.
2. To analysis of crop diversification at tashil level.

Methodology:

The present research papers depend on Secondary data. The researcher has Secondary data collected from the Socio-Economic Abstract, Sangli District 2003-2004 and 2022-2023.

The Gibbs and Martin Index of Diversification (1962) provides a useful alternative index for measuring the degree of diversification in the cropping pattern in an area and the formula developed for calculating the index is an under-

$$\text{Index of Diversification} = I - \frac{\Sigma x^2}{(\Sigma x)^2}$$

Therefore, The Gibbs and Martin Index of Diversification (1962) is proved to be most suitable

Table No. 1: Sangli District Crops and its Diversification (in percentage) 2003-04

Sr. No	Tahils	Cereals	Pulses	Oil Seeds	Cash Crops	Fruit Vegetable Crops	Fodder Crops	$1-\Sigma x^2/(\Sigma x)^2$	Index
1	Walwa	30.2	8.5	31.9	27.3	1.04	1.06	$1-2749.28/(100)^2$	0.72
2	Miraj	42.8	14.99	24.88	11.59	3.32	2.42	$1-2826.74/(100)^2$	0.71
3	Palus	NA	NA	NA	NA	NA	NA	$1-0/(100)^2$	NA
4	Kadegaon	NA	NA	NA	NA	NA	NA	$1-0/(100)^2$	NA
5	Tasgaon	31.72	20.44	34.07	6.36	4.63	2.78	$1-2654.29/(100)^2$	0.73
6	Atpadi	74.73	11.5	1.96	4.51	1.47	5.83	$1-5777.14/(100)^2$	0.42
7	Kavathe-Mahankal	75.65	11.56	5.47	5.49	1.11	0.72	$1-5918.35/(100)^2$	0.4
8	Shirala	40.59	6.04	13.4	7.58	1.55	30.93	$1-2880.09/(100)^2$	0.71
9	Jath	77.7	13.36	6.77	1	0.88	0.29	$1-6263.45/(100)^2$	0.37
10	Khanapur	57.25	19.01	14.05	3.19	2.02	4.48	$1-3870.66/(100)^2$	0.61
11	Sangli District	57.57	13.32	15.17	7.65	1.76	4.53	$1-3803.97/(100)^2$	0.62

Source: Socio-economic Review Sangli District 2003-04

*NA- Not Available

Low Crop diversification index (below 0.55):-

In the during 2022-23, Jath, Kavathe-Mahankal, Atpadi tehsils has lowest diversification index respectively, 0.54, 0.50 and 0.5 but in 2003-04 it was 0.37, 0.42 and 0.4. Jath, Kavathe Mahankal and Atpadi tehsils are occupancy mostly area (65 Per cent) in cereals crop like Jowari and Bajari. Remaining cropped area is distributed in to all crops.

Moderate Crop diversification index (0.55 to 0.70):-

Kahanapur tehsil are moderate diversification index with 0.61 in 2003-04 and

Table No. 2: Sangli District Crops and its Diversification (in percentage) 2022-23

Sr. No	Teshils	Cereals	Pulses	Oil Seeds	Cash Crops	Fruit Vegetable Crops	Fodder Crops	$1-\Sigma x^2/(\Sigma x)^2$	Index
1	Walwa	11.96	6.59	29.18	49.2	3.07	0	$1-3459.22/(100)^2$	0.65
2	Miraj	38.74	9.88	13.19	24.11	13.66	0.42	$1-2539.41/(100)^2$	0.74
3	Palus	8.24	10.4	19.89	54.34	7.13	0	$1-3666.79/(100)^2$	0.63
4	Kadegaon	25.66	10.1	22.07	40.13	2.04	0	$1-2862.09/(100)^2$	0.71

in measuring the diversification of crops in Sangli District and hence is adopted here, at point of time. The Q-GIS 3.34 software is used for graphical representation of tehsil-wise crop diversification distribution in Sangli district.

Result and Discussion:

Crop diversification means the raising a variety of crops. In the Sangli district Crop diversification has increased from 0.62 in 2003-04 to 0.71 in 2022-23. Because the number of crops has been changed each time during the study period. That's why the increase in the crop index value.

A tehsil level analysis of crop diversification in sangli district show a different picture as compared to the district as a whole. Although the variation in index values from 2003-04 to 2022-23 in Sangli district as a whole a high, inter tehsil differences are significant.

Khanapur Shirala, Walwa, and Palus tehsils are moderate diversification index with 0.69, 0.66, 0.65 and 0.63 in 2022-23. It has moderate crop diversification index in Sangli District. However Khanapur tehsil low decreases of crop diversification index due to the 57 Percent area occupied in the Cereals crop. During in the 2022-23 Shirala, Walwa, and Palus tehsils has occupied Cash Crops like Sugarcane. Shirala tehsils receives high rainfall than other tehsis. Walwa tehsils is high irrigation facilities.

5	Tasgaon	39.35	8.92	17.7	16.11	17.67	0.25	1-2513.08/(100)2	0.74
6	Atpadi	67.22	3.57	0.74	9.38	18.54	0.55	1-4963.81/(100)2	0.5
7	Kavathe-Mahankal	64.23	11.56	1.4	11.38	10.73	0.7	1-4506.2/(100)2	0.54
8	Shirala	42.77	2.25	24.68	29.8	0.5	0	1-3331.72/(100)2	0.66
9	Jath	64.48	14	7.37	6.75	7.13	0.27	1-4504.44/(100)2	0.54
10	Khanapur	26.6	15.08	10.03	44.63	3.62	0.04	1-3040.49/(100)2	0.69
11	Sangli District	43.86	10.19	13.66	23.59	8.46	0.24	1-2842.21/(100)2	0.71

Source: Socio-economic Review Sangli District 2022-23

High Crop diversification index (Above 0.70):-

In the during 2022-23 Miraj, Kadegaon and Tasgaon tehsils has high diversification

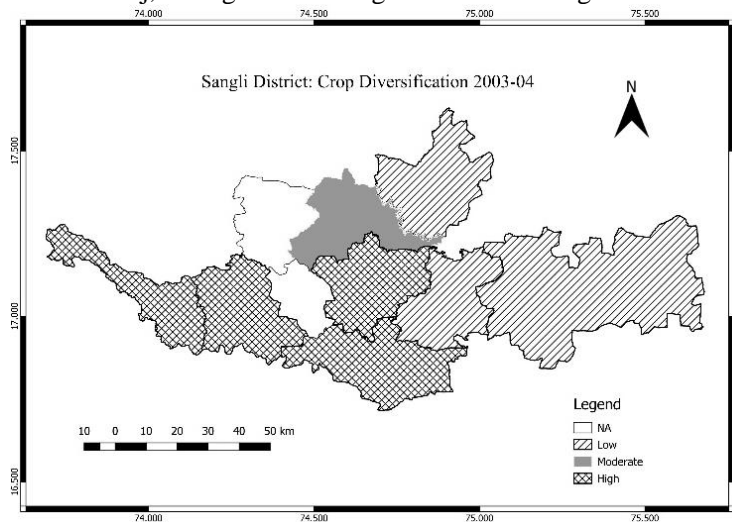


Fig No. 2

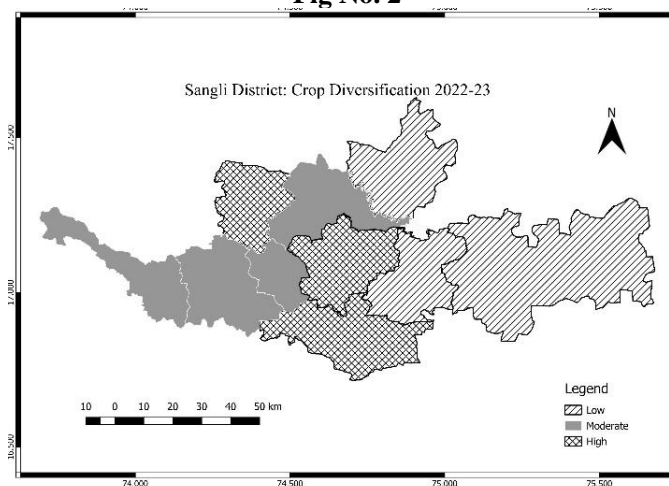


Fig. No.3

index respectively, respectively, 0.74, 0.74 and 0.71 and in 2003-04 Miraj tehsil (0.71), Walwa (0.72) Tasgaon (0.73), Shirala (0.71) crop diversification index respectively, Because well irrigation facilities and Oil Seeds Crop, Cash crop and fruit and vegetables crops are occupy in high agricultural area.

Conclusion:

This paper presents crop diversity analysis in Sangli district. From the point of view of Sangli district, the eastern part of Sangli is drought-prone, and in the eastern part of Sangli district, the area

under Cereals crops in 2003-4 is about 57.57, while in the eastern part, the area under Cereals crops in 2022-23 is 43.86. Due to lack of water, the area of oilseeds, fruits, vegetables and sugarcane crops is less. The western part of Sangli district is generally well irrigated due to the Krishna, Warana Yerala Rivers, so the area of sugarcane, oilseeds, fruits and vegetables is high in these areas and the crop productivity is high in these areas. In the present scenario need to the develop irrigation facilities, change cropping pattern, Soil properties, water management in Sangli District.

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Study of periphyton from Kayadhu river system (Maharashtra) for aquaculture practice

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Abstract:

Periphyton is a mixture of organisms attached to underwater substrates. The present study was carried out on diversity of periphyton on Kayadhu river system of Kalamnuri dist. Hingoli of Maharashtra. For the study sample was collected from the irrigation canal of Kayadhu river system and preserved for analysis. From the results it was observed that the periphyton sample has different genera of class Chlorophyceae, different genera of class Bacillariophyceae and zooplanktons. The physicochemical parameters of river water were within the suitable range of aquaculture. The bacterial colony count was also done. The two types of bacteria were observed and the total count of bacteria was 165 ± 5 per ml of water. The study shows that this irrigation canal of river can be utilized for the periphyton based aquaculture.

Keywords: Aquaculture, periphyton, river system

Introduction:

Numerous terms such as Nereiden, Aufwuchs, Bewuchs, Lasion, Be-lag, and Besatz were adopted by hydrobiologists over time to describe periphyton or similar organisms, as stated in a study by Sládečková (1962). The term "periphyton" was first introduced in 1928 and comes from the Greek words peri meaning around and phyton meaning plant. In 1945, Young was the first to describe periphyton as the organisms found on submerged surfaces covered in a slimy film. There is a vast array of organisms present in periphyton, including algae, bacteria, fungi, protozoa, zooplankton, and other invertebrates. These organisms work together as a group, which results in them being very effective at obtaining and digesting nutrients. Periphyton is complex aquatic biota attached to underwater substrates has association of non-attached organisms (Azim et al., 2005). Periphyton plays a crucial role in aquatic ecosystems. Periphyton is readily consumed by tiny invertebrates, fish, and shrimp, which significantly boosts the productivity of both natural and man-made aquatic ecosystems. The periphyton in freshwater habitats serves as natural food for fish and aquaculture systems (Chavan et al., 2012). The culture system utilized biodegradable substrates to produce periphyton, which acts as a supplementary food source for the fish in the system (Gangadhar et al., 2012). The present study is to explore the diversity of periphyton from the irrigation canal Kayadhu river system.

Materials and Methods:

Study area:

The irrigation canal of Kayadhu river system near Kalamnuri taluka of Hingoli district, Maharashtra was selected for the study. The Kayadhu River is a southern tributary of Penganga River. The periphyton communities from different natural substratum were observed such as from soil (epipelon) and stones (epilithon).

Physico-chemical analysis of water sample:

The periphytic water sample was collected from the canal of Kayadhu River system and subjected to the physico-chemical analysis. It includes temperature, pH, dissolved oxygen, chloride, phenolphthalein alkalinity and total alkalinity, free CO₂, phosphate, sulphate, nitrate, hardness and calcium hardness by following the standard procedure of water examination (Trivedy et al. 1998).

Collection and preservation of periphyton:

The periphyton samples from different substrates (from soil and stones) were collected in a container. And this mixture was preserved in 4% formalin and in Lugol's solution. The temporary slides were made in glycerin and the permanent slides were prepared in DPX mount. The slides were observed under the compound microscope (Fatima & Chavan. 2023).

Taxonomic identification:

Periphytic samples were identified by comparing morphological characters using keys from freshwater biology by Edmonson (1959).

Bacterial colony count:

For the bacterial count from periphyton the sample was diluted in distilled water and stored in PBS solution. The total plate count of bacteria was carried out on plate count agar (PCA) by using spread plate method (Massa et al., 1998).

Results and Discussion:

Physico-chemical analysis of water:

The physico-chemical parameters of water samples were depicted in the table no. 1. The temperature of water was 28°C. The temperature

helps to accelerate the growth of periphyton. The pH of water was neutral or slightly alkaline that favours the growth of fish in aquaculture Pandey k et al., (2005). Dissolved oxygen (DO) content in river water was 8.91 mg/L. DO perform great role in the organisms cultured in the ecosystem Shaikh et al., (2015). The free CO₂ of water was 8.03 mg/L. The total alkalinity, chloride contents, calcium hardness, phosphate and nitrates were shown in table (1). All the water quality parameters were suitable for aquaculture system.

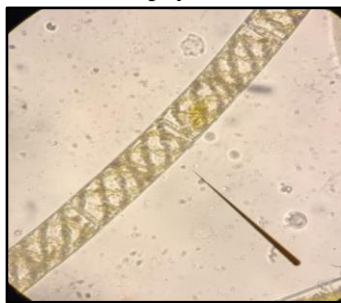
Table 1: Physico-chemical parameters of river water.

Parameters	River sample reading
Temperature °C	28
pH	7.9
DO (mg/ L)	8.91
Free CO ₂ (mg/ L)	8.03
PA (mg/ L)	0
TA (mg/L)	80
Cl (mg/L)	43.55
Ca ++(mg/L)	85.40
P (mg/L)	0.03
N (mg/L)0000	0.4

Identification of periphyton:

The periphyton from the river showed the high diversity. The periphyton observed from the river system showed the presence of different genera of class Chlorophyceae such as *Spirogyra* (4

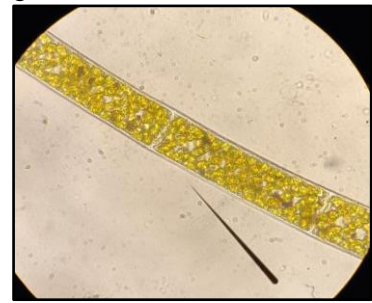
species), *Oedogonium* and *Hormidium* (fig: 1). The genera of class Bacillariophyceae such as *Fragilaria* (2 species), *Nitzschia*, *Synedra* and *Pinnularia* (fig: 2) were observed along with the zooplankton such as *Cyclop sp.* (fig: 3).



Spirogyra sp.



Spirogyra sp.



Spirogyra sp.



Spirogyra sp.



Oedogonium sp.



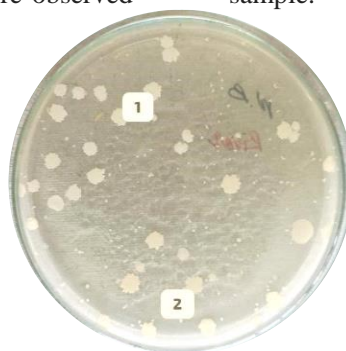
Hormidium sp.

Fig 1: Chlorophyceae genera of periphyton

*Fragilaria sp.**Fragilaria capusina**Closterium sp.**Nitzschia sp.**Synedra sp.**Pinnularia sp.***Fig 2: Bacillariophyceae genera of periphyton****Fig 3: Zooplankton (*Cyclop sp.*)****Total bacterial colony count in periphyton sample:**

On the basis of morphological characteristics two types of colonies were observed

in the sample and numbered as 1 and 2 as shown in fig 4. The total plate count of bacteria on PCA media obtained was 165 ± 5 per ml of diluted water sample.

**Fig 4: Total number of colonies****Conclusion:**

In this project the study of periphyton from the irrigation canal of Kayadhu river system was done. The species diversity of periphyton was observed. From the results it was found that the periphyton community of river system shows the presence of different genera of class Chlorophyceae, different genera of class Bascillariophyceae and zooplanktons along with bacterial colonies. As we aware that the periphyton has important role in aquatic ecosystem, one of the major role of periphyton is in aquaculture. It is used as food for many herbivorous and omnivorous fishes. From the

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results we can conclude that the canal of kayadhu river system would be good for periphyton based aquaculture.

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The Importance of the Psychological Factor in the Novel 'Zubaida's Window' by Iraqi Writer Iqbal Qazwini

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Introduction:

Importance of psychological factors dictates the need for discoveries on this subject. In this article, we have made an attempt to consider the peculiarities of a young man's mind and his psychological problems in society. The psychological aspect is the concern of all writers, but the complex and diverse spirited world does not diminish the work of depicting its diversity, external and internal characters. In their analysis, Soviet Muslim psychologists emphasized identity in the work, but without exposing personality, its inner psycho-emotional world. Zubaida Qazwini's "Window" is an Iraqi prose work of the proscribed Pan-Arabism. In two scenes of a small culmination, weak heart pains and tears were poured. However, the novel is of great interest for it is a national Iraqi hero who is hypercritical and a strict judge of a monarch of a fairy tale. Many good qualities. Iraqi Zolotonos and Japonchiks have become part of Zubaida, who is trying to surround herself with the same affirming, intelligent, patriotic, and other historical characters, in which the Iraqi teenager is trying to absorb human knowledge and Iraqi youth. The mind nourishes and provides knowledge to the people. Adults and Japanese children have the best knowledge in the world ('Golden children') and are powerful in a complex, materially great knowledge and become great with internal strength. The mind symbolizes knowledge, the Cherub. The hero has many beautiful qualities; he's human working skills in Palestine. Sakals work around a cunning British intelligence officer, discovering and neutralizing a network of Shiite dissenters, bringing funds to the country.

There are several large problems and inevitable answers in the novel "Zubayda's Window". Yet different critics have different responses. Our world is complex, diverse, and life is multicolored, exotic psychological characters in literature, hypochondriac. Zubaida's psychological portrait is very complicated, subtle, and individual. The reason for sexualized behavior lies in the mind of the attractive beauties, there is a clearer portrayal of her gentle, decent, and deep personality. However, by examining the protagonist's psychological issues, we can learn a lot about the value of peace construction, the necessity to build a world and human life in hordes in cities, and the treasure of being a highly conscious personality with clear understanding and polite actions. We then mention major behaviors: goodwill, goodwill, and goodwill once again, goodwill several times at the end or at any other time of the story. Goodwill strengthens thinking. The emergence of iconic values in painting occurs not as a preference. The hero cannot and should not be left by the writer. It should be as good as possible because women have so much apart! These people outsource their good intentions too! Premier's daughter, Abu Bakr's youngest, Zubaida and Jackplait Plot of Arabic classics convey. The valor of a powerful girl, who was capable of evil, magnanimous abandonment of

the throne, is portrayed in the book. The good behavior and the thoughts contained here should be used by readers. Many people will choose to base their life, like the wise, emotional girl heroine, from their life. We can't help but feel good when we're with such a nice person. For it is much more beautiful than any fairy tale and is (!) Real Zotoppia! Kitya is as good as any other girl!

Background of the Novel and the Author

In the literary text, which is in essence an image typical of the life of man in his relationship with the universe or with the self and through various diverse events, we can agree with the existence of internal impact factors that form it. One of the most accurate pictures of these factors is the psychological image created by the writer for his character and which interchanges between the writer and the reader. Because the reading of the text in general and the novel in particular is a human act by a man and it discusses the man as a human body and human feelings and moral values, therefore, he can know and feel other people. On the contrary, when the novelist takes up topics or problems that are not linked to his interior such as the novel of the conflict or the novel of the observation of natural phenomena or the novel of nursery rhymes, it is a trace of its nonactual relationship with society and with the human mind.

At that data, we have chosen for our research in this department the novel because it presents the best image to give an idea of the human mind, which in its turn finds its first and last space inside the human being. In view of the presence of this novelistic orientation, we have also chosen the psychological essay which was established in the early 19th century and is based on studies and analyzes of the work of literature from this aspect. It is based on studies that specialize in literary creativity and themes by focusing on the psychological state of the writer, his own feelings, and the psychological state and psychological depth of the characters, design, construction, and takeoff, and his relation with the reader. These columns describe the psychological level and the presence of the effect within the literary work and achieve a measure of communicative framework between the work and the reader.

Understanding the Psychological Factor in Literature

A considerable part of the attraction of literature is the psychological factor, the ability of the work of fiction to explain, and even justify, human conduct. Examination of literature from this viewpoint has only recently been deemed serious. At first, the only concern in literary research was minute and varied detail about all that has been written by the author. Research also centered to a high degree on the biographical element in the work. Textual and author-centered literary criticism excluded psychological analysis. Literary criticism form has been many and varied, but literary ideology changed some time ago to concentrate first and foremost on the work and on the reader. Indeed, if literary perspective excluded human understanding, it would lose its global attraction. In reality, the interest that literature has for the psychologist is nothing new. The poets have frequently revealed a powerful perception of mental events and have formulated a new 'psychological' knowledge.

Interest in the psychological approach to fiction arises from many of the fundamental characteristics of literature which we otherwise examine: the universal reader, the relationship between reader and characters, the world of fantasy and the complex mechanism of art. This psychological factor is significant in its capacity to reflect the life of the imagination. To understand literary psychology, therefore, a psychological method of analysis is necessary, appropriate to this complexity and contradictions. Grasping the psychological aspect of literature means, above all, making a plea for a dynamic approach to the characters which, hitherto, has never truly been recognized in the technical structure of the narrative. This is as much as to say that literary 'psychologists' should demonstrate an interest in responding to the demands of

psychology, and that they can offer useful contributions to the discipline of psychology by developing a new kind of evaluation and comparison.

Definition and Significance

Psychology acquired its present form and significance within the past 150 years, with "Zubaida's Window" marking the beginning of the "literature of the ego." Freud came to realize that it was literature that had the most insight into life and its problems, especially in the days of its classical glory. This insight led him to believe that the process of creating literature was curative. The writer not only uncovered his mental traumas and complexes but also anxieties that tormented others. Literature allowed the expression of thoughts that could not be stated in a scientific investigation, a therapeutic value that lay in expressing incapacitating fears in words.

The psychological factor in fiction writing was dealt with even before Freud. For hundreds, perhaps thousands, of years, writers had already been analyzing the most complex psychological phenomena through their characters. Literature thus represents numerous and variegated priorities. "Zubaida's Window" also focuses on the psychological analysis of characters' behavior in order for each to acquire their self-identity and a state of fulfillment. A character who is going through an important change in his or her life is doing some very private things that nobody else knows about. There are a number of external events, but there is one or more internal events that have not been given a jam or a home.

Analysis of Psychological Themes in 'Zubaida's Window'

In order to achieve the aim of the present study, it is important to focus first on the psychological themes that abound in Zubaida's Window. All the contents of the novel are significant in this regard. After all, Qazwini aims in this work to reveal our region's thorny problems, together with different types of men and women and the motives that drive each. The study also throws light on the psychological theme in this novel as manifest in one chapter, Zubaida's fears. A more detailed study of fear is proposed as a focus for future psychological research so that it reveals all aspects of this strange phenomenon which has attracted a great deal of attention from psychology and to examine anxiety which affects the characters in capital or subsequent place.

This study has dealt with the psychological factor in certain characters in the novel here and there, and certainly a study which limits its literary psychological treatment to a single chapter cannot be, due to the lack of familiarity with every play entirety, except of token value. Regarding Qazwini's treatment of the Arab heritage's social and personal

problems, it is the opinion of the present study that the most striking method which he employs in the novel is psychological method as manifested in the structure of the characters, plot and narrative technique.

Character Development

One major psychological factor is character development, which is one of the strong elements in a fictional context. Through a meaningful story, the reader can identify with the characters' feelings and experiences. As readers turn inward and explore their life experiences through characters they meet in a novel, they become more aware of their own characteristics and their social responsibilities. What a splendid thing that human beings can think, feel, and bring into existence such experiences, whether they are real or hypothetical! Indeed, we learn from reading not only stories, but also stories about life. The reader mirrors the story and re-establishes a close connection with the unique name given to that character.

We can regard some writers as traveling companions due to the subject matter or the space they provide for our inner thoughts, where we face episodes of happiness, anxiety, and anger. The reader, based on experience or learning, adjusts his or her relationship with that character or experiences events in the spirit of other known people in the social context. The dynamic surface of character development contributes to readers' overall experience by explaining human behavior and motivation, and it thus becomes an arena in which readers can encounter new perspectives on life. In novels, psychoanalysis has transformed itself into an unsettlingly fantastic world that weaves its way into the mysteries of our inner life.

Impact of Psychological Elements on the Plot and Themes

War is one of the most commonly used themes in literature, and psychological literature has also sought to shed light on the effects of war in general. A novel such as Zubaida's *Window* would be of great meaning to the students and staff at Education City, which includes students from the Arab world, and would foster mutual understanding among the various communities in Qatar. With the psychological impact of war as a theme in reading, it would be possible to provide insight into understanding the complexities of the human mind—providing a new understanding for the survivors of conflict, famine, and terrorism. The psychological impact of war can be evaluated from different vantage points. The split between collective and individual experience draws sustenance from historiography, but it is also a constant part in literary analysis.

The psychological effects of dwelling on themes of war in stories are many, including the fact that war literature helps provide a lifespan of memories and

gives available histories, traces common memories of the readers as well as a successor group identity. The advantages of utilizing a text such as Zubaida's *Window* from the Arabic today are legion, including the benefits of cooperative reading. Rather than be an exercise where students form a classroom of insiders and outsiders, this work would provide a form of inner experience that can contribute to the opening up and the mapping of important regions of experience. This work would provide students with the opportunity to disclose the intimate and the familiar, representing universal phenomena and providing the value of reflection and emotional response. It would help students to understand the psychological effects of the hostilities that arise in wartime.

Conclusion

Yet, despite all the tribulations that the novel describes and the depths of despair that it reaches, Zubaida's *Window* testifies to human consummation. The capacity to reach out and respond to the individual's worth is long and permanent. The psychological factor gives Zubaida the impetus and strength to withstand the hardships of school and home life, helps her overcome the psychological sufferings and the feeling of the world's rejection. It also works on once-humiliated Mr. Qadi and on her friend Sharifa, to make them respect the existence of each individual, to overcome bitterness, disillusionment, to return to life, to hope again. Moreover, the psychological factor in the humanizing function of literature, the human self-knowledge through which reader and writer reach out to each other, leads the reader to the genuine literary text and phases out the ambiguity in its construction.

Aiming at grasping reader response as an essential factor in the literary work, this study tried to explicate the concepts or focus in Zubaida's *Window* both by the approach that believes in the organic relationship of the text, the writer, and the reader and/or by believing that the novel addresses fundamental humanistic concerns as a fictional work of art. Additionally, this study superimposed psychoanalytic and humanistic psychology, major theoretical influences on reader-response critics, to explicate the reader's identification with the literary characters as fundamental elements of genuine literary texts. Such an approach contributes to dismantling the barriers of alienation among young readers, and in particular among young Arabs who are brought up in an atmosphere of mental and emotional intimidation and proximity.

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Quest of Identity in Culture: A Critical Analysis of Anuradha Roy's *All the Lives We Never Lived*

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Abstract:

This paper aims to analyze Anuradha Roy's novel subverts and resists gender norms while examining Feminist themes tradition and culture are significant components of modern society all our lives we never explored the ideas of culture and traditions. The analysis provides vivid status that cultural norms prevent women from leading the lives that they choose to live. The pain and yearning for independence experienced by women are the main topics of the novel *All The Lives We Never have Lived*. The novel's main character is Gayatri, an artist who is the wife of Week Chand. Therefore, the research paper highlights the novel applicability to current concerns about Gender, race, class, and power as well as its capacity to prove critical thought and discussion

Keywords: Anuradha Roy, all the lives are we never lived, feminist, gender, tradition, culture, women, race, class, power.

Introduction:

The role of women in literature has evolved significantly over time, reflecting broader social changes and shifting cultural attitudes. Historically, women in literature were often confined to stereotypical roles, such as the passive love interest or the moral caretaker, reflecting the gender biases prevalent in society. However, as feminist movements gained momentum, literature began to portray women in more complex and varied roles, challenging traditional narratives and exploring themes of gender equality, empowerment, and identity. Women writers and characters in modern literature are defying expectations more and more, providing rich, complex portrayals and a diversity of viewpoints. This change has made it possible to examine female experiences, voices, and struggles in a more nuanced way, which has resulted in a more comprehensive and inclusive understanding of gender dynamics. In addition to reflecting societal shifts, the way women are portrayed in literature has a significant impact on public opinion and the advancement of conversations about gender equality. The role of women play in literature is frequently fairly broad. In literary works, women are always portrayed as supporting characters. Anuradha Roy has focused particularly on social injustice and the condition of women her writings are relevant to current interests because of her understanding of human nature and her sensitive portrayal of characters.

Anuradha Roy is an Indian author known for her novels that explore themes of family, relationships, and the complexities of life in

contemporary and historical India. She has received critical acclaim for her storytelling and lyrical prose. Roy received the Sahitya Akademi Award in 2023 including the Man Asia Prize and Won the Economist Crossword Prize for fiction. *An Atlas of Impossible Longing* her debut book has been translated into fifteen different languages worldwide. It was shortlisted for the Crossword Prize and listed by World Literature Today as one of the 60 most important books on contemporary India.

The etymology of the word “culture” reveals a rich history that reflects its multifaceted nature. The word “culture” originates from the Latin word “cultura,” which is derived from “colere,” meaning “to cultivate” or “to till.” In its earliest usage, it referred to the cultivation of land and the agricultural practices associated with farming. Today, ‘culture’ has a wide array of meanings. It can refer to the arts and humanities, a set of shared attitudes, values, goals, and practices that characterize an institution or organization, the customs and social behaviors of particular people or societies, and more. It encompasses everything from pop culture and subcultures to corporate culture and multiculturalism. The term has evolved significantly over centuries, reflecting changes in societal values and understandings of human development and social organization. Culture refers to the process of familiarizing ourselves with the most excellent knowledge and wisdom that has been created and expressed throughout the world. It also involves understanding the history of human thought and creativity. “Culture is then properly described not as having its origin in curiosity, but as having its origin

in the love of perfection; it is a study of perfection. It moves by the force, not merely or primarily of the scientific passion for pure knowledge, but also of the moral and social passion for doing good... culture is the acquainting ourselves with the best that has been known and said in the world, and thus with the history of the human spirit" (Arnold, 42).

All the Lives We Never Lived has been praised for its introspective and innovative storytelling. Critics have highlighted Roy's ability to intertwine personal and political histories, offering readers a profound meditation on the nature of freedom and the consequences of personal choices. The novel's exploration of the female experience in a colonial context has been particularly noted for its depth and sensitivity. In the novel, *All the Lives We Never Lived* the history of India's fight for independence from British Colonial rule is wrapped up in a family drama that depicts conflicts within the family. The novel opens with Myskin, a middle-aged horticulturist receiving a letter in the fictional Himalayan village of Muntazir, where Myskin grew up, his mother Gayatri abandoned him when he was nine years old. Mythin remembers his mother leaving him behind as the Indian independence movement became part of World War II. An enormous country fights to free itself from the oppressive legacy of colonialism on international science a talented young lady who was raised by her father to appreciate and pursue the arts is also filled with a desire.

Women's problems are frequently encountered with a variety of different types of problems. Women's case of newspaper and other media. Numerous issues that affect women contribute to injustice and violence Women who are marginalized in society are fighting for their freedom, equality, and right to live. "In the end, it is the stories we tell about ourselves that define who we are. We are not just the sum of our experiences, but also the narratives we weave around them" (Roy, 99). Finding a description of the women's fight for liberation and rights in Anuradha Roy's novel *All the Lives We Never Lived* is the aim of this study. The form of Gayathri's character's struggle to find her identity in the culture is the context of the study.

It cannot be denied that marriage in Indian society is a turning point in a woman's life Even though both men and women from childhood when comes to married life society restricts them from having to live for their husbands. Women's goals and mental happiness are not even taken for granted in most families. The quest for identity among women is a multifaceted journey shaped by cultural, societal, and personal influences. This exploration delves into the complexities of how women navigate their self-concept within the constraints and expectations imposed by society. It examines how

traditional roles, evolving gender norms, and the impact of intersectionality such as race, class, and sexuality affect women's self-identity. The study highlights the tension between societal pressures and individual aspirations, illustrating how Gayatri engages in a continuous process of self-definition and self-affirmation. Through personal narratives and theoretical frameworks, this inquiry sheds light on the dynamic and often challenging paths women take to reconcile their identities with external expectations. The findings underscore the importance of empowering women to forge their own identities and advocate for a more inclusive and supportive environment for diverse expressions of womanhood.

"When we recognize that women's labor, women's knowledge, and women's identities are central to sustaining life, we can begin to build a more just and equitable world" (Shiva, 56). Gayatri is awaiting to be freed from traditional views on marriage and social graces and she is waiting for art to be recognized as a serious endeavor rather than merely a pastime a woman can engage in on the weekend to look forward to a time when people of art a time when woman won't need to leave their homes to find a home as did Gayatri as Roy's protagonist Myskin sets out on the same journey that his mother took decades earlier they are all in a state of waiting because there is no other constant.

A woman has her thoughts and her desires. Indian society is still functioning as a society that fails to think about women's desires. Society should jointly try to create a man who will not destroy the identity of the woman even after marriage and who will accompany her in her ambitious journey. Gayatri is presented as a pivotal character whose identity is multifaceted and evolves throughout the narrative. "One day, I'll live far away", she says to me at the end of the story" (Roy, 60). She is the protagonist's mother, whose unconventional life choices and personal rebellion against societal norms deeply impact her family and the story's events. Gayatri's identity is explored through her relationship with her family, her political activism, and her quest for personal freedom, making her a central figure in understanding the novel's themes of self-discovery and the consequences of unfulfilled dreams.

It overturns the patriarchal social ideologies that need to change the view of women only as a link to men. This is the time to make women only as a link to men. "Patriarchy is not merely a system of male dominance but a complex web of social, economic, and cultural forces that shape women's lives and experiences" (Johnson, 145). This is the time to make women understand that even after marriage, they have goals they have the motivation to travel towards their goals, and they have the right to live independently. After marriage, the wife can

live with rights, freedom, and happiness only when the husband becomes a companion who understands her feelings and supports her ambitions without treating her as a possession.

Women who fight for individual freedom are portrayed in this novel, drawing readers' attention to the subject and demonstrating to them the significance of women's struggles for freedom and equal rights particularly for marginalized women. "To be a woman is to have a destiny that is, in a sense, both more and less than that of a man. The woman is defined as the Other, the negative, the deviation, the exception" (Beauvoir, 23). Women's gender equality is what gave rise to the feminist movement which advocates for equal rights, status, and standing for men and women in both the public and private sphere demanding anticipation of equal rights and justice with men, is the central objective of the study. Roy's narrative structure, which shifts between past and present, adds depth to the exploration of self-identity. Through these shifts, the reader gains insight into how the past continuously influences the present and how the lives we envision or imagine affect our self-conception. Myshkin's reflections on his mother's life are interspersed with his own experiences, creating a dialogue between the two that reveals the fluidity and complexity of identity.

The novel also touches on the idea of identity as a social construct. Gayathri's life outside societal norms challenge the conventional expectations placed upon her, highlighting the constraints imposed by society on individual identity. Myshkin's journey is as much about understanding his mother's rebellion as it is about questioning the societal structures that shaped his own identity. Eventually, "*All the Lives We Never Lived*" presents a thought-provoking analysis of the search for one's own identity. The statement posits that our self-perception is dynamic and ever-changing, shaped by our experiences and the lives of those we depart from. The struggle with self-identity, potential, and aspiration is a universal human experience, which is reflected in Myshkin's journey. The work explores the self in a profoundly meaningful way by encouraging readers to reflect on their quests for identity. "Identity is a process of the invention and reinvention of the self, always in a state of becoming, never in a state of being" (Bhabha, 155).

The quest for identity in *All the Lives We Never Lived* is characterized by a complex interplay of personal goals, cultural influences, and historical contexts. Anuradha Roy's nuanced portrayal of her characters' struggles allows us to explore how identity is constructed, challenged, and redefined in the face of a shifting cultural and historical landscape. *All the Lives We Never Lived* depicts the identity quest as a complex interplay between

individual aspirations, cultural influences, and historical settings. A rich field for examining how identity is created, contested, and redefined in the face of shifting cultural and historical contexts is provided by Anuradha Roy's nuanced depiction of her characters' struggles. Therefore the study reveals that identity is not a static construct but a fluid and ongoing negotiation influenced by cultural heritage, societal expectations, and personal experiences. The findings underscore the significance of cultural contexts in shaping identity and the importance of understanding these processes in a globalized world.

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Synthesis of N-(4-chlorophenyl)-1-(substituted phenyl) methanimine and their biological study.

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Abstract:

Some novel imines have been synthesized and tested as antibacterial agents. The results of the in vitro tests showed that most of the synthesized compounds were antimicrobial and antifungal inactive against E coli and Fungus.

Keywords: 4-chlorobenzaldehyde, 2,4-dimethoxybenzaldehyde, 4-isopropylbenzaldehyde, 4-isopropylbenzaldehyde, 3-nitrobenzaldehyde, 4A- molecular sieves, Toluene, ethanol, reflux condensers

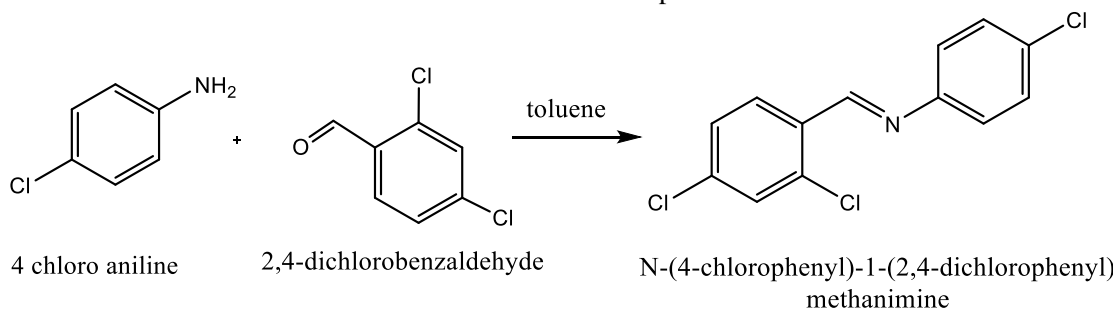
Introduction:

Schiff bases are condensation products of primary amines and carbonyl compounds. Structurally, Schiff base (also known as Imine or azomethine) is an analogue of a ketone or aldehyde in which the carbonyl group (C=O) has been replaced by an imine or azomethine group.

Experimental Section:

Compound A: synthesis of N-(4-chlorophenyl)-1-(2,4-dichlorophenyl) methanimine

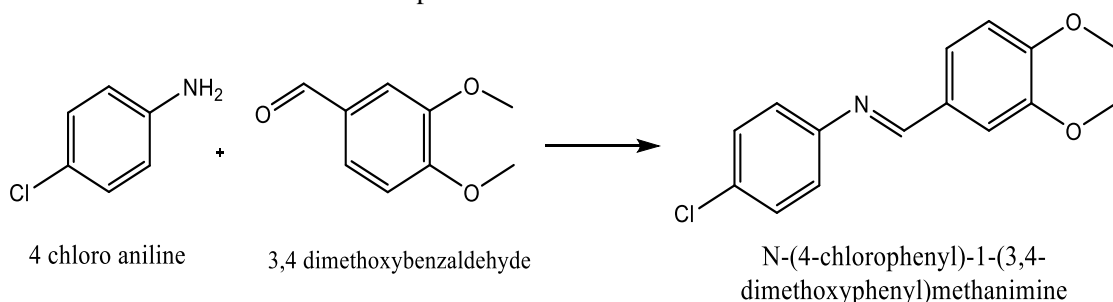
4-chloroaniline in 20 ml toluene was added to a solution 2,4-dichlorobenzaldehyde. The mixture was heated under reflux for 2 hour in the presence of 4A molecular sieves. The mixture was filtered and then solvent was evaporated. The crude products were purified by crystallization from ethanol to give compounds.



Compound B: Synthesis of N-(4-chlorophenyl)-1-(3,4-dimethoxyphenyl)methanimine

4-chloroaniline in 20ml toluene was added to a solution 3,4 dimethoxybenzaldehyde. The mixture was heated under reflux for 2 hour in the presence

of 4A molecular sieves. The mixture was filtered and then solvent was evaporated. The crude products were purified by crystallization from ethanol to give compounds.

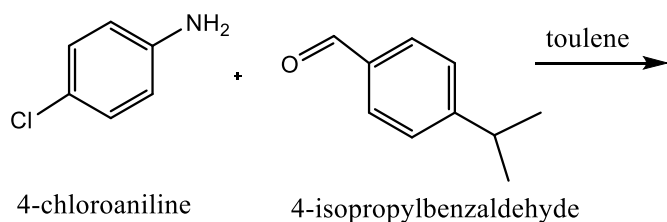


Compound C: Synthesis of (E)-N-(4-chlorophenyl)-1-(4-isopropylphenyl)methanimine

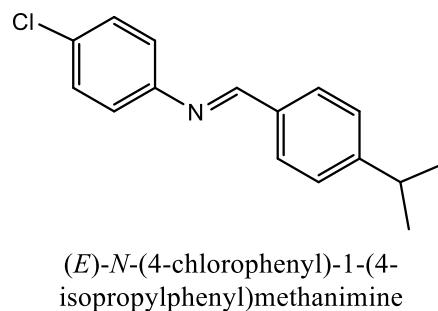
4-chloroaniline in 20ml toluene was added to solution 4-isopropylbenzaldehyde. The mixture was

heated under reflux for 2 hour in the presence of 4A molecular sieves. The mixture was filtered and then solvent was evaporated. The crude products were

purified by crystallization from ethanol to give

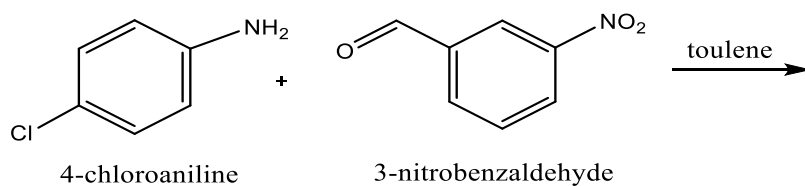


compounds.

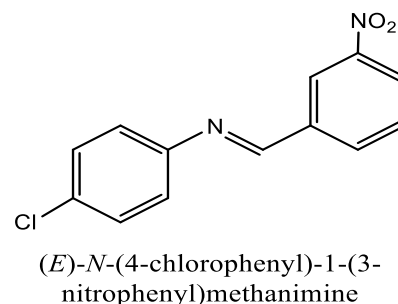


Compound D: Synthesis of (*E*)-*N*-(4-chlorophenyl)-1-(3-nitrophenyl)methanimine

4-chloroaniline in 20 mL toluene was added to a solution 3-nitrobenzaldehyde. The mixture was heated under reflux for 2 hours in the presence of



4A molecular sieves. The mixture was filtered and then solvent was evaporated. The crude products were purified by crystallization from ethanol to give compounds.



Characterization

Various spectral, analytical and biological applications of the above Schiff bases & their complexes were studied. The details are as

under: Some physical properties analytical and spectral data of the substituted imines compounds are summarized in Table 1:

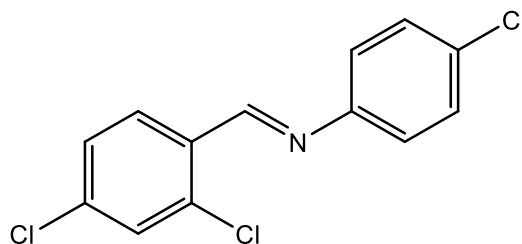
Table 1. Analytical and spectral data of compounds.

Compound No.	Melting point., °C	Yield	IR band, cm ⁻¹
Compound A	144	73 %	1610 v (N=C)
Compound B	131	76%	1640 v (N=C)
Compound C	147	74%	1610 v (N=C)
Compound D	153	71%	1620v (N=C)

The infrared spectral data of the imines are in agreement with the expected range. A band at 1600-1660 cm⁻¹ is due to C=N vibration. The UV

absorption show bands for all compounds at about λ_{max} 600 and 230 nm corresponding to n- π^* with conjugated system compounds

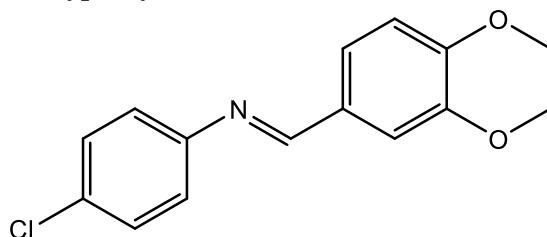
Characterization of compounds:



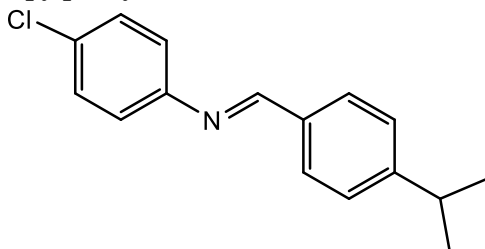
N-(4-chlorophenyl)-1-(2,4-dichlorophenyl)methanimine

¹H NMR (300 MHz DMSO) δ 8.67 (s, 1H), δ 7.89 (d, 1H), δ 7.70 (s, 1H), δ 7.51 (d, 1H), δ 7.40 (d, 1H), δ 7.02 (d, 1H).

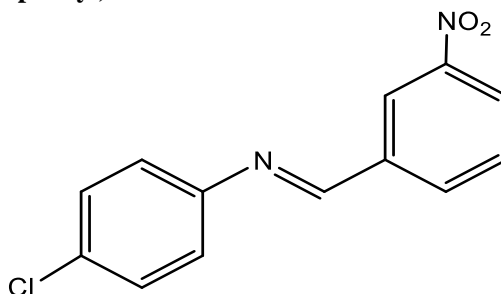
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N-(4-chlorophenyl)-1-(3,4-dimethoxyphenyl)methanimine

¹H NMR (300 MHz DMSO) δ 8.63 (s, 1H), δ 7.53 (d, 1H), δ 7.40 (s, 2H), δ 7.41 (d, 1H), δ 7.02 (s, 2H), δ 7.07 (d, 2H), δ 3.83 (d, 6H).

(E)-N-(4-chlorophenyl)-1-(4-isopropylphenyl)methanimine

¹H NMR (300 MHz DMSO) δ 8.58 (s, 1H), δ 7.82 (d, 2H), δ 7.37 (d, 2H), δ 7.40 (d, 2H), δ 7.02 (d, 2H), δ 5.00 (t, 1H), δ 1.20 (d, 6H).

(E)-N-(4-chlorophenyl)-1-(3-nitrophenyl)methanimine

¹H NMR (300 MHz, DMSO) δ 8.64 (s, 1H), δ 8.50 (s, 1H), δ 8.25 (d, 1H), δ 8.09 (d, 1H), δ 7.63 (t, 1H), δ 7.40 (d, 1H), δ 7.02 (d, 1H).

Table 2. Antimicrobial and Anti fungus activity of compounds

Test Compound	Zone Of Inhibition In Mm	
	GM+VE BACTERIA	FUNGUS
	Staphylococcus aureus	Candida albicans
Compound A	12 mm	13 mm
Compound B	13 mm	15 mm
Compound C	15 mm	27 mm
Compound D	12 mm	14 mm
REFERENCE ANTIBIOTICS	13 mm (OFLOXACIN)	12 mm (CO-TRIMOXAZOLE)

On the basis of Anti- Microbial testing of the given compounds found to be Anti-Microbial & Antifungal activity

Result:

In this work, we report the synthesis of newly synthesis imines in presence of solvent toluene and their application in operationally simple, safe and fast method for the imine synthesis.

The IR spectral data of the imines compound A shows the mainly 1610 v to C=N vibration frequency compound B shows that mainly 1640 to C=N vibration. Compound D contain C=N stretching frequency at 1620cm⁻¹ & 1643 (Aromatic C=C stretch).

We have examined the activity of our imines using the solvent toluene. Based on the literature survey,

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we have carried out reaction of derivatives aromatic aldehyde with derivatives aromatic aniline for 2 hours. The method shows moderate to good yield.

Conclusion:

The condensation of substituted aniline and substituted aldehyde was accomplished using imines was using solvent toluene. Substituted imines show the good efficiency for the condensation reaction with maximum yield in less reaction time. Moreover, the present protocol remains an effective and environmentally friendly alternative method for production of imines.

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A Study on Medical Tourism in Vellore City – An Empirical View

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Abstract:

Medical tourism comprises a phenomenon where over five million patients a year are traveling across international borders to obtain various forms of health care. Most of these patients travel from developed countries to developing countries, seeking highly invasive medical treatments to less invasive and recreational medical procedures. By the year 2012, the medical tourism industry generated over \$100 billion with over 50 countries making it a priority in trade for their country. With active government promotions, India has become one of the leading destinations for medical tourism. The three most important reasons that these medical tourists chose India for their treatments were: 1) the high quality of the doctors and medical facilities in India, 2) the affordable cost of treatments, and 3) the availability of specific treatments that might not have been available in their home countries. Patients also researched the topic thoroughly before they came to India. Knowledge was gained primarily from the Internet, print media, television shows and friends. Overall, the patients had very positive attitudes towards medical tourism. Most of them felt that they could get treatment because of their positive opinion on medical tourism, their ability to get treatment if they desired, and support from their families and loved ones.

Keywords: Medical Tourism, India, Government Promotions.

Introduction:

Medical tourism or health tourism is a term initially refers to the act of patient going to different country for either urgent or medical procedure or patient travelling from one place to another for specialized surgical and other forms of specialized treatment. It is perceived as one of the fastest growing and emerged as the most promising industry in most of the countries including India. Tourism is a relaxation of human being visiting various parts/places of the world after attaining certain needs as per their financial strengths. But, in the case of medical tourism is a need of patients and their capacities in the ground of financial supports to take the medical treatment. The tourism is in the behind of various modes of transports. The selection of medical tourism is also impacted on the time, demand, money, availability, political, natural calamities, national securities and other uncontrollable economic conditions.

India has emerged as one of the leader in promoting medical tourism. The Indian medical tourism industry growing at an amount of 30% patients from Europe, west Asia, U.S and Africa. An estimate of 15000 patients arrived from across the

globe from U.S.A, U.K, Middle East, Africa and SAARC countries for medical treatment in India. Indian corporate hospitals have a large pool of doctors, nurses and supporting staff ensuring individual care. The highly skilled personnel with wide experience and international exposure excel in cardiology, orthopedic surgery, dentistry and dermatology. To name a few Apollo Hospital group, MIOT Hospital –Chennai, Manipal Hospital Group – Bangalore are some of the well known hospital for medical tourism.

Definition Medical Tourism:

Medical tourism, also called health tourism, surgical tourism, or medical travel, international travel for the purpose of receiving medical care. Many patients engage in medical tourism because the procedures they seek can be performed in other countries at relatively low cost and without the delay and inconvenience of being placed on a waiting list. In addition, some patients travel to specific destinations to undergo procedures that are not available in their home country.

Growth in the popularity of medical tourism has captured the attention of policy-makers, researchers and the media. Examples of such

procedures include stem cell transplants and gender-reassignment operations. There is as such no agreed definition. Some countries count foreign patients' visits to hospitals whereas others count the entry of individual patients into the country.

Literature Review:

1. Medical tourism is a burgeoning industry. According to Hopkins et al. (2010), medical tourism is "a rapidly emerging manifestation of global commercialization of health care" (p. 185).
2. Gupta (2008) writes that "medical tourism is a multi-billion dollar industry promoted by governments and the medical and tourism industries" (p. 4).
3. Although some forms of medical tourism may be centuries old, medical tourism in the twenty-first century is different from any previous characterization. This aim of this chapter is to provide a range of perspectives on historical and contemporary medical tourism as a way of establishing this study's conceptual framework.
4. Morphosis of Medical Tourism: Globally and in India Medical tourism has become a multi-billion dollar industry. According to McKinsey and Company, medical tourism was a \$60 billion market in 2006 and they predicted that it could be a \$100 billion industry by 2012 (Hansen, 2008).

Objective of the study:

1. To study the growth and basic concepts of medical tourism in general.
2. To analyze the growth of medical tourism in Vellore.

Research Methodology:

This research is a descriptive study. The necessary secondary data was collected from various websites including those of Government of India, magazines, journals, other publications, etc.

Origin of Medical Tourism :

Medical tourism as concept is thousands of years old. Greek pilgrims travelled from Mediterranean to the small territory like Saronic Gulf called Epidauriain (Greece) in ancient times, as this territory was sanctuary of the healing god Asklepios. Greece later became the travel destination for Medical Tourism. During the Roman period British patients took the water at the time of bath, and these practices prevailed for long. In the beginning of 18th century, Europeans travelled to spas from Germany to the Nile. In early stage of nineteenth century people from Europe visited neighboring countries in order to improve their health as there were no restrictions on travel. Because of the availability of professional and often specialized medical care patients started travelling to tourist destinations like the Swiss lakes, the Alps for tuberculosis sanatoriums. The new era ushered the development of sophisticated surgeries, newer

techniques for dental implants and radiotherapy for treating cancers.³

Medical Tourism & other Areas:

The concept of medical tourism has interlinked with marketing, finance, insurance, transport, corporate, human resources and other electronics communication and technology. The wellness tourism is the emerging marketing environments booming in an exuberant level due to corporate investors are concentrating medication industries. It results, franchise of corporate hospitals promulgated new ventures on different facilities (transport, residence, physicians, guides and assistances, medical technicians, labs and diagnosis centre and the like) linked with medication industries in certain packages as per the needs of the customers/patients.

Support of Medical Tourism:

There are several supporting systems have been done for the betterment of medical tourism such as medical educational institutes conducting seminar, workshop and symposia; government initiations on publicity and promotional activities for the medical tourism. Many of the international brands are promoting the medical tourism (Incredible India, and Wellness or Medical Tourism Service Providers).

Allopathy medicine:

Christian medical college & hospital (CMC) one of the largest hospitals in India is located in the heart of Vellore. It attracts a floating population of at least 5000 person a day from across India and foreign countries. The hospital was founded in the early part of 20th century by an American medical missionary Dr. Ida Scudder. It also occupies a prominent place among the medical institution in India. The CMC hospital has a functioning quality management programmer and Is one of the first Asian hospital to have been awarded the ISO certificate. The mental health centre and rehabilitation centre in this college campus, the base hospital at CHAD and RUSHA and the Ida scudder ward and eye hospital in the Schell campus. The services range from internal medicine and child health to neurology and neurosurgery, organ transplantation, advanced cardiology and other complicated surgical treatment are done here. Apart from the quality treatment it has good tourism places and there are a number of luxury hotels like Aavana inn, hotel palm tree, hotel darling residency etc.

Another famous hospital for allopathic treatment in Vellore district is the Apollo KH hospital; Ranipet was established on the 14th September, 2003. It is an association between Apollo hospital enterprise ltd and the K.H group. The hospital campus is spread across 10 acres of land. The 100 bed multi specialty hospital was

founded with the objective of rural upliftment and development of community health.

Siddha Medicine:

Walajapet which is famous for siddha medicine is a locality and part of Vellore city in the state of Tamil Nadu. It is strategically located on the palar river on the route between Chennai and Bangalore. By bus this locality can be reached in about 30 minutes from Vellore city center and in about 2.5 hours from Chennai. It is well connected both by road and railways. Their system is capable for treating all types of disease other than emergency cases; in general it is effective in treating any types of skin problems. It is effective of paralysis and effectively heals wound, cuts and burns. Numbers of private dispensaries are running by the expert practitioners in this field around walajapet. Prasanthi ayur nilayam, murthy ayurvedic centre, Sri Amman Ayurvedic center, orient health care, ruby herbals and san clinic are a few Ayurvedic hospitals in Vellore.

Homeopathic clinics in Vellore:

Aarogya Homeopathic clinic, Abirami Homeo clinic, Kannan Homeopathy clinic, Sri Sai Homeopathy clinic and Maheshwari Homeo clinic are some homeopathic clinics in Vellore.

CMC, Vellore: A preferred hospital in Vellore

CMC Vellore is preferred over private hospitals in Chennai due to low cost treatment. Rates for bed and nursing in general ward is INR 400-620. Today daily charge comes to around INR 920 if the professional and therapy fees also added. Total daily charges for semi private rooms is INR 2,225, for single room is 2,010 while for deluxe room it is 2,575, bed rates in intensive care units(ICU) is INR 2,575.

The patients have to pay an advance at the time of admission. In case you have taken health insurance the money will be reimbursed by the insurance company. For this, first you have to pay the entire hospital bill and get a 'reimbursement certificate' from the hospital. This reimbursement certificate is then sent to the insurance company.

Treatment in CMC, Vellore:

Patients come to CMC, Vellore for dental treatment, eye operations, chemotherapy, dialysis, bone marrow transplants and open heart surgeries etc. it is a 1700 bedded Multicomplex hospital. In U.K, a bone marrow transplant will cost USD 2,50,000 but in India, it will come to USD 69,200 Liver transplant in U.K takes USD 3,00,000 But in India it will come to USD 69,350. Heart surgery comes to USD 30,000 in U.K and USD 8,700 in India. Orthopedic Surgery will cost you USD 20,000 but in India, it will cost you USD 6,300. This is why India has become a preferred destination for medical tourism.

Influx of patients in India and foreign countries in Vellore

1. No doubt, patients from Bhutan, Sikkim, Nepal, and also from Bihar, Rajasthan, and Jharkhand throng to Vellore for best treatment there is no compromise on quality of treatment. The government too collaborates with CMC, Vellore for its health care schemes.
2. The 130 bed community health and development (CHAD) hospital provides health care to tribal, rural and semi urban localities around Bagayam in Vellore. A number of community development project and medical camps are organized.
3. Low cost effective care unit (LCECU) serves the medical needs of the urban poor, rural unit for health and social affairs (RUHSA) is a model for socio economic development with promotion of health as a means to development.
4. Medical tourism in Vellore is the result of trust, faith, love, honesty of one medical institution where patient interest is always the priority the common that binds all doctors, nurses and paramedical staffs here is 'healing'

Medical tourism industry overview:

The Indian health care market is RS 15 billion and growing an over 30% every year. Indian private hospitals are increasingly finding a mention in the itineraries of foreigners, with the trend of medical tourism catching up in the country. If industry estimates are to be believed, size of the medical tourism industry stands at RS. 1,200 – RS. 1,500 crore (RS. 12 – 15 billion) a recent CII – McKinney study on Indian healthcare says medical tourism alone can contribute RS. 5,000 –RS. 10,000 crore (RS.50-100 Billion) additional revenue for tertiary hospitals by 2012, and will account for 3-5% of the total healthcare delivery market This is huge, untapped market, not just for the therapeutic medical tourism like Ayurveda, but also for curative treatment. India can lead the world in medical and health tourism since we have a tremendous advantage with a large pool of skilled manpower and technological edge.

Why india?

The countries where medical tourism is being actively promoted include Greece, south Africa, India, Malaysia, philippines, and Singapore. India is recent entrant into medical tourism. The Indian government predicts that India's \$17 – billion a year health care industry could grow 13 per cent in each of the next six years. Boosted by medical tourism which industry watchers say is growing at 30% annually. Price advantage is a major selling point. The slogan thus "First world treatment" at third world price" the cost differential across the board is huge. Only a tenth and sometimes even a sixteenth of the cost in the west India has a lot of hospitals offering world class treatment in nearly

every medical sector for long promoted for this cultural and scenic beauty. India is now being put up on international map has a heaven for those seeking quality and affordable healthcare. Analyst say that has money as 1,50,000 medical tourist come to India in 2014. As Indian corporate hospitals are on par if not better than the best in Thailand, Singapore, etc. here is scope of improvement and the country is becoming a preferred medical destination. In addition to the increasingly top class medical care, a big draw for foreign patients is also the very minimal or hardly any waitlist as is common in European or American hospitals.

About Chennai:

Chennai is the capital of Tamil Nadu- a beautiful state in south India- is one of the fast growing metropolitan cities of India. Chennai has been the most visiting city in India by foreign tourist (since 2008). Overtaking new Delhi and Mumbai with visitors to heritage cities in Kancheepuram and Mahabalipuram and medical tourist making at the largest numbers. In 2011, Chennai was ranked 41st in global top 100 cities destination ranking, 31,74,500 tourist a fourteen percent increase from 2010, this is from 6,50,000 tourist in 2007, when Chennai was the most visiting city in India by foreigners ranked after Delhi and Mumbai. Tourist from USA, Sri Lanka, Malaysia and Singapore had visited the city in 2017. The city has golden beaches, inviting monuments, holy places and an obvious Tamil culture. The city is the spice of south India that has been holding the secrets of rich flavor from time immemorial. The city is now becoming India's health capital by attracting 45% of health tourist's from abroad. It can be stated that with large number of multi- and super-specialty.

Facilitation by government;

The government of India has recognized the economic potential of medical tourism. It has facilitated travel by introducing a special visa category known as 'medical visa' for patients as well as introduced tax incentives for hospitals.

✓ **Ease of travel and communication**

- Travel to Chennai (India) has become easier and much faster due to introduction of private airlines. Access to internet in Chennai is considered to be one of the cheapest in the world and communication facilities are well established. Travel agencies have a great online presence and can offer you package deals that include travel cost boarding as well as treatment costs.

✓ **Easy availability of medicine and drugs**

- Certified drugs and medicines are easily available in Chennai, at comparatively lesser prices.

✓ **Modern & traditional**

- Modern medical aid as well as traditional therapy, such as Ayurveda, yoga, naturopathy

etc. is easily available at different locations in Chennai.

✓ **Tourism potential**

- People, who come for relatively simple, but important procedures, can consider packing in some travel too, with their doctor's permission. This is an added advantage. Every part of the country is rich in history and diverse in geography.

Conclusion :

Indian, NRIs and tourist from around the world are beginning to realize the potential of modern and traditional Indian medicine followed in Vellore district. The hospitals in and around Vellore also realized of this niche market and have begun to tailor their services for outside patient. But it also required the co operation of the state government to make the effort to promote the medical tourism in Vellore district. With globalization, medical tourism is becoming a new and emerging international business that is gradually increasing in importance. Along with this development comes many entrepreneurial opportunities to capitalize on the growth of this industry. Much of the travel and services in the tourism infrastructure supports this industry and so promotes the growth.

The cost-effective and quality healthcare India has to offer to its patients, there is great potential for attracting patients from other countries. With the cost of medical treatment in the developed western world remaining high, the Indian medical tourism sector has an edge because of cost-effective medical care. Studies have shown that healthcare in India saves about 65-80 per cent money compared to similar service in the United States. India's system of traditional medicine are a combination of Ayurveda, Siddha Yoga and meditation, it aims at curing ills and helping the patient to lead a healthy, balanced lifestyle. There are a number of health farms and nature spas in India that attract a number of foreigners looking for help in bringing about lifestyle changes and detoxification of the body. The Ministry of Tourism has recognized the scope of medical tourism and has initiated MDA (Market Development Assistance). Scheme to key players in the medical tourism space and road shows are organized at regular intervals to promote India as a medical tourism destination. "Make in India" initiative gives enough opportunities for Medical tourism in terms of identified sectors viz. Tourism & Hospitality and Wellness.

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A Study of Different Data Mining Techniques used for Rainfall Prediction

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Abstract:

Agriculture is the backbone of Indian economy, in India irrigation facility is still not so good and most of agriculture sector depends upon the rain. So the Indian economy depends upon the agriculture Sector. Early prediction of rainfall is necessary for the better economic growth of our country so rainfall plays an important role in agriculture sector. Also the early prediction of rainfall is necessary for the different areas as like ongoing project, Transportation, developing the different infrastructure in our country, scientific research etc. Rainfall prediction become one of the most scientifically and technologically challenging task in the world. Unlike the use of different traditional methods, the modern Weather forecasting consisting of the combination of knowledge of trends and patterns with different weather forecasting models. There are different rainfall forecast methods are available such as the Empirical method and dynamic method. The rainfall analysis based on historical data by using empirical methods and its relationship is different for atmospheric and oceanic variables. The most of empirical approaches used for climate prediction are regression, artificial neural network, and Sensor-Based, Numerical weather prediction model.

Keyword: Data Mining, Rainfall prediction, Regression. WEKA Tools.

Introduction

Rainfall prediction is very important because heavy and irregular rainfall can have many impacts like destruction of crops and farms, damage of property so a better prediction model is essential for agricultural farms because the early warning can be minimize risks to life and property. The Rainfall prediction mainly helps farmers because they utilized water resources efficiently. Also Rainfall prediction is a challenging task and the results should be accurate. For predicting rainfall there is different hardware devices are used by the weather conditions like pressure, temperature, humidity. These traditional methods cannot work in an efficient way so by using data mining techniques we can produce accurate results. We can use the historical data for analysis of rainfall and the predict the rainfall for future seasons. We can apply different data mining techniques like classification, regression etc. Different techniques produce different result so it is important to choose the right algorithm and model according to the requirements.

Background Study

Data mining [1] is a process which finds useful patterns from large amount of data. Data mining can be also defined as the process of extracting implicit, previously unknown and useful information and knowledge from large quantities of noisy, ambiguous, random, incomplete data for

practical application. There is a new technology with great potential to help different companies focus on the most important information in their databases. To discover and predict knowledge uses machine learning, statistical and visualization technique which is understandable to the user. Prediction is the most important technique of data mining which is used for to develop a model that can classify the data and discover relationship between independent and dependent data.

Data mining is a technology of exploring data to discover unexplored patterns. Other the hand the theoretical, and technological developments, also contributed to our knowledge of the atmospheric weather conditions. So weather prediction is also important goal of atmospheric research. Hence change in the weather condition is risky for human society [3]. It also affects on the human society in all the possible ways. Weather prediction is usually done using the data collected by remote sensing satellites. Different weather parameters like wind speed, temperature, rainfall, and cloud conditions are projected using image taken by meteorological satellites to access future trends. Prediction model can be developed statistically using different data mining techniques as like regression, clustering, decision tree, artificial neural network etc. Weather prediction is a form of data mining which is

occupied with finding hidden patterns inside largely available meteorological data.

Data mining techniques

There are various data mining techniques such as: Classification, Prediction, Clustering, Association, Outlier Detection and Regression. The prediction discovers relationship between dependent

and independent variables. There are different algorithms of classification and prediction. Some of them are Classification Regression Decision Tree, Bayesian, Artificial Neural Networks and Support Vector Machines (SVM). There are several criteria for evaluating the prediction performance of algorithm [2].

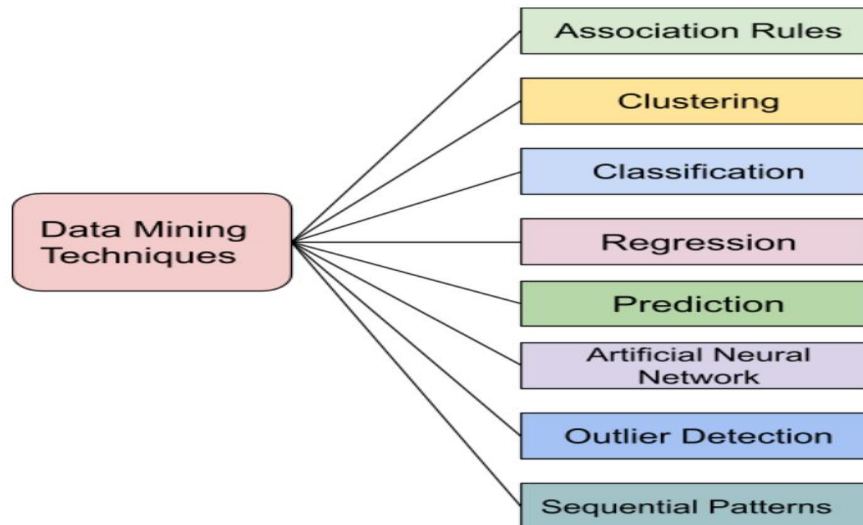


Fig: - Different data mining Techniques

Different Methods of Rainfall Prediction

Regression

Regression is the type of supervised machine learning technique that is used to predict any continuous-valued attribute. Regression is used in any business organization to analyze the predictor variable and target variable relationships. It is a most important tool to analyze the data that can be used for financial forecasting and time series modeling.

There are two types of regression, linear and logistic regressions. Also the other different types of regression can be performed depending on their performance and individual data set.

Regression can be predict all type of dependent data sets, which are expressed in the expression of independent variables, and the trend is available for a finite number of time. Regression provides a good path to predict variables, but there are different restrictions and assumptions like the independence variables, inherent normal distributions of the variables.

For example, suppose considers two variables, A and B, and their joint distribution is a bivariate distribution, these two variables might be independent, but they are also correlated. The marginal distributions A and B needed to be derived and use. Data needs to be studied carefully before applying Regression analysis, and perform certain preliminary tests to ensure the Regression is applicable.

Following are different types of Regression

- 1) Linear Regression
- 2) Logistic Regression

3) Lasso Regression

4) Polynomial Regression

Linear Regression

It is the type of regression that forms a relationship between the target variable and one or more independent variables for the utilizing a straight line.

Polynomial Regression

The power of the independent variable is more than one in the regression equation; it is called as polynomial equation.

Logistic Regression.

The dependent variable is binary in nature, i.e., 0 and 1, true or false, success or failure, it is logistic regression technique. As like linear regression, it does not need any independent and dependent variables to have a linear relationship.

Lasso Regression (Least Absolute Shrinkage and Selection Operator)

It is a linear type of regression. In Lasso regression, all the data points are compressed towards a central point, also known as the mean. The process of lasso regression is fitted for sparse and simple models with fewer parameters than other regression. This type of regression is well fitted for models that suffer from multiple regressions.

Multiple Linear Regressions-

The statistical measure of the regression that attempts to determine the strength of the relationship between dependent variable which is denoted by Y and a series of other changing variables known as independent variables. More than two predictor variables are used in regression model called Multiple Regression Model.

Data Collection and Preprocessing

Feature Extraction

The Feature Extraction technique is used for selecting a subset of relevant features for building strong learning models. Many features like Temperature, Evaporation, Wind Speed, Terrain features, Height from sea level, humidity, and perceptible water affects the rainfall. The following are the features selected.

Relative Humidity

The term Relative humidity is used to describe the amount of water vapor in a mixture of air and water vapor. It is defined as the ratio of the partial pressure of water vapor in the air-water mixture to the soaked vapor pressure of water at the prescribed temperature. The relative humidity of air depends on not only the temperature but also on the pressure of the system. Relative humidity is used instead of absolute humidity in situations where the rate of water evaporation is important, as it takes into account the variation in soaked vapor pressure.

Pressure

Air pressure is different over a time and from place to place and these temporal differences are typically caused by the temperature of the air. Cool air is heavier than warm air. Warm air is less lighter than cool air and will therefore rise above it. Areas of high pressure can be caused when cool air is dropping and pressing on the ground. In this situation the weather is typically dry and clear. In

contrast, when warm air increases, it causes a region of low pressure. With low pressure, the weather is often saturate and cloudy.

Temperature

The temperature is measured an atmospheric temperature at different levels of the Earth's atmosphere. It is governed by many factors, including incoming solar radiation, altitude and humidity. Air temperature is the intensity aspect of sun's energy that impresses the earth's surface. Because of the amount of energy from the sun reaching towards the earth differ from day to day, from latitude to latitude and from season to season, temperatures also differ. The earth receives a constant flow of radiant short-wave energy from the sun. The earth also radiates the long-wave energy to space. During the day, the flow of short-wave radiation absorbed oversteps, long -wave energy emitted, and the surface temperature increases.

Methodology

Rainfall prediction has become one of the most challenging tasks in the world. There is a different rainfall forecast methods are available. For that purpose different data mining techniques are used such as clustering, classification and Regression techniques for rainfall prediction. Prediction can be done by considering the data training and testing them than accordingly building the model shown below

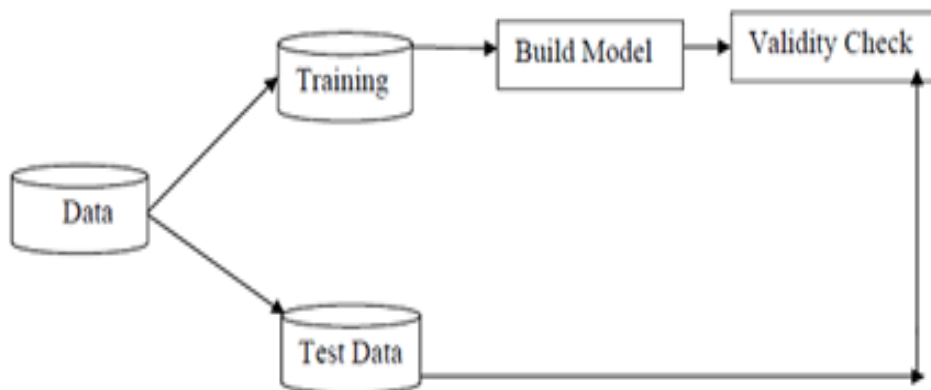


Figure: Overview of the forecasting model

There are various data mining techniques such as: Classification, Prediction, Clustering, Association, Outlier Detection and Regression. The prediction discovers relationship between independent variables and independent variables. There are different algorithms of classification and prediction, some of them is Classification, Regression, Decision Tree, Artificial Neural Networks, Support Vector Machines (SVM), and Bayesian. There are different criteria for evaluating the prediction performance of algorithm.

The methodology used will follow the following steps that are as follows.

1. Data Collection
2. Data Preprocessing

3. Data Transformation
4. Applying Classification
5. Algorithms.
6. Predicting the data

The experiment carried out will be on the data set taken from the meteorological department and after collecting those data the data mining Ensemble technique will be applied to extract the pattern and then by the help of classifier those pattern are trained on the classification model and then with the help of ensemble model it will be tested so that the accurate forecast in advance can be done to avoid the various problems and disaster that can be happened.

Proposed Methodology

In the proposed work the time series data set is analyzed to forecast rain precisely than the existing models. The work will be carried out in two different faces that are firstly collecting the data from weather forecast department and then applying the data mining ensemble techniques.

As data mining is the process that attempts to discover patterns in large data sets. It uses methods at the intersection of machine learning, statistics, artificial intelligence and database systems. The overall goal of the data mining process will be extract information from a data set and transform it into an understandable structure for further use so data mining is used for extracting or mining knowledge from large amount of data. The goal of data mining is to extract information and convert them into useful knowledge for future information. Data-mining is a process that can be applied to

different type of data ranging from weather forecasting, product design, and electric load prediction. Meteorological data mining is a form of Data mining concerned with finding hidden patterns inside largely available meteorological data, so that the information retrieved can be converted into usable information. Useful information can play important role in understanding the climate changeability and rainfall prediction. This understanding can be used to support many important sectors that are affected by climate like agriculture, water resources, forestry and tourism. Particularly, it is useful to predict the natural disaster like flood and drought.

Thus many data mining algorithms are used to predict the rainfall. The rainfall prediction methods are as follows.

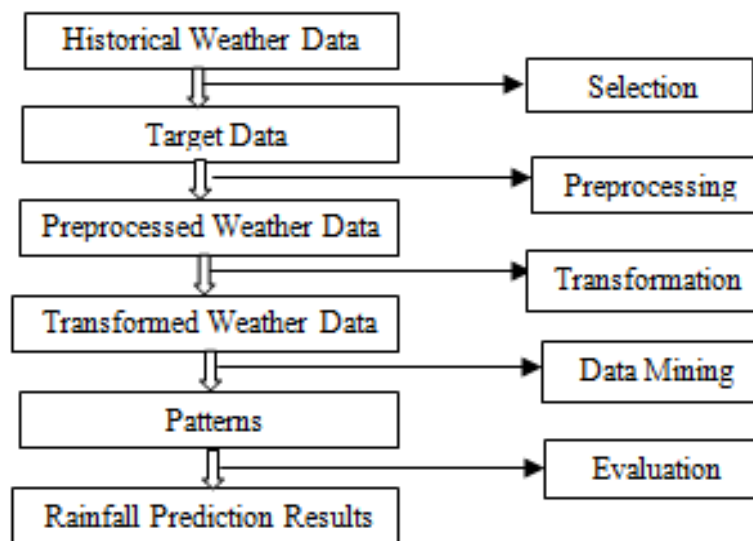


Figure: Overview of the forecasting model

The work proposed is based on Ensemble Prediction for prediction of the annual rainfall record of Maharashtra region by taking into account the data of all districts. This Ensemble computing approach is used to increase accuracy on your dataset and is to combine the predictions of multiple different models together. After the result achieved then finally by the help of **WEKA tools** the result will be compared and will be trained to give much better and accurate result

Conclusion:

The conclusion that can be made after data collected should be analyzed and trained in a proper manner so that it can be tested by ensemble algorithm more efficiently in order to get the predicted result very nearness to a measured value or the standard set. The attempt of the work will be to analyze the time series data set in order to forecast rain precisely than the existing model. The developed method will be targeted to be so simple that it can tested and validated without any complexity also in order to increase the accuracy of

the model proposed by combining the model predictions with Ensemble Predictions so that it will helpful in the agriculture sector for increasing the productivity.

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Environmental Politics and Sustainable Development from a Human Rights Perspective

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Abstract:

This paper explores the intricate relationship between environmental politics, sustainable development, and human rights. It argues that addressing environmental issues through the lens of human rights not only enhances the effectiveness of environmental policies but also ensures that these policies uphold the dignity and well-being of all individuals. By examining key issues such as the right to a healthy environment, the impact of environmental degradation on marginalized communities, and the integration of human rights into sustainable development strategies, this paper aims to provide a comprehensive understanding of how human rights considerations can contribute to more equitable and effective environmental policies.

Introduction:

The concepts of 'human rights', 'environment' and 'sustainable development' have been at the center of global debate for more than half a century. The loss of life, financial loss, and natural loss after the two world wars has undoubtedly raised the question of the survival of the present and future generations. Especially after the Second World War, especially during the Cold War period, new dimensions of development in the field of science and technology started to be established, thus causing enormous damage to nature. The destruction of natural resources has threatened the existence of all the creatures on earth. The way in which natural resources are being exploited day by day has increased the concern of future generations. The intersection of environmental politics and human rights has gained significant attention in recent years as the urgency of environmental crises such as climate change, biodiversity loss, and pollution has become increasingly evident. Sustainable development, as articulated by the United Nations' Brundtland Commission, emphasizes meeting the needs of the present without compromising the ability of future generations to meet their own needs. This concept inherently incorporates environmental protection and socio-economic equity. However, integrating human rights into sustainable development frameworks is essential for addressing the disparities that often exacerbate environmental issues. This paper aims to explore how human rights can inform and enhance environmental politics and sustainable development. By investigating the relationships between these domains, the study seeks to highlight the importance of considering

human rights in environmental policy-making and sustainable development strategies.

Environmental Politics and Human Rights:

Policy Integration:

Environmental programs frequently neglect the mortal rights counteraccusations of environmental declination. For case, air and water pollution can disproportionately affect underprivileged communities, undermining their right to health and a decent standard of living. Incorporating mortal rights into environmental politics requires legal fabrics and participation and responsibility transnational agreements similar as the Paris Agreement and the Sustainable Development Goals(SDGs) decreasingly emphasize the need for mortal rights considerations. still, effective perpetration is critical. icing that affected communities can share in decision- making processes and hold governments responsible is essential for integrating mortal rights into environmental programs. mortal rights principles give a normative frame for assessing and addressing environmental issues. crucial rights include, the right to a healthy terrain and rights of marginalized communities This arising right is decreasingly honored as essential for icing other mortal rights, similar as the right to health and the right to life. Indigenous peoples, original communities, and other marginalized groups frequently bear the mass of environmental declination, pressing the need for their rights to be defended in environmental programs. The interaction between Earth's terrain and ecology and mortal life is inextricable. In fact, it would not be an magnification to say that since the actuality of mortal life in ecology depends on the rational

balance of the terrain, the natural and indigenous right of every person to live a nutritional, healthy and happy life is secured from it. The mortal rights that moment are seen in the constructive form each over the world can be seen to have their origins in ancient mortal history. But it's because the ultramodern period is a more grueling time for mortal rights that these rights are set up to have acquired a more comprehensive, formative and universal form. Gradationally, these mortal rights were developed more and more and they started to be included in the constitutions of the countries and at the global position. The Universal Declaration of Human Rights is considered important in this sequence. The Universal Declaration of Human Rights(UDHR) is a protestation espoused by the United Nations General Assembly on December 10, 1948. The Declaration was originally espoused worldwide indeed though there was no list law/regulation. Since 1948, this protestation has been making its mark on the constitutions of colorful countries around the world as well as on colorful global, public, indigenous laws and covenants. All the vittles of the present protestation are essential for the life of this existent. It substantially states that according to Composition – 1, all mortal persons are born free and have equal quality and equal rights. They're endowed with the power of study and common sense and should bear with each other in a spirit of brotherhood. According to Composition – 2, everyone is entitled to all the rights and freedoms set forth in this protestation without distinction of race, colour, coitus, language, religion, political or other opinion, public or social origin, property, birth or other status. There should be no demarcation. Further, there shall be no demarcation on the grounds of the political, jurisdictional or transnational status of the country or home of which a person is a occupant, whether that country or home is independent, non-self-governing or under any form of sovereignty. According to Composition – 3, everyone has the right to life, liberty, security(<https://mr.wikipedia.org>). The Constitution of India provides six abecedarian rights to citizens. They include – Composition – 14 to 18 Right to Equality, Composition – 19 to 22 Right to Liberty, Composition – 23 to 24 Right against Exploitation, Composition – 25 to 28 Right to Freedom of Religion, Composition – 29 to 30 Cultural and Educational Right, Composition – 32 Right to indigenous remedy. Under the present provision, the existent has got the right to live a safe and healthy life. But in the present time, due to the ongoing declination of the terrain, the physical and internal health of the existent is in peril, and the question of the actuality of mortal life has arisen. In such a case, it's necessary to realize that the honest perpetration of the vittles of the below mortal

rights can only be achieved through the protection and conservation of the terrain through sustainable development and for this, individualities, associations and governments must contend. Indeed though sweats are being made in this direction at the public and global position for the once many times, achieving the thing of sustainable development is still a dream for the mortal race.

Sustainable Development and Human Rights

Sustainable development encompasses economic, social, and environmental dimensions. Integrating human rights into sustainable development involves ensuring that policies not only address environmental concerns but also respect and promote fundamental human rights.

Policy and Practice

Sustainable development initiatives that do not consider human rights can lead to inequitable outcomes. For example, Economic Development Projects and Access to Resources: Large-scale development projects, such as dams or mining operations, can displace communities and disrupt their lives. Human rights-based approaches to these projects emphasize prior consent and fair compensation. Ensuring equitable access to resources such as clean water and energy is a fundamental aspect of both human rights and sustainable development.

Today the development process has engulfed the whole world. Considering the overall development, the highest development has been in the agriculture and industrial sector. It has also increased the capacity to accommodate the maximum number of people based on available natural resources; But with all this economic development, there are dangerous changes in the climate, water cycle, biodiversity and ecosystems. Climate and water cycle are deteriorating, biodiversity and ecosystems are deteriorating and this is a very serious matter. All these are being sacrificed for development. That begs the question, should development continue? If economic development continues, nature is rapidly changing; If development is stopped, how to meet the burden of such a huge population? Will the earth be able to bear the burden of this growing population in the future? The answer to this question is sustainable development. The progress of the country cannot be stopped. Similarly, we cannot afford to let the environment deteriorate. The golden mean of both of these is development without environmental degradation. Deterioration was first discussed at the Stockholm Environmental Conference in 1972. In it the concept of sustainability or sustainable development is taken as a bridge to bridge the gap between environment and development(John A. Kazi F. & Peter P.: 2008:22). The concept of sustainable development was presented in the year 1987 by the "World Commission on Environment and Development" in

the report "Our Common Future". The Brundtland Report is also known as "Our Common Future"(Strange T. & Bayley A.:2008:24) In this report, the basic idea is to think about the future and develop. Gro Harlem Brundtland, Chairman of the Commission and Prime Minister of Norway, while defining sustainable development, said that - "meeting the needs of the present without compromising the needs of future generations"(Sangale S, Tabake N.:2011:100). to continue uninterrupted for many years. Sustainable development means to continue the current development but while it is going on, it should be developed with some care and vigilance for the environment so that the next generation does not have to suffer its effects on the environment. Especially, the Rio Summit of 1992 and many international conferences after that are related to the environment and sustainable development (Basu Rumki. :2017:386). Recently, many programs of the United Nations are emphasizing on 'human development' and it is being pointed out that the direction of environmental politics is trying to bring it to the path of sustainable development. .

Until two decades ago, only economic factors were taken into account while evaluating human development. Accordingly, the countries are economically prosperous and the countries where the people are rich are called developed countries. And other countries where there was poverty and lack of economic development were called progressive countries. North America as well as most countries in Europe are economically more advanced today, having been industrialized long ago. These countries strengthened their economy by exploring the natural resources of their country and using the natural resources of the developing nations. Thus, during the development process, the rich countries became economically more capable and prosperous while the poor countries became poorer. In the process, rich countries fail to realize that their standard of living can be affected by the environment in developing countries. Therefore, in recent times, developed countries have been politicizing how developing countries are responsible for environmental degradation. But it is true that due to this development process in developed and developing countries, the effort to improve the standard of living and living conditions of people cannot be done by sacrificing the environment.

International organizations play a critical role in promoting the integration of human rights into sustainable development. For instance, the UN's SDGs explicitly mention the need for inclusive and equitable development, while the Human Rights Council and other bodies monitor and advocate for human rights within environmental policies.

Conclusion

Thus, from the above objective analysis, the interrelationship between sustainable development and environmental protection from the perspective of human rights is clear. If we want to protect and preserve life on Earth, we need to adopt an environmentalist approach based on the principle of opposition to economic materialism and the chauvinism that flourishes from it. Environmentalists have started green movements all over the world. Such green movements include organic farming, vegetarianism, alternative technologies, sustainable development and pressure groups, interest groups and political parties in some countries. For sustainable development, it is necessary for the country, society and individual to do environmental politics from the perspective of human rights and for this it is necessary to plan and implement a concrete action program. Such action programs mainly include - population growth control, poverty alleviation, conservation of natural resources, recycling of waste materials, efforts to reduce pollution, compliance with laws, research work, environmental awareness, efforts at international level, preservation of values, etc. Therefore, it is undeniable that sustainable development can only be achieved through the protection of the environment and the environment and ultimately human rights can be protected and promoted only through sustainable development. Sustainable development is the need of life. For that the requirement is to develop and enforce legal standards that integrate human rights into environmental policies. To ensure that marginalized communities are actively involved in environmental decision-making processes. It is essential to increase awareness about the connections between human rights and environmental sustainability among policymakers, stakeholders, and the public. By integrating human rights considerations into environmental politics and sustainable development strategies, we can achieve a more sustainable and equitable future for all.

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Isolation and Extraction of Natural Cellulose Fibers from *Sanseveria trifasciata* Plant in local area

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Abstract:

There are many fibre yielding plants in India, which has wide potential for use in diversified fields, but they remain unexplored so far. Application of natural fibres is superior to synthetics because they can be achieved cheaply and they have an environmental advantage. The less explored natural fibres belong to leaf fibres. Hence in this work an attempt has been made to extract fibres from *Sanseveria trifasciata* leaves and it was examined for its structural aspects for textile applications. The *Sanseveria trifasciata* leaf is found abundantly in our country. *S. trifasciata* fibre are the essential alternative in the ever-expanding horizon of textile fibre. These fibres are not toxic in besides the disposal of fibre wastes is easier as they are necessarily biodegradable. The extraction of fibres involves the retting process which is followed by the decortication process. From the above various methods, a suitable extraction method is selected based on the parts of the plant from which the fibre is to be extracted.

Keywords: *Sanseveria trifasciata* fibre, extraction process, chemical properties, physical properties, mechanical properties.

Introduction:

In India there are many fibre producing plants, which has a wide range of diversified fields. Large quantity of *Sanseveria trifasciata* leaf is found in our country. *Sanseveria trifasciata* belongs to Agavaceae. *Sanseveria trifasciata* plant is an evergreen herbaceous perennial plant. Its stiff leaves grow vertically from basal rosette. Mature leaves are dark green cross-banded and usually range between 70-90cm in length and 5-6cm in width (Hamdir 2022). It is commonly called the snake plant because of the shape of its leaves & their sharpness. The plant is used as an ornamental purpose, it easily grows in any surrounding and multiplies (Abral, H. and E. Kenedy. 2015). They can grow in any condition of temperature like in full sun or light shade but thrive well in a moist, fertile soil with a high organic matter content with care. *Sanseveria* is known variously as bow-strip hemp, snake plant, zebra lily, mother-in-law's tongue, cow tongue, leopard lily, devil's tongue, good luck plant, oxygen plant etc. *Sanseveria trifasciata* is the most common species found cultivated in gardens or pots, particularly *Sanseveria* are used a great deal in decorative flower arrangements. (Kanimozhi M. 2011). *Sanseveria* are a source of white strong elastic fibre commonly used in the manufacture of rope, fishing lines, cordage, fine matting, bowstring, and clothing which can substitute the applications of variety of fibre. Eco-friendliness in textiles is in continuous contact with skin. Nature is blessed with

invaluable fibre yielding 2 plants which has wide potential for use in diversified fields, but they still remain in the background. (Rose, 2017) So, this study mainly focuses on the exploration of *Sanseveria trifasciata* fibre for textile application. In this investigation an attempt has been made to explore *Sanseveria trifasciata* fibre for textile application. (Kant, R. and P. Alagh. 2013). Ecofriendly, biodegradability, recyclable and reusable properties of cellulosic and lignocellulosic fibres such as cotton, jute, etc. are gaining focus and the marketing of their products are increasing. (Yumna, M. R. Arbianti, 2018) Cellulosic and lingo cellulosic fibres are bio-polymer are obtained from a large variety of plant and crops. The fibre was extracted from the leaves by retting and hand scraping method. Physical and mechanical characterizations were performed on *S. trifasciata* fibre, fibre strength, elongation, fibre length, fineness, diameter, and moisture content. (Wolela 2019).

Material And Methods:

The *S. trifasciata* leaves were collected from the local area of Akola. For the purpose of extraction and to analyse the extraction fibres different types of materials have been used in this investigation.

Fiber Extraction: There are different techniques of leaf fibre extraction methods, from these techniques water retting and hand scraping are one of the best methods.

Water Retting: In the stagnant water retting the leaves were pounded and made into bundles. These bundles were immersed in stagnant water by placing stones over it to keep the entire leaves submerged for about three weeks. The leaves were then removed, washed and finally dried in sunlight for about 5-7 hours.

Hand scraping: In this fibre extraction method a knife and fork are used, by putting the *Sanseveria trifasciata* leaf and scratch repeatedly by using the knife or fork until the fibre is seen, after that scratch gently or slowly to prevent the fibres from damage. Finally, the extracted fibre will be washed by water and dried by sunlight. Hand scraping of the leaves must be after harvesting. If left the leaves longer, the leaves will become dry and the fibres will be difficult to extract. Hand scraping is the easiest and the shortest way of fibre extraction method mechanically, but it is the most tiresome, time consuming and requires much manpower energy. Characterization of *Sanseveria trifasciata* fibre (STF) The fibre properties of STF were investigated for their potential as a source of textile fibres The following tests were carried out.

Fiber length: The fibre length was measured using a calibrated metal scale by straightening the fibre over a flat table and the result is expressed in centimetres. Care should be taken that the fibre should not be elongated.

Fiber diameter: To determine the diameter of the Fiber the microscope was used. To get exact results

Plates:



Table:

Sr. No	Fiber Length	Fiber Dimeter	Number of Fiber Per Leaf.	Moisture Content	
				Dry	Wet
A	31	0.273 g	250	0.988g	3.839g
B	34	0.450 g	340		
C	37	0.140 g	238		
D	30	0.99 g	245		
E	31	0.173 g	230		
F	76	1.700 g	712		
G	90	1.507 g	326		
H	31	0.122 g	331		
I	62	0.494 g	282		
J	32	0.120 g	243		

Conclusion:

The fiber of the plant was extracted from

microscope micrographs was taken at ten different areas and the average value taken.

Result and Duscussion:

The *Sanseveria trifasciata* fibre testing reports were studied and the results are given below.

Fiber Length: The average numbers of fibres were extracted from a single leaf of *Sanseveria trifasciata* are 76. The lengths of STF were measured manually the average mean value was 59cm. The fibre length is considered as one of the essential quality parameters of raw textile material because length to width ratio is the primary requirement of any textile fibre. The range of the fibre length is wide, so it is suitable to produce any count.

Fibre diameter:

Diameter of the fibre is one of the most important properties of the fibre. The fibre diameter was observed with a projection microscope. The dimension was found to be in the range between 0.99 μ m to 1.700 μ m with the average value of 0.6-206 μ m. The fibres lack of crimp when seen neither through naked eye nor microscope. The diameter of 10 *Sanseveria trifasciata* leaf fibre indicates that it is finer than other leaf fibres.

Fiber Number: The average number of fine cellulose fibre was extracted from a single leaf of *S. trifasciata* are 712. The number of cellulose fibres were measuring manually the mean value was 36 and the range of the fibre is thick, so it is suitable to produce any count Moisture contents and moisture regain.

this study shows that the fiber had good strength and fineness. This fiber plant having good strength and as a renewable source, the fiber can be used to make Products like sacks, ropes, mattresses. The plant leaf of *Sanseveria trifasciata* were relatively easy to grow and multiply in any atmosphere, they could be considered as an essential alternative source for natural cellulose fibers, and the fiber can be used to make different handcraft products.

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Strategies to Manage Stress & Mental Health in College

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Abstract:

From the beginning of the 21st century, there has been an increased level of competition in the world, across All fields and professions (Abercrombie HC, 2003). The high levels of pre-requisite standards have added Considerable stress to student life in higher education institutions (Abouserie R, 1994). The current study aimed To encompass previous research conducted in the area of academic stress, with special focus on India A comprehensive literature review conducted using key words academic stress, academic anxiety, Sources or causes of stress, coping strategies employed and academic performance (Agrawal RK, 2007). The EBSCO, ProQuest, Google Scholar were the main database sources from which the articles were gathered (Akil H,1999). Coalesced findings from studies conducted after 2000 indicate that across Indian cities, the prevalence Rate of student stress ranges from 13% to 45% (Aldwin C, 1987). Most of the literature discussed academic stress Quantitatively, and a lesser number of studies explored it qualitatively. Very few proposed strategic intervention In order to control academic stress among higher education students. Critical issues in the area of academic Stress have been identified, with discussion on the findings and shortcomings of existing research (Ang Stres2006). Directions for future research and potential reform implementations in management of academic stress

Keywords: Academic stress, Higher education students, Academic performance & coping strategies

Introduction:

Some amounts of stress are good to push the persons to Do the level of optimal alertness, behavioral and cognitive Performance Masih and Gulrez have indicated that “Stress is A lifestyle crisis” (Arun P,2009). In literature, Stress has been Conceptualized based on three main viewpoints-stress as a Response, stimulus and as a transaction (Awino JO,2008). In The response based view it is viewed as a bodily response to Any threatening stimuli Whereas in the stimulus-based view,

Stress is defined as events external to the individual such as Life events which require adjustment and adaptation (Bansal V, 2009). Finally, in the transaction-based view, stress is a Dynamic process of assigning meaning and coping based on Person-environment transactions (Behere SP,2011). Various physiological responses are associated with stress or

Stressful stimuli (Bennett TH,2014). To help the individual To cope with the stimuli these repertoire of responses play A vital role (Biron C, 2008). These are maintained by two Biological systems. These include the sympathetic division of the autonomic nervous system (Bourne LE, 2003). Continuous psychological stressors activate the sympathetic

System leading to the release of adrenaline (Braunsteinbercovitz H, 2003). It plays a crucial role in the preparing an Individual for either fight or

flight reaction (Bray SR, 2004). The second is the stress-responsive system is the brainpituitary-adrenocortical axis which regulates the release of Glucocorticoid (GC) hormones which mobilize energy into Blood stream from the storage sites of the body (Brown BB, 2002). Stress is considered a critical condition since it influences The individual’s thoughts, feelings and finally behaviour In total (Buchanan TW, 2006). Excess stress levels lead to Problems and discomfort irrespective of age (Burnett PC, 1997). Specifically, students also face stress due to their

Academics in the phase of formal professional education (C.P Matthew,2017). This far-reaching impact of stress has made It an important topic in academia, leading many scholars to Explore the phenomenon in its various operational contexts. Although academic stress has been covered greatly in Western literature, there are comparatively lesser reviews in The Indian context (Cannon WB, 1932). There exist a many Problems in blind adaptation of Western-based studies in the Indian context (Cave D, 2011). Fundamentally speaking, The western individualistic society contains the academic

College life, with its promise of new experiences and opportunities, can also be a time of significant stress and mental health challenges. Balancing academic work, social life, and often a part-time job can feel overwhelming. It’s crucial to

adopt effective strategies to manage stress and maintain mental health.

This comprehensive guide will explore some mental health tips for students and stress relief techniques tailored to the college environment. The goal is simple: to help you navigate these years more easily and be resilient.

Understanding Stress and Mental Health in College

Embarking on your college journey opens up a chapter filled with opportunities, learning, and growth. However, it's also a phase where you're likely to encounter various stressors that can impact your mental health. It's crucial to grasp the nature of stress and the significance of mental health during these formative years, ensuring you're equipped to navigate this period effectively.

The Nature of Stress

Stress, in its essence, is the body's reaction to any change that requires an adjustment or response. The body reacts to these changes with physical, mental, and emotional responses. Stress is a normal part of life. It can be beneficial in manageable doses, propelling us to adapt and overcome challenges, thus fostering resilience and growth. For instance, the stress of approaching deadlines can spur you into action, enabling you to focus and perform effectively.

However, the college environment can often amplify stress beyond day-to-day challenges. Academic pressures, social dynamics, financial concerns, and the process of defining one's identity and future can all merge into a potent source of stress. When stress becomes chronic, without adequate opportunities for relief or relaxation, it ceases to be a positive force and can lead to or exacerbate mental health issues.

The Spectrum of Mental Health:

Mental health is integral to our overall well-being, encompassing our emotional, psychological, and social welfare. It influences how we think, feel, and behave in daily life. It also affects our ability to cope with stress, overcome challenges, build relationships, and recover from life's setbacks and hardships.

In the context of college life, preserving mental health is paramount. The pressures and challenges unique to this period can strain even the most resilient. Mental health issues can manifest in various ways, from mild anxiety and stress to more serious conditions like depression, eating disorders, and addiction. Recognizing the signs of mental health issues is the first step in seeking help and finding solutions. **The Interplay Between Stress and Mental Health**

The relationship between stress and mental health is complex and bidirectional. On one hand, chronic stress can lead to mental health problems. On the other, existing mental health issues can

exacerbate our stress response, creating a vicious cycle that can be difficult to break without intervention. College students are particularly vulnerable to this cycle. The constant juggling between academic demands, part-time jobs, social expectations, and the quest for personal identity can leave little room for self-care and relaxation, laying the groundwork for mental health challenges.

Finding Balance and Seeking Help

Navigating stress and maintaining mental health in college isn't just about avoiding challenges; it's about learning to balance them. It involves recognizing when you're overwhelmed and developing strategies to address stressors head-on. This balance is not static but a continuous process of adjustment and adaptation.

Moreover, seeking help when you're struggling is not a sign of weakness but a proactive step towards resilience and well-being. College campuses offer a range of resources, from counseling services to stress management workshops and support groups, all aimed at helping you manage the pressures of college life. **Strategies for Managing Stress**

Here are several approaches to help manage stress effectively:

1. Time Management

One of the most cited sources of stress among college students is the feeling of having too much to do and not enough time to do it. Effective time management can alleviate much of this pressure. Here's how:

Create a Schedule: Use a planner or digital calendar to keep track of assignments, exams, and social commitments. Seeing your obligations on paper or screen can make them feel more manageable.

Prioritize Tasks: Only some things need to be done right now. Determine which tasks are most urgent and important, and tackle those first.

Break Tasks Into Smaller Steps: Large projects become less daunting when broken down into smaller, more manageable parts.

2. Build a Support System

Having a robust support system can significantly reduce stress. This can include friends, family, or college support services. Don't hesitate to share your feelings and experiences with trusted individuals. They can offer advice, a listening ear, or just be there to share in your college journey.

3. Exercise Regularly

Physical activity is a proven stress reliever. It releases endorphins, the body's natural mood elevators. You don't have to engage in intense workouts to get the benefits. Even a daily walk or a quick yoga session can make a difference.

4. Practice Mindfulness and Relaxation Techniques

Mindfulness and relaxation techniques, such as meditation, deep breathing exercises, and progressive muscle relaxation, can help center one's

thoughts and reduce stress. Many colleges offer free workshops or classes on these practices.

5. Healthy Eating

What you eat can affect your energy levels and mood. A balanced diet can help manage stress levels. Try to eat regular, nutritious meals and avoid too much caffeine or sugar, which can increase anxiety.

6. Get Enough Sleep

College students are notorious for sacrificing sleep, but lack of sleep can exacerbate stress and impact academic performance. Aim for 7-9 hours of sleep per night. Establishing a regular sleep schedule can also help improve the quality of your sleep.

7. Set Realistic Goals

Setting goals can give you a sense of direction and purpose. However, setting unrealistic goals can lead to frustration and increased stress. Make sure your goals are achievable and aligned with your values and interests.

8. Take Breaks

It's important to take regular breaks to recharge. Short breaks during study sessions can improve focus and productivity. Longer breaks for leisure activities or hobbies can help maintain balance and well-being.

9. Learn to Say No

Overcommitting can lead to burnout. It's important to know your limits and be willing to say no to additional responsibilities when you're already stretched thin.

10. Seek Professional Help When Needed

Sometimes, despite our best efforts, stress can become overwhelming and interfere with our ability to function. Many colleges offer counseling services free of charge to students. Don't hesitate to seek professional help if you're struggling to manage stress or experiencing mental health issues.

Conclusion:

College is a time of growth and learning, both academically and personally. While stress is an inevitable part of this journey, it doesn't have to define your college experience. By adopting effective stress relief techniques for college students and prioritizing your mental health, you can navigate the challenges of college life with resilience and positivity.

Remember, it's not about eliminating stress but learning how to manage it effectively. Take the time to explore what strategies work best for you, and don't hesitate to reach out for support when needed.

Your college years can be some of the best years of your life, full of discovery, friendship, and personal achievement. By managing stress and maintaining your mental health, you're setting the stage for a fulfilling and enjoyable college experience.

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A review on antioxidant potential & application of peel extracts of cucurbita moschata (Pumpkin) in advanced Dermatology.

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Abstract:

Cucurbita moshchata is worldwide in distribution and rich in carotenoids, vitamins, dietary fiber, minerals and phenolic compounds. It has also medicinal values. Pumpkin (Cucurbita moshchata L.) is an economically important food resource cultivated due to its nutritional composition. It has been used traditionally both as Humans and animal feed, also has Ethnomedicinal potential. It is cultivated throughout the world specially in tropical area of Asia, Africa and America. Pumpkin fractions are rich source of nutritional components like oils, proteins, carbohydrates and minerals. Moreover, plant derived by-products with proper handling, may represent a low cost source of bio-active compounds potentially important for Pharmaceuticals and cosmetics industries. The study confirms the potential application of peel extracts of Pumpkin from Cucurbita species in dermatology.

Keywords: Cucurbita, Peel extract, Feed-source, Bioactive. Dermatology.

Introduction:-

India is a repository of medicinal plants. The herbal treasure of nation is rich in its floristic wealth. Ethno-botany accounts for the study of relationship between people and plants for their use as medicines, Staple food, shelter, clothing, fuel, fodder and other household purposes [22]. It deals with the interaction of indigenous plants and the local inhabitants of the area. The aim of ethno-botanists is to explore how these plants are used as food, clothing, shelter, fodder, fuel, furniture and how medicinal use of such plants is associated to other characteristics of the plant species. They understand and collect the knowledge of valuable plants by the use of anthropological methods. Central India is one of those region in India where the tribal population and forest dwellers form a considerable part of the population [23]. Their studies brought to light numerous less known uses of plants and interesting data on about ethnomedicinal plants.

Besides, By-products of cultivated plants are one of the major environmental concerns worldwide. Due to the high concentration of bioactive chemicals, such waste may be considered hazardous due to the interference with the plant growth, deterioration of the drinking water quality or toxic effects on sensitive marine organisms. Moreover, plant-derived by-products, with proper handling, may represent a low-cost source of bioactive compounds potentially important for pharmaceutical and cosmetics industries. The aim of the study was to evaluate the phytochemical composition, antioxidant

activity of extracts from peels of *C. moschata*. The extracts were prepared using “green solvents” (water, 50% propylene glycol, and 20% ethanol) and ultrasound assisted extraction. The type of solvent also had a significant impact on the extract’s composition and bioactivity. Aqueous peel extracts contained the highest amounts of flavonoids, showed the greatest antioxidant potential and the most significant in vitro SPF values. The study confirms the potential application of peel extracts from *Cucurbita* spp. cultivars in cosmetic products.

Material and Methods:- *Cucurbita moschata* is generally grown for their leaves, flowers, fruits and sometimes for their oil seeds [24]. According to Mbogne et al. [25] the leaves of *C. maxima* contains iron, vitamin A and C that are important in countries where anemia due to malaria and immune deficiency is common. They are low-calorie vegetables that are suitable for any diet. Vines and fruits are used as fodder for domestic animals). González et al. (2001) reported that pumpkin is an important source of vitamin A (4±20 mg / g). They can thus play an important role in the fight against Avitaminosis A, which affects more than 250 million children under five years of age worldwide [25]. They are a good source of ascorbic acid (22.9 mg/100 g) and inhibit the development of degenerative diseases such as cancer, diabetes, cardiovascular and neurological diseases [26]. The seeds of *Cucurbita* species are sources of oils and proteins. Despite their nutritional benefits, pumpkin is among the neglected crop. Farmers play a crucial role in plant domestication and conservation [27].

They ensure the preservation and management of local species. A better strategy for the conservation, valorization and improvement of *C. moschata* genetic resources must take into account the perception of farmers. Despite the nutritional, medicinal and biodiversity benefits of pumpkin to agriculture, humans and livestock, to the best our knowledge, no work has been done on the level of varietal diversity at national level, the drivers for its production and utilization, the farm management methods, the local taxonomy, the probable origin and seed management practices. Hence, the specific objectives were to: (i) conduct a survey for the collection of the various accessions of pumpkin on the basis of local taxonomic criteria (ii) collect information on the use e survey for the collection of the various accessions, uses and knowledge of producers .

The growing demand for extracts and substances of plant origin in the food, pharmaceutical and cosmetics industries contributes to the generation of an increasing amount of biodegradable waste, which may constitute from 10% to even 60% of the plant material. These wastes are mainly parts of plants that are not consumed, not used for industrial purposes or arise in the processing of vegetables and fruits[1,2].

By-products from agricultural and food processing industries have become a serious ecological issue, due to the possibility of leading to environmental pollution and generating significant costs related to its storage and disposal. Throwing away of plant-derived biomass also raises questions about the rational exploitation of natural resources. As proven by several examples, agricultural and food processing by-products contain considerable quantities of valuable bioactive compounds and therefore can be useful for technological and pharmaceutical purposes [3-5]. Agricultural by-products are also considered as rich source of of active compounds for cosmetics applications. Due to growing consumers interest in “zero- waste” and sustainable cosmetics[6,7].

Pumpkin (*Cucurbita* L.) is an economically important species with a high production rate. It belongs to the *Cucurbitaceae* family, which comprises about 130 species growing in the wild and cultivated all over the world. There are about 20 species belonging to the *Cucurbita* genus, including the most commonly cultivated: *Cucurbita maxima* Duchesne, *C. pepo* L., *C. moschata* Duchesne ex Poir, *C. ficifolia* Bouché, and *C. argyrosperma* C. Huber. Yellow to dark orange colors of *Cucurbita* sp. fruits result from the high content of carotenoids, including carotene, lutein or zeaxanthin. These two pigments absorb UV radiation and blue light, as well as scavenge free radicals and reactive oxygen species (ROS) [8]. The most commonly used part of

the pumpkin is the pulp, used for the production of various food products and as a source of natural pigment in the form of powder added to confectionery, bakery, pasta, and dairy products. Pumpkin pulp and seeds are also sources of various phytochemicals with documented health-promoting properties, including antioxidant, antimicrobial, and anticancer activities [9]. Extracts, juices, and powders from the whole fruits of *Cucurbita* spp. are also well known active ingredients in cosmetics with skin conditioning, hair conditioning, humectant, and skin protecting functions [10].The chemical composition of pumpkin pulp is considerably diversified and it depends both on the species and variety. Kulczyński and Gramza-Michałowska, compared the content of carotenoids, polyphenols, flavonoids, tocopherols, minerals, vitamins C and B1, pumpkin species *C. moschata* [11] and the content of carotenoids, polyphenols, tocopherols, minerals, and vitamins in fruits of [11] *C. maxima* Duchesne cultivars [12]. Pumpkin peel is a less studied part of the fruit but recent scientific data indicate that peels from various cultivars are also rich in biologically active phytochemicals, such as carotenoids, polyphenolic compounds, and amino acids [14–16]. Pumpkin peel extracts were shown to possess specific biological activities. Shaygan et al. showed that the treatment of burn wounds in rats with cream containing hydroalcoholic extracts from the peel of *C. moschata*, improved the parameters associated with efficient wound repair, including a better regeneration of the epidermic layer, a higher density of dermis collagen fibers, and lower presence of inflammatory cells, indicating its regenerative potential [15].Accelerated wound healing and a reduced expression of tissue oxidative stress biomarkersby *C. moschata* peel extracts in rat skin wound models was also reported by Bahramsoltani and colleagues [16]. These data indicate a possible application on *Cucurbita* spp. peel extracts in dermatology and skin care products.

In order to meet consumer expectations, the preparation of plant extracts for the purpose of the cosmetics industry must follow green extraction procedures, characterized by a low energy consumption and a high recovery of active compounds. Ultrasound assisted extraction (UAE) and microwave-assisted extraction (MAE) are good examples of such methods, which allow for the efficient extraction of active substances from the plant material [17–19]. Application of non-toxic solvents, which can be easily evaporated or allowed to be used directly in cosmetic products, is another important factor to be considered. These solvents include water, ethanol, or mixtures of water with propylene glycol (PG) or glycerine [20]. Sharma and colleagues compared the efficacy of the carotenoid extraction from the peel of *Cucurbita maxima* var. Gold Nugget and Amoro F1, using

three extraction technologies considered as green—UAE, MEA, and conventional solvent extraction. UAE was shown as the most efficient method [14]. Therefore, the aim of the following study was to evaluate the composition and selected biological activities of aqueous (A), hydroglycolic (HG), and hydroethanolic (E) extracts from peels of *C. moschata*, prepared using UAE, in respect of their application as active ingredients for the cosmetics industry.

Results and Discussion

Species/Variety	Extract	Total Phenolics (mg GAE/g dw)	Flavonoids (mg QE/g dw)	Protein (mgBSA/g dw)
<i>C. moschata/muscut</i>	W	14.700 ± 0.935 a	2.598 ± 0.127 a	76.143 ± 4.261 a
	HG	11.619 ± 0.406 b	2.511 ± 0.222 a	21.957 ± 3.207 b
	E	7.171 ± 0.189 c	1.983 ± 0.111 b	25.681 ± 3.579 b

W—aqueous extracts, HG—hydroglycolic extracts, E—ethanolic extracts; mean ± SD; means that do not share the same letter are significantly different with $p < 0.05$ within one species/variety. The content of total phenolic compounds in the analyzed extracts that were calculated for the herein proposed extraction methodology, and the W extract.

In respect to the flavonoids, the highest content of these compounds was found in the W extracts from all peels. The flavonoid content in the W extracts varied from 2.598 ± 0.127 (*C. moschata* ‘Muscat’). The W extracts were also shown to contain the most significant amounts of proteins—the highest protein content was detected in *C. moschata* ‘Muscat’ (76.143 ± 4.261 mg BSA/g dw) acts. Previous studies by Achilonu et al. demonstrated that the content of protein in

Table 2. DPPH and ABTS scavenging activities of *Cucurbita* spp. peel extracts.

Species/Variety	Extract	ABTS Scavenging (µg TE/g dw)	DPPH Scavenging (µg TE/g dw)
<i>C. moschata/Muscat</i>	W	3.895±0.040a	2.860±0.280a
	HG	2.460±0.041b	2.290±0.103b
	E	3.552±0.190a	2.470±0.075ab

W—aqueous extracts, HG—hydroglycolic extracts, E—ethanolic extracts; mean ± SD; means that do not share the same letter are significantly different with $p < 0.05$ within one species/variety. The antioxidant potential of pumpkin peel extracts has not been compared, to date. More data is available for total pumpkin fruit extracts. Kulczyński et al. determined the antioxidant activity of aqueous and aqueous-methanolic extracts from lyophilized flesh *C. moschata* cultivars, using the DPPH and ABTS scavenging methods, FRAP (ferric reducing antioxidant power), chelating activity, and ORAC. No statistically significant differences ($p > 0.05$) were found between the pumpkin species *C.*

3.1. Active Compounds of Cosmetic Significance Present in *Cucurbita* sp. Peel Extracts

Aqueous (W), hydroglycolic (HG) and hydroethanolic (E) extracts were prepared using ultrasound assisted extraction (UAE) and compared for their content of total phenolic compounds, flavonoids, and proteins (Table 1). UAE was found to be more efficient than the microwave assisted extraction and conventional solvent extraction in obtaining pumpkin peel extracts enriched in phenolic components, as well as its significant antioxidant activity

pumpkin peel is higher than in the flesh. In the mentioned study, the content of protein in the peel of *C. moschata* 11.30 ± 0.99 g/kg raw weight [21]. The content of particular phytochemicals in the W, HG and E extracts from the analyzed.

3.2. Antioxidant Properties of the *Cucurbita* sp. Peel Extracts

The antioxidant potential of *Cucurbita* spp. peel extracts was compared, using ABTS and DPPH scavenging assays (Table 2). The antioxidant activity was detected for the HG extracts from *C. moschata* ‘Muscat’ (2.470 ± 0.041 µg TE/g dw for the ABTS assay). For the most analyzed pumpkin varieties, the W and E peel extracts showed higher antioxidant activities than the HG extracts in both the ABTS and DPPH scavenging assays.

moschata, in respect to all of the used methods. [13]. The antioxidant properties of pumpkin extracts cannot be directly related to the content of total phenolics or flavonoids, shown in Table . Several other compounds with an antioxidant potential, which were not included in this study are more likely to present in the analyzed extracts: carotenoids, carbohydrates, and vitamins C and E [11,12]. Therefore, it is very difficult to estimate the total antioxidant activity of the pumpkin peel extract only, based on the content of the particular group of compounds the HaCaT keratinocytes at a concentration of > 200 µg/mL [28], photoprotective ingredients in topical applications. In the studies, mostly the pumpkin seed oil was shown as an

effective UV protecting ingredient, due to its sunscreen and antioxidant properties [29]. Besides this beneficial aspects of Pumpkin Peel it is also found that, The [pumpkin facial treatment](#) is a rejuvenating and nourishing skincare procedure and a chemical peeling that uses the extracts and power of varying fruit extracts (including pumpkins) to promote healthy and glowing skin. Pumpkin facial is a gentle form of chemical peel, consisting of pumpkin extracts and fruit enzymes to gently exfoliate the skin, regulate oil balance and eliminate the layer of dirt and dead skin cells, often making the skin look dry and dull.

The natural exfoliants in the pumpkin extracts have promising results in eliminating the outer layer of dirt and excess oil from the skin to unveil a smoother and clearer skin tone. Besides exfoliation, the nourishing ingredients in the facial seep deeper into the skin, rejuvenating it from within. The high antioxidant levels in the ingredients of the pumpkin facial are a game changer. If your skin is damaged due to the dirt and pollution outdoors, this nourishing facial can be a game-changer for your skin. Pumpkin is a rich source of Vitamin A and salicylic acid. While the former has antioxidative properties, the latter hydrates and rejuvenates the skin.

Hence, pumpkin facial benefits our skin in multiple ways.

Conclusions:

The studies showed that peels from various pumpkin (*Cucurbita* spp.) cultivars, considered by the food industry as by-products, might be used as a valuable source of active compounds with cosmetic properties. By using an eco-friendly extraction method and “green solvents” (water, 20% (v/v) propylene glycol in a water mixture or 70% (v/v) ethanol obtained pumpkin peel extracts that might be directly used in cosmetic formulations.

In vitro studies using human keratinocytes showed that all extracts were not cytotoxic up to the concentration of 1000 µg/mL and thus might be considered as non-irritant for the skin cells. The performed studies and statistical analysis showed that the type of solvent used for the extraction of the pumpkin peels has a significant impact on its phytochemical content and cosmetic-related activities. Among the analyzed extracts, the most interesting were the W extracts, as they contained the highest amounts of flavonoids, showed the highest antioxidant potential in the ABTS and DPPH scavenging assays, and the most significant in vitro SPF values.

It is however worth noting that the significant variations in the phytochemical content and biological activities, described in the scientific literature for the extracts from the flesh of pumpkin cultivars are also detectable with respect to the peel

extracts. The presented study will contribute to the more sustainable utilization of natural resources.

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Eco-Friendly Innovations in Library Science: A Path to Sustainable Information Management

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Abstract:

The growing global emphasis on environmental sustainability has extended its influence to all sectors, including library science. This paper explores the integration of eco-friendly innovations within libraries, emphasizing their role in promoting sustainable information management. Ultimately, this paper aims to demonstrate that by embracing sustainability, libraries can not only reduce their ecological footprint but also serve as leaders in the broader movement toward environmental responsibility. The findings suggest that with the right innovations and commitments, libraries can significantly contribute to a sustainable future while continuing to fulfill their essential role in society.

Keywords: Eco-friendly libraries, Sustainable information management, Green library practices, Environmental impact of libraries, etc.

Introduction:

As the global focus on environmental sustainability intensifies, every sector is reevaluating its practices to minimize ecological impact, and library science is no exception. Libraries, traditionally seen as pillars of knowledge and community, are increasingly recognized for their potential to lead in the movement toward environmental stewardship.

The concept of sustainability in libraries goes beyond mere recycling programs or energy-saving measures; it encompasses a holistic approach to managing resources, designing infrastructure, and delivering services that reduce environmental harm. From the construction of green buildings to the adoption of digital resources, libraries are exploring various strategies to minimize their ecological footprint while maintaining their essential role in society. This paper explores the myriad ways in which libraries are adopting eco-friendly practices, emphasizing the intersection of sustainability and information management. It examines the evolution of green initiatives within the library sector, the challenges faced in their implementation, and the potential for libraries to serve as models of sustainability in their communities. The importance of this topic lies not only in the environmental benefits but also in the broader implications for social responsibility and community leadership. As libraries evolve to meet the demands of the digital age, they must also rise to the challenge of becoming sustainable institutions.

The Concept of Sustainability in Library Science:

Sustainability, a principle rooted in meeting the needs of the present without compromising the ability of future generations to meet their own needs, has gained significant traction across various fields, including library science. In the context of libraries, sustainability encompasses a broad spectrum of practices aimed at reducing environmental impact while maintaining the core functions of information preservation, access, and community service.

Defining Sustainability in the Context of Libraries:

Sustainability in libraries is often associated with three primary pillars: environmental, economic, and social sustainability. Environmental sustainability focuses on reducing the ecological footprint of libraries through energy-efficient buildings, responsible resource management, and the adoption of digital technologies that minimize the use of physical materials. In practice, sustainability in library science can manifest in various ways, from the design and construction of green library buildings to the implementation of waste reduction programs, energy-saving technologies, and eco-friendly procurement policies. Additionally, libraries are increasingly integrating digital resources and services, which not only reduce the need for physical materials but also extend access to information in a more sustainable manner.

Historical Perspective on Eco-Friendly Practices in Libraries:

The integration of sustainable practices in libraries is not a recent phenomenon. For decades, libraries have explored ways to reduce their environmental impact, often in response to broader societal shifts toward environmental consciousness. Early efforts included the use of recycled paper, energy-efficient lighting, and the implementation of basic recycling programs. In the late 20th and early 21st centuries, the concept of "green libraries" began to take shape, with a growing emphasis on sustainable building design and operations. The Leadership in Energy and Environmental Design (LEED) certification, introduced in the late 1990s, became a benchmark for environmentally sustainable buildings, and many libraries sought to achieve this certification as part of their commitment to sustainability.

The Role of Libraries in Promoting Environmental Awareness:

Beyond their operational practices, libraries play a crucial role in promoting environmental awareness and education within their communities. As trusted institutions that provide access to information, libraries are uniquely positioned to educate the public about sustainability issues, from climate change to conservation and waste reduction.

Moreover, libraries can serve as models of sustainable behavior, demonstrating how institutions can reduce their environmental impact while still fulfilling their mission. By adopting and showcasing eco-friendly practices, libraries not only contribute to the global effort to protect the environment but also encourage their communities to adopt more sustainable lifestyles.

Green Building And Infrastructure:

As the world increasingly prioritizes sustainability, the design and infrastructure of libraries have evolved to reflect eco-friendly principles. Green building practices in libraries not only reduce environmental impact but also create healthier, more efficient spaces that support the well-being of both users and staff.

Sustainable Library Design and Architecture:

Sustainable design in libraries focuses on creating buildings that minimize environmental impact while maximizing functionality, comfort, and aesthetic appeal. This involves careful consideration of factors such as site selection, orientation, and the use of renewable materials. Libraries designed with sustainability in mind often incorporate natural light, which reduces the need for artificial lighting and enhances the indoor environment for patrons and staff.

Key elements of sustainable library architecture include:

- **Energy-Efficient Building Envelope:** The building envelope, which includes walls, roofs, windows, and doors, plays a crucial role in regulating indoor temperatures and reducing energy consumption. High-performance insulation, energy-efficient windows, and green roofs are common features of sustainable library buildings, helping to maintain comfortable indoor conditions while minimizing the need for heating and cooling.
- **Sustainable Materials:** The choice of materials in library construction is another critical aspect of green building. Sustainable materials, such as recycled content, locally sourced wood, and low-emission products, reduce the environmental footprint of the construction process and contribute to healthier indoor air quality. The use of certified sustainable wood, for example, ensures that the materials are harvested in a way that preserves forests and promotes biodiversity.

Energy Efficiency in Libraries:

Energy efficiency is a cornerstone of green building practices, and libraries are no exception. By reducing energy consumption, libraries can lower operating costs, decrease their carbon footprint, and create a more sustainable future. Several strategies are employed to enhance energy efficiency in libraries:

- **Lighting:** Efficient lighting systems, such as LED bulbs and automated lighting controls, significantly reduce energy use. Daylighting strategies, which maximize the use of natural light, are also commonly implemented to further decrease reliance on artificial lighting.
- **Heating, Ventilation, and Air Conditioning (HVAC):** Energy-efficient HVAC systems are essential for maintaining a comfortable indoor environment while minimizing energy consumption. Advanced HVAC systems often include features such as programmable thermostats, demand-controlled ventilation, and energy recovery ventilators, which optimize energy use by adjusting to the needs of the building in real time.
- **Renewable Energy Sources:** Many sustainable libraries incorporate renewable energy technologies, such as solar panels or geothermal heating and cooling systems. These systems not only reduce dependence on fossil fuels but also provide a visible demonstration of the library's commitment to sustainability.

The Impact of Green Libraries on Communities:

Green libraries serve as more than just functional spaces; they are symbols of a community's commitment to sustainability. By adopting eco-friendly building practices, libraries not only reduce their own environmental impact but also inspire patrons and local communities to pursue

sustainable practices in their own lives. Green libraries often become centers for environmental education, hosting workshops, lectures, and events that promote awareness and action on sustainability issues.

In conclusion, green building and sustainable infrastructure are integral components of eco-friendly innovations in library science. By embracing these practices, libraries can significantly reduce their environmental impact; lower operating costs, and create healthier, more inviting spaces for users.

Sustainable Library Operations:

Sustainable library operations are critical in minimizing the environmental impact of libraries while maintaining efficient service delivery. By adopting eco-friendly practices in daily operations, libraries can contribute to a more sustainable future, reduce costs, and enhance their role as community leaders in environmental stewardship. This chapter explores key areas of sustainable operations, including waste reduction, resource conservation, and the sourcing of materials, offering insights into how libraries can integrate sustainability into their core functions.

Reducing Waste and Recycling Programs:

Waste reduction is a fundamental aspect of sustainable library operations. Libraries generate waste from a variety of sources, including paper, packaging, electronic equipment, and discarded materials. Implementing robust waste reduction and recycling programs helps minimize the environmental footprint of library activities.

- **Paper Reduction:** Despite the digital age, paper remains a significant component of library operations, from printed materials to administrative documents. Libraries can reduce paper consumption by promoting digital alternatives, such as e-books, online journals, and electronic databases. Additionally, encouraging double-sided printing, using recycled paper, and digitizing records can further decrease paper usage.
- **Book and Material Disposal:** Libraries frequently need to dispose of outdated or damaged materials. Instead of sending these items to landfills, libraries can explore alternative disposal methods, such as donating to local charities, participating in book recycling programs, or organizing book sales to give materials a second life.

Sustainable Sourcing of Materials and Resources:

The procurement of materials and resources plays a significant role in sustainable library operations. By choosing eco-friendly products and services, libraries can support sustainability at every stage of their operations.

- **Green Procurement Policies:** Libraries can develop and implement green procurement

policies that prioritize environmentally friendly products and services. This includes purchasing recycled paper, non-toxic cleaning supplies, energy-efficient equipment, and sustainably sourced furniture. Green procurement not only reduces environmental impact but also sends a message to vendors and suppliers about the library's commitment to sustainability.

- **Sustainable Collection Development:** Collection development is a core function of libraries, and it offers opportunities for sustainability. Libraries can prioritize digital resources, which reduce the need for physical space and materials. When acquiring physical materials, libraries should consider factors such as the environmental impact of production, the longevity of the items, and the potential for reuse or recycling at the end of their lifecycle.

Eco-Friendly Collection Development:

Eco-friendly collection development is a critical component of sustainable library operations. It involves the careful selection, acquisition, and management of library materials with a focus on minimizing environmental impact. By adopting sustainable practices in collection development, libraries can reduce waste, conserve resources, and ensure that their collections remain relevant and accessible in an environmentally responsible manner.

Sustainable Practices in Acquisitions and Cataloging:

The acquisition and cataloging of library materials are central to collection development. To make these processes more sustainable, libraries can adopt practices that reduce the environmental footprint of their collections while maintaining the quality and breadth of available resources.

- **Digital Resource Acquisition:** The increasing availability of digital resources, such as e-books, online journals, and databases, offers libraries an eco-friendly alternative to traditional print materials. Digital resources eliminate the need for physical production, shipping, and storage, thereby reducing the associated environmental impact. Additionally, they can be accessed remotely, reducing the carbon footprint of patrons who would otherwise need to travel to the library.
- **Sustainable Cataloging:** Sustainable cataloging practices involve minimizing the use of physical materials, such as labels, binders, and paper records, and maximizing the use of digital tools for catalog management. Libraries can implement electronic cataloging systems that reduce the need for printed catalogs and enable more efficient management of digital and physical collections. This not only reduces

waste but also improves access to and discoverability of resources.

The Impact of E-books and Digital Media on Sustainability:

The shift towards digital media is one of the most significant trends in eco-friendly collection development. While print materials have long been the cornerstone of library collections, digital resources offer several advantages in terms of sustainability.

- **Reduced Resource Consumption:** E-books, online journals, and other digital media require no paper, ink, or physical storage, significantly reducing the consumption of natural resources. Additionally, digital resources do not require physical transportation, further decreasing their carbon footprint.
- **Space Efficiency:** Digital collections require minimal physical space, freeing up valuable real estate within libraries that can be repurposed for other community-focused activities. This can reduce the need for new construction or expansion, which typically involves significant environmental costs.

The Role of Policy and Leadership in Eco-Friendly Collection Development:

Effective eco-friendly collection development requires strong leadership and clear policies that prioritize sustainability. Library administrators and policymakers play a crucial role in setting the agenda and ensuring that sustainability is integrated into all aspects of collection management.

- **Sustainability Policies:** Libraries should develop and implement formal sustainability policies that guide collection development practices. These policies should outline specific goals and strategies for reducing environmental impact, such as prioritizing digital acquisitions, using sustainable materials, and adopting life cycle management practices.
- **Leadership and Advocacy:** Library leaders can advocate for sustainability within their institutions and in the broader library community. By promoting eco-friendly practices and encouraging staff and patrons to participate in sustainability initiatives, library leaders can create a culture of environmental responsibility that extends beyond collection development.
- **Continuous Improvement:** Sustainable collection development is an ongoing process that requires regular assessment and adaptation. Libraries should regularly review their collection development practices, assess their environmental impact, and seek out new opportunities for improvement. By staying informed about emerging trends and

technologies, libraries can continue to evolve and enhance their sustainability efforts.

Challenges and Opportunities in Implementing Eco-Friendly Practices:

Implementing eco-friendly practices in library science presents both challenges and opportunities. As libraries strive to reduce their environmental impact and embrace sustainability, they encounter obstacles that require innovative solutions and proactive strategies. At the same time, these challenges open doors to new opportunities for growth, community engagement, and leadership in the field. This chapter examines the key challenges libraries face in implementing eco-friendly practices and explores the opportunities that arise from these efforts.

Challenges in Implementing Eco-Friendly Practices:

1. Budget Constraints:

- **Challenge:** One of the most significant challenges in adopting eco-friendly practices is the financial cost. Green technologies, sustainable building materials, and energy-efficient systems often require a substantial initial investment, which can be difficult for libraries with limited budgets.
- **Opportunity:** Despite the upfront costs, sustainable practices often lead to long-term savings through reduced energy consumption, lower waste disposal costs, and improved operational efficiency. Libraries can explore grants, government incentives, and partnerships with local businesses to fund these initiatives.

2. Limited Staff and Resources:

- **Challenge:** Many libraries operate with limited staff and resources, making it difficult to prioritize and implement sustainability initiatives. The additional workload of planning, executing, and maintaining eco-friendly practices can strain existing personnel.
- **Opportunity:** Libraries can leverage community volunteers, collaborate with local environmental organizations, and encourage staff to engage in professional development focused on sustainability. Involving staff and the community in sustainability efforts can foster a sense of ownership and shared responsibility.

3. Technological Barriers:

- **Challenge:** The adoption of green technologies, such as digital resources and energy-efficient systems, often requires libraries to upgrade their existing infrastructure. This can be particularly challenging for older buildings or institutions with outdated technology.
- **Opportunity:** Upgrading to sustainable technologies presents an opportunity for libraries to modernize their operations and improve service delivery. By investing in

energy-efficient systems, libraries can reduce their carbon footprint and lower operational costs over time. Additionally, the integration of digital resources can enhance access to information and streamline library processes.

Conclusions:

Eco-friendly innovations in library science represent a crucial path toward sustainable information management, reflecting the growing responsibility of libraries to lead in environmental stewardship. As institutions dedicated to the preservation and dissemination of knowledge, libraries are uniquely positioned to model and promote sustainability within their communities. The shift toward eco-friendly practices, from green building designs and sustainable operations to the development of digital collections and life cycle management, demonstrates the potential for libraries to significantly reduce their environmental impact while enhancing service delivery.

Throughout this exploration, it has become evident that the journey toward sustainability in library science is both complex and rewarding. Libraries face numerous challenges, including budget constraints, resistance to change, and technological barriers. However, these challenges are met with equally compelling opportunities for innovation, collaboration, and leadership. By adopting sustainable practices, libraries can improve operational efficiency, reduce costs in the long term, and create healthier, more inviting spaces for patrons and staff alike.

Sustainability in library science is not just about reducing waste or conserving energy; it is about reimagining the role of libraries in a rapidly changing world. By embracing eco-friendly innovations, libraries can position themselves as leaders in the global movement toward sustainability, setting an example for other institutions and inspiring their communities to take action.

In conclusion, eco-friendly innovations in library science are not just an option but a necessity for the future of libraries. As stewards of knowledge and community resources, libraries have a profound responsibility to lead by example in the quest for a sustainable world. By embracing the challenges and opportunities of sustainable practices, libraries can ensure that they remain vibrant, resilient, and essential institutions for generations to come.

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A Study on Impact of E Marketing on Consumer Buying Behaviour

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Abstract:

This study explores the impact of e-marketing on consumer buying behavior, emphasizing the role of digital channels in shaping customer interactions and decision-making. E-marketing, which includes strategies like digital advertising, website design, social media influence, and personalization, is pivotal in modern business practices. The research examines various digital marketing strategies and their effectiveness in building and maintaining strong customer relationships. Through a survey of 60 respondents, the study identifies key factors such as price transparency, personalized recommendations, and social media engagement as crucial for enhancing customer satisfaction and loyalty. The findings suggest that businesses should focus on these areas to optimize their e-marketing efforts. The study also acknowledges limitations including sample size and geographic focus, and suggests directions for future research to explore broader and more diverse consumer behavior trends.

Introduction:

In this modern era e-Marketing is the gateway between industries and people. It aims to build relationships; create brand stories, and spike up the demand for any product or service. Companies use a variety of marketing tactics in an attempt to capture, engage and convince the consumer that their products are better than those of competitors.

For a business to grow consistently, it has to satisfy the needs of consumers. This includes how to adjust with the market shifts, learn about keep changing consumer demands and taste buds, experiment what work best for you, and engage more n more into customers or prospects at large. For highest consumer engagement, the marketers have to understand their buying behavior or purchase decision making and collective psychology. The fact that it depends on reports, data and surveys. This data is what marketers look at to inform their strategies and decisions.

Meaning of e-marketing:

E-marketing is an advertising medium that every business operates via the internet, via electronic devices commonly called online or internet marketing, this type of promotion is usually referred to as web marketing also. Under this context, a business uses modern means of communication media and technology to attract new customers or keep current ones but at the same time build loyalty. Depending on what your business goals are, the type of products that you sell and how many people can take service from them some types of online tools a business use for e-marketing.

Why is e-marketing important?

E-marketing is a critical component of contemporary business strategy. It offers several distinct advantages:

- 1. Expanded Market Reach:** Digital platforms enable businesses to access a global customer base, surpassing geographical limitations and fostering growth opportunities.
- 2. Optimized Resource Allocation:** Compared to traditional marketing channels, e-marketing often delivers superior return on investment. Digital campaigns can be meticulously tailored to specific budgets, making them viable for enterprises of all scales.
- 3. Precision Targeting:** Through data-driven insights, e-marketing facilitates the identification and engagement of specific customer segments. This precision enhances campaign effectiveness and maximizes resource utilization.
- 4. Measurable Performance Metrics:** Digital marketing platforms provide comprehensive analytics tools for tracking campaign performance. Key performance indicators (KPIs) such as website traffic, click-through rates, and conversion rates inform data-driven decision-making.
- 5. Personalized Customer Engagement:** Leveraging customer data, e-marketing enables the creation of tailored experiences, fostering stronger customer relationships and loyalty.
- 6. Interactive Communication:** Digital channels provide opportunities for direct and timely interaction with customers, building trust and brand advocacy.

7. **Continuous Availability:** Online platforms ensure uninterrupted brand visibility, enabling businesses to connect with customers 24/7.
8. **Competitive Differentiation:** A robust online presence is essential for thriving in today's competitive landscape. Effective e-marketing strategies contribute to market leadership.
9. **Adaptability and Agility:** Digital marketing campaigns can be swiftly adjusted to align with evolving market dynamics, customer preferences, and emerging trends.

Meaning of consumer behaviour:

Consumer behavior is the systematic study of individuals, groups, or organizations and the processes they use to select, secure, use, and dispose of products, services, experiences, or ideas to satisfy needs and wants. It encompasses a wide range of psychological, social, and cultural factors that influence purchasing decisions. This field seeks to understand the consumer's decision-making journey, from initial need recognition to post-purchase evaluation. By examining factors such as demographics, lifestyles, motivations, and environmental influences, marketers can develop effective strategies to attract and retain customers.

Review of literature:

“IMPACT OF DIGITAL MARKETING ON CONSUMER BUYING BEHAVIOUR” This research investigated the influence of digital marketing on consumer purchasing behavior among Nile University students and staff. A survey methodology was employed to collect data from a sample of 120 participants. Online questionnaires were distributed via convenient sampling using platforms such as email, WhatsApp, and Facebook. Quantitative analysis using SPSS version 23 was conducted on the collected data. Findings reveal that the study population is familiar with digital marketing and engages in online purchasing. Social media emerged as the most impactful digital channel influencing consumer behavior within the university community. Based on these results, it is recommended that businesses in Abuja enhance their social media, website, and email marketing strategies to expand customer reach, increase patronage, and improve customer relationship management.

“CAN THE V-COMMERCE BE AN INFLUENCING FACTORS TOWARDS CONSUMER BUYING BEHAVIOUR” **This study explores the potential of V-commerce as a novel marketplace and examines factors influencing consumer buying behavior within this emerging domain.** Data was collected from 128 V-commerce users in Salem to identify key determinants of purchase decisions. Utilizing the GARRETT Ranking method, the research found that security and virtual experience are primary factors shaping consumer attitudes toward V-commerce. The

findings suggest that V-commerce presents significant opportunities for businesses seeking to expand their market reach in the digital era.

“Digital Marketing and Consumer Buying Behaviour in Nile University of Nigeria, Abuja”

This research investigated the influence of digital marketing on consumer purchasing behavior among Nile University students and staff. A survey-based methodology was employed to collect data from a sample of 120 participants using an online questionnaire. Descriptive statistics were utilized to analyze the collected data. The findings reveal that the study population is familiar with digital marketing channels and actively engages in online shopping. Social media emerged as the most influential digital channel impacting purchasing decisions. The study concludes that businesses in Abuja can benefit from optimizing their social media, website, and email marketing strategies to enhance customer acquisition and retention.

“Achieving consumers’ attention through emerging technologies: The linkage between e-marketing and consumers’ exploratory buying behavior tendencies” **This study aimed to understand how online marketing influences people's buying decisions, especially when they're exploring new products.** The researchers looked at different types of online marketing, like internet ads, emails, and mobile marketing, to see how they affect people's choices. They studied Chinese university students to gather data. The results showed that online marketing does indeed influence people's buying decisions. Interestingly, gender didn't play a significant role in this relationship. The researchers suggest that businesses should use these online tools to better understand and reach customers in today's digital world. While the study provides valuable insights, it's important to note that the findings might not apply to people outside of China.

Objectives

- 1) To identify effective digital channels for building strong customer relationships
- 2) To offer valuable suggestions

Research methodology

In the present study, research has collected data from primary and secondary sources. Primary data was collected from survey. Questionnaire was circulated to more than 60 respondents but proper answers were given by 60 respondents therefore analysis done on 60 respondents. Secondary data was collected from articles, websites and etc. Convenient sampling method was adopted.

Data analysis:

Ranking 1: How can businesses build and maintain strong customer relationships through digital channels?

Table No.

	F1		F2		F3		F4		F5		F6		F7	
1	8	9.60	6	7.20	9	10.8	7	8.40	7	8.40	7	8.40	16	19.2
2	8	8.27	8	8.27	6	6.20	9	9.30	7	7.23	15	15.5	7	7.23
3	7	6.30	8	7.20	8	7.20	6	5.40	17	15.3	7	6.30	7	6.30
4	7	5.48	7	5.48	8	6.27	16	12.5	6	4.70	9	7.05	7	5.48
5	7	4.67	7	4.67	15	10.0	8	5.33	8	5.33	6	4.00	9	6.00
6	9	4.50	15	7.50	7	3.50	7	3.50	8	4.00	8	4.00	6	3.00
7	14	1.40	9	0.90	7	0.70	7	0.70	7	0.70	8	0.80	8	0.80
	60	40.22	60	41.22	60	44.67	60	45.17	60	45.67	60	46.05	60	48.02

F1: Digital Advertising

F2: Website Design and Usability

F3: Search Engine Optimization (SEO)

F4: Customer Reviews and Ratings

F5: Social Media Influence

F6: Personalization and Recommendations

F7: Price Transparency and Comparison

Observation:

The table represents an analysis of various digital strategies businesses can use to build and maintain strong customer relationships, ranked by frequency and GM (Geometric Mean) scores across different categories. The categories include Digital Advertising (F1), Website Design and Usability (F2), Search Engine Optimization (SEO) (F3), Customer Reviews and Ratings (F4), Social Media Influence (F5), Personalization and

Recommendations (F6), and Price Transparency and Comparison (F7). Price Transparency and Comparison (F7) emerges as the most effective strategy, with the highest GM Score of 48.02, accounting for 20.9% of the total GM score across all categories. It is followed closely by Personalization and Recommendations (F6) with a GM score of 46.05 (20.1%) and Social Media Influence (F5) with a GM score of 45.67 (19.9%). On the other hand, Digital Advertising (F1) and Website Design and Usability (F2) have lower overall GM scores of 40.22 (17.5%) and 41.22 (18.0%), respectively. These insights suggest that businesses focusing on transparency, personalization, and social media engagement are more likely to foster strong customer relationships.

Table No.

Seven Factors		
Rank	Percent Position	Garret Score/Value
1st Rank	13.57	72
2nd Rank	27.86	62
3rd Rank	42.14	54
4th Rank	56.43	47
5th Rank	70.71	40
6th Rank	85.00	30
7th Rank	99.29	6

Observation:

The table shows the ranking of seven factors, each associated with a Percent Position and a corresponding Garret Score. The 1st ranked factor, with a Percent Position of 13.57, receives the highest Garret Score of 72, indicating its top significance. As the ranks progress, the Percent Position increases, and the Garret Scores decrease, reflecting a diminishing level of importance. The 2nd ranked factor has a Percent Position of 27.86

with a Garret Score of 62, followed by the 3rd rank at 42.14 with a score of 54. The trend continues with the 4th rank at 56.43 (Garret Score 47), the 5th rank at 70.71 (Garret Score 40), and the 6th rank at 85.00 (Garret Score 30). The 7th and final rank has the highest Percent Position of 99.29 but the lowest Garret Score of 6, indicating its least importance among the factors considered. This ranking system highlights how the perceived value or impact of each factor diminishes as the rank increases.

Table No.

Total score	Average	Rank
2413	40.22	7
2473	41.22	6
2680	44.67	5
2710	45.17	4
2740	45.67	3
2763	46.05	2
2881	48.02	1

Observation:

The data outlines the total scores, averages, and rankings of seven factors, highlighting their relative importance or effectiveness. The factor ranked 1st has the highest total score of **2881** and an average of **48.02**, indicating its superior significance. Following closely, the 2nd ranked factor has a total score of **2763** with an average of **46.05**, and the 3rd ranked factor has a total score of **2740** with an average of **45.67**. As the ranks decrease, so do the total scores and averages. The 4th, 5th, and 6th ranked factors have total scores of **Table No.**

	F1		F2		F3		F4		F5	
1	8	10.72	12	16.08	9	12.06	10	13.40	11	14.74
2	8	8.96	14	15.68	5	5.60	15	16.80	8	8.96
3	12	11.04	8	7.36	13	11.96	7	6.44	10	9.20
4	7	4.76	10	6.80	11	7.48	8	5.44	14	9.52
5	15	2.10	6	0.84	12	1.68	10	1.40	7	0.98
	50	37.58	50	46.76	50	38.78	50	43.48	50	43.40

- F1:** Mobile Shopping Experience
- F2:** Security and Privacy Concerns
- F3:** Online Payment Options
- F4:** Delivery and Return Policies
- F5:** Promotions and Discounts

Observation:

The table ranks five core components of a comprehensive e-marketing strategy that effectively drives customer acquisition, engagement, and retention. Security and Privacy Concerns (F2) stand out as the most critical factor with a GM score of **46.76**, making up **20.7%** of the total score. Delivery and Return Policies (F4) and Promotions and Discounts (F5) follow closely with GM scores of **Table No.**

Five Factors		
Rank	Percent Position	Garret Score/Value
1st Rank	19.00	67
2nd Rank	39.00	56
3rd Rank	59.00	46
4th Rank	79.00	34
5th Rank	99.00	7

Observation:

The table represents that the five factors affecting user preferences in mobile shopping are ranked according to their Garret scores. Mobile Shopping Experience (F1) holds the highest importance with a Garret score of 67 at the 1st rank, indicating it is the most valued factor. Security and Privacy Concerns (F2) follows with a score of 56, **Table No.**

Total score	Average	Rank
1879	37.58	5
2338	46.76	1
1939	38.78	4
2174	43.48	2
2170	43.4	3

2710, 2680, and 2473 with averages of **45.17, 44.67, and 41.22**, respectively. The 7th and lowest-ranked factor has a total score of **2413** with an average of **40.22**, reflecting its lesser importance in comparison to the others. This ranking illustrates a clear hierarchy, with the highest-ranked factors being more impactful.

Ranking 2: What are the core components of a comprehensive e-marketing strategy that effectively drives customer acquisition, engagement, and retention?

43.48 (19.2%) and **43.40** (19.2%), respectively, emphasizing the importance of secure transactions, efficient logistics, and attractive offers in retaining customers. The Mobile Shopping Experience (F1) and Online Payment Options (F3) are also significant, with GM scores of **37.58** (16.6%) and **38.78** (17.2%), though slightly less critical. Overall, this ranking suggests that businesses should prioritize security, delivery efficiency, and promotional strategies while also focusing on enhancing the mobile shopping experience and payment flexibility to build a robust e-marketing strategy.

reflecting its significant, though lesser, importance. Online Payment Options (F3) is ranked 3rd with a score of 46, suggesting it is important but not as critical as the top two factors. Delivery and Return Policies (F4) and Promotions and Discounts (F5) have lower scores of 34 and 7, respectively, ranking 4th and 5th, which highlights their lesser impact on user preferences compared to the other factors.

Observation:

The table provides scores for five entities with their corresponding total scores, averages, and ranks. The entity ranked 1st has the highest average score of 46.76 with a total score of 2338, indicating it performed best overall. The 2nd ranked entity has an average score of 43.48 with a total score of 2174, and the 3rd ranked entity has an average of 43.4 with a total score of 2170, showing close performance. The 4th ranked entity has an average score of 38.78 with a total score of 1939, and the 5th ranked entity, with the lowest average of 37.58, has a total score of 1879. This ranking demonstrates that there is a notable performance difference among the entities, with the top rank showing a clear lead.

Suggestions:

1. Enhanced Personalization: Businesses should leverage data analytics to offer highly personalized experiences to customers, including tailored recommendations and targeted promotions.
2. Improved Transparency: Companies should focus on price transparency and detailed product information to build trust and encourage informed purchase decisions.
3. Strengthening Social Media Presence: Increasing engagement through social media by regularly interacting with customers and providing valuable content can enhance brand loyalty.
4. Optimizing Mobile Experience: Ensuring a seamless mobile shopping experience and offering various online payment options can improve customer satisfaction and retention.
5. Utilizing Customer Feedback: Regularly collecting and analyzing customer reviews and ratings can provide actionable insights for improving products and services.
6. Adaptation to Trends: Businesses should remain agile and adapt their strategies based on evolving digital marketing trends and consumer preferences.

Limitations:

1. Sample Size: The study's findings are based on a limited sample size, which may not fully represent broader consumer behavior trends.
2. Geographic Focus: The research is concentrated in specific regions, potentially limiting the generalizability of the results to other areas or global markets.
3. Data Accuracy: The reliance on self-reported data from surveys may introduce biases or inaccuracies in understanding consumer behavior.
4. Evolving Digital Landscape: The rapidly changing nature of digital marketing tools and platforms may affect the relevance of the findings over time.
5. Cultural Factors: The study may not account for cultural differences in consumer behavior, affecting the applicability of the findings across diverse populations.

Scope:

The scope of this study encompasses the impact of e-marketing on consumer buying behavior, focusing on various digital channels and strategies used to engage and retain customers. The research includes an analysis of factors such as social media influence, personalization, and price transparency, with a specific focus on certain demographic and geographic segments. The study aims to provide actionable insights for businesses to enhance their e-marketing strategies and improve customer relationships.

Conclusion:

The study highlights the critical role of e-marketing in shaping consumer buying behavior. It identifies key strategies, such as price transparency, personalization, and social media engagement, as essential for building and maintaining strong customer relationships. While the study provides valuable insights into effective e-marketing practices, it also acknowledges limitations such as sample size and geographic focus. Businesses can leverage the findings to refine their digital marketing strategies, enhance customer experiences, and stay competitive in a rapidly evolving digital landscape. Future research should address these limitations and explore the impact of emerging technologies and global trends on consumer behavior.

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Critical Analysis of Water Pollution Laws in India

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Abstract:

Water is valuable. It is not simply a purifier, but also more prone and vulnerable to pollution. It possesses an inborn system to filter its own contaminants, but only to a limited extent and only for specific pollutants. Water is one of Nature's most significant components and an essential component of the ecosystem, providing not only for the survival and sustenance of plants, humans, and other beings, but also for the advancement, posterity, and prosperity of the entire planet. Water covers approximately 80% of the earth's surface, which is 50,000 million hectares. This pollution can take various forms, including air, soil, sound, and water. Pollution is a global issue that affects everyone. Pollution in all forms has increased dramatically in recent decades as a result of fast population growth and industrial development. The author of this essay discusses the topic of water contamination in the country as well as the legal framework. In this essay, the author examined the definition, causes, and legal framework for controlling water pollution in India.

Keywords: Water, water pollution, constitution of India, Water laws.

Introduction:

Water pollution is a major concern in India. The substantial drop in the supply of drinkable water around the planet is a perilous situation. There are other types of pollution, but water pollution is of particular significance because it is directly tied to the nation's health and prosperity. Furthermore, agricultural waste, uncontaminated sewage, solid unprocessed waste, and small-scale enterprises are major sources of water contamination. Sewage pollutes the groundwater and surface water that was previously safe to drink. Thus, India's water contamination is rapidly expanding. According to Dr. Bhargava, water pollution is the introduction of chlorine into water, rendering it unfit for a specific application.

Introduction to Water pollution in India

Water pollution is defined as the release of pollutants into water bodies, either indirectly or directly. Pollutants might range from household sewage to organic waste and harmful factory chemicals released into water. However, organic wastes from houses are less damaging than industrial discharges. Furthermore, human-generated organic waste has a significant impact on water quality. Thus, we shall analyze pollution in the Ganga River, India's major freshwater distributor. The Gangotri glacier in the Himalayas is the perennial source of water for the River Ganga. It has religious significance for Hindus in addition to providing a consistent supply of potable water to North India throughout eleven states.

Causes of Water Pollution

1. Industrial Discharges

Industries either directly dump chemicals and waste items into bodies of water or indirectly through drainage systems. Heavy metals, chemicals, and lubricants are among the most significant contaminants. The effects include harm to aquatic life and pollution of drinking water sources.

2. Agricultural Activities

Irrigation, fertilizer and pesticide use, and other agricultural activities can all cause runoff into neighboring bodies of water. Pesticides, phosphates, and nitrates are all major contaminants. Eutrophication, algal blooms, and the extinction of aquatic species are all negative consequences.

3. Domestic Wastewater

Domestic Wastewater Household wastewater comprises a variety of contaminants, including human waste, cleaning chemicals, and medications. Untreated residential wastewater can lead to waterborne illnesses and water contamination.

4. Improper garbage disposal

Improper garbage disposal, such as dumping solid and hazardous trash into bodies of water, can cause water contamination. Plastics, chemicals, and heavy metals are among the most significant contaminants. Plastics are consumed by aquatic creatures, toxicity occurs, and drinking water supplies are contaminated.

5. Atmospheric deposition

Atmospheric deposition is the transfer of contaminants from the atmosphere to aquatic bodies. Acid rain and other airborne pollutants are among the most significant pollutants. Water bodies will become acidic, and drinking water supplies will be contaminated.

6. Oil spills.

Oil spills from ships or offshore drilling rigs can cause considerable water pollution. Major contaminants include oil and chemicals employed in the cleanup. The impacts include the extinction of aquatic species, poisoning of water sources, and the loss of livelihoods for people who rely on these bodies of water.

7. Mining Activities.

Mining activities can pollute water by releasing waste products and runoff from mine sites. Acid mine drainage, sedimentation, and heavy metals are all major pollutants. Contamination of water sources, loss of aquatic life, and habitat damage are all negative consequences.

8. Climate Change.

Climate change can have a substantial impact on water quality due to changed precipitation patterns, rising temperatures, and sea level rise. Changes in water flow, increased fertilizer runoff, and changes in water resource availability are all potential consequences.

Legal Framework in India

Irrigation laws have historically been the most developed area of water law in terms of legislative development. This is partly owing to the colonial government's emphasis on the promotion of big irrigation projects. This included the necessity to establish a regulatory framework in this area. As a result, some of the fundamental elements of Indian water law are inherited from irrigation acts. For example, in Northern India, the early Northern India Canal and Drainage Act of 1873 attempted to govern irrigation, navigation, and drainage.

One of the long-term effects of this legislation was the establishment of the government's power to use and manage water from all rivers and streams running via natural channels, as well as all lakes, for public reasons. The 1873 Act rejected to assert the state's ownership over surface waters. This Act, on the other hand, is significant because it affirms the government's power to regulate water use for the benefit of the general public. This has been increasingly reinforced. Thus, the Madhya Pradesh Irrigation Act of 1931 went considerably farther and emphasized the state's direct sovereignty over water: "All rights in the water of any river, natural stream, natural drainage channel, natural lake, or other natural collection of water will belong in the Government."

Colonial law is significant in this area, as acts such as the MP Act of 1931 are still in effect. Furthermore, the 1949 Waters Regulation confirmed in the MP that the government retains all rights to water from any natural source of supply. The far more recent Bihar Irrigation Act of 1997 states that the government retains all rights to surface water. Water legislation is primarily reliant on the state. This is owing to the constitutional

framework, which has granted states the authority to regulate in this area since the Government of India Act of 1935. States have the unique ability to manage water supplies, irrigation and canals, drainage and reservoirs, water

However, there are limitations to the utilization of interstate rivers. Furthermore, the Union has the authority to legislate on specific topics. These include national waterways shipping and navigation, as well as authority to manage tidal and territorial seas. The Constitution also states that the Union may legislate to resolve interstate water problems. Although no substantive sections could be added to the Constitution at the time of its adoption, the Inter

State Water Disputes Act was passed in 1956. This establishes a procedure for resolving interstate river disputes

that have not been settled through negotiation. It establishes specific tribunals to resolve such disagreements and has been used in a number of cases.

Parliament also passed the River Boards Act, which establishes a framework for the central government to create river boards to advise the state government on the regulation or development of an interstate river or river valley. River boards can advise governments on a variety of topics, including water resource conservation, control, and optimum use, as well as the promotion and operation of irrigation, water supply, and drainage schemes, and flood control programs. However, this act was never put into operation.

While the constitutional framework limits the central government's role in water control, some places have already recognized the need of national water regulation. In 1974, Parliament passed the Water Act, which addressed water contamination. This act intends to prevent and regulate water pollution, as well as preserve and restore the health of the water. It empowers water boards to develop pollution prevention and control rules and regulations.

In addition to statutory frameworks, India maintains a number of common law principles relating to water and land rights. These include distinct standards for groundwater and surface water. Existing surface water rules continue to be founded on the early common rule of riparian rights. The essential concept was that riparian owners had the same right to use the water of a stream that flowed past their land as other riparian owners, such that the water came to them in the same flow, quantity, and quality.

While the courts recognize an unambiguous fundamental right to water, policies and measures to achieve it have not moved as far. Water law encompasses a variety of additional rules and regulations that directly or indirectly affect water.

One example is dams. Two important parts of dam building are governed by laws and regulations that only partly address water. The Environmental Impact Assessment Notification establishes a framework for evaluating the environmental implications of proposed big hydropower and irrigation projects.

Since 1985, the River Valley Projects Guidelines for Environmental Impact Assessment have provided a broad framework for assessing the implications of prospective big dam projects. The Land Acquisition Act of 1894 remains the fundamental act in terms of displacement. This colonial legislation, enacted with the colonial authority's interests in mind rather than those of displaced people, grants the government extremely limited rights and significant control over the eviction process.

Water Law Reforms

There have also been progressive requests for improvements to water-related laws and policies. This is due to two major considerations. First, water law and policy framework have received little attention for a long period. Although various water-related regulations have been enacted throughout the years, nothing has been done to establish a more comprehensive integrated water framework. Second, the recognition that most countries around the world are experiencing a water crisis and that availability and access to freshwater will be a challenge for almost all countries in the coming decades has resulted in a number of international initiatives in most developing countries to reform water governance, law, and policy. In other words, both domestic and international concerns have influenced current water law and policy developments.

Reforms in the water sector have been proposed to address declining availability per capita, increasing water quality issues, and increased competition for control, access, and use of available freshwater. They want a complete reform of water sector governance. In particular, the present changes aim to reduce the role of the public sector while emphasizing people's direct contributions to their water requirements and private sector participation. These governance improvements are founded on a set of principles that guide the reform process. This section emphasizes some of the major concepts that govern the changes, as well as the sorts of measures

Conclusion

Water pollution is a complex problem with numerous causes and consequences. Understanding

the key causes of water contamination and their origins allows us to prevent and mitigate its effects. This involves decreasing our use of hazardous chemicals, correctly disposing of waste, and adopting efficient wastewater treatment methods. Individuals can also help conserve our water resources by implementing more sustainable activities and supporting policies that prioritize clean water for all.

While water law improvements are welcome given existing water challenges, it is unclear that reforms based on the concepts established in water sector reforms can provide an adequate solution. Although ongoing water law reforms may help enhance water management, they are theoretically incapable of addressing water's human, social, environmental, and health components. This is sad because any water law that is not based on the constitutional right to water and the idea of public trust is certain to fail as a legal tool and in terms of implementation among the vast mass of people.

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Green House Effect

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Abstract:

The greenhouse effect is a crucial natural phenomenon that controls the temperature of the Earth and makes it possible for life to exist. Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and water vapor are all greenhouse gases (GHGs) that contribute to this process by trapping heat in the Earth's atmosphere. Because of these gases, sunlight can freely enter the atmosphere, where it is absorbed by the Earth's surface and re-emitted as heat in the form of infrared radiation. This infrared radiation is absorbed by greenhouse gases, which then re-radiate it in all directions, including back toward the Earth's surface, warming the planet. Despite the fact that the greenhouse effect is necessary for sustaining a climate that is suitable for human use, human activities have significantly increased the atmospheric concentration of greenhouse gases, resulting in an enhanced greenhouse effect and warming of the planet. The use of fossil fuels, deforestation, industrial processes, and agricultural practices are all major contributors to this rise. The resultant climb in worldwide temperatures significantly affects normal biological systems and human social orders, appearing in additional successive and serious climate occasions, rising ocean levels, and disturbances to food and water supplies. The mechanisms of the greenhouse effect, its role in climate regulation, and the effects of its intensification due to human activities are examined in this abstract. Strategies for mitigating and adapting to the effects of climate change require an understanding of these dynamics. While adaptation involves preparing for and managing the unavoidable effects of a changing climate, effective mitigation requires reducing greenhouse gas emissions through sustainable practices, the adoption of renewable energy, and conservation efforts. In the face of the growing climate crisis, this dual approach is essential for preserving environmental stability and human well-being.

Introduction:

The greenhouse effect is a fundamental natural process that controls the Earth's climate in a big way. Without it, the planet would be excessively cold to support life as far as we might be concerned. This peculiarity includes the catching of intensity inside the World's climate, basically by ozone harming substances (GHGs) like carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and water fume. These gases not only allow sunlight to enter the atmosphere and warm the surface of the Earth, but they also absorb and reemit infrared radiation, preventing some of this heat from returning to space. Throughout the last hundred years, human exercises have altogether adjusted the regular equilibrium of the nursery impact. The Industrial Revolution marked the beginning of a dramatic increase in fossil fuel burning, which resulted in elevated atmospheric concentrations of CO₂ and other greenhouse gases. GHG concentrations have also increased as a result of activities like intensive agriculture, deforestation, and industrial processes. A major contributor to

climate change and global warming is this increase in the greenhouse effect, also known as the enhanced greenhouse effect.

A stronger greenhouse effect has profound and far-reaching effects. The polar ice caps are melting, sea levels are rising, and extreme weather events like hurricanes, droughts, and heatwaves are becoming more frequent and more severe as a result of rising global temperatures. These progressions present huge dangers to normal biological systems, biodiversity, and human social orders. Changes in weather patterns, habitat loss, and strains on food and water supplies all have an impact on human health, economic stability, and safety. For addressing the challenges posed by climate change, it is essential to comprehend the greenhouse effect and its implications. Understanding not only the scientific principles that underlie the greenhouse effect but also the human activities that exacerbate it is necessary for this. Compelling techniques to relieve environmental change require a deliberate work to diminish GHG discharges, progress to environmentally friendly power sources, and carry

out maintainable land-use rehearses. In addition, in order to prepare for and manage the unavoidable effects of a warming climate, adaptation measures are essential.

An in-depth look at the greenhouse effect, its natural mechanisms, the anthropogenic factors that have increased its intensity, and the urgent need for strategies to mitigate and adapt are laid out in this introduction. One of the most pressing environmental issues of our time is addressing the greenhouse effect and its effects, which necessitates immediate and ongoing global and local action.

Objective:

The greenhouse effect, its mechanisms, and the significant role it plays in regulating Earth's climate are the primary focus of this research. Additionally, the research aims to investigate how human activities contribute to the intensification of the greenhouse effect and its implications for climate change and global warming. The following are, in particular, the goals of this study:

1. To Explain the Mechanisms of the Greenhouse Effect:

Describe in detail the natural processes that cause the greenhouse effect. Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and water vapor are just a few of the major greenhouse gases (GHGs) that are involved. Identify and explain them. Delineate how these gases trap heat inside the World's climate and add to the warming of the planet.

2. To Analyze the Historical Context and Current Trends in Greenhouse Gas Concentrations:

Analyze verifiable information on ozone harming substance focuses in the climate. Examine the significant wellsprings of these gases, zeroing in on both normal and anthropogenic starting points. Examine the current patterns of emissions of greenhouse gases and their implications for the climate conditions of the future.

3. To Assess the Impact of Human Activities on the Greenhouse Effect:

Examine the factors that contribute to the rise in GHG concentrations, such as agriculture, industrialization, deforestation, and other human activities.

Analyze how the greenhouse effect is exacerbated by industrial processes, land use changes, and combustion of fossil fuels. Discuss the idea of the increased greenhouse effect and how it directly relates to climate change.

4. To Examine the Consequences of the Intensified Greenhouse Effect:

Investigate the effects of climate change on natural ecosystems, such as the melting of polar ice, rising sea levels, and shifts in weather patterns. Examine the socioeconomic effects of climate change, such as threats to human health, economic stability, and the availability of food and water. Feature explicit

instances of outrageous climate occasions and their associations with the improved nursery impact.

5. To Identify Mitigation Strategies to Reduce Greenhouse Gas Emissions:

Examine the current global, national, and local initiatives and policies aimed at lowering greenhouse gas emissions. Investigate new technologies and eco-friendly methods that can aid in mitigating the effects of the greenhouse effect. Talk about the job of environmentally friendly power sources, energy proficiency measures, and protection endeavors in decreasing discharges.

6. To Discuss Adaptation Measures to Cope with Climate Change Impacts:

Determine methods for coping with the inevitable effects of climate change. Discuss the significance of community-based adaptation strategies, sustainable agriculture, and resilient infrastructure. To improve climate resilience, emphasize the need for integrated planning and policymaking.

7. To Foster Awareness and Encourage Action:

Advance attention to the nursery impact and its suggestions among different partners, including policymakers, organizations, and the overall population. Through education, advocacy, and community involvement, encourage proactive measures to address climate change.

This study aims to contribute to a comprehensive understanding of the greenhouse effect and its crucial significance in the context of global climate change in order to achieve these goals. The knowledge gained can be used to develop efficient strategies for mitigation and adaptation, thereby assisting efforts to safeguard the environment and ensure a sustainable future for future generations.

Literature Review:

The nursery impact, a characteristic peculiarity fundamental for keeping up with life-supporting temperatures on The planet, has been broadly concentrated on with regards to environmental change. Key research findings on the mechanisms of the greenhouse effect, the role of greenhouse gases, the impact of human activities, and the consequences for global climate systems are compiled in this literature review.

Mechanisms of the Greenhouse Effect

The absorption and re-emission of infrared radiation by greenhouse gases in the Earth's atmosphere is what causes the greenhouse effect. The foundation for comprehending this process was laid by Arrhenius (1896) and Fourier (1824)'s foundational studies. The warming effect of CO₂ was first quantified by Arrhenius, and the atmospheric phenomenon was first described by Fourier. The role of greenhouse gases in capturing heat and their radiative properties in subsequent studies (Lacis et al., 2010).

Key Greenhouse Gases:

The greenhouse effect is dependent on greenhouse gases like CO₂, CH₄, N₂O, and water vapor. The Intergovernmental Panel on Climate Change (IPCC, 2021) examines how these gases contribute to global warming. The most significant source of CO₂ is combustion of fossil fuels, with CH₄ and N₂O coming from agricultural and industrial processes being more potent gases with greater potential to cause global warming. Since pre-industrial times, CO₂ levels have increased by more than 45 percent, according to studies (IPCC, 2021). The Falling Bend (Falling, 1960) gives a persistent record of air CO₂, showing an unmistakable vertical pattern. Myhre et al., found that, despite its lower abundance, CH₄ is 28-36 times more efficient than CO₂ over a 100-year period. (2013). Sources incorporate farming; squander the executives, and petroleum product extraction. Most agricultural activities release N₂O, which has a potential to cause global warming that is 298 times greater than that of CO₂ over a 100-year period (Davidson, 2009). According to Hold & Soden (2000), water vapor functions as a feedback mechanism that intensifies the effects of other greenhouse gases.

Human Activities and the Enhanced Greenhouse Effect:

The greenhouse effect has been significantly exacerbated by human activities. The atmospheric concentration of greenhouse gases has increased as a result of the burning of fossil fuels, deforestation, and industrial processes (IPCC, 2021). Research by Hansen et al. (1988) was one of the first to draw attention to the warming trend caused by human activity. Concentrates on show that petroleum derivative burning is the biggest wellspring of CO₂ emanations (Olivier and Peters, 2020). The Global Carbon Project's (Friedlingstein et al.) efforts to quantify emissions (2020), emphasize the scope of the difficulty. According to research, deforestation significantly contributes to CO₂ emissions, with tropical deforestation alone accounting for 10 to 15 percent of global emissions (Baccini et al., 2012). CH₄ and N₂O emissions come primarily from agricultural activities. The primary sources of N₂O are fertilizer use and enteric fermentation in livestock and rice paddies (Smith et al., 2007).

Consequences of an Intensified Greenhouse Effect:

The improved nursery impact prompts an Earth-wide temperature boost and environmental change, with huge ecological, monetary, and social effects. The IPCC's 2021 assessment of these effects is comprehensive. Research shows a worldwide temperature increment of roughly 1.1°C since the late nineteenth century. Studies foresee further increments, with potential serious effects. Ocean Level Ascent: Sea levels are rising as a result of the

melting of polar ice caps and the thermal expansion of seawater. Extreme Weather Events: Research projects a rise of 0.19 meters over the past century and up to 1 meter by 2100. Global warming is linked to an increase in the frequency and severity of extreme weather events like hurricanes, droughts, and heatwaves. Emanuel and others' studies highlight these trends.

Mitigation and Adaptation Strategies:

Strategies for both mitigation and adaptation are needed to deal with the greenhouse effect. Policy changes, technological advancements, and community-based initiatives are all subjects of research. According to Pacala & Socolow (2004), studies emphasize the necessity of reducing greenhouse gas emissions through the adoption of renewable energy, energy efficiency, and reforestation. Research emphasizes the significance of adapting to unavoidable climate impacts through resilient infrastructure, sustainable agriculture, and disaster risk reduction. Examples of international agreements include the Paris Agreement.

Future Research Directions:

The improvement of climate models, comprehension of feedback mechanisms, and investigation of the socioeconomic effects of climate change should be the primary focuses of future research. Interdisciplinary methodologies are fundamental for far reaching arrangements.

History Of Greenhouse Gases:

The presence of the nursery impact was contended for by Joseph Fourier in 1824. Claude Pouillet's arguments and evidence were further bolstered in 1827 and 1838, and John Tyndall reasoned from experimental observations in 1859. In 1896, Svante Arrhenius provided a more comprehensive measurement of the effect. However, none of these scientists used the term "greenhouse" to describe the effect; In 1901, Nils Gustaf Ekholm was the first person to use the term in this way. In 1917 Alexander Graham Chime composed. "The net result is the greenhouse becomes a sort of hot-house," and "The unchecked burning of fossil fuels] would have a kind of greenhouse effect." Bell went on to call for using renewable energy sources like solar power.

Global Warming:

Because an increase in the concentration of greenhouse gases results in a decrease in the outgoing infrared radiation, the Earth's climate needs to change in some way to restore the equilibrium between incoming and outgoing radiation. This "climatic change" will incorporate a "an Earth-wide temperature boost" of the World's surface and the lower air as heating up is the least complex way for the environment to dispose of the additional energy. In any case, a little climb in temperature will prompt numerous different changes, for instance, overcast cover and wind designs. In their third assessment report, the

"Intergovernmental Panel on Climate Change" predicted that the global mean surface temperature would rise by 1.4°C to 5.8°C by 2100. Some of these changes might make the warming worse, while others might make it better. Aerosols, which are known to cool the climate, and oceans, which have a large thermal capacity, are taken into account in this projection. However, there are numerous uncertainties in this projection, such as the magnitude of the ocean delay, climate feedbacks, and future greenhouse gas emission rates.

Reduction and Control Measures of Greenhouse Gases:

Because the majority of the problem is global and no single nation or group of nations can provide its own solution, reducing greenhouse gas emissions is essential to all nations. In the community of global atmospheric sanity, international and regional cooperation is more sought after and has received strong support. In regard to this battle, Joined Countries System Show on Environmental Change as of late happened to manage the worldwide environment issue. In order to reduce the potentially harmful concentration of anthropogenic greenhouse gases in the atmosphere, this was carried out through the formation of an international agreement involving a number of nations from various regions.

What is the Greenhouse Effect?:

A house made of glass that can be used to grow plants is called a greenhouse. The greenhouse's plants and air are warmed by the sun's rays. The greenhouse is heated by the heat that is trapped inside and cannot escape, which is necessary for the growth of the plants. Same is the situation in the world's climate. The earth's atmosphere is heated by the sun during the day. The heat is reflected back into the atmosphere at night as the earth cools. The earth's atmosphere's greenhouse gases absorb the heat during this process. This is what allows living things to survive on Earth and makes the surface of the planet warmer. However, the earth's temperature has significantly increased as a result of elevated levels of greenhouse gases. This has prompted a few exceptional impacts.

Causes of Greenhouse Effect: The greenhouse effect is primarily caused by:

Burning of Fossil Fuels:

Our lives are significantly influenced by fossil fuels. They are frequently used for transportation and electricity generation. CO₂ is released when fossil fuels are burned. The use of fossil fuels has increased as the population has grown. As a result, more greenhouse gases are being released into the atmosphere.

Deforestation:

Plants and trees take in carbon dioxide and delivery oxygen. The removal of trees results in a significant rise in greenhouse gases, which in turn raise the temperature of the planet.

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Farming:

One of the factors that contribute to the atmosphere's greenhouse effect is the nitrous oxide found in fertilizers.

Industrial Waste and Landfills:

The factories and industries release harmful gases into the atmosphere. Additionally, landfills release methane and carbon dioxide, which contribute to the increase in greenhouse gases.

Smog and Air Pollution

Brown haze is framed by the mix of smoke and mist. It can be brought on by both natural and man-made actions. Smog is typically produced by the accumulation of additional greenhouse gases like sulfur dioxide and nitrogen oxides. Automobile and industrial emissions, agricultural fires, natural forest fires, and the interactions between these chemicals are the primary causes of smog.

Acidification of Water Bodies

Expansion in the aggregate sum of ozone depleting substances in the air has turned the greater part of the world's water bodies acidic. Acid rain forms as a result of the greenhouse gases combining with the rainwater. This prompts the fermentation of water bodies. Additionally, the contaminants that are carried in the rainwater end up in the rivers, streams, and lakes, resulting in their acidification.

Runaway Greenhouse Effect:

When a planet takes in more radiation than it can give back, this happens. As a result, less heat is lost by the earth's surface, and the planet's temperature continues to rise. This phenomenon is thought to have occurred on Venus' surface billions of years ago, according to scientists.

This phenomenon is believed to have occurred in the following manner:

- When a planet's temperature reaches the boiling point of water, it causes a runaway greenhouse effect. Accordingly, all the water from the seas changes over into water fume, which traps more intensity coming from the sun and further expands the planet's temperature. This at last speeds up the nursery impact. Another name for this is the "positive feedback loop."
- A different scenario could result in the greenhouse effect expanding beyond control. Let's say that the temperature rise caused by the aforementioned factors reaches a point where chemical reactions begin. Carbon dioxide is pushed from the rocks into the atmosphere by these chemical reactions. The runaway greenhouse effect would result as a result of this heating the planet's surface and further accelerating the transfer of carbon dioxide from the rocks to the atmosphere.

Simply put, an increase in the greenhouse effect causes a runaway greenhouse effect, which would raise Earth's temperature to the point where there would be no more life in the near future.

Advantages and Disadvantages of the Greenhouse Effect

Advantages

1. Essential for Life on Earth: Regulation of Temperature The Earth's surface stays warm enough for life to thrive through the natural greenhouse effect. Without it, the typical surface temperature would be about - 18°C (0°F), making the planet dreadful (Lacis et al., 2010).

2. Stabilization of Climate: Moderate Temperature Variations The greenhouse effect contributes to the stabilization of daytime and nighttime temperature variations, resulting in a climate that is more stable and favorable to diverse ecosystems.

3. Agricultural Productivity: Enhanced Conditions for Growth: Certain ozone harming substances, similar to CO₂, can upgrade plant development by expanding photosynthesis, possibly working on farming efficiency under controlled conditions (Ainsworth and Long, 2005).

4. Water Vapor and the Hydrological Cycle: Aid to the Hydrological Cycle: According to Hold & Soden (2000), water vapor, a significant greenhouse gas, is essential to the hydrological cycle because it influences the patterns of precipitation and the availability of freshwater resources.

Disadvantages

1. Global Warming and Climate Change: a rise in temperature: Global warming is caused by the increased greenhouse effect caused by increased levels of GHGs produced by humans. Since the late 19th century, this has led to an average temperature rise of 1.1°C (IPCC, 2021). Extreme Conditions: Global warming is linked to an increase in the frequency and severity of extreme weather events like hurricanes, droughts, and heatwaves (IPCC, 2021).

2. Sea-Level Rise: Polar Ice Caps Melting: Sea levels are rising as a result of melting polar ice caps and glaciers as a result of rising global temperatures. This poses a threat to ecosystems and coastal communities (Oppenheimer et al., 2019).

3. Ocean Acidification: Influence on Marine Life: Ocean acidification is brought on by higher concentrations of dissolved CO₂ as a result of elevated CO₂ levels. This has a negative impact on marine life, particularly on organisms with skeletons and shells made of calcium carbonate (Orr et al., 2005).

4. Ecosystem Disruption: Loss of biodiversity: Temperature and precipitation patterns alter ecosystems and biodiversity, resulting in species extinction and habitat loss (Bellard et al., 2012).

5. Human Health Risks: Diseases Caused by the Heat: Heat-related illnesses and deaths are more likely to occur at higher temperatures, especially in vulnerable populations (Watts et al., 2018). Vector-Borne Infections: According to Githeko et al., climate change has the potential to broaden the range of vector-borne diseases like dengue fever and malaria, posing significant threats to public health. (2000).

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6. Agricultural Challenges: Crop Yields: While CO₂ can upgrade plant development, the general effect of environmental change on farming is negative. Expanded temperatures, changing precipitation examples, and outrageous climate occasions can lessen crop yields and food security (Doorman et al., 2014).

7. Economic Costs: Recovery from a Disaster: Response to and recovery from climate-related disasters incur significant financial costs. Damage to infrastructure, high healthcare costs, and the loss of livelihoods are all examples of this (Stern, 2007).

8. Social and Political Stability: Conflict and Migration: Environmental change-incited asset shortage can prompt constrained movement and struggle over assets, sabotaging social and political solidness (Barnett and Adger, 2007).

The Natural Greenhouse Effect

The Earth's temperature stays within a range that is safe for life to exist thanks to the natural greenhouse effect, a crucial atmospheric process. The natural greenhouse effect's mechanisms, the role of greenhouse gases, and the process's overall significance in climate regulation are discussed in depth in this section. Certain gases in the Earth's atmosphere absorb and re-emit infrared radiation, which is how the greenhouse effect works. The process is described in detail below: The Sun releases energy in the form of sunlight that reaches Earth's atmosphere. Roughly 30% of this sun oriented radiation is reflected once again into space by mists, climatic particles, and intelligent surfaces like ice and snow (albedo impact). Earth is heated by the remaining 70% of solar radiation that is absorbed by the surface. The reabsorbed energy is then released as heat in the form of infrared radiation. Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and water vapor (H₂O) are examples of greenhouse gases (GHGs) that absorb a significant amount of the infrared radiation emitted by the Earth's surface. Greenhouse gases re-emit energy in all directions, including back toward the surface of the Earth, after absorbing infrared radiation. The planet warms as a result of this process, which stores heat in the atmosphere.

The regular nursery impact is a major barometrical cycle that keeps the World's environment inside a livable reach. To appreciate the delicate balance that sustains life on our planet, it is essential to comprehend its mechanisms and the function of greenhouse gases. However, the fact that human activities have upset this equilibrium emphasizes the need to reduce the increased greenhouse effect in order to avoid negative effects of climate change. The increased greenhouse effect caused by human activities poses significant challenges, despite the fact that the natural greenhouse effect is necessary for maintaining temperatures that support life on Earth. The

disadvantages of intensifying the natural greenhouse effect outweigh the benefits, highlighting the urgent need for strategies to mitigate and adapt to the effects of global warming and climate change. The writing on the nursery impact highlights its basic job in environment guideline and the significant effect of human exercises on this normal cycle. For effective strategies to mitigate and adapt to the effects of an intensified greenhouse effect, ongoing research is essential.

Greenhouse Gases:

The greenhouse effect, which causes the Earth's surface to warm, is caused by gases in the atmosphere that absorb and emit infrared radiation. The characteristics, sources, and effects of the primary greenhouse gases are examined in depth in this section: water vapor (H₂O), nitrous oxide (N₂O), carbon dioxide (CO₂), methane (CH₄), and other significant greenhouse gases. Volcanic eruptions, plant and animal respiration, and the breakdown of organic matter are all examples of respiration. Deforestation, the use of fossil fuels like coal, oil, and natural gas for transportation and energy, and some industrial processes like making cement. Water fume is the most plentiful ozone depleting substance and assumes a huge part in the normal nursery impact. By increasing in concentration as the atmosphere warms, water vapor amplifies the effects of other greenhouse gases, creating a positive feedback loop. A significant portion of the natural greenhouse effect is caused by it. The natural greenhouse effect, which controls Earth's climate, relies heavily on greenhouse gases. However, the concentrations of these gases have significantly increased as a result of human activity, enhancing the greenhouse effect and causing climate change and warming around the world. Grasping the qualities, sources, and effects of ozone harming substances is fundamental for creating compelling methodologies to moderate their emanations and address environmental change.

The Effects of Global Warming: Greenhouse Effect:

The environment, human health, and socioeconomic systems all suffer as a result of global warming, which is caused by the enhanced greenhouse effect caused by increased concentrations of greenhouse gases (GHGs) from human activities. The main effects of global warming are described in this section. The frequency, duration, and intensity of heatwaves have increased, posing significant health risks, particularly to vulnerable populations such as the elderly and children. The polar ice caps in the Arctic and Antarctic are melting at an accelerated rate, contributing to rising sea levels. Since the late 19th century, the global average temperature has increased by approximately 1.1°C. Projections suggest further increases if GHG emissions continue unabated. As ocean temperatures rise, seawater

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expands, contributing to rising sea levels, and thawing permafrost releases stored methane and carbon dioxide, further accelerating global warming in a positive feedback loop. Glaciers are also retreating worldwide, affecting the availability of freshwater for millions of people. Sea level rise is caused by the addition of meltwater from glaciers and ice sheets. Depending on emission scenarios, current projections predict a sea level rise of 0.3 to 1 meter by 2100. Rising sea levels cause coastal erosion, more flooding, and the loss of habitat for humans and wildlife. Low-lying regions and little island countries are especially weak. An unnatural weather change is connected to an expansion in the recurrence and force of outrageous climate occasions, including storms, hurricanes, dry spells, and weighty precipitation. Hotter temperatures increment dissipation rates, prompting more continuous and serious dry seasons, which effect water supply, agribusiness, and environments. Expanded barometrical dampness content because of higher temperatures prompts more extreme precipitation occasions, causing flooding and soil disintegration. Expanded assimilation of intensity by the seas prompts changes in marine biological systems, influencing fish populaces and coral reefs. More elevated levels of CO₂ in the air lead to expanded CO₂ retention by seas, bringing about fermentation. This affects marine life, particularly those with skeletons and shells made of calcium carbonate. The impacts of a worldwide temperature alteration driven by the improved nursery impact are significant and boundless, influencing regular frameworks, human wellbeing, and financial designs. To meet these challenges, immediate and ongoing efforts must be made to reduce greenhouse gas emissions, adapt to unavoidable changes, and build community and ecosystem resilience.

Discussion:

The nursery impact is the cycle through which intensity is caught close to Earth's surface by substances known as 'ozone harming substances.' Envision these gases as a comfortable cover encompassing our planet, assisting with keeping a hotter temperature than it would have in any case. Carbon dioxide, methane, ozone, nitrous oxide, chlorofluorocarbons, and water vapor are all examples of greenhouse gases. Water fume, which responds to temperature changes, is alluded to as a 'input', since it enhances the impact of powers that at first caused the warming. To be affecting the climate on a global scale in a negative way. The physical and biological effects, potential costs to society, and likely costs of abatement are briefly reviewed in this paper. For a "thinking pessimistically" situation it is difficult to survey, in financial terms, the full scope of conceivable non-straight synergistic impacts. However, it appears likely that the effects will be within the "affordable" range in the "most

favorable" (though not necessarily "likely") case of slow-paced climate change, at least in the world's industrialized nations. In the "third world" the idea of moderateness is of suspicious importance, making the issue of quantitative assessment exceedingly difficult.

Conclusion:

This study has demonstrated that emissions from power generation and energy use have been linked to the potential to influence greenhouse gases, which are the main cause of global warming. In point of fact, human-caused greenhouse gas emissions from energy activities surpass those from other human activities. In essence, the study also argued that reducing greenhouse gas emissions strategically is necessary to preserve the global environmental distinction for sustainable development and biodiversity interaction. Last but not least, it argued in favor of expanding use of renewable energy sources to address issues of energy security, energy management, and health. Any material that can reflect sunlight is used to build a greenhouse, usually glass or plastic. It mostly warms up because the sun warms the ground and the things inside the greenhouse, which in turn warm the air inside. In contrast to the outside environment, the greenhouse confines the air, which continues to heat.

Climatologist trust that rising environmental convergence of carbon dioxide and other "nursery gasses" delivered by human exercises, like consuming of non-renewable energy sources and deforestation, are warming the Earth. The system is usually known as the "nursery impact" makes the Earth livable. The atmosphere's gasses act like greenhouse glass, allowing sunlight to enter while preventing heat loss. However, the accumulation of greenhouse gases like carbon dioxide, methane, and nitrous oxide has altered the chemical composition of the atmosphere. This rise in temperature was vehemently argued to be generally triggered by the emission of carbon based compounds from the consumption of fossil fuels for power generation. This rise in temperature was vehemently argued to be generally triggered by the emission of carbon based compounds from fossil fuels. Carbon dioxide, methane, and nitrous oxide concentrations are all known to be rising, and their greenhouse gases, primarily chlorofluorocarbons (CFCs), have been significantly added to the atmosphere in recent years.

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Fault Detection in network layer protocol

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Abstract:

Certain failures are easy to detect with the flooding scheme described in this paper. Others are not. This section will discuss which sorts of errors can be automatically diagnosed and reported, so that a network manager can then investigate the problem.

Keywords: Trusted node, Public Key List packets, Data ACK, PKL ACK, Data Packets, PktSize, ClkTol

Introduction

1. Faulty Trusted Nodes.

Since the task of a “trusted node” is to generate a Public Key List Packets with the latest information, failure of a “trusted node” can only consist of one of the following:

1. Failing to send any Public Key List packet.
2. Having its Public Key List packets with highest sequence number contain incorrect information.
3. It can contain too many nodes(more than N)
4. It can leave out nodes.
5. It can contain correct nodes.
6. It can contain correct nodes with incorrect public keys.

Symptoms of such failures do not necessarily prove failure of the “trusted node”, since the same symptoms can also from other causes. However as long as these symptoms can be detected by at least one non-faulty node, they can be reported and investigated.

Including Too Many Nodes in PKL

If T’s latest (one with highest sequence number) Public Key List Packets contains M nodes, then any node V with parameter N set such that $N < M$ will detect and report the problem. “the problem”, in this case can be either that T is faulty, or that V’s parameter N is set incorrectly.

Omitting nodes or Reporting Incorrect Keys

If T’s latest Public Key List Packets leaves out node V, or reports V With an incorrect public key, then if V receives T’s Public Key List Packets, V will detect and report the problem. T’s latest Public Key List Packets will reach v if a path of non-faulty nodes connect T with V, and there is no other validly signed Public Key List Packets from V with the same sequence number.

Inclusion of Nonexistent Nodes

If T’s PKL contains incorrect nodes, but its report also contain all the non-faulty nodes, together with correct keys for them, this

problem will not be automatically detected by the network, unless a comparison is made between T’s PKL and the PKL issued by a different “trusted node”. However, as long as T’s PKL is correct regarding the non-faulty network nodes, the inclusion of incorrect nodes will not interfere with the correct functioning of the Network Layer.

1.1 Faulty Forwarding Nodes

Detection of faulty forwarding nodes is not easy with our scheme. The very robustness of our scheme is somewhat of a disadvantages because a problem will not be detected unless no non-faulty path exist between source and destination. For instance, if several paths exist between S and D, but failure have occurred along some of those paths, it would be desirable to detect and report the problem so that those paths can be repaired, even though they are not needed at the time. It is undesirable to detect failure only after all paths have failed, and the network is no longer operating.

Let us assume the following conditions in the network:

1. At least one non-faulty path exists between all pairs of non-faulty nodes in our network.
2. Some number of faulty forwarding nodes exists, that fall to forward packets, but do acknowledge them correctly when received from a neighbor.

This situation cannot be detected with our scheme. Every non-faulty node will successfully receive the packet with largest sequence number from every other node, and no hint of trouble will be evidenced by the state of the “Send-Flag” and “Ack-Flag” on each packet.

It is only when all non-faulty paths fall that any evidence exists that there is a problem evidence by some non-faulty not receiving the latest packet from some source. This situation cannot be detected automatically by the Network Layer with our

scheme, since nodes do not know whether later packets exist, unless they receive them. However, the upper layer protocol can inform the Network Layer when it fails to get acknowledgement to its packets launched to a destination node.

In this case (when no non-faulty route exists), node by node query can determine which nodes have received the latest packet from a particular source/key pair, which will allow a network manager to have good idea of which nodes have failed. This manual query assumes that the network manager knows the topology of the network. With our scheme, the Network Layer is not aware of the identity of neighbors, so a node by node query done without knowledge of the topology will just yield a list of nodes reporting they have seen the latest sequence number, and list of nodes reporting they have not. Without knowledge of the topology, this information does not narrow down the candidate failing nodes at all – any node on either list can be either faulty or non-faulty.

2. Variant

2.1 Multiple Outstanding Packets

The above design assumes S will not generate a packet with sequence number $k+1$ until its packet with sequence number k has been delivered. If S fails to follow this rule, and instead issues two packets in rapid succession, its second packet may overtake its first packet, and the older packet will be dropped before delivery.

Note however, that there might be slow paths in the network, in addition to fast paths. If the source issues packet $k+1$ after packet k has been successfully delivered over the fastest path in the network, but while k still in transit over slower paths, $k+1$ may overtake k over some of the slower paths, causing no ill effect (in fact, causing the positive effect of limiting some redundant traffic).

Unfortunately, the source has no way of knowing when at least one copy of its packet has been successfully delivered to the destination. It can learn of that fact in approximately twice the time, since the destination can send an acknowledgement. If the source wishes to maximize its throughput, therefore, it must estimate the time of delivery. If the source issues packets too quickly, some of its packets may get lost due to being overtaken by packets with higher sequence number. But since the Network Layer is assumed to be a datagram service this is in fact legal.

A modification to our algorithm allows safer “pipelining” of packets. (Pipelining” is allowing multiple packets from the same source/key pair to be in transit simultaneously.) The modification is to require nodes to keep, instead of a single buffer per source (and per key), m buffers per source/key pair, where m is the number of packets desired in the pipeline. If the largest sequence number seen so far by node B from source/key pair

S/p is k , then node b keeps any packets with sequence numbers between $km+1$ and k with source/key pair S/p .

2.2 Less Persistent Data Packet Flooding.

It is not essential that a node B reacquire the database of data packets received prior to its own simple failure. Most likely, these packets have already reached their destinations, or (if the only path to the destination was through b , which was down at the time), the packets are so old that upper layers no longer need them. In fact, it is usually preferable, from the point of view of the higher layer protocols, that very old data packets do not get delivered. Public Key List packets are different, since it is essential that every node store the most recently issued PKL from each trusted node. The “persistent” design is necessary for PKLs.

In the design above, we used the same mechanism for distribution data packets and PKL packets. Since the design is overly reliable for data packets, it could be modified to be less “persistent” in the case of data packets.

The modification consists of not modifying “Send-Flag” for neighbor W on all data packets, when receiving a Restart Notification message from W . As a result, recovering node W does not receive old data packets that it had acknowledged prior to its own failure. The only case in which an old data packet should be reflooded is the case in which a source is issuing packet when memory of packets from that source with higher sequence numbers remains in the network. The mechanism of having receipt of an older looking packet trigger reflooding of the stored packet ensures that the reflooding will occur in this case.

The modification results in some bandwidth efficiency gain, since the entire database of old data packets need not be transmitted on each link to a recovering node. If the node were nonfunctional for long enough, it would never have acknowledge most of the data packets stored by its neighbors, so upon recovery the majority of the data packet database will be transmitted anyway.

Temporarily wasting bandwidth on links to a recovering node is not a very important problem, since the links were of no benefit to the network while the node was nonfunctional, and wasting the bandwidth after the node recovers is equivalent to the node having been down slightly longer. However, a more radical modification prevents wasting the bandwidth. The more radical modification consists of clearing “Send-Flag” for W on all data packets, upon receipt of a “Restart-Notification” from W .

The theory behind this proposal is that the majority of packets in the database either have an alternative path to the destination, or were generated sufficiently long ago that they will be of no use if delivered now. Only packets generated prior to W 's

recovery will fail to be flooded through W. A source cannot expect packets to reach a destination through a node which is nonfunctional. Packets generated after W's recovery will be transmitted to W

2.3 Elimination of Acknowledgments

It is interesting to note that acknowledgments are needed only as an optimization, for efficient use of bandwidth. They are not needed for correctness

The design would be correct if we eliminated all of the following:

- Packets
 1. Data ACK
 2. PKL ACK
 3. Restart Notification
 4. Restart ACK
- Flags
 1. Per Packet, Per Neighbor "Send-Flag" and "ACK-Flag", for both data Packets and PKL Packets.
 2. Per Neighbor, Restart Flags.

The result is a design with only two types of packets:

1. Data Packets
2. Public Key List Packets

The volatile database consists only of the node's own sequence numbers, and the latest Data and PKL packet from each source/key pair.

The database is scanned in order. Every packet in the database is transmitted in order. If no new packet is received from a particular source/key pair, its old packet will be retransmitted every time the database is rescanned.

Since packets are transmitted without maintaining state regarding acknowledgements, there is no need for a node to be informed when its neighbor restarts. Thus the need for Restart Notification packets is also eliminated.

This modification yields a simpler, equally robust design, but it is far less efficient in bandwidth usage.

2.4 Hierarchical Networks

An $O(N)$ database can be impractically large in very large networks. The same trick of adding hierarchy to make a routing algorithm tractable can be used to make robust flooding practical. In this section we present a design for accomplishing flooding in a hierarchical network. We present a two level hierarchy; through the scheme can be easily extended to arbitrary numbers of levels, for even larger networks.

Topology and Addressing

The network will be partitioned into sub networks, such that each sub network is of manageable size.

Addressing will be hierarchical, consisting of two parts,

SUBNET This portion specifies which sub network the node belongs to.

NODE: This portion specifies the individual node within the sub network SUBNET.

Within a sub network, all nodes will have the same value for the SUBNET portion of their address, and all will have distinct NODE values.

There will be two types of routing.

1. **Level_1 routing** – this type of routing concern itself with all the individual nodes and links within a sub network.

2. **Level_2 routing** – this type of routing concern itself with paths to sub networks and the sub network consisting of level 2 routers, but does not concern itself with the details inside of sub networks.

Nodes that participate only in level 1 routing are known as "level 1 routers". Nodes that participate in level 2 routing are known as "level 2 routers". Level 2 routers reside in a subnet, and additionally participate in level 1 routing within the single sub network in which they reside.

The sub network consisting of level 2 nodes is known as the "level 2 sub network".

General Routing Pattern

When source and destination nodes of a packet are in the same sub network, the packets are flooded only within the sub network. When source and destination are in different sub networks,

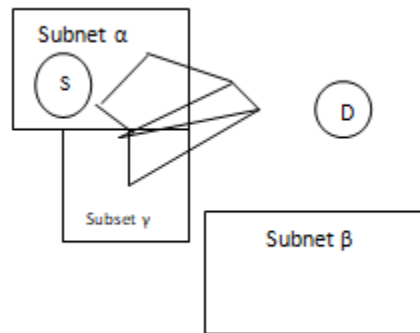
1. First the packet is flooded throughout the source sub network.

2. Next the packet is picked up by each of the Level 2 routers in the source sub network, and signed.

3. Each of those Level 2 routers floods their copy of the packet throughout the Level 2 sub network.

4. Each of the Level 2 routers in the destination sub network pick up and sign each copy of the packet, and flood them within the destination sub network.

Thus the destination will receive multiple copies of the packet, equal to the product of the number of level 2 routers in the source sub network and the number of level 2 routers in the destination sub network.



For example in the picture above, source s generates a packet with destination d . The SUBNET portion of s 's address indicates that s resides in subnet α . The SUBNET portion of d 's address indicates that d resides in the subnet β .

The packet is first flooded throughout subnet α , using the resources and signed by the public key of s . Since the destination address indicates the destination is in a different subnet, all level 2 routers residing in subnet α , i.e. A, B and C, pick up the packet for flooding throughout the level 2 sub network.

Each of A, B and C independently supply their signature and sequence number to the packet. Since the node in the level 2 subnet and the nodes in subnet β have no knowledge of the ultimate source s , s 's identity, sequence number, and signature are at this point irrelevant pieces of information in the packet, from the point of view of the Network Layer.

Thus each of A, B and C independently overwrite the header fields:

1. Source node
2. Sequence number
3. Public key
4. Packet signature

With their own ID, sequence number, public key and signature.

At this point, the packet becomes three independent packets as far as the level 2 subnet can detect.

When one of the level 2 routers in subnet β (E or F) receives a flooded packet destined for subnet β (as indicated by the SUBNET portion of the "destination node" field in the packet header),

Why this works

Flooding within a sub network (source ID and Destination ID have identical "SUBNET" fields) works identically with flooding in a nonhierarchical network.

When Source and Destination are in different subnets, each level 2 router acting on behalf of the source sub network must guarantee fairness for all sources within that sub network. Then each source in the source sub network is guaranteed some sources within the level 2 sub network ($1/N$ of the resources guaranteed to the level 2 router, where N is the number of level 2 routers).

it picks up the packets for flooding throughout destination subnet β . As before since node A, B and C are not known within subnet β , the fields overwritten by A, B and C (source node, sequence number, etc.) are now irrelevant inside of subnet β . Thus each of E and F independently overwrite the same header fields.

1. Source node
2. Sequence number
3. Public key
4. Packet signature

With their own ID, sequence number, public key and signature.

Since E and F cannot correlate the packets they receive from A, B and C as all having originated from the same ultimate source, (because they cannot remember more than a constant number of packet from each level 2 router, and the packet from A, B and C resulting from s 's original packets may arrive at different times), each of E and F will originate three separate packets into subnet β , one for each packet of A, B and C

Databases: As in the non-hierarchical flooding scheme, nodes within a sub network keep stat about all the other nodes in their own sub network/ In other words, public keys are kept for, and buffers are reserved for, each other node in the sub network. Level 2 routers participate within a single sub network, but in addition keep state about all the other level 2 routers. A level 2 "trusted node service" broadcasts public keys for all level 2 routers, within the level 2 sub network. Each level 2 router keeps public keys and buffers for each other level 2 routers.

Each level 2 router R which introduces level 2 traffic into the destination sub network must guarantees fairness to each level 2 router (each "source" in the level 2 sub network), for the introduction of traffic into the destination sub network. Then each level @ router will be guaranteed $1/M$ of the resources guaranteed to R whit the destination sub network where M is the total number of level 2 routers ID. Key pairs within the level 2 sub network.

This assures that source sub network is guaranteed access into the destination sub network. Thus the fraction of bandwidth guaranteed to source node S

within a foreign destination sub network is the fraction of bandwidth guaranteed per node in the source sub network, times the fraction of bandwidth guaranteed to each level 2 router in the level 2 sub network, times the fraction of bandwidth guaranteed per node in the destination sub network.

2.5 Flooding Without Network Layer Cryptography

It is interesting that a flooding scheme can meet the Byzantine robustness criteria without Network Layer Cryptography and without $O(N)$ buffers. We present here a scheme that theoretically accomplishes the robustness goal without using Network Layer Cryptography, but is totally impractical due to the negligible performance it achieves.

This scheme requires use of reasonable accurate elapsed time timer (as opposed to globally synchronized clocks). Some threshold say 10%, is set, such that if a node’s elapsed time clock is not within that percentage of true elapsed time, the node would be considered faulty.

A data packet contains the following:

Source node	The Identity of the source node
Destination node	The Identity of the destination node
Remaining hops	The number of hops further this packet is allowed to traverse
User data	To be delivered, but not interpreted by the Network Layer.

Each node keeps H buffers, each of size $PktSize$. Each buffer is reserved for packet with a specific hop count. A packet occupies the buffer corresponding to the hop count specified in the packet’s “remaining hops” field.

Since routing is via flooding, each packet must be transmitted to all neighbors except the one from which it was received. Thus associated with each buffer is flag for each neighbor, indicating whether

The robustness achieved by this scheme is “ A packet from non-faulty source A to non-faulty destination D will have high probability of reaching D provided that at least one path of non-faulty processor and links connects A and D , regardless of the number of other faulty components in the network”

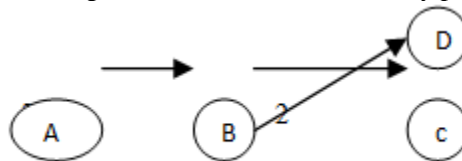
A Priori Knowledge

The manually configured information required at each node consists of:

1. H - the maximum path length in the network
2. $PktSize$ – the maximum sized data packet to be processed
3. $Nbrs$ – the maximum number of neighbors of any node in the network
4. $ClkTol$ – the maximum allowable ratio of measured times between two non-faulty processors. To ensure this, we require the ratio of time measure by any non-faulty processor to true elapsed time to be between $1/ClkTol$ and $ClkTol$.

the packet occupying the buffer still needs to be transmitted to that neighbor. When all flags are clear, the buffer is free for acceptance of another packet with the specified “remaining hops”.

The M/S scheme, with per neighbor fairness added, assures fairness and packet progress in the absence of Byzantine failure. However a single Byzantine failure in the network can cause zero throughputs on a non-faulty path in the network.



In the picture above, the Path $A-B-C$ is non-faulty , and A has a packet with “remaining hops” of 3, waiting to be transmitted to B . Non-faulty B has a packet with “remaining hops” of 2, waiting to be transmitted to D , who is faulty and will never accept a packet from B . Thus A will never be able to transmit to B even though B is non-faulty, with this scheme. To prevent Byzantine failures from blocking the progress of a packet through a non-faulty path, we must also add timers. This scheme can be shown to meet the correctness condition by induction:

Suppose a non-faulty path A_1, A_2, \dots, A_k exists between non-faulty processors S and D .

Assume that the path is exactly H long, and that S initialized “remaining hops” to H . Since D , assuming it is non-faulty, will process each packet within 1 time unit, and since D has at most $Nbrs$ neighbors, D will accept the packet within $Nbrs$ time units(times the fudge factor of $ClkTol$).

Assuming A_k is non-faulty, it will forward each packet occupying the buffer for “remaining hops” of 1 each time the neighbor to which it is queued request it. Since a neighbor is required to request a packet with “remaining hops” of 1 within $Nbrs$ time units, from each neighbor A_{k-1} can expect that A_k will be ready for receiving the packet within an extra factor of $Nbrs$.

If the path is actually shorter than H , the proof still holds. The only consequence of setting “remaining hops” higher than necessary (though a value greater than H is illegal and would be discarded), is that the timers are longer than would be necessary for the S to D path.

This scheme has the obviously undesirable property that the throughput on a non-faulty path of m hops is only guaranteed to be one packet for every $(\text{ClkTol} * \text{Nbrs})^m$ time units, making this scheme clearly without practical utility.

An additional point of note is that the scheme does not necessarily yield a storage advantage over the cryptographic, per-neighbor scheme discussed in the main portion of this chapter, since H is likely to be $O(N)$. In order to meet the robustness requirement that non-faulty node pair A and b should be able to communicate provided that any non-faulty path between them exist, then H must be at least as large as the longest possible path between any pair of nodes in the network. Thus H is quite likely to be very close to $N-1$, the longest possible path in any network of n nodes

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A Way Towards Physical Activities and Fitness: A Free-Running Case Study

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Abstract:

Free running has lately unfold over the virtual media and has seeing that come to be an reputable game. Despite this boom in recognition there may be no peer-reviewed literature at the body structure and anthropometry of the athletes or the bodily needs of the game. This examine aimed to outline loose-going for walks and discover a number of the physiological traits of the athletes and the game, via way of means of challenge the evaluation of anthropometric information and vertical bounce overall performance in 7 loose-runners; in addition, GPS facts turned into amassed from three education periods for one loose-runner. The loose-runners withinside the gift examine displayed excessive electricity output as end result of excessive vertical bounce overall performance. They additionally displayed low ranges of frame fats and occasional frame mass. The GPS information illustrated that loose-going for walks is an intermittent game depending closely at the phosphagenic electricity system; consequently, loose-runners need to awareness their education making use of this electricity system. Another final results from the studies is the idea that destiny research need to trial one-of-a-kind system to reveal the physiological needs and depth of the game because of in particular excessive-depth brief bursts of electricity utilised.

Keywords: Physical, medicine, young people, games

Introduction:

Free Run is a recent development and international phenomenon that gained a prestigious reputation in 2008. The first video game of the year took place in London, England. Before that, free running was an unexplored field that was born in France in the 1980s under the name of Landamp;#039;Art du Déplacement. Landamp;#039;Art du Déplacement has its origins in the French military exercise Parcours du Combattant, a perfect obstacle course based largely on circulation initiated by Georges Herbert and inherited by Raymond Belle and his son David Belle. From there, it became Parkour. Parkour eventually became child's play for David Belle, Sébastien Foucan and other partners. They founded the Yamakasi training organization in the suburbs of Paris under the influence of Bruce Lee and Jackie Chan, developing parkour as a religious practice and a way to control body movements. In 2001, the Yamakas created their first media about parkour: Modern Samurai Begins to Wreak havoc. The free tours, available to English-speaking audiences, attracted greater media coverage, especially after the 2003 documentary Jump London. Experiential learning is applied at all levels, exploring the connections between different subjects as well as hands-on learning, learning that combines arts and sports, and pedagogy Take storytelling as a practice standard for each subject. Classroom

activities are transformed into competency-based teaching and learning to close the achievement gap. In addition, assessment tools, including “as” and “of” assessments and “scope” of learning, correspond to the learning objectives, skills and attitudes of each subject. An interdisciplinary strategy called “arts integration” uses diverse perspectives and expressions of art and culture as a basis for understanding concepts in all courses. Another multidisciplinary educational strategy is physical integration, using physical activity as a home sport in educational practices to promote the development of skills such as collaboration, initiative, self-management ethics, self-discipline, teamwork, responsibility, citizenship, etc. To help students develop a lifelong attitude towards fitness and achieve the level of fitness envisioned by the Fit India movement, sports-integrated learning is being used in classrooms. The movement supports multifaceted development, improving physical and psychological health as well as cognitive abilities, which is why its inclusion in school education is an obvious necessity.

The athletes' collective achievements are captured in a number of intense and carefully edited sequences. Sports activities include gymnastics, rugby league and rock climbing. However, slow walking is a game for beginners and does not use common definitions or classifications. French freestyle has recently emerged in France through

media promotion and has evolved from a primarily naval training pastime into a respected aggressive sport. The idea of stimulating relaxation is versatile, as are the functions and motivations, and is therefore of interest in many discussions. Although competitions have been held since 2008, many athletes who shoot at the beginner level are non-aggressive. As this is a relatively recent sport, there may be limited peer-reviewed literature that identifies the biomechanical or physiological demands at the expert and beginner levels. There may also be no peer-reviewed literature that identifies the physiological or anthropometric characteristics of freestyle athletes. While profiling sports and athletes is good for those affected, not all sports, especially those with less recognition, benefit from it. There is clearly a corresponding need to explore new sports. In fact, identifying emerging competition needs and assessing the overall performance of athletes in each sport will help to find appropriate training methods. This allows for the measurement of overall performance of athletes using standardized quantitative measures including body fat percentage or to standardize energy production or power-to-weight ratio. The Open Pavement Study joins the learning network by providing it for similar and broader research and promoting its practice. Therefore, the purpose of this case study is to a) explain what agility walking is and what qualities the game requires from athletes interacting during training and b) explore the metabolic demands of the playing field. This case study could be a good way to integrate walkers and free runners into a health research network as a game and population. It provides common information on energy and power, athlete anthropometry, depth range, and power requirements of the game. It could even provide a platform to build fate studies, as well as athlete and game profiles and cross-sectional studies, and inspire overall performance and injury prevention by comparing sport profiles.

Methodology:

There were six members in the activities and one player in the 6 episodes. All members underwent anthropometric measurements and general vertical jump. However, the top player also participated in an energy audit and underwent training using geographic positioning software (GPS). For the first time, the body mass of members was determined with a digital scale and the upper part was measured with a stadiometer. Age and rapid education were noted. Skinfolts were measured at seven points (triceps, biceps, subscapularis, supraspinales, abdomen, thighs, and calves) on the right side of the frame using skinfold bags according to ISAK recom

mended size methods. Measurements were taken to the nearest 0.2 mm 4 seconds after caliper installation. To improve accuracy, the same assistant made three measurements within 10%. In 1978, the Jackson and Pollock equation began to be used to determine the body fat percentage of members. After demographic and anthropometric measurements, members were introduced to the stroke mat and stroke style protocol, and the change in vertical stroke head to gait was measured. It was modified to increase the effectiveness of the subsequent control and to improve and cancel familiarization effects, thus becoming an introductory consultation. A second review consultation was conducted at least forty-eight hours after the initial consultation to increase the effectiveness of the consultation. Vertical jumping head peak measured on a digital wire displacement trampoline. A gauge that measures the jump head with an accuracy of ± 0.5 cm using movement means. The participants could heat their personal time within the desired training consultation. Each rotated player allowed 5 attempts to reach the maximum vertical rebound. Two attempts were allowed for warm-up. Participants were instructed to stand with their hips shoulder-width apart and land with their feet back on the mat. The strength of the counter movement became unstandardized and the use of palms was allowed. Participants were asked to decrease the intensity before explosively accelerating vertically with a loose arm movement. This was modified to mimic the plyometric movements of the game and allow subjects to have different limb cycles. 30 seconds of passive relaxation became commonplace between rebound attempts. The power generation peak changed in Carlock et al. For the computational behavior of Eq., presented by Sayers et al. From this, the ratio of electrical energy to weight was changed by distributions calculated by the weight of the frame.

Analysis :

Data had been analysed the usage of SPSS facts V 20.0. Means, preferred deviations and coefficient of versions had been calculated for top, frame mass, frame fats percent, vertical bounce heights, vertical bounce electricity output, age and education age. Normal distribution of overall performance variables turned into examined the usage of a KolomogorovSmirnov test. Descriptive facts had been calculated for the education periods. Reflections whether or not the athletes' physiological profiles met the located needs of loose-going for walks had been additionally made.

Table no 1 Mean GPS and heart rate data

Performance Variable	Mean Value
Distance covered (km)	0.54 ± 0.10
Time (min)	33.05 ± 5.58.8
Movement time (min)	10.45 ± 1.43.51
Percentage time moving (%)	32.61 ± 1.94
Average speed (km·h ⁻¹)	1.00 ± 0.25
Max speed (km·h ⁻¹)	11.76 ± 2.66
Elevation change (m)	2.33 ± 1.53
Average heart rate (bpm)	144.33 ± 5.77
Max heart rate (bpm)	175.00 ± 5.00

Discussion:

Physical indifference was the antithesis of a pandemic because of its occurrence and unreasonable risk of disease. Due to events, health effects and life cycle changes, it is recommended to take measures to promote physical interest. The Institute of Medicine formed a sports and school environment committee to find ways to use sports as a challenge for youth and health. The aim was to examine current movement status and physical interest in the school environment, which includes pre-school and after-school, and to determine how these factors affect young and younger, immediate and long-term physical, leisure, and cognitive and psychosocial. development In making the diagnosis, we consider the fact that many organs and physical interest are involved in the early stages of civilization. And first the man had to fight for survival. Running, jumping and throwing are mandatory because they are actually three important movements. The purpose of this review was to explain what free

Table 2. Comparison of Mean ± SD anthropometric and power output data of the present free-runners with gymnasts and climbers

Variable	Climbers (n=11) MacLeod et al [16]	Gymnasts (n=41) Marina et al [15]	Gymnasts Jemni et al [13]
Age (years)	23.2 ±3.2	18 ±4.3	21.8 ±2.4
Training age (years)	5.3 ± 1.9		
Height (cm)	175.5 ±6.7	161.0 ±11.9	168.2 ±6.0
Body mass (kg)	66.4 ± 6.8	55.0 ±12.5	67.5 ±8.0
Body fat (%)	11.3 ±3.6		10.3 ±1.5
Power (W)		3575*	
Power per kg (W·kg ⁻¹)		65.0*	

The ability to give male or female free runners maximum pressure or "power" ratings gave a maximum of one hundred and twenty pounds in the squat exercise at any point and ninety pounds of maximum power in the frame at any one

walking is and what it takes as a game, using athlete body quantitative profiling and anthropometry. The aim of this study was to assess and understand the metabolic demands of the game using heart rate and GPS measurements. The effects of the review showed that the free runner pattern studied produced excessive energy, resulting in excessive vertical rebound. In addition, they had a low frame fat content in contrast to different sports and coffee frame mass. Evaluating the data of Jemni et al. of national and global gymnasts engaged in sport with comparable movement patterns, it was found that free runners had an average decrease in frame fat percentage of -2.46%. The absolute and relative power of the free runners in this study was better than the average power of the male gymnasts of Marina et al., 1525.58 W and 10.42 W·kg⁻¹, respectively. However, Marina et al used the so-called drop shock method, which detected the production of electrical energy at a height for a forty-centimeter drop, rather than using counter-motion jumps in this aspect.

time. bench press exercise during technical failure. Wilstøff et al found that maximum squat was clearly negatively correlated with 10m and 30m sprints and certainly with vertical jump

among elite soccer players. This emphasizes the importance of maximal power in producing energy over short distances in minimal time in movements such as free running. Despite this, Cronin and Hansen did not find the massive triple jumps or full-jump energy of part-time and full-time experienced rugby league players among most squats and sprints. However, they emphasized that the high variability in these patterns may tend to distort the accuracy of these effects. Most 3-rep controls are also no longer true max power due to the repetition of the movement. Changing from paired to single company control may have additionally provided the "true" maximum power data and energy efficiency of the entire sprint or jump. Although maximal power is not always the most convenient predictor of overall performance, it can be hypothesized that an athlete with better maximal power will want to increase and decelerate solid mass, such as body mass, with particular ease. Despite the high reliability of the small pattern, Stone et al proved this by showing that maximally efficient subjects had excess energy during different loads. Thus, the more powerful the free runners were, the more potential existed for an explosive rebound or landing at a certain distance, which extended the athlete's efficiency and defense.

Conclusion:

Measures to promote physical interest are recommended due to occurrence, health effects and life cycle changes. The Institute of Medicine formed a sports and school environment committee to look for ways to use sports as a challenge for youth and health. The aim was to examine the current state of movement and physical interest in the school environment, which includes before and after school, and to find out how these factors affect young and younger people. Free-runners within the gift examine displayed excessive energy output as end result of excessive vertical bounce overall performance. Free-runners additionally displayed low ranges of frame fat, and a low frame mass. The GPS information illustrated that free-jogging is an intermittent game depending closely at the phosphagenic electricity system, and consequently free-runners must consciousness their schooling at the utilisation of this electricity system. The effects additionally advise that, because of the bodily nature of free-jogging, destiny research must trial exclusive device to screen the physiological needs and depth of the game.

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A study of an entrepreneurial competencies of small-scale industries of Chandrapur

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Abstract:

This study investigates the impact of entrepreneurial competencies on the success of small-scale industries in Chandrapur, focusing on identifying key skills and training needs for local entrepreneurs. The analysis is based on a comprehensive evaluation of factors such as strategic thinking, opportunity recognition, financial management, leadership, and innovation. By examining Garret Mean (GM) scores and ranking data, the research highlights that strategic thinking and opportunity recognition are perceived as the most critical competencies for business success in the region. Financial management and leadership are also important but rank lower in comparison. The study reveals an inverse relationship between percentile position and Garret scores, suggesting that higher-ranked positions might experience a decrease in satisfaction or performance measures. The findings underscore the need for targeted training programs to enhance specific entrepreneurial skills, with a focus on areas where performance is currently lacking.

Introduction:

Entrepreneurial skills are essential for small-scale industries to succeed and expand, especially in areas like Chandrapur. These competences cover a broad spectrum of abilities, know-how, and character traits that support company owners in running their enterprises successfully. Small-scale businesses, which frequently have few resources and contend with fierce competition, mostly depend on their owners' entrepreneurial spirit to endure and grow.

There are a lot of small-scale companies in Chandrapur, a district well-known for its abundant natural resources and industrial activity. By generating jobs and supplying the community with goods and services, these sectors boost the local economy. Nonetheless, the abilities of the business owners who oversee these sectors play a major role in their success.

In this study, we will explore the entrepreneurial competencies of small-scale industry owners in Chandrapur. We aim to understand how these competencies influence the performance of their businesses and identify areas where additional support or training might be needed. By examining the specific skills and attributes that contribute to business success in this region, we can provide valuable insights that may help other small-scale entrepreneurs improve their chances of success.

Review of Literature:

Entrepreneurs require a particular set of abilities, know-how, and conduct to effectively run

and expand their enterprises. These are known as entrepreneurial competences. These qualities are those that allow entrepreneurs to carry out activities and jobs in a successful manner, according to Man, Lau, and Chan (2002). Strategic thinking, opportunity awareness, problem-solving, leadership, and financial management are examples of critical competencies. According to research by Mitchelmore and Rowley (2010), these skills are essential for small business success, especially in settings that are competitive and have limited resources. Economic development depends heavily on small-scale industries (SSIs), especially in emerging nations. Tambunan (2008) found that SSIs had a major positive impact on regional development, employment creation, and poverty reduction. But these sectors frequently deal with issues like scarce money, technology, and skilled personnel. Thus, the entrepreneurial skills of SSI owners play a critical role in determining their performance (Srinivas, 2013). Numerous studies have examined the connection between corporate performance and entrepreneurial qualities. Higher competency among entrepreneurs is associated with better business outcomes, such as increased market share, profitability, and growth in sales, according to Chandler and Jansen's (1992) research. In a similar vein, Ahmad, Ramayah, Wilson, and Kummerow (2010) highlight the close relationship between the performance of small businesses and particular competences like opportunity recognition and resource mobilization. The entrepreneurial climate

is greatly influenced by the geographical context, such as that of Chandrapur. Research conducted by Dana (2000) and Morrison (2000) indicates that the development of entrepreneurial abilities is influenced by local elements such as culture, economic conditions, and resource availability. These competencies are especially important for overcoming local obstacles and seizing growth possibilities in areas like Chandrapur, where small-scale companies are common. Numerous scholarly investigations have emphasised the significance of training and development programs in augmenting entrepreneurial competencies. According to a study by Gibb (1997), focused training programs can greatly enhance entrepreneurs' abilities and knowledge, which will boost their company's performance. In a similar vein, Henry, Hill, and Leitch's (2005) research highlights the necessity of ongoing education and career advancement for entrepreneurs, particularly in demanding and dynamic work settings. This literature analysis emphasizes how important entrepreneurial skills are to small-scale industry success, especially in areas like Chandrapur. It also emphasizes how important it is to launch targeted programs for training and development to support business owners in

developing their skills and achieving better business results.

Objectives:

1. To assess the influence of entrepreneurial competencies on the success of small-scale industries in Chandrapur.
2. To identify training needs for enhancing entrepreneurial skills among small-scale industry owners in Chandrapur.

Research Methodology:

In the present study, researcher has taken primary and secondary data. For primary data 50 small scale industrialist was taken. Stratified disproportionate random sampling adopted.

Limitations: This study is limited by its focus on Chandrapur, a small sample size, and the reliance on subjective self-reported data. Additionally, the data reflects a specific time period, which may not capture future changes.

Scope: The study concentrates on entrepreneurial skills in Chandrapur, assessing their impact on business performance and identifying areas where training could improve entrepreneurial success.

The table provided summarizes the frequency and Garrett Mean (GM) scores associated with each competency across different ranks. Here's the detailed analysis:

Table no: 1- Following table is showing frequency counts and Garret Mean Score

Rank	F1		F2		F3		F4		F5		F6		F7	
	Freq.	GM Score	Freq.	GM Score	Freq.	GM Score	Freq.	GM Score	Freq.	GM Score	Freq.	GM Score	Freq.	GM Score
1	20	28.8	20	28.8	0	0	0	0	0	0	10	14.4	0	0
2	20	24.8	20	24.8	0	0	0	0	0	0	0	0	10	12.4
3	10	10.8	0	0	20	21.6	0	0	0	0	0	0	20	21.6
4	0	0	10	9.4	20	18.8	20	18.8	0	0	0	0	0	0
5	0	0	0	0	10	7.8	20	15.6	20	15.6	0	0	0	0
6	0	0	0	0	0	0	10	5.8	19	11.02	21	12.18	0	0
7	0	0	0	0	0	0	0	0	11	1.32	19	2.28	20	2.4
Total	50	64.4	50	63	50	48.2	50	40.2	50	27.94	50	28.86	50	36.4

Strategic Thinking and Planning (F1)

- **Rank 1:** 20 respondents ranked this competency as the most important, giving it a high GM score of 28.8.
- **Rank 2:** 20 respondents placed it second, with a GM score of 24.8.
- **Rank 3:** 10 respondents ranked it third, with a GM score of 10.8.
- **Total GM Score:** 64.4
- **Analysis:** Strategic Thinking and Planning is clearly regarded as the most critical competency. The fact that it appears in the top three ranks for all respondents indicates its widespread recognition as vital to business success in Chandrapur.

2. Opportunity Recognition (F2)

- **Rank 1:** 20 respondents gave it the top rank, resulting in a GM score of 28.8.
- **Rank 2:** Another 20 respondents ranked it second, with a GM score of 24.8.
- **Rank 4:** 10 respondents ranked it fourth, resulting in a GM score of 9.4.
- **Total GM Score:** 63
- **Analysis:** Opportunity Recognition is also highly valued, closely following Strategic Thinking and Planning. This competency's strong presence in the top two ranks suggests that the ability to identify new business opportunities is crucial for the survival and growth of small-scale industries in Chandrapur.

3. Financial Management (F3)

- **Rank 3:** 20 respondents ranked it third, with a GM score of 21.6.
- **Rank 4:** Another 20 respondents ranked it fourth, resulting in a GM score of 18.8.
- **Rank 5:** 10 respondents placed it fifth, giving it a GM score of 7.8.
- **Total GM Score:** 48.2
- **Analysis:** Financial Management holds a middle-ground position in terms of importance. While it is not as highly ranked as Strategic Thinking or Opportunity Recognition, it is still considered essential, especially in the third to fifth ranks.

4. Leadership and Team Management (F4)

- **Rank 4:** 20 respondents ranked it fourth, with a GM score of 18.8.
- **Rank 5:** Another 20 respondents placed it fifth, resulting in a GM score of 15.6.
- **Rank 6:** 10 respondents ranked it sixth, giving it a GM score of 5.8.
- **Total GM Score:** 40.2
- **Analysis:** Leadership and Team Management is seen as important but not as critical as the top-ranked competencies. Its presence in the fourth to sixth ranks suggests that while leadership skills are valued, they may not be as immediately impactful as other competencies.

5. Innovation and Creativity (F7)

- **Rank 3:** 20 respondents ranked this competency third, resulting in a GM score of 21.6.
- **Rank 7:** 20 respondents placed it seventh, with a low GM score of 2.4.
- **Total GM Score:** 36.4
- **Analysis:** Innovation and Creativity have a mixed ranking. While some respondents see it as highly important, ranking it third, others consider it less critical, placing it last. This suggests that innovation is valued, but not uniformly across all respondents.

6. Marketing and Customer Relationship Management (F6)

- **Rank 1:** 10 respondents ranked this competency first, resulting in a GM score of 14.4.

- **Rank 6:** 21 respondents placed it sixth, with a GM score of 12.18.
- **Rank 7:** 19 respondents ranked it seventh, giving it a GM score of 2.28.
- **Total GM Score:** 28.86
- **Analysis:** Marketing and Customer Relationship Management is perceived as less critical compared to other competencies. Its lower GM scores and rankings suggest that respondents may prioritize internal competencies over external marketing efforts.

7. Problem-Solving and Decision-Making (F5)

- **Rank 5:** 19 respondents ranked this competency fifth, with a GM score of 11.02.
- **Rank 7:** 11 respondents placed it seventh, resulting in a GM score of 1.32.
- **Total GM Score:** 27.94
- **Analysis:** Problem-Solving and Decision-Making are ranked the lowest, indicating that respondents may view these skills as less critical or perhaps more inherent and less trainable compared to other competencies. The low GM scores suggest a perception that while important, these skills are not as central to success as strategic or financial competencies.

Overall Summary:

- **Top Competencies:** Strategic Thinking and Planning (F1) and Opportunity Recognition (F2) are the top-ranked competencies, highlighting the importance of strategic foresight and the ability to seize opportunities in the small-scale industry sector in Chandrapur.
- **Mid-Level Competencies:** Financial Management (F3) and Leadership and Team Management (F4) are considered important but not as critical as the top competencies.
- **Lower-Ranked Competencies:** Innovation and Creativity (F7), Marketing and Customer Relationship Management (F6), and Problem-Solving and Decision-Making (F5) are ranked lower, suggesting these are viewed as less essential for immediate business success in this context.

This analysis provides a clear picture of the priorities of small-scale industry owners in Chandrapur, emphasizing strategic and opportunity-focused competencies.

Table no: 1.1 - Following table is showing percent position and Garret score

Rank	Percent Position	Garret Score
1	13.57	72
2	27.86	62
3	42.14	54
4	56.43	47
5	70.71	39
6	85.00	29
7	99.29	6

The provided data illustrates an inverse relationship between Percent Position and Garret

Score. As the Percent Position increases, reflecting a higher rank or percentile, the Garret Score

decreases. Initially, at the 13.57th percentile, the Garret Score is at its highest of 72. As the Percent Position progresses to 27.86%, the Garret Score drops to 62, continuing to decrease as the percentile rises. By the time the Percent Position reaches 99.29%, the Garret Score has significantly declined to 6. This trend shows that higher percentiles are

associated with lower Garret Scores, indicating that as one moves to a higher percentile, the Garret Score—which could represent a measure of performance or satisfaction—declines. This pattern suggests that improvements in percentile ranking might correspond with a decrease in the Garret Score.

Table no: 1.2- Following is showing average score ad rank of each factor

Factors	Average	Rank
Strategic thinking and planning	64.4	1
Opportunity recognition	63	2
Financial management	48.2	3
Leadership and team management	40.2	4
Problem-solving and decision-making	27.94	7
Marketing and customer relationship management	28.86	6
Innovation and creativity	36.4	5

The table provides data on various factors related to their average scores and ranks, highlighting their relative importance or performance in a specific context. Here's an analysis:

1. Overview:

The table lists factors associated with performance or capabilities, with each factor having an average score and a rank.

2. Key Insights:

1. Strategic Thinking and Planning ranks highest with an average score of 64.4, indicating it is perceived as the most crucial or well-executed factor among those listed.
2. Opportunity Recognition follows closely with an average score of 63, also scoring high and suggesting it is an important factor in the context.

3. Performance Analysis:

1. Financial Management and Leadership and Team Management are in the mid-range, with average scores of 48.2 and 40.2, respectively. These factors are deemed less critical compared to strategic thinking and opportunity recognition but still hold significant value.
2. Innovation and Creativity scores 36.4, placing it in a lower tier, yet still above the bottom factors.

3. Marketing and Customer Relationship Management and Problem-Solving and Decision-Making are the lowest-ranked with average scores of 28.86 and 27.94, respectively. These factors are considered less effective or prioritized compared to others.

4. Implications:

1. The highest-ranking factors, such as Strategic Thinking and Planning and Opportunity Recognition, are seen as key drivers of success or performance.
2. Factors with lower ranks, like Problem-Solving and Decision-Making and Marketing and Customer Relationship Management, might need attention or improvement.
3. The variation in scores suggests differing levels of effectiveness or importance among the factors, with strategic and opportunity-related skills being more valued or better executed.
4. This analysis highlights the varying importance of each factor, suggesting areas of strength and opportunities for improvement based on their average scores and ranks.

Please rank the following areas where you feel you need the most training to enhance your entrepreneurial skills:

Table no. 2- The table presents data on the frequency (Freq.) and GM (Garret-Murthy) Scores across seven factors (F1 to F7) for seven different ranks. Analyzing the data reveals some distinct patterns in how different factors are rated across the ranks.

Rank	F1		F2		F3		F4		F5		F6		F7	
	e	s	e	s	e	s	e	s	e	s	e	s	e	s
1	18	25.92	20	28.8	0	0	0	0	0	0	10	14.4	2	2.88
2	20	24.8	20	24.8	0	0	0	0	0	0	0	0	10	12.4
3	12	12.96	0	0	19	20.52	1	1.08	0	0	0	0	18	19.44
4	0	0	10	9.4	19	17.86	20	18.8	1	0.94	0	0	0	0
5	0	0	0	0	12	9.36	19	14.82	19	14.82	0	0	0	0
6	0	0	0	0	0	0	10	5.8	18	10.44	21	12.18	1	0.58
7	0	0	0	0	0	0	0	0	12	1.44	19	2.28	19	2.28
Total	50	63.68	50	63	50	47.74	50	40.5	50	27.64	50	28.86	50	37.58

The table shows that Factor F1 exhibits a relatively high GM Score at Rank 1 with a frequency of 18 and a GM Score of 25.92,

indicating a strong performance in this factor. Similarly, Factor F2 has a high GM Score of 28.8 at Rank 1 with a frequency of 20, reflecting a notable

performance. In contrast, Factors F3, F4, F5, F6, and F7 show varying patterns. For instance, Factor F3, despite having a frequency of 19 at Rank 3, shows a GM Score of 20.52, which is higher than some factors with lower ranks. Factor F4, with a frequency of 20 at Rank 4, also has a relatively high GM Score of 18.8, indicating moderate performance.

At lower ranks, Factors F5 and F6 show lower GM Scores and frequencies, especially at Rank 6 and Rank 7, where they have the lowest scores of 10.44 and 1.44, respectively. Factor F7's performance is

Table no. 2.1- Following table is showing percent position and garret score

Rank	Percent Position	Garret Score
1	13.57	72
2	27.86	62
3	42.14	54
4	56.43	47
5	70.71	39
6	85.00	29
7	99.29	6

The table provides data on the relationship between Percent Position and Garret Score across seven ranks. Here's a comprehensive analysis:

The table reveals an inverse relationship between Percent Position and Garret Score. As the Percent Position increases, which corresponds to moving up the ranks, the Garret Score declines. Specifically, at the 13.57th percentile, which represents the top rank, the Garret Score is at its highest of 72. This score decreases progressively as the Percent Position increases.

For instance, at the 27.86th percentile (Rank 2), the Garret Score drops to 62. This downward trend continues, with the Garret Score decreasing to 54 at the 42.14th percentile (Rank 3) and further to 47 at

Table no. 2.3- Following table is showing the average score and rank of each factor

Factors	Average	Rank
- Financial management and budgeting	63.68	1
- Marketing strategies and customer engagement	63	2
- Digital literacy and e-commerce skills	47.74	3
- Leadership and human resource management	40.5	4
- Legal and regulatory compliance	27.64	7
- Product development and innovation	28.86	6
- Business planning and strategy development	37.58	5

The table highlights the relative importance or effectiveness of several factors based on their average scores and ranks.

1. Financial Management and Budgeting ranks highest with an average score of 63.68. This suggests that financial management and budgeting are considered the most critical or well-executed factors among those listed, indicating strong performance or high importance in this area.
2. Marketing Strategies and Customer Engagement is closely behind with an average score of 63. This shows that marketing and customer engagement are also highly valued

notably low across the ranks, especially at Rank 7, with a GM Score of 2.28 and a frequency of 19.

Overall, Factors F1 and F2 stand out with higher GM Scores and frequencies at top ranks, suggesting they are rated more favorably. In contrast, Factors F5, F6, and F7 have lower scores and frequencies at the lower ranks, indicating weaker performance or lower importance in those areas. The distribution of scores highlights the relative strengths and weaknesses across the different factors, with some showing consistent high performance and others lagging behind.

the 56.43rd percentile (Rank 4). By the time the Percent Position reaches 70.71% (Rank 5), the Garret Score is 39. The trend persists with the Garret Score falling to 29 at the 85.00th percentile (Rank 6) and further plummeting to 6 at the 99.29th percentile (Rank 7).

Overall, this data indicates that as the percentile rank improves (i.e., as one moves closer to the top rank), the Garret Score, which may measure performance or satisfaction, declines. This suggests that higher-ranking positions are associated with lower Garret Scores, highlighting a potential inverse correlation between percentile position and the Garret Score.

and perform well, ranking just slightly below financial management.

3. Digital Literacy and E-Commerce Skills ranks third with an average score of 47.74. This indicates a significant but somewhat lower emphasis compared to the top two factors. The relatively high score reflects its importance but also suggests room for improvement.
4. Leadership and Human Resource Management follow with an average score of 40.5. While it is ranked fourth, it has a lower average score compared to the top factors, indicating it is important but less effective or emphasized than financial management and marketing.

5. Business Planning and Strategy Development is ranked fifth with an average score of 37.58. This factor shows moderate performance and importance, suggesting it is valued but not as highly as the top four factors.
6. Product Development and Innovation and Legal and Regulatory Compliance are at the lower end of the ranking, with average scores of 28.86 and 27.64, respectively. These lower scores suggest that product development, innovation, and compliance are perceived as less effective or less critical compared to other factors.
7. Overall, the table indicates that financial management and marketing are seen as the most crucial and well-performed areas, while product development, innovation, and compliance are considered less effective or less emphasized. The distribution of scores highlights where strengths and weaknesses lie, guiding potential areas for improvement or focus.

Conclusion:

The analysis demonstrates that entrepreneurial competencies play a crucial role in the success and expansion of small-scale industries in Chandrapur. Strategic thinking and opportunity recognition emerge as the most valued skills, reflecting their significance in navigating competitive and resource-constrained environments. Financial management and leadership are recognized as essential but less prioritized compared to strategic and opportunity-focused competencies. The lower rankings of innovation, marketing, and problem-solving highlight areas where improvement is needed. The observed inverse relationship between percentile position and Garret score suggests that higher-ranking positions may face challenges in performance or satisfaction. To support the growth of small-scale industries, it is imperative to develop targeted training programs that address the identified gaps and enhance the critical competencies of entrepreneurs in Chandrapur. This approach will help improve business outcomes and foster a more robust entrepreneurial ecosystem in the region.

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शिवकालीन व पेशवेकालीन कृषी व्यवस्था

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सारांश:

हिंदुस्तान प्राचीन काळापासूनच शेतकी प्रधान देश असल्यामुळे शेतीविषयक धोरणावरच देशाचे अर्थकारण प्रामुख्याने अवलंबून राहिले. महाराजांचे या बाबीकडे सतत लक्ष असे. ताब्यात आलेल्या मुलुखात गावी वसवून शेतीची लागवड करताना तीन गोष्टी महत्त्वाच्या असत. पहिली गोष्ट म्हणजे नापीक जमीन पिकाऊ करणे. दुसरी म्हणजे पीक, गावकरी व शेतकरी यांचे सर्व संकटापासून संरक्षण करणे आणि तिसरी गोष्ट म्हणजे राज्यातील सर्व जमिनीची शास्त्रशुद्ध मोजणी करून सारा आकारणी करणे. महाराजांची महसूल मंत्री अण्णाजी दत्तो सुरनीस हे याबाबतीत अत्यंत कर्तबगार होते. महाराजांनी शेती, शेतकरी, गावकरी यांच्याशी राज्य सत्तेचा सरळ संबंध प्रस्थापित केला. वतनदारांच्या कचाट्यातून या जनतेची मुक्तता करून पगारी सरकारी अधिकारी नेमले व त्यांच्यामार्फत अर्थकारणात शिस्त आणली. महाराजांनी याबाबतीत क्रांती घडवून आणली.

शब्दसूची: १) नक्त - नगदी द्रव्य., २) गला - धान्यरूपाने. ३) महसुलाचा सर्वसाधारण दर २/५ - शेतकऱ्याला उत्पन्नाचे पाच हिस्से करून त्यातील दोन सरकार दरबारी जमा करावे लागत. बाकी तीन हिस्से स्वतःसाठी ठेवता येत., ४) मोटस्थळ - विहीर खोदून मोठेच्याद्वारे पाणी देणे. ५) पाटस्थळ - सरकारच्या कालव्याच्या मार्फत पाणी दिले जाई., ६) तगाई - सरकारी कर्ज होय.

प्रस्तावना:

सर्वसामान्य लोकांना हक्काचे उत्पन्नाचे साधन असावे म्हणून आणि स्वराज्यात असलेल्या इंच इंच भूमीचा शेतीसाठी उपयोग आणि जल नियोजन सामूहिकरीत्या झाले तर त्याचा प्रभावी उपयोग करता येतो. शिवाय लोकांमध्ये एक रुपयाची भावना सुद्धा वाढावी यासाठी महाराजांनी सहकार शेती नावाची संकल्पना अमलात आणली. आणि यासंदर्भात आदेश दिला, "खास देशमुख व देशकुलकर्णी व मोकदम व मोखतसर चार रयता अशा मिळून एक विचाराने गावचा गाव, त्याची रक्कम अमकी, त्याची जमीन अमकी, त्याची अब्जल दुयम, सियम अमक्या, ऐसी जाती निवडून, त्यास पिकाचा आजमास करून, कष्ट केल्याने काय पिकेल, ते चौकस करून, ती रक्कम त्याच शेतीच्या शिरी वसवून, सधम पाहून आकार करणे, ऐसे की, एक ठिकाण, मलिकंबरी रक्कम अमकी झाली, त्यामध्ये खरीप एक पीक कमी, रवी दुपीक अमकी, ऐसी जात निवडून त्यामध्ये अमके बीघे, ऐसा पिकाचा आकार करून ठिकाणचे ठिकाणात पाच सात कुळें असली तरी असो, त्या शेतावर हुकूम गाव खंडणी सारा आकार करणें." आणि या सहकार शेतीमध्ये सरकारी अधिकारी किंवा शेतमालक यांनी काही लाचखोरी करू नये किंवा काही अपरा-तफर करू नये म्हणून प्रशासनात पारदर्शकता असली पाहिजे. आणि या भ्रष्टाचार मुक्त

प्रशासनाचा लोकांना फायदाच झाला पाहिजे यासाठी महाराजांनी पक्का बंदोबस्त केला. आणि नियम घालून दिला. "धाऱ्यांची रक्कम आणि जमिनीची प्रत ठरवावी सात जणांनी मिळून. देशमुख, देशपांडे, गावचा पाटील आणि चार भारदस्त गावकऱ्यांनी एक विचाराने निर्णय घ्यावा." अशाप्रकारे महाराज सामूहिक शेतीचे जनक असून, ही योजना जनसहभागातून लागू करत असताना पंचायत राज ही प्रशासकीय व्यवस्था अंमलात आणून सत्तेचे विकेंद्रीकरण अगदी गाव पातळीपर्यंत केले.

शिवकालीन कृषी व्यवस्था:

स्वराज्य स्थापनेनंतर शिवरायांनी मावळ खोरे तसेच स्वराज्यात पाणी अडविण्याच्या कामांना प्राधान्य दिले. डोंगरी गडकोटांवर व त्यांच्या दऱ्याखोऱ्या; वाड्या - वस्त्यात, खेड्यात कठीण खडकात तळी खोदली. काही ठिकाणी विहिरी बांधल्या. अशा अनेक तलाव, बांध विहिरी व तळी खेड्यात तसेच सिंहगड, तोरणा - राजगड गडकोटांवर अद्यापही उत्तम स्थितीत आहेत. शासनाने उशिरा का होईना शिवरायांच्या या आदर्श जलनीतीचा वारसा स्वीकारून शिवकालीन तळे योजना हाती घेतली आहे.

दुष्काळ पडल्यास शेतसारा माफ करून शेतकऱ्यांच्या सवलती मध्ये अन्नधान्ये, बी-बियाणे वाटप केले जाऊ लागले. स्वराज्याच्या कोठारात धान्य जमा होऊ

लागले. मधले दलाल बंद झाल्याने स्वराज्याची धान्य कोठारे भरू लागले. या कोठारातून गरजू प्रजेला पुरेसे अन्नधान्ये मिळू लागली. खेड्यात नेमलेले पाटील महसूल धान्य गोळा करणे उसनवारी देणे यासाठी मदत करीत. पडिक जमिनी पिकांच्या लागवडीसाठी मोठ्या प्रमाणात येऊ लागल्या. शेती व्यवसायात बैल जोडी ही महान शक्ती होती; रयतेची ही गरज ओळखून शिवाजी महाराजांनी आपल्या राज्यव्यवस्थेत गरजू शेतकरी रयतेला बैल जोडी विकत घेण्यासाठी बिनव्याजी कर्ज देण्याची तरतूद केली होती. शेतीची उपकरणे खरेदी करण्यासाठी सुद्धा सरकारातून कर्ज देण्याची व्यवस्था केली गेली होती. आपल्या अधिकाऱ्यांना दिलेल्या एका पत्रात शिवाजी महाराज म्हणतात, "ज्याला सेतू करावयास कुवत आहे आणि त्याला जोतास बैल, नांगर, पोटास दाना नाही, त्यावीण तो आडोन निकामी जाला असेल, तरी त्याला रोख पैकी हाती घेऊन दोन चौ बैलांचे पीक द्यावे, बैल घेवावे." शेती व्यवसाय वाढीस लागला पाहिजे, शेतकरी सुखी तर राजा सुखी, शेतकरी गरीब तर राजा गरीब; आणि राजा गरीब तर राज्य गरीब, ही त्या काळची अर्थनीती होती. आपल्या सैन्याच्या हालचालीही पेरणीच्या मार्गात आड येऊ नये याकडे शिवाजी महाराजांचे विशेष लक्ष असायचे.

सारा आकारणी:

महाराजांनी हिंदवी स्वराज्यातील शेतजमिनीसाठी सारा म्हणजे शेत जमीन महसुलाचा सर्वसाधारण दर २/५ असा ठेवला. शेतकऱ्याला उत्पन्नाचे पाच हिस्से करून त्यातील दोन सरकार दरबारी जमा करावे लागत. बाकी तीन हिस्से स्वतःसाठी ठेवता येत. जमिनीच्या दर्जानुसार शेतसाऱ्याचा दर कमी जास्त होत असे. तत्कालीन मुगल राजवटीमध्ये सारा वसुलीचा दर १/२ इतका होता. याचा अर्थ तेथील शेतकऱ्याला आपल्या उत्पन्नाच्या निम्मे उत्पन्न सरकारात जमा करावे लागे. शेतसाऱ्याची आकारणी दोन प्रकारांनी केली जाई. नक्त म्हणजे नगदी द्रव्य व गला म्हणजे धान्यरूपाने. असे गोळा झालेले धान्य कोठ्यांमध्ये साठवून महागाईच्या दिवसात विक्रीला काढले जाई. दुष्काळी परिस्थितीला तोंड देतानाही या धान्याचा उपयोग होई. स्वराज्य स्थापनेपूर्वी आदिलशाही जमिनीची मोजणी करत नसत. तर नजरमान्याने आजमास करून वतनदार टकबंदीची म्हणजे साऱ्याची रक्कम ठरवीत. हा प्रदेश स्वराज्यात दाखल झाल्यावर मात्र या कार्याला शिस्त लावली जाई. इ.स. १६७६ सारी महाराजांकडे येतात लगेच जमिनीची मोजणी व त्या जमिनीची प्रतवारीही ठरविली गेली. बागाई जमिनीत नारळ, सुपारी, उंडी; फणस, ताड इत्यादी झाडे येत. या झाडाची मोजणी करून कर आकारणी नगामागे केली जाई. पुष्कळादा अतिवृष्टी या वादळामुळे झाडे मोडत. अशा मोडलेल्या झाडांची पाहणी करून साऱ्यात सूट दिली जाईल. अशा वर्षी दरवर्षीप्रमाणे सारा न आकारता अन्य पिकांची ही प्रत्यक्ष पाहणी करून सारा आकारला जाई. याला अजमासपाहणी म्हणत.

कु. देवयानी रामदास उंबरकर

पाटबंधारे:

'मोटस्थळ व पाटस्थळ' पाण्याशिवाय शेतकरी जगू शकत नाही हे जाणून शिवाजी महाराजांनी राज्याची तिजोरी संपूर्ण खाली झाली तरी शेतकरी, शेती, सामान्य जनता व महाराष्ट्राला मोठं करण्यासाठी नवे शेतीचे, पाण्याची निर्णय घेऊन ते राबविले. ते रयतेला खूप संपन्नतेकडे, समृद्धीकडे घेऊन गेले. स्त्रियांच्या संरक्षणासाठी, प्रतिष्ठेसाठी नवे कायदे करून महाराजांनी समाजाला शिस्त लावली. सामान्य शेतकरी स्त्रियांवरच्या अत्याचारांना पायबंद, दुष्काळ पाणी योजना, पडीक जमिनीतून राष्ट्रीय उत्पादन अस शिवाजी महाराजांचे धोरण होतं. शिवाजी महाराजांनी तत्कालीन वतनदारांच्या विरुद्ध शेतकऱ्यांना संघटित केले. वतनदार आणि जहागीरदारांनी चालविलेल्या शोषणाविरुद्ध लढा उभारला. जमीन मालकीच्या संदर्भात शेतकऱ्यांना अनुकूल असे क्रांतिकारक बदल केले. त्यामुळे शेतकरी वर्गाला सुरक्षितता वाटू लागली. जमिनीला दोन मार्गाने पाणीपुरवठा केला जात असे. विहीर खोदून मोठेच्याद्वारे पाणी देणे त्याला मोटस्थळ म्हणत; दुसरा सरकारच्या कालव्याच्या मार्फत पाणी दिले जाई त्याला पाटस्थळ म्हणत. नदीचे व तलावाचे पाणी पडीक जमिनीला देऊन महाराजांनी शेती व्यवसायाला उत्तेजन दिले होते.

जमिनीचे वर्गीकरण व मोजणी:

'काठी मोजणीने' जमीन मापली जाई. ५ हात ५ मुठी = १ काठी. १ काठी = ८२ तसू. २०×२० काठ्या = १ बिघा. १२० बिघे = १ चावर. (शके १८३८ च्या भाग.इ.सं.मं.च्या अहवालात थोडे वेगळे कोष्टक दिलेले आढळते. ते असे, २० काठ्या लांब व १ काठी रुंद = १ पांड, २० पांड = १ बिघा. ६० बिघे = १ पाव. ४ पाव = १ चाहूर. १ चाहूर = ६४ कुरगी. ८ नवटाक = १ चाहूर. यातील बिघ्यास आदिलशाही बिघा संबोधले जाई.) जमिनी ही बारा प्रतीच्या आढळतात. १ अब्वल, २ धूम, ३ सीम, ४ चारसीम, ५ बावील किंवा बावूल, ६ खारवट, ७ राहू, ८ खारी, ९ कुड्याट, १० राजपाळ, ११ तुरवटे व १२ मनूत. यापैकी राज्यपाळ = झुडपाची. खारवट = समुद्रकाठीची, खारी = खाडीजवळची. बावल = खडकाळ. खुरी = दगडाळ. तुरवटे = द्विदल धान्य व ताग पिकवणारी. मनूत = झाडांच्या मुळ्या असलेली व साफ न केलेली. याशिवाय वजन म्हणजे नापीक व वरकस म्हणजे डोंगरी हेही प्रकार दिसतात. स्वराज्यातील जनतेचे पीक पाण्याचे नुकसान होऊ नये म्हणून दक्षता घेतली जात होती आणि युद्धाचे ढग जमा झाल्याबरोबर महाराज मैदानी प्रदेशातील जनतेला डोंगराळ दुर्गम परिसराचा आश्रय घेण्यास सांगत असत आणि त्या परिसरातील किल्लेदार, सुभेदार, हवालदार आणि इतर सर्व अधिकाऱ्यांना या संदर्भात आदेश दिले जात असत आणि या आदेशाची काटेकोरपणे अंमलबजावणी

व्हावी यासाठी महाराज अत्यंत दक्ष असत. या संदर्भातील अनेक पत्रे इतिहासाकडे उपलब्ध आहेत. स्वराज्यात वतनदार सरकारी अधिकारी गाव, कामगार किंवा रयतेवर जुलूम करू शकत नसत. भ्रष्टाचार करू शकत नसत. संपूर्ण राज्य हे न्यायनीतीवर आधारलेले असे होते. जमीन धारा शेतसारा गोळा करण्यात शिस्त व नियमबद्धता होती.

पेशवेकालीन कृषी व्यवस्था:

पेशवेकालीन महाराष्ट्रात म्हणजे १८ व्या शतकात शेती हाच आर्थिक जीवनाचा मुख्य आधार होता. १८ व्या शतका पूर्वीची शेती व १८ व्या शतकातील शेती यात विशेष फरक पडला नव्हता. कोकणात भात आणि देशावर जोंधळा व बाजरी ही मुख्य पारंपारिक पिके होती. या काळात नवीन पिके जरी विशेष घेतली जात नसली व दर एकरी उत्पादनातही विशेष वाढ झाल्याचे दिसत नसले तरी महाराष्ट्रातील दर एकरी उत्पादन इंग्लंड मधील दर एकरी उत्पादनापेक्षा निदान १८ व्या शतकाच्या अखेरीपर्यंत तरी कमी नव्हते. शेतीशी संबंधित मिरासदारी, उपरी, वेठबिगारी पद्धती तशाच सुरू होत्या. वतने, बलुतेदारी पद्धती जुन्याच होत्या.

शेतीत भांडवल गुंतवण्याकडे अजून कल नसला तरी लागवडीखालील क्षेत्राचा विस्तार होत होता. राज्याचा मुख्य व्यवसाय कृषी असल्याने पेशवे काळात जास्तीत जास्त जमीन लागवडीखाली आणण्याचा प्रयत्न करण्यात आला. ह्याबाबतीत पेशव्यांनी शेतकऱ्यांना खूप संरक्षण दिले. पडीत असलेली जमीन एखाद्याने मेहनतीने लागवडीखाली आणल्यास त्याला सुरुवातीची ५-६ वर्षे शेतसारा माफ होता. मात्र शेतीपासून शासनाला फारसे उत्पन्न नव्हते. कारण बराच भाग पर्वतीय होता. त्यातही कृषी पूर्णतः पावसावर अवलंबून होती. कोकण प्रदेशात प्रामुख्याने तांदूळ होत असे. देशावरील सह्याद्रीच्या पूर्वेकडे मुख्य पीक ज्वारी होते. कोकण आणि देश यातील वाहतूक घाटातून चालत असल्याने दळणवळणाचा खर्चही जास्त होता. मात्र दळणवळण करणाऱ्या या व्यापाऱ्यांना शासनातर्फे संरक्षण देण्यात येई. शेतमालाच्या किमतीत अठराव्या शतकाच्या मध्यापासून हळूहळू वाढ होऊ लागली असली तरी दळणवळणाच्या साधनात मात्र कोणतीही प्रगती झाली नव्हती. लमाणी, वंजारी लोक आपल्या मालवाहन बैलांचे तांडे घेऊन गावोगावात जात; परंतु वाहतुकीच्या साधनाच्या मागासलेपणामुळे दोन जवळच्या बाजारपेठातही जलद व कायम संपर्क साधता येत नसे.

पाटबंधारे:

बागाईत जमिनीचे सोयीसाठी पाटस्थळ व मोटस्थळ असे दोन भाग केलेले दिसून येतात. ज्या बागाईत जमिनी पूर्वीपासून लागवडीखाली आहेत. त्यांच्यावर ऊस व इतर बागाईत पिकांसाठी प्रत्येक बिघ्याला १० रु. सारा बसवावा. बागाईताने शेतीचे उत्पन्न अधिक येत असल्यामुळे तिकडेही पेशव्यांची लक्ष असे. प्रांत बागलाण येथील बागायितास पाटाचे पाणी, बंधारे फुटले म्हणून जात नाही. ते पाट बांधण्याकरिता दर साल ५००० रुपये प्रमाणे एकूण

२५ हजार रुपये खर्चण्याचे ठरले. बनेश्वर येथील धरणास खर्च ८०० रुपये येतो. त्यापैकी चारशे रुपये रोख सरकारातून दिले बाकीचे चारशे रुपये धरणाचे पाणी मिळणार त्याच पासून दामाशाहीने द्यावयाचे. तुंगभद्रेच्या कालव्याचा बंधारा फुटला होता. तो बांधण्याबद्दल हुजूरहून २००२ दिले. कसवे जायखेड प्रांत बागलाण येथे पाटस्थळाचे जमिनीस तीन बंधारे होत. ज्या पडीक जमिनी बागाईतीखाली नव्याने येतील. त्यांना पाटस्थळ व मोटस्थळ यांच्यासाठी साऱ्यांची पुढील प्रमाणे दर आकारणी करित असे :

पाटस्थळ बागाईत जमिनीचे साऱ्याचे दर -

१ वर्षे ५ रु. प्रत्येक बिघ्याला

५ वर्षे १० रु. प्रत्येक बिघ्याला

मोटस्थळ बागाईत जमिनीचे साऱ्याचे दर -

१ वर्ष १ रु. प्रत्येक बिघ्याला

५ वर्षे ५ रु. प्रत्येक बिघ्याला

सारा आकारणी:

प्रत्येक पिकाला वेगवेगळा सारा आकारला जात असे. प्रत्येक भागानुसार सारा आकारण्याची पद्धत होती. जमीन महसुलामधील जाचक सारा आकारण्याची पद्धत नानासाहेब पेशव्यांनी बंद केली. सारा आकारताना रयतेला मुख्य घटक करून अधिकारी व सुभेदारांना कर गोळा करताना प्रजेवर अन्याय अत्याचार होणार नाही. याबाबतीत नानासाहेब पेशवे स्वतःदक्ष राहत असत. पहिल्या माधवरावांच्या काळात नेरळ तालुक्यातील जमिनींना व पिकांना साऱ्याचे वेगवेगळे दर लावल्याचे दिसून येते ते पुढील प्रमाणे -

1. सरस प्रत्येक बिघ्यास ५ रुपये
2. मध्यम प्रत्येक बिघ्यास ४ रुपये
3. कनिष्ठ प्रत्येक बिघ्यास ३ रुपये
4. रब्बी व वरकस प्रत्येक बिघ्यास १ रु. ८ आ.

पडीक जमिनबद्दलचे धोरण:

पेशव्यांनी लागवडीखाली आकारणाऱ्या जमिनीबद्दल ज्याप्रमाणे एक स्वतंत्र धोरण आखले होते तसेच पडीक जमिनीच्या बाबतीत सुद्धा अतिशय लोकाभिमुख धोरण आखल्याचे दिसून येते. ज्या ठिकाणी जमीन लागवडीखाली आणणे कठीण असे तेथे विशेष प्रयत्न करण्याबद्दल सरकारातून प्रोत्साहन दिले जात असे. कोकणातील अंजनवेल व सुवर्णदुर्ग या दोन तालुक्यात जमीन ही लागवडीखाली आणता येत नसे. तेव्हा अशी जमीन लागवडीखाली आणण्यासाठी ज्या सूचना दिल्या होत्या. त्यामध्ये अशी एक सूचना होती की, शेतकऱ्यांनी डोंगराळ प्रदेश फोडून काढावा व ती माती खाचखळग्यात घालून एक चांगली सलग जमीन तयार करावी. लोकांना प्रोत्साहन देण्यासाठी पुढील प्रमाणे आवाहन करण्यात आले होते -

१) जी कोणी व्यक्ती डोंगर फोडून जमीन तयार करेल व त्या जमिनीला बांधबांधोरी करेल त्या व्यक्तीला त्या जमिनीपैकी निम्मी जमीन इनाम दिली जाईल व उरलेल्या निम्म्या जमिनीवर वीस वर्षे सारा आकारला जाणार नाही. त्यानंतरच्या पुढील पाच वर्षांत नाममात्र सारा आकारला जाईल.

२) ज्या जमिनी समुद्रकिनाऱ्याला असून पाण्याखाली जातात. त्या जमिनींना जी कोणी व्यक्ती बांधबांधोरी करेल त्याला १/४ जमीन इनाम दिली जाईल.

तगाई पद्धत व लिलाव पद्धत:

डॉ. सेन यांनी तगाई संदर्भातील उपयोग स्पष्ट केले आहेत. तगाईचा फायदा शेतकऱ्याला होतो. दुष्काळ व टंचाईच्या काळात शेतकऱ्याला पैसा उपलब्ध करून देणे आणि सावकारी जोखंडातून शेतकऱ्याची मुक्तता करणे. यासंदर्भात तगाई हा रयतेचा पैशाचा पत्र मोठ्या प्रमाणात नानासाहेब पेशवे काळामध्ये सोडविला गेला. तगाई म्हणजे सरकारी कर्ज होय. या कर्जाची वसुली करत असताना रयतेवर जुलूम, जबरदस्ती होणार नाही याची दक्षता घेतली जात असे. गरजू व्यक्तींना बिनव्याजी ही तगाई दिली जात असे. पेशवे काळातील लिलाव पद्धती ही जमीन महसुलाची महत्त्वपूर्ण पद्धत होती. या पद्धतीत नानासाहेब पेशव्यानंतर ज्यादा पैसे मिळविण्यासाठी दुसऱ्या बाजीरावाने ही पद्धत सुरू केली. पेशवाईत मराठ्यांची सत्ता देशात दूरवर पसरल्याने परप्रांतातून महाराष्ट्रात पैसा येऊ लागला. परप्रांतातून अधिकाधिक कारागीर महाराष्ट्रात येऊन स्थायिक होऊ लागले. परिणामी शेतमालाच्या मागणीत वाढ होऊन त्यांच्या किंमती वाढू लागल्या; परंतु इ.स.१८१८ मध्ये पेशवाई बुडाल्यावर वरील चित्र पालटले. लागवडीखालील जमिनीचे क्षेत्र असे कमी झाले तसेच शेतमालाच्या किंमती ही मोठ्या प्रमाणात घसरून शेती व्यवसायाची दुर्दशा झाली.

निष्कर्ष:

कष्टकरी शेतकऱ्यांच्या कल्याणासाठी शिवरायांनी खेड्यापाड्यात जमिनीची प्रतवारी सुरू केली. भावा भावातील वाद विवाद समंजसपणे सोडविले. जमिनीचा महसूल, शेतसारा गोळा करणाऱ्या देशपांडे, जहागीरदार, कुलकर्णी यांना बडतर्फ केले. त्यामुळे कष्टकरी शेतकऱ्यांकडून वसूल होणारा अमानुष सारा बंद झाला. पडीक जमिनी पिकाखाली आणण्यासाठी कुणबी, कष्टकऱ्यांना कर्ज देण्याऐवजी, शेतीची अवजारे, बी-बियाणे, बैल जोडी खेड्यातच मिळण्याची सोय झाली. लोहार, सुतार, शेतीचे अवजारे तयार करून कुणबी, शेतकऱ्यांना देऊ लागले. त्याचा मोबदला पीके आल्यानंतर सुतार, लोहारांनी देण्याची बलुते पद्धत सुरू केली. शेती हे खाते स्वतंत्र नसून त्याची व्यवस्था मामलेदार, कमावीसदार व ग्रामस्थ यांच्याकडेच होती. त्याबाबतीत त्यांच्याकडून हुजूरत जशी शिफारस होईल त्याप्रमाणे विचारपूर्वक योजना करण्यात येत असे. सांप्रत इंग्रजी राज्यात शेतकऱ्यांना सरकारांतून तगाई मिळते तिची कल्पना नवीन नसून पेशवाईतील

कु. देवयानी रामदास उंबरकर

पद्धतीचेच ते अनुकरण आहे. तगाईच्या रकमा कमाविसदार व मामलेदार आपल्या जवळच्या पैशातून देत वसूल करून घेत.

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“ज्ञानेश्वरी : आध्यात्मिक तत्वज्ञानाचा अमृतकुंभ”

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सारांश:

भगवतगीतेच्या सर्व टीकाग्रंथात लोकप्रिय आणि रसाळ टीकाग्रंथ म्हणजे ज्ञानेश्वरांची ज्ञानेश्वरी होय. ज्ञानेश्वरीत ज्ञानदेवांनी गीतेवर केलेले भाष्य म्हणजेच आध्यात्मिक तत्वज्ञानाचा अमृतकुंभच म्हणावे लागेल. कारण आध्यात्मिक तत्वचिंतनातून ज्ञानेश्वरीची काव्यमय गुंफण गुंफल्या गेली आणि यातूनच परमसुंदर भाष्य रसाळ काव्य व विश्वरूपी तत्वज्ञान याचा सुरेख संगम ज्ञानेश्वरीत साधला गेला.

प्रस्तावना:

म्हणूनच संत नामदेवांनी या परमसुंदर भाष्याला 'देशीकार लेणं' म्हटलं तर विनोबा याच ज्ञानदेवीला 'धर्मकिर्तन' म्हणतात. अशाप्रकारे ज्ञानोत्तर अनेक 'महानुभवांच्या वाणीतुन' ज्ञानदेवी बद्दल गौरोवाचे उद्गार काढल्या गेले म्हणूनच ही गीता टीका खऱ्या अर्थाने आध्यात्मिक तत्वज्ञानाचा महाकुंभच ठरते. खऱ्या अर्थाने आध्यात्मिक विषयाचे काव्यपूर्ण विवेचन या दृष्टीने हा ग्रंथ त्या काळातील सर्व भाषांच्या साहित्यात लोकोत्तर म्हणावा लागेल. कारण मौलिक स्वरूपाचे तत्वज्ञान आणि अब्बल दर्जाचे काव्य या दोहोंचा इतका मनोहर संगम दुसऱ्या कोणत्याही भाषेत आढळणार नाही.

अशी ही विश्वविख्यात गीताटीका रचतांना ज्ञानदेवांनी मात्र कुठेही मी पणाचा ठसा उमटविला नाही तर हे सर्व भाष्यकारांना वाट पुसत पुसत व व्यासांचा मागोवा घेतच पूर्ण केले आहे असे नम्रपणाचे उद्गार काढतांना ज्ञानदेव म्हणतात.

“आणि बापु पुढा जाये। त घेत पाऊलांची सोय।

बाळ ये तरी लाहे। पावो कायी ॥

तैसा व्यासाचा मागोवा घेतु। भाष्यकराने वाट पुसतु।

अयोग्यही मी न पवतु। के जाईन”॥

असे विनयशीलपणे सांगतात. अशी ही ज्ञान देवाची ज्ञानदेवी आध्यात्मिक महासुखाची शांती कथाच

आहे. आत्म्याचे अमरत्व व व्यापकत्व सांगणारा उपनिषदातील आध्यात्मविचार जरी इथे असला तरी खऱ्या अर्थाने ही कथा शृंगाराच्या माथा पाय ठेवीत आहे. इथे शृंगार रसाला थारा नसून शांत भक्ती आणि वत्सल या रसांना ज्ञानदेवांनी अधिक महत्व दिले असून जयाचिये बरवेपणी। कीजे आठ रसांची ओवाळनी ॥ इतके शांतरसाचे महत्व ओसंडून वाहते व त्यातूनच आध्यात्मिक तत्वज्ञान पाझरत आहे. या सर्व गुणवैशिष्ट्यामुळे.

दिसो परतत्व डोळा पाहो सुखाचा सोहळा। रिघो महाबोधसुकाळ। माजी विश्व। असे विश्वाच्या महान सुखाचे चित्र ज्ञानेश्वर वारंवार रेखाटतात आणि म्हणून ते पुढे म्हणतात की, या महऱ्हाटीयेच्या नागरी। ब्रह्मविद्येचा सुकाळ करी। अशी आपली इच्छा प्रगट करतात. असे हे ज्ञानदेवांचे विश्वव्यापी सर्वांगसुंदर स्वप्न म्हणजे परमेश्वरास केलेली विनंतीस म्हणावे लागेल म्हणूनच ते पसायदान रूपी दानात “जो जे वांछिल, तो ते लाहो, प्राणीजात” अशी ईश्वरास मागणी करतात. यासोबतच ते “दुरितांचे तिमिर जाओ। विश्व स्वधर्म सूर्य पाहो”। अशीही प्रार्थना करतात.

अशी ही सर्वांगसुंदर गीता टीका रचतांना ज्ञानदेव मात्र महाभारत व गीता गौरव करण्यास विसरले नाहीत. हे त्यांच्या मनाचे मोठेपण म्हणावे लागेल. महाभारताचे गुणवर्णन करतांना ते तर महाभारत म्हणजे सर्व साहित्य रत्नांचे भांडारच आहे आणि गीता ही तर त्या पेक्षाही श्रेष्ठ

आहे हे सांगतांना ते म्हणतात. “न तरी सकल धर्मांचे माहेर। सज्जनांचे जिन्हार लावण्या रत्नभांडार। शारदेचे”॥

अशाप्रकारे ज्ञानेश्वरीचे विवेचन करतांना सर्वच विभूती व महानुभवियांना वंदन करून त्यांचे मोठेपण जगासमोर मांडणे हेच ज्ञानेश्वर माऊलीच्या स्वभावाचे विनम्रपणाचे मोठेपण आहे. अशाच या विनयशील सुसंस्कारामुळे विठ्ठल संप्रदाय जगविख्यात करण्याचे सामर्थ्य ज्ञानदेवांच्या अब्द्वैती तत्वज्ञानात होते. असेच म्हणावे लागेल.

भारतीय गुरुपरंपराप्रमाणे आपल्याही सदगुरुचे मोठेपण सिद्ध करणे हा ज्ञानेश्वरांचा परमप्रीतीचा विषय आहे. म्हणून ते म्हणतात की हा सदगुरु म्हणजे सकल विद्याचिये सृष्टी। धात्रा। आहे म्हणूनच ते म्हणतात “साधका तू माऊली। पिके सारस्वत तुझा पाऊली”। या कारणे मी सावली नसडे तुझी। असे गुरु चरण न सोडण्याचे समर्थ ते अनेक ओव्यांमधून श्रोत्यांपुढे मांडतात कारण या सदगुरुमुळेच माझेच नव श्वासोच्छ्वासही प्रबंध होआवे ऐवढे सामर्थ्य गुरु मध्ये असते.

गुरुप्रमाणेच श्रोते हा सुध्दा ज्ञानदेवांचा आदराचा विषय आहे. त्यांच्या भावनेची कवळीक जाणतांना श्रोते हे सर्वज्ञ आहे त्यांना काहीही शिकाविण्याची गरज नाही. हे सांगतांना ते म्हणतात की,

“अहो हिमकराशी विंझणे। की नावापुढे आडकवणे लेणियासी लेणे। हे काही आर्थी” ॥ ज्याप्रमाणे बर्फाला वितळावे म्हणून, नादाला एकावं म्हणून सांगावे लागत नाही त्याचप्रमाणे श्रोत्यांना अवधान द्या म्हणून सांगावे लागत नाही. तरी पण वतृत्व अवधानाचा होय चारा असे मिशिकलपणे ते सांगतात. म्हणून ज्याप्रमाणे चकोर चंद्रचांदणे वेचत त्याप्रमाणे चकोराप्रमाणे ही कथा श्रोत्यांनी हळुवारपणे ऐकावी.

ज्ञानेश्वरीतील मोक्ष संन्यास योग हा १८ वा अध्याय म्हणजे जणू मानवी जिवनाचा कर्म सिध्दांत असून तत्वज्ञानाची परीसिमाच आहे. कारण ज्ञानेश्वरांनी आपल्या भाष्याकरिता इतर संस्कृत साहित्य भांडारातील ग्रंथसंपदा न घेता भगवतगीताच घेतली कारण भगवत गीता हा तत्व ज्ञानावरील अमूल्य, अजोड असा ग्रंथ असून यात मानवी जीवनाचे आदर्श मुल्ये, आदर्श तत्वे आणि कर्तव्याचे म्हणजेच कर्मांचे सुंदर विवेचन केले आहे. आणि भगवतगीतेमध्ये कृष्णाने ८७ श्लोकामध्ये केलेले कर्मांचे विवेचन ज्ञानदेवांनी

प्रा. डॉ. गणेश वैरागडे

“मोक्षसमन्यासयोगाच्या” माध्यमातून १८१० ओव्यांमध्ये विस्तृत रुपाने व पसायदानरुपी वरदानासह आपणापुढे मराठीत मांडले आहे. हा खऱ्या अर्थाने ज्ञानदेवांचा ज्ञानेश्वरीतील कर्मसिध्दांतच होय. ज्ञानेश्वर इथे सुरुवातीलाच म्हणतात की हा अठरावा अध्याय म्हणजे जणू एकाध्यायी गीताच होय व्यासाचार्य हे जणू श्रेष्ठ शिल्पकार असून त्यांनी गीतेचे मंदिर बांधतांना वेदरत्नांच्या पर्वतावर जे उपनिषदांचे पठार आहेत त्या पठारातून उत्कृष्ट रत्ने वेचून त्यातून हे गीतामंदिर तयार केले आणि हा १८ वा अध्याय म्हणजे त्या मंदिराचा जणू कळसच आहे.

या संदर्भात ज्ञानेश्वर म्हणतात “मी कळसू याची कारणे। अठरावा अध्याय म्हणे उवाइला बदरायणे” गीताप्रसादा लोकी तरी आधी ऐसे जे दुरुनी कळसू दिसे। आणि भेटीची हावतसे देवतेची तीर्थ। ज्याप्रमाणे कळसाचे दर्शन झाले की आतील देवदर्शन झाल्याचे श्रेय त्या भक्ताला मिळते त्याप्रमाणे हा १८ वा अध्याय संपूर्ण गीतेचा सारच होय म्हणजेच संपूर्ण १७ अध्यायाचे सार सांगणारी ही एक अध्यायी गीताच होय आणि हाच ज्ञानेश्वरीचा कळसाध्याय होय. कारण मानवी कर्मांचे विस्तृत विवेचन ज्ञानेश्वरांनी या कर्म सिध्दांताच्या माध्यमातून केले आहे. आपल्या कर्म सिध्दांतांचे विवेचन करतांना ज्ञानदेव गीतेतील कृष्णाच्या पाऊलावर पाऊल टाकून म्हणतात की, चांगले कर्म सुचने आणि त्याचे योग्य आचरण करणे व त्याची शेवटी फळ मिळणे हे सारे अवघड आहे. त्यापेक्षा कर्माचा त्याग म्हणजे संन्यास हा अधिक चांगला नव्हे काय? या पेक्षा मोक्ष संन्यास योगाचा माध्यमातून कर्म, मोक्ष, त्याग व संन्यास यावर भाष्य करतांना ज्ञानेश्वर म्हणतात “तरी फिटो कर्माचा पागू की जे अवधाची त्यागू” म्हणजे मुळीच कर्म करायचे नाही या त्यागाला संन्यास म्हणावे मात्र कर्म करावे व त्याचे फळ त्यागावे. असा निरपेक्ष वृत्तीला खरा त्याग म्हणावे. कारण गीतेतील 'कर्मन्ये वादीकारस्ते माफलेशु कदाचना' असे सांगतांना कर्म करतांना जो क्लेष ठेवत नाही त्यालच खरे आत्मज्ञान प्राप्त होते. या फला त्यागाला खरा संन्यास म्हणतात.

असं ते सर्वांगुणसुंदर सृष्टीतील तत्वज्ञान ज्ञानदेवाने सर्वासमोर ठेवले होते. परंतु काव्यरुपात तो महाकुंभ आहे म्हणजेच आध्यात्मिक तत्वज्ञानाचे निरुपण करतांना ज्ञानदेवीत काव्य आपोआप फुलू लागते. आणि हा काव्यरस साडेतीन चरणरुपी ओवी पात्रात ठेवल्यामुळे

तत्वज्ञानासारखा रुक्ष विषय कोमलकान्त बनला आहे. कारण इथेही ज्ञानदेवांची कवितेची कविकडे पाहण्याची दृष्टी ही आध्यात्मिकच आहे. ज्ञानोबांच्या या ज्ञानदेवीने जेवढा तत्वबोध जनसामान्यांपर्यंत नेऊन पोचविला तेवढा संस्कृत मराठीतील किंवा कोणत्याही भाषेतील एकही तात्वीक ग्रंथाकडून पोचविला गेला नसेल.

उपमा, भाषासौंदर्य, तत्वज्ञान, भक्ती व अद्वैत यांची सांगड, अलौकिक निरिक्षण शक्ती, अप्रतिम कवित्व

शैली आणि अफाट वाडःमयमाधुर्य या सर्व गुणांच्या संमिश्रणाने ज्ञानेश्वरी हा ग्रंथ न भूतो न भविष्यती असा झाला आहे.

संदर्भ ग्रंथः

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- २) प्राचीन मराठी वाडःमयाचे स्वरूप - ह.श्री. सेनोलीकर
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प्रस्तावना :-

भारत हा कृषिप्रधान देश आहे. आजही देशात तथा महाराष्ट्रात सुमारे ६० ते ६५ टक्के लोक शेती व्यवसायावर अवलंबून आहेत. ग्रामीण भागातील लोकांची उपजिविका शेती व्यवसायावर अवलंबून आहे. महाराष्ट्रातील सुमारे ६७ लाख शेतकरी कुटुंबांकडे फक्त एक हेक्टर एवढे जमिनीचे क्षेत्र आहे. चाळीस लाख शेतकरी कुटुंबांकडे एक ते दोन हेक्टर इतकेच जमिनीचे क्षेत्र आहे. दोन ते चार हेक्टर एवढे क्षेत्र असणारे सुमारे २२ लाख शेतकरी आहेत. सात लाख शेतकऱ्यांकडे ४ ते १० हेक्टर क्षेत्र असून, १० हेक्टरपेक्षा जास्त जमीन असणारे अत्यंत अल्प शेतकरी आहेत. यापैकी बरेचसे क्षेत्र पावसाच्या पाण्यावर अवलंबून आहे. त्यामुळे खात्रीशीर उत्पादन मिळण्याची श्र्वाश्र्वती नसते. मर्यादित जमिनीचे क्षेत्र उपलब्ध असल्याने आणि सिंचनाच्या सुविधा मुबलक नसल्याने याच क्षेत्रातून अधिक उत्पादन कसे घेता येईल, याचा विचार करणे गरजेचे आहे. शेतकरी आणि शासन यांच्या संयुक्त प्रयत्नांने शेती उत्पादने वाढविणे शक्य होत आहे. सद्यच्या काळामध्य कृषी शिक्षणाला महत्त्व प्राप्त झाले आहे. जिल्हा आणि ग्रामीण भागातही कृषी संदर्भातील महाविद्यालये आणि कार्यालये सुरु झाले आहेत. कृषी शिक्षणाचे महत्त्व लक्षात घेता माध्यमाने सुद्धा दाखल घेऊन दैनिक, साप्ताहिक, पाक्षिक व वाहिन्या सुरु केल्या आहेत त्याचा फायदा देशातील शेतकऱ्यांना मोठ्या प्रमाणात होत आहे.

सुधारीत बि-बियाणे आणि औषधे :-

शेती उत्पादन हे शेतीची आवश्यक मशागत, विविध निविष्टांचा योग्य प्रमाणात आणि वेळेवर वापर या गोष्टींवर अवलंबून असते. कृषी उत्पादन वाढीसाठी मुख्यत्वे भांडवल, सिंचनाची व्यवस्था या कृषी निविष्टा महत्त्वाच्या आहेत. त्यामुळे पेरणीसाठी सुधारीत बियाणे, खते, पीक किड व रोग संरक्षण करणारी औषधे उपलब्ध करता येतात. परंतु, वरील कृषी निविष्टांशिवाय महत्त्वाची आणि गरजेची कृषी निविष्टा म्हणजे कृषी तंत्रज्ञान. देशातील तसेच महाराष्ट्रातील कृषी संशोधकांनी अभ्यास करून आणि विशेष परिश्रम घेऊन विविध विषयांसंबंधी सुधारीत कृषी तंत्रज्ञान उपलब्ध करून दिले आहे. पिकांचे सुधारीत वाण, खताच्या मात्रा, पेरणीपध्दती, सिंचनपध्दती, पाणी व्यवस्थापन, अंतर्गत मशागत, पीक संरक्षण, जमिनीची मशागत, सुधारीत अवजारे व यंत्रे आणि इतर शेतीसंबंधी विषयावर सुधारीत तंत्रज्ञान संशोधनाद्वारे उपलब्ध करून देण्यात आले आहे. तसेच विविध पिके, भाजीपाला,

फळशेती, फुलशेती, पशुसंवर्धन, चारा पिके आणि यांत्रिक शेती याबाबत मोठ्या प्रमाणात उपयुक्त कृषी तंत्रज्ञान आज उपलब्ध आहे.

कृषी तंत्रज्ञान :-

महाराष्ट्रातील कृषी विद्यापीठात अविरतपणे सुधारीत कृषी तंत्रज्ञानाविषयी संशोधन सातत्याने सुरु आहे. शेतकऱ्यांना कृषी तंत्रज्ञानाची माहिती व्हावी आणि शेतकऱ्यांनी उपलब्ध कृषी तंत्रज्ञानाचा अवलंब करून शेती उत्पादने वापरावेत, यासाठी कृषी खात्यामार्फत विद्यापीठे आणि कृषी महाविद्यालये याविषयी प्रचार आणि प्रसार करीत असतात. विविध माध्यमांचा वापर यासाठी केला जात आहे. शेतकऱ्याला कृषी तंत्रज्ञानाबाबत प्रशिक्षित करण्याचे प्रयत्न सुरु आहेत. ग्रामीण भागातील शिक्षण घेऊ इच्छिणाऱ्या मुलांनी कृषी शिक्षण घेतले तर त्याचा निश्चितपणे फायदा होईल.

शास्त्रीय ज्ञानाचा उपयोग :-

प्रत्येक व्यवसाय करताना त्या व्यवसायासंबंधी आवश्यक शास्त्रीय ज्ञान गरजेचे असते. शिक्षणाद्वारे

मिळविलेल्या ज्ञानाचा आणि माहितीचा उपयोग निश्चितपणे यशस्वी होण्यासाठी होतो, हे सिद्ध झाले आहे. आज वैद्यकीय, अभियांत्रिकी, पशुसंवर्धन या विविध क्षेत्रात शिक्षणाच्या सुविधा उपलब्ध आहेत. या क्षेत्रातील मिळविलेल्या ज्ञानाचा तसेच तंत्रज्ञानाचा यशस्वीपणे उपयोग होत आहे. प्रत्येक क्षेत्रातील तंत्रज्ञान हे शास्त्रावर आधारित असते. शास्त्र आणि तंत्रज्ञान यांची सांगड घातलेली असते. तंत्रज्ञानाचा वापर करताना त्या क्षेत्राशी संबंधित ज्ञानाची व शास्त्रीय माहिती महत्त्वाची असते. शेती व्यवसाय हा शास्त्र आणि कला (कौशल्य) यावर आधारित आहे. म्हणून शेती शास्त्राची आणि त्यातील कौशल्याची माहिती करून घेणे शेतकऱ्यांच्या दृष्टीने अत्यंत महत्त्वाचे आहे. शास्त्रीय ज्ञानाद्वारे आपण एखाद्या गोष्टीबाबत कारण आणि परिणाम या संबंधाचा शोध घेतो. एखाद्या माणसाला काही आजार झाला तर डॉक्टर त्याच्या आजाराचे कारण शोधून उपचार करतात. कृषी व्यवसायात अशा अनेक बाबी आहेत की ज्यावर कारण आणि परिणाम यांची मीमांसा विचार करून उत्पादनात वाढ करता येऊ शकते.

पिकांचे संरक्षण :-

जमिनीत असणारे अन्नघटक यावर उत्पादन अवलंबून असते. खते देताना उपलब्ध घटकाचे प्रमाण लक्षात घेऊन पिकांना आवश्यक ते घटक दिले जातात. जमिनीच्या प्रकाराचा अभ्यास करून पी नियोजन करणे गरजेचे आहे. पिकांना लागणाऱ्या पाण्याची गरज अभ्यासून पिकांना पाणी देणे गरजेचे असते. पिकावर येणाऱ्या कीड व रोग याचा पिकावर दिसणारी लक्षणे पाहून त्याचे संरक्षण करणे महत्त्वाचे असते. या सर्व गोष्टींसाठी कृषी शाखेसंबंधीचे ज्ञान आवश्यक आहे. यासाठी शेतकरी कुटुंबातील विद्यार्थ्यांनी कृषिविषयी शिक्षण घेण्याची गरज आहे. त्यामुळे शेती उत्पादनात निश्चितपणे वाढ होईल.

शेतीचे नियोजन :-

सर्वसाधारणपणे १००० ते १५०० लोकसंख्या असलेल्या गावात आरोग्याच्या दृष्टीने २ ते ३ उच्चशिक्षित डॉक्टरांची गरज असते. तसेच तीन ते चार कृषी पदवीधर स्वतः शेती करीत असतील तर त्यांच्या ज्ञानाचा आणि अनुभवाचा गावातील शेतकऱ्यांना फायदा होईल. शेतीचे हंगामानुसार नियोजन करणे गरजेचे आहे. यासाठी कृषिविषयक ज्ञानाची-माहितीची गरज आहे. कृषितज्ञ हे ग्रामीण भागात कृषिविषयक मार्गदर्शन व सल्लागार म्हणून कार्यरत असल्यास शेतकऱ्यांना त्यांच्या व्यवसायात नक्कीच फायदा होईल. महाराष्ट्रात सरकारने आणि विद्यापीठांनी

कृषी शिक्षणाच्या सुविधा मोठ्या प्रमाणात उपलब्ध करून दिल्या आहेत. कृषी विद्यालयांमध्ये सध्या प्रवेश प्रक्रिया सुरू आहे. या संधीचा ग्रामीण भागातील मुलांनी फायदा करून घ्यायला हवा.

कृषीची अवस्था :-

आज आपण अन्नधान्य, फळे, भाजीपाला आणि दूध उत्पादनात जगातील पहिल्या तीन देशांमध्ये आहे, तरीही हा अन्नदाता अडचणीत का आहे? शेवटी काय कारण काय आहे? आपल्या इथल्या शेतीची अवस्था दरवर्षी ढासळत चालली आहे. वास्तविक, आज शेती आणि शेतकरी यांच्यावर जे संकट आले आहे, त्याची दोन प्रमुख कारणे आहेत. आपल्या शेतमालाला खर्चातुसार भाव मिळत नाही. त्याच बरोबर आपल्या शेतकऱ्यांचा उत्पादन खर्चही निघत नसल्याची परिस्थिती आज आहे. अखेर तोट्याची शेती हे किती दिवस चालणार? आपल्या शेतकऱ्यांनी कमी उत्पादन घेतले तरी त्रास आणि जास्त उत्पादन घेतल्यास जास्त त्रास होतो. दुसरे संकट म्हणजे वर्षानुवर्षे शेतीमालाचे उत्पादन कमी होणे. आज ७० टक्क्यांहून अधिक शेती एक हेक्टरपेक्षा कमी आहे. आपल्या शेतीचे भविष्य तसेच वर्तमान या स्थितीत आहे. परंतु लोकसंख्येच्या वाढीसह काही क्षेत्र अकृषक होत आहे. हे कारण आहे कृषी क्षेत्र लहान होण्याचा आणि त्याच बरोबर उत्पादक कमी होत आहे आणि लहान शेतकऱ्यांच्या उपजीविकेवर मोठ्या प्रश्नचिन्ह निर्माण झालेला आहे. ग्रामीण भागातील मोठ्या युवा वर्ग

कामगारांची भ्रमनिराशा :-

शेती करण्याऐवजी शहरात जाऊन रोजगार हा आता सर्वात प्रतिष्ठित व्यवसाय बनविला आहे. आपण कसत असलेल्या शेतीची प्रतिष्ठा आणि दर्जा सातत्याने घसरत आहे. जणू गावातून शहराकडे जाण्याची स्पर्धा लागली कि काय असे वाटत आहे. तरुण वर्ग हा शेतीपासून भ्रमनिरास होत आहे. सर्वात वाईट गोष्ट म्हणजे सुशिक्षित ग्रामीण तरुण, शेतीपासून जवळजवळ पूर्णपणे दुरावला आहे. आपल्या येणाऱ्या पुढच्या पिढीने आपला पारंपारिक व्यवसाय म्हणजे शेती हा स्वीकारावा असे बहुतेक शेतकऱ्यांनाही वाटतच नाही.

कृषीमालाला भाव मिळना :-

आज आपण अन्नधान्य, फळे, भाजीपाला आणि दूध उत्पादनात जगातील पहिल्या तीन देशांमध्ये आहे, तरीही हा अन्नदाता अडचणीत का आहे? शेवटी काय कारण काय आहे? आपल्या इथल्या शेतीची अवस्था दरवर्षी ढासळत चालली आहे. वास्तविक, आज शेती आणि शेतकरी यांच्यावर

जे संकट आले आहे, त्याची दोन प्रमुख कारणे आहेत. आपल्या शेतमालाला खर्चानुसार भाव मिळत नाही. त्याच बरोबर आपल्या शेतकर्यांचा उत्पादन खर्चही निघत नसल्याची परिस्थिती आज आहे. अखेर तोट्याची शेती हे किती दिवस चालणार? आपल्या शेतकर्यांनी कमी उत्पादन घेतले तरी त्रास आणि जास्त उत्पादन घेतल्यास जास्त त्रास होतो. दुसरे संकट म्हणजे वर्षानुवर्षे शेतीमालाचे उत्पादन कमी होणे. आज ७० टक्क्यांहून अधिक शेती एक हेक्टरपेक्षा कमी आहे. आपल्या शेतीचे भविष्य तसेच वर्तमान या स्थितीत आहे. परंतु लोकसंख्येच्या वाढीसह काही क्षेत्र अकृषक होत आहे. हे कारण आहे कृषी क्षेत्र लहान होण्याच आणि त्याच बरोबर उत्पादक कमी होत आहे आणि लहान शेतकर्यांच्या उपजीविकेवर मोठ्या प्रश्नचिन्ह निर्माण झालेला आहे. ग्रामीण भागातील मोठ्या युवा वर्ग

निष्कर्ष:-

शेती करण्याऐवजी शहरात जाऊन रोजगार हा आता सर्वात प्रतिष्ठित व्यवसाय बनविला आहे. आपण कसत असलेल्या शेतीची प्रतिष्ठा आणि दर्जा सातत्याने घसरत आहे. जणू गावातून शहराकडे जाण्याची स्पर्धा लागली कि काय असे वाटत आहे. तरुण वर्ग हा शेतीपासून भ्रमनिरास होत आहे. सर्वात वाईट गोष्ट म्हणजे सुशिक्षित ग्रामीण तरुण, शेतीपासून जवळजवळ पूर्णपणे दुरावला आहे. आपल्या येणार्या पुढच्या पिढीने आपला पारंपारिक व्यवसाय म्हणजे शेती हा स्वीकारावा असे बहुतेक शेतकर्यांनाही वाटतच नाही. आज सुमारे ७० टक्के लोक ग्रामीण भागात राहतात. त्या लोकांची उपजीविका शेती वर अवलंबून आहे परंतु त्या शेतकर्यांना उपजीविकेचे इतर चांगले साधन सापडल्यास त्यांना शेती सोडायला सुद्धा तयार आहे. त्यामुळे एवढ्या मोठ्या प्रमाणावर शेतीचु होणारी नामुष्की हा चिंतेचा विषय आहे. शेती हे पीक उत्पन्नाचे प्रमुख साधन यासाठी शेती या क्षेत्रात भरपूर काही शिकण्यासारखे आहे आपल्या मनात शेती विषय जिद्द असणे आवश्यक आहे त्याच बरोबर आपण शकतो पाण्याचा कमी वापर म्हणजे ठिबक सिंचन व तुषार सिंचन व शेतीतील नवं नवीन पिकपद्धती आणि कृषी आणि कृषी-तंत्रज्ञान यांच्यात समन्वय साधता आला तर ओसाड वाळवंट ही हिरवेगार करता येतात.

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- 2) [https://krishi.vikash.yojana.Nic.. in..Date](https://krishi.vikash.yojana.Nic..in..Date) 17/11/2023
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डॉ. गणेश गोविंदराव माने

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सायबर गुन्हे आणि सोशल मीडियाची भूमिका

डॉ. बालाजी लक्ष्मणराव शिंदे

वृत्तपत्रविद्या विभाग प्रमुख पुण्यश्लोक अहिल्यादेवी होळकर महाविद्यालय, राणीसावरगाव ता. गंगाखेड, जिल्हा परभणी

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प्रस्तावना :-

आपण जितक्या वेगाने डिजिटल जगाकडे वाटचाल करीत आहोत, त्याच वेगाने सायबर गुन्ह्यांचे प्रमाणही वाढत आहे. ज्या वेगाने तंत्रज्ञानाची प्रगती झाली. त्याच वेगाने मानवाचे इंटरनेटवरील अवलंबित्वही वाढले आहे. एका जागी बसून, इंटरनेटच्या माध्यमातून जगाच्या काना-कोपऱ्यात माणसाचा प्रवेश सोपा झाला. आजच्या काळात, सोशल नेटवर्किंग, ऑनलाइन शॉपिंग, डेटा संग्रहित करणे, गेमिंग, ऑनलाइन, अभ्यास, ऑनलाइन जॉब इत्यादीसारख्या सर्व गोष्टी इंटरनेटद्वारे मिळू शकतात. आजच्या काळात इंटरनेटचा वापर जवळपास सर्वच क्षेत्रात होत आहे. इंटरनेटच्या वापरमुळे आणि त्याच्याशी संबंधित फायद्यांसह, सायबर गुन्ह्यांची संकल्पना देखील विकसित झाली आहे. सध्या भारतातील नागरिक सोशल नेटवर्किंग साइट्स वापरतात. देशात सोशल नेटवर्किंग साइट्सच्या वापराबाबत नागरिकांमध्ये जागरूकतेचा अभाव आहे. तसेच बहुतेक सोशल नेटवर्किंग साइट्सचे सर्व्हर परदेशात आहेत, ज्यामुळे भारतातील सायबर गुन्ह्यांच्या मुळापर्यंत पोहचणे कठीण होते. या लेखात सायबर गुन्हे, त्याचे प्रकार, प्रतिबंधात्मक उपाय आणि सरकारने केलेल्या तरतुदी यावर चर्चा केली जाईल. यासोबतच सायबर गुन्ह्यांमध्ये सोशल नेटवर्किंग साइट्सच्या भूमिकेचेही मूल्यमापन केले जाणार आहे.

सायबर गुन्हे म्हणजे काय?

सायबर गुन्हे विविध स्वरूपात होतात. काही वर्षांपूर्वी इंटरनेटच्या माध्यमातून होणाऱ्या गुन्ह्यांबाबत जनजागृतीचा अभाव होता. सायबर गुन्ह्यांच्या बाबतीत भारतही इतर देशांच्या तुलनेत मागे नाही, जिथे सायबर गुन्ह्यांच्या घटनांचे प्रमाणही दिवसेंदिवस वाढत आहे. सायबर गुन्ह्यांच्या प्रकरणांमध्ये, सायबर गुन्हेगार वापरकर्त्यांची वैयक्तिक माहिती, गोपनीय व्यवसाय माहिती, सरकारी माहिती किंवा डिव्हाइस अक्षम करण्यासाठी प्रवेश मिळविण्यासाठी डिव्हाइस वापरू शकतो. वरील माहिती ऑनलाईन विकणे किंवा खरेदी करणे हा देखील सायबर गुन्हा आहे. संगणक आणि इंटरनेटच्या वापरानेही गुन्हेगारी कृती आहे. यात शंका नाही. सायबर क्राईम, ज्याला 'इलेक्ट्रॉनिक गुन्हे' असेही म्हणतात, हा एक गुन्हा आहे. ज्यामध्ये संगणक, नेटवर्क उपकरण किंवा नेटवर्क गुन्हा करण्यासाठी ऑब्जेक्ट किंवा साधन म्हणून वापरले जाते. त्यांच्यामार्फत (संगणक,

नेटवर्क उपकरणे किंवा नेटवर्क) जिथे असे गुन्हे केले जातात तिथे त्यांच्यावर कारवाई केली जाते. गुन्ह्यांमध्ये सायबर खंडणी, ओळख चोरी, क्रेडिट कार्ड, फसवणूक, संगणकावरून वैयक्तिक डेटा हॅक करणे, फिशिंग, बेकायदेशीर डाउनलोडिंग, सायबर स्टॅकिंग, व्हायरस पसरविणे यासह विविध क्रियाकलापांचा समावेश होतो. हे नमूद करण्यासारखे आहे की, सॉफ्टवेअर पायरसी हा देखील सायबर गुन्ह्याचा एक प्रकार आहे. ज्यामध्ये सायबर गुन्हेगार केवळ ऑनलाइन पोर्टलद्वारेच गुन्हे करतात असे नाही.

सायबर गुन्ह्यांचे वर्गीकरण:

सायबर तज्ञांच्या मते, "गुन्ह्यांची श्रेणी दोन श्रेणींमध्ये विभागली जाऊ शकते. ज्या गुन्ह्यांमध्ये संगणकावर हल्ला केला जातो. अशा गुन्ह्यांची उदाहरणे म्हणजे हॅकिंग, व्हायरस हल्ला इ. ज्या गुन्ह्यांमध्ये संगणकाचा वापर शस्त्रसाधन म्हणून केला जातो. या प्रकारच्या गुन्ह्यांमध्ये सायबर दहशतवाद, आयपीआर

उल्लंघन, क्रेडिट कार्ड फसवणूक, पोर्नोग्राफी इत्यादींचा समावेश आहे.

सायबर गुन्ह्यांच्या श्रेणी:

सायबर गुन्हे तीन प्रमुख श्रेणींमध्ये येतात. ज्यात व्यक्ती, मालमत्ता आणि सरकारविरुद्ध गुन्हे समाविष्ट आहेत. व्यक्तींविरुद्ध सायबर गुन्हे: गुन्हे ऑनलाइन असले तरी वास्तविक नागरीकांच्या जीवनावर परिणाम करतात. यापैकी काही गुन्ह्यांमध्ये सायबर छळ आणि सायबर स्टॉलिंग,चाइल्ड पोर्नोग्राफीचे वितरण, विविध प्रकारची फसवणूक, क्रेडिट कार्ड फसवणूक, मानवी तस्करी, ओळख चोरी आणि ऑनलाइन बदनामी यांचा समावेश आहे. सायबर गुन्ह्यांच्या या श्रेणीमध्ये, एखाद्या व्यक्ती किंवा समूहाविरुद्ध दुर्भावनापूर्ण किंवा बेकायदेशीर माहिती ऑनलाइन लीक केली जाते.

विशिष्ट मालमत्तेविरुद्ध सायबर गुन्हे: काही ऑनलाइन गुन्हे मालमत्तेविरुद्ध असतात, जसे की, संगणक किंवा सर्व्हरविरुद्ध किंवा वापरणे. या गुन्ह्यांमध्ये हॅकिंग, व्हायरस ट्रान्समिशन, सायबर आणि टायपो स्कॉटिंग, कॉपीराइट उल्लंघन, आयपीआर उल्लंघन इत्यादींचा समावेश आहे. उदाहरण कोणीतरी तुम्हाला वेब-लिक पाठवितो, त्यावर क्लिक केल्यानंतर एक वेब पेज उघडते, जिथे तुम्हाला तुमच्या बँक खात्याशी संबंधित, गोपनीय दस्तऐवजांशी संबंधित सर्व माहिती विचारली जाते आणि ही माहिती भारतीय रिझर्व्ह बँकेकडून मागविली जाते, असे म्हटले जाते. सरकार, तुम्ही तिथे सर्व माहिती द्या आणि त्यानंतर त्या माहितीचा वापर करून तुमच्या कागदपत्रांमध्ये आणि बँक खात्यात छेडछाड केली तर याला मालमत्तेवरचा सायबर हल्ला म्हटले जाईल.

सरकारी तपशीलांविरुद्ध सायबर गुन्हे: हा सर्वात गंभीर सायबर गुन्हा मानला जातो. सरकारविरोधात केलेल्या अशा गुन्ह्याला सायबर दहशतवाद असेही म्हणतात. सरकारी सायबर गुन्ह्यात सरकारी वेबसाइट किंवा लष्करी वेबसाइट हॅक करणे समाविष्ट आहे. विशेष म्हणजे जेव्हा एखाद्या सरकारविरुद्ध सायबर गुन्हा केला जातो,तेव्हा तो त्या राष्ट्राच्या सार्वभौमत्वावर हल्ला आणि युद्धाचे कृत्य मानले जाते. हे गुन्हेगार सहसा दहशतवादी किंवा इतर शत्रु देशांचे सरकार असतात. अशा सायबर गुन्ह्यांवर नियंत्रण ठेवण्यासाठी प्रत्येक देशाच्या सरकारने कडक सायबर कायदे केले आहेत.

डॉ. बालाजी लक्ष्मणराव शिंदे

सोशल मीडियाची भूमिका:

मोठ्या प्रमाणावर सोशल नेटवर्किंग साइट्स वापरणाऱ्या लोकसंख्येला सायबर क्राईमच्या धोक्यांविषयी माहिती नाही. विविध सोशल नेटवर्किंग साइट्सचे सर्व्हर इतर देशांमध्ये केंद्रित आहेत, ज्यामुळे हे देश नागरीकांच्या वैयक्तिक माहितीचा गैरवापर करू शकतात, अशी भीती निर्माण झाली आहे. नागरिक त्यांची वैयक्तिक माहिती, विविध सोशल नेटवर्किंग साइट्सवर शेअर करतात, ज्यामुळे हॅकर्स सहजपणे ही सोशल नेटवर्किंग अकाउंट हॅक करतात आणि नंतर मिळालेल्या माहितीचा गैरवापर करतात. सोशल नेटवर्किंग साइट्सवरील हॅकर्स लोकांना ऑनलाइन फसवणुकीचे बळी बनवितात.विविध ऑनलाइन मनी ट्रान्सफर ॲप्सद्वारे दहशतवादी आणि देशविरोधी घटकांना निधी पुरवला जातो, असल्याचेही सुरक्षा यंत्रणांना आढळून आले आहे.सायबर गुन्हेगार विविध ऑनलाइन गेमद्वारे मुलांना गुन्हे करण्यास प्रोत्साहित करतात.

सायबर गुन्ह्यांना आळा घालण्यासाठी सरकारचे प्रयत्न:

'माहिती तंत्रज्ञान कायदा, 2000' भारतात मंजूर झाला. ज्याच्या तरतुदी तसेच भारतीय दंड संहितेच्या तरतुदी सायबर गुन्ह्यांचा एकत्रितपणे सामना करण्यासाठी पुरेशा आहे. माहिती तंत्रज्ञान कायदा 2000 चे कलम 43, 43A, 66, 66B, 66C, 66D, 66E, 66F, 67, 67A, 67B, 70, 72, 72A आणि 74 हॅकिंग आणि सायबर गुन्ह्यांशी संबंधित आहेत. सरकारने 'राष्ट्रीय सायबर सुरक्षा धोरण, 2013' जारी केले. ज्या अंतर्गत अत्यंत संवेदनशील माहितीच्या संरक्षणासाठी सरकारने 'नॅशनल क्रिटिकल इन्फॉर्मेशन इन्फ्रास्ट्रक्चर प्रोटेक्शन सेंटर (NCIIPC)' ची स्थापना केली. या अंतर्गत 2 वर्षांपासून जन्मठेप आणि शिक्षेची किंवा दंडाचीही तरतूद केली आहे. विविध स्तरांवर माहिती सुरक्षा क्षेत्रात मानव संसाधन विकसित करण्याच्या उद्देशाने, सरकारने माहिती सुरक्षा शिक्षण आणि जागरूकता (ISEA) प्रकल्प सुरू केला आहे.'कंप्युटर इमर्जन्सी रिस्पॉन्स टीम (CERT)' ची स्थापना सरकारने केली आहे. जी संगणक सुरक्षेसाठी राष्ट्रीय स्तरावरील मॉडेल एजन्सी आहे.सायबर गुन्ह्यांचा समन्वित आणि प्रभावीपणे सामना करण्यासाठी देशात 'सायबर स्वच्छता केंद्र'ही स्थापन करण्यात आली आहे. हे इलेक्ट्रॉनिक्स आणि माहिती तंत्रज्ञान मंत्रालयाच्या (MeitY) अंतर्गत भारत सरकारच्या डिजिटल इंडिया मोहिमेचा एक भाग आहे. माहितीची

देवाणघेवाण करण्यासाठी आणि सायबर सुरक्षेच्या दृष्टीने सर्वोत्तम पद्धती अवलंबण्यासाठी भारत अमेरिका, यूके आणि चीनसारख्या देशांशी समन्वय साधत आहे. इंटर-एजन्सी समन्वयासाठी, 'इंडियन सायबर क्राइम को-ऑर्डिनेशन सेंटर-I4C' ची स्थापना करण्यात आली आहे.

भारतीय सायबर गुन्हे समन्वय केंद्र:

जानेवारी 2020 मध्ये, सायबर गुन्ह्यांचा सामना करण्यासाठी गृह मंत्रालयाने भारतीय सायबर गुन्हे समन्वय केंद्र (I4C) चे उद्घाटन केले आहे. ही योजना संपूर्ण भारतात लागू करण्यात आली आहे. सायबर गुन्ह्यांचा अधिक चांगल्या प्रकारे सामना करण्यासाठी आणि I4C समन्वित आणि प्रभावीरीतीने अंमलात आणण्यासाठी योजनेत खालील प्रमुख घटकांचा समावेश आहे.

1. नॅशनल सायबर क्राइम
2. ग्रेट अॅनालिटिक्स युनिट
3. नॅशनल सायबर
4. क्राइम रिपोर्टिंग पोर्टल
5. संयुक्त सायबर
6. गुन्हे अन्वेषण पथकासाठी प्लॅटफॉर्म
7. नॅशनल सायबर क्राइम
8. फॉरेंसिक लॅबोरेटरी इकोसिस्टम,
9. नॅशनल सायबर
10. क्राइम ट्रेनिंग सेंटर
11. सायबर क्राइम इकोसिस्टम मॅनेजमेंट युनिट
12. नॅशनल सायबर रिसर्च अँड इन्व्हेस्टिगेशन सेंटर

बुडापेस्ट अधिवेशन म्हणजे काय?

सायबर क्राइम आणि डेटा सुरक्षेला चालना देण्यासाठी आंतरराष्ट्रीय सहकार्याची गरज गृह मंत्रालयाकडून सायबर क्राइमवरील बुडापेस्ट कन्व्हेन्शनवर स्वाक्षरी करण्यासाठी दबाव येत आहे. बुडापेस्ट कन्व्हेन्शन ऑन सायबर क्राइम हे बुडापेस्ट कन्व्हेन्शन ऑन सायबर क्राइम म्हणून ओळखले जाणारे अधिवेशन आहे. हा अशा प्रकारचा पहिला आंतरराष्ट्रीय करार आहे, ज्यामध्ये इंटरनेट आणि संगणक गुन्ह्यांना आळा घालण्यासाठी राष्ट्रीय कायदे सुसूत्रीकरण, तपास तंत्र सुधारणे आणि या संदर्भात जगातील इतर देशांमधील सहकार्य वाढविण्याचा प्रयत्न केला आहे. अधिवेशनाचा कलम 32B डेटामध्ये प्रवेश करण्यास परवानगी देतो आणि अशा प्रकारे राष्ट्रीय

सार्वभौमत्वाचे उल्लंघन करतो, म्हणून भारताने त्यावर स्वाक्षरी करणे बाकी आहे.

निष्कर्ष:

भारत इंटरनेटचा तिसरा सर्वात मोठा वापरकर्ता आहे. अलिकडच्या वर काळात सायबर गुन्ह्यांमध्ये अनेकपटींनी वाढ झाली आहे. सायबर सुरक्षा प्रदान करण्यासाठी सरकारने अनेक पावले उचलली आहेत. भारत कॅशलेस इकॉनॉमी स्वीकारण्याच्या दिशेने वाटचाल करीत असताना, सायबर सुरक्षा सुनिश्चित करणे आवश्यक आहे. डिजिटल इंडिया कार्यक्रमाचे यश मुख्यत्वे सायबर सुरक्षेवर अवलंबून आहे. त्यामुळे भारताला या क्षेत्रात वेगाने काम करावे लागेल. दुसरीकडे सोशल मीडियाने अभिव्यक्ती स्वातंत्र्याच्या अधिकाराला नवा आयाम दिला आहे. आज प्रत्येक व्यक्ती सोशल मीडियाच्या माध्यमातून आपले विचार कोणत्याही भीतीशिवाय व्यक्त करू शकतो. हजारो नारिकांपर्यंत पोहचू शकतो, मात्र सोशल मीडियाचा जपून वापर यापासून आपल्याला वाचवू शकतो. ऑनलाइन फसवणूक आणि सायबर क्राइमचे गंभीर धोखे निर्माण झाले आहेत.

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3. राष्ट्रीय सायबर, अपराध रिपोर्टिंग पोर्टल- 2020, भारत सरकार
4. भारताचे सायबर कायदे



भारतीय राज्यघटना आणि विकासाची ऐतिहासिक पार्श्वभूमी

सहा.प्रा.नासीर कॉसम शेख

राज्यशास्त्र विभाग प्रमुख, श्री विठ्ठल रूखिमणी कला, वाणिज्य व विज्ञान महा.

सवना ता. महागांव जि. यवतमाळ.

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सारांश:-

भारतामध्ये इंग्रजी राजवटीचा प्रवेश झाला. ईस्ट इंडिया कंपनीतील अधिकारी आणि कर्मचारी हे व्यापारी धोरणाशी निगडित होते. ईस्ट इंडिया कंपनीने भारताला लुटून नेण्याचा प्रयत्न केलेला आहे. ईस्ट इंडिया कंपनीची स्थापना १६०० मध्ये केली. हिंदी महासागराच्या क्षेत्रात व्यापार करण्याकरीता ही कंपनी स्थापन केल्या गेली. १८५८ च्या राणीच्या जाहीरनाम्याद्वारे ब्रिटीश पार्लमेंटने भारतीयांकरीता उदार धोरण अवलंबविण्याची शक्ती दिली १८६१, १८९२, १९०९, १९१९ आणि १९३५ च्या भारत सुधारणा कायद्याद्वारे भारतामध्ये अनेक सुधारणा करण्यात आल्या होत्या. ब्रिटीशांनी शासन कारभार चालवीत असतांना जनतेच्या प्रतिक्रिया जाणून घेण्यासाठी विविध प्रकारचे कमीशन व समित्या नेमल्या. लोकशाही शासनाच्या बुरख्याखाली ब्रिटीशांनी भारतीय लोकांवर एकाधिकारासाठी ही पध्दतशीरपणे गाजवली.

संशोधनाची उद्दिष्टे –

प्रस्तुत संशोधन विषयाची उद्दिष्टे पुढीलप्रमाणे नमुद करण्यात येईल.

१. विकास ही निरंतर चालणारी प्रक्रिया आहे याचे अध्ययन करणे.
२. आधुनिक लोकशाहीची प्रक्रिया ब्रिटीश काळात मिळाली याचा शोध घेणे.
३. भारतातील संसदीय शासन प्रणालीचा ऐतिहासिक पार्श्वभूमीचा उलगडा करणे.

संशोधन विषयाची गृहीतकृत्ये –

प्रस्तुत विशयाला नवीन दिशा व मार्गदर्शन मिळण्याकरीता पुढील गृहीतकृत्य मांडण्यात आली आहे.

१. ब्रिटीशांनी भारतामध्ये केंद्रीयकृत पध्दतीने राज्यशासन केले.
२. १८५८ च्या कालखंडात ब्रिटीशांच्या शासन करण्याच्या पध्दतीमध्ये बदल झाला नाही.
३. भारताच्या राज्यघटनेवर ब्रिटीश कारकीर्दीचा प्रभाव पडलेला नाही.

संशोधन पध्दती – प्रस्तुत विषयाचे संशोधन पूर्ण करण्याकरीता प्राथमिक व दुय्यम साधनांचा उपयोग करण्यात आला आहे.

प्रस्तावना – कोणत्याही देशाच्या विकासाचा आधारस्तंभ तेथील नागरीकांना मिळालेल्या अधिकारीच्या दर्जावर अवलंबून असते. जे राज्य नागरीकांना त्यांच्या स्वतःच्या न्याय अधिकारांपासून वंचित ठेवू शकतात. अधिकार हे नागरीकांच्या सूत व व्यक्त गुणांच्या विकासाकरीता पोषक परिस्थिती निर्माण करित असतात. स्वातंत्र्य, समता, बंधूता

व न्याय ह्या लोकशाही मूल्यांच्या मुलभूत आधारावर त्या देशाचा विकास होतो. भारतासारख्या देशांमध्ये प्राचीन, मध्ययुगीन, मोघल व ब्रिटीशकालीन ऐतिहासिक वारश्याचे अध्ययन केल्यास लोकशाही मूल्यांची स्थिती फारशी प्रशंसनीय नव्हती अशी पुरावे मिळतात. राष्ट्रीय एकात्मतेचा भाव व सामाजिक विषमतेमुळे विदेशी राज्यकर्त्यांनी इंग्रजांनी भारतावर शेकडो वर्षे राज्य केले हे आपणास इतिहासात दिसून येते. त्यानंतर मोघलांचे शासन भारतावर लागू झाले त्यामुळे नागरीकांच्या अधिकारांवर गदा आली.

ब्रिटीशांनी भारतातील परिस्थितीचा फायदा घेतला आणि आपली सत्ता येथे स्थापन केली आणि त्याचा तीव्र गतीने विस्तार केला. विखूरलेलया प्रशासकीय व्यवस्थेला ब्रिटीशांनी एकतेच्या सुत्रात बाधण्याचे व्यवस्थित कार्य इंग्रजांनी करून दाखविले. आणि ब्रिटीशांनी भारतीयांना लोकशाहीचे धडे गिरविण्याचे महान कार्य केले. २६ जानेवारी १९५० ला जी भारतात राज्यघटना लागू करण्यात आली आहे. त्या राज्यघटनेत इंग्रजांची छाप पडलेली दिसून येते.

घटनात्मक विकास आणि भारत –

विकास हे निरंतर चालणारे एक साधन आहे. भारतीय राज्य घटनेच्या विकासाचा पाया प्राचीन व मध्ययुगीन काळामध्ये साम्राज्याच्या विस्ताराची संकल्पना आस्तित्वात आली आहे. लोककल्याणकारी राज्याच्या संकल्पनेचे पुरावे तुरळक प्रमाणांमध्ये आढळल्याचे दिसून येतात.

प्रमुख राजकीय पद प्राचीन आणि मध्ययुगीन काळामध्ये अनुवांशिक स्वरूपाचे होते. यामुळे तत्कालीन

संवेज्ञानिक संहरचनेबाबत निर्णय निर्धारण प्रक्रिया ही केंद्रीय स्वरूपाची होती. वेद, पुराण, उपनिषद व ऋग्वेद यामध्ये राजावर लोकमताचे दडपण येत होते. विदेशी शासकांनी भारतामध्ये शासन करित असतांना येथील प्राचीन व मध्ययुगीन वारस्याच्या मूलभूत सापड्याला धक्का न लावता भारत देशावर दिडशेपेक्षा जास्त वर्षांपर्यंत शासन केलेले आहे. आधुनिक काळातील गणतंत्राप्रमाणे बौद्धकालीन गणतंत्राचे अस्तित्व भारतामध्ये होते. परंतु ईस्ट इंडिया कंपनीने भारतीयांवर शासन प्रस्थापित करण्याकरीता भीषण अन्याय व अत्याचार केले होते. शासनावर नियंत्रण प्रस्थापित करतांना लोकतांत्रिक मार्गाने नियंत्रण प्रस्थापित करणे राजकीय विकासामध्ये अभिप्रेत असते. त्याची सुरुवात १८५८ पूर्वी झाल्याचे ऐतिहासिक पुरावे दिसून येतात.

१८५७ चा उठाव शमविण्यामध्ये ब्रिटीशांना तारेवरची कसरत करावी लागली. १८५७ च्या उठावामुळे भारतीयांमध्ये राष्ट्रप्रेम व देश प्रेमाची भवना लोकांमध्ये निर्माण झाली. लोकांमध्ये देशप्रेमाची असलेली आग विझविण्यासाठी ब्रिटीशांना घाम गाळावा लागला. भारतामध्ये आपले साम्राज्य कायम टिकवून ठेवण्यासाठी ब्रिटीशांनी भारतीयांना आमीष दिले. आणि त्यामुळे आधुनिक काळातील राज्यघटनेचा पाया रचलयास मोलाचे सहकार्य लाभले. म्हणजेच ब्रिटीशांनी चालविला शासनकारभार याचे संपूर्ण अध्ययन भारतीय लोकांना मिळाले. आणि त्यामुळेच भारतीय लोकांमध्ये स्वातंत्र्याची चाहल लागली. युग कोणतेही असो शासन सत्तेवर जनतेचे नियंत्रण असणे हे लोकशाहीशी अभिप्रेत आहे.

१९१९ चा कायदा –

१९१९ च्या भारत शासन अधिनियमांची अंमलबजावणी १९२० मध्ये करण्यात आली. या कायद्यामध्ये अंतर्भूत असलेल्या घटकानुसार शासन चालवतांना कोणत्या बाबी समोर आल्या याचे अध्ययन करण्याकरीता १० वर्षांनी आयोगाची नेमणूक करण्याचे ठरविण्यात आले. १९२० चे भारतीयांचे असहयोग आंदोलन स्वराज्य दलाची भूमिका ह्या गोष्टी निर्माण झाल्या. १९२८ मध्ये कलकत्ता येथे काँग्रेसच्या अधिवेशनात स्वराज्याची मागणी करण्यात आली. इंग्रजांनी भारतीयांच्या मागणीकडे दुर्लक्ष केले. त्यामुळे १९३० मध्ये पूर्ण स्वराज्याची मागणी करण्यात आली. भारतीयांचा असंतोष वाढत गेला. त्यामुळे इंग्रजांनी दुर्लक्ष करून चालणार नाही. पंडीत नेहरू यांनी सायमन कमीशन व गोलमेज परिषदेमध्ये इंग्रजाविरुद्धचा असंतोष दाखविला.

१९३५ सायमन कमिशन च्या शिफारशी – सायमन कमीशनवर चर्चा करण्यासाठी लंडनमध्ये तीन गोलमेज परिषदा घेण्यात आल्या होत्या.

१) सायमन कमिशनने दोन वर्षांच्या कालावधीत भारतासाठी कशी राज्यघटना असावी या बाबतीत आपला रिपोर्ट तयार करून मे १९३० मध्ये जाहीर केला.

२) प्रांतातील विद्वल राज्यपध्दती रद्द करून सर्व खाती लोकप्रतिनिधीच्या ताब्यात देण्यात यावी.

३) ब्रिटिश लोकांनाच मतदानाचा अधिकार ठेवून जाती पंथानुसार राखीव मतदारसंघ असावे.

४) नेहरू अहवालातील तत्वे जर सरकारने स्विकारली नाहीत तर सविनय कायदेभंग सुरू करण्याच्या सूचना दिल्या.

५) केंद्रीय कायदेमंडळातील काही सभासद अप्रत्यक्ष निवडून द्यावे.

६) राज्यघटना ही लवचिक असून त्यामध्ये आवश्यकतेनुसार बदल करण्याचा अधिकार ब्रिटीश सरकारला असावा.

१९३५ चा भारत सरकार कायदा –

भारताच्या प्रांतातील सर्व खात्याचा कारभार भारतीय प्रतिनिधीच्या हाती सोपविण्यात आला. तीन गोलमेज परिषदांनंतर हा कायदा पास झाला. प्रांताना स्वायत्तता देण्यात आली. १९३५ च्या कायद्याने भारतात अंतर्गत स्वशासनाचा पाया घातल्या गेला. या कायद्याने केंद्रात दुहेरी शासन व्यवस्था सुरू केली आणि या कायद्याने संघराज्याची निर्मिती केली.

समारोप –

ब्रिटीशांनी भारतामध्ये जवळ जवळ १५० वर्षे सत्ता गाजवली. प्रारंभी त्यांनी भारतीयांची लुट करून अन्याय व अत्याचार केले. ईस्ट इंडिया कंपनी सरकारच्या काळात प्रशासन करण्याच्या अनुभवहीनतेमुळे भारतीयांचा असंतोष १८०७ च्या उठावाच्या रूपाने उफाळून आला. १८५८ नंतर पार्लमेंट ने भारताच्या शासनाची सुत्रे स्वतःच्या हातात घेवून भारतीयांना टप्या टप्याने राजकीय व सामाजिक सुधारणा करित भारतावर सत्ता गाजवली.

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४. पाटील. बी.बी. – भारतीय शासन आणि राजकारण, फडके प्रकाशन, कोल्हापूर.

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६. भोळे, डॉ. भा.ल. – भारतीय शासन आणि राजकारण, पिंपळापूर प्रकाशन, नागपूर.



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सारांश:-

मानवाधिकाराच्या सिध्दातानुसार सर्व मानवांना किमान चांगले जीवन जगता यावे. याकरिता आर्थिक, सामाजिक, राजकीय सांस्कृतिक परिस्थितीचा एक समान आकृतीबंध निश्चित केल आहे. मानवाधिकार नागरिकांच्या हातातील प्रभावी शस्त्र आहे. प्राचीन काळापासून भारतात मानवी जीवन परंपरेला जोपासण्यात स्त्री ने महत्वपूर्ण भूमिका बलायली आहे. नवगृष्टी, नवजीवन निर्माण करणारी, समता व ममतेचा मूलस्रोत असलेली, प्रतिभायंत, विदुषी अशी स्त्रीची अनेक रूपे आढळतात. एकाच वेळी दुहेरी तिहेरी भूमिका पार पाडण्याचे सामर्थ्य हे स्त्री मध्येच दिसून येते. प्राचीन काळापासून ते सद्यकालीन स्त्री जीवनाची वाटचाल ही फार उल्लेखनीय आणि कर्तृत्वसंपन्न राहिलेली आहे. मात्र जागतिकीकरणाच्या या रेठ्यात तिच्या या कर्तृत्व संपन्नतेला वेगळेच वळण लागले आहे. १० डिसेंबर हा दिवस मानवी हक्क दिन म्हणून पाळला जातो. आज सर्वच क्षेत्रात महिला पुरुषांच्या बरोबरीने जरी काम करीत आहेत तरीही महिलांना कुटुंबात आणि समाजात दुय्यम स्थान आहे. स्त्रियांवर अनेक अत्याचार होत आहेत. बालविवाह मोठ्या संख्येने होत आहेत. हुंडाबळी, अंधश्रद्धा, लैंगिक अत्याचार यांना मोठ्या प्रमाणात स्त्रियांना बळी जावे लागत आहे. कायदा होऊनही महिलांना कायदेशीर हक्काची जपणूक न होणे, शरीर विक्रीय करणाऱ्या स्त्रियांचे प्रश्न, स्त्रियांच्या आरोग्याचे प्रश्न, यावर लक्ष वेधले गेले आहे. आज माणूस म्हणून असणाऱ्या आपल्या हक्काबद्दल स्त्री ही जागृत झाली असून आत्मविकास आणि समाज विकासाचा पल्ला गाठण्यासाठी ती प्रयत्नशील आहे. स्त्रियांची स्वतःच्या प्रश्नाबाबत वाढत जाणारी जागरूकता म्हणजे तिच्या माणूसपणाच्या स्थित्यंतराची ती प्रक्रिया आहे. आणि आता ती खऱ्या अर्थाने कार्यप्रवण झाली आहे.

शब्दसूची: महिला सक्षमीकरण, मानवी हक्क, लैंगिक समानता, महिला हक्क, स्त्रीवाद, लिंग-आधारित हिंसा, महिलांचा राजकीय सहभाग, महिलांचे आर्थिक सक्षमीकरण, शिक्षण आणि महिला हक्क.

प्रस्तावना:

दोन जागतिक महायुध्दानंतर मानवी अधिकारामा प्रश्न प्रामुख्याने चर्चीला घेतल्या गेल्या 24 ऑक्टो 1945 मध्ये जागतिक संयुक्त राष्ट्रसंघटना उदयास आली. त्यासोबतच मानवी हिताच्या दृष्टिने इलोनहार रुटमाच्या अध्यक्षतेखाली समिती नेमून मानवाधिकाराचा प्रश्न प्राधान्याने हाताळल्या गेला यामधूनच 10 डिसेंबर 1948 रोजी संयुक्त राष्ट्रसंघटनेने मानवाधिकाराचा जाहिरनामा घोषित केला त्यातील विभिन्न कलमाच्या अनुषंगाने हनन होणाऱ्या नागरिकांचे हक्क अबाधित राखल्या गेले. मानवी चक्रीना विस्तार मिळू लागल्यानंतरच 'अमेस्टी इंटरनॅशनल संस्था उदयास आल्यात आणि त्या त्या देशातील राज्यकर्त्यांच्या धोरण निर्णय आणि संयुक्त राष्ट्रांच्या मानवाधिकार घोषणेत प्रत्येक नागरिकाला मुलभूत स्वरूपाचे हक्क प्राप्त होतात. माणूस म्हणून जीवन जगण्याचा अधिकार,समतेचा हक्क, अनेक प्रकारचे स्वतंत्र्याचा हक्क त्यामध्ये भाषण स्वातंत्र, विचार, मतदानाचा हक्क निवडणुका व प्रशासनात समान भागीदारी मिळणे आवश्यक

आहे. सामाजिक व सांस्कृतिक अधिकारांतर्गत प्रत्येकाला शिक्षणासह सामाजिक व सांस्कृतिक कार्यक्रमात खुलेपणाने भाग घेता येतो. जाती, धर्म पंथ, लिंग, भाषा यावरून भेदभाव न करणे. १९४६ साली स्त्रियांच्या दर्जाबाबत विविध देशांच्या सरकारी प्रतिनिधीचा समावेश असलेला एक आयोग स्थापन करण्यात आला होता. स्त्रियांबाबत प्रतिकूल आणि विषमता मूलक वागणूक लक्षात घेऊन आयोगाने स्त्रियांच्या उन्नतीच्या प्रश्नावर लक्ष केंद्रित केले, त्याचप्रमाणे स्त्रियांच्या प्रश्नांची मानवी हक्काशी असलेली अविभाज्यता ही अधोरेखित केली. स्त्री विषयक हक्कांच्या कल्पनेस अधिक चालना देण्याकरीता संयुक्त राष्ट्रसंघटनेने अनेक जागतिक परिषदा आयोजित केल्याया तून स्त्रियांच्या अनेक प्रश्नांना वाचा फोडण्याचे बहुमूल्य काम केले. १८ डिसेंबर १९७९ रोजी संयुक्त राष्ट्रसंघटनेने स्त्रियांबाबत केल्या जाणाऱ्या सर्व प्रकारच्या भेदभावावर बंदी घालणारा संकेत मान्य केला. २ सप्टेंबर १९८१ पासून याची अमलबजावणी सुरू झाली. या संकेताच्या कलम १७ नुसार २३ निष्पक्ष तज्ज्ञांची एक समिती नेमली जाते. स्त्रियांबाबत होणाऱ्या भेदभावावर बंदी घालणार ही समिती संबंधित देशाकडून

ठराविक मुदतीत येणारे अहवाल तपासते. संकेताचा उद्देश स्त्रियांबाबत आचरण्यात येणारे भेदभाव बंद व्हावेत. आणि स्त्री-पुरुष समतेच्या तत्वाची अमलबजावणी व्हावी असा आहे. स्त्रियांचे जबरदस्तीने केले जाणारे विवाह, परिवारांतर्गत स्त्रियांना सहन करावी लागणारी हिंसा, शिक्षणाची, आरोग्याची आणि सार्वजनिक जीवनाची अपुरी उपलब्धता, रोजगाराबाबत केला जाणारा भेदभाव असे जे स्त्रियांबाबत केले जाणारे विशिष्ट असे भेदभावाचे प्रकार आहेत. ते बंद व्हावेत हे या संकेताचे उद्दिष्ट आहे.

महिलांच्या सबलीकरणाचे राष्ट्रीय धोरण:

केंद्र सरकारने २००१ मध्ये महिला सबलीकरणाचे राष्ट्रीय धोरण जाहीर केले. या धोरणाचे उद्दिष्ट महिलांच्या सबलीकरण व विकास घडवून आणणे, महिलांविरुद्ध करण्यात येणारा सर्व प्रकारचा भेदभाव दूर करणे आणि जीवनाच्या सर्व क्षेत्रांत महिलांचा सक्रिय सहभाग वाढविणे हे आहे. त्याकरिता एक राष्ट्रीय कृती कार्यक्रमही निश्चित करण्यात आला आहे. त्यामध्ये स्त्रियांवर होणाऱ्या अत्याचाराची माहिती घेणे, अन्यायग्रस्त स्त्रियांना न्याय मिळवून देणे, स्त्रियांना शासकीय धोरणे व योजना यांचा लाभ मिळवून देणे, विविध संस्था, संघटना, मंडळे, आयोग यांमध्ये स्त्रियांना अधिकारपदे मिळवून देणे, स्त्रियांना उद्योग व व्यवसाय करण्यासाठी वित्तीय संस्था व बँका यांच्यामार्फत अर्थसाहाय्य उपलब्ध करून देणे, स्त्रियांना व्यवसाय सुरू करण्यासाठी प्रशिक्षण देणे, आर्थिकदृष्ट्या दुर्बल घटकांतील महिलांना मदत करणे, नोकरी करणाऱ्या महिलांना नोकरीच्या ठिकाणी आवश्यक त्या सुविधा उपलब्ध करून देणे इत्यादी गोष्टींचा अंतर्भाव करण्यात आला आहे.

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महिलांशी प्रत्यक्ष संबंधित असलेल्या वरील कायद्यांखेरीज इतरही अनेक कायद्यांत महिलांच्या हक्कांचे रक्षण करण्यासंबंधी तरतुदी आहेत. उदाहरणार्थ- हिंदू

विवाह कायदा, हिंदू वारसाहक्क कायदा, कुटुंब न्यायालय कायदा इत्यादी.

महिला सबलीकरणाच्या धोरण:

- (१) स्त्री-पुरुष समानता प्रस्थापित करणे हे महिला सबलीकरणाच्या धोरणाचे एक प्रमुख उद्दिष्ट होय.
- (२) स्त्रियांवर आतापर्यंत झालेला अन्याय दूर करून समाजात त्यांना प्रतिष्ठा व सन्मान मिळेल अशी व्यवस्था निर्माण करणे ही सभ्य व सुसंस्कृत सामाजिक जीवनाची गरज होती. त्यातून स्त्रियांच्या सबलीकरणाच्या धोरणाचा पाठपुरावा करणे आवश्यक बनले.
- (३) राष्ट्रीय विकासाच्या कार्याला गती देण्यासाठी व राष्ट्रीय विकासाचे उद्दिष्ट साध्य करण्यासाठी महिलांना सक्षम बनविणे गरजेचे आहे.
- (४) स्त्रियांना आर्थिकदृष्ट्या स्वावलंबी बनविणे हे महिला सबलीकरणाचे आणखी एक उद्दिष्ट होय.
- (५) भारतीय राज्यघटनेने भारतातील सर्व नागरिकांना सामाजिक न्याय मिळवून देण्याची हमी दिली आहे. स्त्रियांना सक्षम बनविण्याखेरीज व त्यांच्या कल्याणासाठी खास उपाययोजना केल्याखेरीज सामाजिक न्याय प्रस्थापित करण्याचे उद्दिष्ट साध्य होणार नाही.
- (६) महिलांच्या राजकीय सहभागाचे प्रमाण वाढविण्यासाठी विशेष प्रयत्न करणे गरजेचे आहे. महिला सबलीकरणाचे हे एक महत्त्वाचे उद्दिष्ट सांगितले जाते.
- (७) भारतीय राज्यघटनेत असे स्पष्टपणे म्हटले आहे की, राज्य नागरिकांमध्ये धर्म, वंश, जात, लिंग, जन्मस्थान यांपैकी कोणत्याही आधारावर भेदभाव करणार नाही.
- (८) भारतीय घटनेने नागरिकांना संधीची समता दिली असून त्या संदर्भात असे नमूद करण्यात आले आहे की, कोणत्याही नागरिकाला धर्म, वंश, जात, लिंग, कुळ, जन्मस्थान, वास्तव्याचे ठिकाण या किंवा यांपैकी कोणत्याही एका कारणावरून राज्याच्या नियंत्रणाखालील पद मिळविण्यास अपात्र ठरविले जाणार नाही.
- (९) आपल्या राज्यघटनेत नागरिकांच्या मूलभूत कर्तव्यांचा (भाग ४ए, कलम ५१ए) समावेश करण्यात आला आहे. राज्यघटनेच्या या भागातही महिलांना समानतेची वागणूक देण्यासंबंधी आणि त्यांच्या प्रतिष्ठेचे रक्षण करण्यासंबंधी उल्लेख आहे.
- (१०) मूलभूत कर्तव्यांपैकी एक कर्तव्य असे सांगितले आहे की, धार्मिक, भाषिक, प्रादेशिक किंवा वर्गीय भेदभावांच्या पलीकडे जाऊन सर्व भारतीय जनतेत ऐक्य व बंधुभावाची भावना वाढीस लावली जावी तसेच स्त्रियांच्या प्रतिष्ठेला कमीपणा आणणाऱ्या प्रथांचा त्याग करावा.

समारोप:

आज सर्वच क्षेत्रात स्त्रिया ह्या पुरुषाच्या तुलनेत कठेच कमी नाहीत. प्राचीन काळापासून स्त्रियांना दुय्यम वागणूक देण्यात आली आहे. त्यामुळे स्त्रियांना अनेक

अधिकार व हक्कापासून वंचित राहावे लागले. परंतु संयुक्त राष्ट्रसंघाच्या करारनाम्यानुसार अनेक देशातील स्त्रियाकरिता अनेक प्रकारचे हक्क प्रदान करण्यात आले. परिणामी स्त्रिया सबलीकरणाच्या दिशेने वाटचाल करू लागल्या आहेत. या करारावर सही केल्यामुळे भारत मुलभूत स्वातंत्र्य स्त्रियांना उपभोगता यावे याची हमी देण्याचा भारतसरकारचा प्रयत्न आहे. भारतामध्ये आरोग्य, शिक्षण, रोजगार व आर्थिक सबलीकरणाच्या क्षेत्रात चांगले यश मिळत नाही. आज स्त्रिया सर्वच क्षेत्रात प्रगती करत असतांना दिसत आहेत.

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भारताचे सक्षमीकरण: मानव संसाधन विकासात शिक्षणाची महत्त्वपूर्ण भूमिका

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सारांश

भारताच्या मानव संसाधन विकासामध्ये शिक्षण आणि साक्षरतेच्या भूमिकेचे विश्लेषण करणे हा या संशोधनचा उद्देश आहे. हा संशोधन पेपर तीन मुद्द्यांमध्ये विभागलेला आहे, यामध्ये पहिला भारतातील शिक्षणात मनुष्यबळ विकासाची गरज, दुसरा मुद्दा भारतातील मनुष्यबळ विकासात शिक्षण आणि साक्षरतेची भूमिका अधोरेखित करणे, शेवटचा तिसरा मुद्दा तांत्रिक शिक्षणाच्या सुविधांचा विस्तार करणे. शिक्षणामुळे विद्यार्थ्यांना कामगारांची गुणवत्ता सुधारण्यात आणि संघटनेत अधिक उत्पादन मिळविण्यात बदल घडवून आणण्यास मदत झाली परंतु संबंधित अभ्यासक्रमांच्या शिक्षणातून किंवा शैक्षणिक संस्थेतून पदवी घेतल्यानंतर प्रशिक्षण घेत असलेल्या कामगारांची ही गुणवत्ता असल्याचे दिसून येते.

प्रस्तावना

मानव संसाधन व्यवस्थापन ही व्यवस्थापनाच्या संपूर्ण संकल्पनेतील एक उप-संकल्पना आहे. हे व्यवस्थापन प्रक्रियेत मानव संसाधन या विशिष्ट पैलूला विशेष महत्त्व देते. आजकाल मानव संसाधन व्यवस्थापन भारतात खूप लोकप्रिय झाले आहे आणि भारत सरकारने त्याच्या प्रगतीसाठी 'मानव संसाधन विकास मंत्रालय' ची स्थापना केली आहे. मात्र, देशातील बहुसंख्य नागरिकांना मनुष्यबळाचा नेमका अर्थ काय आहे याबद्दल पुरेसे ज्ञान नाही. मनुष्यबळ म्हणजे केवळ कामगारांची संख्या आणि त्यांच्या जबाबदारी नव्हेत. हुनान संसाधन म्हणजे ज्याचा वापर केला जाऊ शकतो. मनुष्यबळ ही कंपनीची मानवी शक्ती मानली जाते. याचा अर्थ, ते संपूर्ण ज्ञान, माहिती आणि बुद्धिमत्ता, कौशल्ये, आकलनशक्ती आणि वेग, संस्थेतील नैसर्गिक कला तसेच वैयक्तिक स्वारस्य, विश्वास, प्रेम, वृत्ती, आदर, भावना आणि संबंध इत्यादींशी संबंधित आहे. त्या संस्थेच्या कामात. थोडक्यात, संस्थेचे मानव संसाधन म्हणजे त्याच संस्थेत काम करणाऱ्या कर्मचाऱ्यांच्या क्षमता, ज्ञान, कौशल्ये, क्षमता, बौद्धिक आणि दृष्टिकोनांची बेरीज. सर्व ज्ञान, आदर, कला, वृत्ती शिक्षणातून आली. भारतात, प्रभावी शिक्षण प्रणाली उपलब्ध नाही परंतु बाहेरील देशांनी मानव संसाधन विकास स्थापित केला ज्याचा मुख्य उद्देश शिक्षणाच्या सुविधा निर्माण करणे आणि आपल्या देशांमध्ये साक्षरता वाढवणे हा आहे. साक्षरतेशिवाय आपण कोणत्याही क्षेत्रात प्रगती करू शकत नाही. तर, या संकल्पना भारतात स्वीकारल्या जातात आणि त्यांनी मानव संसाधन विकास मंत्रालयाची स्थापना केली. भारताचे पंतप्रधान स्वर्गीय श्री. राजीव गांधी यांनी ही गरज ओळखली आणि मानव संसाधन विकासासाठी प्रथमच भारत सरकारच्या मंत्रालयाच्या अंतर्गत एक स्वतंत्र मंत्रालय स्थापन करण्यात आले.

भारतातील मानवी संसाधन विकासातील शिक्षणाची गरज:

प्रत्येक विकसित देश लोकांच्या शिक्षणाला प्रथम प्राधान्य देतो. हा देशाचा यशस्वी विकास आहे. अमेरिका, जपान विकसित झाले कारण त्यांची शिक्षण प्रणाली अविकसित देशांच्या तुलनेत प्रभावी आहे. अमेरिका, जपान, चीन यांनी कौशल्य विकास संस्था स्थापन केल्या, तंत्रज्ञानासह शैक्षणिक सुविधा पुरविल्या, राष्ट्रीय उत्पन्न

शिक्षणावरील खर्चात अधिक वाटा घेते. जागतिकीकरणात शिक्षण आणि त्याच्या सुविधांमध्ये अनेक बदल झाले आहेत. आधुनिक काळात लोकसंख्येचा गुणात्मक पैलू हा परिमाणात्मक पैलूइतकाच महत्त्वाचा मानला जातो. संसाधनांचा पुरवठा हा देशातील लोकांवर अवलंबून असतो. शास्त्रज्ञ अधिक चांगल्या आणि अधिक कार्यक्षम संसाधनांचा शोध लावतात, उद्योजक उत्पादनात शोध वापरण्याची जबाबदारी घेतात. देशातील उत्पादन हे देशात उपलब्ध असलेल्या मनुष्यबळाच्या गुणवत्तेवर अवलंबून असते. कामगारांची गुणवत्ता सुधारणे आणि संघटनेत अधिक उत्पादन प्राप्त करणे परंतु संबंधित अभ्यासक्रमांच्या शिक्षणातून किंवा प्रशिक्षणातून मिळणाऱ्या कामगारांची ही गुणवत्ता. त्याची गरज आणि जबाबदारी भारत सरकारकडे आहेत. ज्ञानाच्या अर्थव्यवस्थेला चालना देणाऱ्या जागतिक बाजारपेठेत भारताची आर्थिक वाढ कायम राखण्यासाठी, 2012 पर्यंत उच्च शिक्षणातील विद्यार्थ्यांची संख्या जवळजवळ दुप्पट करणे आवश्यक आहे. भारताची 51 टक्के लोकसंख्या 25 वर्षांपेक्षा कमी वयाची आहे. शिक्षणाच्या योग्य प्रवेशाशिवाय देशाचा जनसांख्यिकीय लाभांश जनसांख्यिकीय आपत्तीमध्ये बदलू शकतो.

भारताच्या मानवी संसाधन विकासातील शिक्षण आणि साहित्याची भूमिका:

मनुष्यबळ विकास मंत्रालय हे मनुष्यबळ विकासासाठी जबाबदार आहे. मंत्रालय दोन विभागांमध्ये विभागले आहे:

1. प्राथमिक आणि माध्यमिक शिक्षण, प्रौढ शिक्षण आणि साक्षरता यांच्याशी संबंधित शालेय शिक्षण आणि साक्षरता विभाग आणि
2. उच्च शिक्षण विभाग, जो विद्यापीठ शिक्षण, तांत्रिक शिक्षण, शिष्यवृत्ती इत्यादींशी संबंधित आहे.

पूर्वीचे शिक्षण मंत्रालय आता 26 सप्टेंबर 1985 पासून या दोन विभागांतर्गत कार्यरत आहे. मंत्रालयाचे नेतृत्व मंत्रिमंडळ दर्जाचे मनुष्यबळ विकास मंत्री करतात, जे मंत्रिमंडळाचे सदस्य असतात. स्मृती इराणी या सध्याच्या मनुष्यबळ विकास मंत्री आहेत, ज्या या पदावर असलेल्या सर्वात तरुण आहेत. यासाठी लोकांच्या शिक्षणाचा स्तर सुधारण्यासाठी सरकारला प्राथमिक, माध्यमिक आणि

विद्यापीठ स्तरावर सामान्य शिक्षणावर आणि महाविद्यालयीन स्तरावर तांत्रिक शिक्षणावर खर्च करावा लागतो. हा खर्च मानवी भांडवलातील गुंतवणूक म्हणून मानला जातो कारण यामुळे मानवी संसाधनांची उत्पादकता सुधारते. विकसित देशांमध्ये हा खर्च शिक्षण आणि पालकांना परवडू शकतो म्हणून ते उचलू शकतात. गरीब देशांमध्ये सरकारला खर्चाचा मोठा भाग उचलावा लागतो जेणेकरून लोकांना शिक्षणासाठी खर्च करणे परवडेल. सरकारने दिलेल्या मार्गदर्शक तत्वांनुसार उच्च शिक्षण पुढे नेण्याची जबाबदारी शेवटी मनुष्यबळ विकास मंत्रालयाची असते. मनुष्यबळ विकास मंत्रालयाने प्रायोजित केलेल्या उपक्रमांमध्ये 'राष्ट्रीय उच्च शिक्षण आणि संशोधन आयोग' आणि 'शिक्षण न्यायाधिकरण विधेयक 2010' यासारख्या प्रकल्पांचा समावेश आहे. उच्च शिक्षणाचे आंतरराष्ट्रीयकरण सुधारण्यासाठीच्या उपक्रमांवर काम करण्यासाठी मंत्रालयाचा एक विभाग आहे. संस्थात्मक सहकार्य, गुणवत्ता हमी आणि शिष्यवृत्ती यासारख्या संबंधित प्रकल्पांसाठी आंतरराष्ट्रीय सहकार्य कक्ष (आय. सी. सी.) जबाबदार आहे. माध्यमिक आणि माध्यमिकोत्तर शिक्षणाची जबाबदारी उच्च शिक्षण विभागाकडे आहे. विद्यापीठ अनुदान आयोग (यू. जी. सी.) कायदा, 1956 च्या कलम 3 अंतर्गत, भारताच्या विद्यापीठ अनुदान आयोगाच्या (यू. जी. सी.) सल्ल्यानुसार शैक्षणिक संस्थांना अभिमत विद्यापीठाचा दर्जा देण्याचा अधिकार विभागाला आहे. अमेरिका आणि चीननंतर, उच्च शिक्षण विभाग जगातील सर्वात मोठ्या उच्च शिक्षण प्रणालींपैकी एकाची काळजी घेतो. हा विभाग देशात उच्च शिक्षण आणि संशोधनाच्या जागतिक दर्जाच्या संधी आणण्यात गुंतलेला आहे, जेणेकरून आंतरराष्ट्रीय व्यासपीठावर भारतीय विद्यार्थ्यांची कमतरता भासणार नाही. यासाठी सरकारने संयुक्त उपक्रम सुरू केले आहेत आणि भारतीय विद्यार्थ्यांना जगाच्या मताचा लाभ घेता यावा यासाठी सामंजस्य करारांवर स्वाक्षर्या केल्या आहेत. देशातील तांत्रिक शिक्षण व्यवस्थेचे व्यापकपणे तीन श्रेणींमध्ये वर्गीकरण केले जाऊ शकते—

- केंद्र सरकारच्या अनुदानित संस्था,
- राज्य सरकारद्वारा अनुदानित संस्था आणि
- स्वयं-वित्तपोषित संस्था.

भारतात साक्षरतेचे प्रमाण वाढवून सुरुवात करावी लागली. 1950-51 मध्ये 5 वर्षांपेक्षा जास्त वयाच्या लोकसंख्येच्या 18: लोक साक्षर होते, तर 1999-2000 मध्ये हे प्रमाण 7 वर्षांपेक्षा जास्त वयाच्या लोकसंख्येच्या 65: पर्यंत वाढले. 1950-51 मध्ये हे प्रमाण पुरुषांसाठी 27: आणि महिलांसाठी 9: आणि 1999-2000 मध्ये पुरुषांसाठी 75: आणि महिलांसाठी 54: होते. ही तफावत कमी झाली आहे आणि साक्षरतेत लक्षणीय वाढ झाली आहे. माध्यमिक स्तरावर नावनोंदणी 1950-51 मध्ये 15 लाखांवरून 1999-2000 मध्ये 2.82 कोटींवर गेली. प्राथमिक स्तरावर विद्यार्थ्यांची नोंदणी 1950-51 मध्ये 2.23 कोटींवरून 1999-2000 मध्ये 15.27 कोटींवर गेली, 6 ते 11 वर्षे वयोगटातील 85: मुली प्राथमिक शाळेत गेल्या तर 11-14 वर्षे वयोगटातील 50: मुली शाळेत गेल्या. महिलांच्या शिक्षणाचा स्तर वाढवण्याच्या विशेष प्रयत्नांमुळे परिस्थिती सुधारली आहे. अनेक राज्ये मुलींना माध्यमिक स्तरावर मोफत शिक्षण देतात. पुरुष आणि स्त्रियांमधील अंतर कमी होत चालले आहे. महिला शिक्षणामुळे महिलांच्या उत्पादनक्षमतेचा वापर करण्यास मदत होते. वैद्यकीय, अभियांत्रिकी, वास्तुकला, माहिती तंत्रज्ञान, लेखाशास्त्र आणि व्यवस्थापन

यासह शिक्षणाच्या सर्व क्षेत्रांमध्ये विद्यार्थिनींचे प्रमाण वाढत असल्याचे दिसून आले आहे. उत्पादन आणि व्यवस्थापनाच्या सर्व क्षेत्रांमध्ये सुशिक्षित महिला कर्मचार्यांची संख्या वाढत आहे. ते राष्ट्रीय उत्पन्नात योगदान देत आहेत.

शिक्षण म्हणजे केवळ अभ्यास करणे नव्हे, तर आरोग्य आणि पोषण देखील आहे, कारण यामुळे विद्यार्थ्यांच्या शैक्षणिक सुविधांचा पूर्ण वापर करण्याची क्षमता सुनिश्चित होते. कुपोषणाचा मुलांच्या संवेदी, संज्ञानात्मक, सामाजिक आणि भावनिक विकासावर मोठ्या प्रमाणात परिणाम होऊन शिकण्याची क्षमता मर्यादित होते. सहा वर्षांचे वय, प्राथमिक शिक्षणासाठी प्रवेशाचे औपचारिक वय, आरोग्याच्या समस्यांच्या संदर्भात कृती करण्यास खूप उशीर होऊ शकतो. या संदर्भात, शिक्षण क्षेत्रातील लाभांची शाश्वतता सुलभ करण्यासाठी इतर विकास उपक्रमांसह शिक्षणाच्या एकत्रीकरणावर भर दिला पाहिजे.

तांत्रिक शिक्षणाच्या सुविधांचा विस्तार करा: अभियांत्रिकी आणि वैद्यकीय महाविद्यालये, तंत्रज्ञान संस्था, पॉलिटेक्निक, तंत्रज्ञान संस्था, पॉलिटेक्निक, औद्योगिक प्रशिक्षण संस्था इत्यादींच्या माध्यमातून तांत्रिक शिक्षण दिले जाऊ शकते. भारतातील शेतीचे महत्त्व लक्षात घेता, कृषी शाळा, महाविद्यालये आणि विद्यापीठे आणि संस्था किंवा प्रशिक्षण केंद्रांमध्ये उपलब्ध असलेल्या इतर अभ्यासक्रमांद्वारे विशेष शिक्षणाच्या सुविधा पुरविल्या जातात. वैद्यकीय पदवीधरांची संख्या 1981 मधील 2.20 लाखांवरून 1999 मध्ये 3.71 लाख, अभियांत्रिकी पदवीधरांची संख्या 3.05 लाखांवरून 8.46 लाख आणि अभियांत्रिकी पदविकाधारकांची संख्या 4.26 लाखांवरून 13.13 लाख झाली. याच कालावधीत कृषी पदवीधरांची संख्या 1.06 लाखांवरून 2.39 लाखांवर गेली. तांत्रिक मनुष्यबळ आता मोठ्या संख्येने उपलब्ध आहे आणि यामुळे देशातील उत्पादनाला मदत होत आहे.

निष्कर्ष आणि उद्दिष्ट:

भारतीय अर्थव्यवस्थेवर त्याच्या शिक्षणामुळे पद्धतशीरपणे परिणाम होतो. असे दिसून आले की, स्वातंत्र्यापूर्वीची शिक्षण व्यवस्था आणि उत्पादन धोरण अत्यंत कमकुवत होते. त्या वेळी, भारत प्रगती करू शकत नव्हता, त्याची मुख्य कारणे अशिक्षित लोक होती, परंतु स्वातंत्र्यानंतर सरकारने शिक्षण आणि साक्षरतेस प्राधान्य दिले नाही. त्याचा उत्पादनावर वाईट परिणाम झाला, यामुळे विकसित देशांच्या तुलनेत भारतीय अर्थव्यवस्था कमकुवत होती आणि तंत्रज्ञान, दळणवळण, जीवनमान, शैक्षणिक माहिती तंत्रज्ञान इत्यादींमध्ये भारत सुधारत नव्हता.

मानव संसाधन विकासात शिक्षण मदत करू शकते हे अभ्यासाद्वारे सिद्ध झाले आहे आणि सरकारने मानव संसाधन विकासाशी संबंधित धोरणे स्वीकारली आहेत. गेल्या सहा दशकांमध्ये सर्व शिक्षा अभियान, मध्यान्ह भोजन योजना, तसेच 1956 मध्ये यू. जी. सी. ची स्थापना, कौशल्य विकास आयोग इत्यादी उच्च शिक्षणात शिक्षण आणि साक्षरतेत अनेक बदल झाले आहेत. मनुष्यबळ विकास मंत्रालयाच्या स्थापनेनंतर उपलब्ध असलेल्या अनेक सुविधा द्या आणि शिक्षणाचे दरवाजे उघडा. भारतात अनेक कौशल्य विकास प्रशिक्षण केंद्रे आणि संस्था आढळतात आणि अनेक विद्यार्थी या संस्थांमध्ये प्रशिक्षण घेतात. येथे, स्वयंचलित दर्जेदार कामगार तयार करणे आणि कारखाना किंवा संस्थेमध्ये उत्पादन वाढवणे. शिक्षण आणि साक्षरतेशिवाय आपण प्रगती करू शकत नाही हे स्पष्ट आहे.

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उच्च माध्यमिक स्तरावरील भूगोल विषयाच्या विद्यार्थ्यांना ऑनलाईन अध्ययनात येणाऱ्या अडचणींचा विश्लेषणात्मक अभ्यास

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गोषवारा:

शिक्षणाच्या केंद्रस्थानी असणारा विद्यार्थ्यांचे शारीरिक, मानसिक आरोग्य व आर्थिक परिस्थिती यांचा सर्वकष अभ्यास होणे गरजेचे आहे. तसेच उपरोक्त सारासार विचार करून सर्वसमावेशक अशी ऑनलाईन शिक्षण प्रणाली असावी ज्यामुळे विद्यार्थ्यांवर कोणत्याही विपरीत परिणाम न होता तो आशावादी राहून स्वाभाविकपणे माहिती व ज्ञान संपादन करण्यासाठी ते प्रवृत्त झाले पाहिजेत. त्याचबरोबर कोणताही विद्यार्थी या ऑनलाईन शिक्षण प्रणालीमुळे शैक्षणिक प्रवाहातून बाहेर फेकला जाऊ नये याची दक्षता ही घ्यावी लागेल. अन्यथा आधुनिक माध्यमे विद्यार्थ्यांच्या दृष्टीने शाप ठरू नयेत हीच एक अपेक्षा. सदर शोधनिबंधामधील माहिती प्राथमिक स्रोतावर अवलंबून असून याअंतर्गत जयसिंगपूर कॉलेज मधील अकरावी व बारावी मधील 100 विद्यार्थ्यांच्या कडून ऑनलाईन प्रश्नावली भरून घेण्यात आल्या आहेत.

प्रस्तावना:

परिवर्तन हा निसर्गाचा नियम आहे हे आपण पूर्वीपासून शिकत आलो आहोत. या परिवर्तना बरोबर जे आपल्यामध्ये बदल करतात तेच या परिवर्तनाच्या चक्रामध्ये यशस्वी होतात. मात्र या परिवर्तनामध्ये आवश्यक उपलब्ध साधने व परिवर्तन स्वीकारणाऱ्याची मानसिक स्थिती हे घटक सर्वात महत्त्वाचे आहेत. कोरोना साथीमुळे जगात सर्व पातळीवर बदल घडत असून आर्थिक, राजकीय, सामाजिक व सांस्कृतिक बदल होताना आपण पाहत आहोत. यामध्ये शैक्षणिक क्षेत्र याला अपवाद राहिले नसून या आपत्तीमुळे शैक्षणिक क्षेत्रामध्ये अमूलाग्र बदल झालेले दिसून येत आहेत. सध्या या क्षेत्रात एक शब्द सर्रासपणे सर्वत्र वापरला जात आहे तो म्हणजे 'ऑनलाईन शिक्षण' होय. शैक्षणिक प्रवाहामध्ये विद्यार्थी हा आधुनिक शिक्षणाचा केंद्रबिंदू मानतो. मात्र या पद्धतीचा उपयोग या विद्यार्थ्यांना होत आहे का ? ऑनलाईन शिक्षण कितपत विद्यार्थ्यांच्या पर्यंत पोहोचत आहे ? विद्यार्थ्यांना आर्थिक दृष्ट्या परवडत आहे का? विद्यार्थ्यांची मानसिकतेचा विचार करता, ते त्यांना कितपत समजते व रुजते याचा अभ्यास होणे महत्त्वाचे वाटले म्हणून प्रश्नावलीच्या माध्यमातून प्राथमिक माहिती

एकत्रित करून ऑनलाईन शिक्षणाची सद्यस्थिती यावर हा संशोधनात्मक लेख लिहिण्याचा प्रयत्न केला आहे.

अभ्यास विषयाचे महत्त्व:

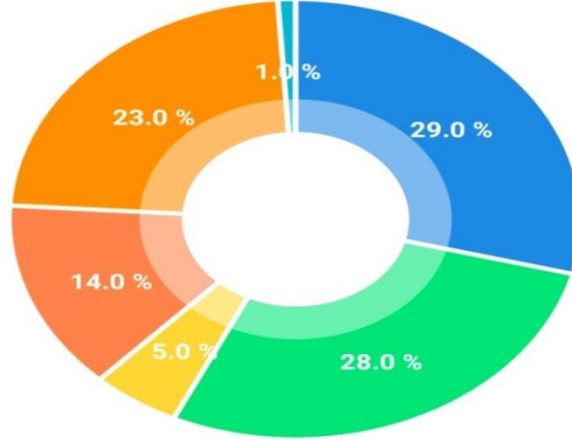
ऑनलाईन शिक्षणासंदर्भात काही प्रश्न महत्त्वाचे आहेत. यामध्ये शासन-शिक्षण विभाग-महाविद्यालय-शिक्षक व विद्यार्थी यांच्यामध्ये समन्वय असणे महत्त्वाचे आहे. शासनाने शिक्षण विभाग व शिक्षकांना ऑनलाईन पद्धतीने शिक्षण देण्यास सांगितले मात्र ऑनलाईन शिक्षणासाठी बरेच पर्याय उपलब्ध असल्याने बराच गोंधळ झालेला दिसतो. यासाठी विद्यार्थ्यांच्यासाठी ठराविक एक यूजर फ्रेंडली ॲप्लिकेशन विकसित करणे अत्यंत आवश्यक आहे. कारण अध्ययन-अध्यापन, नोट्स, टेस्ट व उपस्थिती यासाठी वेगवेगळ्या पर्यायांचा वापर न करता त्याच्या शैक्षणिक स्तरासाठी एकच पर्याय उपलब्ध करून देणे अत्यंत महत्त्वाचे आहे.

माहितीचे स्रोत:

अभ्यास विषयाच्या माहितीसाठी प्राथमिक स्रोत प्रामुख्याने निवडण्यात आला. इ.11 व 12 वी मधील 100 विद्यार्थ्यांच्या कडून ऑनलाईन प्रश्नावली मार्फत माहिती घेण्यात आली. तसेच विद्यार्थ्यांनाच्या मध्ये गट चर्चा करून माहिती एकत्रित करण्यात आली.

विश्लेषण:

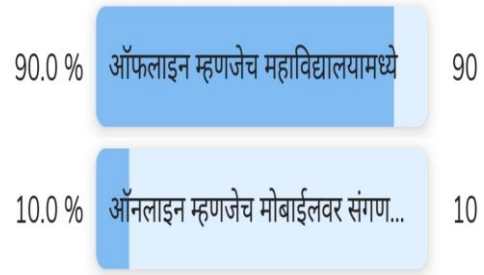
भूगोल प्रात्यक्षिक मध्ये विद्यार्थ्यांना सर्वाधिक रुची असणारे घटक



18. ऑनलाइन अध्ययनाचा सर्वाधिक ताण आपणास पुढीलपैकी कोणत्या शारीरिक अवयवावर होताना दिसतो



8. भूगोल हा विषय आपणास अध्ययनासाठी कोणत्या स्वरूपात सर्वाधिक प्रभावी वाटतो



निष्कर्ष:

ऑनलाइन शिक्षणाची सद्यस्थिती या संशोधनातून आलेला काही निष्कर्ष.

१. अभ्यास क्षेत्रातील ऑनलाईन शिक्षण घेत असलेल्या 34% विद्यार्थ्यांना ऑनलाईन शिक्षण दररोज तीन तासा पेक्षा जास्त वेळ नसावे असे वाटते तर फक्त 12% विद्यार्थ्यांना पाच तासा पेक्षा जास्त ऑनलाईन शिक्षण असावे असे वाटते.

२. दररोज एका विषयासाठी सर्वसाधारण 45 मिनिटे ते 1 तास एवढा वेळ असावा असे अनुक्रमे 38% व 35% विद्यार्थ्यांना वाटते.

३. ऑनलाईन शिक्षण घेतेवेळी विद्यार्थ्यांना कोणत्या प्रमुख व मूलभूत समस्यांना सामोरे जावे लागते याबाबत 90% विद्यार्थी नेटवर्क प्रॉब्लेम व कमी नेटपॅकची उपलब्धता ही समस्या मोठ्या प्रमाणात दिसून येते.

४. विद्यार्थ्यांना ऑफलाइन पद्धतीने म्हणजेच महाविद्यालयांमध्ये प्रत्यक्ष शिक्षण घेण्यास 90% विद्यार्थी

रुची दाखविताने. मात्र 10% विद्यार्थी हे ऑनलाइन शिक्षण प्रभावी मानतात.

५. ऑनलाइन शिक्षणामुळे 66 टक्के विद्यार्थ्यांना डोळ्यांशी संबंधित समस्या जाणवत असल्याचे सांगतात तर 8% विद्यार्थी पाठदुखीचा त्रास होत असल्याचे दिसून येते.

६. ऑनलाइन शिक्षणाबाबत 35 टक्के विद्यार्थी मानतात की, त्यांच्या झोपेवर विपरीत परिणाम होत आहे.

संदर्भ:

- 1) <https://www.lessonup.com/site/en>
- 2) <https://www.upeducators.com/blog/the-complete-guide-to-teaching-online/>



जागतिक हवामान बदल आणि तापमान वाढ

प्रा. डॉ.सुधाकर हंगे

कला महाविद्यालय नांदुर घाट तालुका केज जिल्हा बीड

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प्रस्तावना:

पर्यावरण ही एक व्यवस्था आहे. पर्यावरणाच्या एका भागावर एखाद्या घटकाचा परिणाम झाला तर त्याचे परिणाम पर्यावरणावर पडतात. मानवाने स्वतःच्या स्वार्थासाठी कृत्रिम सीमा निर्माण करून जमिनीचे वाटप करून स्वतःच्या विकासासाठी पर्यावरणाचा वापर केलेला आहे. केवळ भौतिक स्वरूपाच्या विकासावर जोर देत निरंतर विकासाला छेद देत पर्यावरणीय समस्या निर्माण केल्या यामुळे पर्यावरणाचे मोठ्या प्रमाणात नुकसान झाले आहे पर्यावरण बदल अनेक कारणाने होत आहेत. जगातील अनेक बऱ्या संस्कृती केवळ पर्यावरणातील बदलामुळे नष्ट झाल्या आहेत. हा जागतिक इतिहास आहे.

औद्योगिक क्रांतीनंतर जगात कारखानदारी वाढली उद्योगधंदे वाहतूक साधनांचा विकास आधुनिक शेती यांच्यात मोठ्या प्रमाणात वाढ झाली आहे. त्यामुळे जगात सर्वत्र दगडी कोळसा, नैसर्गिक वायू, खनिज तेल यांचा वापर इंधन म्हणून मोठ्या प्रमाणावर होऊ लागला. त्यामुळे कार्बन डाय-ऑक्साइड, मिथेन, इत्यादी वायूचे प्रमाण वातावरणात वाढू लागले. त्यामुळे पृथ्वीच्या सरासरी तापमानात वाढ होत चाललेली आहे जागतिक तापमान वाढ मुख्यतः हरितगृह वायू मुळे होते यात कार्बन डाय-ऑक्साइड, मिथेन, नायट्रोसॉक्साइड, क्लोरोफ्लोरोकार्बन, ओझोन इत्यादी वायूचा समावेश होतो.

जागतिक तापमान वाढीची कारणे:

औद्योगिक क्रांती:-

औद्योगिक क्रांतीनंतर जे अनेक विविध परिवर्तन झाले त्याचाच एक परिणाम म्हणजे वातावरणातील कार्बन डाय-ऑक्साइड मिथेन कार्बन इत्यादी सारख्या वायूचे प्रमाण वाढले ग्रीन हाऊसचा परिणाम जीवनासाठी भयानक निर्माण झाला आणि पृथ्वीचे तापमान वाढले आणि ओझोन वायूचा कमी होणारा थर या दोन गोष्टींचा पर्यावरणावर खूप मोठा परिणाम झालेला आहे.

वाढलेली कारखानदारी:-

आज कारखान्याचे प्रमाण खूप मोठ्या प्रमाणात वाढलेले आहे वाहतूक व कारखाने यांना लागणाऱ्या खनिज तेलाच्या प्रमाणात वाढ झाली व कारखान्यातून बाहेर पडणारा कार्बन डाय-ऑक्साइड सल्फर डायऑक्साइड यासारखे वायू हवेत मिसळल्याने त्याचा परिणाम तापमान वाढीवर झालेला आहे.

खनिज संपत्तीचे उत्खनन:-

मानवाच्या प्रवृत्तीमुळे अनेक पर्यावरणाच्या समस्या निर्माण झालेल्या आहेत मानव आपल्या प्रगतीसाठी अनेक शोध

लावत आहे त्यामुळेच खनिज संपत्तीचे उत्खनन होऊन जागतिक तापमान वाढेल त्याची भरच पडत आहे.

रासायनिक खते व कीटकनाशकांचा वापर:-

हरितक्रांती बरोबरच शेतातील उत्पादनात वाढ होण्यासाठी रासायनिक खताचा वापर वाढलेला आहे ज्यात युरिया पोटॅश अमोनियम सल्फेट इत्यादी खतांचा वापर वाढलेला आहे. याबरोबरच कीटकनाशकांचा वापर सुद्धा जास्त वाढलेला आहे या कारणामुळे जमिनीच्या तापमान वाढ होण्याचे प्रमाण वाढलेले आहे.

आण्विक चाचण्या:-

आज प्रत्येक राष्ट्रांमध्ये आण्विक चाचण्या घेण्यामध्ये स्पर्धाच निर्माण झालेली आहे आपले संरक्षण सामर्थ्य वाढवण्यासाठी आण्विक चाचण्या घडवून आणत आहेत या आण्विक चाचण्यामुळे पृथ्वीच्या तापमानात प्रचंड वाढ झालेली आहे.

जंगल तोड:-

जागतिक तापमान वाढीचे सर्वात महत्त्वाचे कारण हे जंगलतोड आहे जंगलामुळे पर्यावरण आणि जमिनीचे संरक्षण होते तसेच जमिनीत पाणी साठवून ठेवणे कार्बन

डायऑक्सिडचे शोषण करणे व ऑक्सिजन बाहेर सोडणे हवा शुद्ध करणे हे फायदे जंगलाचे आहेत परंतु आज मोठ्या प्रमाणात जंगल तोड होत आहे जंगलाची जमीन विकासाच्या प्रकल्पाखाली जात आहे खान धरणे मानव वस्ती यातून वाढत जाणारी वाळवंटे आणि पुराणी होणारी जमिनीची धूप यामुळे पृथ्वीवरील तापमान प्रचंड प्रमाणात वाढत आहे.

वाहतूक व्यवस्था:-

औद्योगिक कारणामुळे दळणवळणाची साधने वाढली आणि वाहतुकीसाठी लागणारे खनिज तेलाचे प्रमाण स्वयंचलित वाणातून बाहेर पडणारे विषारी वायू यासारखे प्रदूषके हवेत मिसळल्याने हवेचा दर्जा घसरून त्याचा परिणाम तापमान वाढीवर होतो.

नागरिकरण:-

आज खेड्यातून शहरात येणाऱ्या लोकांचे प्रमाण मोठ्या प्रमाणात वाढले आहे असे स्थलांतर झाल्यामुळे नागरिक करण जास्त प्रमाणात झाले आणि त्यामुळे नवनवीन सुविधा यांचा अवलंब केला गेला असल्यामुळे तापमानात वाढ होत आहे.

सूर्यकिरणांची दाहकता:-

सूर्यकिरणांची दाहकता वाढल्यास जागतिक तापमान वाढ होण्याची शक्यता असते सध्याच्या परिस्थितीत सूर्यकिरणांची उत्सर्जन हे नेहमीप्रमाणे आहे किरणांची कमी जास्त झाल्यास त्यावेळी ची जागतिक तापमान कमी जास्त होते त्याचाही परिणाम तापमान वाढीवर झालेला दिसून येतो.

ज्वालामुखीचे उत्सर्जन:-

ज्वालामुखीच्या उत्सर्जनाने देखील जागतिक तापमान बदलू शकते त्याचा परिणाम तापमान कमी जास्त होण्यास देखील होऊ शकतो कारण वातावरणातील धुली कणांचे प्रमाण वाढते जे अतिनील किरणे शोषून घेण्यात कार्यक्षम असतात.

जागतिक तापमान वाढीबाबत उपाय योजना:

1. संयुक्त राष्ट्र संघाचे असणारे योगदान .
2. आंतरराष्ट्रीय पर्यावरण विषयक कायद्यांची क अंमलबजावणी.

3. विकसित देशांना पुढाकार घेण्याची गरज.
4. हरितगृह अणुचाचण्यावरती बंदी .
5. पर्यावरण शिक्षणाचा विकास .
6. लोकसहभागातून पर्यावरण रक्षण .
7. स्वयंसेवी संस्थांचे योगदान .
8. पारंपारिक ऊर्जा साधनांचा वापर वाढवायचा .
9. जास्तीत जास्त वृक्षारोपण .
10. जंगलतोड पूर्णपणे बंद करणे .
11. प्रदूषणावर पूर्ण नियंत्रण ठेवणे .

सारांश:

जागतिक तापमान वाढ हे संपूर्ण जगासाठी मोठे आव्हान आहे. पर्यावरणाच्या ऱ्हासातून तापमान वाढ खूप मोठ्या प्रमाणात होत आहे. पर्यावरण जागृती साठी जागतिक स्तरावर मोठे प्रयत्न होत आहेत तसेच अनेक कायद्यांची निर्मिती ही केली जात आहे सर्व कायदे अस्तित्वात असले तरी पर्यावरण तापमान वाढ तच आहे. त्यासाठी कायद्यामध्ये सुधारण्याची व खडक अंमलबजावणी ची गरज आहे कायद्याचे उल्लंघन करणाऱ्यांसाठी कठोर शिक्षा कोणी आवश्यक आहे व त्याचबरोबर जनतेचे सहकार्य असणे देखील आवश्यक आहे. भारतातच नव्हे तर संपूर्ण जगामध्ये कायदा तिथे पळवाट हे सूत्र असते आणि म्हणूनच प्रत्येक क्षणाला पर्यावरणाचा ऱ्हास होतो त्यातून तापमानात वाढ झालेली आहे म्हणून मानवाने आपल्या भौतिक विकासाला मर्यादा घालून शाश्वत विकासाची मुळे रुजवली पाहिजेत त्यामुळे तापमान वाढ थांबेल पर्यावरणाचे संरक्षण व संवर्धन होईल.

संदर्भ:

1. पर्यावरण शास्त्र एक अभ्यास-तू.म.विराट, रेणुका प्रकाशन, औरंगाबाद.
2. पर्यावरण शास्त्र-बापट आणि सुरेखा पंडित,श्री साईनाथ प्रकाशन,नागपूर.
3. इकॉलॉजी आणि एन्व्हायरमेंट-शर्मा पी.डी. रस्तोयोगी पब्लिकेशन, मिरठ.
4. एन्व्हायरमेंट सायन्स- एस सी संत्रा,न्यू सेंट्रल बुक एजन्सी प्रायव्हेट लिमिटेड ,कोलकत्ता.
5. Global warming www. Org.



अस्वस्थ तांड्यातील : हृदयस्पर्शी 'चिरकांडी' कथा

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गोषवारा -

मराठी साहित्यक्षेत्रात नव्यानेच एक अस्वस्थ मन तांड्यातील एक तरुण कथाकार डॉ.विजय जाधव. तांड्यातील वास्तवाचा खरा चेहरामोहरा घेऊन 'अस्वस्थ तांडा' या कथासंग्रहाचे कथाकार डॉ.विजय जाधव हे तांड्यातील जगणे घेऊन आले. 'अस्वस्थ तांडा' या कथासंग्रहातील 'चिरकांडी' या कथेतून समाजमनात खोलवर रुजलेली अज्ञान, अंधश्रद्धा इ.वर प्रकाशझोत टाकणारी कथा आहे.

बीजशब्द- फाटका, चिरकांडी, बळी, दुष्काळग्रस्त, पशूहत्या, अघोरी, गुप्तधन इ.

प्रस्तावना:

कथाकार डॉ.विजय जाधव यांचा 'अस्वस्थ तांडा' हा पहिला कथासंग्रह (2020)ला प्रकाशित झाला असून गौर बंजारा समाजातील वास्तवावर लक्षवेधून घेतो. तांड्यातील वास्तव जन्मापासून पाहणारा नव्हे तर आईच्या गर्भात असताना कथाकाराच्या मनावर कळतनकळत ते पडसाद उमटत गेलेत. तांडा आणि संघर्ष आणि त्याला सामोरे जाण्याची ताकद डॉ.विजय जाधव यांना तांड्यातून मिळाली.'अस्वस्थ तांडा' या कथासंग्रहात एकूण बारा कथा असून गौर-बंजारा तांड्यातील चित्तरकथा घेऊनच सामोरा येतो.

कथाकार डॉ.विजय जाधव यांच्या 'अस्वस्थ तांडा' या कथासंग्रहातील 'चिरकांडी' ही कथा असून ही कथा आप-आपले स्वतंत्र अस्तित्व घेऊनच भेटतात.ह्याला पाझर फोडणारी ही कथा आक्रोश, वेदना, स्त्रीचे जगणे, स्त्री-पुरुष स्वभावदर्शन इ.लक्षवेधक ठरते.तसेच गौर-बंजारा समाजातील लोकसंस्कृती,चालीरीती,रूढी,प्रथा,परंपरा इ.यातूनच कथाकाराने 'चिरकांडी' कथेला वास्तव रूप दिले.एक नव्हे तर असंख्य भयावह वास्तव,सत्य ही कथा मनाला चटका लावून जाते.

"वेळ येताच सोयाबीनच्या हंगामात तांड्याला सूचक शीळ घालीतच प्रवेश केला.....'(पृष्ठ क्रमांक) या संवादातून तांड्यातील आनंदाचा उत्साह, स्वप्नांना नवी पालवी फुटणारे वातावरण अचानक तांड्याला चैतन्याचे दृश्य दिसू लागते. तोच तांड्यातील हुरूप संवादातून, " मांडीला,आजच्या आज सोयाबीन आडवाच पडलं पाह्यले

गड्या! तेच सांगायला आलो!" (पृष्ठ क्र.) केशव निरोप घेऊन आला. हाताला काम भेटले पण असमाधानी किंवा परिस्थितीने पुरा वैतागलेला मांगीलाल आपल्या मनातले दुःख केशवराव सांगतो."केशव ,तू वापराचा धनी...आन मी आतून बाहेरून फाटका !तसा तूला बरा!वावरताना आन मजूर यात फरक असणारच."(पृष्ठ.क्र) 'चिरकांडी' कथा डोळ्यापुढे उभे करते एक चित्तथरारक नाट्य,खलनायकी प्रवृत्तीची स्त्री,क्रूर मानसिकता असलेले पुरुषी चेहरे इ. तांड्यातील काही विकृत मानसिकतेत जगणारे डोळ्यासमोर येतात.

'चिरकांडी'म्हणजे रक्ताची उडालेली धार,रक्ताचा चिखल, रक्ताच्या थारोळ्यात पडलेला बळी दिलेला शेटजी लहान निरागस मुलगा. रक्तबंबाळ मन आणि पावलापावलावर माणुसकीचा भर रस्त्यात, गर्दीत तांड्यातील मानसिकतेचा झालेला खूनच! असे म्हटल्यास वावगे होणार नाही. आजही सुशिक्षित, अडाणी सगळेच काही प्रमाणात लोक झटपट श्रीमंत होण्यासाठी, कष्ट न करता पैसे मिळविण्यासाठी अनेक भोंदू बुवांचे जातात आणि बुवाबाजीच्या जाळ्यात अडकतात आणि तेथूनच गुप्तधनाच्या खूनापर्यंत आजही मजल गाठणारी मानसिकता तांड्याला उध्वस्तेकडे नेणारी ठरते. केवळ, अडाणीपण, अशिक्षित, अंधश्रद्धा यामुळे समाजातील असा हा चेह-यावरचा खोटा पांघरलेला मुखवटाच कथाकार डॉ विजय जाधव यांनी अतिशय प्रखरतेने 'चिरकांडी' कथेतून समोर आणलेला आहे.

कथाकार डॉ.विजय जाधव लिखित 'चिरकांडी' या कथेचे शीर्षक बोलके,सूचक ,सहज आकलन होणारे , मनाला कायमच चुटपुट लावणारे तसेच अस्वस्थ करून जाणारे आहेत. कथेत पुढे येणा-या,घडणा-या नरबळीचा घटनाक्रम मनोविक्षेपणात्मकरित्या ,सूक्ष्मनिरिक्षणातून कथाकाराने शब्दबद्ध केलेला आहे.

'चिरकांडी' या कथेतील कथानक, पात्रे,वातावरणनिर्मिती,संवाद आणि भाषा यातून कथेतील आशयसौंदर्य प्रकटते. 'चिरकांडी' या कथेतील गुप्तधनाच्या दिलेला बालकाचा बळी ते भयानक दृश्य मानवी मनाला गोठून टाकणारे,बधिर करणारे आहेत. या भयानक घटनेने कथानक डॉ.विजय जाधव हादरून जातात.आपला तांडा नेमका कुठे निघाला? यातूनच एकामागून एक घडणा-या घटना कलाकाराला सुन्न करणा-या ठरतात.तांडा लोकसंस्कृतीला मानणारा. लोकजीवन, प्रथा, रूढी, परंपरा, रीतिरिवाज याला मानणारा .श्री सेवालाल महाराजांनाच्या विचाराला मानणारा आहे. परंतु अज्ञान, अंधश्रद्धा, जुगार, नवस, बळी, पशूहत्या, मांसाहार आणि व्यसनात अडकलेला, भरकटत गेलेला दिसतो.तसेच या तांड्यातील सुशिक्षित माणसे आपल्या तांड्यातील ही अवस्था पाहतात.बरेचदा तेही अशा गोष्टीला खतपाणी घालताना दिसतात. परंतु अशा अवस्थेत तांड्यातील मानसिकता कथाकाराला वेदनादायक ठरते.या विचारातूनच या कथेची निर्मिती अतिशय सूक्ष्मनिरिक्षणातून, अभ्यासपूर्ण मनन,चिंतनातून झालेली जाणवते. तांड्याची ही मानसिकता बदल्याची ताकद नुसत्या विचारातूनच नव्हे तर प्रत्यक्ष कृतीतून घडते.या विचारातून "चिरकांडी'कथेची वास्तवानुभव प्रकटते.तांड्यातील लोकांच्या मनात खोलवर रुजलेली अज्ञान, अंधश्रद्धा यातूनच अंधाराकडे,उध्वस्तेकडेच घेऊन जाणारी कथा पुढे सरकते.तांड्यातील आनंद कमी पण दुःख मात्र कायमच पाहीला पुजलेले.असंख्य बळी गेलेत,जात आहेत. उदा.कधी सुना गेलेला हंगाम,सुगीचे दिवस रिते हात,दुष्काळ,महापूर, गरिबी,हाताला काम नसणे दारूचे व्यसन, जुगार,,नवस,बळी,सावकाराचे कर्ज इ.यातून तांड्यातील माणुसकी कुठेतरी हरवत चालली.एका दुष्टचक्राकडे घेऊन जाणारी ही एक सूडकथाच ठरते.

कथाकाराने यात अतिशय ताकदीने मुख्य, गौण स्त्री-पुरुषे पात्रे ही काल्पनिक नाही तर ती तिथलीच आहे.केवळ नावे बदलली आहेत. उदा.तुंग प्रमुख, मांगीलाल, केशव,नागोराव महाराज,शेठजींना मुलगा,लिंगपिसाट लीला,नागोराव महाराज सोबत लीलाचे असलेले अनैतिक संबंध आहे.स्वार्थासाठी आपल्याच लोकांना पसविणारे ,

प्रा. डॉ.प्रियदर्शनी वसंतराव देशमुख

एका दिवसात श्रीमंत होण्याकरीता गुप्तधनासाठी एका निष्पाप मुलाला बळी देण्याचे अघोरी कृत्य या कथेतील प्रसंगातून येते.'चिरकांडी' या कथेतील भयावह वास्तव कथाकाराने मांडलेले आहेत. उदा.मांजर जवळच गाव,हनुमान मंदिर ,जत्रा,जत्रेतील गर्दी,स्त्री-पुरुष, आबालवृद्ध यातून घटनाक्रम लक्षवेधून घेतो.

अंधश्रद्धा,अज्ञानात काही गौर-बंजारा एवढा अडकलेला आहे.त्याला काही धनवान, सुशिक्षित लोकही अशा कृत्याला खतपाणी घालतात आणि त्यातूनच हे सर्व व्यसनात अडकून स्वतःचा,कुटुंबाचा प्रियाने समाजालाही अधोगतीकडे घेऊन जातो.कथाकार डॉ.विजय जाधव यांनी मनोविक्षेपणात्मकरित्या या कथेतून विविध भावपदर उलगडलेले आहेत.कथाकाराला तांड्यातील मानसिकतेचा असंख्य प्रश्न भेडसावतात नव्हे तर दिवस-रात्र अस्वस्थ करतात.कथाकार इथेच थांबत नाहीत.तर इथून चिकित्सकपणे या कारणांचा शोध घेऊन या मानसिकतेच्या मुळापर्यंत पोहचण्यासाठी कायमच धडपडतो आणि त्याचा शोध घेऊन आपल्या सशक्त लेखणीतून प्रखरपणे मांडतो.

तांड्यात श्रीमंतीसुद्धा आणि दारिद्र्य आहे.आजही पशूहत्या,पशूबळी ,नवस इ.समस्या,प्रश्न इतके वाढलेले आहेत की त्यासाठी प्रबोधनात्मक कार्य एकत्रित येऊन करणे किती जरूरीचे आहे.तसेच ते सगळ एकाच दिवसात होणार नाही हे कथाकाराने चांगलेच आहे.परंतु म्हणून काही कथाकाराची लेखणी थांबलेली नाही.तर आपल्या तांड्यातील लोकांची मने जिंकून ही लढाई लढायची हा मानसशास्त्रीय दृष्टीकोन डॉ.विजय जाधवांच्या लेखणी आणि प्रत्यक्ष कृतीतून जाणवतो. यासाठी बंजारा समाजातील लोकांना विश्वासात घेऊन त्यांना बंजारा समाजातील अनेक,सुधारक,विचारवंत, साहित्यिक हे सगळे आप आपल्या परीने कार्य अवरित करीत आहेत.

उत्सव, सणवार, तीज-त्यौहार,दिवाळी इ.विविध सणवार तांड्यातील घरोघरी परिस्थितीनुसार साजरे करतात. गावातील जत्रा,यात्रा यासाठी आतुर झालेले मन आणि यातूनच काही आनंद,सुखाचे क्षण वैविध्यपूर्ण रंगाची पखरणही होते.हेच ते काही क्षण तांड्यात आनंदोत्सव घेऊनच येतात.हेच ते क्षण असतात तांड्यासाठी कष्टाला विसर पाडणारे!

बंजारा बोलीभाषेतील विविध गाणे अशावेळी मुली,स्त्री-पुरुषाच्या तोंडी अगदी उत्स्फूर्तपणे येतात .तांडा संपूर्ण गाण्याच्या सुरात बुडालेला,रमलेला.तांड्यातील जगण, मरण आणि यातील सुख,आनंद, उत्साह,यातना,दुःख,चिरवेदना गाण्यातून अभिव्यक्त होते.बंजारा तांड्यातील गाणे हे संस्कृती,संस्कार आणि जीवनदर्शन घडविते.

कथाकार डॉ.विजय जाधव यांना समाजभान आहे. घराघरातील वाईट प्रथा, पद्धती,जत्रेत बोकड देणे, नवस करणे,बळी देणे तर कधी पशूबळी तर कधी नरबळी गुप्तधनासाठी देणे आणि त्यासाठी सावकाराकडून कर्ज काढणे .पशूहत्या,मांसाहार आणि दारूचे अतोनात व्यसन असणे.व्यसनामुळे विचारशून्यता ,बधीरपणे जगणे.याची चीड कथाकाराला सातत्याने येते. तांडाज कधी या विकृतीतून बाहेर पडून माणूस म्हणून जगेल यासाठी प्रबोधनाची,जनजागृतीची गरज आहे.यासाठी गाव,शहर,महानगर ,देश आणि परदेशात स्थायिक झालेला गौर-बंजारा तांड्यातील लोक एकत्र येऊन आपण या तांड्याला चांगले दिवस साठी आणण्यासाठी समोर यावे; रते. यासाठी लोक पुढे येत आहेत. पण एवढेसे पुरेसे नाही. कारण हे अज्ञानपण एवढे खोलवर मुळे लोकांच्या डोक्यात घट्ट बसलेले आहे की ते अत्यंत जिकरीचेचे काम आहे .वेळ लागेल पण माझ्या तांड्यालाही चांगले दिवस येतील याच आशावादाने अस्वस्थेतून कथाकार बंजारा सभा,व्याख्यान,साहित्यातून कथाकार बंजारा सभा, साहित्य संमेलन इ.तून समाजाशी सातत्याने संवाद साधतो. आपल्या विद्यार्थ्यांना या वास्तवाचे दर्शन ते घडवितात.

आधीच अठराविश्व दारिद्र्य त्यात त्यात जत्रेत देवाकडे केलेला नवस आणि बळी देण्यासाठी सावकाराकडे किडूकमिडूक गहाण ठेऊन कर्जबाजारी होणे ही मानसिकता यांना आरपार उध्वस्तेकडेच घेऊन जाणारी आहे. बोकड कापणे,मांसाहार म्हणजे विषारी मुळे,पोटमुळे जी त्याला या सापळ्यात अडकवित जाते. तो स्वतःहून यामध्ये अज्ञान ,अंधश्रद्धा यातूनच तो विनाशाकडे जातो हेच वास्तव चित्र तांड्यातील कथाकाराने आपल्या समृद्ध लेखणीतून मांडलेले आहे.

जत्रा अगदी हाकेच्या अंतरावर तांड्यातील हात यात्रेच्या कामाला लागतात. तांड्याची लोकसंस्कृती दर्शन , पारंपरिक पद्धतीने आलेली आरती, त्यांची श्रद्धा यातून प्रकटते.

"जेजे हनुमान बापू
जे जे मगरघस बापू
खडीसाखर आरपार रेणू
पडलेली खडी करणार
सगर ओत आड आणि
शेष्ट बटवे वत रूपा रेल चलागो बापू...."

हनुमानबापू मगरघस बापूचा जयजयकार.....ही बंजारा संस्कृती नितान्त श्रद्धेवर डॉ.विजय जाधव प्रकाशझोत टाकला. कथाकाराचा जत्रेतोला विरोध नाही आहे तो त्यातील अंधश्रद्धा, पशूहत्या, मांसाहार, व्यसनाना कारणे हेच तांड्याला अधोगतीला न्यायला कारणीभूत आहे.

नागोराव महाराजा सारखी विकृत मानसिकतेचे प्रतिनिधित्व करतो. तर लीला सारखी व्यामिचारी,

प्रा. डॉ.प्रियदर्शनी वसंतराव देशमुख

लिंगपिसाट स्त्री, विकृत चाळे, घाणेरडे कृत्य करणारी आणि गुप्तधनाच्या या वाईट घटनेला नागोराव महाराज सोबत राहून या कृत्याला प्रत्यक्षात आणणारी क्रूर खलनायिका, कपटी कारस्थानी स्त्री पात्र. एका विनाशाकडे घेऊन जाणारे चित्र कथाकाराने 'चिरकांडी' कथेतून विविध घटना-प्रसंगातून वातावरणनिर्मिती केलेली आहे.डोळ्यासमोर चित्र हुबेहुब उभे राहिल एवढी ताकद कथाकाराच्या लेखणीतून लक्षवेधक ठरते. मंतरलेले ताईत, धागेदारे, गंडेदारे,व्रत, उपवास ,अमावस्या, पोर्णिमा यातूनच गुप्तधनाचा दिवस ठरणे. यासाठी पूजेसाठी लागणारे सामानसुमान आणि महत्वाचा बळी,नरबळी देण्यासाठी पायाळू मुलाचा शोध आणि त्यातूनच गुप्तधन मिळेल ही नागोराव महाराजाची

आणि त्यातूनच गुप्तधन मिळेल ही नागोराव महाराजाची भूमिका मांगीलालला शेठजीचा मुलगा पळविण्यापर्यंत मजल गाठायला लावतो. कजली सारखी जादू,मंत्रमुग्ध याचाही उल्लेख पुढे-पुढे येत जातो.अशा बुवाबाजीच्या दुकानापासून तांडा कसा वाचेल?हवेतून गंडेदारे,कुंकू,कापूर, प्रसाद काढणे इ.अगदी शुद्ध फसवेगिरी परंतु ज्याने डोळ्यावर आणि मनावर अंधश्रद्धेचा पट्टी बांधलेली आहे .त्याला यात काहीच गैर किंवा चुकीचे वाटत नाही?हाच मूळ प्रश्न सातत्याने कथाकाराला भेडसावतो.

लागणताईत, धागदारे, व्रत, उपवास अमावस्या, पोर्णिमा ठरणे.. सामानसुमान ने देवा साठी नरबळी यापून गुप्तधनाचा बळी पायाळू मुलाचा शोध आणि त्यातूनच गुप्तधन मिळक समासात उनके विद्युनन्द भाई बुवा-समासा आपदे पंजे पसरून आहे की अशा गोष्टीला खतपाणी घादणार त्याचे चेके सातत्याने अशाच लोकांच्या शोधातच असतात इथे मागीजाक सारखी माणस बुवाबाजीच्या जाळ्यात अडकून हातचलाखी तंत्र मंत्राला बळी पडते. कसे संमोहीत करणारे जाळ्यात णार नगूबुबा ओढतात हेच मूळ विषय आहे. हिंगाविसाद, कामवासना पूर्व करण्यासाठी जागोराव महाराजाळया कृत्यात बरोबरीने साथ हेते. अशा या अनीकि कबधान गुड्सची लागण

नागोराव - केशव व मोनीबाया. षड्यंत्राचे सूत्रधार व मागीदाद या अंधश्रद्धत स्वतःहून अडकता नरबळी शेन्जीचा मुळगा. ज्ञानही असंख्य नरबळी गुप्तधनासाठी दिसत आहे. या वास्तव विषयाला डॉ. जाधवानी कथेतून मांडलेले आहे. तेथूनच षड्यंत्र सुरू होते,

"धन की बेटी
इंदरकी बेटी
सनहन करत है
तन मन कुदत है
उपर से फेका पानी
तेरे दिल की बात पहचानी

आ जा ऊपर, अब ना कोई डर इन्मान की बळी, कर के कबुली
छूँ मंतर"

छूया मंत्रात कोर्यनाट्य सुरु होते मध्ये कुणीच बोलायच नाही दिलेली धमकीच!मुलाच्या डोळ्यावर लाल पट्टी बांधून बोकड कापण्यागत नागोराव महाराजाने मुलाची मान खटकन कापणी.रक्ताच्या थारोळ्यात देह निपचित पडलेला.मुलाचा गगनभेदी आक्रोश दाबून टाकला या विकृत मानसिकता आणि अंधश्रद्धेने...मांगीलाल या घटनेचे हे रूप पाहून हादरला आणि जोराजोरात ओरडू लागला.

" बंद बंद करा रे.... पण तोवर सगळ संपले असते बुवाबाजी आणि नागोराव महाराज, लीला, केशव सारखे माणसे जिकलेले.घटना अशा वळणावर येईल.

कुणीच बोलायचे नाही घातलेली धमकीचे मुळाच्या डोळ्यावर लाल पट्टी बांधून बोकड कापण्यागत नागोराव महाराजाने भुवानी मान देह... खटकन कापला

घटनेचे हे रूप पाहून हादरला आणि. " बंद बंद करा रे...." पण तोवर सगळ संपले असते. बुवाबाजी आणि नागोराव महाराज, लीला, केशव सारखे माणसे जिकलेले.कथेतील घटना अशा वळणावर येते.'भंग भंग झाला म्हणून...."ओरडत आता गुप्तधन भेटणार नाही अस सांगत सामानसुमान घेऊन आडरानात पळाला तर लीला तांब्याच्या वाटेने...

मांगीलालच्या स्वप्नाचा मुदडा होतो.

संदर्भ ग्रंथ :

- 1) डॉ विजय जाधव -'अस्वस्थ तांडा' ,ग्रंथाली प्रकाशन, मुंबई, प्रथमावृत्ती 25 डिसेंबर 2019
- 2) डॉ.विजय जाधव -'गोरवेणा', ग्रंथाली प्रकाशन, मुंबई, प्रथमावृत्ती 25 डिसेंबर 2021



आम्ही वंशज सूर्याचे: एक दृष्टिक्षेप

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सारांश:

सामाजिक परिवर्तनाची सकस बीजं ही साहित्यातूनच पेरली जातात. आमूलाग्र असा बदल व्हावा हेच हेतूप्रधान साहित्याला अपेक्षित असते. विषमता आणि मनुष्यत्वद्रोही शोषणव्यवस्था समूळ नष्ट व्हावी हेच मानवतावादी लेखण्यांचे बलस्थान आणि त्यांनी घेतलेला तो एक वसा असतो. हा मार्ग खडतर तितकाच तो आव्हानात्मकही असतो. समाजक्रांती असो वा जगातली कुठलीही क्रांती, तिची जन्मभूमी ही ग्रंथालयच असते. आजवर जगात फक्त साहित्यानेच परिवर्तनाच्या चळवळी निर्माण करून त्या जिवंत ठेवलेल्या आहेत, हे स्पष्ट वास्तव विस्मरणाच्या सुपूर्द करता येत नाही.

प्रस्तावना:

त्यातल्या त्यात कविता हा प्रकार अधिकच प्रभावी. त्या समाजातला काळोख नष्ट करून वेळोवेळी स्वच्छ प्रकाशवाटा निर्मिण्याची महत्त्वपूर्ण कामं केलेली आहेत. केशवसुतांनी तत्कालीन व्यवस्थेत कवीचे महत्त्व अधोरेखित करताना म्हटले होते_ 'आम्हाला वगळा गतप्रभ झणी होतील तारांगणे/ आम्हाला वगळा विकेल कवडी मोलापरी हे जिणे.' कवी आणि त्याच्या कवितेमुळे माणसांचं जगणं हे मूल्यप्राप्त झालेलं आहे. समाजातल्या अति दुर्बल घटकांना मानसिक बळ पुरवून त्यांना उजेडगामी बनविण्याचेही काम कवितेनं केलेलं आहे. खरं म्हणजे, कवितेनं निर्जीव अशा घटकांना सजीव करण्याकडं विशेष लक्ष पुरविलेलं आहे. समजून घेण्याजोगी कविता समजून घेता आली तर तिच्या अचाट सामर्थ्याचा प्रत्यय येईल. मात्र विचार, भाषाविषयक सौंदर्य, वास्तव आणि निर्भीडपणा प्रत्येक कवितेत असतो असं अजिबात नाही. लाखों कवींपैकी फक्त बोटानंवर मोजता येतील इतकीच दमदार आणि धारदार नावं आपल्यापुढं येऊ शकतात ह्या वास्तवाचाही विचार करावा लागतो. तरीसुद्धा काही कविता ह्या फार उंचीवर गेल्या नसल्या तरी त्यातले सामाजिक भानही लक्षात घ्यावे लागते. म्हणजे, अल्पशा प्रमाणात का असेना त्यांचे मूल्य मान्य करावे लागते. मधुराणी बनसोड ह्या कवयित्री असून त्यांचा नवीन कवितासंग्रह 'आम्ही वंशज सूर्याचे' एवढ्यातच हातात पडला. त्यात नेमके काय म्हणून त्यात मी मला गुंतवून घेण्याचा प्रयत्न केला. यापूर्वी बनसोड यांचाच 'सन्मार्ग' हा अभंगसंग्रह प्रकाशित झालेला आहे. तो मला बऱ्यापैकी भावला होता. त्यांनी त्याद्वारे उपेक्षित, शोषितांच्या काहीशा प्रश्नांना हातही घातला होता. त्यांनी

आपल्या कुवतीनुसार दुःखाची काही हक्काची स्थळही शोधण्याचा प्रयत्न केला होता.

बहुसंख्य लोक हे न पावणाऱ्या देवाचा धावा करतात. शेतकरी हा हवालदिल झाल्याच्या कहाण्या जन्मास येत आहेत. दुसरीकडं, अविरतपणे धनाढ्यांबरोबरच शोषक वर्गाचे मजल्यांवर मजले चढताना दिसत आहेत. अशा सुमारास, गाभाऱ्यातल्या कुठल्याशा देवाला कवयित्री अंधश्रद्धेत फसलेल्या परंपरेला धक्के देत निघून सांगते,

'सोड तो गाभारा। आणि सोड विटा।

धर बावा वाटा वावराची।।

वावरात माझ्या। घाल एक फेरी।

पूर्ण तुझी वारी कर आता।।'

ह्या अभंगाच्या ओळी वाचतानाच विठ्ठल वाघ यांच्या काही ओळी नजरेपुढं येतात_

'आखाडीला यारे तुमी माहा वावर पंढरी

हाले भळ्याच्या शेतात झेंडी इठोबाची खरी'

ते म्हणतात की, शेतातच पंढरपूर आहे आणि विठ्ठलाच्या मंदिरासह विठ्ठलसुद्धा.

'आम्ही वंशज सूर्याचे' हा मधुराणी बनसोड यांचा सामाजिक विषयाशी संबंधित कवितासंग्रह. यात आजूबाजूला वावरत असलेल्या परिस्थितीला त्यांनी समजून घेण्याचा प्रयत्न केलेला आहे. आजूबाजूला प्रत्यही अन्याय_ अत्याचार होताना दिसताहेत. सारंकाही बघूनही लोक त्यांकडं कानाडोळा करतात आणि निघून जातात; परंतु असं काही न करता कवयित्री त्यांविरोधात धगधगायला लागते. त्या केवळ पुढल्या समस्याच शब्दबद्ध करत नाहीत, तर त्यांवर उपायही सुचवतात. आम्ही सूर्याचे वंशज आहोत हे

स्पष्ट करण्याकडं ध्यान देतात. त्यांची कविता ही कथाप्रकाराच्या जवळून जाणारी आहे असंही वाचताना अधूनमधून जाणवत राहते.

बनसोड यांच्या कवितेत फुले, शाहू आणि डॉ. बाबासाहेब आंबेडकरांची वैचारिक प्रतिबिंबंही पडलेली दिसून येतात. त्यांची लेखणी विशेषतः सत्याकडं झुकताना दिसते. ती परिस्थितीपुढं हात न टेकता संघर्षाच्या बाजूला उभे राहते ही तिची एक जमेची बाजू.

बुद्धांचा धम्म अस्तित्वात आला ती जगातली अतिशय महत्त्वाची आणि सर्वोच्च म्हणता येईल अशी क्रांती ठरली. त्या क्रांतीमुळेच अखिल मानवी समाजाला जीवन जगण्याचा सर्वश्रेष्ठ मार्ग सापडला. त्यानंतर डॉ. बाबासाहेबांनी धम्मतत्त्वं उपयोगात आणून या देशाला संविधान दिलं. त्या माध्यमातून इथल्या सर्वच उपेक्षित, वंचित घटकांना जगण्याचा आणि मनुष्यत्वाचा अधिकार मिळाला. सगळं काही धम्मऊर्जेमुळेच शक्य झालेलं आहे... नेमकी हीच जाण असल्यामुळे 'आम्ही वंशज सूर्यांचे' ह्या संग्रहातल्या पहिल्याच कवितेतून कवयित्री व्यक्त होते,

'शुद्ध कुशल कर्माची
आम्ही चाखतो वा फळे
चालू लागलो ह्या वाटा
त्या धम्म क्रांतीमुळे'

आज आम्ही जी आनंदाची सुमधुर फळे चाखत आहोत, सुखाच्या वाटेवरून चालत आहोत हे केवळ बुद्धांच्या धम्मक्रांतीमुळेच शक्य झालंय. हे स्पष्ट आहे, तर मग आम्ही कुणाचे वंशज?_ निःसंदेह बुद्धांचे, धम्माचे!! म्हणजेच, सूर्यांचे! आम्ही मागे हटणारच नाही. आमचा हाच प्रगतीपथ आहे. इथंच उजेडाचे दिवे हातांत दिसतील, जागृतीचा ऊर्जाशील मार्ग दिसेल. ज्या प्रथा_ परंपरा काळोखाकडं घेऊन जातात त्या जाळून टाका. केशवसुत म्हणतात,

'जुने जाऊ द्या मरना लागूनी
जाळून किंवा पुरूनी टाका
सावध ऐका पुढल्या हाका!'

अशीच काहीशी भूमिका कवयित्री घेते. तुम्ही सूर्यमार्गी झाल्यामुळे सर्वत्र सौख्यपिकं डोलताना दिसतात. आणि हा सत्याचा मार्ग सोडू नका, कारण हे मार्ग 'निळ्या नभाचे निराळे' असेच आहेत.

'नित्य स्मरतो' ह्या कवितेतून बुद्धांच्या शिकवणुकीचे महत्त्व अधोरेखित झालेले आहे, त्यातूनच ज्ञानदिशा निश्चित झालेली आहे, त्यामुळेच मुक्यांना वाचा आणि पांगळ्यांना आधार मिळालेला आहे. अशी जाणीव प्रस्तुत कवयित्रीलाही आहे_

'कर्मकांडाला देऊन ठोकर
ज्ञान अवगत करतो...

तू दाविला विज्ञानमार्ग
तो मी धरतो...'

बुद्धांना स्मरल्यामुळेच कर्मकांड नाकारून ज्ञान अवगत करणं शक्य होते, विज्ञानमार्गावर आरूढ होता येते... ही प्रखर जाण इथं व्यक्त झालेली आहे.

ह्या जगाला अगदी जिवंतपणीच पडलेलं स्वप्न म्हणजे बाबासाहेब! बाबासाहेबाच नसते तर आजच्या काळातही कंबरेला झाडू आणि गळ्यात गाडगं लटकलेलं असतं. आपल्या सर्वांचं जगणं किड्यामुंग्यांसारखं झालं असतं. पण आज सर्वत्र जाणिवेला पालव्या फुटलेल्या दिसतात. मनूवाद्यांच्या छाताडांवर बसून संविधान हे समानता आणि माणुसकी शिकवीत आहे. त्यामुळेच लोकांना सुखाचे चार घासतरी खायला भेटताहेत. बनसोड 'तू नसतास तर' मधून म्हणतात,

'तू नसतास तर बाबा
आम्हीही कुठे असतो
रस्त्याच्या कडेला
भीक मागत बसलो असतो.'

अधूनमधून वाटायला लागते की, हा संग्रह म्हणजे बाबासाहेबांचा एक जणूकाही विचारसंग्रहच आहे. रस भीमनामाचा, खोळधारी, आकाशझेप, प्रकाशवाट, पांघरते निळाई, माझ्या भिमानं, जात गाडली तू, माणूस दिलदार झाला, स्तुतीस शब्द नाही, भीमाची पुण्याई, झुकला ना कुठे, ना मी दास पायरीचा, भिमासारखा, अरे आठवा, बाबाची लेखणी, बा तुझी प्रखर वाणी, तिथे तलवार येथे लेखणी, भीम तिथे विसावला अशा एकूण वीस कविता ह्या बाबासाहेबांच्या विचारलेखणीशी संबंधित आहेत. ह्या साऱ्या कवितांमध्ये 'पांघरते निळाई' ही कविता लक्षवेधी आहे. आपण आजपर्यंत 'ग' गणपतीचा आणि 'भ' भटजीचा शिकत आलोय. तसा तर प्रत्यक्षात आपला गणपती आणि भटजीशी काहीएक संबंध नाही. आता त्या मूळ अक्षरांची ओळख बदलायला हवी. सर्वसामान्यांना आपली वाटेल अशीच ओळख निर्माण केली गेली पाहिजे. एका आईच्या भूमिकेत प्रवेशून कवयित्री इथे वेगळ्या पद्धतीने व्यक्त झालीय_

'काल माझ्या तीन वर्षांच्या लेकीनं
लेखणीने पाटीवर
ए फॉर आंबेडकर,
बी फार बाबासाहेब,
गिरवलाय, अगदी घोटून घोटून
तेव्हा आनंदाशू घरंगळले डोळ्यांतून मी चिंब झाले
आणि पहिल्यांदा माय झाल्याचा अभिमान वाटला..'

कुठलंही लेकरू अशाप्रकारे शिकत असेल, तर आई नावाचं एक संवेदनशील मन निश्चित राहते. तिला वाट

दाखविण्याची गरज उरत नाही. आणि आभाळाला कुठला रंग आहे हेसुद्धा विचारण्याची गरज वाटणार नाही. भय फक्त एवढंच की, तिच्या मनात कुणी जातीची पेरणी करू नये. बाकी बाबासाहेबच पुरेसे आहेत.

बाबासाहेब हे जातींच्या मर्यादित बंदिस्त असलेले नाव नाही. त्यांनी संविधान आणि आपल्या मानवतावादी कार्यातून बौद्धांपेक्षा इतरांना बरंच काही दिलेलं आहे. त्यांनी माणसातलं मनुष्यत्व जागृत केलं, मुद्द्यांना जिवंत करून त्यांच्यात माणूस असल्याच्या जाणिवा प्रज्वलित केल्या. संविधानाने तर माणूस म्हणून माणसाला त्याचे अधिकारच बहाल केले.

डॉ. बाबासाहेब घटना निर्मितीच्या कार्यात गुंतलेले होते, त्या सुमारास आलेला एक असा अनुभव_ डॉ. पंजाबराव देशमुखांच्या डोळ्यांत पाणी आलं होतं. पण का? हेसुद्धा जाणून घेतलं पाहिजे.

आदिवासी, भटके विमुक्त वा स्त्रिया असतील_ ह्या सर्वांच्या सर्वांगीण कल्याणाचे मार्ग बाबासाहेबांनी संविधानात निर्माण केले, ही दुर्लक्ष करावं अशी निरर्थक वा टाकाऊ गोष्ट नाही. ते फार मोठे ऐतिहासिक दृष्ट्या महत्त्व असलेले कार्य आहे. अशा मुद्द्यांकडेही कवयित्रीची नजर वळते_

'काळा अंधार माघारी सारला वन माय

माझ्या भिमाने, साऱ्या जगाला मारलं वन माय'

कवयित्रीच्या अंतर्मनात कुठंतरी अस्वस्थता जाणवते म्हणूनच

त्यांच्या कवितेतून सामाजिक वास्तव आणि परिवर्तनविषयक जाणिवा डोकावताना दिसतात. त्यांना वाटते की, समाजातले प्रचंड अज्ञान आणि असलेले सर्व प्रकारचे अन्याय _ अत्याचार नाहीसे व्हावेत. वंचित, बहुजनांना त्यांचा जगण्याचा अधिकार मिळावा. अशा आशयाच्या जवळपास पंधरावीस कविता त्यांच्या ह्या संग्रहात समाविष्ट करण्यात आलेल्या आहेत, त्यांपैकीच ह्या _ वाकू नये, वाघ पाहिजे, जाग मर्दा जाग, मेरे लाल पिले निले, पशू पक्षी बरे, मार्ग पंचशिलेचा, गाडली मनुवृत्ती मातीत, रावण, श्रमिक, जाळू जाती पाती, झुकलो नाही दगड धोंड्यापुढे, मशाल, मेंदूचा उकंडा, माणुसकी.

आपल्या जीवनात येणाऱ्या अडीअडचणींवर खऱ्या अर्थाने पुढं जायचं असेल, तर आपण देव... देव करत बसलो पाहिजे की थोरांची प्रेरणादायक चरित्रं वाचून परिश्रमपूर्वक पुढं पुढं गेलो पाहिजे?_ ह्या संदर्भात आलेल्या काव्य पंक्ती,

'केले असते तू | थोरांचे स्मरण

ठरते कारण | प्रगतीला||

सावध असावे | नित्य बहुजना

वाकू नये कणा | भटापुढे ||'

डॉ. विजय जाधव

यातून बहुजनांच्या अधोगतीचे कारणच अधोरेखित केले गेलेले आहे. त्यांच्या मार्गबदलाच्या गरजेवर भावना व्यक्त झालेल्या आहेत. दुसरे असे की ज्या कुणाला समाजाप्रती आस्था वाटते, ज्यांच्या मनात तळमळ उफाळून येत असते तो खरं म्हणजे ज्वालामुखीगत असतो. म्हणूनच 'वाघ पाहिजे' ह्या कवितेत त्यांची प्रतिबिंबित झालेली भूमिका महत्त्वाची वाटते. त्या म्हणतात,

'मी वाघीन भीमाची

मला वाघ पाहिजे

समाजाच्या प्रति त्याला

जाग पाहिजे!'

अत्याचार होतो तेव्हाच आपण जागे असलो पाहिजे, त्याचवेळी आपल्याला राग आला पाहिजे. असं झालं नाही तर काय होईल?... त्यासाठी 'जाग मर्दा जाग' ह्या कवितेतून डोकावलेली सूचना बरी वाटते,

'आरे जाग मर्दा जाग आतातरी जाग

तुझ्या हक्कांचं तू मागे

नाहीतर होशील रे बर्बाद!'

आपण निद्रिस्त असल्यामुळे दीडदमडीवाल्या विचाराच्या लोकांनी आपली वाट लावलेली आहे. भ्रष्टाचार्यांनी अज्ञासह नोटाही फस्त केलेल्या आहेत. ह्या वर्तमानातही आपण उपाशीच आहोत. आपल्याला राहायला धड म्हणावा असा सुरक्षित निवाराही नाही; परंतु ते मखमली बिछान्यावर लोळतात. आपल्या झोपडीत होळी तर त्यांची रोजच दिवाळी. आपली लेकरं कुपोषित, त्यांची लेकरं लुसलुशीत _ असं हे का झालंय?_ तर आपण जागे नाही. आपल्या हक्कांसाठी भीमराजा खपला, कधी अर्धपोटी तर कधी उपाशीही निजला. तरीही नाही डगमगला हे आपण सर्वांनीच लक्षात ठेवलं पाहिजे. आपल्यात एकोपा वाढला पाहिजे. याच आशयाच्या 'पशू पक्षी बरे' ह्या कवितेतून कवयित्री व्यक्त होते_

'जनावरं बरे, पक्षी बरे, एकोप्याने तरी राहतात

वाचा असून माणसं डिवऱ्या म्हशीवानी पाहतात'

आपल्यावर अन्याय झाला आणि आपल्यासमोर इतर कुणावरही अत्याचार होत असेल तर तशावेळी आपण बोललो पाहिजे. पशू, पक्षी हे परस्परांच्या मदतीला धावून जातात... आणि आपण फक्त व्हिडिओ काढतो, व्हायरल करतो, पळून जातो.

खरं म्हणजे, सन्मार्गाचा अवलंब करणं फार गरजेचं आहे. काय घ्यावं आणि काय घेऊ नये हे बऱ्याचदा कळत नाही. संत सेवालाल महाराज हे 'पांचपारा' मध्ये सांगतात, 'चोरी करो मत कोई, मुके प्राणीर काढो मत लोई, लुची लबाडी करो मत कोई, दारु मत पिवजो कोई, करजो मत रंडीबाजी.'

अर्थात, चोरी करू नका, मुक्या प्राण्यांचं रक्त काढू नका, लांडीलबाडी करू नका, दारू पिऊ नका आणि रंडीबाजी करू नका... ही अशी आचारसंहिता आपल्या आचरणात उतरविल्यास विजय संपादित करणं ही अशक्य श्रेणीतली गोष्ट असणार नाही. गौतम बुद्धांनी तर फार पूर्वीच अशा प्रकारचे प्रबोधन केलेलेच आहे. कवयित्रीसुद्धा 'मार्ग पंचशिलेचा' ह्या कवितेतून यावरच भर देताना दिसते _

'जीवनाला जरा सुख पाहिजे तर
पंचशील तत्वांचा मार्ग तू वर
शुद्ध काया वाचा असावी माणसा
उंचावेल तुझ्याही बुद्धीचा स्तर'

जातीवादाची उतरंड असलेला हा देश आहे. त्यातून श्रेष्ठ - कनिष्ठ असा जाणीवपूर्वक भेदभाव निर्माण केला गेला. अस्पृश्य ठरविल्या गेलेल्याचा स्पृश्याला हस्तस्पर्श झाला तरी वाटला जात होता. परंतु डॉ. बाबासाहेब आंबेडकरांनी संविधानाद्वारे परंपरेचा भाग झालेली जातीयता दूर केली. हे वास्तव कवयित्री विसरलेली नाही _

'विटाळ माणसाचा माणसाला होता

तीच मनुवृत्ती मातीत गाडली...!'

देशात जातीवादविरोधी कायदा अस्तित्वात असूनही त्याचं प्रामाणिकपणे पालन केलं जात नाही.....

जे कुठं केल्यासारखं वाटते तो एक दिखाव्याचा प्रकार असतो . कारण पूर्वव्यवस्था ही परंपरावाद्यांच्या नसानसांत भिनलेली आहे. माणसाच्या मनातली जात ही जाता जात नाही . एक दलित कवी म्हणतो,

'जुनाट इमला झाला सारा

पाडून टाका देऊन धक्का

आज इमारत जुनाट झाली

जीव अकारण मरतील खाली

म्हणून म्हणतो पाडून टाका

देऊन धक्का...!'

जुनाटच झालेली आहे जातीयवादाची इमारत. ती पाडणं हे गरजेचं आहे. आणि त्यावेळी तिच्याखाली अकारण जीवितहानी होण्याची अधिक भीती आहे. म्हणून तत्पूर्वीच, आपण ती नष्ट केली पाहिजे. 'जाळू जाती पाती' ह्या कवितेतून नेमकं यावरच मधुराणी बनसोडही बोट ठेवतात _

'अशा पेटवू वाती आणि मशाल घेऊ हाती

उठा गड्यांनो जाळू आता इथल्या जाती पाती.'

आपल्या पोटात कमालीची जातीयवादाची भावना आणि सोबतच देव.. देव हे समीकरण बरं वाटत नाही. आता आता तर मंदिरं उभारण्याला प्राधान्य देण्यात येत आहे. त्यासाठी करोडो रुपयांचा निधीही उपलब्ध केला जात आहे. मंदिरातले पुजारी मुख्यमंत्र्यांच्या पदापर्यंत पोहोचत आहेत. सरकारी शाळा बंद करण्याला महत्त्व दिलं जात आहे. खाजगीकरण द्रुतगतीनं पुढं पुढं सरकते आणि नोकऱ्या दुर्मीळ

झाल्या आहेत. त्या विरोधात कुणी आवाज काढला तर त्याला सरळ सरळ देशद्रोही ठरविलं जात आहे. मोठ्या संख्येत हक्कंचित लोक रस्त्यांवर जीवननिर्वाह करताना दिसतात. त्यांना राहायला घरं नाहीत... आणि दुसऱ्या बाजूला, मंदिरातल्या दगडांची प्रतिष्ठा वाढविण्यात येत आहे. यावर सागर जाधव म्हणतात,

' माझ्या देशात दगडाला छप्पर

हजारो मंदिरं, माणूस बेघर

माझ्या देशात नद्या अन् तळी

तहानेनं व्याकूळ रिकाम्या ओंजळी'

असं हे वास्तव असताना मंदिरातल्या दगडांना महत्त्व का दिलं जातंय? त्या दगडांवर तेल, तूप, दूध टाकावं का? हा असा अभिषेक? अकारण उपवास करावा का? ह्या अशा हानिकारक संस्कृतीला इथं कवयित्री नाकारून 'झुकलो नाही दगड धोंड्यापुढे' ह्या कवितेतून आपले मत व्यक्त करते ते अशाप्रकारे _

'पाषाणाच्या उंच उंच त्या इमारती

अन् त्यात नांदणारी ती पाषाण संस्कृती

आम्हांला ती कधीच मान्य नाही

आम्ही तिच्यामागे धावणारसुद्धा नाही'

तमाम वंचित, बहुजनांचे दिशादर्शक आणि पाठिराखे फुले, शाहू आणि आंबेडकर आहेत हे सर्वमान्य झालेलं आहे. त्यांनीच आपल्याला पारंपरिक काळोखातून बाहेर काढण्याचे प्रयत्न केलेले आहेत. त्यात आणखी एक नाव बनसोड यांनी जोडून एकप्रकारे कृतज्ञताच व्यक्त केलेली आहे,

'सांग तुझ्या काळजात कुणाचं रे नाव

शिव, शाहू, जोतिबा आणि भिमराव...'

भीमशक्ती आणि शिवशक्ती एकत्र आल्यास सत्ता आपल्या हातांत येऊ शकते; परंतु असे होऊ नये यासाठी व्यवस्थासमर्थक कार्य करत असतात हे नीट ओळखून पावलं टाकली पाहिजे.

रामायण आणि महाभारतातल्या व्यक्तिरेखा सातत्याने लोकांवर लादल्या जातात. त्यातल्या अनेक पात्रांवर धर्मांध आणि जात्यांध व्यवस्थेनं अन्याय केल्याचे दिसून येते. महाभारताचा खरा नायक कुंतीपुत्र कर्ण असेल, महानायिका द्रौपदी असेल किंवा रामायणातली सीता असेल, रावण असेल_ ह्या सर्वांवर जाणीवपूर्वक अन्याय केला असल्याचे दिसून येते. आणि आदर्श, आज्ञाधारी पुरुष म्हणून रामाला पुढं करण्यात आलंय. सीताहरण केलं म्हणून रावण दोषी, शिक्षा रावणाच्या बहिणीला हे ठीक आहे? तिचं नाक कापणं हे समर्थनीय आहे? रावण चिडला यामागे हे कारण नाही? तरीही त्याने सीता पळविल्यानंतर तिला हातसुद्धा लावला

नाही. तरीही तिच्या चारित्र्यावर संशय घेऊन रामानं तिला अग्नीपरीक्षेस प्रवृत्त केलं. मग प्रश्न उपस्थित होतो की, हा कसला आदर्श पुरुष? या दृष्टीनं 'रावण' ही कविता बोलकी आहे,

कळला नाहीच रावण माणसाला
निर्बुद्ध जाळतात दरसाल त्याला
घेतली त्याने कुणाची अग्नी परीक्षा
अन्याय करणारा खरा देव झाला!

आता काळ हा कूस बदलून पुढंपुढं सरकतोय. पूर्वी, व्यवस्था ही सक्रिय असूनही माणसात माणुसकीचं दर्शन व्हायचं. अनोळखी पाहुण्याचाही अनादर व्हायचा नाही. 'अतिथी देव भवते' ही संस्कृती नांदायची. ग. ल. ठोकळ यांचं एक जुनं जानपद खूप प्रसिद्ध आहे. एक प्रवासी प्रवास करत असताना एका गावात पोहोचला. रात्र झाली म्हणून तो रस्त्याच्या कडेला असलेल्या एका घरी गेला. त्याला आदरातिथ्याचा भाग म्हणून तिथं चहा- पाणी दिलं गेलं. जेवणाची व्यवस्था केली गेली. तदंतर त्याला विचारलं की, पाव्हणे, कुठल्या गावचे. तिथंच त्याला मुक्कामाला ठेवून घेतलं. तो पाहुणा सकाळी तिथून जेवण करून निघाला. तो पाहुणा नातेवाईक तर नव्हताच, ओळखीचाही नव्हता. तरीही त्याचं आदरातिथ्य केलं गेलं. त्याला राहण्या संदर्भात आग्रह केला गेला. तो म्हणतो, 'मला जावं लागेल.' तेव्हा पुढल्या वाटचालीसाठी घरमालक त्याला शुभेच्छा देतो _

'जात आहात तर
सुखानी जा...
बाध मोहरे तव वाटेवर...'

आताशा, शहरांसह गावखेडीही माणुसकीबाह्य होताना दिसताहेत. गावं आतून पोखरली जाताहेत. सूडभावना उन्मत्त झालेल्या आहेत. आता तर मोबाईलची नव संस्कृती माणसाला गुलाम करण्यात यशस्वी झालेली आहे. तिने माणसाच्या जगण्यातलं स्वातंत्र्यच हिरावून घेतलं आहे. त्याचाच हा असा परिणाम दिसून येतो _

'कितीही येवो लाट थंडीची
चूल हल्ली पेटत नाही
गावाकडे गेलं तरीही
गावं आपलं वाटत नाही'

अन्यायकारक असलेला पूर्वकाळ बदलला आणि म्हणूनच दिवसेंदिवस मुली मोठ्या प्रमाणात शिक्षण घेताना दिसताहेत. त्या मुंबई, पुणे अशा महानगरांमध्ये चांगल्या नोकऱ्या करताहेत. मुलींचं मेरिटमध्ये येण्याचं प्रमाणही वाढतच आहे. हे केवळ क्रांतीज्योती सावित्रीबाईंमुळे शक्य झालेलं आहे. याची जाण कवयित्रीला आहे _

'माय सावित्री तू फेऱ्या मारत बसली असती
तर आमच्या हातात ही लेखणी नसती'

गाडगेबाबांचेही कार्य हे महापुरुषांच्याच मालिकेतले आहे. त्यांनी आपल्या हातांत खराटा घेतला तो दिखावा वा फोटो काढण्यासाठी नाही. त्यांनी गावांची स्वतः स्वच्छता करून एक समाजाला मोठा संदेश दिला. त्याविषयी कवयित्री आपल्या 'आरं माणसांनो' ह्या कवितेतून म्हणते,

'सांगून गेले गाडगेबाबा मन मेंदू स्वच्छ करा रे
आरं माणसांनो, आधी माणूस व्हा रे...'

आजच्या काळात, संपूर्ण देशातलं राजकारण घाणेरडेपणात न्हाऊन निघत आहे. नेता हा नेता म्हणून अपात्रतेच्या जबड्यात अडकलाय. आदरणीय असं काही त्याच्यात आढळनासं झालंय. शिवाय ज्याच्या त्याच्या सर्वांगात वाऱ्यासारखी नेतेगिरी शिरलेली दिसतेय. वारा बेभान आणि नेतेगिरीही बेभान... अशा दोन बेभान गोष्टी एकत्र येऊन धावपळ करताना दिसताहेत. फार पूर्वी बा. सी. मर्ढेकरांनी लिहून ठेवलेलं आजघडीलाही अगदी ताजंताजं वाटते _

'जो जो उठे तो तो नेता, भारी लंब्या चवड्या बाता
पारी हुलंडीचा नियंता कोणी नाही'

कुठला नेता कुठल्या पक्षात, कुठला पक्ष चांगला हेच आजकाल नीट ओळखता येणं कठीण झालंय. पैशासाठी आणि ईडीच्या नव प्रकरणांमुळे कुणी कुठंही चाललंय. आणखीही अशोभनीय असं बरंच काही प्रत्यही दिसायला लागलंय. नैतिक मूल्यं ही अनैतिकतेच्या चिखलात फस्त चाललीत. राजकारणाची व्याख्याच बदलून गेली. अशा काहीशा मुद्यावर कवयित्रीने इथं हात घातला _

'पाखरांचा थवा बघून
हेवा मज वाटला
माणसाने का बरे हा
पक्ष वेगळा थाटला?'

एकूणच, आजचा माणूस हा माणूसपणाची पातळी सोडून वागायला लागलाय. माणूस आणि माणुसकीत कमालीचं अंतर वाढत चाललंय. त्याचं बोलणं तसं वागणं दिसत नाही आणि वागणं तसं बोलणं दिसत नाही. ह्या सर्वच्या सर्व गंभीर अशाच समस्या आहेत. तरीही त्यांचं समूळ उच्चाटन करायचं झालं तर एकच अचूक आणि परिणामकारक पर्याय आहे. तो म्हणजे, फक्त बाबासाहेब आंबेडकर!! त्यांची वैचारिक मूल्यं प्रत्यक्ष आचरणात आणली तरच प्रगतीच्या सर्व वाटा बंधमुक्त होऊ शकतात. माणसाला खऱ्या माणसाप्रमाणे जगता येऊ शकते. ह्या कवितासंग्रहाच्या निर्मितीमागे नेमका असाच काही उद्देश असावा असे वाटते. ह्या संग्रहात पुष्कळशा कविता नाट्यमय स्वभावाच्या आहेत. त्यात विविध अशा अलंकारांनाही स्थान देण्यात आलेलं आहे. आदिबंध, मार्क, रूपक, प्रतिभा आणि प्रतीकंही अधूनमधून डोकावताना दिसतात. थोडक्यात, अधिकच वापर झाल्याचे जाणवते. कवितेने गरुडभरारी घ्यावी असं कवयित्रीला वाटत असेल तर त्यासाठी तिला वाचन, चिंतन

- मनन आणि समृद्ध अशा साहित्यवाचनाचा आवाका वाढविण्याची अतिशय गरज आहे. केशवसुतांनी कवितेला आकाशातील वीज म्हटलेलं आहे. तिला धरायचं म्हटलं की ओघानंच होरपळणं आलं. होरपळून घ्यायची तयारी ठेवायची की नाही हे स्वतः कवयित्रीलाच ठरवावं लागेल.

तूर्तास एवढंच की, प्रस्तुत संग्रह हा पूर्णतः निष्फळ ठरेल असं वाटत नाही. त्यांच्या ह्या प्रयत्नास मनःपूर्वक शुभेच्छा!

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“विदर्भातील आदिवासी आंध्र जमात आणि त्यांच्या विधी, प्रथा, परंपरा”

प्रा.रघुनाथ विश्राम करवते

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प्रस्तावना :-

आदिवासी आंध्र जमात हि अति प्राचीन जमात आहे. म्हणूनच या जमातीला आदिम जमात सुद्धा म्हणतात. संपूर्ण भारतामध्ये ४९ आदिवासी जमाती आहेत. त्यापैकी महाराष्ट्रात ४७ जमाती आढळतात. त्यापैकीच आंध्र हि महत्वपूर्ण जमात मानली जाते. १ आंध्र जमातीचे वास्तव्य महाराष्ट्रात विदर्भ आणि मराठवाड्यातील काही जिल्ह्यांमध्ये दिसून येते.त्यामध्ये विदर्भात अकोला, वाशिम, बुलढाणा,यवतमाळ व मराठवाड्यात हिंगोली, नांदेड, परभणी या भागात आंध्र जमात अगदी डोंगर, दऱ्यात, माळावर, नदीकाठी वस्त्या करून राहते. त्यामुळेच हि जमात २१ व्या शतकात वावरतांनासुद्धा अतिशय मागास मानली जाते. त्याची विविध कारणे आहेत. त्यामध्ये प्रामुख्याने शिक्षांपासून वंचित राहले. विविध विधी, रूढी-परंपरांना जपून चालणारी जमात आणि नवीन बाबींचा स्वीकार करायला वेळ लावणारी जमात आहे. वेगवेगळ्या अनिष्ट प्रथांना बळी पडणारी जमात. त्यातच शासनाचे उदासीन धोरण तसेच जादूटोणा यावर फारमोठा विश्वास. अश्या विविध बाबी या जमातीला प्रगतीपासून मागे ठेवत आहेत. आदिवासी हा शब्दच आदीमता सूचित करतो. त्यानुसार मूळचे रहिवाशी म्हणजेच आदिवासी, यामध्ये महाराष्ट्रातील आदिवासी जमातीपैकी आंध्र ही एक प्रामुख्याने अकोला, बुलढाणा, वाशीम, यवतमाळ या चार जिल्ह्यात प्रामुख्याने आढळते.प्रा.राजेश धनजकर यांच्या मते आंध्र जमात सातवाहन कालीन मानली जाते. २ आंध्रप्रदेश या लगतच्या क्षेत्रातून येणाऱ्या तेलगूभाषिक लोकांचा आंध्र जमातीवर मोठा प्रभाव दिसून येतो. ही जमात अतिदूर्गम, डोंगरदऱ्यात अगदी प्राचीन काळापासून या जमातीच्या वस्त्या आढळून येत आहेत. आजही आंध्र जमात डोंगरदऱ्यात राहत असली तरी पूर्वीपेक्षा राहणीमानामध्ये बराच बदल झालेला दिसून येतो. तरीसुद्धा इतर लोकांच्या तुलनेत मात्र शिक्षण, आरोग्य, राहणीमान या बाबतीत मात्र फारसा विकास झालेला नाही.

आंध्र जमातीची सामाजिक पार्श्वभूमी :-

आंध्र आदिवासी समाज हा डोंगरदऱ्यात, जंगलात निसर्गाच्या सान्निध्यात राहणारा आहे .त्यांचे वस्तीस्थानाचे क्षेत्र इतर प्रगत समाजापासून दूर डोंगरदऱ्यात, जंगलात असल्याने त्यांच्यात कमालीचा मागासलेपणा आहे .आंध्र आदिवासी जमात ही समूहाने राहणारी जमात आंध्र आदिवासी ही समूहाने राहणारी जमात आहे. आणि एकजिनसीपणा हे या जमातीचे प्रमुख लक्षण आहे. कुठलेही सामाजिक कार्य एकोप्याने पार पाडतात.समान संस्कृती, समान धर्माचरण, समक सामाजिक नियमाने व एकाच प्रकारच्या भौगोलिक प्रदेशामुळे आंध्र जमातीच्या संपूर्ण आचार -विचारात एकजिनसीपणा दिसतो. प्राचीन काळापासून समूहाने राहणाऱ्या या जमातीने आपली पारंपारिक एकजूट अजूनही कायम ठेवली आहे. सण, उत्सव व समारंभ प्रसंगी हे लोक एकात्म भावनेने सर्व कामे पार पाडतात.हे या जमातीचे महत्वाचे वैशिष्ट्ये आहे. लबाडी आणि चोरी हे प्रकार या जमातीमध्ये मुळीच दिसत नाहीत. प्रामाणिकपणा, खरे बोलणे, आदर करणे, आपुलकी, इमानदारीने कोणतेही काम करणे व नको त्या गोष्टीचा आव न आणणे इत्यादी गुण या जमातीमध्ये पाहायला मिळतात. प्रामाणिकपणा हा आंध्र समाजाला वरदान आहे. तसा

भिन्नेपणा हा समाजाचा अभिशाप आहे. आंध्र समाजाचा माणूस परक्या माणसास घाबरत असे. त्यामुळे आंध्र आदिवासीवर संघटीत समाजाकडून अन्याय, अत्याचार होत गेले. आंध्र आदिवासी हे काटक आहेत. शिकार करतांना धाडस दाखवतात. तो अंधराला कचरत नाही. जंगली जनावरांना घाबरत नाहीत.तो हिंस्र पशुलाही ठार मारू शकतो.परंतु शहरी माणसाला भितो. कारण असंघटीतपणा एकजूटीचा अभाव आहे. त्यामुळे अन्यायाला बळी पडावे लागते. आंध्र आदिवासी स्पृश- अस्पृश्य पाळत नाहीत.

आंध्र जमातीचे कष्टमय जीवन :-

आदिवासी आंध्र जमातीचे जीवन हे कष्टमय आहे. घरात अन्न असेल तर त्यांच्या चुली पेटतात. निसर्गातील पालेभाज्या, फळे आणि शिकारीवर त्यांचे दिवस काढतात. पूर्वी पावसाळ्यामध्ये घरात साठवलेले धान्य संपत असे. याकरिता उन्हाळ्यात शिकारीतून आणलेले काही मटन वाळवून ठेवत व पावसाळ्यात आपल्या गर्जेनुसार त्याचा वापर करत असत. परंतु आज मात्र रोजगार मिळत असल्यामुळे तसे काही करावे लागत नाही. आंध्र जमातीचे लोक विविध कामे करतात. त्यांना कामाची अजिबात लाज नाही. हाताला मिळेल ते काम करतात आणि आपला उदरनिर्वाह भागवतात. श्रीमंत लोकांच्या सालाने, महिन्याने आजही आंध्र लोक राहत आहेत. गावात मोल मजुरी

करतात. गिट्टी खदान, व्रीट भट्टी, ऊसतोड, गुरे राखणे, शेळी पालन, असे विविध कामे करतात. एकवेळ उपाशी राहतील परंतु कुणापुढे हात पसरवत नाहीत. ही बाब या जमातीच्या **आंध जमातीचे राहिनिमान :-**

विदर्भातील आंध जमातीचे राहणीमान आताच्या दृष्टीकोनातून फार वेगळे होते. परंतु आता २१ व्या युगात वावरतांना मात्र आंध जमत आणि इतर जाती जमातीच्या मध्ये फारसा फरक जाणवत नाहीत. फरक तेवढाच आहे. आंध जमातीचे लोक हे अतिशय गरीब आहेत. कारण त्यांच्याकडे जमिनी खूप कमी आहेत. त्याचबरोबर त्यांना खूप व्यसन आहेत. त्यामुळे त्यांच्या परीस्तीत नुसार त्यांचे राहणीमान चांगलेच म्हणवे लागेल. इतर समाजात वावरतांना त्यांना कमी पणा वाटतो. कारण त्यांची परीस्तीती ही हलाखीची असल्यामुळे इतर जाती जमातीची बरोबरी करू शकत नाहीत.

पोशाख :-

विदर्भातील आंध जमातीचे लोकांचा पोशाख पूर्वी पेक्षा फार बदलेला आहे. पूर्वी पुरुष मंडळी कमरेला लुगी अंगात नागमणी बनियन व डोक्याला फेटा किंवा त्याला मुंडासे असे म्हणत. आणि महिला लुगळे, चोळी असा पेहराव राहायचा. आता मात्र त्यामध्ये खूप बदल झाला आहे. आज इतर लोकांच्या सानिध्यात आंध लोकांचा सहवास वाढत चाललेला आहे. त्यामुळे इतर जमाती प्रमाणेच शर्ट, पैजामा, डोक्याला पांढरा रुमाल आणि महीला साडी, ड्रेस वापरताना दिसत आहेत. काही भागात आजही आंध लोक दारिद्र्यामुळे आजही कपडे घालत नाहीत.

दागदागिने :-

आंध जमातीमध्ये आपापल्या ऐपतीप्रमाणे सोन्याची दागिने सुद्धा वापरात आहेत. पायात तोडे, कल्ल्या, अंगठयात बेले, करंगळीत मासोळीची अंगठी, तोरडया कानात व कुडया-कर्णफुलेही असायची. स्त्रियांच्या हातात बांगडीच्या मागेपुढे एक-एक कडे असतात. त्यालाच पाटल्या म्हणतात पायात बांदीचे कडे, तोरडया घालतात. आंध आदिवासी स्त्रियांना सोन्यापेक्षा चांदीचे दागिने जास्त आवडत, आता मात्र त्यामध्ये थोडाफार बदल दिसून येतो. तर पुरुष मंडळी हातात कडे, कमरेला साखळी, बोटात मुंदी व कानात बाळी हे दागिने घालत होते. परंतु आज यातील काही अलंकार कमी झालेत. विवाहित स्त्रिया हातावर नवऱ्याचे नाव, कपाळावर चाळयावर पिंपळाचे पान गालावर हनुवटीवर गोंदतात. एकूण आंध आदिवासीचे राहणीमान अगदी सरळसाधे असून पराकोटीच्या दारिद्र्यातही निसर्गाच्या सान्निध्यात आपले समाधानी जीवन व्यतीत करत आहेत. आज मात्र यामध्ये बराच बदल झालेला आहे. लोक मेहनती असल्यामुळे महिला सोन्याची दागिने वापरतांना दिसत आहेत.

आंध जमातीमधील व्यसनाधीनता :-

विदर्भातील आंध जमातीमध्ये मोठयाप्रमाणात व्यसनाधीनता दिसून येते. कारण या जमातीमध्ये अशिक्षित लोकांचे प्रमाण जास्त असल्यामुळे त्यांना चांगले वाईट या बाबींची फार माहिती नाही. त्यामुळे आणि खूप अंग मेहनतीची कामे करत असल्यामुळे त्यांना थकवा जाणवतो.

प्रा.रघुनाथ विश्राम करवते

बाबतीत खूप महत्वाची आहे. यावरून लक्षात येते कि आंध जमात फार मेहनती आणि कष्टाळू आहे.

त्यामुळे आंध लोकं व्यसनात फार गुंतलेले. दिसतात. त्यामध्ये दारू, तंबाखू, बिडी, सिगारेट, वरली मटका, जुगार, पत्ता, अशी विविध व्यसनं आंध जमातीमध्ये पाहायला मिळतात. परीस्तीती खूप गरीब असली तरीसुद्धा अशी व्यसने पळताना दिसतात.

आंध जमातीमधील जादूटोणा :-

आंध जमात शिक्षणापासून वंचित राहिली म्हणून त्यांना फार चांगले किंवा वाईट यातील फारसा फरक जाणवत नाही. लक्षात आलं तरी प्रथा, परंपरांनी आपलं जीवन व्यतीत केलं आहे. त्यामुळे त्यांना विविध देव-देवता, पुजा-अर्चा केल्याने प्रसन्न होतात असा समज आहे. तसेच देव, देवी अंगात येणे या गोष्टीवर त्यांचा फार विश्वास आहे. फार प्राचीन काळापासून आंध जमातीत जादूटोणा प्रसिद्ध आहे. याला विदर्भातील आंध जमात सुद्धा अपवाद नाही. यांचा जादू विद्येवर फार विश्वास आहे म्हणून अलौकिक शक्तीच्या सामर्थ्याविषयी या लोकांच्या मनात अजिबात शंका नाही. आजही या जमातीतील लोक जेव्हा आजारी पडतात. आजार लवकर बरा व्हावा याकरिता जी जादू वापरली जाते तिला पांढरी जादू म्हणतात.

पांढरी जादू :- जी जादू समाजाच्या हिताची मानली जाते ती पांढरी जादू यामध्ये कोणताही व्यक्ती आजारी असल्यास त्याला दवाखान्यात नेण्या अगोदर मांत्रिकाकडे नेले जाते. यामध्ये मग कोणताही आजार असो जसे ताप, खोकला, सटवी होणे, लहान बाळाला नजर लागणे, उलटया होणे, विंचू चावणे, साप चावणे अश्या विविध आजारावर उपाय म्हणून झाडपाला, वनौषधी व मंत्राचा वापर करून त्या आजारी व्यक्तीला औषधी, धागे दोरे, पेटी अंगठी अश्या वस्तू दिल्या जातात त्यामुळेच आजार बारा होतो असे त्यांचे म्हणणे आहे आणि विश्वास आहे. जादूमुळे निसर्गातील अनेक शक्तीवर विजय मिळविता येते. त्यावर निमंत्रण ठेवता येते. अर्थात हे करण्यासाठी कुठल्या ना कुठल्या देवतेचा सहारा घेणे आवश्यक आहे. हे काम करण्यासाठी त्या देवतेला संतुष्ट करणे आवश्यक असते. त्यासाठी भगत किंवा मांत्रिक खास स्वरूपाची साधना करावी लागते. कठोर तपश्चर्या करावी लागते असा आंधांचा विश्वास आहे.

काळी जादू :- ह्या दुसऱ्या प्रकारामध्ये जि जादू आहे ती समाजाच्या वाईट प्रवृत्ती मधून वापरली जाते. त्यामध्ये कारणी करणे, भानामती करणे, मुठ मारणे, कुसळी लावणे, विंचू चढवणे, अश्या प्रकारे या मध्ये कुणी आजारी पडला तर त्याला मांत्रिकाकडे नेले जाते त्यानंतर त्या व्यक्तीला समोर बसवले जाते नंतर त्या मांत्रिकाच्या अंगात देव, देवता येऊन झुलायला लागतो आणि स्वताशीच बडबड करतो, आणि देवाला विचारतो याचा आजार काय आहे. आणि मग तो त्या आजारी व्यक्तीच्या मनात भीती घालून देतो. आणि तुला कारणी, भानामती केली असे सांगून त्याला आपण सांगेल त्याप्रमाणे वागेल असे भाग पाडतो. असे करून त्याला सांगतो की आजार बरा व्हावा असे वाटत असेल तर तुला देवाच्या दरबारात सात आठवडे यावे लागेल, आणि साखर,

तेल, बदाम, काजू, शेंगदाणे अगरवत्ती, नारळ अश्याप्रकारचे समान सांगतो आणि त्याला देवाच्या नावाने लुटण्याचा प्रयत्न करतो. लोक सुद्धा विचार न करता सर्व काही करायला तयार होतात. शेवटच्या आठवड्यात त्या आजारी व्यक्तीकडून बोकड, कोंबडा कापायला सांगतात आणि आजार बरा होणार अशी ग्वाही देतात. अश्याप्रकारे जादू आतापर्यंत अस्तित्वात होती अस मानतात. एखाद्या व्यक्तीला दवाखाना करून जर तबियत बरी होत नसेल तर ते भानामती केली अस मानतात.

भानामती :- भानामती ही स्त्रीला केली जाते. भानामती करताना त्या स्त्रीच्या वस्त्रावरून किंवा डोक्याच्या केसावरून व पायाखालची माती घेऊन भानामती केली जाते. तेव्हा ती स्त्री लहरीत घुमते व मागचे पुढचे सर्व घडलेले सांगते. माहीत नसलेली भाषा बोलते स्वतःशीच बडबड करते. तिला अशी पिडा महिनोमहिने होत राहते. अमावस्या व पौर्णिमेला जास्त त्रास होतो.

मूठ मारणे :- आंध्र आदिवासी समाजामधील मूठ मारणे हा भयंकर प्रकार आहे. ज्या व्यक्तीस मूठ मारली जाते . त्या व्यक्तीस रक्ताच्या उलट्या होतात व तो एकाकी मरण पावतो. त्यांच्या थुकीने इतर व्यक्ती मरतात. आंध्र जमातीत असे जबर पक्के छा-छू वाले आहेत. त्यांनी आपला हात एखाद्याच्या डोक्यावरून फिरवला की लगेच त्या व्यक्तीचा मृत्यू होतो. तसेच ते आपल्या थुकीने समोरच्या व्यक्तीस मारतात अशी समजूत आहे.

चोट खेळणे :- आंध्र आदिवासी समाजात जादूवाली व्यक्ती आपल्याकडे व दुसऱ्याकडे किती जादू आहे हे आजमावण्यासाठी चोट खेळली जाते. एखादी वस्तू पडक्या विहिरीत टाकणे ती दुसऱ्याने जाऊन आणणे अशी विविध पद्धतीने चोट खेळली जाते. अशा प्रकारची विद्या पूर्वी होती. अलिकडे फारसे दिसून येत नाही.

कुसळी :- कुसळी करणारी व्यक्ती स्त्री व पुरुषी दोघेही असतात. कुसळी ही दुसऱ्याच्या घरचे धान्य आपल्या घरी आणते. शेतीतील खळ्याचे धान्याच्या राशीवर कुसळी लावता येते. कुसळी विद्या अवगत करावी लागते आणि त्याच विद्येच्या साहाय्याने दुसऱ्याच्या घरचे धान्य आपल्या घरी आणले जाते. कुसळी लावणाऱ्या व्यक्तीला ग्रहणाच्या दिवशी बरूची दोरी वळावी लागते. ही दोरी खळ्याला पुरेल एवढी वळली जाते. मांत्रिक त्या दोरीची व फणीची मंत्राच्या साहाय्याने पूजा करतो. दोरीतील मंत्राच्या सामर्थ्याने दुसऱ्याच्या खळ्यातील धान्य त्या व्यक्तीच्या खळ्यात येऊन पडते. अशी कुसळीची जादू असते.

गारा वळविणे :- निसर्गातील अनेक शक्तींवर जादूमुळे विजय मिळविता येते. त्यावर नियंत्रण ठेवता येते. आंध्र आदिवासी समाजातील काही वईद लोक आपल्या गावावर पडणाऱ्या गारा इतरत्र मंत्राच्या साहाय्याने वळवितात. अशी विद्या फक्त विशिष्ट व्यक्तीकडेच असते. गारामुळे येणारे संकट ती व्यक्ती दूर करते. निसर्गावरही नियंत्रण ठेवण्याच्या विद्या आंध्र आदिवासी समाजातील काही व्यक्तीकडे होती असे म्हणतात. परंतु ते शक्य वाटत नाही.

कर्णी करणे :- एखाद्या व्यक्तीला दुःख किंवा त्रास द्यायचा असल्यास कर्णी ही विविध प्रकारे केली जाते. त्या व्यक्तीच्या ताटात केस काढणे, ताटात शेण पाडणे, तोंडात केस घालणे, अंगावरचे वस्त्र जाळणे, घर जाळणे, घरचे कपडे जाळणे, एखाद्या विवाहीत तरुणांचे पौरुषत्व नष्ट करणे, हातापायातून वारा घालणे, पिसेपण लावणे, केगामती करणे, अन्नावरची वासना उडविणे, अशा अनेक प्रकारची कर्णी करतात. काही छा-छू वाल्याकडे अघोरी विद्या ही असते .हे लोक मारुतीला जेरबंद करतात. अघोरी विद्येने गावाकर मरीचा गाडा घालतात. मरीचा गाडा उलटा घातल्यावर गावात महामारी उत्पन्न होते. व लोकसाथीच्या रोगाला बळी पडतात .

वईद) :वैद्य :- आंध्र आदिवासीमध्ये ज्या व्यक्तीजवळ अघोरी जादू नष्ट करण्याची शक्ती असते त्यास वईद असे म्हणतात. वईदाची जादू गाड्याने मोजली जाते. अठरागाड्या, छत्तीस गाड्या अशी विद्या त्याच्याजवळ असते. ते बंगालच्या कालिका देवीची आराधना. साधना करतात. त्याबरोबर नवनाथ, मारोती, मसाई या देवीची सुद्धा विद्या प्राप्त करून घेतात. वईद अमावस्या पौर्णिमेच्या दिवशी साधन तयार करतात .मसान वट्यात जाऊन बाळंतीण स्त्री वारली असेल तर तिला तिसऱ्या दिवशी बाहेर काढून तिची विधिवत पूजा करतात. स्त्रीचे केस विंचरतात व मंत्राने तिला जागृत करतात. ही विद्या शिकणारी स्त्री असेल तर ती कार्तिक महिन्यात रात्री गावाबाहेरच्या देवदेवतांची पुजा करते. व त्यांना मंत्राने बांधते .असे सात दिवस करते. त्यानंतरच ती झाली. असे समजतात.

आंध्र जमातीमधील अंधश्रद्धा व समजूती :- आंध्र आदिवासी हे जंगल, डोंगरदऱ्यात राहतात. त्यांनी निसर्गाशी संबंधित हजारो वर्षांच्या जीवनानुभवातून अनेक श्रद्धा, अंधश्रद्धा निर्माण केल्या आहेत. बाळंतीणत स्त्री कधीही घुबडाला मातीचा ढेकूळ (खडा) फेकून मारत नाही. कारण तो खडा घुबड घेऊन जाते. त्यामुळे बाळंतिण तिच्या बाळाला सोबणी हा आजार होण्याची भीती असते. म्हणून बाळंतीण स्त्री घुबडाला खडा फेकून मारत नाहीत. शेतीच्या खळ्याच्या वेळी सकाळी चारच्या दरम्यान जर घुबड ओरडले तर धान्याचे माप केले जात होते. कारण धान्यात वाढ होते. अशी श्रद्धा आहे. रात्री घुबड ओरडणे अशुभ समजतात.

टावस पक्षी :- टावस या पक्षाला आंध्र आदिवासी लोक पवित्र समजतात. तो पक्षी ज्या झाडावर बसलेला असेल त्या झाडाला पाच वेढे घातले जातात. असे करणे शुभ व चांगले समजले जाते.

मुंगसाचे तोंड दिसणे शुभ :- कोणत्याही कामाला जाताना मुंगसाचे तोंड दिसणे शुभ समजले जाते.

हिवराच्या झाड अशुभ :- आंध्र लोक हिवराच्या झाडाला अशुभ समजतात त्याखाली जेवत व बसत नाहीत.

सूर्य, चंद्र ग्रहण :- गर्भवती स्त्रीला सूर्य, चंद्र ग्रहणाच्या वेळी काहीही काम करू देत नाहीत.

बैल तोरनाखाली न जाने :- पोळ्याच्या दिवशी बैल तोरणाखालून नाही गेला तर त्याला आजार जडतो असा एक समज या लोकात रूढ आहे.

कोल्ह्याने आवाज काढल्यास :- मळण चाल असताना कोल्ह्याने आवाज काढल्यास धान्याच्या राशीत वाढ होते अशी

व्यक्तीचा मृत्यू झाल्यावर :- एखाद्या व्यक्तीचा मृत्यू झाल्यावर त्याचे दफन केल्यानंतर त्या दिवशी रात्री देव्हान्यासमोर तव्यात राख पसरवली जाते. त्यावर टोपले झाकून खलबत्ता टोपल्यावर ठेवला जातो. सकाळी झाकलेले टोपले काढून त्या राखेचे निरीक्षण केले जाते. व पावलाच्या ठश्यावरून मृत व्यक्ती कशाच्या जन्माला गेली हे पाहिले जाते.

शिकार मिळाली नसेल :- आंध आदिवासी जमात ही शिकारी जमात आहे. हरण, रानडूकर, तितर, मेदड, ससा, रोही अशा प्राण्यांची शिकार करण्यात आंध आदिवासी लोक माहिर (कुशल) आहेत. परंतु एखाद्यावेळी शिकार मिळाली नसेल त्यावेळी ते सर्व एका झाडाखाली जमतात. प्रत्येकाच्या केसाची एकेक बट कापतात. ते केस सर्व एकत्र करून जाळतात व त्याचा धूर वाघूर या जाळ्याला देतात. कारण असे केल्याने शिकार मिळते अशी आंध आदिवासींची श्रद्धा आहे.

नाग-नागिनीचे फलन : नाग-नागिनीचे फलन चालू असताना त्यांच्यावर कोरा कपडा फेकला असता नंतर काही वेळाने तिथून नाग-नागीण निघून गेल्यावर तो कपडा घेऊन खळ्यावर धान्याच्या राशीवर झाकला असता धान्याची वाढ होते अशी समजूत आहे.

कुत्रा मोठयाने रडने:- कुत्रा अचानक घरासमोर येऊन मोठयाने रडत असेल तर काहीतरी अघटित घटना घडणार.

पाऊस येणार संकेत :- मुंग्या जमिनीतून मोठयाप्रमाणात बाहेर येऊ लागल्या तर पाऊस येणार असे काही नैसर्गिक संकेत आंध आदिवासी समाजात आहेत.

सगोन पाहणे:- सागोन पाहणे किंवा त्यालाच शकून पाहणे असे म्हणतात. अपशकून पाहतात व मानतात. एखादी व्यक्ती आजारी पडत असेल शकून पाहतात यातून करणी आहे की देवधर्माचे आहे याचाही शोध शकून पाहून लावतात. त्यालाच आंध आदिवासी सगोन पाहणे असे सुद्धा म्हणतात.

मूल पायाळू असेल :- एखादे मूल पायाळू म्हणून जन्माला आल्यास त्याला जमिनीतील धन दिसते असे आंध लोक मानतात. अशा मुलावर वीज पडण्याचीही भीती असते. म्हणून त्याच्या हातात, पायात कथलाचे पाच धातूचे वाळे घालतात. गुप्त धन काढण्यासाठी पायाळू माणसाला मांत्रिक लोक सोबत नेतात. त्या ठिकाणची पूजा केल्याने धन पायाळूला बोलते, वस्तू मागते, त्या वस्तू तेथे ठेवतात. कधी कधी धन कोंबडया, बकऱ्याचा बळी मागते ते दिले जाते. एवढे करून काहीही मिळत नाही ही केवळ अंधश्रद्धा आहे. अशा अनेक श्रद्धा, अंधश्रद्धा आंध जमातीत असल्याचे दिसून येतात. आजही त्यांनी टिकवून ठेवलेल्या दिसतात. अश्या वेगवेगळ्या समजुती आंध जमातीत आहेत. त्या कितपत

खऱ्या किंवा खोटया आहेत माहिती नाही परंतु आजही या जमातीत ह्यासर्व गोष्टी मानतात.

आंध आदिवासी जमातीतील विधी :-

विदर्भातील आंध जमातीमधील लोक मोठयाप्रमाणात विधी पार पडतात. अगदी जन्मापासून तर मृत्यू पर्यंत विविध विधी या जमातीत उत्साहात न चुकता पार पडतात. मग त्यांच्या परीस्तीती कितीही हलाकीची असो परंतु विधी न चुकता पार पाडले जातात. आंध जमातीत मुलगा, मुलगी असा भेदभाव अजिबात होत नाही. मुलगी जरी जन्माला आली तरी तेवढ्याच आनंदाने विधी पार पाडले जातात. आंध जमातीत प्रामुख्याने पुढील विधी पार पडले जातात. जन्म विधी, पाचवी, जावळ, नावकरी, लग्न विधी, शेती काम करण्याचा विधी, सण समारंभ विधी, पाऊस येत नसेल तर विधी, मृत्यू विधी असे विविध विधी आंध जमातीत मोठया उत्साहात पार पडले जातात.

जन्म विधी :- आंध जमातीत मुलगा, मुलगी असा भेदभाव अजिबात होत नाही. मुलगी जरी जन्माला आली तरी तेवढ्याच आनंदाने विधी पार पाडले जातात. आणि बाळंतपना नंतर विधी पार पडल्याशिवाय काम करायला जमत नाही. **पाचवी :-** बाळंतपना नंतर पाच दिवस झाले म्हणजे त्याला पाचवी असे म्हणतात. ती पुजल्या नंतर ती महिला घरभर फिरू शकते. **बारसे :-** बाळाला बारा दिवस झाले की विधी पार पाडला जातो. **जावळ :-** आंध जमातीत बाळाचे जावळ काढण्याचा विधी पार पडलाच जातो.

लग्न विधी :- आंध जमातीमध्ये लग्नाच्या माध्यमातून विईध विधी पार पाडले जातात. मागण्या जाणे, सुपारी फोडणे कुंकवाचा विधी, घाना काढणे, मांडव विधी, हळद फोडणे, देळणे,घट भरणे, हळद लावणे, दैवत मांडणे, न्हाणारा बनवणे, आहेरविधी, इवाई भेट, नवरदेव पूर्णा काढणे, लग्न विधी, पाठवण करणे. अश्या प्रकारे विधी पार पडतात.

निसर्गपूजा :- अनादी काळापासून आंध आदिवासी हा निसर्ग पूजक आहे. निसर्गातील गूढ व अनाकलनीय शक्तींना ईश्वर मानून त्या शक्तीचे मोठया आदराने स्तवन करतो. निसर्गाच्या कुशित निर्भेळ व निर्मळ जीवन जगणारा आदिवासी सभोवतालच्या डोंगर, दऱ्या, नदी-नाले, वृक्ष-वेली व पशुपक्ष्यांना इश्वराचे प्रतिरूप मानून त्यापुढे नतमस्तक होतो. या निसर्गाचे आपल्यावर फार मोठे उपकार आहेत. त्यांच्या कृपेनेच आपले जीवन सुरळीत व सुरक्षित आहे. म्हणून आपण त्या निसर्गाचे सदैव ऋणी राहिले पाहिजे. तेव्हा निसर्गशक्तीला संतुष्ट करण्यासाठी पशुपक्ष्यांचा बळी दिला जातो.

इशोर पूजाविधी :- उन्हाळ्यात शेवटच्या अमावस्येला सकाळी गावाजवळील नदी, ओढयाला दगड, मातीचा बांध घालतात. एका कोपऱ्यातून पाण्याला वाट देण्यात येते. तेथून ते पाणी वाहताना इशोरमधून जाते. (इशोर = मासे पकडण्याचे जाळीदार जाळे) त्यात मासे पकडतात. हा इशोर म्हणजे देव. त्याची पूजा केली जाते. आम्हाला पाऊस पडल्यानंतर भरपूर मासे मिळू दे. म्हणून त्याची प्रार्थना केली जाते.

धोंडीचा विधी :- एखाद्या वर्षी पाऊस पडला नाही किंवा पडण्याची शक्यता नाही. अशावेळी आंध आदिवासींचे मुले पाऊस यावा यासाठी धोंडीचा विधी पार पाडतात. बारा ते वीस या वयोगटातील मुले एकत्र जमतात. दोन नग्न मुलांच्या कमरेला लिंबाचे डहाळे बांधतात. त्यांच्या हातात लाकडी मुसळ देतात. मुसळाच्या दोन्ही टोकाला त्या दोन मुलांनी पकडलेले असते. त्या मुसळाच्या मध्यभागी उलटी बेंडकोळी लटकवलेली असते. बेंडकोळी उलटी टांगलेली असल्यामुळे ती ओरडते व पावसाला साद घालते. अशी विधीची संपूर्ण तयारी करून ती मुले प्रत्येक घराच्या समोर जाऊन धोंडीचे गीत गातात व नाचतात. गीत असे

- 1) धोंडी बाई धोंडी, धडणे दिवस, पाणी पतंग हिवस
धोंडी गेला शेतात, पाणी आले हातात. साळी डाळ पिको पायसा पायली को ४
- 2) “धोंड धोंड पाणी दे, साई मे पिकू दे.५
- ३) “ धोंडी धोंडी दिवसं पाणि मोठं हिवस, इस्कल बेन्डकी पाणि बोलाव” ६

पाणि गेल शेतांत, पिक आला हातात, इस्कल बेन्डकी पाणि बोलाव” असे गाणे झाल्यावर त्या घरची स्त्री मुलांच्या अंगावर थंड पाणी टाकते व मुसळाची व बेंडकोळीची पूजा करते. तसेच थोडे धान्य मुलांच्या झोळीत टाकते. ४/५ दिवस हा विधी चालतो. शेवटच्या दिवशी संध्याकाळी दाळभात किंवा गोडभात किंवा गावातील मोठ्या लोकानी सहभाग घेतला तर गाव पंगतच करतात. त्या ठिकाणी विधीची समाप्ती होते. आंध लोकांचा असा समज आहे कि त्याच दिवशी पाऊस येतोच आणि सुरुवात होते.

खळ्याचा विधी:- आंध आदिवासी लोक ज्वारीची कापणी करून कणसांचा एकत्र ठिकाणी ढिग रचतात. एके दिवशी त्या ठिकाणची जागा निर्मळ करून एक मेढ रोवून (तयार केलेली जागा हि गोलाकार असते त्याच्या मधोमध एक पळसाचे ओले लाकूड रोवतात) त्या मेढीची व जागेची पूजा करून खळे सुरू केले जाते. सर्व कणसे मळणे झाल्यावर त्या घाण्याची एकत्रपणे रास केली जाते. खळ्याच्या बाजूलाच एखाद्या झाडाखाली बाजूला देव असतो. प्रथम त्याची विधिवत पूजा केली जाते. त्याला कोंबड्याचा बळी देऊन नैवेद्य दाखविला जातो.

पावसाचा विधी :- पाऊस योग्य वेळी पडला नाही तर आंध आदिवासी स्त्रिया पाऊस पडावा यासाठी पाऊस येण्याचा विधी पार पाडतात. ज्या स्त्रिया घरी हा विधी करायचा आहे. संध्याकाळी त्या घरी पाच ते सात बायकांना बोलावले जाते. एका कळशीत पाणी भरून त्यात पाच रुचकिके पाने ठेवली जातात. आणि एक बेंडकोळी त्या कळशीत टाकली जाते. तसेच म्हशीच्या शेणाचा चेंडकोबा करून त्याच्या डोक्यावर हाराळी खोवली जाते. कळशीची व चेंडकोबाची पूजा करून एक काठोक (लाकडी परात) उबडी घालून त्यावर उभा चाटू धरला जातो. यावेळी जमलेल्या सर्व स्त्रिया त्या चाटूला पकडतात व तो चाटू इकडून तिकडे फिरवत पाऊस येण्याविषयीची गाणी म्हणतात.

फतेपुरीचा विधी :- आंध आदिवासी समाजातील फतेपुरीचा विधी हा श्रावण महिन्यातील पोळ्याच्या आदल्या दिवशी प्रा.रघुनाथ विश्राम करवते

असतो. हा धार्मिक विधी वाडी-वस्त्यातील गुरांना कोणत्याही प्रकारचा त्रास किंवा आजार येऊ नये म्हणून पार पाडतात. ही परंपरा आजही कायम आहे. या विधीसाठी लागणाऱ्या साहित्याच्या खरेदीसाठी पैसे वर्गणी गोळा केली जाते. आणि धान्य ही स्वीकारले जाते. जमलेल्या पैशातून गूळ, नारळ, गुलाल, उदबत्ती, कापूर यांसारख्या वस्तू घेऊन फतेपुरीच्या ठिकाणी जातात. पुजारी हा तूप, दही, मोहोळ मध व गुलाल या साहित्याने फतेपुरीची पूजा करतो. पुजेनंतर एका काठीला पांढऱ्या कापडाचे निशान बांधले जाते. सोबत आणलेल्या पिठाच्या पोळ्या करतात. आणि ते पोळ्या पेटलेल्या विस्तवाच्या इंगळावर भाजतात. यावेळी पहिली पोळी धुणीत टाकून इतर पोळ्यांचे तुकडे करतात. व ते तुकडे गुळाच्या पाण्यात सोडतात. अशा काल्याचा पहिला घास धुनिला टाकला जातो. त्यानंतर नारळ फोडून प्रसाद सर्वांना वाटतात. या विधीचे विशेष म्हणजे मुली व स्त्रियांना मुळीच प्रवेश नसतो. सावालीही चालत नाही कारण फतेपुरी या देवाला स्त्री ही वर्ज्य आहे. असे सांगतात. पोळ्याचे तुकडे व गुळाचे पाण्याचा काला एकत्र करून त्याचाच प्रसाद सर्वांना वाटला जातो. आगारी फिरवणूच प्रसादाचे सेवन केले जाते. प्रसाद शिल्लक राहिलातर गुरांना दिला जातो. धुणीतील राखेचा अंगारा आंध लोक घरी घेऊन जाऊन आपापल्या गोठ्यात टाकतात.

कापूस वेचणीचा विधी :- आंध आदिवासी लोक कापूस वेचणीला सुरू करण्यापूर्वी कापसाची विधिवत पूजा करतात. कापसाच्या रानात एका ओळीला थोडी जागा निर्मळ करून पाच दगड, पाच कापसाची बोंडे घेऊन त्याची पूजा करतात. कापसाच्या धाग्याचाच पाळणा करतात. पाळण्यासाठी बोडे ठेवतात. आणि छोट्या गाडग्यात दूध ठेऊन ते दूध उतूजाईपर्यंत तापवले जाते. दुध उतू गेल्यावरच नारळ फोडून प्रसाद वाटतात. त्यानंतर शेतात ताक व भात एकत्रित करून शेतात सर्वत्र फेकतात आणि नंतर कापूस वेचणीला सुरू करतात. हा विधी यवतमाळ जिल्ह्यात होताना दिसून येतो. हे केल्याने शेतातून कुसई कापूस घेऊन जाऊ शकत नाही आणि शेत आपल्याला बरकत देते असा समज आहे. आता बऱ्याच भागात कापूस पेरणीच बंद झालेली आहे. त्यामुळे हि प्रथा काही भागात कायम बंद झाली आहे.

बाऱ्या म्हणणे :- श्रावण महिन्यात किंवा नागपंचमी सणाला महादेवाची आराधना करण्याची हि पद्धत विदर्भातील आंध जमातीचे लोक करतात. नागपंचमीच्या सणाच्या दिवशी सकाळी महादेवाची लाह्या, फुटाने, कुंकू, तांदूळ टाकून पूजा करतात. त्यानंतर गावातील मंडळी महादेवाच्या मंदिराजवळ बाऱ्या म्हणण्याकरिता साहित्य जमवतात त्यामध्ये तांब्याच्या मोठ्या घागरी, त्यावर पितळीची ताट आणि तांब्याची कडे सर्व एका ठिकाणी ठेवतात. त्यानंतर त्याची पूजा व बाऱ्या म्हणणाऱ्या व्यक्तीची पूजा करतात. त्यानंतर महादेवाची विशिष्ट अशी गाणी म्हणतात व सोबतच डाव्या हाताने घागरीवर ठेवलेले ताट व उजव्या हाताने कडे त्या घागरीवर वाजवतात. अगदी ताला सुरात संध्याकाळ पर्यंत गाणी गातात. एकदा म्हणायला सुरुवात झाली की काहीही अडचणी आल्या तरीसुद्धा म्हणणे बंद

करत नाहीत, मग मुसळदार पाऊस आला तरीसुद्धा बाऱ्या बंद करत नाहीत पावसातच म्हणणे सुरूच राहते. त्यानंतर गावातील साप चावल्यावर औषधी देणारी काही मंडळी आहे. ते सर्वांची पूजा करून काकडी, गुळ, नारळ, खारीक, खोबरं, या सर्वांचा मिळून प्रसाद बनवतात. आणि सर्व गावभर घर घर वाटप करतात. यामाध्यमातून महादेव आपल्या गावावर प्रसन्न होतो आणि आपल्या गावावर कोणतीच रोगराई येणार नाही हा समज आंध्र जमातीच्या लोकांचा आहे.

मृत्यू किंवा अंत्यविधी :- विदर्भात आदिवासी आंध्र जमातीत अंत्यविधी करतांना लग्न झालेले स्त्री अथवा पुरुष असेल तर त्यांना जळतात. अन्यथा दफनविधी केला जातो. मोठी व्यक्ती असल्यास सावडन १० दिवसांनी करतात. अन्यथा ३ दिवसात सावडतात. तेरवी १३ दिवसांनी करतात. अश्या वेळेस गावातील तसेच सगे सोयरे सर्वांची मदत होते. राख नदी किंवा धरणात टाकतात. आणि सर्वांना जेवण दिले जाते.

आंध्र जमातीमधील प्रथा परंपरा व लोकसमजुती :-

विदर्भातील आंध्र जमातीमध्ये अनेक प्रकारच्या रूढी ,परंपरा आजही अस्तित्वात आहेत. त्यामध्ये बालविवाह, पोटाला कुंकू लावणे, पाळण्याला बाशिंग बांधणे, बाजेवर नवरदेव नवरी यांना हळद लावणे, वाळीत टाकणे, देवाचा शेंदूर काढणे, देवाच्या नावाने मुलं सोडणे, देवावर हात ठेवणे, मुलांच्या शपथ घेणे, बाळाला आजोबाचे नाव ठेवणे, अंगावर गोधून घेणे, विधवा स्त्रीने शुभ कार्यात न येणे, नवस कबुलने, दृष्ट काढणे, भूत बाधा विश्वास, विंचू उतरविणे, साप उतरविणे, कावीळ उतरविणे, पोट चिरणे, पाणि देणे, पेटी देणे, धागा उतरविणे, गुप्त धन पाहणे, धोंडी मागणे,

लोकसमजुती :- १) दरवाज्याची कडी वाजवू नये. २) केस चुलीत टाकू नये. ३) विस्तवावर थुंकू नये. ४) तळ हातावर मीठ देऊ नये. ५) घराच्या उंबरठ्यात शिंकू नये. ६) खरकटे पाणि चुलीत टाकू नये. ७) चुलीत पाणि टाकू नये. ८) उंबरठ्यावर उभे राहू नये. ९) स्मशानात भूत राहतात. १०) बुरुज,पिंपळाचे झाडावर भूत राहतात. ११) भुताचे पाय उलटे असतात. १२) अमावास्या, पौर्णिमेला भूत बाहेर निघतात. १३) पांढरा भात शेतात नेऊ नये. १४) अपघाताने मृत्यू झाल्यास त्याचे भूत होते. १५) कमरेत गाईचे चामडे कमरेत कर्दोळ्यात बांधल्यास भूतबाधा होत नाही. १६) देव देवताच कोप झाल्यास साथीचे रोग येतात. १७) लींबू ओलांडू नये. १८) घरावर कावळा ओरडत असेल तर पाहुणे येणार असे समजतात. १९) बेडूक मारल्यास मुले मुकी जन्माला येतात. २०) काळ्या चिमणीची राख मुलींच्या अंगावर टाकल्यास मुलगी वश होते.

समारोप :-

अश्याप्रकारे थोडक्यात विदर्भातील आंध्र आदिवासी जमातीच्या विधी, प्रथा, परंपरा, थोडक्यात मांडलेल्या आहेत. ज्यामध्ये आंध्र जमात पार्श्वभूमी,

लोकजीवन श्रद्धा, अंधश्रद्धा ,समजुती, चालीरीती, यांचा थोडक्यात अभ्यास केला आहे.

संदर्भ :-

1. डॉ. राजेश धनजकर - मराठवाड्यातील आंध्र जमातीचे लोकसाहित्य, अनुराधा पब्लिकेशन नांदेड प्रथम आवृत्ती सप्टे. २०१३ पृ. क्र. ०१
2. डॉ. राजेश धनजकर - मराठवाड्यातील आंध्र जमातीचे लोकसाहित्य, अनुराधा पब्लिकेशन नांदेड प्रथम आवृत्ती सप्टे. २०१३ पृ. क्र. ०२
3. प्रा. विश्वनाथ धुमाळ - आंध्र आदिवासी जमात- इतिहास व सांस्कृतिक वारसा, प्रथम आवृत्ती, वैभव प्रकाशन पुणे पृ. क्र. ४८.
4. डॉ. राजेश धनजकर - मराठवाड्यातील आंध्र जमातीचे लोकसाहित्य, अनुराधा पब्लिकेशन नांदेड प्रथम आवृत्ती सप्टे. २०१३ पृ. क्र. १६१
5. इतर माहिती हि पुढील व्यक्तींच्या मुलाखती घेण्यात आल्या, सीताराम करवते, वासुदेव नाईक, उकंडा करवते, लक्ष्मण करवते कोसगाव, कडूजी डाखोरे भीमराव लोखंडे , कवरदरी, गजानन ठाकरे चोंडी, समाधान नाईक धोधानी .
6. इतर माहिती संकलित केलेली आहे.



"वनहक्क कायदा 2006 च्या अनुषंगाने वनहक्कधारक नागरिकांना मिळालेल्या अधिकाराचे अध्ययन"

श्री सुरेश जे. भालेराव¹, डॉ. धर्मेन्द्र पु. तेलगोटे²

¹संशोधक, राज्यशास्त्र विभागप्रमुख, श्री गजानन महाराज महाविद्यालय

मुकुटवन, ता. झरी जामनी, जि. यवतमाळ,

²मार्गदर्शक, प्राचार्य, बाबासाहेब देशमुख पारवेकर, महाविद्यालय, पारवा, ता. घाटंजी, जि. यवतमाळ

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सारांश :-

जगामध्ये सर्वच देशात कमी अधिक प्रमाणात आदिवासी जमातींचे अस्तित्व आहे. भारतातही आदिवासी जमातींच्या लोकांची संख्या मोठ्या प्रमाणात आहेत. जगातील एकूण आदिवासी जमातींपैकी 23 टक्के आदिवासी लोक भारतामध्ये वास्तव्यात असून याची नोंद संयुक्त राष्ट्र संघात झालेली आहे. भारतामध्ये जवळपास 645 इतक्या आदिवासी जमाती आढळून येतात. प्राचीन काळापासून भारतातील आदिवासी लोकांचा जंगलाशी अतिशय जवळचा संबंध असून त्यांना आपल्या दैनंदिन उपजीविकेसाठी जंगलावर अवलंबून राहावे लागत आहे. परंतु ब्रिटिश काळापासून ते भारत स्वतंत्र झाल्यानंतर सुद्धा या आदिवासी समुदायावर, त्यांच्या वनविषयक हक्कांवर कायद्याने बंधने आणल्या गेली. भारत स्वतंत्र झाल्यानंतर अनेक कायदे करण्यात आले परंतु ते कायदे आदिवासी समुदायाचे पाहिजे त्या प्रमाणात संरक्षण करू शकले नाही.

वनाच्या उपयोगामुळे आदिवासींवर न्यायालयीन खटले दाखल केले गेले. यामुळे त्यांना वनातून आपली उपजीविका पूर्ण करण्यास अडचणी येऊ लागल्या. या अडचणी दूर करण्याकरता भारतामध्ये अनेक ठिकाणी लोक चळवळी व आंदोलने करण्यात आली. या सर्व परिस्थितीची दखल घेऊन केंद्र सरकारने पारंपरिक रित्या वनावर अवलंबून असणाऱ्या आदिवासी व इतर पारंपारिक वननिवासी वनहक्काची मान्यता अधिनियम 2006 म्हणजेच वनहक्क कायदा 2006 ला संसदेत पारित केल्यानंतर यावर राष्ट्रपतीची स्वाक्षरी होऊन 2007 ला अमलात आला. याचे नियम 1 जानेवारी 2008 पासून संपूर्ण भारतभर लागू करण्यात आले. या कायद्याने नागरिकांना दोन प्रकारचे अधिकार प्रदान केले. एक म्हणजे वैयक्तिक वनहक्क आणि दुसरा म्हणजे सामूहिक वनहक्क जो गाव समाजाला मिळाला आहे.

प्रमुख शब्द :- वनहक्क, कायदा, अनुसूचित जमाती, इतर पारंपारिक वननिवासी, आदिवासी, सामूहिक वनहक्क, वैयक्तिक वनहक्क, वनहक्कधारक नागरिक.

प्रस्तावना :-

भारताची जंगले शेकडो लाखो आदिवासी लोकांची वस्तीस्थाने आहेत. ज्यामध्ये लाखो आदिवासी जमाती व इतर पारंपारिक वननिवासी मोठ्या प्रमाणात राहतात. जगामध्ये सर्वच देशांत कमी अधिक प्रमाणात आदिवासी जमातींचे अस्तित्व आहे. विशेषतः आशिया खंड, आफ्रिका खंड आणि अमेरिका खंडामध्ये आजही मोठ्या प्रमाणावर आदिवासी जमाती राहतात. जगातील एकूण आदिवासी जमातींपैकी 23 टक्के आदिवासी लोक भारतामध्ये वास्तव्यास असून याची नोंद संयुक्त राष्ट्र संघात झालेली आहे. भारतामध्ये जवळपास 645 इतक्या आदिवासी जमाती आढळून येतात. या आदिवासी समूहांना अनुसूचित जमातीचा दर्जा देण्यात आला आहे. परंतु भारतीय

संविधानामध्ये जमातीची स्पष्ट अशी व्याख्या देण्यात आलेली नाही. मात्र देशाचे राष्ट्रपती आवश्यकतेनुसार आदिवासी जमाती किंवा त्या अंतर्गत काही गट किंवा समुदायाला अनुसूचित जमाती म्हणून जाहीर करू शकतात.

प्राचीन काळापासून भारतातील आदिवासी लोकांचा जंगलाशी अतिशय जवळचा संबंध असून त्यांना आपल्या दैनंदिन उपजीविकेसाठी जंगलावर अवलंबून राहावे लागत आहे. जंगल हे त्यांच्या गरजा भागवण्याचे महत्त्वाचे साधन आहे. परंतु ब्रिटिश काळापासून ते भारत स्वतंत्र झाल्यानंतर सुद्धा या आदिवासी समुदायावर, त्यांच्या वनविषयक हक्कांवर कायद्याने बंधने आणल्या गेली. भारत स्वतंत्र झाल्यानंतर अनेक कायदे करण्यात आले. परंतु ते कायदे आदिवासी समुदायाचे पाहिजे त्या प्रमाणात संरक्षण करू शकले नाही.

ब्रिटिश काळापासूनच आदिवासी समुदायावर ऐतिहासिक अन्याय झाल्याचे दिसून येते. यामुळे आदिवासी समाजाची स्थिती अधिकच बिकट होत गेली. वनांच्या उपयोगामुळे आदिवासींवर न्यायालयीन खटले दाखल केले गेले. त्यामुळे पिढ्यान् पिढ्या त्यांचे वनात असलेले अस्तित्व आणि गौण वन उत्पादनावर असलेल्या त्यांच्या उपजीविकेवर कायद्याने बंधने आणली.

वनासंबंधी संरक्षणार्थ असलेल्या कायद्यामुळे पारंपरिक स्वरूपात वनावर अवलंबून असणारे आदिवासी व इतर पारंपारिक वननिवासी समुदायावर एक प्रकारची कायदेशीर बंधनी येऊ लागली. त्यांना वनातून आपली उपजीविका पूर्ण करण्यासाठी अडचणी येऊ लागल्या. या सर्व अडचणी दूर करून वनातून गौण वणउपज गोळा करून उपजीविका पूर्ण करता यावी याकरता भारतामध्ये अनेक ठिकाणी लोक चळवळी झाल्या व अनेक ठिकाणी आंदोलने करण्यात आली. या सर्व परिस्थितीची दखल घेऊन केंद्र शासनाने पारंपरिकरित्या वनावर अवलंबून असणाऱ्या आदिवासी व इतर पारंपारिक वननिवासी वनहक्काची मान्यता अधिनियम 2006 म्हणजेच वनहक्क कायदा 18 डिसेंबर 2006 रोजी संसदेत पारित केला. 29 डिसेंबर 2006 रोजी माननीय राष्ट्रपतींची यावर स्वाक्षरी होऊन 31 डिसेंबर 2007 रोजी हा कायदा अमलात आला. याचे नियम 1 जानेवारी 2008 पासून लागू झाले आणि या कायद्याची अंमलबजावणी झाली. यातील अंमलबजावणी दरम्यान येणाऱ्या अडचणी दूर करण्यासाठी सप्टेंबर 2012 मध्ये 2008 साली लागू करण्यात आलेल्या नियमात काहीसा बदल करून 2012 मध्ये सुधारित नियम लागू झाले. वनहक्क कायद्याने नागरिकांना दोन प्रकारचे अधिकार प्रदान करण्यात आले. एक म्हणजे वैयक्तिक वनहक्क आणि दुसरा म्हणजे सामूहिक वनहक्क.

वनहक्क कायदा निर्मिती मागील उद्देश :-

वनहक्क कायदा निर्मिती मागील उद्देश खालील प्रमाणे आहे.

- 1) अनुसूचित जमाती व इतर पारंपारिक वननिवासी जे आपल्या खऱ्याखऱ्या गरजांसाठी वनावर किंवा वन जमिनीवर अवलंबून आहे अशा वननिवासी समूहांवरील ऐतिहासिक अन्याय दूर करणे.
- 2) वनहक्कांना कायदेशीर मान्यता देण्याबरोबरच वनातील जैवविविधता संरक्षणासंबंधी वनहक्कधारक नागरिकांमध्ये त्यांच्या कर्तव्याची जाणीव निर्माण करणे.
- 3) सामूहिक वनहक्क प्राप्त ग्रामसभेमार्फत लोकसहभाग व विविध शासकीय विभागाचे लाभ आणि योजनांना एककेंद्री करून सामूहिक वनहक्काचे व वनाचे संरक्षण, संवर्धन, त्याचा वापर, त्याचे पुनर्निर्माण व वनव्यवस्थापन करणे.
- 4) गावाच्या विकासाच्या दृष्टीने सार्वजनिक प्रयोजनाकरता एक हेक्टर पर्यंत वन जमीन उपलब्ध करून देणे.

श्री सुरेश जे. भालेराव, डॉ. धर्मेंद्र पु. तेलगोटे

वनहक्क कायद्याने वनहक्कधारक नागरिकांना प्रदान केलेले अधिकार :-

वनहक्क कायद्यातील कलम 3 नुसार वनहक्कधारक नागरिकांना वैयक्तिक स्वरूपाचे किंवा गावातील सर्व नागरिकांना सामूहिक वनहक्क अशा दोन्ही प्रकारचे अधिकार प्राप्त झाले आहे ते पुढील प्रमाणे आहे.

- 1) वनामध्ये राहणाऱ्या अनुसूचित जमातीच्या किंवा इतर पारंपारिक वननिवासी व्यक्तीने किंवा व्यक्तींनी वस्तीस्थानासाठी किंवा उपजीविकेकरता वैयक्तिक किंवा सामूहिक भोगवट्या खालील वनजमीन प्राप्त करण्याचा व त्यामध्ये निवास करण्याचा अधिकार वनहक्क धारक नागरिकांना किंवा गाव समाजाला मिळाला आहे.
- 2) पूर्वीचे संस्थानिक किंवा जमीनदार यांच्या काळात वापरले जाणारे वनाधिकार, जे कोणत्याही नावाने ओळखल्या जाणारी निस्तार सारखे हक्क किंवा अधिकार असतील ते अधिकार वनहक्क धारक नागरिकांना किंवा गाव समाजाला प्राप्त झाले आहे.
- 3) पारंपारिक स्वरूपात गावाच्या सीमांतर्गत किंवा सीमे बाहेरील वनांमधील अकाष्ठ (इमारती लाकूड वगळता) वनउपज संकलन करण्याचा, ते वापरण्याचा व त्या वनउपजाची विक्री करण्याचा अधिकार वनहक्क धारक नागरिकांना किंवा गाव समाजाला मिळाला आहे.
- 4) पाण्यामधील मत्स्य उत्पादन व इतर उत्पादन करण्याचा व त्याचा वापर करण्याचा अधिकार तसेच गुरेचरई करण्याचा अधिकार आणि भटक्या किंवा धनगर समाजाच्या पारंपरिकरित्या हंगामी साधने मिळविण्याचा अधिकार इतर समाजाला मिळाला आहे.
- 5) आदिम जमाती समूह आणि कृषी पूर्व समूहाच्या निवासाचे व निवासस्थानाचे सामाजिक धारणाधिकाराचा अधिकार वनहक्क धारक नागरिकांना किंवा गाव समाजाला मिळाला आहे.
- 6) ज्या दाव्यावर वाद विवाद होतात अशा कोणत्याही राज्यांमधील कोणत्याही नावाने ओळखले जाणारे विवादास्पद जमिनी संदर्भातील अधिकार वनहक्कधारक नागरिकांना मिळतील.
- 7) वनजमिनी संदर्भातील पट्टा किंवा भाडेपट्टा किंवा अनुदान या सर्वांचे मालकी हक्कांमध्ये रूपांतर करण्याकरता कोणत्याही स्थानिक प्राधिकरणाने किंवा राज्यशासनाने दिलेले अधिकार त्यांना प्राप्त झाले आहे.
- 8) सर्व वनगावांचे जुने वस्तीस्थाने व ज्या गावांची भूमापन झाले नाही त्या गावांमध्ये वसाहत करण्याचा व त्या गावांचे रूपांतर महसुली गावांमध्ये करण्याचा अधिकार वनहक्कधारक नागरिकांना मिळाला आहे.
- 9) निरंतर उपयोग करण्यासाठी पारंपारिकरित्या संरक्षण व संवर्धन करण्यात आलेल्या कोणत्याही सामाजिक वनसंसाधनाचे संरक्षण करण्याचा, पुनर्निर्माण करण्याचा,

संवर्धन किंवा वनव्यवस्थापन करण्याचा अधिकार वनहक्क धारक नागरिकांना किंवा गाव समाजाला मिळाला आहे.

10) कोणतेही राज्य शासन कायदानुसार किंवा जिल्हा स्वायत्त संस्थेच्या कायदाने मान्यता दिलेले अधिकार किंवा कोणत्याही राज्याच्या रूढीगत कायदानुसार आदिवासी समूहाचे हक्क म्हणून स्वीकारलेले अधिकार वनहक्क धारकांना प्राप्त झाले आहे.

11) जैवविविधतेचा उपयोग करण्याचा अधिकार, त्यासोबतच जैविक व सांस्कृतिक विविधतेशी संबंधित असणाऱ्या समुदायाच्या पारंपारिक ज्ञान व बौद्धिक संपदेचा अधिकार वनहक्कधारक नागरिकांना किंवा गाव समाजाला मिळाला आहे.

12) वर नमूद केल्याप्रमाणे परंतु वननिवासी अनुसूचित जमाती किंवा यथास्थिती इतर पारंपारिक वननिवासी यांचे कडून उपभोगण्यात येत असलेले अधिकार, शिकार करण्याचा किंवा जाळ्यात पकडणे किंवा वन्य प्राण्यांच्या एखाद्या प्रजातीचा भाग कापून घेणे या रूढीगत अधिकारांखेरीज इतर पारंपारिक स्वरूपाचे अधिकार वनहक्क धारक नागरिकांना असतील.

13) ज्या ठिकाणी अनुसूचित जमाती व इतर पारंपारिक वननिवासी यांना 13 डिसेंबर 2005 पूर्वी त्यांचा कायदेशीर अधिकार डावलून कोणत्याही स्वरूपाच्या वन जमिनीतून बेकायदेशीर रित्या निष्काशित किंवा विस्थापित करण्यात आले असेल तर त्या लोकांचे पर्यायी जमिनीसह मूळ रूपात पुनर्वसन करण्याचा अधिकार वनहक्क धारकांना मिळाला आहे.

14) सामूहिक वनसंसाधनाचा अधिकार हा अतिशय क्रांतिकारक व महत्त्वपूर्ण हक्क आदिवासी समुदायाला मिळाला आहे. या अधिकारानुसार कलम 3 (1) नुसार पारंपारिकरित्या त्यांच्या सामूहिक जंगलाचे संरक्षण करण्याचा, वनाचे व्यवस्थापन करण्याचा, संवर्धन व पुनर्निर्माण करण्यासाठी आराखडे तयार करण्याचा अधिकार वन हक्क धारक नागरिकांना किंवा ग्रामसभेला मिळाला आहे.

15) वन हक्क कायद्याच्या 3 (2) नुसार गाव विकासाच्या सुविधांसाठी एक हेक्टर पर्यंत वन जमीन मिळविण्याचा अधिकार मिळाला आहे. यामध्ये शाळा, दवाखाना, रेशन दुकान, टेलिफोन, विजेच्या तारा, पाण्याची टाकी, पानवटे, पिण्याची पाईपलाईन, पावसाच पाणी साठवन व्यवस्था, अंगणवाडी, रस्ते, समाजभवन, गोदाम, शीतगृहे,

स्मशानभूमी इत्यादी गावविकासाचे काम करण्याचा अधिकार नागरिकांना किंवा ग्रामसभेला मिळाला आहे.

निष्कर्ष -

वनहक्क कायदा लागू होऊन पंधरा वर्षांपेक्षा अधिक कालावधी झाला आहे. परंतु या कायद्याची अंमलबजावणी होऊन आदिवासी समुहावर होत असलेल अन्याय दूर झाला किंवा नाही असा महत्त्वपूर्ण प्रश्न निर्माण होतो. कारण शासनाने अनुसूचित जमाती व इतर पारंपारिक वननिवासीकरिता वनहक्क कायद्याच्या माध्यमातून अनेक अधिकार दिल्याचे दिसते. परंतु या कायद्याची अंमलबजावणी करत असताना अनेक समस्या निर्माण होताना दिसते. यामध्ये लोकांमध्ये असलेले कायद्याविषयी अज्ञान, लोकसहभागाचा अभाव, शासकीय यंत्रणेची उदासीनता, लोकांची वैयक्तिक उदासीनता अशा अनेक समस्या निर्माण झाल्यामुळे लोकांना कायदाने अधिकार मिळूनही त्यांना त्याचा थेट फायदा होताना दिसून येत नाही. खऱ्या अर्थाने जर आदिवासी समाजावरचा ऐतिहासिक अन्याय दूर करायचा असेल आणि त्यांना दिलेल्या वनहक्काची योग्य अंमलबजावणी करायची असेल तर शासनाने कायद्याविषयी जास्तीत जास्त जनजागृती करून लोकसहभाग वाढविणे आवश्यक आहे. तरच या कायद्याचा आदिवासी समाजाला व इतर पारंपारिक वन निवासी नागरिकांना मिळालेल्या वनहक्काचा फायदा होऊन त्यांच्या विकासाला गती मिळेल.

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भाषा और समाज, हिंदी भाषा पर प्रौद्योगिकी का प्रभाव

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सारांश :-

मेरी भाषा में तोते भी राम राम जब कहते हैं,
मेरे रोम रोम में मानो सुधा-स्रोत तब बहते हैं ।
सब कुछ छूट जाय मैं अपनी भाषा कभी न छोड़ूंगा,
वह मेरी माता है उससे नाता कैसे तोड़ूंगा ॥

मैथिलीशरण गुप्त

भाषिक और सांस्कृतिक रूप से विभाजित विश्व के विभिन्न देशों में सामाजिक, आर्थिक एवं सांस्कृतिक विकास में आनेवाली अनेकानेक व्यावहारिक बाधाओं में भाषा की समस्या एक महत्वपूर्ण एवं ज्वलन्त समस्या है। भारत जैसे विविधता प्रधान देश में यह समस्या अपनी चरम सीमा पर है। विश्वभर में नित नई प्रौद्योगिकी का विकास हो रहा है। एक देश दूसरे देश के साथ प्रौद्योगिकी का आदान प्रदान कर रहा है। ऐसे में प्रौद्योगिकी को समझने के लिए जरूरी है कि वह उस भाषा में हो जिसे देश के सबसे अधिक लोग बोलते व समझते हों। हम रोज ऐसी काफी चीजे देखते है जो पहले अंग्रेजी में होती थी और अब उनमें हिंदी शामिल होने लगी। हिंदी को शामिल करना इनके लिए कोई मजबूरी नहीं है बल्कि आवश्यक है। भारत की आधी से ज्यादा आबादी हिंदी को अच्छे से समझती तथा बोलती है। इनके लिए अंग्रेजी के मुकाबले हिंदी में संवाद करना काफी आसान होता है। आज की प्रौद्योगिकी ने हिंदी को हमारे जीवन का महत्वपूर्ण अंग बनाने में मदद की है। हिंदी अब वैसी नहीं रही जैसी पहले थी। अब हिंदी की परिभाषा और रूपरेखा में बदलाव आया है।

मुख्य शब्द: भाषा, समाज, हिंदी भाषा, प्रौद्योगिकी, प्रौद्योगिकी का प्रभाव आदि।

प्रस्तावना:

भाषा ही वह दिव्य ज्योति है, जो सम्पूर्ण संसार को एकसूत्र में बाँधने की शक्ति रखती है। जो परस्पर एक दूसरे से सम्बन्ध स्थापित करती है। भाषा रूपी दिव्य ज्योति से अज्ञान रूपी अंधकार को दूर किया जाता है। भाषा को परिभाषित करते हुए भोलानाथ तिवारी जी इस प्रकार कहते हैं – “भाषा उच्चारण अवयवों से उच्चरित मूलतः प्रायः यादृच्छिक ध्वनि प्रतीकों की वह व्यवस्था है, जिसके द्वारा किसी भाषा-समाज के लोग आपस में विचारों का आदान-प्रदान करते हैं।” अर्थात् भाषा के अंतर्गत ऐसे ध्वनिप्रतीकों का पूर्ण योग आता है, जिनके द्वारा हम अपने विचारों को व्यक्त कर सकते हैं।

व्यक्ति समाज की सबसे छोटी इकाई है। व्यक्ति और समाज एक दूसरे के अभिन्न अंग हैं। डॉ.धर्मराज सिंह समाज को इस प्रकार परिभाषित करते हैं-“व्यक्ति की सामूहिक इकाई ही

समाज है।” अर्थात् मनुष्य सामाजिक प्राणी है। समाज व्यक्तियों से बनता है। मानव के विकास-क्रम में समाज की स्थापना हुई है। भाषा सामाजिक व्यवहार का एक साधन है जिसके द्वारा मनुष्य दूसरों से संपर्क, सहयोग आदि बनाए रखता है। भाषा तथा समाज का अटूट सम्बन्ध है। अतः भाषा समाज की वस्तु हैं।

है राष्ट्रभाषा भी अभी तक देश में कोई नहीं, निज विचार जान सके जिससे परस्पर सब कहीं।

इस योग्य हिन्दी है तदपि अब तक न निज पद पा सकी,

भाषा बिना भावैकता अब तक न हममें आ सकी? ॥

हिन्दी भाषा के लिए मैथिली शरण गुप्त जी की ये पंक्तियाँ स्मरणीय है। हिन्दी समन्वय और एकता की भाषा है। हिन्दी, अपनी सरलता, सहजता और व्यापक भाषिक समृद्धि के कारण सदियों से जनमानस की भाषा रही है। नई राष्ट्रीय शिक्षा नीति 2020 में भारतीय भाषाओं पर जोर दिया

गया है। भारतीय भाषाओं के विकास से ही हिन्दी भाषा का भी विकास होगा। हिन्दी भाषा के मजबूतीकरण के लिए हिन्दी भाषा को व्यापार और अन्तर्राष्ट्रीय संवाद की भाषा बनानी होगी। जैसे हमारे माननीय प्रधान मंत्री श्री नरेंद्र मोदी जी हिन्दी भाषा को सम्मान देते हैं। नई शिक्षा नीति मुख्यतः कौशल विकास और रोजगार निर्माण को बढ़ावा दे रही है। वर्तमान समाज में प्रौद्योगिकी और मानव जीवन एक दूसरे के पूरक बन गए हैं। प्रौद्योगिकी ने, वैज्ञानिक ज्ञान के नवाचार, आविष्कार और अनुप्रयोग के साथ-साथ मानव जीवन, समाज, व्यापार जगत, शिक्षा, भाषा, स्वास्थ्य, मनोरंजन, पर्यावरण, संचार और परिवहन आदि अनेक क्षेत्रों को प्रभावित कर मानव जीवन को आसान और आरामदायक बना दिया है। जिस के कारण मानव जीवन में प्रौद्योगिकी की मांग दिन ब दिन बढ़ती जा रही है।

Review of Literature:

प्रौद्योगिकी हिंदी भाषा को भी हमारे जीवन का महत्वपूर्ण हिस्सा बनाने में मदद कर रही है। जिस के फलस्वरूप हिंदी का व्यवहार-क्षेत्र धीरे-धीरे बढ़ता चला जा रहा है। आज डेढ़ सौ से भी अधिक भारतेतर विश्वविद्यालयों में हिन्दी-अध्ययन तथा शोध-कार्य चल रहा है। विदेशों में बसे भारतवंशी एवम् अप्रवासी भारतीय हिंदी का अध्ययन अपनी सांस्कृतिक अस्मिता को अक्षुण्ण बनाए रखने के लिए कर रहे हैं तो विदेशी नागरिक हिंदी-अध्ययन में इसलिए लगे हैं कि इसके माध्यम से भारत की सांस्कृतिक संपदा को आत्मसात करने के साथ-साथ समकालीन भारत का प्रामाणिक ज्ञान प्राप्त किया जा सके। यह प्रौद्योगिकी के कारण ही संभव हो पा रहा है। इस संदर्भ में डॉ जगदीश व्योम जी की कविता की पंक्तियाँ उद्धृत हैं -

माँ भारती के भाल का शृंगार है हिंदी, हिंदोस्ताँ के बाग की बहार है हिंदी

घुट्टी के साथ घोल के माँ ने पिलाई थी, स्वर फूट पड़ रहा, वही मल्हार है हिंदी

तुलसी, कबीर, सूर औ' रसखान के लिए, ब्रह्मा के कमंडल से वही धार है हिंदी।

आज विदेशों से हिंदी की अनेक पत्रिकाएँ प्रकाशित हो रही हैं। अमेरिका, चीन, नार्वे तथा जापान से क्रमशः प्रकाशित 'विश्व-विवेक', 'चीन सचित्र', 'शांतिदूत' तथा 'जापान भारती' आदि उल्लिखित पत्रिकाएँ, अपनी वैविध्यपूर्ण सामग्री, सुरुचिपूर्ण साज-सज्जा तथा शुद्ध मुद्रण के क्षेत्र में भारत से प्रकाशित हिंदी-पत्रिकाओं से कम नहीं हैं। इनकी प्रसार-संख्या भी लगातार बढ़ रही है। कोरोना काल के पश्चात विदेशों में छपने वाली कई पत्र-पत्रिकाएँ ई-किताबों का रूपधारण कर चुकी हैं और विश्वभर के पाठकगण इन्हें आनलाईन पढ़ भी रहे हैं। जिनमें सिंगापुर से निकलने वाली सिंगापुर संगम त्रैमासिक पत्रिका उल्लेखनीय है।

हिंदी फिल्में भी आज सारे संसार में लोकप्रिय हैं। कहीं वे अपने मूल रूप में तो कहीं भाषांतरित रूप में दिखलाई जा रही हैं।

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लेखन, श्रव्य एवं मौखिक आदि भाषई कौशल को युवाओं में विकसित करने के लिए साउन्ड इंजीनरस और फोनिटीसिअन्स मिलकर एक नया एप बनाने की दिशा में कार्य कर रहे हैं। युवाओं में भाषा और संप्रेषण, हिंदी व्याकरण और संप्रेषण, कार्यालय हिंदी, अनुवाद विज्ञान, संभाषण कला, भाषा कंप्यूटिंग, रंग आलेख रंगमंच, चलचित्र लेखन, समाचार संकलन और लेखन, विज्ञापन लेखन, रचनात्मक लेखन, साहित्य और हिंदी सिनेमा, दृश्य श्रव्य माध्यम लेखन, कोष विज्ञान एवं पारिभाषिक शब्दावली, कला और साहित्य, संगीत एवं साहित्य, संपादन प्रक्रिया और साज सज्जा, सृजनात्मक लेखन की विविध क्षेत्र, हिंदी की संस्कृतिक पत्रकारिता, पटकथा लेखन, फिल्म समीक्षा, ब्लॉग लेखन, समाचार लेखन, संवाद लेखन, पुस्तक प्रकाशन, मीडिया लेखन और समाज माध्यम लेखन, फीचर लेखन, इंटरनेट पत्रकारिता, आदि अनेको क्षेत्र में कौशल विकसित करने में भी प्रौद्योगिकी का महत्वपूर्ण योगदान है। विज्ञापन के क्षेत्र में दूरदर्शन, रेडियो तथा समाचारपत्र इन तीनों माध्यमों की महत्वपूर्ण भूमिका है। बाजारीकरण, निजीकरण, जागतिकीकरण एवं तंत्रज्ञान के कारण विश्वस्तर से लेकर स्थानिय स्तर तक यातायात, राजनीति, व्यापार, मनोरंजन, बैंक, बीमा, निर्माण, सेवा प्रशासन आदि क्षेत्र में विज्ञापन की व्याप्ति है विज्ञापन के इस व्याप्ति के कारण विज्ञापन एक स्वतंत्र व्यापार का क्षेत्र बन गया है।

जनसंचार माध्यमों में समाचारपत्र, श्राव्यमाध्यम, दृश्यश्राव्य माध्यम, पोस्टर, बैनर, होल्डींग्स आदि के क्षेत्र में स्थानिक स्तर से लेकर राष्ट्रीय स्तर तक संगणक एवं तंत्रज्ञान ने क्रांती लाई है। जिस के कारण आज स्थानिक स्तरों पर अनेकों समाचार पत्र छापे जा रहे हैं। स्थानीय पत्रकरीता, मुद्रण व्यवसाय, संगणक तंत्रज्ञान, आदि सह व्यवसायों में भी रोजगार प्राप्त हो रहे हैं। ज्ञान-विज्ञान, तंत्रज्ञान, दर्शन, समाज, संस्कृति, साहित्य, नवनिर्माण, अंतरिक्ष, आदि विषयों को पत्रकारिता प्रतिबिंबित करती है। पत्रकारिता में अध्यापन, संशोधन, पर्यटन, स्पर्धा परीक्षा, जनसंपर्क अधिकारी, राजभाषा अधिकारी, संवाददाता हिंदी निर्देशक, राष्ट्रीयकृत बैंको में प्रूफरीडर, उदघोषक, सेवाक्षेत्र, संचारक्षेत्र आदि हिंदी से संबंधित अनेको रोजगार हैं। इंटरनेट पत्रकारिता ने नए युग को जन्म दिया है। पत्रकारिता ने वर्तमान में अपना जाल, रेडियो, टेलिविजन, भ्रमणध्वनी यंत्र, न्युज चैनलों, पत्र पत्रिकाओं, वेबसाईटो, वीडियो मॅगजीनों, रिपोर्टाज, फिचर, खोज, फोटो, ग्राफिक्स, साक्षात्कार, आंतरिक्ष, स्टिंग आदि विभिन्न क्षेत्रों तक फैलाया हुआ है। समाचार प्रसारण विविध खेलों का हिन्दी में सीधा

प्रसारण, मनोरंजन, साक्षात्कार, निवेदन, नाट्य तथा धारावाहिक प्रस्तुतीकरण भी प्रौद्योगिकी का ही देन है।

गूगल इनपुट टूल्स जैसे गूगल ट्रैन्स्लैशन, स्पीच टू टेक्स्ट, टेक्स्ट टू स्पीच आदि सुविधाएं भी हिन्दी के लिए प्रौद्योगिकी का ही देन है। जिन के कारण अनुवाद, टंकण आदि काम बहुत ही आसानी से हो जाते हैं। जिस की वजह से युवा आत्मनिर्भर भी बन सकते हैं।

मोबाइल में हिंदी टंकण की सुविधा

भारत के प्रौद्योगिकी ने मोबाइल में हिंदी टंकण की सुविधा को लाकर एक नया आयाम स्थापित किया है। प्रथम मोबाइल की भाषा केवल अंग्रेजी तक ही सीमित थी जिससे पढ़े-लिखे व्यक्तियों सहित कई लोगों को मोबाइल टंकण में कठिनाई आती थी। लेकिन पिछले कुछ सालों से मोबाइल में हिंदी भाषा का चलन शुरू हुआ और बहुत तेजी से पूरे भारत में फैल गया। कोरोना महामारी के बाद देश के हर एक व्यक्ति के हाथ में मोबाइल आ गया। मोबाइल की भाषा हिंदी भी हो जाने के कारण उन्हें मोबाइल चलाने में सुगमता होने लगी। लोग अपने फोन के जरिए हिंदी के सही वाक्य बना लेते हैं। स्पीक एंड राइट तकनीक की वजह से हिंदी में लिखना और भी ज्यादा आसान हो गया है। वर्तमान के सभी स्मार्टफोन्स में हिंदी टाइपिंग टूल मौजूद होता है जिससे इसे लिखना आसान हो जाता है। यह प्रौद्योगिकी का ही देन है। टाइप-राइटर और प्रेस की असुविधा की बात अब समाप्त टाइप-राइटर और प्रेस की असुविधा की बात अब समाप्त हो गई है, क्योंकि अब हिन्दी के टाइप-राइटर का 'की-बोर्ड' अंग्रेजी के टाइप-राइटर की भाँति छोटा और सुविधाओं से युक्त बन गया है। जिस के कारण प्रेस में हो रही असुविधा भी काफी हद तक दूर हो चुकी है।

आनलाईन में आसानी से हिन्दी साहित्य रचनाओं की उपलब्धि

हिन्दी साहित्यकारों ने अपनी साहित्यिक रचनाओं से साहित्य जगत को समृद्ध किया है। भारतेन्दु हरिश्चंद्र, मुंशी प्रेमचंद, महावीर प्रसाद द्विवेदी, श्याम सुन्दर दास, रामधारी सिंह दिनकर आदि कई साहित्यकारों की रचनाएं अब सिर्फ किताबों में ही नहीं रही हैं बल्कि अब ये रचनाएं प्रौद्योगिकी के माध्यम से घर तक पहुंच गई हैं। ऑनलाइन इन्हें पढ़ना अब आसान हो गया है और यही कारण है कि कुछ हद तक युवा पीढ़ी भी इनसे जुड़ पा रही है। अब हिंदी सीखने की सीमा सिर्फ स्कूलों तक ही सीमित नहीं रह गई है बल्कि ये घर तक पहुंच गई हैं। आनलाईन में हिन्दी किताबें पढ़ना प्रौद्योगिकी के चलते आसान हो गया है। आनलाईन श्रव्य मंच (ऑडबल प्लेटफॉर्म) पर हिन्दी कहानियों को सुनने की सुविधा भारत विविधता प्रधान देश है। भारतेन्दु हरिश्चंद्र का कथन "चार कोस पर पानी बदले, आठ कोस पर वाणी / बीस कोस पर पगड़ी बदले, तीस कोस पर धानी" आज भी चरितार्थ हो रहा है। भाषाओं का बाहुल्य होने के कारण अपने देश में जिन व्यक्तियों को हिन्दी पढ़नी और लिखनी नहीं आती हैं किन्तु सुनकर समझ पाते हैं ऐसे लोग इन श्रव्य मंचों पर हिन्दी कहानियों को सुनकर, समझकर

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हिन्दी साहित्य से जुड़ सकते हैं क्योंकि समाज में परिवर्तन लाने की शक्ति जितनी साहित्य में है उतनी तलवार, बम तथा गोलों में भी नहीं है। श्रव्य मंच की व्यापकता को बढ़ाने के लिए प्रौद्योगिकी तेजी से अपने कदम बढ़ा रही है।

भारत में अंतर्जाल और हिन्दी वेबसाइट की भूमिका

सब से पहले भारत में अंग्रेजी वेबसाइट का ही बोलबाला था किन्तु आज हिन्दी वेबसाइट की वजह से इंटरनेट की पहुंच उन लोगों तक संभव हुई है जो इंटरनेट को मात्र गाना या सिनेमा को डाउनलोड करने का साधन समझते थे। हिंदी वेबसाइट के आने से इस के उपयोग करनेवालों को सभी जानकारी अंग्रेजी के अलावा हिंदी में भी मिलने लगी। इस वेबसाइट पर दुनियाभर की जानकारी उपलब्ध रहती है। नेट वेबसाइट वीडियो, मंगीनों, चित्र अनुवर्तन, खोज, फोटो, कार्टून, ग्राफिक्स साक्षात्कार, स्टिंग ऑपरेशन, ब्लॉग लेखन, समाज माध्यम लेखन, यूट्यूब चैनल, समालोचन आदि में भी हिंदी ने अपनी जड़े मजबूत की है। नई शिक्षा नीति में तीसरी कक्षा से ही दूरस्थ एवं डिजिटल शिक्षा दिये जाने पर बल दिया गया है और इसे कार्यान्वित करने के लिए केंद्र एवं राज्य सरकारों के द्वारा दीक्षा, स्वयं, स्वयं प्रभा, नैशनल डिजिटल लैब्रेरी, स्पोकेन ट्यूटोरियल, वरचुअल लैब, ई-यंत्रा, मेरा मोबाइल मेरा विद्यालय, स्माइल, प्रोजेक्ट होम क्लसेस, पढाई तुहार दुआर, बुनियाद, ई-विद्वान आदि दर्जनों डिजिटल प्लेटफार्म तथा टीवी चैनल्स शुरू किए गये हैं।"ये सब प्रौद्योगिकी की ही देन है।

फेसबुक और गूगल भी दुनिया को हिंदी में जानकारी दे रही हैं पहले पहल फेसबुक और गूगल भी केवल अंग्रेजी में ही जानकारी दे रही थीं लेकिन आज प्रौद्योगिकी के विकास से वे भी हिन्दी में जानकारी देने लगी है।

मोबाइल फोन कंपनियां अपने फोन को अंग्रेजी के साथ हिंदी भाषा में भी उपलब्ध करा रही हैं। दुनिया की सभी बड़ी बड़ी मोबाइल फोन कंपनियां भविष्य के बाजार के रूप में भारत को देख रही हैं और भारत में धड़ल्ले से व्यापार कर रही हैं। लगभग सभी बड़ी कंपनियां अपने फोन को अंग्रेजी के साथ हिंदी भाषा में भी उपलब्ध करा रही हैं। चाइनीज कंपनियां तो पहले से ही अपने हर छोटे-बड़े फोन को हिंदी में उपलब्ध करवा रही थी और आज भी यह सिलसिला जारी है। गांवों में जिस किसी के पास भी मल्टीमीडिया फोन होता है वो उसे हिंदी में इस्तेमाल करना ज्यादा सरल समझते हैं। स्मार्टफोन के लिए कई तरह के ऐप्लीकेशन भी डेवलप किए गए हैं। इनमें से भले ही अधिकतर अंग्रेजी में हो लेकिन भारत में लोग अभी भी हिंदी भाषा के ऐप्लीकेशन का इस्तेमाल करते हैं। इसलिए ऐप में अलग से हिंदी भाषा को भी दिया जाता है।

हिंदी में ई-मेल की सुविधा

गूगल, ई-मेल जैसी अपनी महत्वपूर्ण सुविधा को जल्द ही पूर्णतया हिंदी में भी उपलब्ध कराने वाली है। उदाहरण के लिए, अभी तक आपका ईमेल एड्रेस अंग्रेजी भाषा में होता था। लेकिन कुछ ही दिनों बाद आप अपना

ईमेल आईडी हिंदी में भी बना पाएंगे। इस संदर्भ में मैथिली शरणगुप्त जी की भारत भारती कविता की पंक्तियाँ उदरुत हैं-

सर्वत्र एक अपूर्व युग का हो रहा संचार है, देखो, दिनोंदिन बढ़ रहा विज्ञान का विस्तार है;

अब तो उठी, क्या पड़ रहे हो व्यर्थ सोच-विचार में ? सुख दूर, जीना भी कठिन है श्रम बिना संसार में ॥

निष्कर्ष:

हिंदी संस्कृत का एक सरल रूप है, जिसे पढ़कर हम भारत के प्राचीनतम ज्ञान, परंपरा, सांस्कृति, सभ्यता, एवं इतिहास के ज्ञान को प्राप्त कर सकते हैं। वर्तमान में विश्व में सबसे ज्यादा बोली जानेवाली भाषाओं में हिन्दी तीसरे स्थान पर है। प्रौद्योगिकी के मदत से हिन्दी साहित्य को और भी ज्यादा लोगों तक पहुंचाया जा सकता है। हिंदी भाषा सबसे अनोखी है जिसे अपने जीवन का हिस्सा बनाना बहुत ही आसान है। भविष्य में ज्यादा से ज्यादा लोग प्रौद्योगिकी के माध्यम से हिंदी से और भी सरल ढंग से जुड़ सकेंगे। इस संदर्भ में मैथिलीशरण गुप्त जी के भारत-भारती कविता की पंक्तियाँ उद्धृत हैं-

है राष्ट्रभाषा भी अभी तक देश में कोई नहीं, हम निज विचार जान सकें जिससे परस्पर सब कहीं।

इस योग्य हिन्दी है तदपि अब तक न निज पद पा सकी, भाषा बिना भावैकता अब तक न हममें आ सकी? ॥

आओ, बने शुभ साधना के आज से साधक सभी, निज धर्म की रक्षा करें, जीवन सफल होगा तभी।

संसार अब देखें कि यदि हम आज हैं पिछड़े पड़े- तो कल बराबर और परस विश्व के आगे खड़े ॥

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जागतिकीकरणाचे राष्ट्रीय व सामाजिक स्तरावर होणारे परिणाम

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सारांश:

जागतिकीकरण म्हणजे देशाच्या राजकीय, आर्थिक व्यवहाराचा विस्तार करणे होय. 20वे शतक हे क्रांत्याचे शतक म्हणून ओळखले जाते. या शतकात जगामध्ये अभूतपूर्व बदल घडून आले. हे साम्राज्यशाही विरोधी लढयाचेही शतक होते. या क्रांत्याची सुरुवात 1917 रशियन क्रांतीपासून झाली. चिनी, व्हीएतनामक्रांती, कोरिया, क्युबा व पूर्व युरोपामधील समाजसत्तावादी राष्ट्रांची स्थापना समाज सत्तावादाने श्रमीक जनतेस वर्गिय शोषणापासून मुक्ती दिली. स्थानिक वस्तुंची व घडामोडींची जागतिक स्तरावर स्थानांतरणाची प्रक्रिया, देशाच्या अर्थव्यवस्थेचे जगाच्या अर्थव्यवस्थेबरोबर एकत्रीकरण करणे, एकाचवेळी जगाचा व जगातील सर्व लोकांचा विचार करणे, यात व्यापार, विदेशी थेट गुंतवणुक, भांडवल प्रवाह, प्रवास व तंत्रज्ञान यांच्या प्रसाराच्या माध्यमाने राष्ट्रीय अर्थव्यवस्थेत आंतरराष्ट्रीय अर्थव्यवस्थेसाठी खुले केले जाते.

प्रस्तावना:

जागतिकीकरण नविन तंत्रज्ञान, नविन आर्थिक संबंध व सरकार, आंतरराष्ट्रीय संस्था, व्यवसाय, कामगार व नागरि समाजासह विविध अभिनेत्यांसह राष्ट्रीय व आंतरराष्ट्रीय धोरणाद्वारे चालविले जाते. तसेच औद्योगीकरण, संस्कृती, विज्ञानात प्रगती, दारिद्र्य, निरिक्षणे, बेरोजगारांचे निर्मुलन, आरोग्य, शिक्षण, गृहनिर्माण, विज्ञान-तंत्रज्ञानाच्या क्षेत्रातील प्रचंड झेप या गोष्टी शक्य झाल्या. याचा भांडवलशाही राष्ट्रावरही परिणाम झाल्यानंतर समाजवादात बदल करण्याचे उद्देशाने गोर्बाचेव यांनी ग्लास्तनोस्त व पेरिख्रोईका या नावाने प्रत्यक्षात सुरु करण्यात आलेल्या सुधारणा समाजवादी मुल्यांना व मार्क्सवाद लेनिनवादाला तिलांजली देणाऱ्या ठरल्या. यातूनच सोव्हिएत अर्थव्यवस्थेची दुर्दशा झाली.

सन 1987 ऑक्टोंबर क्रांतीच्या 70व्या वाढदिवसानिमित्त गोर्बाचेव भाषणात जागतिक राजकारणातील चार प्रमुख अंतविरोधाचे स्वरूप पालटल्याचे मान्य केले. तेव्हाच ते मार्क्सवाद, लेनिनवादापासून दूर गेले असे दिसते. त्यानंतर जागतिक भांडवलशाहीला अनुकूलता तयार झाली. याचा उपयोग

करण्याच्या उद्देशातून उदारिकरण, खाजगिकरण, जागतिकीकरण व आधुनिकीकरण या चार खांबावर आधारलेली भांडवलशाहीने जागतिक स्तरावर स्विकारली 1 जानेवारी 1995 जागतिक व्यापार संघटना अस्तित्वात आली.

संशोधनाची उद्दिष्ट्ये :

- 1) जागतिकीकरणाच्या परिणामाचा अभ्यास करणे.
- 2) राष्ट्रीय व सामाजिक व्यवहाराचा आढावा घेणे.
- 3) जागतिकीकरणाचा समाज घटकावर होणारा परिणाम अभ्यासणे.

संशोधनाची गृहितके :

- 1) जागतिकीकरणाचे परिणाम व विकासाचा अभ्यास करणे.
- 2) जागतिक भांडवलशाहीचे अवलोकन करणे.

संशोधन पद्धती :

प्रस्तुत शोधनिबंधासाठी ग्रंथालयीन व विश्लेषणात्मक संशोधन पद्धतीचा वापर करण्यात आलेला आहे.

जागतिक भांडवलशाही व जागतिकीकरण :

सध्याची जागतिक भांडवली अर्थव्यवस्था, जागतिकीकरण या नावाने ओळखली जाते. हा शब्द प्रयोग 1970-80 च्या दशकात प्रत्यक्ष व्यापारी जगतात वापरायला सुरुवात झाली. त्यात उदारिकरण, खुली अर्थव्यवस्था, खाजगीकरण या नावाने ओळखली जाते. भांडवलशाहीत भांडवल शाहितील अरिष्ट दूर करण्यासाठी वापरलेला एक मार्ग म्हणजे जागतिकीकरण होय. आज जागतिकीकरण हे सर्वव्यापी झाले आहे. मानवी समुह प्रत्यक्ष व अप्रत्यक्षरित्या जागतिकीकरणामुळे प्रभावित झाले आहे.

जागतिकीकरणाचा जागतिक अनुभव :

या व्यवस्थेचा गाभा शोषण व विषमता हाच होय. UNO च्या पाहणी पथकाच्या अहवालात म्हटले की, 1990-1999 दहा वर्षांचा आढावा विश्वव्यापी विषमता वाढली आहे. सर्वात श्रीमंत देशातील वरच्या 20% लोकांकडे राष्ट्रीय उत्पादनाच्या 86% भाग आहे. तर खालच्या 20% लोकांकडे 1% भाग आहे. जगातील सर्व श्रीमंत अशा तीन व्यक्तीची मालमत्ता अविकसीत देशातील 60 कोटी लोकांच्या मालमत्तेपेक्षाही अधिक आहे. जगातील 100 कोटी लोक निरक्षर आहेत. तेवढ्याच संख्येच्या लोकांना रोजकमाई मिळत नाही. 34 कोटी स्त्रीया 40 वर्षांच्या आत मरतात. 25 कोटी बाल मजुर आहेत. 16 कोटी कुपोषणाने मरत आहेत.

सन 1944 ब्रेटन वुडस् येथील वाटाघाटीतुन जागतिक बँक व आंतरराष्ट्रीय नाणेविधी या दोन संस्थांची स्थापना झाली. आंतरराष्ट्रीय आर्थिक व्यवहारामध्ये स्थिरता आणणे व आंतरराष्ट्रीय व्यापार वाढीस मदत व्हावी हा उद्देश होता. प्रत्यक्षात असे होतांना दिसत नाही. उलट 1973 पासून आर्थिक प्रगतीला धक्के बसावयास सुरुवात झाली. यातुन भांडवली राष्ट्रांनी जागतिक आर्थिक व्यवस्थेची जागतिकीकरणाची संकल्पना मांडली. यात जागतिक बँक, आंतरराष्ट्रीय नाणेविधी या जागतिक वित्त संस्थांना वेठीस धरण्यांत येऊ लागले.

या वित्त संस्थांनी अविकसित व देशांना कर्ज देतांना आपली बाजारपेठ विकसीत राष्ट्रांच्या मालाला खुली करून दयावी असे प्रयत्न सुरु केले. यामुळे हे राष्ट्र कर्जबाजारी झाले. आंतरराष्ट्रीय नाणेविधी व जागतिक बँकेच्या शिफारशिवरून हा करार 1948 गॅट करार अस्तित्वात आला. यामध्ये भारत सहभागी आहे.

शासनाच्या आर्थिक सुधारणा एका बाजुने दारिद्र्य, उपासमार, आर्थिक विषमता वाढविणाच्या विरुद्ध होत आहेत. तर दुसऱ्या बाजुला धनदांडग्याच संपत्तीत प्रचंड वाढ झाली आहे. उदा. 1991 टाटाच्या संपत्तीचे मुल्य 8531 कोटी रुपये होते ते सन 1998-99 मध्ये 47446 कोटी रुपर्य पोहचले. रिलायन्स 3600 कोटी रुपये पासून 33757 कोटी रुपयापर्यंत वाढली.

वीज, पाणी, रस्ते इत्यादी सुविधा निर्माण करण्याऐवजी कंपन्याने फ्रीज, टि.व्ही., व्ही.सी.आर., मोटार गाड्या, स्कुटर्स, टेलीफोन इ. उत्पादन वाढले.

आर्थिक सुधारणांचा दुसरा टप्पा :

- 1) सर्व संस्थात्मक बंधने दूर करून पूर्णपणे व्यापारास मुभा देणे.
- 2) श्रमीक नोकरदारांना असणारे सध्याचे रोजगाराचे संरक्षण काढून घेणे.
- 3) कंत्राटी पध्दतीस चालना देणे.
- 4) खते, विज, औषधे सारख्या इत्यादी वस्तुंना बाजार यंत्रणेतील किंमतींना अधिष्ठान प्राप्त करून देणे.
- 5) शिक्षण, आरोग्य, पाणी पुरवठा व सामाजिक सुरक्षितते बाबतही सरकारची भूमिका मर्यादित करणे, अनुदान कपात धोरण तीव्र करून यासर्व क्षेत्रामध्ये खाजगीकरण व व्यापारीकरणाची तत्वे रुजविणे.
- 6) अल्पबचती, सामाजिक सुरक्षा फेड यावरील व्याजदर कमी करून हा पैसा शेअरबाजार व कंपनी क्षेत्राकडे वळविले.

राष्ट्रीय स्तरावर होणारे परिणाम :

1) विचार करण्याची पध्दती :

उदारिकरणाचा संबंध बाजाराशी असतो यात अश्या नफा-तोटा या शब्दात व्यक्त केले जाते. ज्या गोष्टी नफा देत नाहीत. पण समाजहिताच्या असतात. लोकसहभागाच्या असतात; त्यांनाही बंद करण्यासाठी राज्य उदारीकरणाच्या प्रक्रियेत कार्यरत असते. यात अनुदान बंद केले जाते. आधारभूत किंमतीचे तत्व दिल्या जाते.

उदारीकरणतुन केंद्रीकरण जोपासले जाते. आर्थिक स्थिती खालावलेला सामाजिक वर्ग, राजकिय स्पर्धेतून बाद होणार यातुन श्रीमंत, अतिश्रीमंत वर्गच राजकारणात राहणार. राजकीय रचनेत केंद्रीकरणच

राहणार. काही मोठ्या घराण्याच्या हातील राज्य बाहुले होणार, समाज कारणापासून राजकारण होणार.

2) समाज घटकावर होणारे परिणाम :

बेरोजगार :

कल्याणकारी राज्याचे स्वरूप समाप्त होणार. राज्याचे कार्यक्षेत्र कमी होणार. राज्य नकारात्मक कामावर लक्ष देणार. शासनाची कामे कमी होणार. यातून नोकर भरती कमी होणार. खाजगी क्षेत्रात वाढ होईल, हे क्षेत्र अत्याधुनिक तंत्रज्ञानाला महत्व देत. यातून मनुष्यबळ कमी होणार. परिणामतः बेरोजगारात वाढ होणार. उदारिकरणामुळे बेरोजगारी वाढत आहे.

भारतात सार्वजनिक मोठ्या उद्योगात 20 लक्ष कामगार आहेत. सहकारी क्षेत्रातही रोजगारात वाढ झाली नाही. उदा. 1990-91 मध्ये 190.6 लक्ष रोजगार होते. ते 1992-93 मध्ये 195.6 इतकी अल्पवाढ झाली आहे. बेकारीतून नैराश्य, नैराश्यातून कायदा, सुव्यवस्थेवर परिणाम, सामाजिक तणाव निर्माण होते.

अनुसूचित जमाती :

भारतातील अनुसूचित जमातीवर विपरीत परिणाम जागतिकीकरण व उदारिकरणाचा होणार आहे. त्याची वर्तमान स्थिती पुढील प्रमाणे आहे. भारतातील साक्षरतेचे प्रमाण 52.21% आहे. तर अनुसूचित जमातीचे 29.6% आहे. प्राथमिक क्षेत्रात अनुसूचित जमातीचे प्रमाण 67.53% आहे. तर दुय्यम क्षेत्रात 3.85% आहे.

आज 8.6% शेतीस पाणी, 80.00% शेती कोरडवाहू आहे. ते महागडी वि-बियाणे, औषधी, खते घेऊ शकत नाहीत. जागतिकीकरणामुळे त्यांना दिली जाणारी मदत कमी होणार. पारंपारिक व्यवसाय धोक्यात येणार जंगलविषयक कायदयामुळे जीवन कठीण होणार.

आरोग्यावरील परिणाम :

आरोग्यासाठी वाढती रोगराई लक्षात घेता त्या वाढीव रकमेची तरतुद अपेक्षित होती. ती करण्यात आलेली आहे. खाजगी मोठ्या दवाखान्याची संख्या वाढते आहे. सध्या एक महत्वाचा उद्योग म्हणून दवाखान्याकडे पाहिले जाते. झोपडपट्टी, कुपोषण, प्रदूषित पाणी, अन्नातील भेसळ यामुळे रोगराई वाढणार. मात्र यावर उपाय म्हणून आर्थिक तरतुद आरोग्यासाठी वाढविण्या ऐवजी उदारीकरणात तो क्रमाने कमी होणार.

प्रा. डॉ. रमेश टिकाराम बागडे

भारताच्या बाबतीत जागतिक बँकेने केलेल्या अभ्यास क्रमानुसार प्रदूषित पाण्यामुळे जे रोग होतात ते पाच वर्षाखालील 15 लक्ष मुलांचा दर वर्षी बळी घेतात. आजारांमुळे 200 दशलक्ष मनुष्य कायम वाया जातात. प्रदूषित पाण्यामुळे जे अपंगत्व येते त्यामुळे 30.5 लक्ष मनुष्य कायम वाया जातात. त्यामुळे देशाचे 336 दशलक्ष रुपयाचे वर्षाला नुकसान होते.

इतर कमकुवत घटकावर परिणाम :

खाजगीकरणतून आदिवासी स्त्रीया, मुले कामगार यांना विकत घेणारी पण कायम शोषण करणारी बलाढ्य जागतिक बाजारपेठ होय. जागतिकरणाचा व उदारिकरणाचा परिणाम स्त्रीयांवर अतिशय वाईट झाला. उदा. चिन सारख्या देशात शरीर विक्री करणाऱ्या स्त्रीयांची संख्या वाढली आहे. भारतातही 5 लक्षापेक्षा जास्त स्त्रीया वेश्या व्यवसाय करतात. अर्थव्यवस्थेच्या शब्द भंडारात देहविक्री करणाऱ्या स्त्रीयांना 'सेक्स वर्कर' म्हणून संबोधले होते. व इतर परकीय कर्जाचा बोजा वाढत आहेत. सरकारी उद्योग धंद्यातील तोटा वाढतच चालला आहे.

निष्कर्ष (Conclusion):

जागतिकीकरणाचे राष्ट्रीय, सामाजिक स्तरावर खोलवर परिणाम झालेले दिसून येतात. श्रीमंत हा श्रीमंत होत चालला व गरिब हा गरीबच होत चालला आहे. आरोग्य, कृषी, रस्ते, पाणी, स्वच्छता, एकूण उत्पादनावर परिणाम झाला. राजकिय क्षेत्र श्रीमंत वर्गाच्या हातातील बाहुले झालेले आहे. सर्व सामान्यांची पिळवणूक होत आहे. जागतिकीकरणतून जीवनावश्यक वस्तुच्या उत्पादनाऐवजी चैनीच्या वस्तु तयार करण्याकडे कल असते. यातून सर्व सामान्य हितासाठी आवश्यक वस्तु सेवा मिळेनाशा झाल्या आहेत. जागतिकीकरणतून बेकारी वाढत आहे. भ्रष्टाचारास वाव मिळत आहे. कृषी क्षेत्राकडे दुर्लक्ष होत आहे. सदरिल विकासाला खिळबसली आहे. रस्ते, पाणी पुरवठा, आरोग्य, शिक्षण समस्या गंभीर स्वरूप धारण करत आहे. संतुलित विकासाला खिळबसतांना दिसत आहे.

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