

ISSN No 2347-7075
Impact Factor- 7.328
Volume-3 Issue-2

**INTERNATIONAL
JOURNAL of
ADVANCE and
APPLIED
RESEARCH**



Publisher: P. R. Talekar
Secretary,
Young Researcher Association
Kolhapur(M.S), India

Young Researcher Association



**International journal of advance and applied research
(IJAAR)**

A Multidisciplinary International Level Referred and Peer Reviewed Journal

Volume-3

Issue-2

Chief Editor

P. R. Talekar

Secretary,

Young Researcher Association, Kolhapur(M.S), India

Executive Editor

Dr. M. S. Shinde

I/C Principal,

IQAC Coordinator and HOD,

Department of Physics

Mahant Jamanadas Maharaj

Art's, Commerce and Science College Karanjali

Editor

Dr. P.T. Wankhedkar

Department of Zoology

Mahant Jamanadas Maharaj

Art's, Commerce and Science College

Karanjali

Dr. N. R. Giri

HOD, Department of Zoology

Mahant Jamanadas Maharaj

Art's, Commerce and Science College Karanjali

Editorial & Advisory Board

Dr. S. D. Shinde

Dr. M. B. Potdar

Dr. P. K. Pandey

Dr. L. R. Rathod

Mr. V. P. Dhulap

Dr. A. G. Koppad

Dr. S. B. Abhang

Dr. S. P. Mali

Dr. G. B. Kalyanshetti

Dr. M. H. Lohgaonkar

Dr. R. D. Bodare

Dr. D. T. Bornare

Published by: Young Researcher Association, Kolhapur, Maharashtra, India

The Editors shall not be responsible for originality and thought expressed in the papers. The author shall be solely held responsible for the originality and thoughts expressed in their papers.

© All rights reserved with the Editors



CONTENTS

Sr No	Paper Title	Page No.
1	A Geographical Study of Sex Ratio in Latur S. B. Ashture	1-4
2	A Study on Factors Influencing Individual Investment Decisions Towards Indian Share Market Mrs. Abilasha N, Dr. Madhu Tyagi	5-11
3	A Relative Study on The Decalogue of Ronald Knox and The Earlier Novels in The Dublin Murder Squad Series of Tana French Janani P R, Dr. Preetha C	12-13
4	The Ecocentric Environmental Paradigm In Coehlo's The Alchemist Mantha Padmabandhavi Prakashrao	14-17
5	A Study On Environmental Perspectives Of Amitav Ghosh's The Hungry Tide G. Prema	18-21
6	Mobile Apps Of Libraries: Boon For Library Users Dr. Sangaraj Hosamani	22-25
7	Voices Of The Subaltern Female Protagonist In Vikas Swarup's The Accidental Apprentice Prashant Jambhulkar, Dr. Vivek V. Joshi	26-30
8	"A Study Of Modern Teaching Techniques In Acquiring English Language With Global Perspective" Dr.P.R.V.N.Kesava Kumar	31-36
9	Study Of Interactions Of 2-[2-(Cyclohexylcarbonyl) Benzoyl] Amino-3-Methylbutanoic Acid (2ca3mba) With Bsa At Different Ph Using Ultrasonic Interferometer And Ft-Ir Techniques Shrikant B. Thakare	37-42
10	Effect Of Child Exploitation On The Socio-Economic Status In India Dr. Sanjay Kumar Das	43-48
11	Very Rare Sp. Of Odonates (Dragonflies And Damselflies) At Salim Ali Lake (Aurangabad City) JB Aghade, SA Saraf	49-52
12	New Media Use By Academic College Librarians To Provide Information To Library Users During Covid-19 Pandemic Period Amol Bhaudas Meshram, Dr. Kishorsingh R. Chungade	53-58
13	Skill Impact Bonds In Enhancing Youth Population In India Kaleeshwari.S, Dr.M. Jegadeeshwaran	59-61
14	Padmini As An Existential Woman In Girish Karnad's Play Hayavadana Priti Nilkanth Bhandekar, Dr. Vivek V. Joshi	62-64
15	The Study On Significance Of Dramatic Techniques In Roy Williams's Depiction Of Realistic Content In Joe Guy Mr. Samadhan M. Jadhav, Dr. Prabhanjan B. Mane	65-70
16	Study Of Zooplankton Diversity, Abundance And Seasonal Variations From Nakana Lake,Dhule (Ms) India Patil, M. U., Patole, S. S.	71-76
17	The Desperate Femeinsts Swetta Rajendra Singh Gautam, Dr.Vivek V.Joshi	77-79
18	Environmental Accounting And Reporting: A Disclosure Of Business Impact On Environment Lt. Dr. Vijay Kumar Madugu	80-84
19	Understanding Lifelong Learning And Its Prevalence Among College Students Swati Tulshan, Susmita Neogi	85-88
20	Feature And Use Of Open Source Software For Library Mr. Satish K. Chandel, Dr. Kishorsingh R. Chungade	89-91

21	The Role Of Photojournalism In Empowering Women To Achieve Sustainable Development Nithish P	92-95
22	A Survey On Impact Of Cement Industry In Gadchandur In Chandapur District Dr. Farukh Ahemad Sheikh, Prof Rima Potdukhe	96-100
23	Issues And Challenges Of Child Labour Dr. Nandini N	101-104
24	Wastewater Management And Its Challenges Dr. Kavita Hingane	105-109
25	Isolation Of Antimicrobial Resistance Bacteria From The External Body Surface Of Houseflies Collected From Civil Hospital Malegaon Mohammad Ismail Ansari, Fariha Shafaq, Azra Ghayasuddin	110-114
26	Impact Of Migration On The Sugarcane Cutter Labourers In Maharashtra Supriya Chandrakant Gaikwad	115-118
27	Automation In Estimation Of Land Surface Temperature Based On Landsat Satellites In The Upper Mutha Basin, Pune District Kishor R. Sonawane, Jyotiram C. More	119-126
28	Effect of Cypermethrin and Oxyfluorfen on alimentary canal of earthworm, Eisenia foetida D. S. Patil, P. K. Bagul, P. A. Suryawanshi , B. C. More	127-134
29	Status Of Academic College Libraries Regarding Sustainable Library Service Provision To Its Users Shyamkumar S. Gorde, Prof. Dr. Harshal R. Nimbhorkar	135-138
30	Impact Of Natyashastra On Indian Folk Theatres Dr.Sarika Sinha, Akash Dahariya	139-141
31	Retirement Planning: Awareness Among Individuals Ms. Sanampreet Kaur Kapoor, Dr. Sangeeta	142-154
32	Sustainable Development: A Call For A Change Dr. Maneesh. B	155-157
33	The Consequence Of Chemical Use On Cerastus Moussonianus Hatchability Prakash Tanaji Wankhedkar, Niranjana Ramesh Giri, Shaikh Hasim Mohammed Isak	158-162
34	Impact Of Climate Change On Agriculture Production And It's Sustainable Solutions Dr. Nandini Pandurang Wagh	163-165
35	Synthesis And Structural Properties Of Zinc Ferrite Rahul Upalaikar	166-168
36	A Study On Awareness Of Early Adolescent Boys Regarding Genral Information And Changes In Morality During Early Adolscent Stage Nita B. Gaikwad, Gaytri Tiwari	169-174
37	Survival Of Ankita Sharma In Preeti Shenoy's Life Is What You Make It Harini P.	175-178
38	"A Study On Industrial Pollution And Environment In Ghugus" Dr Sarika Baban Nande, Prof Rima Potdukhe	179-185
39	Analyzing Energy Efficiency In Office Building: A Case Study In Raipur, Chhattisgarh Shanta Dash, Mahendra Joshi	186-195
40	Recent Trends And Development In The Livestock Sector: A Descriptive Analysis Susanthika S	196-203
41	Natural Resources And Laws! Dr. Prakash Laxmanrao Dompale	204-207
42	Research Methodology: An Introduction Dr. Vaishali E. Aher	208-211
43	"A Comparative Analysis Of Health Status And Level Of Awareness In Pregnant Women In Jind District" Poonam Lohan,Rinku Kharb	212-222

44	Zinc Oxide Nanoparticles: Investigation On The Parameters Affecting The Structure Of Zno Nps In Sol -Gel Synthesis JOSÉ, Basílio José Augusto, SHINDE, Mahendra Devidas	223-232
45	Recent Changes In Msmes Sector And It's Impact On Economic Development In India Miss SUBHALAXMI JOSHI, Dr. Bandana Pathak	233-237
46	Investigation On The Tube Well Water Quality Of A Village From Daryapur Taluka, Dist. Amravati, Maharashtra, India S.R.Bansod	238-243
47	Social And Cultural Crises Between The Arvind Adiga's The White Tiger And Last Man In Tower Ashwini M.Ingale, Prof. Dr. Kishor K. Wagh	244-246
48	A Study Of Drinking Water Quality Impact On Human Health : Special Reference To Balapur Tahisal District Akola In The State Of Maharashtra Dr. Alpna Deokar	247-251
49	Status Of Agro-Tourism Centers: A Geographical Study Of Selected Area Of Maharashtra Prof. Santosh Maruti Shinde	252-256
50	Vaishnavism in West Bengal and its Environmental Ethics Mrs. Ipsita Chakraborty, Dr. P. Ganesan, Dr. Debaprashad Chatterjee	257-261
51	Carrier Mobility in The Field Effect Transistor Channel in The Single Walled Carbon Nanotubes Jay Shankar Kumar, Versha Joshi, Vimal Sagar	262-266
52	Information Literacy: - An Overview Mr. Ashok B Nagare	267-269
53	' Shiva ' The Hero Of ' The Shiva Trilogy ' – By Amish Tripathi Kavita Vasantrao Kakde, Dr. Kishor K Wagh	270-272
54	A Geographical Analysis of LULC in Pachora Tehsil of Jalgaon District (MH) Prof. Rahul V. Patil , Dr. S. N. Bharambe	273-275
55	Record Of The Predatory Stink Bug Andrallus Spinidens (Fabricus) (Heteroptera: Pentatomidae: Aesopinae) From Goa State, India Ayesha E. Shetkar, Vijaykumar S. Gadekar, Aishwarya S. Naik, S. V. More	276-278
56	Quantum Machine Learning - A Study Mr. K. VigneshKumar, Dr. N. Sumathi, Mrs. B. Vidhya , Ms. A. Subhasheni	279-286
57	Land Resources of Wasteland Development in Mizoram State, India- A Geographical Perspective Dr. Amol S. Shinde	287-290
58	श्रीकृष्ण जन्मलीला विमर्शः डॉ.रुक्मर महापात्र	291-293
59	नगरीय आकारिकी की अवधारणा और नगरों/नगरीयकरण की उत्पत्ति एवं विकास का अध्ययन डॉ. भूपेन्द्र कुमार जॉगिड	294-310
60	“पाचवीच्या गाण्यातील आदिवासी कोकणांच्या धारणा व संस्कार” डॉ. मधुचंद्र लक्ष्मण भुसारे	311-315
61	पर्यटन रोजगार, विकास की संभावनाएँ नीतियाँ एवं सुझाव (बिलासपुर संभाग के संदर्भ में) श्रीमति सपना नामदेव	316-321
62	"कृषी आणि जल संसाधन व्यवस्थापन " सहा. प्रा .) कुमारे लक्ष्मण नागोराव, (सहा.प्रा.) अशोक प्रबती कांबळे	322-326
63	भारत में समावेशी शिक्षा – एक मूल्यांकन डॉ. राजेश शौर्य	327-333
64	A Facile Synthesis Of (1r,2r)-1,2-Cyclohexan Dimethanol, A Key Intermediate Of Lurasidone Hydrochloride-An Atypical Antipsychotic Drug Pramod A. Dhokrat, Pavankumar V. Solanki, Tejas C. Gaikwad, Radhakrishnan M. Tigote	334-340

65	जलवायु परिवर्तन एवं संपोषणीय विकास की ओर बढ़ते कदम Dr. Nisha Sharma	341-347
66	म्यूचुअल फंड डॉ. मोनिका बाबेल	348-353
67	Exact Study of Transient Thermoelastic Deformation of a Thick Circular Plate Gaikwad Priyanka B.	354-360
68	Climatic Change and it's Impact on Environment R. R. Attarde	361-363
69	Study of snakes and view of community towards snakes Sunil N. Khade, Priyanka B. Gaikwad	364-367
70	Marine gastropods distribution, taxonomy and statistical analysis, along west coast of India Sunil N. Khade, Priyanka B. Gaikwad	368-372
71	Women Leadership In India: The Changing Landscape Ms. Shweta Audichya, Dr Deepti Bhargava	373-377



A GEOGRAPHICAL STUDY OF SEX RATIO IN LATUR

S. B. Ashture

Associate Professor & Head Department of Geography,
Shri Kumarswami Mahavidyalaya, Ausa Dist. Latur

Corresponding Author- S. B. Ashture

Email:- sbashture@gmail.com

DOI- [10.5281/zenodo.7295521](https://doi.org/10.5281/zenodo.7295521)

Abstract:

Geography is mainly concerned with spatio-temporal analysis of population. This branch deals with spatio-temporal growth of human population, fertility and mortality. Sex composition constitutes one of the most readily observable elements of population. An understanding of the sex ratio of a population in the spatial context is one of the vital demographic characteristics of any region. It has a strong bearing on birth and death rates, migration, size and composition of households and the occupational structure of any region.

Keywords: Sex structure, Social attitude, Economic factors, Imbalance

Introduction:

Population Geography is a newly emerged branch of Human Geography. It is mainly concerned with spatio-temporal analysis of population. It involves magnitude of population as well as biological, social, cultural and economic characteristics. This branch deals with spatio-temporal growth of human population, fertility and mortality, causes behind it as well as distributional pattern of population on globe, its various densities, rural-urban distribution, process of urbanization, Migration of population, causes and consequences. Composition of population i.e. sex structure, age structure, occupational structure, dependency burden and literacy levels keeps quite importance in the study of the discipline. According to G. T. Trewartha Population Geography was concerned with understanding the regional differences in earth's covering of people (Trewartha, 1969, p.87)

Sex composition constitutes one of the most readily observable elements of population. Sex ratio reflects the socio-economic conditions prevailing in an area and a useful tool for regional analysis (Franklin, 1958). An understanding of the sex ratio of a

population in the spatial context is one of the vital demographic characteristics of any region. Apart from itself being an important regional characteristic, sex ratio not only mirrors the socio-economic condition of an area but also reflects a stage in the historical development of population (Franklin, 1956). It has a strong bearing on birth and death rates, migration, size and composition of households and the occupational structure of any region (Hawley, 1959). It is a function of three basic factors; First sex ratio at birth, secondly sex ratio at death and lastly sex selectivity among migrants. Sex ratio signifies the number of females per one thousand males (Dawan and Basu, 2015). Sex ratio generally influences the form and tempo of life in any region.

Location of the study Area:

The study region i.e. Latur district is situated in the south-east part of the Maharashtra and it lies between 17° 52' north latitude to 18° 50' north latitudes and 76° 12' east longitudes to 77° 18' east longitudes. It is bounded on the north by Beed and Parbhani districts, on the north-east by Nanded district, on the south-east and south by the Karnataka state and on the north-west, west and south by

Osmanabad district. The total geographical area of Latur district is 7157 sq.km. and it covers 2.39 per cent of the total geographical area of Maharashtra.

Objectives of the Study:

This research paper lights on specific objectives, as following:-

- 1 To identify and examine the spatio-temporal variation in sex ratio at tahsil level of Latur district.
- 2 To examine the influencing factors on the sex ration of the study area.
3. To find out consequences of deckling sex ratio and to suggest remedies.

1.3 Database and Methodology:

Present study deals with secondary data only. The information is collected from newspaper, census handbook of latur district, socio-economic review, previous research papers, unpublished thesis and websites. Collected data is tabulated, processed and presented with suitable diagrams. Findings are based on analysis of data.

Sex ratio of the study area is calculated with following formula:-

$$\text{Sex ratio} = \frac{P_m}{P_f} \times 1000$$

Whereas: P_m= Number of males in the particular population of the area.

P_f= Number of females in the particular population of the area.

Temporal variations in sex ratio:-

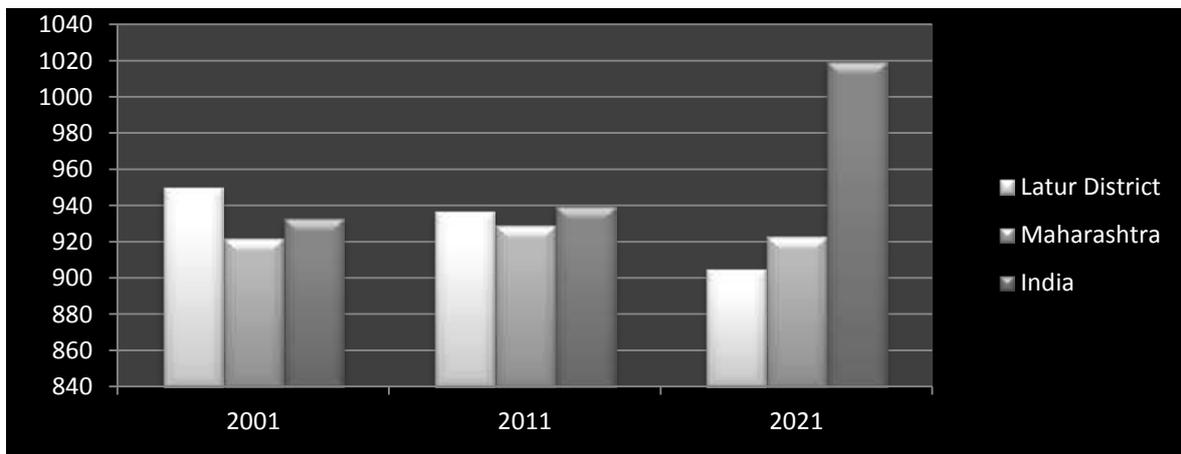
As per data shown in table no 1.1, figures regarding to sex ratio are fluctuating.

Sex ratio of the study region is continuously declining, it focus on serious social situation of future. In 2001, there was 950 females per 1000 males, and proportion worked out to 905 in 2021. At state level it is quite changing with – 6 between 2011-2021. At national level, proportion of females is increasing, which is really good. It is increased from 933 in 2001 to 1020 females per 1000 males. In the history of census, it is first time, where proportion of females is crossing male digits. We can consider, it is success of population policy as well as social change.

Table no 1.1 Temporal variations in sex ratio 2001-21

Year	Latur district	Maharashtra	India
2001	950	922	933
2011	937	929	940
2021	905	923	1020

Graph 1.1 Sex Ratio 2001-2021



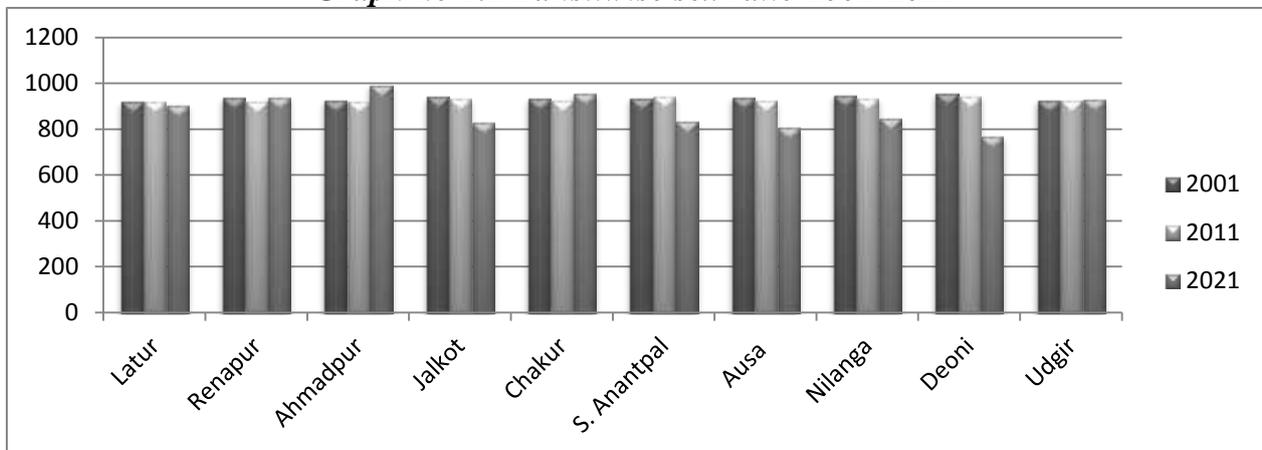
Spatial variations in sex ratio:-

In the study area, latur district, Sex ratio was 935 in 2001 and it is seriously declined to only 905 in 2021. Highest sex ratio was observed in Nilanga(956) and Deoni (950) tahsil whereas loest was found in Udgir(929) and Latur (921).

Table no 1.2 Spatial variations in Sex Ratio in Latur District 2001-2021

Sr. No.	Tahsil	Female per 000' male 2001	Female per 000' male 2011	Female per 000' male 2021	Change 2001-11	Change 2011-21
1	Latur	921	922	908	+1	-14
2	Renapur	940	921	942	-19	+21
3	Ahmadpur	929	924	994	-5	+70
4	Jalkot	944	935	834	-9	-111
5	Chakur	937	929	956	-8	+27
6	S. Anantpal	938	947	836	+9	-111
7	Ausa	941	926	810	-15	-116
8	Nilanga	950	937	849	-13	-88
9	Deoni	956	946	771	-10	-175
10	Udgir	929	925	931	-4	+6
	District	935	928	905	-7	-23

Source : District Census Handbook (C.D.), Latur District- 2001-11

Graph no 1.2 Tahsilwise sex ratio 2001-2021

According to 2011 census, overall sex ratio of the study region was 928 females per 1000 males, it is declined by -7 females. Lowest sex ratio is found in Renapur and Ahmedpur tahsil. In 2021, proportion of females is largely declined in the study area. Ahmedpur, Renapur and Udgir tahsil have been recorded positive growth in sex ratio. Very serious decline in sex ratio is noticed in Deoni tahsil with -175 as well as in Ausa tahsil with -116 females and in Shirur Anantpal tahsil with -111 females.

Concluding Remarks:

1. Proportion of females per 1000 males is very worst and not satisfactory in the study area. Declining sex ratio is due to poverty, social status of women, and preponderance of male births and higher rate of female mortality especially in infant, child and young age group.

2. Sex ratio of the study area also influenced by physical, social and economic factors. Dowry system, early marriages of females, attitude of society towards females, economic dependency of women's are major factors in declining the proportion of females in total population.

3. Recently Government and NGO's championing the campaign for mass awareness regarding 'Save and educate the girl child' or 'beti bachao, beti padao' has to be the motto for every Indian family. At the same time Government should implement social, employment and educational policies and changes the mentality of male concerning females.

4. The Government should promote more higher and technical education facilities in rural areas for women.

5. The dowry prohibition act 1961 should be strictly implemented.

6. Increase the status of women through the employment opportunities and higher level education.

References:

1 . Barakade, A.J.(2012) Declining sex ratio: an analysis with special reference to Maharashtra state, Geoscience Research, 3(1) 92-95.

2. Census of India: District Census Handbook- 2001,2011.

3. Das Gupta, M (1987) Selective discrimination against female children in rural Punjab, India, Population and Development review, 13(1), 77-100.

4. Franklin, S.H. (1956): The pattern of sex ratios in New Zealand , Economic Geography, 32. 162-176.

5. Mundhe N.N. and Jaybhaye, R.J. (2014): A Study of Urbanization in pune district using Geoinformatics approach, International Journal of Advance and Applied Research pp 45-55.

6. Mundhe. N.N. and Dhawale G.M. (2016): Spatio- Temporal Variation in Sex Ratio of Pune District in Maharashtra. International Journal of Recent Scientific Research, Vol 7 Issue 8, pp 12903- 12908.

7. Newspaper - Daily Punyanagri dated 20 February, 2022.



A STUDY ON FACTORS INFLUENCING INDIVIDUAL INVESTMENT DECISIONS TOWARDS INDIAN SHARE MARKET

Mrs. Abilasha N¹ Dr. Madhu Tyagi²

¹Research Scholar, School of Management Studies (SOMS), Indira Gandhi National Open University (IGNOU), New Delhi.

²Research Supervisor, School of Management Studies (SOMS), Indira Gandhi National Open University (IGNOU), New Delhi.

Corresponding Author- Mrs. Abilasha N

Email-abhi.mysore1991@gmail.com

DOI- 10.5281/zenodo.7295523

Abstract:

Purpose: The objective of current paper is to understand the internal and external factors influencing the investors while investing on equity share. Also, to know the purpose of investing in equity market and to understand the sources of information that investors rely for investing in share market.

Methodology: The study is based on primary and secondary data collection. Primary data collected through structured Questionnaire. The secondary data was collected through various sources like various textbooks, magazines, research paper, government notices, websites etc.

Findings: The study revealed that external factors influencing on equity investment are Inflation rate, Exchange rate, Economic Growth, Government policies, market volatility and tax benefits and internal factors influencing on equity investment are share price, dividend policy, profitability, company reputation, return on investment and EPS. Also, study evident that higher growth prospects is the purpose on equity investment and internet & brokers advices are the major sources of information and investors are investing on mutual fund also along with equity share market.

Research Implications: The study focuses factors influencing individual investment decision towards equity market. The current paper helps investors and financial planner to analyze and comprehend the key elements that influence investors' decision-making and motivate them to invest in various choices and avenues. It also helps investors in developing appropriate strategies for better decision-making process.

Originality: This research aims to provide a road map for the investors interested in making their investment decisions by understanding the most influencing external and internal factors investing in equity market.

Key words: *Equity market, SEBI, Investment*

Introduction:

The Indian capital market has grown dramatically. During the 1990s, there was a surge in investor interest, and the introduction of Equity Guilt into statutory legislation aided the capital market. The Foreign Exchange Regulation Act is one example of such legislation. An important recent development has been the participation of foreign institutional investors in the primary and secondary markets for securities. Investing in developing countries has expanded dramatically in recent years. Among emerging countries, India has experienced significant financial inflows in recent years.

India's government's liberalization programme has begun to bear fruit, and the nation is in position for a significant acceleration of its industrial and economic growth. The growth of the business sectors is the key driver of the nation's economy. A

capital market is a place where governments and commercial businesses can raise long-term capital by trading securities. As the raising of short-term funds occurs on other markets, it is described as a market where money is offered for periods greater than a year. The bond market and the stock market are both parts of the capital market.

The stock market has become an appealing investment opportunity for the majority of investors, and it has developed tremendously over the years. However, because of the volatility in the stock market, many investors are hesitant to invest. The risk generally faced by investors in the stock market is enormous, and investors are afraid of losing their hard-earned money. Even though the return on investment in the stock market is substantial, investors must incur an equivalent amount of risk. Furthermore, investors must be certain of the

investment avenue they are choosing in order to secure good returns.

Review of Literatures:

The behavioural finance theory claims that investors rely on many sorts of information when making investment decisions, making it important to understand the factors that influence investing behavior. Academics and professionals have long used the efficient market hypothesis to guide their analysis of investment performance. The hypothesis is predicated on the idea that investors make decisions based on all available information and act rationally. However, **Rastogi (2015)** strongly supports the role of behavioural factors in investment decision making as its answers to many questions related to financial investment-related concerns that conventional finance theory cannot adequately explain can be explained by behavioural finance.

The good number of research has to be done to identify the factors influencing towards equity investment. **Thulasipriya (2015)** has identified in his research the factors like Tax benefit, security & safety, high returns, liquidity are the major factors considered by investors before investing. However, **M. Shinde and Priyanka Zanvar (2015)**, **Ramanujam and Chitradevi (2012)** states that demographic factors of investors such as age, educational qualification, income level, affect the investor's level of risk tolerance influences individual's investment decision. Also, **Ambrose Jagongo (2014)** through his case study revealed that reputation of the firm, expected corporate earnings, profit and condition of statement, past performance firms' stock, price per share, feeling on the economy and expected dividend by investors. Whereas, **Arun Lawrence and Dr. Zajo Joseph (2013)** opined that friends and mediaplay a key role in influencing the investors share trading decisions. Similarly, investors also invest in equity market based on psychological biases such as preference of self-regulation, precautions attitude, risk bearing capacity and lack of information affects the decision making of the investors **Chandra and Kumar (2012)**, **Slovic Paul (1972)**.

it was found that investors are getting more information through Internet sources, magazines and finance journals and most of the investors invest through Online trading **Barber and Odean (2001)**, **Radha V (1995)** Furthermore, it is important to know what motivates an individual to invest in equity market. **Potter (1971)**, **Santi Swarup K (2008)**, the empirical study revealed that dividends, rapid growth, investment for saving purposes, quick profits through trading, professional investment management and long- term growth that motivates an individual investors' attitudes towards their investment decisions. Also, literacy level

among students is increasing and they too invest in equity market based on their life styles, age, experience, knowledge **Rajarajan V (2000)**, **Volpe, Chen, and Pavlicko (1996)**, **Maruthu Pandian P, Benjamin Christopher S (2007)**.

Research Gap:

In order to find out the research gap in the area of factors influencing towards investment decision in equity market, the literature review evident that research has been done towards investors behaviors towards mutual fund and portfolio management, but there are very few works focusing on factors influencing towards investors decision in equity market. Most of the papers focused general factors influencing in equity market investment but current paper focused on differentiating Internal and External factors influencing on individual decision making towards investing in equity shares.

Need and importance of the study:

This study will assist not only investors but also various financial institutions, banks, companies, and advisors, in analyzing and comprehending the key elements that influence investors' decision-making and encourage them to invest in various choices and avenues. Better consideration of behavioural procedures and results is important for financial planners because a thoughtful consideration of investor perceptions of various investment alternatives. Also, behavioral finance assists financial advisors in developing appropriate asset distribution strategies for their investors which enhances confidence and helps in maximizing their return on investment.

Objectives:

1. To understand the internal and external factors influencing the investors while investing in equity market.
2. To identify the factors that motivates the investors to invest in equity shares.
3. To recommend strategies by which investors can optimize their return on investment.

Hypotheses:

The researchers have frame two hypotheses based on the objectives:

Hypothesis 1: H0: There is a significant relationship between internal factors and investors decision making on equity share.

Hypothesis 2: H0: There is a significant relationship between external factors and investors decision making on equity share.

Research Methodology:

Type of Research: The research paper is of nature of descriptive and exploratory research.

Data Source and type: The current study is based on both **primary and secondary** sources. The primary data has been collected through structured questionnaire and secondary sources includes

journals, research articles, finance magazines, textbook etc.

Sampling Unit and sample data: For examining the factors influencing on individual investment decision towards Indian Stock Market, the sample of 168 responses was collected and analysed. The target population was 250 responses and the sample collected was **168** individual investors from Mumbai city has been collected through **purposive sampling** method.

Statistical tools: In order to know the reliability of primary data, **Cronbach's Alpha** has been adopted.

Table 1: Showing the result of reliability test

Variables	Cronbach's Alpha
Internal factors	0.72
External factors	0.84

Source: Primary data

Interpretation: The result of Cronbach's shows that both external and internal factors influencing on

For analyzing the data and testing research hypotheses, **T- test** has been adopted by using SPSS version 21. Also, simple bar charts were used to represent data.

7.0 Analysis and Interpretation:

Reliability test:

The test of reliability test will be done to test reliability of the variables taken for the study.

Cronbach's alpha greater than 0.70 will be taken as data reliability.

investors decision making on equity market taken for the study is reliable.

Table 2: Showing the Demographic Profile of the Respondents

Variable	Details	No. of Response	Percentages
Age	15-25	21	13
	25-35	58	35
	35-45	42	25
	45-55	28	16
	Above 55	19	11
Gender	Male	106	63
	Female	62	37
Qualification	12 th Pass	4	2
	Undergraduate	23	14
	Graduate	52	31
	Post graduate	60	36
	Doctorate	21	13
	Chartered Accountant	8	5
Occupation	Business	18	10.7
	Service in private sector	76	45
	Service in government sector	44	26
	Chartered Accountant	8	5
	Retired	4	2
	Student	18	10.7
Monthly Income	Below 20,000	6	4
	20,000 – 40,000	20	5
	40,000 – 60,000	58	35
	Above 60,000	84	50

Source: Primary data

Table 3: Showing the External factors influencing on investors decision towards Equity market

Factors	T statistics	Sig.	Result
Political stability	2.445	0.066	Rejected
Inflation rate	6.120	0.004	Accepted
Exchange rate	3.478	0.016	Accepted
Economic growth	4.116	0.048	Accepted
Current economic indicators	2.900	0.058	Rejected
Government Policies	3.829	0.001	Accepted
Market volatility	4.082	0.042	Accepted
Tax benefits	3.249	0.011	Accepted

Source: Primary Data

Interpretation:

The above table indicates the external factors influencing on investors investment decision. The result showed that Inflation rate, Exchange rate, Economic Growth, Government policies, market volatility and tax benefits, P-value is less than 0.05, therefore the Null hypothesis is accepted.

Therefore, it is concluded except political stability and Current economic indicators, all other factors will influence investors decision making process while investing in equity market. Hence, there is a significant relationship between factors influencing with investment decisions.

Table 4: Showing the Internals factors influencing on investors decision towards Equity market

Factors	T statistics	Sig.	Result
Price of the share	3.492	0.032	Accepted
Dividend policy	8.020	0.016	Accepted
Profitability	4.166	0.008	Accepted
Company reputation	8.128	0.016	Accepted
Return on investment	4.110	0.044	Accepted
Earnings per share	4.889	0.028	Accepted
Board structure	2.642	0.052	Rejected

Source: Primary Data

Interpretation:

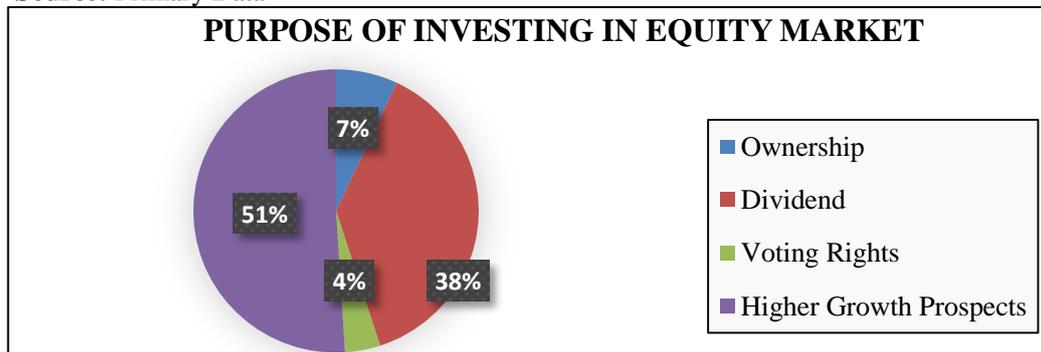
The above table indicates the Internal factors influencing on investors investment decision. The result showed that, shar price, dividend policy, profitability, company reputation, return on investment and earning per share, P-value is less than 0.05, therefore the Null hypothesis is accepted. Therefore, it is concluded that except Company

board structure, all other factors will influence investors decision making process while investing in equity market. Hence, there is a significant relationship between factors influencing with investment decisions.

Table 5: Showing the purpose of equity investment of the respondents

PURPOSE	NO. OF RESPONSES	RESPONSES (in %)
Ownership	11	7
Dividend	63	38
Voting Rights	8	4
Higher Growth Prospects	86	51
TOTAL	168	100

Source: Primary Data



Interpretation: Out of the 168 responses, majority of respondents are investing their wealth

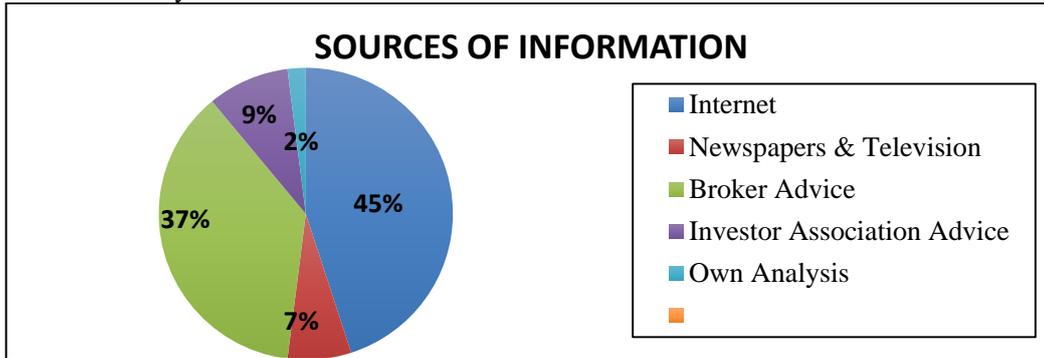
towards Equity market as it gives higher growth prospects in future and dividend on their investment.

Table 6: Showing the source of information for the respondents

SOURCES	NO. OF RESPONSES	RESPONSES (in %)
Internet	75	45
Newspapers & Television	13	7
Broker Advice	62	37
Investor Association Advice	15	9
Own Analysis	3	2

TOTAL	168	100
-------	-----	-----

Source: Primary Data

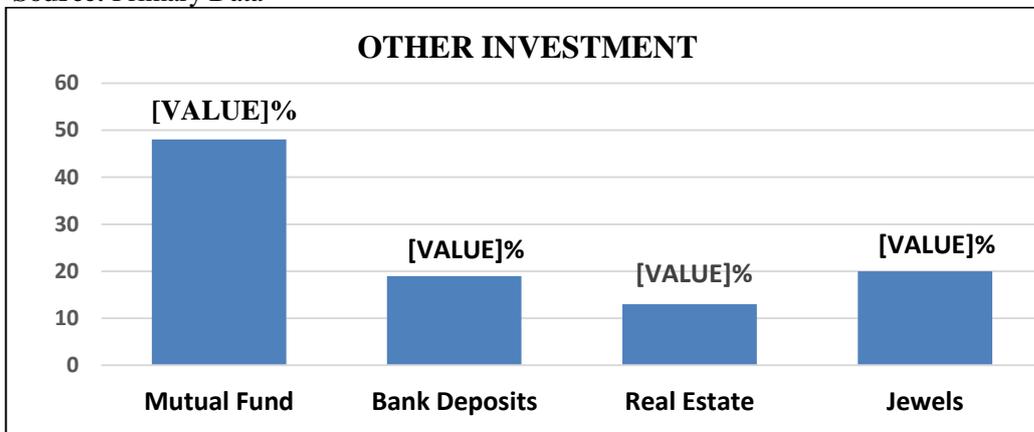


Interpretation: Out of the 168 responses, majority of respondents rely on the information about equity investment through internet sources and broker advices.

Table 7: Showing the other investments of the respondents

OTHER INVESTMENTS	NO. OF RESPONSES	RESPONSES (in %)
Mutual Fund	81	48
Bank Deposits	32	19
Real Estate	21	13
Jewels	34	20
TOTAL	168	100

Source: Primary Data



Interpretation: Out of 168 responses, majority of the respondents have mutual fund deposits along with equity investments.

Findings of the study:

The following are the findings of the study:

1. The study shows that Inflation rate, Exchange rate, Economic Growth, Government policies, market volatility and tax benefits are the major external factors influencing on individual investment decisions towards equity share market.
2. The study shows that Inflation rate, Exchange rate, Economic Growth, Government policies, market volatility and tax benefits are the major external factors influencing on individual investment decisions towards equity share market.
3. The study shows that share price, dividend policy, profitability, company reputation, return on investment and earning per share are the major internal factors influencing on individual

4. investment decisions towards equity share market.
4. Higher growth prospects and dividends are the main purpose of investing in equity share market.
5. Major respondents are getting investment information through Internet sources and brokers advices.
6. Other than Equity share capital, majority of the investors prefer to invest in Mutual fund as its safest form of investment option.

Suggestions of the study:

1. Before buying shares, investors should make as much effort as they can to conduct a fundamental, technical, and financial analysis.
2. Financial advisors should examine the investors behaviour and preferences while trading in mutual funds, equities, derivative and other financial instruments because behavioural finance is a new and promising area of finance
3. There are certain investments that are risky, so

investors should decide how much risk they're willing to face based on their age.

4. The regulatory authority should raise investor understanding of both economic and behavioural issues in order to assist them in making rational stock market investments and also take appropriate action to control market activity and safeguard investors from unethical and unlawful stock market players.
5. Investors must also diversify their investment in different companies by creating a portfolio of investments in order to avoid risks and enhance returns.
6. Investors must also be able to understand market and economic indicators, as these factors influence the performance of a stock on the market.
7. Most investors relied on financial advisors, friends and family when making investment decisions. Hence, more advertisements on benefits of investment may be published in newspapers, magazines, booklets, and hoardings.
8. Stock brokerage firms should host seminars by experts at regular intervals which encourages and brings confidence among investors.

Conclusion:

The financial structure of a country ultimately determines its economic prosperity. As the economy grows, new financial intermediaries and securities will emerge to capitalize on the economic expansion. A variety of financial instruments are offered to Indian investors. The present study aims to examine the both internal and external factors influencing on investment decision towards equity market, the result revealed that most of the selected variables significant level is more than 0.05, hence null hypothesis is accepted which shows that there is significant relationship between factors influencing with investment decisions on equity market. It can be concluded that investors to enhance their return on investment on equity share should do fundamental and technical analysis of financial statement and assess their risk bearing capacity to avoid any losses thereto.

Scope for Further Research:

The current study has considered Internal and external factors influencing on investment decision towards equity market only. The further research can be undertaken by considering psychological factors and demographic factors on various financial instruments available in the market. Also, the research can be conducted with larger sample to understand the variability of the results.

References:

1. Ambrose Jagongo (2014); A Survey of the Factors Influencing Investment Decisions: The Case of Individual Investors; International Journal of Humanities and Social Science Vol. 4 No. 4; PAGE (92-102).
2. Arun Jethmalani (1999) "Risky Business", The Economics Times, Daily, Vol. 39, No.119, July 1st, 1999, p.12.
3. Arun Lawrence and Dr.Zajo Joseph, (2013), "Factors leading stock investment: An Empirical Examination" Southern Economist, June 1, 2013 p.p. 45- 47.
4. Bandgar, P.K (2006), "A study of Middle-Class Investor's Preferences for Financial Instruments in Greater Bombay", Finance India, Vol. XIV. No.2, 2006, pp: 574-576.
5. Barber, B. M., and Odean, T. (2001), "The internet and the investor", The Journal of Economic Perspectives, 15(1), 41-54.
6. C.M. Shinde and Priyanka Zanvar (2015) "An Empirical Study on Factors Influencing in Investment Decision making in Pune," International Research Journal of Management and Commerce, Vol.1, Issue.6, PP. 10-23.
7. Chandra A. and Kumar R. (2012), "Factors Influencing Indian Individual Investor Behaviour: Survey".
8. Geetha N. and Ramesh M. (2011), A Study on People's Preferences in Investment Behaviour, IJEMR, Vol. 1, Issue 6, pp. 1-10.
9. Juhi Ahuju (2013), "Indian stock market - review of literature" in TRANS Asian Journal of Marketing & Management Research Vol.2 Issue 7, July 2013, ISSN 2279- 0667.
10. Lakshmi C. N. (2005), "What influences more on the consumer buying decision process", Prastuti, Journal of Management and Research, vol. 2, pp. 45-56.
11. Maruthu Pandian P, Benjamin Christopher S (2007), "A study on Equity Investor Awareness", Doctoral Dissertation at Bharathiar University, 2007.
12. Potter, R.E. (1971), "An empirical study of motivations of common stock investors", Southern Journal of Business, Vol. 6 No.1, pp.41-4.
13. Radha V. (1995) A study on investment behaviour of investors in corporate securities, Doctoral Dissertation at Alagappa University, 1995.
14. Rajarajan V (2000), "Investors Life Styles and Investment Characteristics", Finance India, Vol. XIV, No. 2, 2000, and pp: 465-478.
15. Ramanujam and Chitra Devi (2012), "A Study on the Impact of Socio-Economic Profile on Investment Pattern of Salaried and Business People in Coimbatore City", International Journal of Management and Information Technology, Vol.2 No. 1, PP.67-77.
16. Rastogi S. (2015), "Differences in Behavioral Biases in Investment Decision Making: Gender and Occupation Perspective", Journal of International Business and Economy, 16(1), pp: 13-3.
17. Santi Swarup K (2008), "Measures for Improving

Common Investor Confidence in Indian Primary Market: A Survey”, Research Publication, nseindia.com.

18. Selvam M, Rajagopalan V, Vanitha S, Babu M (2008), “Equity culture in Indian Capital Market”, Sajosps, Vol. 4, No. 1, July-Dec 2008, pp: 66-78.
19. Shanmugam R, and Muthuswamy P (1998), “Decision Process of Individual Investors” Doctoral Dissertation at Bharathiar University, 1998.
20. Slovic Paul, (1972), “Psychological Study of Human Judgment: Implications for Investment decision making”, Journal of Finance, Vol. XXVII, No. 4, Sep. 1972, pp: 772-798.
21. Thulasipriya (2015), “A Study on the Investment Preference of Government Employees on Various Investment Avenues”, International Journal of Management Research and Social Sciences, vol.2, Issue.1, PP.9-16.
22. Volpe, R., Chen, H. and Pavlicko, J. (1996). “Personal investment literacy among college students: a survey”, Financial Practice and Education, 6(2), 86-9



**A RELATIVE STUDY ON THE DECALOGUE OF RONALD KNOX
AND THE EARLIER NOVELS IN THE DUBLIN MURDER SQUAD
SERIES OF TANA FRENCH**

Janani P R¹ Dr. Preetha C²

¹PhD Scholar, Sri Sarada College for Women (Autonomous), Salem-16, Tamilnadu

²Assistant Professor, Sri Sarada College for Women (Autonomous), Salem-16, Tamilnadu

Corresponding Author- Janani P R

Email : prjananisri@gmail.com

DOI- [10.5281/zenodo.7295526](https://doi.org/10.5281/zenodo.7295526)

Abstract:

Crime fiction is the mother of mystery and detective fiction, the hard-boiled mode, the police procedural and historical crime fiction. Being the oldest, mystery and detective fiction acquires the absolute quality of crime fiction. This is the only genre of literature that works based on retrograde analysis, a sort of chess game in reverse. The retrograde analysis involves taking a certain position as the starting point and then reconstructing it backwards to work out how it got into that position. The operation of mystery and detective fiction is hinged upon the aforementioned analysis which begins with the result and works backwards to the causes. Mystery and detective fiction have their roots in American Literature and the pioneer in it is Edgar Allen Poe. The development of the corresponding genre is perceived during the times of the great World Wars. The savour of mystery and detective fiction peregrinated overseas and the veterans are also found in World Literature. One such imminent virtuoso of detective fiction is the American novelist, Tana French. This paper foreshadows an affinity between the commandments of Ronald Knox and the selected novels of Tana French.

Keywords: Detective, decalogue, fair play, crime, murder, mystery

Introduction:

The thread of mystery and detective fiction differs from that of other mainstream fiction in the script and characterization. Every conventional fiction consists of a pinnacle that is detected at the end. Detective and mystery fiction is the sole division which reveals the apex at the beginning. E.M. Forster in his book *Aspects of the Novel* has written,

“The king died and then the queen died” is a story. “The king died, and the queen died of grief” is a plot. “The queen died, no one knew why, until it was discovered that it was through grief at the death of the king.” This is a plot with a mystery in it, a form capable of high development. (Forster, 1927, 94.)

To this P.D James has said in *Talking about detective fiction*, “‘Everyone thought that the queen had died of grief until they discovered the puncture mark in her throat.’ This is a murder mystery.” (James, 2011, 4.)

The early ancestors of the genre could be identified in olden stories, like, the book of Daniel and stories from Herodotus and Hercules myths. The biblical stories of Cain and Abel are the initiation of the genre of crime fiction. Literature has seen the gradual progress of detective and mystery

fiction in its various epoch. Though American literature is accounted for in the birth of detective fiction, its development is glimpsed in British literature. Howbeit, divided by realm, detective fiction has integrated all regions of world literature. Certainly, in the 1920s, critics and crime writers suspected that detective fiction has to strictly adhere to the rules which have been formulated for it, resulting in the advancement of the detection club in 1928. The club has been entailed with the authors of mystery and detective fiction who have sworn to follow the rules of fair play. Fair play is the concept that a whodunnit story should be capable of being solved by an attentive reader. Father Ronald Knox organized the idea of fair play by creating ten basic rules known as the detective story decalogue.

Some forerunners of crime fiction are Edgar Allan Poe, Sir Arthur Canon Doyle, Agatha Christie, Raymond Chandler and Dorothy L. Sayers. The successors of them in contemporary literature are Dan Brown, Stephen King, James Patterson and Patricia Cornwell. In this sequence, Tana French is known as the lady of Irish crime for her efficacious Dublin Murder Squad crime series. This paper of the researcher analyses in detail the fair play of the novels of Tana French analogically to the decalogue of Father Ronald Knox.

Deciphering the decalogue in the novels of Tana French:

Mystery and detective fiction have seen their golden age during the period from 1920 to 1930. A series of ten commandments known as the decalogue has been framed by Ronald Knox, one of the members of the detection club, to ensure the fair play of the detective novels. The novels of Tana French have also been following the decalogue rules with some exceptions.

The first commandment of the decalogue is that 'the criminal must be someone mentioned in the early part of the story. This fundamental instruction according to the decalogue is tracked in the debut novel of Tana French, *In the Woods*. Katherine Devlin is a twelve-year-old child, brutally murdered at the sacrificial stone in the archaeological site of Knocknaree. At the initiation of the novel, the fictional detectives do a random investigation with the archaeologists at the site and conclude that the murder has been committed as revenge against the father of the dead girl. But it is only after the story the perpetrator is exposed to the readers, who is Damien Donnelly, one among the archaeologists, with whom the investigation has been done before.

The murder of Alexandra Madison in *The Likeness* remains suspicious until her look-alike detective Cassie Maddox disguises herself as the dead and enters the place where she lived with her friends. Madison stays with her friends, Daniel March, Justin Mannering, Raphael Hyland and Abigail Stone, at Whitehorn House outside Glenskehy. Never knowing the particulars of the dead, Maddox leads a life with the friends of Madison to bring out the offender. Later, it is revealed that the crook is one of the housemates, Daniel March.

The second commandment of the decalogue is 'all supernatural or preternatural agencies are ruled out as a matter of course. The oeuvres of the novels of Tana French have followed this instruction of the decalogue and have never used the elements of supernaturalism in her novels. The third commandment 'not more than one secret room or passage is allowable, is also abided by in the Murder Squad Series of Tana French. Her novels have traces of the fourth and fifth commandments where there is no usage of any undiscovered chemicals and no representation of a China man. The novel, *In the Woods*, has partially stalked the sixth commandment which says, 'no accident must ever help the detective, nor must he have an unaccountable

intuition which proves to be right. The fictional detective of that novel, Rob Ryan, has met with a childhood trauma which makes him serious about the case and travels by his intuition which later had no relation to the murder sequence.

The seventh and the eighth commandments of the decalogue, 'the detective must not himself commit the crime' and 'the detective must not light on any clues which are not instantly produced for the inspection of the reader', are ardently followed by the crime writer of the Dublin Murder Squad Series, where the fictional detectives of the squad were not the committers of the crime and they had not revealed any suspicions in prior for the readers. The sidekick of the main detective of each novel is the protagonist of its sequel. Through this idea, the author has made the partner of the detective passive by concealing the thoughts that pass through their mind. Hence, this is proof that the ninth commandment is also shadowed in the novels of Tana French.

The last commandment is a crucial one that states, 'twin brothers, and doubles generally, must not appear unless we have been duly prepared for them. It seems that Tana French has been primed to introduce both the concept of twins and doubles in her novels. The twin sisters, Katherine Devlin and Jessica Devlin, play a pivotal role in the novel *In the Woods*, where one among them, Katherine, is the victim. The detective Maddox and the victim Madison are looking alike, indicating the concept of a doppelganger which is the main element in the second novel *The Likeness*.

Conclusion:

The aforesaid comparison and contrast between the decalogue and the select novels of Tana French have proved that the author has followed the path of the descendants of the detection club and has implemented a fair play in setting the concept of detective fiction. Consequently, the author has done justice to her lineage of mystery and detective fiction without variation.

Works cited:

1. French, T. (2019). *In the Woods: A Novel (Dublin Murder Squad)* (Reprint ed.). Penguin Books.
2. French, T. (2021). *The Likeness (Dublin Murder Squad #2)*. Hodder & Stoughton.
3. James, P. D. (2011). *Talking About Detective Fiction* (Illustrated ed.). Vintage.
4. Scaggs, J. (2005). *Crime Fiction (The New Critical Idiom)* (1st ed.). Routledge.



THE ECOCENTRIC ENVIRONMENTAL PARADIGM IN COELHO'S THE ALCHEMIST

Mantha Padmabandhavi Prakashrao

Head, Dept. of English

Swami Vivekanand Mahavidyalay, Shirur Tajband.

Corresponding Author- Mantha Padmabandhavi Prakashrao

Email- manthaapadma@gmail.com

Abstract:

In the present world's geographical scenario, the status of environment is a vital issue. Despite the efforts of Government and Ecocentric groups, the question of the environment has remained unchanged. And this exacting key matter has been observed by many scientists, ecologists and writers throughout the world. Paulo Coelho, a Brazilian novelist also dealt with such issues for conserving the nature and its resources. The terms Ecocentrism and Anthropocentrism are like two poles. The philosophy of Ecocentrism regards nature as the centre for man while Anthropocentrism believes in self-centeredness of human. In the Alchemist, the author advocates the Ecocentric values among the readers. One can perceive these ethics in the actions and beliefs of Santiago, a protagonist. Santiago is a shepherd boy and his fondness for the sheep conveys the message of love for the nature and the animals. Paulo Coelho's perception of Ecocentrism can be explicated when we find Santiago's growing concern for nature, sea and desert. On his journey to find the treasure, Santiago chance upon many creatures and things on the earth. He begins to observe and learn many things from the animals, things and desert. Coelho, a staunch believer of Ecocentric values, reveals that it is man's responsibility to save and care for earth and nature. In the Alchemist, the impressions of anthropocentric philosophy can be seen, where man is self-centered. As a human being, the shepherd boy also longs for wealth. In order to fulfill his dreams, he sets out on journey to seek out the treasure. In due course of time, he meets the Alchemist, who gains the wisdom to convert a metal into gold. In The Alchemist, Coelho promotes the message of love and belief in God. Santiago stalks his dreams and pursue till the end. Through the character of Santiago, Coelho illustrates the importance of ecosystem and the ethics of humans on the earth, for creating healthy humans as well as healthy minds on the earth.

Keywords: Ecocentrism, ecosystem, humanity, self-interest and ethics.

Globally, the ecosystem is deteriorating day by day by the impact of Global warming. Despite the efforts of Government and Ecocentric groups, the issues of the environment have remained unsettled. And this vital problem has been observed by many scientists, philosophers and writers throughout the world. Paulo Coelho, a Brazilian novelist also dealt with such issues for safeguarding the nature. The present paper is an attempt to explore the ecocentric as well as the nature centered ethics as valued by the author himself.

The terms ecocentrism is opposite to the term anthropocentrism. The Ecocentrism believes in nature as the centre for man while anthropocentrism believes in self-centeredness of man. According to a dictionary, ecocentrism is a philosophy or a perspective that places intrinsic value on all living organisms and their natural environment, regardless of their perceived usefulness or importance to human beings."(Ecocentrism) Ecocentrism is a Greek word which means core. It is used in

environmental political values to denote as nature-centered. An Environmentalist aptly points out, "Ecocentrism can be seen as one stream of thought within environmentalism, the political and ethical movement that seeks to protect and improve the quality of the natural environment through changes to environmentally harmful human activities."(Background Ecocentrism)

Anthropocentrism is also a philosophy and a perspective. Anthro is a Greek word which means human being. It believes human beings to be the most important thing of the Universe and regards the world in terms of human values and experiences. It is considered to be deeply rooted in many modern human cultures and mindful acts. According to a dictionary, "Anthropocentrism is considering human being as the most significant entity of the Universe. anthropocentrism interprets or regards the world in terms of human values and experiences."(Anthropocentrism)

In the *Alchemist*, Paulo Coelho inculcates the ecocentric ethics among the readers. One can examine these ethics in the procedures and thoughts of Santiago, a protagonist. Santiago a shepherd boy and his fondness for the sheep pass on the message of love for the animals, the natural world. Santiago attempts to care for the flock from the wolves gives a message of safety of animals. “He decided to spend the night there. He saw to it that all the sheep entered through the ruined gate, and then laid some planks across it to prevent the flock from Wolves.”(Coelho,1). When Santiago wakes up in the morning, sheep also starts moving. It gives him a feeling that some mysterious energy bound his life to that of the sheep, they are so used to me that they know my schedule,” he muttered. Thinking about that for a moment, he realized that it could be other way around: that it was he who had become accustomed to their schedule.”(Coelho,2) Santiago believed that sheep were able to understand what he said. So he read them parts of his books that made an impression on him. He would tell them of the aloneness or the happiness of a shepherd in the fields. Sometimes, he would also speak to them regarding the girl, the daughter of a merchant.(Coelho,4) It suggests that man and animals can recognize their feelings. As a shepherd, Santiago shares his feelings and emotions with the animals. He closely examines them and their schedule which make him to understand them.

Santiago not only watches the animals but also learn from them. It is evident from his conversation with a merchant’s daughter, “Well, usually I learn more from my sheep than from books.” (Coelho,5). The ecocentric principles can be noted when Santiago considers the slaughter of sheep as a monstrous and ugly act. He believes that the sheep trust him and rely upon him; therefore he senses that he owes a great responsibility to protect them but not to slaughter them. “If I become a monster today, and decided to kill them one by one, they would become aware only after most of the flock had been slaughtered, thought the boy. They trust me and they have forgotten how to rely on their own instincts, because I lead them to nourishment.”(Coelho,7)

Coelho’s ecocentric views can be expounded when we find Santiago’s mounting interest for nature, desert and sea. On his expedition to find the treasure, he comes across many creatures and things on the earth. He begins to gain knowledge of many things from the animals, things and desert. He is also impressed by their rudimentary forces. “I’ve learned things from the sheep, and I’ve learned things from crystal, he thought. I can learn something from the desert, too. It seems old and wise.”(Coelho,70). Santiago travels in the desert, by adapting himself to the surroundings. Later on when he reaches Oasis where water, palm trees and shelter

and other people were present, he reminds about the importance of nature in man’s life. He believes that instead of reading a book, he could be benefitted by observing the caravan or people, wind and camel. He can find out many things from them. “The boy too had his book and he had tried to read it during the first few days of the journey. But he found it much interesting to observe the caravan and listen to the wind. As soon as he had learned to know his camel better and to establish a relationship with him, he threw the book away.”(Coelho,72). The author thus insists on the good understanding between man and nature.

Coelho as a believer of ecocentrism, reveals that it is man’s accountability to save and guard earth and nature. According to him, Earth and nature are indivisible things in human life. Everything on the earth add in the development of man. It becomes obvious when Santiago say’s “Everything on Earth is being continuously transformed, because the earth is alive... and it has a soul. We are part of that soul, so we rarely recognize that it is working for us.”(Coelho,75).The importance of Earth and nature becomes coherent with Santiago’s reflections over the nature. He also supposed that everything on the earth had a soul. “He also said that this was not just a human gift, that everything on the face of the Earth had a Soul, whether mineral, vegetable or animal-or even just a simple thought.(Coelho,75).

Santiago’s impressions on trees and animals also accentuate the significance of nature. The impulses he receives indicate many things, which Santiago calls as a world language. “Although the vision of the date palms would someday be just a memory, right now it signified shade, water, and a refuge from the war. Yesterday, the camels groan signaled danger, and now a row of date palms could herald a miracle. The world speaks many languages, the boy thought.”(Coelho,82).

Santiago observes the Hawks as they drift on the wind. Their flight made a kind of sense to him. He observed their movements and tried to read something into it. He believed that the birds were trying to explicate him the meaning of love. “ I am learning the language of the world, and everything in the world is beginning to make sense to me... even the flight of the hawks,” he said to himself. And in that mood, he was grateful to be in love. When you are in love, things make even more sense, he thought.”(Coelho,95). Santiago senses the language of Hawks as a message of love. Through the character of Santiago, the writer promotes the message of love to fellow human beings as well as to the natural world. Moreover, Santiago observes and learns the language of the horses to get very close to the nature.

Santiago’s impressions on the natural world and resources also confirm Coelho’s ecocentric

beliefs. According to Coelho, natural world bear a resemblance to paradise. God created it for the humans and he desires men to understand the wonders of nature. If they are wise enough to realize ecocentric ethics, they can create a paradise on earth."The wise men understood that this natural world is only an image and a copy of paradise. The existence of this world is simply a guarantee that there exists a world that is perfect. God created the world so that, through its visible objects, men could understand his spiritual teachings and the marvels of his wisdom."(Coelho,121). Coelho believes that even a single grain of sand will lead to a great wisdom to know the desert and its creatures. "You are in the desert. So immerse yourself in it. The desert will give you an understanding of the world; in fact, anything on the face of the earth will do that. You don't even have to understand the desert, all you have to do is to contemplate a single grain of sand, and you will see in it all the marvels of creation."(Coelho,122). When humans figure out the marvels of creation, they simply begin to love the nature and conserve it.

The conversation between the boy and the desert, also between the boy and the wind create his great understanding of the nature and earth. The shepherd boy considers that all the creatures on the earth are mutually dependent, which is nothing but the ecosystem. The interdependence of man and creatures and nature can be evidently seen, when the boy say's, "That's why you are created the game in the first place to nourish the falcon. And eventually, man will nourish your sands, where the game will once again flourish. That's how the world goes."(Coelho,138).The shepherd boy spreads the message of love among the creatures saying the soul of the world. He believes it is love that binds all together; so the soul of the world becomes one thing only."(Coelho,143) In his dialogue with the Sun, Sun's comments are remarkable for ensuring the interdependence of creatures on the earth."From where I am, "the Sun said, "I can see the soul of the world. It communicates with my soul, and together we cause the plants to grow and the sheep to seek out shade. From where I am and I am a long way from the earth- I learned how to love. I know that if I come even a little bit closer to the earth, everything there would die, and soul of the world would no longer exist. So we contemplate each other, and we want each other, and I give it life and warmth, and it gives me my reason for living."(Coelho,143). The words of Sun reflect his views about love that connects everything together and gives a motive to live a life.

In the Alchemist, the glimpses of anthropocentric values can be seen where, man is self-centered. As a human being, the shepherd boy also longs for treasure. In order to fulfill his dreams,

he sets out on journey in the search of treasure. In order to gain treasure, he travels from his home i.e. Spain, to the exotic deserts. He eventually meets the Alchemist, who possesses the good judgment to convert a metal into gold.

On his journey to fulfill his dreams, Santiago denies his father's desire to see him as a priest. Instead, he tells his father that he didn't want to become a priest, but wanted to travel. He was able everyday to live out his dream. He wanted to make his life likable by making his dreams come true. He even dreams of a girl, who turned out to be Fatima. On the way to find his treasure, he meets Melchizedek , an old man, who promise him to tell the way to find the hidden treasure, that helps him become conscious of his destiny. When the occasion of making a choice between the flock and treasure arises, he influence towards treasure.

Coelho advocates the message of love and belief in God. He states that people cannot control their feelings. When good things happen in their life, they become happy and if bad things occur they endure. They overlook the present. But Coelho counsels that men should live in the present and leaves the future for God. He accentuates that God reveals the future, so man should live in the present following the teachings of God. "The future belongs to God, and it is only he who reveals it, under extraordinary circumstances.... If you pay attention to the present, you can improve upon it. And if you improve upon the present, what comes later will also be better. Forget about the future, and live each day according to the teachings, confident that God loves his children. Each day, in itself, brings with it an eternity."(Coelho,99)

Till the last part, Santiago follow his dreams, wishes and pursue till the end. His mind always filled with the thoughts of the loved one, i.e. Fatima. Similarly, his mind and heart are longing for the treasures that were hidden in the deserts. But in the search of his dreams and treasures, his heart and mind comes across with God and eternity, which reminds him about the true treasure. When he finds his wealth and fulfills his dreams, he retains information to his love, Fatima, to be a true treasure.

The writer thus advocates the philosophy behind ecocentrism and anthropocentrism. He advocates that ecosystem and its values are inseparable from human centered ideas. But the combination of both ecocentric and anthropocentric values contribute in creating a healthy earth and healthy minds. Through the character of Santiago, Coelho expound the implication of ecosystem and the ethics of humans on the earth, for creating healthy minds on the earth. He believes that, despite of the Global warming and other natural disasters, man can raise himself from those obstacles for living a good life. An Environmentalist aptly said, "The best choice for

nature and mankind to co-exist is to develop and embrace environmental ethics; from understanding the idea of anthropocentrism and ecocentrism, and from being an individualist, to showing concern about the globe that we are living.”(Wu an Ching) Santiago’s positive perspective towards life on the earth elevates him from his ordinary being. His association with the Alchemist inspires his pursuit for destiny. The shepherd boy through his actions and thoughts conveys the message of love for nature and for fellow human beings. He even advocates the love that speaks the language of the world. He at the end of the day learns that everything in the world is a treasure; if we are happy. The character of shepherd boy is influential to value the nature. His manners reflect the idea that anthropocentrism and ecocentrism recognize that man’s well being is dependent on the well being of ecology. Therefore, man should realize that the understanding the ecology is the primary duty of man thus saving the lives of human beings from any sort of devastation. In the Alchemist, the writer exposes the significance adaptation of ecocentric and anthropocentric values

through the character of Santiago. The thoughts and actions also imitate the philosophy of nature centered values which contribute in the creation of perfect human beings.

Works Cited:

- 1) “ecocentrism.”Def.1dictionary.com.August2018 ,web.(n.d)
- 2) <https://www.dictionary.com/browse/ecocentrism>.
- 3) “backgroundecocentrism.”Wikipedea.org.August2018,web.(n.d).
<https://www.en.m.wikipedia.org/wiki/ecocentrism>.
- 4) “Anthropocentrism.”Wikipidea.org.August2018 ,web.(n.d)
<https://en.m.wikipedia.org/wiki/Anthropocentrism>.
- 5) Coehlo,Paulo.*The Alchemist*. India:Thompson Press Ltd,1995 print.
- 6) Wu an, Ching. “Foreword, Anthropocentrism vs Ecocentrism.”Web 7 may 2015.
<Http://prezi.com/tjumjtqzgr80/anthropocentrism-vs-ecocentrism>.



A STUDY ON ENVIRONMENTAL PERSPECTIVES OF AMITAV GHOSH'S THE HUNGRY TIDE

G.PREMA

Guest Lecturer in English, Government Arts and Science College, Tirumangalam,
Madurai

Corresponding Author- G.PREMA

Email:- premamathavan@gmail.com

DOI- 10.5281/zenodo.7295532

Abstract:

Nature and literature have always had a tight association, as proven by poets' and other writers' works throughout history in practically all societies. Many writers have emerged in the twenty-first century to show the relevance of environmental concerns and their profound connection to literature. Amitav Ghosh is one such writer. In a country like India, where ecosystems range from the Himalayas in the north to the Indian Ocean in the south, and from the Sunderbans in the east to the parched Thar in the west, the relationship between nature and society is particularly important. The purpose of this study is to analyse Amitav Ghosh's novel *The Hungry Tide* in order to see how far an ecocritical approach enriches the story.

Key Words: perspective, illuminate, ecological, humanity, resettlement and environment

Introduction

The current environmental situation is a nightmare for humanity. It is a worldwide problem, not just a regional one. The planet's support systems, such as land, water, and air, appear to be spoiled. Every day, the newspapers report on various forms of pollution and environmental devastation. Pesticides polluting food chains, rubbish dumping in waterways, and noxious fumes devastating towns are all commonplace in today's world. Today, we are oblivious to the dangers of global warming and acid rain destroying the top soil. Species diversity is rapidly dwindling. You might never realise that there was an earth at all. Glotfelty writes in one of his works. Our current environmental disaster is the result of our western-based scientific, technological, economic, and cultural thinking and philosophy. It is necessary to alter these different lifestyles. With the rise of rationalism in philosophy, the Renaissance, Reformation, Newtonian physics, and the growth of technology, man grew arrogant and harsh to nature, and his pride drove him to commit ecological sins. All of these adventures instilled in man an adventurous spirit.

Environment is a broad ecological study that includes and excludes diverse discourses, but has a global reach. It also seeks out collaborations with other disciplines, resulting in a diverse spectrum of ecocritical approaches such as ecofeminism, green studies, environmental justice, and land ethic, among others, to define ethical conceptions that will address environmental concerns. Environmental issues have posed an unforeseen threat to both human culture and Mother Earth in recent years. We are on the verge of trench because to widespread misuse of regular assets. The rainforests are being cut down, petroleum products are rapidly disappearing, seasonal patterns are being jumbled, and biological disasters are occurring all over the world, and our current situation is on the brink. Under these circumstances, Ecocriticism evolved as a new way of looking at natural composition in the last two decades of the previous century. It is a significant development that arose as a result of man's domineering behaviour toward nature.

This research attempts to investigate ecocritical ideas as expressed in selected novel writing as well as Indian English writing. This naturally situated writing

study develops environmental competency among people who are becoming environmentally conscious and, as a result, paying close attention to Mother Nature. Because ecological worry is one of the most pressing issues of the day, Ecocriticism has seen rapid development in the short time since its debut. It is an interpretive tool for examining nature composition that is commonly associated with environmental analysis, animal studies, green cultural studies, ecosophy, ecology, ecofeminism, ecospiritualism, and other related topics.

Nature is a branch of ecological science that focuses on the relationships between organic beings and their existing situation. Ramdeo Misra (1908-1998) is known as the Father of Indian Ecology because he made significant contributions to the field of ecology in the Indian context among his contemporaries. In India, he built the foundations of ecology. He was instrumental in the development of ecology as a key discipline for teaching and research in India's traditional divisions. Scholarly and social frameworks have shaped how we perceive and interact with the environment in which we live. The natural discussions include both imaginative and realistic efforts to secure our place in the infinite plan. In the person, narrative, and setting, thoughtfulness about the climate demonstrates the point of interaction and impact of orientation, racism, class, legislative issues, religion, and so on. As we look fundamentally and inventively at the point of interaction of "Environment and Literature," we need to evaluate such projections as we look fundamentally and inventively at the point of interaction of "Environment and Literature."

Natural concerns have been present in Indian English fiction to varying degrees. Residents venerate the canal Kanchamma in early Indian fiction like Raja Rao's *Kanthapura*, just as Hindus all around India adore the Ganga. The river Sarayu has a significant impact on several characters in R.K. Narayan's *Malgudi*. There is evidence of a hideaway across the stream, as well as wilderness clans on the slopes, making it a perplexing location immersed in the essence of the place. We see the vile effects of urbanisation later in Kamala Markandaya's

writings. Any climate speaker must have a strong attachment to their newly acquired land. In her story, *Nectar in a Sieve*, industrialisation and the dry season are depicted as a man-made and natural onslaught on the poor. He is obligated to go to the city with his better half to beg because he is too elderly to take any other trade. The entrance of Rahel to Ayemenem across the Meenachal river, which welcomed her with a terrible skull, with openings where teeth had been and a limp hand raised from a medical clinic bed, reveals Arundhati Roy's environmental concern for protecting nature assets like water. Due of the violation, Roy depicts the stream as being confined and deliciously weed-filled.

Critical analysis of the novel

The Hungry Tide is a prescient novel complete of insight, beauty, and humanity. Nature's existence is unthinkable without human life. Man recognises his reliance on the abundant flora and fauna. The riches of the lovely planet are not limited to the creative and aesthetic aspects of existence. It is a necessary prerequisite for survival. In the current climate of environmental concerns, ecological literary criticism, like any other literary motion, is gaining traction. The name of this text refers to Amitav Ghosh's novel *The Hungry Tide*, that is situated in the international's largest mangrove ecosystem, the Sunderbans, and explores the interplay of landscape, water, human beings, and their way of life. The tide, that's always hungry, comes in twice daily, causing the land to constantly reshape and uproot anything everlasting. For the duration of India's division in 1947, a large variety of east Bengali Hindus moved to West Bengal. Hindus from higher social instructions had been particularly focused through low-earnings Muslim tenants. They fled to Calcutta and sought safety in the homes of their wealthy friends and relatives. Low-income Hindus, on the other hand, 'squatted' on both public and private land. The Sunderbans' tides reach approximately 300 kilometres inland, and hundreds of acres of forest are submerged every day. It reappears some hours later. Powerful currents change the island practically daily.

Two visits to Sunderban network are the focal point of the tale. It is a story of

adventure and improbable love, as well as identity and records, set in one of the international's maximum captivating regions. Amitav depicts americanization as a symbol of globalisation. Piya, with her high-tech gps device, fokir, who represents the nearby identification, and kanai, a delhi inhabitant. While kanai reads excerpts from his uncle's journals, the reader is forced to photograph kanai reading them in bengali, that is a transcultural shift. Lusibari and garjontola are locations cited within the novel. Gosaba, canning emilybari, satjelia, and morichjhampi lusibari and garjontola are made-up characters. Gosaba, satjelia, morichjhampi, and emilybari are real localities wherein east bengalese refugees and different dispossessed human beings live. lusibari becomes the principle recognition-a area within the improvement procedure. Lusibari is a small island with a populace of some thousand people. A number of the residents were descendants of the unique settlers, who arrived inside the Twenties. Others observed, a few following the subcontinent's partition in 1947 and others after the bangladesh war of 1971. Many had arrived even more lately, after the compelled depopulation of different adjoining islands. Their arrival turned into geared toward making area for flora and fauna conservation efforts.

Human agreement in regions exact for flowers and animals, reclamation of coastal regions for building functions, and destruction of mangroves, which function habitat for seabirds, amphibians, and aquatic animals, have all been identified as the root reasons of ecological and environmental issues, in addition to the supply of hungry tides and earthquakes. However, in step with Norwegian logician are names, humans are neither the rulers nor the centre of the cosmos, but rather are immersed in a large residing matrix and difficulty to reciprocal laws. That is made clean in this tale, which concentrates on man's in no way-ending warfare with nature. There are not any borderlines to split clean water from salt, river from sea, and land from water within the marshy terrain of sunderban, an archipelago of islands scattered between the ocean and plains of bengal. Survival is a team attempt for the sundarbans inhabitants

G.PREMA

who've found out to stay in concord with nature.

Not like other forests or jungles, a mangrove forest is its own cosmos. There aren't any tall timber, ferns, wildflowers, or chattering monkeys; mangrove leaves are difficult, and the dense foliage makes visibility tough. Humans can never be certain that the landscape is hostile to their presence, that it is cunning and resourceful, and that it is determined to destroy or expel them. Every year, scores of people are killed by tigers, snakes, and crocodiles in the embrace of that deep jungle. The waves are dangerous here. The tides stretch many miles inland, and thousands of mangrove forests vanish every day, only to reappear hours later. Only the truly destitute and displaced, who are rejected and have nowhere else to go, dare to create a home there. They've moved in to make a life off the desolate, unforgiving saline stretches of land. The males are usually fisherman who eats fish and crabs caught in the river and on the sand. As a result, each day of their life is uncertain, making existence on those islands, often known as tide country and dangerous.

Ghosh weaves ethnography and history together. Ghosh delineates a variety of cultural elements of the tide country's micro community through ethnography. It is about the Utopia community founded in the Sunderbans by visionary Scot Daniel Hamilton around the turn of the twentieth century. Daniel attended school in Scotland, a tough, cold, and rocky environment. His tutors told him that labour conquers everything is the most important lesson in life. When Daniel Hamilton and his people were forced to leave their homeland to pursue their fortune, he picked India. He arrived in Calcutta and went to work for Mackinnon & Mckenzie, a firm with whom he had a familial tie. This company bought tickets for the p&o shipping line, which was on the time one of the international's largest. Daniel, a young guy, labored hard and sold a variety of first class, 2d class, 0.33 magnificence, and steering tickets. Ghosh has done a lot of research and has a unique manner of presenting the evolutionary scheme of creation. He's been obsessed with the presence of animistic creation in that region, as well as its ecological balance. He

provides a wealth of knowledge about the giant dolphin as well as the flora and fauna of the area. He also demonstrates that Sunderban is more than just a meeting point for rivers and the sea; it is an incredible melting pot of civilizations that would be impossible to find anywhere else. It's also a strange love story about Piya and Fokir, two lovers. They spent days and nights on the tree in the vast stretches of the river. Both loves were unable to communicate with each other. Ghosh's *The Hungry Tide* is situated in West Bengal's Sunderbans mangrove islands. *The Hungry Tide* looks at refugee resettlement in the Marichjhapi and Sunderban forest reserves, as well as the complicated Man-Animal dynamic in the archipelagos environment. The constant conflict between people and the environment in the Sunderbans, West Bengal's Tide Country, India and Bangladesh, is the subject of this novel. This study will provide readers with additional information about the novel's unexplored areas.

This work shines whilst it depicts nature's wild, untamable, and livid characteristics, which refuse to comply to human will. Tigers and their human prey, crocodiles, snakes, a huge mangrove woodland, storms, and catastrophic typhoons are all vividly defined in this tale. The hungry tide takes region in the sunderbans, a desolate region of northeast india made from masses of small islands produced through the interflow of rivers as they flow into the bay of bengal. With shifting islands, tigers and other predators, terrible soil, and little interplay with the out of doors international, existence is dangerous. Ghosh discusses the sunderbans' population, their history, and their conflicts with nature. The narrative of sunderban's land and those is brilliant. The human beings are fighting nature, the tide, the storm, the tiger, and the frightening surroundings. The novel objectives to attach the personal tales with the larger tale of the area's ecological and environmental elements. The hungry tide considers no longer most effective environmental conservation and the way it might be finished, however also how we'd start to recognize human diversity as a readjustment between one-of-a-kind sorts of human societies and values, the wealthy, the poor,

G.PREMA

the evolved, the undeveloped, the articulate and the silent. However additionally as a rethinking of the way the human is defined, and how this wishes to represent broader categories of existence across species, and even throughout the concept of the planet's complete interconnected pattern of dwelling forces.

Conclusion

The hungry tide represents the persistent shifts that the sunderbans environment of mangrove wooded islands and mudflats endures due to day by day tidal movements with sections of island being briefly submerged and with seawater. As a creator, ghosh's best gift can be his feel of area. Whilst we are separated from his novels in reminiscence, we don't forget pix of a panorama, a metropolis, and a village on the outskirts of a wasteland. In line with his book, the sunderi tree, because the mangrove is understood domestically, gave the area its call. In his work *The Hungry Tide*, Ghosh makes the broader ecological and environmental approach to his vision quite evident. The effort has been made to show that AmitavGhosh's novel is analysed using an ecocritical approach, and that it will undoubtedly provide readers with a fresh and distinctive manner of reading in the framework of ecological study and approach.

Works Cited:

1. Ghosh, Amitav. *The Hungry Tide*, New Delhi: Ravi Dayal, 2004.
2. Dixon, Robert. Travelling in the West: The Writing of AmitavGhosh, the *Journal of Commonwealth Literature*, 31.1 (1996):3-24. Print.
3. Ghose, Sagarika. *The Shadow Lines: Review of the Hungry Tide*, the *Indian Express*. 27 June 2004.
4. Mrs. Bhasin, Kamini. AmitavGhosh's *The Hungry Tide: Intoning Silence*, *Indian Journal Applied Research*, volume 3, issue 8, August 2013.
5. Anushman. *A Mandal*, AmitavGhosh: *Contemporary World Writers*, Viva Books Private Limited, New Delhi, 2010.



MOBILE APPS OF LIBRARIES: BOON FOR LIBRARY USERS

Dr. Sangaraj Hosamani

Librarian, Sree Narayana Guru College of Commerce, University of Mumbai affiliated,
Chembur, Mumbai

Corresponding Author- Dr. Sangaraj Hosamani

Email:- hosamani2018@gmail.com

DOI- [10.5281/zenodo.7295538](https://doi.org/10.5281/zenodo.7295538)

Abstract

The research paper attempts to describe the importance and adoption of introduction of mobile apps in the context of the library resources and services. As it is evident from the studies that, customized developed mobile apps will play a pivotal role in reaching out to library users in more effective way. Mobile apps will act as collective tool in enhancing the visibility of the libraries with their collection and services anywhere any time to the library users. Because, mobile apps in the context of the libraries is need of the day. Hence, the need arises of requirement of mobile apps for individual libraries in digital age. Especially in order to support today's learning and research in higher educational institutions there is requirement of mobile apps for all the libraries. Mobile apps are aiding in providing the access to the library resources and services at a fraction of seconds to the library users. The changed situation necessitates use of digitally enabled mobile apps for learning and research work in educational institutions. This research paper will also portray how and what are the various components of mobile apps included and play a collective role in reaching out to the users more efficiently. Overall, this research paper also tries to look in to various related aspects of mobile apps more effectively.

Key Words: Mobile apps in libraries, Mobile apps and libraries, Libraries and mobile apps.

Introduction:

The role played by the mobile apps in the context of the libraries is paramount one and also in the context of the study as well as it is need of the day. The major objective of any library is to reach out to the library users with proper accessibility to library collection and services in efficient way. Mobile apps will helpful for the libraries to disseminate library related information from time to time in order to upkeep the information requirement of its users. Because, it will become need of the day for the libraries to include mobile apps development and updation of the same from time to time. Library users will utilize the facilities provided through these mobile apps for their learning and research needs in order to find more efficient and authoritative information for their work. Inclusion of many applications in the

context of library mobile apps are inclusive of digital sources because of emergence of more and more information sources in digital form. It is to be considered as a revolutionary step. It is a step to prepare a libraries to move with the time. Emergence of the mobile apps will be considered a benchmark step in the education sector. Recent study of research suggests that usage of mobile apps by the library users day by day. Thus, it necessitates the libraries to develop the mobile apps in order to reach out to its users any where and anytime with remote accessibility. Accordingly, there will be a need in including mobile apps by the libraries. Undoubtedly, mobile apps will play a greater role in helping the library users in completing their learning and research tasks in time.

Statement of the Problem:

Present research study has basically look into the reasons for developing the mobile apps in libraries of higher educational institutions. Also the role played by the mobile apps among the library users in aiding the learning and research activity. Hence, the research problem selected for the study has to be stated as “ **Mobile Apps of Libraries: Boon for Library Users**”.

Objectives of the Paper:

The research paper has the following objectives,

1. To know the need of mobile apps in libraries.
2. To find out the features of mobile apps.
3. To made an effort in analyzing the review of literature published.
4. To draw the findings, suggestions and conclusions based upon the study.

Purpose of Research Paper:

Basic purpose of this research paper is to know the reasons for developing of mobile apps of libraries.

Research Methodology:

In adherence to the requirements of the objectives of the research study, research design employed for the study is analytical and descriptive type. This research design is adopted to have greater accuracy and in depth analysis of research study. Present research study has its own limitations.

Research Questions to be Raised:

The following researches questions will have to be raised in the context of the study are;

- 1) What are the mobile apps?
- 2) Why there is a need to include mobile apps in library management?
- 3) What are the outcome of the research study?

Definition of the Mobile apps:

Generally, mobile app is a *software application developed and designed for the specific purposes for use on mobile devices like smartphones and tablets.*

Need of mobile apps for the Libraries:

Various recent studies have outlined that the role of mobile apps in supporting the academic needs of library users is crucial one in this digital age. Because, now more

number of digital information resources have been emerged over the years. Hence, the emerged situation necessitates the libraries to have their own mobile apps in order to reaching the library resources and service more efficiently to its users.

Features of The Library Mobile Apps:

Library mobile apps have commonly contained the following links.

- 1) Anywhere and anytime use for the library users.
- 2) Introduction and working hours about the library
- 3) Library services and Library Manpower with contact details
- 4) Access to notices, new arrivals, information literacy guides and SMS services.
- 5) OPAC search
- 6) Full or annotated bibliographical details of text of print collection of books and periodicals.
- 7) Digital resources of books and periodicals like e-books, e-journals, databases ...etc.
- 8) Gives new technological experience to the users.
- 9) Any other relevant information to share with users.

Advantages of Mobile Apps:

In the context of the research paper, we can note down few of the benefits of mobile apps for library users are as follows,

- 1) Anywhere, anytime and remote accessibility to library sources and services for the users.
- 2) Faster accessibity leads in saving the time of the user.
- 3) It gives a new technological experience to library users in searching the digital resources.
- 4) Promotes the habit of self way of searching among library users anywhere and anytime..

Disadvantages:

Few of the disadvantages have to noted down in context of the study.

- 1) Developing mobile apps needs technical expertise.

- 2) Service of the experts in developing these apps require monetary investment.
- 3) Always needs the availability of the proper bandwidth Internet facility.
- 4) Always needs the smartphones charged and also sometimes required to carry portable charger for uninterrupted electricity supply.
- 5) Always one has to sit in front of the smartphones and tablets.
- 6) Sitting longer time in front of the electronic devices emits radiation. It affects health of the users.
- 7) Maintenance problem with non-availability of technicians in need of time and escalating costs for the same.

Tools Used for Gathering Information:

Useful information for the study has been gathered from secondary resources. Available information from secondary sources from the journal article and from the Internet are used. Further, all the information collected from different sources has been collated and presented herewith.

Review of Literature:

Few selected works of the researchers in the field have to be reviewed herewith as part of the research study.

Jearanaiwongkul, W & others (2021):

Authors elaborated on findings of the comparative study on mobile apps v/s chat based mobile applications in academic domain.

Gaikwad, S.D & Khapadre, V.S (2018):

Authors explored the ways to disseminate e-sources through mobile apps.

Salza, P and others (2018): Analysed the results of the study that mobile developers rarely update their apps with respect to the used libraries, and when they do, they mainly tend to update the libraries related to the Graphical User Interface, with the aim of keeping the mobile apps updated with the latest design tendencies.

Manjula, T (2017): Described about the need of creating apps to the library for better service.

Mishra, A. (2017): Published a paper with brief introduction about the Mobile

application technology and its use in library services.

Findings of the Study:

We can note down few of the important findings of the research study are as follows,

- 1) Benefits of including mobile apps for libraries are many.
- 2) Various researchers are published papers on many issues related to advantages of including mobile apps for libraries, which is based upon outcomes of the review of literature published worldwide.
- 3) Mobile apps are providing new technological experience to library users.

Suggestions:

A few important suggestions have been noted down as a part of the discussion have been made herewith. The few suggestions are as follows,

Libraries should go for developing their own mobile apps which will be helpful for library users in many ways. Because, it helps to serve library users in a better way.

Conduct of digital information literacy to library users in using the links of mobile apps by the libraries is a must. Because it will make them self-reliant of their information requirements.

Properly structured digital information literacy skills will play a beneficial role among library users in using the links of mobile apps to the fuller extent.

Conclusion:

It is evident from the research study that, the benefits of including mobile apps are many. Upgradation of the mobile apps is a must from time to time when the need arises on an urgent basis. Emergent situations necessitate the development of mobile apps for all the libraries. Because, library mobile apps are a fact and need of the day for all the libraries. Hence, it is hoped that, study addressed issues related to the theme of the article to some or wider extent.

References:

- 1) Gaikwad, S.D & Khapadre, V.S (2018), Some Mobile Apps for E-resources in Library and Information Science,

“Knowledge Librarian” An International Peer Reviewed Bilingual E-Journal of Library and Information Science Special Issue, January 2018.

2) Jearanaiwongkul, W & others (2021). Mobile Applications vs. Chat-based Applications : A Comparative Study based on Academic Library Domain. 1-6. June 2021,
DOI:10.1109/JCSSE53117.2021.9493834,
Conference: 2021 18th International Joint Conference on Computer Science and Software Engineering (JCSSE).

3) Salza, P and others (2018), Do developers update third-party libraries in mobile apps?, ICPC '18: Proceedings of the 26th Conference on Program Comprehension May 2018 Pages 255–265
<https://doi.org/10.1145/3196321.3196341>.

4) Manjula, T(2016), Library mobile apps: For effective services of library, Journal of libray and ICT,vol.5,Iss.2,ISSN2278-3482.

[https://www.indianjournals.com/ijor.aspx?](https://www.indianjournals.com/ijor.aspx?target=ijor:jlict&volume=5&issue=2&article=003)

[target=ijor:jlict&volume=5&issue=2&article=003.](https://www.indianjournals.com/ijor.aspx?target=ijor:jlict&volume=5&issue=2&article=003)

5) Mishra, A. (2017). Mobile App And The Library Services. International Journal of Information Libraries & Society, vol. 6, Issue 1, July 2017.



VOICES OF THE SUBALTERN FEMALE PROTAGONIST IN VIKAS SWARUP'S *THE ACCIDENTAL APPRENTICE*

Prashant Jambhulkar¹ Dr. Vivek V. Joshi²

¹Assistant Professor, Dept. of English, M. B. Patel College, Sakoli, Dist: Bhandara, MS

²Head & Associate Professor, Dept. of English, PGTD Gondwana University, Gadchiroli, MS

Corresponding Author- Prashant Jambhulkar

Email:- prashtaj@gmail.com

DOI- 10.5281/zenodo.7295534

Abstract

Vikas Swarup's *The Accidental Apprentice* is a novel delineating the social and economic scenario of India in the twenty-first century. The protagonist of the novel is a sales-girl from a middle-class family. She tolerates and suffers the subaltern treatment by the patriarchal society, by the employer and by the road ruffians. She faces physical, mental and economic crises, but she shows boldness and courage to get rid of all social and personal problems. She deals with various issues like child labour, forced marriages, scams, corruption in politics, government offices, and the medical profession, taboos, myths, casting couches, casteism, and biased social attitudes towards women. The novel displays the voices of the subaltern female protagonist.

Keywords: Subaltern, voice, underprivileged, deprivation, exploitation

Introduction

In *The Accidental Apprentice* (2013), Vikas Swarup introduces a middle-class, well-educated Delhi family. The novel is a good example of captivating crime fiction. Sapna Sinha resides in the LIG colony with her mother and sister Neha. The LIG Colony is a residential area for the middle-class. LIG stands for "Lower Income Group." She is working as a salesgirl in a store. One day, a man approaches her and introduces himself as the CEO of one of the biggest firms in India as she leaves the store for her lunch break. He explains to her his desire to pass on his vast economic empire to an heir. Acharya offers her the position of CEO to run the Acharya Business Consortium (ABC), with the one condition being that she passes seven tests from the "textbook of life." She will then own the greatest lottery ticket in history. All the incidents she comes across after that are connected to the seven tests. While dealing with other characters in the novel, the protagonist, Sapna Sinha, experiences subordination, deprivation, gender discrimination, and other sorts of conflicts. There are many characters in the novel who are victims of being subaltern, but this paper will critically analyse the voices of

the suffering of the subaltern female protagonist, Sapna Sinha, in the novel.

Subaltern

In the latter two decades of the 20th century, particularly as a result of globalisation in Third World nations, Subaltern Studies, Postcolonial theory, and critique gained importance. As suppressed cultures' historical circumstances are typically ignored by historians, subaltern authors strive to guarantee that these backgrounds are addressed. In postcolonial studies, the term "subaltern" is most frequently employed. The roots of subaltern studies may be found in Later mediaeval England used the term "subaltern" to designate a servant or peasant. In England, throughout the seventeenth and eighteenth centuries, foot soldiers or troops of inferior rank were referred to as subalterns. A subaltern is a person who occupies a lower or inferior position. Antonio Gramsci coined the term for the first time in his work *Notes on Italian History* that was published in *Prison Notebook*. He described the "subaltern" as the oppressed underclass in a society where the ruling class exercises hegemony.

'Subaltern' is a British word for someone of inferior military rank, and combines the

Latin terms for "under" (sub) and "other" (alter) (Abrams 307).

Gayatri Chakravorty Spivak's definition and political understanding of the subaltern, on the other hand, differs from Gramsci's. According to Spivak, the subaltern is unorganised and rarely speaks, implying that they do not represent themselves politically or textually. Subalternity, she believes, is defined by representation and organisation, and once these are achieved, the subaltern ceases to be subaltern. The subalterns, according to Spivak, are portrayed as the "Other" inside dominant, elite ideology and leave little to no evidence of their existence in elite, colonial works. In order to highlight the unequal, scattered, and varied conditions of gendered subaltern, Third World, and marginal women, she aims to re-locate them through feminism. In this essay, *Can the Subaltern Speak?* Spivak raises a subject that will be a key area of discussion in postcolonial feminist literature: whether and how oppressed women can talk, act, and represent for themselves in the face of oppression. Even if there are many hurdles standing in the way of obtaining such "voice-consciousness," postcolonial feminist discourse works to create a place where the "gendered subaltern" can say this "counter sentence."

Voice

The theoretical integrity of the concept of voice may be quite helpful in the investigation of academic discourse. The diverse theoretical and methodological techniques that study on voice in academic institutions has utilised have resulted in a more complex construct that includes and recombines both individual and society viewpoints. These interpersonal and dialogic aspects of writing need to be further studied since they are essential to how academic publications are interpreted. Voice includes things like position, self-representation, and authorial presence.

Critical Appreciation

The paper attempts to explore and critically analyse the conflicts and sufferings of the subaltern female protagonist in the novel. She is from Delhi, working with electronic store as a sales girl. She confronts with problems and unexpected physical, social and economic calamities in her live.

'Hello,' I answer... 'One week is all you've got. Pay up or leave,' he says, and terminates the call. (Swarup 22-24)

Deenu Uncle wants them to leave the apartment since he urgently needs money to build a new location for his restaurant. He made a strong demand that they either leave the apartment or pay one year's rent in advance. His tone changes when he warns her. She must manage the advance within a week. She doesn't make any preparations and accepts the agreement. She does not have a savings account or an emergency fund. She grows numb when demands come knocking at her gate. However, female individuals like Sapna have the courage to face the disaster without a purpose or strategy. She has confidence in her and knows she will act if given the chance. She accepts the deal, not knowing how to manage any crisis without a backup plan. This shows her art of management.

A newlywed couple approach me for advice on buying the right television... He sighs and heads into the pub, probably to drown his disappointment in drink. (Swarup 28-29)

To avoid running into Raja Gulati, the annoying playboy son of the showroom owner, she leaves the counter and exits out the backdoor. He is an alcoholic and a young man of vice. With one of the shop's salesgirls, he had an illicit liaison. He is now attempting to seduce Prachi and Sapna. Instead of doing him a favour, Sapna believes she would prefer to consume live cockroaches. She flatly declines Raja's invitation to go for a drive. He looks at her physique and stares longingly at her legs. The subsequent query is degrading and disgusting. He queries her about whether or not she would be open to having sex with him. She responds indignantly, while burning with rage. The owner or the son of the owner does not have the right to approach a sales assistant at Gulati and Sons and seek sex or to speak to her in slang. She works for the showroom and is neither a slave nor a servant of Gulati & Sons. However, employees frequently encounter this kind of slur and attitude, especially young girls. To keep their jobs, the employees must put up with this. No right exists for the employer or his family to molest their employee.

'But my work doesn't get over until ... 'Go, then,' he says resignedly, caving in to my emotional blackmail. (Swarup 37-38)

In India, the mother's health issues provide compelling justification for requesting an urgent leave from work. Her strategy is successful, and she is allowed to leave the store. She is granted permission on this basis by a crude, haughty, and soulless guy like Madan. Private sector employees are expected to put in more effort and stay on the job longer. They cannot leave before the departure time unless there is a valid and important reason for doing so. To obtain permission to depart early, they must lie to the seniors, endangering the health of their mother in the process.

The first thing I do after leaving Acharya's office is proceed to...I swagger out of Deenu's house and hail another auto-rickshaw. (Swarup 46)

She chooses to accept Acharya's offer. She hurries to Deenu Uncle's apartment as soon as she signs the contract and receives the two-lakh rupee payment. She quickly gives him the advance payment and insists, like a tenant would, that the apartment be painted and repaired. It feels to Deenu uncle like a sharp smack in the face. The way she is acting and the way the advance rent is set up astounds and surprises him. When Deenu Uncle's demands are met, however, he turns conceited. Both Deenu Uncle and Sapna's father are from middle-class households. Being a teacher and not having a lot of money, Sapna's father assisted Deenu uncle. But everything is gone from his memory. After Deenu Uncle's demand and the loss of gold bangles, Sapna maintains her heart, mind and unexpected situation.

In the afternoon the manager calls me to his cubicle...For now, however, I simply nod and swallow my pride. (Swarup 56-58)

Sapna has to travel to Chandangarh on the day of her sister's death anniversary. Madan promises to provide her with all the necessary funds. Sapna anticipates being handed a cab to take her to Chandangarh, but Madan rejects her demand. When the employer issues an order, the employee is left with no other choice. The safety of female employees is never considered by the employer. Any male employee might have been assigned to the demo, but due to the

customer's persistence and the employer's directive, she must comply without hesitation. Workers like Sapna are unable to object to or refuse inconvenient or unpleasant employment. Female employees are dispatched to isolated communities as part of their job description just for the demo of household equipment. There is no regard, favouritism, or sympathy for female employees.

The entire store basks in the reflected glow of the celebrity visit ... you'll ask her for her autograph.' (Swarup 130-133)

The presence of an actress has cast a warm glow across the entire showroom. However, such joy does not endure long. She returns to Gulati & Sons just after an hour, agitated and angry. She has misplaced her engagement ring, which she believes may have fallen off her finger and into the store. Priya doubts Sapna that she has stolen her ring. Priya requests that a physical search be conducted by the police out of frustration and dismay. Being helpless, Sapna is compelled to participate in the physical search while feeling violated. Sapna's underarms are examined by a female constable on her body. Priya is devastated since her boyfriend gave her a ring that costs twenty million rupees. Everyone in the store stares at Sapna with pity and gloating when Priya leaves the shop. Co-workers of Sapna attempt to relieve her stress and embarrassment. While Sapna saw it as an act of humiliation, Priya and the police see it as a form of search.

I insert the knife inside my purse and quicken my steps ... I've never felt more relief in my life than at that climactic moment. (Swarup 172-177)

Sapna put the knife in her handbag after she had bought it. Moving swiftly in the direction of the Japanese Park. The region is infamous for its killings and run-ins. It is dangerous to pass through at night. The three young boys start to follow her as soon as she enters the park via the gate. Her physical harassment by the thugs begins. She threatens to use paper spray to blind them. Albeit in vain. They dare to go close to her. She remembers the knife she just bought. When she pulls out the knife to threaten them, the gang's leader reveals that she has a pistol aimed at her in the face. She fears being raped and realises it might

happen at any time. She wrestles with her identity. She should not be treated like a plaything or an animal because she is a woman. She kicks one of them as she boils with rage. She gets ready to battle so she will not get killed or raped. She feels that she ought to pass away before anything negative is done to her. The sound of the police siren and a voice telling the girl to leave are both heard abruptly. The moment the ruffians hear the authoritative voice, they flee. Karan is the one who frees her from the thugs by using his voice. Her breathing returns to normal. The women are still in pain as a result of these terrible and catastrophic tragedies. In the largely male-dominated culture, women appear to be subaltern.

*Raoji meets us on the terrace of his house...
'Get out of my house, both of you.'* (Swarup 206-209)

The last rehearsal is in Raoji's bungalow, where Sapna and Neha go. With orange juice and a Diet Coke for Neha, they are welcomed. The juice started to taste strangely all of a sudden, causing her a headache and the want to throw up. Her senses are fading. She realises that Raoji could have given his aide the order to lace her beverage. Raoji invites Neha to accompany him to the studio, explaining that he is blind and needs assistance. Sapna tries to prevent Neha from going to the studio when she overhears his move. But her brain, body, and mouth seem paralysed. Neha and Raoji have arrived at the studio. She smashes the scotch bottle on the floor, and then stabs the bottle's sharp edge into her left leg to bring her to consciousness. She hurries to the studio where Neha and Raoji are tangled up on a couch. Her waist is tightly gripped by Raoji's arms as he tries to kiss her, but she is valiantly attempting to break free of his passionate hold. Sapna yells in fury and makes Neha free from his grasp. Sapna strikes him in the solar plexus with her right leg. He hits her and cries out in agony. In exchange, she is spun around by him, her face being pushed up against the wall while her arm is twisted to the breaking point. The rehearsal is ended by him. He attempts to hypnotise and track the victim while him dumbing down to carry out his sexual assault. Neha would have been the second victim of his passion if Sapna had not

been accompanying her. Women are not treated as persons with choices, goals, ambitions, dreams, or, most importantly, self-respect by people like Raoji; rather, they are treated as sex objects.

*'I can't wait,' she wails.... she dashes out of
the building
like someone escaping a raging fire.* (Swarup 302-303)

Sita hits Sapna and verbally criticises her for declining to buy her a kidney. Tilak Raj advises Sapna to avoid playing on the poor people's emotions because doing so might result in significant financial loss for her. Although she has no desire to harm Sita, she must refrain morally from purchasing a poor person's kidney. Who will buy her kidney, asks Sita as she sobs for her son? Tilak comforts her by promising to sell her kidney to someone else. In a private hospital, Sita's son is receiving leukaemia therapy. Ten thousand is required for his therapy. Sapna, who has a good heart, offers her monthly take-home pay of ten thousand rupees. Sapna is liberated of the evil notion of purchasing a kidney from a needy woman. Sapna provides the needy woman her monthly income despite her inability to assist her and without any sort of obligation.

*The true worth of a job is revealed by the
amount of time it...
and I am glad to be rid of it.* (Swarup 322-323)

Because Sapna was compelled to report on the anniversary of her father's demise, she decides to resign from Gulati & Sons. She is actually tired of Raja Gulati's bad behaviour. After quitting her work, she feels relieved, like she has been let out of jail. She is relieved to quit her boring job where she had to commute daily from the subway, interact with clients, and obey the boss's and her boring co-workers' boring commands. Sapna is a sensible young lady. She must pursue her goals. She is forced to step down. She leaves sooner than she intended to since she values her freedom and self-respect. She aspires and deserves the position of CEO of a large.

*Overcome with hunger and
exhaustion...remands me
to police custody for seven days.*
(Swarup 350-351)

Vinay Mohan Acharya is already deceased when Sapna arrived at his house to greet him. He was stabbed with a knife by someone. As soon as she discovers his death, she leaves his bungalow. The next morning, police arrested Sapna. She has been charged with murder and is being escorted to the police station. Her things have also been taken into custody, along with fingerprints, a DNA sample, and mug shots. She is brought before a magistrate, who rejects her request for bail and sends her for seven days to police detention. She is detained since she was Acharya's lone visitor when he was killed. Although she lacks evidence, she is innocent. Acharya's murder was premeditated in an effort to place the blame on her. She has reasons for doing this, as several people overheard her threatening to murder Acharya. The acid assault on Neha and her subsequent incarceration for murder had completely shattered her.

I close the letter with tears in my eyes... God blesses us with every day. (Swarup 432-434)

As Karan was responsible for Acharya's death, Sapna gets freed. Vinay Mohan Acharya's brother, Ajay Krishna Acharya, arrives with a letter for Sapna. He makes all of his plans clear in the letter. He had a pancreatic tumour, which was quite painful. He will pass away in a few days. He made every effort to have her serve as the company's CEO. He had no desire to defraud her. He was a devoted parent and teacher who continued to share knowledge even after his passing. She expresses gratitude to Ajay for showing her the letter. The position of CEO of the ABC group was still waiting for her. She declines the offer. She doesn't believe she can manage the firm. She believes in her innate wisdom. She does not feel bad about turning down the offer. The offer is simply a piece of her desire and an unexpected salary for her. She values her family's love and support, her friends' generosity, strangers' compassion, and the tiny miracles that God gives her each day. Satisfaction is the key to living a good life. She is happy with the way she is following through.

Conclusion

The overall analysis of Sapna's character as the protagonist of the novel

shows her sufferings, her position in society, and her struggle to achieve her ambition and identity. She is treated as subaltern and underprivileged; she faces deprivation and exploitation for being a woman, poor and powerless. The protagonist, Sapna, is the leading female character who is projected as a modern girl fighting with the employer, her relatives, the thief, and ruffians on the road, struggling with unexpected financial and physical attack. The novel truly delineates the voices of the subaltern female protagonist, who has the courage to cope up with her personal and social problems. Vikas Swarup has attributed heroic qualities to her in projecting the current scenario of the Indian villages and metros.

References

1. Abrams, M H, Geoffrey Galt Harpham. *A Glossary of Literary Terms*, Tenth edition, Wadsworth, Cengage Learning, Boston, M A, 2012.
2. Baldick, Chris. *Oxford Dictionary of Literary Terms*. 4 ed., Oxford University Press, UK, 2015.
3. Said, Edward (1988), "Foreword," *Selected Subaltern Studies*, Oxford University Press, New York, 1988.
4. Spivak, Gayatri C. *The Post-colonial Critic Interviews, Strategies and Dialogues*. Edited by Sarah Harasym, New York, Routledge, 1990, pp.158.
5. Stein, Jess. editor. *The Random House Dictionary of the English Language*, Random House Inc., New York, 1983.
6. Swarup, Vikas. *The Accidental Apprentice*. Great Britain: Simon & Schuster, UK, 2013, Print.



“A STUDY OF MODERN TEACHING TECHNIQUES IN ACQUIRING ENGLISH LANGUAGE WITH GLOBAL PERSPECTIVE”

Dr.P.R.V.N.KESAVA KUMAR

Hon'ble Chairman, Shodhana Educational Research Foundation, Kadapa

Corresponding Author- Dr.P.R.V.N.KESAVA KUMAR

Email:- kk9966129576@gmail.com

DOI- 10.5281/zenodo.7295540

Abstract

The world is in various stages of social, economic, and demographic transition. Economically and politically, the world has changed more rapidly in the past few years than at any time since 1945. English has come of age as the 'global common language'. It is constantly moulded and altered by new communities of users, whether geographic or digital. But as English advances to become a key basic skill for millions around the world, the world will need to invest in its own competitive advantage by sending more of its best and brightest young people out into the world to share and teach the language.

Key words: demographic, global, interdependent, major, unity .

Introduction-

The present paper deals with the role of English Language and Literature with modern and multiple global perspective in 21st century . The emerging global economy is both competitive and interdependent. It reflects the availability of modern communications and production technologies in most parts of the world. So, do we need to be concerned about the future of the English language in the 21st century? According to the Economist, English continues to be the world standard language, and there is no major threat to the language or to its global popularity. But, changes are coming. English has been playing an important role in our educational system as well as in our national life for a very long time. It developed the growth of nationalism and unity. In the twenty-first century, the entire world has become narrow, accessible, sharable and familiar for all the people living on this earth as English is used as a common language even though there are some variations in habits, cultures, traditions, regions and idiosyncratic aspects. As English has got the common qualities, it has been accepted as the global language among the speakers of thousands of different languages. Since science and technology is progressing, there

are tremendous changes taking place in the lives of the human beings everywhere in the world. As a result, the whole world has become a global village and the people have to maintain good relationship with the others. More people are trying to learn English than any other language in the world. English is the language of political negotiations and international business. It has become the international language of science and medicine. English also opens doors in the academic world. Of course, if the best program in your field is in an English-speaking country, English will give you the opportunity to study with the top scholars. Western universities are attracting more and more visiting scholars, students and professors from all around the world, and their common working language is English. As well as studying and teaching, attending international conferences and publishing in foreign journals are some of the key steps to success in academia. In order to speak at these conferences or publish in these journals, excellent English is essential. Journalists and writers around the world are finding a good command of English to be an increasingly useful skill. Even if you're writing your articles and doing interviews in your own language, with good English you

can get background material from international wire services and papers and magazines from around the world. If you want a career in travel, English is absolutely essential. So, what's stopping you from learning this global language? With all the resources available on the internet and so many other English speakers around the world to practice with, there's never been a better time to start learning English. Pick up a book, learn a few words, or even start a course today and take your first steps towards becoming one of nearly 800 million English speakers in the world.

In this fast changing world, the education plays a major role in empowering students to engage with challenges. The 21st century is rapidly changing one in every dimension of human (economically, socially, and technologically). Due to the rapid changes complex problems are faced by educationists, policy makers, managers and teachers as well. Teachers of 21st century have to create students of 21st century with soft skills. The 21st century teachers need teaching skills content mastery as well as integrating teaching with technology. The teacher development programs are much important. The impact of good teaching is increasingly cited as a major determinant of economic well-being of society. Useful & productive systems of teacher compensation function as an important lever for attracting well-qualified and highly motivated people to the teaching profession. **The Teacher of English** has to overcome many problems if his teaching of foreign language is to be effective. In view of the popularity of every walk of life many people want to acquire his skills in using the language. For students, the skills of listening, speaking, reading and writing are very important. The teacher should be able to impart this skills during a six year course at the school. With compulsory primary education and with a number of students from disadvantaged homes, the teachers task in early stages in particularly baffling. Standards of English has fallen in recent years i.e., another challenge for the teacher. The teacher of English should be a role model in all teaching activities.

The Roles of a Teacher in the 21st Century:

Think about the type of lesson you normally teach:

- In which roles are you often involved?
- Are there any roles in which you have less experience?
- Are there any new roles you might try in the future?

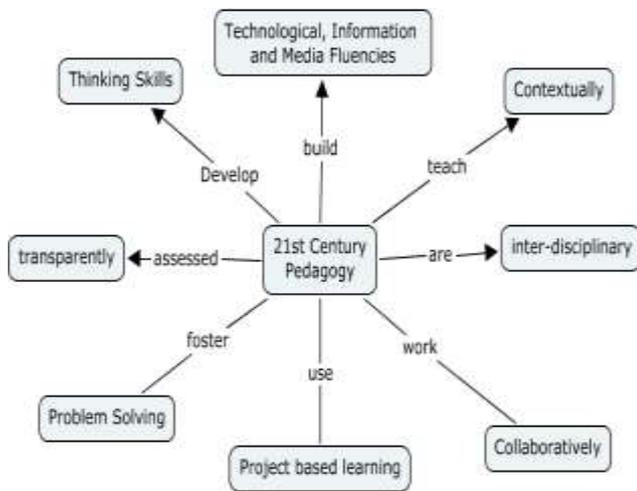
It is clear that the 21st century classroom needs are very different from the 20th century ones. In the 21st century classroom, teachers are facilitators of student learning and creators of productive classroom environments, in which students can develop the skills they might need at present or in future.

“One book, one pen, one child, and one teacher can change the world.”

-Malala

Yousafzai

In the global education industry, one of the world's top education destination is India. Education is regarded as the acquisition of information or knowledge. The process of education includes the transfer of knowledge, skills from one person to another. The recent advances in technology have affected almost every area of our life: such as the way we talk with one other, the way we work together, learn, and teach. These advances became the reason for expansion of our vocabulary, creating new words like Digital natives, Digital immigrants, Digital India, Digital divide and my topic- Role of English Teacher in 21st Century. The 21st century teaching is however a different perspective, learning could never happen the way it is happening these times. Learning happens everywhere, all the time, on any dam topic, assisting any learning style. Now a question is what the “Teacher of 21st century mean”. Great students are the result of great teachers. The student achievement is influence by many factors. The most important influencer is inspiring and informed teacher, so it is significant to have close view on how we train and support beginners, experienced teachers and it makes challenges to every teacher.



“A good teacher can inspire, hope, ignite the imagination and instill a love of learning”.

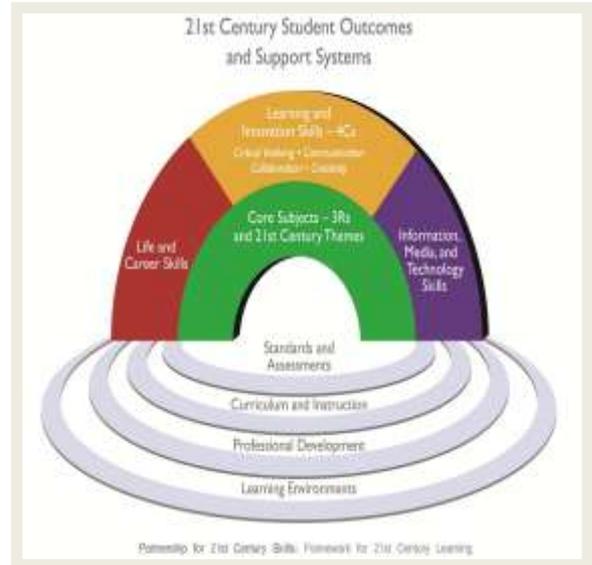
-Brand Henry

Teachers of 21st century have to take in account the needs of their students, prepare them to meet the challenges of future. Teacher’s work is considered complex and demanding. For creating a high quality professional teaching force, it is important to have high quality professional teacher’s development program. The developmental program must incorporate use of technology integration in teaching.



However, before we begin to understand the evolving role of an ESL teacher, let’s outline some of the most popular teacher roles. Harmer, J. states that ‘it makes more sense to describe different teacher roles and say what they are useful for, rather than make value judgments about their effectiveness.’ So

here are some of the most common teacher roles:



Teacher Roles:

Most teachers take on a variety of roles within the classroom, which role do you think most defines your role in the ESL classroom?

- **The Controller:** The teacher is in complete charge of the class, what students do, what they say and how they say it. The teacher assumes this role when new language is being introduced and accurate reproduction and drilling techniques are needed. In this classroom, the teacher is mostly the centre of focus, the teacher may have the gift of instruction, and can inspire through their own knowledge and expertise, but, does this role really allow for enough student talk time? Is it really enjoyable for the learners? There is also a perception that this role could have a lack of variety in its activities.
- **The Prompter:** The teacher encourages students to participate and makes suggestions about how students may proceed in an activity. The teacher should be helping students only when necessary. When learners are literally ‘lost for words’, the prompter can encourage by discreetly nudging students. Students can sometimes lose the thread or become unsure how to proceed; the prompter in this regard can prompt but always in a supportive way.

- **The Resource:** The teacher is a kind of walking resource centre ready to offer help if needed, or provide learners with whatever language they lack when performing communicative activities. The teacher must make her/himself available so that learners can consult her/him when (and only when) it is absolutely necessary.

As a resource the teacher can guide learners to use available resources such as the internet, for themselves, it certainly isn't necessary to spoon-feed learners, as this might have the down side of making learners reliant on the teacher.

- **The Assessor:** The teacher assumes this role to see how well students are performing or how well they performed. Feedback and correction is organized and carried out.

There are a variety of ways we can grade learners, the role of an assessor gives teachers an opportunity to correct learners. However, if it is not communicated with sensitivity and support it could prove counter-productive to a student's self-esteem and confidence in learning the target language.

- **The Organizer:** Perhaps the most difficult and important role the teacher has to play. The success of many activities depends on good organization and on the students knowing exactly what they are to do next. Giving instructions is vital in this role as well as setting up activities.

The organizer can also serve as a demonstrator, this role also allows a teacher to get involved and engaged with learners. The teacher also serves to open and neatly close activities and also give content feedback.

- **The Participant:** This role improves the atmosphere in the class when the teacher takes part in

An activity. However, the teacher takes a risk of dominating the activity when performing it. Here the teacher can enliven a class; if a teacher is able to stand back and not become the center of attention, it can be a great way to interact with learners without being too overpowering.

- **The Tutor:** The teacher acts as a coach when students are involved in project work or self-study. The teacher provides



advice and guidance and helps students clarify ideas and limit tasks.

This role can be a great way to pay individual attention to a student. It can also allow a teacher to tailor make a course to fit specific student needs. However, it can also lead to a student becoming too dependent or even too comfortable with one teacher and one method or style of teaching. What we notice here is that the roles are often interchangeable. The teacher's role is never static. One activity could see an experienced teacher smoothly transition from one role to another.



MULTI MEDIA TOOLS FOR ENGLISH LANGUAGE TEACHING

"I never teach my pupils, I only attempt to provide the conditions in which they can learn."

- Albert Einstein

Technology plays a vital role in developing these characteristics in a teacher. The technology changes constantly and becomes obsolete, but the teacher is constant. They drive the learning spirit among students, day by day, guiding, motivating students to do better every day and make them realize their dreams. There is an urgent need that teachers have to work at the extreme limit. Public education itself struggles with big changes in India, from health epidemics to economic issues. The answer to these challenges of improving teachers' training has a great influence on the student's experiences which they have in classrooms. The States must spend more money on preparation programs and teachers themselves must demand better training.

"If four things are followed- having a great aim, acquiring knowledge, hard work, and perseverance- then anything can be achieved." -A.P.J. Abdul Kalam

Conclusion

The 21st century classroom is created on the premise that students experience what they require to enter the 21st century workplace and live in the global environment. The characteristics of the 21st century classroom therefore set it apart from the 20th century classroom. Lectures on a single subject at a time were the norm in the past. Today, collaboration is the thread for all student learning. For instance, the collaborative project-based approach ensures that the curriculum used in this classroom develops:

- Higher order thinking skills
- Effective communication skills
- Knowledge of technology that students will need for 21st century careers and the increased globalized environment.

While there is certainly a place for teacher-centered, lecture-style learning, the evolving ESL teacher must embrace new teaching strategies that are radically different from those previously employed. The curriculum must become more relevant to what students will be exposed to in the 21st century. Good fruits will only spring from good trees with good roots. Likewise, good foreign language competence will only grow from good experience of success in learning one's mother tongue and second, commonly national, languages.

References

Dr.P.R.V.N.KESAVA KUMAR

1. AhmedHabeeb(2017). https://www.researchgate.net/publication/329880062_HOW_ENGLISH_BECAME_THE_GLOBAL_LANGUAGE/ink/5c1f8e2092851c22a340e03b/download
2. BECAME_THE_GLOBAL_LANGUAGE/ink/5c1f8e2092851c22a340e03b/download
3. Bell, M.A. (2002). Why use an interactive whiteboard? A baker's dozen reasons! Teachers Net
4. Gazette, 3(1). Retrieved from <http://teachers.net/gazette/JAN02/mabell.html>
5. Didi Suherdi (2012), http://file.upi.edu/Direktori/FPBS/JUR._PEND._BAHASA_INGGRIS/196211011987121-DIDI_SUHERDI/ETALASE/21ST%20CENTURY%20ENGLISH%20TEACHER.pdf
6. 196211011987121-DIDI_SUHERDI/ETALASE/21ST%20CENTURY%20ENGLISH%20TEACHER.pdf
7. Haider, Zargham. (2012). Professional Teacher for 21st Century. Journal of Engineering, Science & Management Education, vol-5,issue-II (480-482).
8. & Management Education, vol-5,issue-II (480-482).
9. Hammond, A. (2017). *How did English become the world's most widely spoken language?* –
10. *ESL language studies abroad*. [online] *ESL language studies abroad*. Available at:
11. <https://blog.esl-languages.com/blog/learn-languages/english/english-language-global-number-one/> [Accessed 17 Oct. 2017].
12. *number-one/* [Accessed 17 Oct. 2017].
13. Language, H. (2017). *How English became the global language*. [online] *Global Blog* –
14. *Explore our learning resources*. Available at: <https://englishlive.ef.com/blog/english-became-global-language/> [Accessed 17 Oct. 2017].
15. *became-global-language/* [Accessed 17 Oct. 2017].
16. Partnership for the 21st Century Skills. Available at <http://www.21stcenturyskills.org>. Visited
17. on October 12, 2010.
18. National Council for the Accreditation of Teacher Education (NCATE). (2008). Professional
19. standards for the accreditation of schools, colleges, and departments of education.
20. Washington, DC: NCATE.

21. Siddiqui, M. A. (2011). Teacher education and ICT: Global context, policy and framework. Education in India. Retrieved from <http://mohdakhtarsiddiqui.blogspot.in/2011/08/teacher-education-and-ict-global.html>
23. <https://www.edutopia.org/discussion/9-reasons-why-teachers-should-blog>
24. teachers-should-blog
25. VOA. (2017). *Where Did the English Language Come From?*. [online] Available at:
26. <https://learningenglish.voanews.com/a/where-did-english-come-from/1571948.html>
27. [Accessed 17 Oct. 2017].



STUDY OF INTERACTIONS OF 2-{{2-(CYCLOHEXYLCARBAMOYL) BENZOYL} AMINO}-3-METHYLBUTANOIC ACID (2CA3MBA) WITH BSA AT DIFFERENT PH USING ULTRASONIC INTERFEROMETER AND FT-IR TECHNIQUES

Shrikant B. Thakare¹

¹Arvindbabu Deshmukh Mahavidyalaya Bharsingi, Tah. Narkhed, Dist. Nagpur

Corresponding Author- Shrikant B. Thakare

Email:- _shrikantthakare3@gmail.com

DOI- 10.5281/zenodo.7295542

Abstract:

In this paper we account the interaction of the 2-{{2-(cyclohexylcarbamoyl) benzoyl} amino}-3-methylbutanoic acid (2CA3MBA) with protein Bovine serum albumin (BSA) using ultrasonic interferometer technique. 2CA3MBA solution was added to aqueous solution of BSA and its ultrasonic velocity had been calculated at different composition of BSA and 2CA3MBA on ultrasonic interferometer. Difference in the ultrasonic velocity at different compositions is a measure of binding of the 2CA3MBA with BSA. Binding effect at various pH viz. 3, 4 and 5 shows that 2CA3MBA bound to the BSA more significantly at pH 3 than at pH 4 and 5. Scatchard analysis gives the values of association constants (K_f) 0.5035, 0.5023 and 0.5021 at pH 3, 4 and 5 respectively. Furthermore FT-IR study was done which showed the changes in secondary structure of BSA and confirms the binding of 2CA3MBA with BSA.

Key words: Ultrasonic interferometer, FT-IR, BSA, Association constant, Scatchard analysis

Introduction:

Affinity of drug for protein in blood is one of the efficient biological characteristics of that drug. Human serum albumin (HSA), alpha acid glycoprotein (AGP) and lipoprotein are three major proteins in human blood also called as a plasma protein. Plasma proteins are most abundant protein it comprises 60% of total protein in blood. These proteins perform the function of transportation of drug. HSA primarily binds acidic drugs and acid glycoprotein binds basic drugs [1-2]. Binding of chiral drug to HSA protein is topic of interest as it is measure of metabolism of transportation of drug. BSA in lieu of HSA was used in this paper as it is easily available and showed similar structure bonding chemistry as HSA. BSA is alkaline having 7-8 pH range [3]. There are various forces which are responsible for binding of drug to plasma protein they are hydrogen bonding, Vander wall forces, electrostatic attraction etc. Effect of binding on specific

site of BSA for ciprofloxacin and captopril drugs in presence of specific site probe was studied using equilibrium dialysis [4]. The protein-protein and protein-ligand interactions involved in retinol transport in plasma were studied [5]. Drugs like ibuprofen & naproxen show successive binding to protein [6]. Effect of arsenic on binding of protein with warfarin and acetaminophen had also been observed [7]. Crystal structure analysis of binding of warfarin to BSA was also done [8]. NMR Spectroscopic approach reveals metabolic diversity of human blood plasma associated with protein drug interaction [9]. Effect of arsenic on binding of paracetamol with BSA was studied using equilibrium dialysis method [10]. Thin layer chromatography technique used for study of protein binding interaction of daspone and pyrimethamine [11]. Structure based approach for discovering protein-ligand binding affinity and drug designing from serum albumin

model systems was studied using NMR technique [12]. Affinity and specificity of ciprofloxacin-BSA interaction was studied by fluorescence spectrophotometry [13]. Mass spectrometry-based tools were used to investigate protein-ligand interactions for drug discovery [14]. Interaction of propranolol with glycoprotein was also studied using micro liquid-liquid interface [15]. Comparative study of various techniques for drug-protein binding gives informative knowledge [16]. Study of protein-drug interaction using ultrasonic interferometer can also add valuable contribution in the field of drug metabolism however only few observations are seen in drug metabolism using ultrasonic interferometer. Study of binding of various ligand with serum protein using FT-IR technique also add valuable contribution in this study. Changes in secondary structure of protein due to addition of ligand confirm the binding of that ligand with serum protein. Study of interaction of the bioactive component Jatrorrhizine to human serum albumin shows significant change in secondary structure of HSA [17]. Interactions of human serum albumin with chlorogenic acid and ferulic acid were studied [18]. Study binding of atrazine and 2, 4-D with HSA show partial unfolding [19]. Effect of binding of mitoxantrone with HSA was successfully observed using FT-IR [20]. Quercetin and amantadine successfully bind with egg albumin which form new complex [21].

In this paper we report the simple and useful ultrasonic interferometer technique for the study of interaction of 2CA3MBA with BSA. The compound showing antibacterial activity synthesized using known method [22] and characterized by spectral techniques viz. IR, NMR and Mass spectrometry. Moreover, study of said 2CA3MBA was also done using FT-IR technique and changes in secondary structure of BSA were observed.

Materials and Methods:

For synthesis, all the chemicals used were of A.R. grade of Merck India Limited make 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). ^1H NMR

spectra of the compound were recorded in CDCl_3 on NMR instrument (500MHz) using TMS as an internal standard from SAIF, CDRI Lucknow.

For measurement of binding, ultrasonic interferometer has been used (Mittal model-F-05 with accuracy 0.1%), BSA ($M_r = 66,500$) (make-chemsworth chemical Ltd. India) was used. 0.1M sodium acetate buffer solution of 3, 4 and 5 pH were used.

All the FT-IR spectral measurements were done on a Bruker alpha IR Spectrometer (Germany) at room temperature department of chemistry J.B. College of science Wardha. All spectra were taken via the Attenuated Total Reflection (ATR) method with resolution of 4 cm^{-1} and 60 scans. 50 μM Solution of bovine serum albumin and 0.01M drug solution were prepared in acetate buffer solution of pH 4. Initially the FT-IR spectra of BSA and then complex solution BSA-ligand were recorded under the same condition between range 1300 cm^{-1} and 1800 cm^{-1} .

Measurement of binding affinity:

Set up of ultrasonic interferometer done at 1MHz frequency range and appropriate cell of similar frequency used to measure ultrasonic velocity of sample solutions. BSA solution of 50 μM concentration in aqueous phase using a buffer solution of pH 3, 4 and 5 prepared and ultrasonic velocity of these solutions measured in lack of compounds. Secondly the 0.001M solution of an appropriate drug prepared using a buffer solution of varying pH 3, 4 and 5. Then a mixture of solution of BSA and drug at room temperature in different composition viz. 9:1, 8:2, 7:3, 6:4, 5:5, 4:6 prepared and allow to stand for half an hour and afterward, inserted into the cell to measure ultrasonic velocity. Graph plotted between ultrasonic velocity and percent ligand fraction. From the ultrasonic velocity the values of specific binding obtained. Afterward the Graph of Specific binding Vs Percent ligand fraction plotted for varying pH 3, 4, and 5, from which values of the association constant obtained.

Observation and Result

Experimental observations:

In the first part of the experiment ultrasonic velocity of the BSA in the absence of drug 2CA3MBA calculated at pH 3, 4, and 5 which are 1486.870, 1494.260 and 1498.327 m/s respectively. Furthermore, ultrasonic velocity

for the varying composition of the BSA-2CA3MBA viz. 9:1, 8:2, 7:3, 6:4, 5:5, 4:6 recorded at pH 3, 4, and 5. From ultrasonic velocities, the association constant calculated using the Scatchard plot at pH 3, 4, and 5 which are 0.5035, 0.5023 and 0.5021 respectively. **Fig. 3** show the Graph for ultrasonic velocity Vs percent ligand fraction and **Fig. 4** shows the Graph of specific binding Vs percent ligand fraction at pH 3. Similarly, **Fig. 5** and **6** illustrated the Graph for ultrasonic velocity Vs percent ligand fraction and the Graph of specific binding Vs percent ligand fraction at pH 4 while **Fig. 7** and **Fig. 8** shows the Graph for ultrasonic velocity Vs percent ligand fraction and the Graph of specific binding Vs percent ligand fraction at pH 5.

Experimental observations using FT-IR spectroscopy: -

Initially complex solutions of the BSA-2CA3MBA prepared in various compositions as 10:0, 9:1, 8:2, 7:3, 6:4, 5:5, and 4:6. The solution allows to stand for half an hour, then FT-IR spectrum of this solution recorded. Secondary structure of BSA in absence of 2CA4MBA shows mainly two bands. One of amide I at wavelength 1633.46 cm^{-1} is due to C=O stretching and second band at wavelength 1542.870 cm^{-1} is due to C-N stretching coupled with N-H bending mode as shown in **Fig. 9** by A. On binding with 2CA3MBA, amide I band of BSA shifted to higher wavelength significantly however there is the slight changes in amide II band

References:

1. Albengres E. Urien S. et.al. (1987) Binding of two anthranilic acid derivatives to human albumin, erythrocytes, and lipoproteins. *Molecular Pharmacology*. 31:294-300.
2. M. Otagiri. et.al (2005) A molecular functional study on the interactions of drugs with plasma proteins, *Drug Metab. Pharmacokinetic*. 20: 309–323.
3. Putnam FW. et.al. (1975) The Plasma protein's structure, function and genetic control.
4. New York: Academic Press. p. 141-147.
5. Mahbulal A. Reza N. (2004) Drug-drug interaction between ciprofloxacin and captopril at binding site of BSA. *Biological science*. 7:79- 81
6. Raz A. Shiratori T. Goodman D.S. (1970) Studies on the protein-protein and

wavelength. Changes in value of the wavelength of secondary structure of BSA mentioned in **Fig. 9** below from B to G which confirms that 2CA3MBA shows successful binding affinity with BSA.

Discussion:

Ultrasonic technique shows simple and effective method for interaction of 2CA3MBA with BSA. *2-[[2-(cyclohexylcarbamoyl) benzoyl] amino}-3-methyl butanoic acid* having antibacterial activity show efficiency to bind with BSA. We have studied the novel interaction of this 2CA3MBA with BSA protein using ultrasonic interferometer technique. Study of interaction of this ligand with BSA show successful binding with BSA. The values of association constant at pH 3, 4 and 5 are found to be 0.5035, 0.5023 and 0.5021 respectively. It means that binding of 2CA3MBA with protein BSA is more efficient at pH 3. FT-IR study further confirms that 2CA3MBA shows the affinity for serum protein BSA. Secondary structure of protein BSA in presence of 2CA3MBA show changes in amide I and amide II absorbance value. Amide I value increases to 1643.73 cm^{-1} from 1633.94 cm^{-1} and Amide II value decrease from 1542.87 to 1540.269 cm^{-1} which confirm its binding of 2CA3MBA with BSA.

Acknowledgement:

The authors are thankful to the principal, in-charge, coordinator of the department of Chemistry, Bajaj College of Science Wardha for providing the necessary facilities to carry out the research work.

- protein- ligand interactions involved in retinol transport in plasma. *Biological Chemistry*. 245: 1903-1912.
7. Rahman M. et.al. (2005) Competitive binding of i-bruprofen naproxen to protein. *Pharmaceutical Science*. 18: 43-44.
8. Md. Ashrafal Alam. Riaz Uddin et.al. (2008) Protein binding interaction of warfarin, acetaminophenol in presence of Arsenic. *J Pharmacol*. 3: 49-54.
9. Isabulle petitpas. et.al. (2001) Crystal structure analysis of warfarin binding to BSA *Biological chemistry*. 276:22804-22809.
10. Yuangyuan et.al. (2013) NMR Spectroscopic approach reveals metabolic diversity of human blood plasma associated with protein drug interaction. *Analytical chemistry*. 85: 8601-8.

11. Riaz, U. Nadia, S. et.al. (2012) Effect of arsenic on paracetamol binding to bovine serum albumin using site specific probes. *International Current Pharmaceutical Journal*. 1(11):361-365
12. Ahmad R. A. Roggers H.J. (1980) Pharmacokinetics and protein binding interaction of daspone and pyrimethamine. *BCJP*. 10(5): 519-524.
13. Fielding L. Rutherford S. Fletcher D. (2005) Determination of protein ligand binding affinity by NMR: observations from serum albumin model systems. *Magnetic res. Chemistry*. 43:463-472.
14. Yan H J. Zhang, Y. Liu Y. et.al. (2010) Affinity and specificity of Ciprofloxacin-BSA interaction. *The Protein Journal*. 29: 234- 241.
15. Pacholarz K. Garlish R.A. et.al. (2012) Mass spectrometry-based tools to investigate protein-ligand interactions for drug discovery. *Chem. Soc. Rev.* 41: 4335-4355.
16. Lopes P. Katakya R. (2012) Chiral interaction of propranolol and acid Glycoprotein at a micro liquid-liquid interface. *Anal. chem.* 84: 229-2304.
17. Busch M H. Carles L B. et.al. (1997) Comparison of various technique for study of drug protein binding. *Journal of chromatography*. 777: 311-328.
18. Juan Kang, Yuan Liu et.al. (2004) Interactions of human serum albumin with chlorogenic acid and ferulic acid. *Biochimica et Biophysica Acta*. 1674: 205–214.
19. Ying Li, Wenying He, et.al (2005) Binding of the bioactive component Jatrorrhizine to human serum albumin. *Biochimica et Biophysica Acta*. 1722:15– 21.
20. Purcell M. Malonga H. et.al. (2001) Interactions of atrazine and 2,4-D with human serum albumin studied by gel and capillary electrophoresis, and FTIR spectroscopy. *Biochimica et Biophysica Acta*. 548: 129-138.
21. Khanna S. Islama B. et.al. (2008) Interaction of mitoxantrone with human serum albumin: Spectroscopic and molecular modeling studies. *European journal of pharmaceutical sciences*. 35: 371–382.
22. Bakkialakshmi S. Barani V. (2013) FT-IR study on the interaction of quercetin and amantadine with egg albumin. *International journal of pharmaceutical, chemical and biological sciences*. 3(3): 559-564. Pande S. Utale P. Tekade P. et.al. (2014) Synthesis and antibacterial evaluation of carboxamide derivatives of amino acids. *Pharmaceutical Chemistry*. 48: 29- 33.

Tables

Table 1:- Ultrasonic velocity of BSA-2C3MBA at different pH and Composition

Composition of BSA-2C3MBA	Ultrasonic velocity at pH		
	3 pH	4 pH	5 pH
10:0	1484.700	1492.860	1495.207
9:1	1512.260	1514.870	1519.260,
8:2	1519.870	1518.928	1522.870
7:3	1520.260	1521.260	1522.698
6:4	1518.920	1522.860	1524.260
5:5	1519,870	1519.870	1525.870
4:6	1520.870	1518.684	1525.260

Table 2:- Specific binding values BSA-2C3MBA at different pH and Composition

Composition of BSA-2C3MBA	Specific binding at varying pH		
	3 pH	4 pH	5 pH
9:1	0.5054	0.5038	0.5039
8:2	0.5058	0.5045	0.5046
7:3	0.5060	0.5048	0.5045
6:4	0.5057	0.5052	0.5048
5:5	0.5058	0.5047	0.5049
4:6	0.5060	0.5045	0.5049

Figures

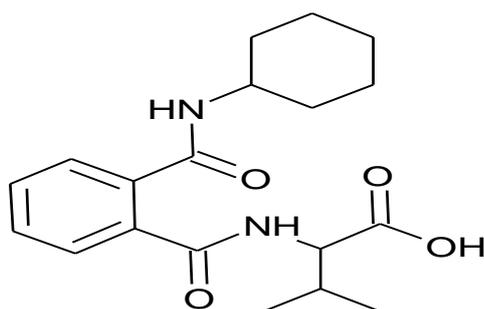


Figure 1. Structure of 2-[[2-(cyclohexylcarbamoyl) benzoyl]amino]-3-methyl butanoic acid.

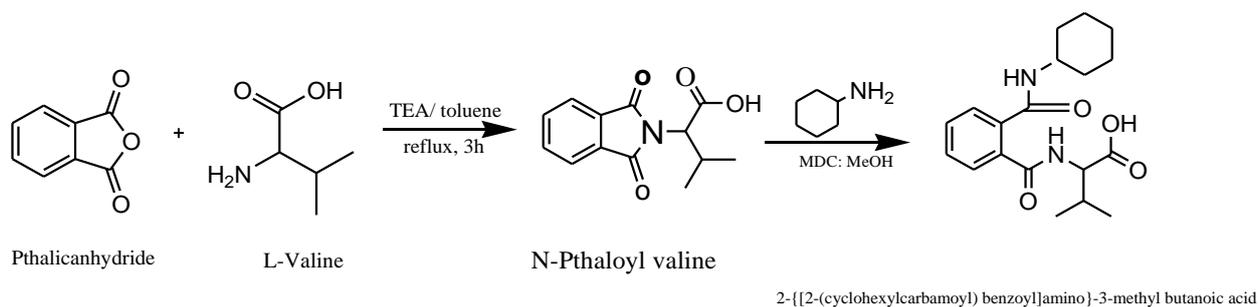


Figure 2: Scheme for the preparation of 2-[[2-(cyclohexylcarbamoyl) benzoyl]amino]-3-methyl butanoic acid (2CA3MBA)

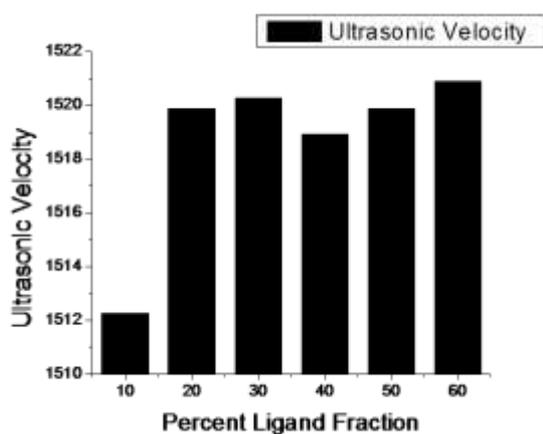


Fig. 3:- Ultrasonic velocity Vs Percent ligand fraction at pH 3 for 2CA3MBA

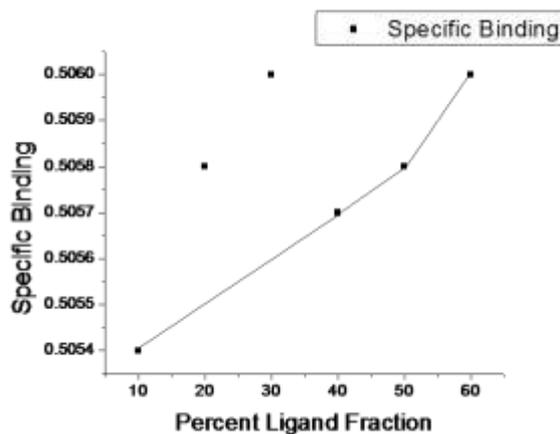


Fig. 4:- Specific binding Vs Percent ligand fraction at pH 3 for 2CA3MBA

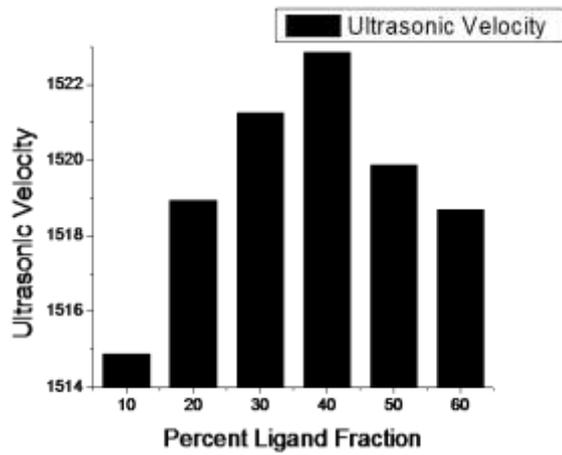


Fig. 5:- Ultrasonic velocity Vs Percent ligand fraction at pH 4 for 2CA3MBA

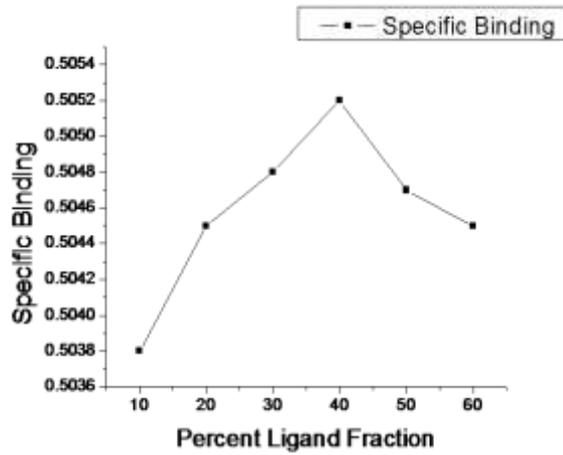


Fig. 6:- Specific binding Vs Percent ligand fraction at pH 4 for 2CA3MBA

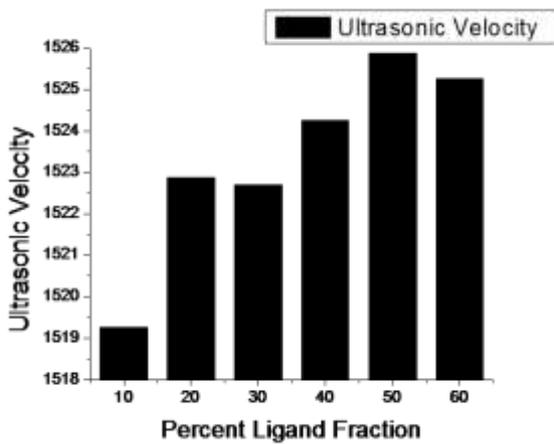


Fig. 7:- Ultrasonic velocity Vs Percent ligand fraction at pH 5 for 2CA3MBA

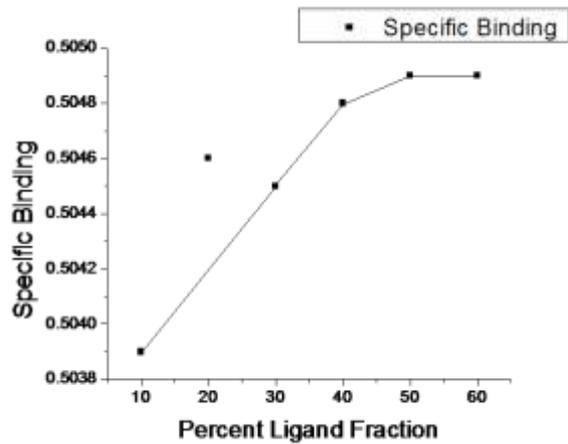


Fig. 8:- Specific binding Vs Percent ligand fraction at pH 5 for 2CA3MBA

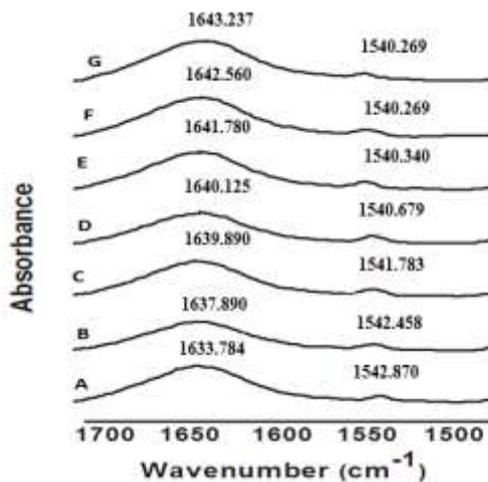


Fig. 9. Graph of absorbance Vs wave number for various composition of BSA and 2CA3MBA



EFFECT OF CHILD EXPLOITATION ON THE SOCIO-ECONOMIC STATUS IN INDIA

Dr. Sanjay Kumar Das

Assistant Professor, Department of Economics, Purnea Mahila Mahavidyalaya,
Purnea University, Purnia.

Corresponding Author- Dr. Sanjay Kumar Das

Email:- kumarsanjay.das@gmail.com

DOI- 10.5281/zenodo.7295544

Abstract

Child exploitation is a major social problem in many countries. In India also large number of children are working as a child labour. It is necessary to identify about child exploitation in regional and national level. All children have right to get education, nice care taker and to have bright future. Every child has right to express their feelings, emotions, wishes and problems. Parents should take first responsibility for the children. Government has made policy for development of child. We should adopt Government policy and community engagement for improving the conditions of child.

Introduction

The term child exploitation is often defined as work that deprives children of their childhood. People use the children for someone's advantage, gratification or profit, which often results in unjust, harmful treatment and cruel to a child. As a result, children are losing their potential and dignity, which is harmful for physical and mental development of child. Children are particularly vulnerable to the deprivation of their basic needs that secure their survival, facilitate their growth and development and ensure their protection. The focus on children is best reflected in the Millennium Development Goals (United Nations, 2000). Two of the eight Millennium Development Goals - universal primary education and reduction in child mortality - are directly related to the well-being of children while the goal of eradicating extreme poverty and hunger has an indirect impact on their well-being. The Millennium Development Agenda of the United Nations which constitutes the basis for the Millennium Development Goals, promotes policies that improve lives of the poor children worldwide. All the work should not be done by children but it should be categorised, which will not affect children to do hazardous work. If children are helping in some activities like helping parents around the home like buying the small things for

their home, it gives the mental support their minds to develop more as well as their Mathematics will be strong. Sometimes assist their brother and sister in a good way, helping their grandparents too. These kinds of activities are good for contribution towards child development. Child exploitation is a very serious matter for our society. Many of us are not taking it seriously. As we have talked about this topic as well and moral responsibility to remove it from the root. We are watching in our areas, lots of parents asking children to work. Even though we are in developing country, every day child labour is growing and destroying their childhood. As poverty is increasing in the country it will make more problems to educate our country in future. In this paper, the child labour exploitation and its socio-economic condition are taken with reference to India. For the safety of child many programs are held by NGOs. However, in India children are working as child labour. Mainly they belong to poverty-stricken. Whole life they are spending in bad situation. If they get good education then we may see good or bright future of the children. But they are working at a very young age and it affects both the children and the society. In many areas, people take children for work and pay very few amounts. Children are not mature enough to do hazardous work.

The problem of child exploitation has become a stigma for our country. If this problem is not eradicated from the root, then the future of the entire country will be spoiled. Now-a-days parents also must get education then only they can think for their children. Many children are affected by HIV/Aids, due to lack of knowledge. Children are also affected by natural calamities, manmade disaster and they become disable.

The overall aim of this research is to provide further more understanding of the crisis of child exploitation and its impact on children's accessibility and participation in primary education. It is necessary to identify the relative importance of household location like urban and rural areas, background characteristics like education, health, hygiene or sanitation, material conditions and other economic characteristics. It is expected to remove the child exploitation from the root and to provide health care to the neglected, deprived, abused and exploited children and help in their protection. In addition to this it is necessary to promote literacy, to educate in the field of anti-dowry, untouchability and other social evils to remove it deeply and to make the region as child labour free by preventing the incidents of child labour, employing girls and boys and to provide socio-economic enhancement facilities.

2. Literature Review

Children are not full social and economic agents and hence they cannot secure resources necessary for their survival, growth and development until a certain age. Similarly, children have no or very limited freedom in making decisions related to their own welfare and benefit (White et al, 2002). Within the household, they are dependent upon elder members of the household including their parents in meeting out their basic needs. Moreover, for the fulfilment of their basic needs they have to rely to a significant extent upon the production of goods and services by public authorities, especially in the areas of education and health (Gordon et al 2003).

Dependencies of children get manifested typically in the poor social and economic settings. Poverty, at the early stages of life, has enduring consequences on those who survive into adulthood. It condemns them to recurrent poverty spells and a life full of

hardship and misery (Grinspun, 2004). As such, there has been an increased interest in recent years on the impact of poverty on survival, growth, development and protection of children in contemporary social, economic and cultural settings (Lister, 2004). There have been number of attempts to mainstreaming child rights and child well-being issues in the development discourse of the country. These include, among others, Campaign against Child Labour launched in 1992, Campaign against Child Trafficking launched in 2001 as part of the International Campaign against Child Trafficking, Child Rights Group within the World Social Forum, etc.

In 2004, the Government of India adopted National Charter for Children 2003 which underlined the intent to secure for every child its inherent right to be a child and enjoy a happy and healthy childhood, to address root causes that negate health growth and development of children.

At the same time, renewed thinking on promoting and sustaining child well-being at the government level is reflected in the Integrated Child Protection Scheme which aims to promote the 'best interests' of the child, to prevent violations of child rights through appropriate punitive measures against perpetrators of abuse and crimes against children and to ensure rehabilitation for all children in need of care and protection (Government of India, 2007).

Despite all provisions, commitments, guiding principles and efforts, protecting rights of the child secure well-being of children in India in terms of their survival, growth, development and protection, remains a major development challenge. A report on the progress towards Millennium Development Goals prepared by the Government of India has concluded that India will not be able to achieve the Goal of reduction in the under-five mortality rate by two third between 1990 and 2015 (Government of India, 2015).

As per Census 2011, the total child population of Bihar in the age group of 0-17 years is 4,75,03,065, which is close to half (45.6 per cent) of the total population (10,40,99,452) of the state. The female child population in the age group of 0-17 years constitutes nearly 47.5 per cent of the total child population of the state. Majority (90 per cent) of Bihar's child population resides in

rural areas, whereas urban child population accounts for only 10 per cent of total child population.

In India, child labour has affected the society critically. They are living near the river and doing fishing business supplementary. Many parents are dependent on their children, because children are very expert to catch the fish. Instead of schooling they are fishing. Many parents are also not concern about it. They want only their needs, not children's bright future. They don't have another option. Another reason is they belongs to poor families. Due to poverty, it is not possible to dream good things about their children. Poverty causes trap for them. Most important noted point is that children are dropping the school in between the academic session which creates a wide gap. Slowly they are going far from the studying engage in doing different work as a child labour.

The level of immunisation of children is also low in the district. Only 21 Percentage of the children are fully immunised. Many people are not taking benefits from ICDS (Integrated Child Development Services). Many children are doing hard work both at their education and invaluable contribution to the economy of their homes and the locality in which they live. They are the great majority of Araria children and have been seen sometimes levelled the 'lost' children. Many people have to pay their debts every week. Sometimes they are not having food to eat also because of debts. Debts also become trap for them. Another point is, if in a family, four or five children are there, then they are sending one child to the school and rest are working at home. They cannot choose any option because they are already in debt. To overcome from debt obviously they have to work together. All children regardless of age, identity and ability deserve equal opportunities to development in order to reach their optimal potential. Children below

the eighteen should get good opportunity for the study - include the rights to survival, protection, development and participation.

3. Child Exploitation in India

It is estimated that India has largest number of child exploitation in the world. According to the census 2004-2005 there were 1,26,66,377. Mainly effect the age of 5-14 years old. India has seen a dramatic fall in child exploitation in the last few years. During 1996 more children were labourer in India. There are five biggest states which are India's biggest child labour employers marked – Bihar, Uttar Pradesh, Rajasthan, Madhya Pradesh and Maharashtra. India's biggest hub is Uttar Pradesh. We can say that one half of India's total child labour population works here. According to a campaign against child labour study, Uttar Pradesh has 19,27,997 child labourers. In 2014, the number of child labourers has decreased by 65%. This was the answer to Rajya Sabha questions about child labour. Later many are rescues from child labour between 2013-2014. In India child exploitation has little bit improved. Male child exploitation is highlighted in Orissa, followed by Tripura and Andhra Pradesh respectively, whereas female's child labour is highlighted in Andhra Pradesh. India has accepted the convention on the rights of the child, which was concluded by the UN general assembly on 20th November 1989. On 10th December 1996, supreme court gave main features of directions in their judgement, which are as under-

Survey the working children

Withdrawal the working children and make sure that they are getting proper education.

Employment to one adult member of the family of child

Regulating hours work for children in non-hazardous occupation. Time also should be less for the children to work.

Table-1. Enforcement on Child Labour Act, 1986

Years	Inspection	Violation	Prosecution	Conviction
2009	325077	8766	5622	1480
2010	256014	11180	4670	1546
2011	150871	14412	6012	986
2012	164455	11045	5118	1145
2013	1083471	8675	3462	1083
Total	1979888	54078	24884	6240

Source: Census 2013

Child exploitation is prominent in rural area. In India, 75% of working children live in India's villages. Where most of them work in agriculture. Some of them also work in household industries and many are employed in home-based services. Some are doing fishing. It is surprising that more boys and girls are forced into doing hazardous work, which is not fit for them. According to the census data, there are over 80 lakh child labourers (age between 5 to 14 years) in India. In India government aims to save the children from child labour. Government is taking strong action for this. All the areas are trying their best. Hidden child labour children government is taking out successfully. Around 50,000 children are successfully withdrawing child domestic workers from domestic help. NGOs has rescued many children from the clutches of child labour. They are doing best role in all areas.

Many children need lots of love, but they are not getting. Currently in the newspaper, news came in Karnataka that during lockdown, 188 child marriage happened. But Government have taken it seriously and made it serious action for this. In India, people are not aware of their children education. Daily current news informs about the child rape. Due to this condition many parents are worried to not send the children in school. Because school is so far. This happens every day in India. Many people are not giving value how precious children are. They only need their physical benefits. That is the reason Government always informs us - save the children from different kinds of harms - abuse, neglect, exploitation, physical danger and violence. Child needs fresh environment to overcome from it. Many children are working near Street for their foods. But in India many People are taking advantage of this. When children are employed or doing unpaid work, then surely, they cannot go for school. Act also define 63 jobs as hazardous like handloom, industry, factories, soap manufacturing, and to pack medicine etc. This all-dangerous work will affect their health. Many children are born as disable, due to the nature.

In 2014, save the children kept around 1.62 lakh Children away from harm. Government is trying, children to take out from unwanted works. But exact total number take out the

child labour is difficult, because still some children are hidden to the survey, like those who are living in forest and living near the river. These people are not getting government benefits. Whole life they are spending to cut tree and eat the fruits as a food.

4. Scenario of Child Labour During Covid-19

Due to Covid-19 many schools are closed. Many children are affected from this situation. Many people lost their jobs. Many get there half salary, which effected more family members. According to the World Bank, in India 11 million people have a chance of slipping below the poverty line due to pandemic related job losses. Poverty again increases and affects the children.

Children were getting food in government schools, but due to Covid-19 all schools were closed. After this situation they are not getting food to eat. For their foods they started working in fields, agriculture and factories. Because for body, food is more important. So that furthermore, previous financial vulnerability push parents to send their children to work, as seen in India. Specially it effected Northern India. Here many people are under below poverty line. A report by the International Labour Organisation (ILO) and UNICEF warns that more than 9 million children are at the risk of being pushed into child labour. The big reason is school is closed. They are poor so they cannot buy smart phone for the student to do their studies. In this pandemic situation, the government tried to help the students. During the lockdown government asked the states leaders to make sure that meals were delivered to students. Many children didn't get advantage of this. Due to distribution the things in unwanted areas. As result, we can see parents and children both are working for the family's survival. Many states they have distributed the things among the children with faithfully, like Kerala and West Bengal opted to distribute raw materials and dry rations through Anganwadi workers. Some states are not serving midday meals to children.

In the survey of June 2020 in 14 states of India, revealed that out of the sample of 7,325 families, two-fifths of the families did not receive midday meals-related compensation for their children. During

lockdown many children work as rag pickers to earn money to eat food. It affects all the sector. Many labours ran away from the factories due to covid-19. As per a survey undertaken by the ILO in 2006 in the northern regions of India, the wages difference between employing a child versus employing an adult varied significantly. While an adult was paid Rs. 90 whereas a child was paid only Rs. 40 for the same work, the survey revealed. Finally, we can say how child exploitation increase in India due to Covid-19. The Labour Minister also says that there is a possibility of more children engaging in child labour. Because of their food they have to take some action. Due to jobs losses also, parents agreed to send their children to work in different places. Through this situation, poverty became the root cause of child labour and child labour leads us to illiteracy and reinforces poverty-stricken.

5. Role of Community Participation

Community participation is main important role in the Government work. Community participation means gathering together and work together. It should be in group and not in separate. In group people are viewing more things and get solution. Community involving the people in different work. In community whatever works done whole society will get maximum benefit. In community, we can provide the leader to supervise the children and monitoring of identified at-risk children. Community people can report in police station about things related to child labour. Through social awareness, they are teaching new things to child group and religious group also. Government work is supported by community. For example, to travel in the bus community is not taking any fare from children. Free of cost they can go school. Drinking water is provided in every community.

Child exploitation is one of the oldest problems in our society. Children are paid less to their work. They are easy to manipulate. Child exploitation prevents physically intellectual and emotional development of the children. Society thinks if children will not do work, then they will not learn how to manage in their future. Some time society think one way not for children's benefits. From the childhood instead of studying, they do agricultural work in fields.

Now many places society awake from this superstitious mind.

6. Conclusions

Child exploitation is a critical issue in India. Several children have lost their bright future because of child exploitation. Many families are affected by this child exploitation in cities and villages. Due to this, children are not getting good future in their life. To remove child exploitation from the root, Government and Community have to take a strong step. First of all, Government has to recognise the child exploitation from the root, reasons, situations etc. then only plan will work out at grass root level.

To stop child exploitation government, NGO and society have to come together with media. Government is trying at the best to save the children from the child exploitation. Now this is not only government responsibility but also society needs to pay attention towards child labour then only it will work out effectively. Research on child exploitation suggests the various ways to sort out the problems of child exploitation. The key issues for development of children are children's enrolment in school and drop-outs, children with special needs enrolled in schools, quality of education, working children, child marriage and crimes against children.

The poor people have lack of effective access to social infrastructure, such as sanitation, education and health. Access to state health services is also limited and poor have to work out in considerable amounts to meet medical costs. Many children are disabled physically. So, they are treated desperately in the schools. It must be removed from the root and it is necessary to help the disable or handicapped children as well.

References

1. Afenyadu D. (2009). Report End line Evaluation, Prevention, and Withdrawal of Children from the Worst Forms of Child Labour in Fishing.
2. Association for Development (2002). A study on the problem of street and working children at railway station and stations in Delhi.
3. Child Trends (2003). *Child Trends Data Bank*. Washington DC, Child Trends.
4. Children Rights International (CRI) 1996-97. "An adult is a child who has survived".

5. Gordon D, Nandy S, Pantazis S, Pemberton S, Townsend P (2003b). *Child Poverty in the Developing World*, Bristol, The Policy Press.
6. M. Swami Nathan (1998). Economics growth and the persistence of child labour, *World Development*.
7. Ministry of Women and Child Development (2007): Study on Children Abuse.
8. Ministry of women and Child Development (2010): Annual Report.
9. P. Jensen and H.S Nielsen (1997). "Child labour or school attendance? Evidence from Zambia" *Journal of Population Economics*, Vol. 10.
10. Strulik, H (2004). "Child mortality child labour and Economics Department in Economic journal

Websites

1. www.education.in
2. www.futureearn.com
3. www.ilo.org.
4. www.labour.gov.in
5. www.ncbi.nlm.nih.gov
6. www.nipccd.nic.in
7. www.ourworldindata.org
8. www.unicef.org



VERY RARE SP. OF ODONATES (DRAGONFLIES AND DAMSELFLIES) AT SALIM ALI LAKE (AURANGABAD CITY)

JB Aghade¹ SA Saraf²

Department of Zoology, Government College of Arts and Science, Dr. B. A. M. University, Aurangabad.

Department of Zoology, Government College of Arts and Science, Dr. B. A. M. University, Aurangabad.

Corresponding Author - JB Aghade

Email:- jayeshaghade@gmail.com

DOI- [10.5281/zenodo.7295548](https://doi.org/10.5281/zenodo.7295548)

Abstract:

Odonates can be utilized as biological markers of environmental quality and play a critical part in ecosystem functioning. Even though a lot of research has been done on the prevalence and distribution of different insect orders in Aurangabad, little has been done to understand the variety and spread of odonates. Therefore, an effort has been made in the current study to examine the variety and richness of odonates in Salim Ali Lake, Aurangabad, India. Between July, August, and September 2022, a total of 5 species of odonates were discovered in the research region. With two species, the family Cornagrionidae dominated the Zygoptera (damselflies), followed by the Libellulidae and Aeshnidae families (1 sp.). The one species of dragonfly (Anisoptera) that has been observed is a member of the family Cordulegastridae. It can be assumed that the region has an unusual diversity given that it is home to 5 species of odonates, including 3 species of Anisoptera and 2 species of Zygoptera. This uncommon diversity may be due to the area's grasslands, shrubs, and tiny water bodies.

Keywords: Abundance, diversity, Very Rare, India, Aurangabad, Odonates.

Introduction:

One of the most prevalent insects flying over forests, farms, meadows, ponds, and rivers are dragonflies and damselflies, which are collectively referred to as Odonates. The number of living species worldwide is about 6,000. With more than 500 species known to exist, India is very varied [1]. They are prehistoric insect families that emerged some 250 million years ago, during the Carboniferous (Permian) era. The Zygoptera (damselflies) and the Anisoptera are the two suborders of living dragonflies (dragonflies). Anisozygoptera, a third suborder, was previously recognized with two living species from the eastern Himalayas and Japan [2]. Two species of the Anisozygoptera, which resemble Zygoptera in certain ways, are known from Darjeeling, including *Epiophlebia laidlawi*. India's Odonata fauna is made up of 499 species and subspecies, 3 suborders, 17 families, and 139 genera [3]. 463 of the 499 species listed by Mitra [4] and later validated by Subramanian [5] up to this

point. However, for the majority of the species in this region of the world, evidence of abundance and distribution is still lacking. Several species of damselflies have been documented in northeastern India. Fraser [6] gives documentation on 536 species and subspecies from India, including numerous species from Madhya Pradesh, Bangladesh, Bhutan, Myanmar, Nepal, Pakistan, and Sri Lanka, in his three published volumes on Odonata in the "Fauna of British India." Odonates and many types of water bodies are intricately related. While some species like rushing water like rivers, rivulets, hill streams, etc., others prefer standing waterbodies like reservoirs, lakes, backwaters, ponds, or even seasonal rainwater puddles. Odonates, which are the top predators both as adults and as larvae, are essential for the health of the environment because they regulate other insects, particularly those that are dangerous to people (such as mosquitoes and blood-sucking flies). In addition to serving as

predators in the ecosystem, predators have recently received a lot of attention for their importance as indicators of habitat quality. According to anecdotal evidence, certain odonates are so habitat-specific that even little changes can cause them to vanish [1]. In order to prepare the way for future research and the creation of a successful strategy for the conservation of this significant group of insects, the current study set out to explore the species richness and variety of odonates in various places of Salim Ali Lake.

Material and Methods:

In order to evaluate the diversity of uncommon Odonates, the current study was carried out in Salim Ali Lake, Aurangabad, Maharashtra, India in July, August, and September of 2022.

Study Area:

Near the Indian state of Maharashtra, Salim Ali Lake in Aurangabad is situated between 19.8992° N and 75.3423° E latitudes. It is situated at a height of 568 meters above

mean sea level, which is a region with heavy rainfall (588 mm annually). The temperature ranges from 23 to 28 °C for the annual high and minimum.

Survey Method:

In order to cover all the habitats, surveys were carried out throughout the region. During the day, field notes, photos (taken with a Sony Cyber-shot H300 camera), and observations were made. Transect counting was used to track population trends over the course of the study [7]. To decrease the number of variables, present and eliminate bias, the same individual conducted all counts at each location by using the same inspection route.

Identification:

Cross-referencing with standardized references and photo guides from [6, 8, 9, 10, 5, 11] allowed us to photo-document and identify specific photographs of Odonates. Within the region, each species' relative abundance or status is designated as VR-Very Rare (5 sightings).



Fig 1: Location map of Salim Ali Lake, Aurangabad, Maharashtra, India.

Results and Discussion:

The Salim Ali Lake in Aurangabad, Maharashtra, India, was home to a total of 5 species of odonates, including 3 species of anisoptera (dragonflies) and 2 species of zygoptera (damselflies) (Table 1). The Coenagrionidae, which has two species, is the most prevalent family of Zygoptera, followed by the Libellulidae (which has one species), and the Aeshnidae (1 sp.). The family Cordulegastridae is home to the lone species of Anisoptera that have been identified.

Species richness and composition:

The five species of Odonates that have been identified are all extremely rare, according to the number count method for estimating relative abundance.

Species Dominance:

The most common species found in the Zygoptera were Coenagrion mercuriale and Pyrrhosoma nymphula, while the most common species in the Anisoptera were Aeshna caerulea, Sympetrum sanguineum, and Cordulegaster boltonii.

Table 1: List of Very Rare Odonates Recorded in Salim Ali Lake, Aurangabad, and Maharashtra, India.

Sl. No.	Common Name	Scientific Name	IUCN status [11]	Abundance
A	Anisoptera (Dragonflies)			
Family: Libellulidae				
1	Ruddy darter	<i>Sympetrum sanguineum</i>	LC	VR
Family: Aeshnidae (Darners)				
2	Azure hawk	<i>Aeshna caerulea</i>	LC	VR
Family: Cordulegastridae				
3	Golden-Ringed Dragonfly	<i>Cordulegaster boltonii</i>	LC	VR
B	Zygoptera (Damselflies)			
Family: Coenagrionidae (Marsh Dart)				
4	Southern Damselfly	<i>Coenagrion mercuriale</i>	NT	VR
5	Large red Damselfly	<i>Pyrrhosoma nymphula</i>	LC	VR

Odonates have a tropical evolutionary history and have adapted to temperate climates, making them one of the best taxa to study the effects of environmental warming and climate change [12, 13]. Odonates play a key role in environmental monitoring, but little is being done to understand the variety and abundance of this insect group in Maharashtra. Due to its abundance of grassland, bushes, and small water bodies, the Salim Ali Lake has been found to meet the majority of the criteria necessary for Odonates during the study. The information gathered in this study might be useful as a resource for estimating how the local environment will change in the near future.

Strategy for Conservation:

Any plan for protecting odonates—or any other species of creatures, for that matter—must include these three fundamental components [11].

1. Creating protected areas (national parks, nature reserves, etc.) and ensuring that operations in already-existing protected areas are properly managed to ensure the survival of odonates.

2. Modifying agricultural, forestry, and industrial practices to conserve habitats outside of protected areas.

3. Taking action to support options 1 and 2. These are the main ones:

Research, particularly taxonomy and analyses of species distributions and biological needs

a) Reducing pollution

b) Lawmaking, particularly to create protected areas, to regulate development, and to reduce pollution.

c) Public awareness and education.



Azure hawk
(*Aeshna caerulea*)



Ruddy darter
(*Sympetrum sanguineum*)



Golden-Ringed Dragonfly
(*Cordulegaster boltonii*)

Fig 2: Photographs of some Dragonflies recorded during the study.



Southern Damselfly
(*Pyrrhosoma nymphula*)



Large Red Damselfly (*Coenagrion mercurial*)

Fig 3: Photographs of some Damselflies recorded during the study.

Acknowledgment:

For support and essential resources, the authors are grateful to the Guide, Department of Zoology, Gov. College of Arts and Science, Aurangabad, Maharashtra, India.

References:

1. Nair MV. Dragonflies & Damselflies of Orissa and Eastern India. Wildlife Organization, Forest & Environment Department, Government of Orissa. Jyoti Graphics, Bhubaneswar, India, 2011, 254.
2. Kalkman VJ, Clausnitzer V, Dijkstra KB, Albert GO, Paulson DR, Tol JV. Global diversity of dragonflies (Odonata) in freshwater. *Hydrobiologia* 2008; 595:351- 363.
3. Prasad M, Varshney RK. A check list of the Odoanta of India including data on larval studies. *Oriental Insects* 1995; 29:385-428.
4. Mitra TR. Evolutionary Adaptations in Morphology and Ecology of *Tholymis Tilliard* (Faricius) and *Bradinopyga geminata* (Rambur) (Insecta: Odonata). *Records of Zoological Survey of India* 2005; 104(1-2):300.
5. Subramanian KA. India-A Lifescape, Dragonflies of India - A Field Guide. Vigyan Prasar. India Offset Press, New Delhi, 2005, 118.
6. Fraser FC. The Fauna of British-India including Ceylon and Burma, Odonata. Vol. I. Taylor and Francis Ltd., London, 1933, 436.
7. Barhaum KP, Anderson DR, Cauke ZL. Estimation of density from line transects sampling of biological population. *WILD* 1980-1981; Monograph No. 72:515.
8. Fraser FC. The Fauna of British-India including Ceylon and Burma, Odonata. Vol 2, Taylor and Francis Ltd., London, 1934, 442.
9. Fraser FC. The Fauna of British-India including Ceylon and Burma, Odonata. Vol 3, Taylor and Francis Ltd., London, 1936, 461.

10. Subramanian KA. Dragonflies and Damselflies of Peninsular India - A Field Guide. Vigyan Prasar, Noida, India, 2009, 168.
11. Moore NW. Dragonflies- Status Survey and Conservation Action Plan. IUCN/SSC Odonata Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK, 1997, 28.
12. Hassall C, Thompson DJ, Harvey IF. Latitudinal variation in morphology in two sympatric damselfly species with contrasting range dynamics (Odonata: Coenagrionidae). *European Journal of Entomology* 2008; 105:939-944.
13. Neseemann H, Shah RT, Shah DN. Key to the larval stages of common Odonata of Hindu Kush Himalaya, with short notes on habitats and ecology. *Journal of threatened Taxa* 2011; 3(9):2045-2060



**NEW MEDIA USE BY ACADEMIC COLLEGE LIBRARIANS TO
PROVIDE INFORMATION TO LIBRARY USERS DURING COVID-19
PANDEMIC PERIOD**

Amol Bhaudas Meshram¹ Dr. Kishorsingh R. Chungade²

Librarian, SN Arts & UK Commerce College, Akola

Librarian & Phd Supervisor, KRC, GVISH, Amravati

Corresponding Author- Amol Bhaudas Meshram

Email:- aaambbbm72@gmail.com

DOI- [10.5281/zenodo.7295550](https://doi.org/10.5281/zenodo.7295550)

Abstract

Libraries have been under closure due to lockdown enforced as a measure to tackle Covid-19. Therefore, college librarians used e-resources, new media, social media and various web tools for providing library services to the users during COVID-19 pandemic period. Thus, a study was conducted to identify the use of new media tools by library professionals and to evaluate the measures taken by librarians to cater to library users during the Covid-19 pandemic. For this purpose, primary data in view of the study objectives was collected using a short questionnaire and through online and offline survey method. The collected data was statistically analysed and the results showed that the librarians have opted the medium of webinar/Virtual Class/Virtual Meeting for fulfilling the information needs of the users. New media tools were regularly used for delivering various information related services to the users.

Introduction

Many fields experienced severe problems during the Covid-19 induced lockdowns and had to innovate urgently to cope up with the losses. Though the library and information science (LIS) profession also felt some problems with respect to traditional services, the technology adoption prevented it from getting severely affected. Besides, the direct impact on libraries' traditional activities, the library sector was expected to contribute by providing necessary information to users about the pandemic as well as various research efforts that were undertaken by researchers. The libraries meanwhile had to incorporate various concepts and deploying various approaches through social media platforms to provide the needed services in order to retain their relevance and visibility in the new normal. New media tools are among the new concept that libraries are engaging to interact with their teeming users, wherein social media can be defined as forms of electronic communication through which users interact among their peers in order to create, freely, share, exchange and discuss information,

ideas, personal messages and other content about each other and their lives using a multimedia mix of personal words, picture, videos and audio, utilizing online platforms while they are connected to the internet. Moreover, they can easily be accessed through the use of computer or mobile phone devices with internet connectivity. It also uses a group of internet-based application that is built on the technological foundations of Web 2.0 that allows the creation and exchange of user generated contents. The covid-19 pandemic forced academic libraries to reassign resources revamp their web presence and adopt various strategic ways of meeting the growing needs of users. Librarians changed their working practice, innovatively and creatively improved their web pages and visibility, reassigned their resources on their web portals, add new and smarter electronic resources, delivered services through e-technologies and platforms. Many academics have been going on using different technology-service application like Google classroom, Zoom meeting application, Cisowebex application and others. Social media steps like whatsapp,

Face book, LinkedIn has for academic purposes including information sharing and disseminations. In such a challenging situation, academic college libraries had to continue in their roles of information and data provision by providing the library resources to users. Social media platform can be very useful in providing library services to end users faculty members, students and other users. This informed the need to study the use of new media use by academic college librarians to provide information to library users during Covid-19 pandemic.

Rational of the study

During the pandemic situation all educational institutions were under suspension. As time and tide wait for none, the institutions had been compelled to carry out all the possible academic activities through online mode. Hence, different academic activities have been exercised remotely using various technology driven applications like Google Classroom, Zoom meeting application, etc. and many more. In such demanding period, new media can be instrumental in disseminating information and providing library services to the library users. In view of the above, it was apt to conduct this study with an aim to determine the use of new media by academic college librarians to make available information to library users during Covid-19 pandemic period.

Objectives of the study

- To study the use of new media tools by librarians of academic colleges during the Covid-19 pandemic period.
- To evaluate the measures taken by librarians of colleges affiliated to SGBAU

Analysis of the data and results

Working Experience of the librarian

Table 1: Working Experience of the librarian

Experience (yrs.)	Nos.	Percentage
Less than 10 years	37	15.7
10 to 15 years	59	25.1
15 to 20 years	77	32.8
20 to 25 years	36	15.3
More than 25 years	26	11.1
Total	235	100.0

Above Table 1 presents information pertaining to working experience of the librarians working in academic Colleges. 15.7% librarians have less than 10 years working experience while 25.1% librarians

to cater to library users during the Covid-19 pandemic.

Hypotheses of the study

- Librarians working in academic colleges regularly used New Media during COVID-19 period.
- Librarians working in academic colleges proactively provided services through New Media to the users during the COVID-19 pandemic period.

Methodology

Research Design

The present study is conducted by using a combination of descriptive and exploratory research design.

Sample Size

There are a total of 394 colleges affiliated to Sant Gadge Baba Amravati University, Amravati. Out of that 235 are academic colleges affiliated to the Sant Gadge Baba Amravati University, Amravati and all were selected for the Data Collection.

Primary data collection

The primary data was collected using a structured questionnaire and by following survey method. Prior to its use the reliability and validity of the questionnaire was tested.

Secondary Data

In this study, the secondary data was collected from different National and International Magazines, Journals, Books of the reputed authors, internet and other sources.

Statistical Analysis of Data

Analysis of the data was carried out with the help of various statistical tests. The descriptive statistics, such as frequency, mode, percentage, etc were determined from the collected data. All the statistical analysis was carried out by using SPSS 18.0 Software.

have 10 to 15 years working experience. In addition to this 32.8% librarians have 15 to 20 years working experience however 15.3% and 11.1% librarians have working

experience of 20 to 25 years and more than 25 years respectively.

4.2 Acquisition of New Media Skills

Table 2: Acquisition of New Media Skills

Response	Nos.	Percentage
Support of colleagues	22	9.4
Formal education	9	3.8
Self-study	109	46.4
Workshops	82	34.9
Others	13	5.5
Total	235	100.0

$\chi^2_{\text{calculated}}: 176.468; \text{df: } 4; \chi^2_{\text{critical}}: 9.49; p < 0.05$

Above Table 2 presents information pertaining to acquisition of new media skills by the librarians of academic Colleges. 9.4% librarians have acquired new media skills through support of colleagues while 3.8% librarians have acquired new media skills by

taking formal education. In addition to this 46.4% and 34.9% librarians have acquired new media skills through self-study and by attending workshops however 5.5% librarians have acquired new media skills from other means.

4.3 Frequency of using New Media during COVID 19

Table 3: Frequency of using New Media during COVID 19

Frequency of use	Nos.	Percentage
Used every day	166	70.6
Used in a week	29	12.3
Used fortnightly	34	14.5
Used monthly	6	2.6
Never used	0	0.0
Total	235	100.0

$\chi^2_{\text{calculated}}: 394.553; \text{df: } 4; \chi^2_{\text{critical}}: 9.49; p < 0.05$

Above Table 2 presents information pertaining to frequency of using new media during COVID-19 by the librarians of academic Colleges. 70.6% librarians everyday used new media tools during COVID-19

while 12.3% librarians used new media tools weekly. In addition to this 14.5% librarians used the new media tools fortnightly however 2.6% librarians used them on monthly basis.

4.4 Role of New media for delivering library services during COVID 19

Table 4: Role of New media for delivering library services during COVID 19

Level of importance	Nos.	Percentage
Extremely important	195	83.0
Very Important	24	10.2
Important	16	6.8
Less Important	0	0.0
Not Important	0	0.0
Total	235	100.0

$\chi^2_{\text{calculated}}: 591.745; \text{df: } 4; \chi^2_{\text{critical}}: 9.49; p < 0.05$

Above Table 4 presents information pertaining to opinion of librarians of academic Colleges with respect to role of new media for delivering library services during COVID 19. 83.0% and 10.2% librarians feel

that new media is extremely important for delivering library services during COVID 19. In addition to this 6.8% librarians feel that new media is important for delivering library services during COVID 19.

4.5 Methods used to guide users to access online resources

Table 5: Methods used to guide users to access online resources during COVID 19

	Nos.	Percentage
Via Website	16	6.8
Webinar/Virtual Class/Virtual Meeting	155	66.0
Library Mobile App	0	0.0
Enabled Remote Login facilities	39	16.6

Via Libguide	19	8.1
Other	6	2.6
Total	235	100.0

$\chi^2_{\text{calculated}}$: 434.024; df: 5; χ^2_{critical} : 11.07; $p < 0.05$

Above Table 5 presents information pertaining to methods used by the librarians of academic Colleges to guide users to access online resources. 6.8% and 66.0 librarians used website and Webinar/Virtual

Class/Virtual Meeting for guiding users. In addition to this 16.6% librarians enabled remote login facilities for the students however 8.1% and 2.6% librarians used libguide and other source for guiding users.

4.6 Extent of usefulness of New Media during Covid-19 period to fulfil Library Users' demand

Table 6: Extent of usefulness of New Media during Covid-19 period to fulfil Library Users' demand

Response	Nos.	Percentage
High	176	74.9
Moderate	26	11.1
Low	33	14.0
Total	235	100.0

$\chi^2_{\text{calculated}}$: 183.003; df: 2; χ^2_{critical} : 5.99; $p < 0.05$

Above Table 6 presents information pertaining to extent of usefulness of New Media during Covid-19 period to fulfil Library Users' demand. 74.9% librarians highly used new media tools during COVID-

19 period to fulfil library users demand. In addition to this 11.1% librarians moderately used new media while use of new media was less among 14.0% librarians during COVID-19 period.

4.7 Extent of usefulness of New Media during Covid-19 period

Table 7: Extent of usefulness of New Media during Covid-19 period

Response	Nos.	Percentage
High	64	27.2
Moderate	152	64.7
Low	19	8.1
Total	235	100.0

$\chi^2_{\text{calculated}}$: 116.876; df: 2; χ^2_{critical} : 5.99; $p < 0.05$

Above Table 7 presents information pertaining to extent of usefulness of New Media during Covid-19 period to provide access to the open access resources. 27.2% librarians highly used new media tools during COVID-19 period to provide access to

open access resources. In addition to this 64.7% librarians moderately used new media while use of new media was less among 8.1% librarians during COVID-19 period to provide access to open access resources.

4.8 Extent of usefulness of New Media during Covid-19 period to provide information about academic & research purpose

Table 8: Extent of usefulness of New Media during Covid-19 period to provide information about academic & research purpose

Response	Nos.	Percentage
High	59	25.1
Moderate	147	62.6
Low	29	12.3
Total	235	100.0

$\chi^2_{\text{calculated}}$: 96.064; df: 2; χ^2_{critical} : 5.99; $p < 0.05$

Above Table 8 presents information pertaining to extent of usefulness of New Media during Covid-19 period to provide information about academic & research purpose. 25.1% librarians highly used new media tools during COVID-19 period to

provide information about academic & research purpose. In addition to this 62.6% librarians moderately used new media while use of new media was less among 12.3% librarians during COVID-19 period to provide

information about academic & research purpose.

4.9 Extent of usefulness of New Media during Covid-19 period to keep inform the users about related materials

Table 9: Extent of usefulness of New Media during Covid-19 period to keep inform the users about related materials

Response	Nos.	Percentage
High	72	30.6
Moderate	139	59.1
Low	24	10.2
Total	235	100.0

$\chi^2_{\text{calculated}}$: 85.214; df: 2; χ^2_{critical} : 5.99; $p < 0.05$

Above Table 9 presents information pertaining to extent of usefulness of New Media during Covid-19 period to keep inform the users about related materials. 30.6% librarians highly used new media tools during COVID-19 period to keep inform the users about related materials. In addition to this 59.1% librarians moderately used new media while use of new media was less among 10.2% librarians during COVID-19 period to keep inform the users about related materials.

Conclusions

Working Experience of the librarian

On the basis of the study results it is evident that most of the librarians of academic colleges have working experience of 15 to 20 years.

Acquisition of New Media Skills

On the basis of the study results it is evident that most ($p < 0.05$) of the librarians of academic colleges have acquired new media skills from self-study.

Frequency of using New Media during COVID 19

On the basis of the study results it is evident that most ($p < 0.05$) of the librarians of academic colleges regularly used new media tools during COVID 19.

Role of New media for delivering library services during COVID 19

On the basis of the study results it is evident that most ($p < 0.05$) of the librarians of academic colleges feel that new media is extremely important for delivering library services during COVID 19.

Methods used to guide users to access online resources

On the basis of the study results it is evident that most ($p < 0.05$) of the librarians of academic colleges used Webinar/Virtual Class/Virtual Meeting for guiding users to access online resources.

5.6 Extent of usefulness of New Media during Covid-19 period to fulfil Library Users' demand

On the basis of the study results it is evident that most ($p < 0.05$) of the librarians of academic colleges highly used new media tools during COVID-19 period to fulfil library users demand.

5.7 Extent of usefulness of New Media during Covid-19 period to provide access to the open access resources

On the basis of the study results it is evident that most ($p < 0.05$) of the librarians of academic colleges moderately used new media tools during COVID-19 period to provide access to open access resources.

5.8 Extent of usefulness of New Media during Covid-19 period to provide information about academic & research purpose

On the basis of the study results it is evident that most ($p < 0.05$) of the librarians of academic colleges moderately used new media tools during COVID-19 period to provide information about academic & research purpose.

5.9 Extent of usefulness of New Media during Covid-19 period to keep inform the users about related materials

On the basis of the study results it is evident that most ($p < 0.05$) of the librarians of academic colleges moderately used new media tools during COVID-19 period to keep inform the users about related materials.

Testing of Hypothesis

Librarians working in academic colleges regularly used New Media during Covid-19 period.

From the study results it is evident that the librarians working in the academic colleges regularly used new media tools during COVID-19 period. Hence the hypothesis which states that, "Librarians working in

academic colleges regularly used New Media during Covid-19 period” is **accepted**.

Librarians working in academic colleges proactively provided services through New Media to the users during the Covid-19 pandemic period.

From the study results it is evident that the librarians working in the academic colleges used new media tools for fulfilling library users demand, to provide access to open access resources, about academic & research purpose and to keep inform the users about related materials during COVID-19 period. Hence the hypothesis which states that, “*Librarians working in academic colleges proactively provided services through New Media to the users during the COVID-19 pandemic period*” is **accepted**.

Recommendations

- Proper infrastructure like high speed internet connectivity should be arranged for smooth delivery of services through new media.
- The academic college libraries should have to initiate some user awareness programs regarding their services through new media.
- Professional development of Librarians should be done. New media literacy skills of academic librarians should be enhanced and upgraded.
- COVID-19 had witnessed the diminishing value of print resources and the rocketing use of e-resources. There is very urgent need for staff support measures as without staff commitment, nothing could materialize. They need to be equipped with skills and hardware and be adequately protected from the virus risk.

Bibliography

1. Ali, M. Y and Gatiti, P. (2020). The COVID-19 (Coronavirus) pandemic: reflections on the roles of librarians and information professionals, *Wiley Online Library*, 37(2), pp. 158-162.
2. Ashiqab, M., Jabeenc, F and Mahmoodc, K. (2022). Transformation of libraries during Covid-19 pandemic: A systematic review, *The Journal of Academic Librarianship*, 48(4).

3. Dalmer, N and Griffin, M. (2022). “Still Open and Here for You”: News Media’s Framing of Canadian Public Libraries during COVID-19, *The Library Quarterly*, 92(2), <https://doi.org/10.1086/718599>
4. Fasae, J. K., Adekoya, C. O and Adegbilero-Iwari, I. (2021). "Academic libraries' response to the COVID-19 pandemic in Nigeria", *Library Hi Tech*, 39(3), pp. 696-710.
5. Friday, J., Oluchi, C and Ngozi, C. L. (2020). Social Media and Library Services: A Case of COVID-19 Pandemic Era, *International Journal of Research and Review*, 7(10), pp. 230-237.
6. Guo, Y., Yang, Z., Yang, Z., Liu, Y.Q., Bielefield, A and Tharp, G. (2021). "The provision of patron services in Chinese academic libraries responding to the COVID-19 pandemic", *Library Hi Tech*, 39(2), pp.533-548.
7. Harisanty, D., Sugihartati, R., & Srimulyo, K. (2022). Social media and the role of libraries during the COVID-19 pandemic, *Masyarakat, Kebudayaan Dan Politik*, 35(3), pp. 351–363.
8. Hendal, B. A. (2020). "Kuwait University faculty’s use of electronic resources during the COVID-19 pandemic", *Digital Library Perspectives*, 36(4), pp. 429-439.
9. Martzoukou, K. (2021). "Academic libraries in COVID-19: a renewed mission for digital literacy", *Library Management*, 42(4/5), pp. 266-276.
10. Okike, B.I. (2020). "Information dissemination in an era of a pandemic (COVID-19): librarians’ role", *Library Hi Tech News*, 37(9), pp. 1-4
11. Shekharjyoti, N. (2020). "Library Services through Social Media during Lockdown due to COVID-19 with Special Reference to University Libraries of Assam, *Library Philosophy and Practice (e-journal)*, <https://digitalcommons.unl.edu/libphilpra/c/4262>
12. Spikes, M. A. (2022). A Case Study of News Media Literacy Training for Librarians in the US, *The Routledge Handbook of Media Education Futures Post-Pandemic*, 1st Edition, p. 11.



SKILL IMPACT BONDS IN ENHANCING YOUTH POPULATION IN INDIA

Kaleeshwari.S¹ Dr.M. Jegadeeshwaran²

Ph.D. Research Scholar, Department of Commerce, Bharathiar University, Coimbatore.

Assistant Professor, Department of Commerce, Bharathiar University, Coimbatore.

Corresponding Author- Kaleeshwari.S

Email:- madhukaleeshwari@gmail.com

DOI- [10.5281/zenodo.7295552](https://doi.org/10.5281/zenodo.7295552)

Abstract

A large number of the population in India have lost their jobs due to covid pandemic. Especially the youth have been hit harder than adults (25 and above) in the crisis, and risk bearing higher longer economic and social costs. So Indian government has made an attempt and attention to the impact bond is to address the youth employment crisis and specifically that for young women. This becomes essential to focus on the development of skills and employability among people especially women, who have been affected due to the pandemic pressure and loss of jobs. This paper aims to get into the concept of Skill impact bonds, the purpose of the launch of bonds, how they work, and what are the outcomes of the bond in the future. so this will help us in understanding the theoretical framework of skill impact bonds in enchanting the youth and women population in India.

Keywords: *Impact bonds, Skills, Employability, Development, NSDC, and Outcome*

Introduction

National Skill Development Corporation has launched the first of its kind largest impact bond for skilling Indian Youth with global partners, involving 14.4 billion which will benefit 50000 youth making them employment ready. along with the Indian govt the global coalition comprises HRH Prince Charles's British Asian Trust, the Michael and Susan Dell Foundation (MSDF), The children's Investment Fund Foundation (CIFF), HSBC India, JSW Foundation, and Dubai Care s, with FCDO and USAID have collaborated. India's first impact bond involves the public, and private partners and a public-private partners organization. NSDC and MSDF are the risk investors that have committed 4 million to provide upfront working capital to the service provider to implement the program for the lifetime of the impact bonds. The target group includes 60 percent women and girls and the objective is to equip them with skills and vocational training and provide access to wage employment in covid 19 recovery sectors including retail, apparel, healthcare, and logistics. So, it will work towards promoting effective interventions, supporting research,

and enhancing the impact of the skill development Programme. So, this landmark financial instrument applies an entrepreneurial approach to philanthropy and ensures accountability which contributes to the achievement of set objectives.

Statement of the problem

Impact bonds are mainly on women who have lost their job due to national lockdown. Women made up 24 percent of the workforce before the pandemic, yet accounted for 28 percent of all job losses as the pandemic, took hold. India has the lowest female labor force participation in south Asia at 20.3 percent and the current outcome of skilling for them are highly and inadequate. out of every 100 women enrolled in the skilling program only 10 stay in post-skilling jobs for 3 months or more. In India, aspirational youth require skills for jobs that meet the demand of the industry. core functional knowledge and competencies enhance an individual ability to secure and retain a job and improve their potential to earn.

National Skill Development Corporation

- It is not for profit public limited company under section 25 of the Companies Act,1956.

- It was set up by the ministry of finance as a public-private partnership (PPP) model.
- The government of India holds 49 percent of the share capital of NSDC through the Ministry of Skill Development & Entrepreneurship and balances 51 percent of the share capital by private sectors.
- NSDC aims to promote skill development by catalyzing the creation of large, quality, and for-profit vocational institutions.

About the impact of bond

They are the innovative and results-based finance mechanism that leverages private sector capital and expertise, with a focus on achieving results. This shifts the focus from input to performance and results. so rather than the government and financing agency the private investors (risk investors) initially finance the initiative and are repaid by outcome funders only if agreed-upon outcomes are achieved. The impact bonds focus on the outcome and transform the traditional approach to grant-making. so, the outcomes are based on the money spent.

Overview of Skill Impact bonds

The outcome funder on this impact bond for skilling has been convened by the British Asian Trust. Each funder brings their strong perspective, knowledge, and learning in the skilling and education sectors to the design of this impact bond. The NSDC and MSDF are the risk investors who have committed US\$ 4 million to provide upfront working capital to the service providers to implement the program for the lifetime of the impact bonds. When the outcome is delivery is achieved risk invested funding is then reinvested each year. The training will be provided by Apollo, Meds kills ltd, Garam Tarang Employability training service Pvt Ltd, Learnet skills ltd, Magic bus India foundation, and PanIIT Alumni Foundation. The outcomes from the bonds will be accessed by the oxford policy management, Dalerg advisors, and the performance manager will regularly measure the outcomes to achieve outcomes. The stakeholders will work ahead with promoting effective interventions, supporting research, and enhancing the impact of the skill development This landmark financial instrument applies an entrepreneurial approach to philanthropy and ensures accountability which contributes to the

achievement of set objectives. The attention of the impact bond is to address the youth employment crisis and specifically that for young women. The report on the impact bonds elaborates on the focus on women in the skill impact bond is an urgent response to the negative impact of the pandemic on women and employment. Millions of Indians as well as across the world people have lost their jobs during covid 19 pandemic. The youth have been hit harder than adults in the immediate crisis and risk bearing higher longer-term economic and social costs.

Importance of Skill Impact Bond

- The skill impact bond aims to support 50000 young people in 4 years.
- Of this, 60 percent will be women and girls
- To provide them with skills and training access.
- And access to wage employment in Covid-19 recovery sectors including retail, apparel, healthcare, and logistics.
- The coalition has bought around US\$14.4 million in funds to benefit young people
- It focuses on collaboration amongst global partners and also aims at building the capacity of India's skilling and TVET ecosystem through knowledge exchange and promoting good practice.
- The stakeholders will work towards promoting effective interventions, supporting research, and enhancing the impact of the skill development program.

How does skill impact bond works?

- The risk investors will commit an upfront of up to US \$ 4 million to fund service provider intervention.
- Outcome funders will commit US\$14.4 million over 4 years.
- Service providers will deliver skilling interventions to improve employment outcomes.
- Skilling outcomes will be measured by an independent evaluator
- Verified achievement of skilling outcome that translates into employment trigger outcome payment to repay the risk investors.

Conclusion

Skill impact bonds a social impact bond which is wholly on the development of skill and employment covering 60 percent of women in this initiative is considered as a need for the hour. the pandemic impact on

the lives of people and the job loss which they have met by the severe effect of covid has made it necessary for an individual to grade up their skills in order to uphold themselves in the job. So, this is one such bond that will impact skill development under the national skill development corporation. The outcome of the bond will be measured by various agencies under which the investors will be reinvested. Skill impact bonds are most important for regenerating employment in enhancing their livelihood back.

Reference

1. <https://nsdcindia.org/sib>
2. https://www.business-standard.com/article/markets/india-s-first-skill-impact-bond-launched-fund-to-benefit-50-000-youth-121102600967_1.html
3. <https://www.investindia.gov.in/siru/indias-first-skill-impact-bond-gender-lens>
4. <https://timesofindia.indiatimes.com/business/india-business/nsdc-launches-skill-impact-bond/articleshow/87310548.cms>



**PADMINI AS AN EXISTENTIAL WOMAN IN GIRISH KARNAD'S PLAY
HAYAVADANA**

Priti Nilkanth Bhandekar¹ Dr. Vivek V. Joshi²

¹Research Scholar, PGTD of Gondwana University, Gadchiroli, MS

²Head & Associate Professor, Dept. of English, PGTD Gondwana University Gadchiroli,

Corresponding Author- Priti Nilkanth Bhandekar

Email:- prtibhandekar19@gmail.com

DOI- [10.5281/zenodo.7295556](https://doi.org/10.5281/zenodo.7295556)

Abstract:

Existentialism, is a philosophical movement that appeared in the 19th and 20th centuries. But it comes into fashion after world war-II. People's suffering of in two world war is outlook of existentialism. existentialism is concerned with the meaning of human individual existence. However, it formed the problem of alienation and estrangement of human beings. Girish Karnad is one of the versatile personalities of contemporary Indian English drama who penned many beautiful plays which concerned with various themes of writing. Karnad is an outstanding existentialist playwright who portrayed many characters in their plays who appear lonely, alienated, estranged, and frustrated. The play Hayavadana by Karnad is one of his outstanding and enduring contributions to existential philosophy. It closely resembles what is intended to be existentialist art. It highlights the restrictions of dwells on the philosophical implications of human suffering and human life. The present paper mainly focused on the women character Padmini who is struggling for our existence. Through our existence, she feels alienated and estranged from the world. Finally, it proves that the play transforms into an existential work of art largely as a result of Karnad's portrayal of the characters, particularly Padmini. Karnad uses Padmini to demonstrate the basic nature of existence. The accurate representation of Padmini as lonely, perplexing, and alienated.

Key Words: Existentialism, alienation, loneliness, human existence, estranged.

Introduction:

Girish Karnad's play Hayavadana (1971) is based on the *vetalpanchavinsati*, a chain of puzzling stories in the larger chain of Somadeva's *Kathasaritsagara*. Karnad has also taken German versions of the vetala story in "The Transposed Heads" by Thomas Mann, but Karnad has added his own story of transposed heads and composed the play with different concerns. Karnad maintains tight contact with the core personal values throughout the play concerns. He appeared to be aware of how terrible human existence is. He imagines a universe of passions, worries, and unexpected outcomes in life. The play transforms into an existential work of art largely as a result of Karnad's portrayal of the characters, particularly Padmini. Karnad uses Padmini to demonstrate the basic nature of existence. The accurate representation of Padmini as lonely, perplexing, and alienated. The Heroine's

desperation and obsession with death lead Karnad to be one of the excellent human situation dramatists. In the play, Girish Karnad successfully represented Padmini who is suffering an existential crisis in our world and feels alienated and estranged. Likewise, modern man is also trapped in a situation where he is alienated and estranged in our world. Existentialism emerged as a significant issue in this era of technological growth and is a separate philosophical and literary movement that originated in the nineteenth and twentieth centuries. However, appearances of Existentialism can be initiated in Socrates' ideas, the Bible, and other literary works. pre-modern philosophers' and writers' works In Existentialism, try to find meaning in a confusing world. It is a philosophy of existence, specific to human existence, that is exceptional in that the human being starts as nothing and transforms into something by its

deliberate course of activity. Existentialism is a persistent focus on matters interrelated to the human condition and an effort to explain the essence of human life. It must also make the individual aware of the existence of others. They show their deep concern for the important issue of human existence. All existentialists have expressed worry about the state of the world's people and the quest for an authentic life by man. They follow the idea of questioning the prevalence of the human being as the source of thought and endeavor to enlarge the significance of human existence through reason. They describe human existence in certain situations and across a variety of aspects.

In the play 'Hayavadana' The leading female character in the play is Padmini, a daughter of a leading merchant of Pavana Veethi. It defines the literal meaning of the name of Padmini means 'The Lotus plant' which is the abode of Goddess Lakshmi. Padmini is a character who is seen as a lonely lady and finds herself facing of existential crisis. when Kapila goes to her house as Devadatta's messenger but at the time, she is alone in her house. She talks with Kapila for a long time but nobody is present in the scene. So, she feels isolated and lonely in her house but this situation is unending when Devadatta fell in love with Padmini. Devadatta, the son of Brahmin Vidyasagar of Dharmapura. Kapila designates Devadatta's knowledge and appearance he says,

"A poet. A pandit. Knows the Vedas backward writes the grandest poetry ever. Long, dark hair, delicate, fair face. Age twenty. Height five feet seven inches weight..." (Karnad) Devadatta wishes to marry Padmini. Kapila can make the marriage of Devadatta and Padmini take place but before that, there is a conflict in Kapila's mind regarding the matching of Devadatta and Padmini's nature. Kapila expresses his view on Devadatta and says to himself...

"Devadatta, my friend, I confess to you I'm feeling uneasy. you are a gentle soul. You can't bear a bitter word or an evil thought. But this one is as fast as lightning and as sharp. She is not for the likes of you. What she needs is a man of steel. But what can one do? You'll never listen to me." (Shakti)

Kapila speaks to ourselves that Devadatta is not meant for Padmini. She is attractive and intellectual while Devadatta is a simple and gentle soul. He won't be able to fulfill Padmini's instincts and desires she needs a strong and wise man, not a scholar and a poet, to control her. Kapila told Devadatta all this but Devadatta won't listen because Devadatta is obsessed with Padmini and wants to marry her. Kapila arranges their marriage of Devadatta and Padmini. But after marriage, Padmini feels that Devadatta is more devoted to their books and study, so she feels alienated. But her alienation goes increased when they go to Ujjain fair. When Padmini desire beautiful flowers and Kapila brings flowers for Padmini, at the time she is appreciative of a strong and muscular body, Padmini says, "How he climbs like an ape. Before I could even say 'yes', he had taken off his shirt, pulled his dhoti up, and swung up the branch. And what an ethereal shape! Such a broad back: like an ocean with muscles rippling across it and then that small, feminine waist which looks so helpless" (Karnad) but in the way of Ujjain, the tremendous incident happens and Padmini's impressions are alienated. When Both Devadatta and Kapila cut off their head in the kali temple. Padmini, has a twisted existential crisis when they left her alone to face the world and she expresses, "oh god! What's this! Both! Both gone! And didn't even think of me before they went? What shall I do?" (Shakti) Padmini also twisted existential crisis by her wrong choice of action to adjust their heads on the bodies, which creates an existential identity for Devadatta and Kapila. The conflict between the body and mind of Devadatta and Kapila. Devadatta got Kapila's body and Kapila got Devadatta's body. Both are lost their identity with the desire of Padmini. Therefore, Padmini feels happy with changing of heads and bodies of both because she wants "a fabulous body with a fabulous brain and fabulous Devadatta" (Karnad). Though this happiness does not stay for a long time. Devadatta loses his strength of muscles with time. This wake-up again Padmini's conflict and desire for a perfect husband and Padmini says, "what are you afraid of, Devadatta? What does it matter that you are going soft again, that you are losing your muscles? I 'm not going to be stupid again. Kapila's gone out of my life

forever. I won't let him come back again. Kapila? What could he be doing now? Where could he be? Could his body be fair still, and his face dark? Devadatta changes. Kapila changes. And me?" (Karnad) Padmini again felt in an existential situation for admiring our desire for the perfect husband and this leads her alienated from our world. Padmini is again attracted to Kapila whose brahmin body change with their masculine body. She is puzzled and does not know how to solve the problem of our existence. Kapila's desperation and anger in this existential situation are revealed through the lines, "The river only feels the pull of the waterfall. She giggles, and trickles the rushes on the banks, then turns a top of dry leaves in the naval of the whirlpool, weaves a water snake in the wet of silver strands, in the green depths frightens the frog on the rug of moss, sticks, and bamboo leaves, sings, tosses, leaps, and sweeps on in rush while the scarecrow on the bank has a face fading on its mud pot head and a body torn with memories" (Karnad) at last, both Devadatta and Kapila fight and kill each other. And Padmini performs sati. So, Padmini as an existential woman serves to stir us to the very depth of our being and awaken in us clearly and fully the transience of the human mind and the brute reality around. Leading to an existential crisis. Therefore, Girish Karnad represented the character of Padmini who suffers from an existential crisis that leads her to the situation of alienation and estranged.

Conclusion:

In this play *Hayavadana*, Karnad exhibits the characters' feelings of alienation, their desire for life leads to an existential crisis in life. Modern Man is always trapped in situations and he according to his own choice and will, which leads man towards the struggle for our existence. Alienation and estranged are its basic conception of Existentialism. Leading female character Padmini's desire for a perfect husband with a fabulous mind in a fabulous body trapped in the situation of bewildered, alienated, and unable to solve the tangled web of existence.

So, Padmini feels alienation because Padmini's husband with a muscular body with intelligent qualities could be in one person. However, Padmini's desire to have a perfect husband. Could not fulfill what separated her in the real world and feels lonely, alienated, and estranged in our world. In the end, Padmini fails to reach her goal and embraces death. Padmini's desire for human love cannot find its total fulfillment either in the body or in the mind. Afterward the death of Devadatta and Kapila, Padmini performed sati. Bhagavata exclaims, "India is known for its pativrata wives who dedicated their lives to the service for their husband but it won't be an exaggeration to say that no pativrata left this world as Padmini did" (Karnad) Padmini as an existential woman serves to stir us to the very depth of our being and awaken in us clearly and fully the transience of the human mind and the brute reality around. This theme of alienation and estranged which is one of the chief characteristics of existential philosophy embodies Padmini as an existential woman.

References:

1. F.C, Copleston. "Existentialism." *Cambridge University Press* (1948): 19-37.
2. Jaydipsinh, Dodiya. *The plays of Girish Karnad Critical Perspectives*. New Delhi: Prestige Books, 2009.
3. Jonathan, Webber. *Rethinking of Existentialism*. UK: oxford university press, 2018.
4. Karnad, Girish. *Hayavadana*. New York: Oxford University press, 2019.
5. Kurtkoti, Kirtinath. *Introduction to Hayavadana*. New Delhi: Oxford University Press, 1975.
6. Pandey kumar Vipin, Pandey Punam. *Existential Temporality the plays of Girish Karnad*. New Delhi: Adhyayan Publishers, 2018.
7. Shakti, Batra. *Girish karnad Hayavadana is a critical study*. New Delhi: Surjeet Publications, 2018.



**THE STUDY ON SIGNIFICANCE OF DRAMATIC TECHNIQUES IN
ROY WILLIAMS'S DEPICTION OF REALISTIC CONTENT IN *JOE
GUY***

Mr. Samadhan M. Jadhav¹ Dr. Prabhanjan B. Mane²

Research Student, Department of English, Shivaji University, Kolhapur.

Professor, Department of English, Shivaji University, Kolhapur.

Corresponding Author- Mr. Samadhan M. Jadhav

Email:- samadhanj1986@gmail.com

DOI- [10.5281/zenodo.7295558](https://doi.org/10.5281/zenodo.7295558)

Abstract:

The present research study explores the significance of different dramatic techniques used by the playwright Roy Williams in his portrayal of realistic social issues of black-white relationships in the British multiracial in his play *Joe Guy* (2007). The objective of this research paper is to assess the importance of different dramatic devices or techniques used by Roy Williams to depict racial and social problems of his contemporary British society. Williams through his use of unique dramatic techniques, explores the central issue of racial discrimination by the mainstream white and West Indian origin black British people against African blacks in the society. The playwright's fame as the most skilled and versatile black British playwright rests on his abilities to explore racial issues by using some unique techniques like shifting of time, radio playing, stage directions, dramatic monologue, and asides in *Joe Guy*. Williams perfectly blends all these techniques to achieve the goal of exploring the underlining racial and identity issues of African blacks in the British urban society.

Work of literature is a direct reflection of the author's real experiences and close personal observations of the surrounding situations. Roy Williams being the skilled dramatist gives shocking experiences and surprises to the audience by exploring the reality through his innovative and unique dramatics techniques in the play. Williams's this particular skill makes him unique and the most acknowledged black British playwright in the British theatre. Apart from the main plot which contains journey of Joe Guy, a black premier footballer from a poor boy to celebrity footballer like Beckham and his subsequent imprisonment on rape charges. Williams through his dramatic techniques exposes underlying dark truths and racially biased mentalities of the mixed race people living in British society.

Key Words: realism, dramatic techniques, time, radio, acts, scenes, asides, accents, patois, stage directions etc.

Introduction:

Roy Samuel Williams (1968 – till date) is the most versatile black British playwright in the contemporary theatre of Britain and holds an important status among his other contemporary white and black playwrights. His name and fame rests on his skills and abilities of handling the most ignored and untouched black subjects ever on the stage in theatre. He differs from his white counterparts for his focus and portrayal of issues of blacks in his plays. Williams deals with the exploration of social issues like racial discrimination, inequality,

lack of opportunities to blacks, biased relationships between whites and blacks, identity crisis between two black communities of West Indians and Africans etc. It further made him Britain's most revolutionary and social realist dramatist in the British theatrical tradition. Williams received many prestigious awards like Evening Standard Award, Alfred Fagan Award, Lawrence Olivier Award, George Divine Award and John Whiting Award for his outstanding contribution to the British theatre in the last decade of 20th and early years of 21st century. He is an OBE (Order of

British Empire) playwright whose plays have been performed in many mainstream white and black theatres of well repute in Britain. As a matter of fact, dramatic techniques are simply understood as the conventions that playwrights use to make audience feel that they are watching the real on the stage. Particularly, the function of dramatic technique is to continue giving audience the experience of reality apart from the action or main the story of the drama. In the dramatic writings, playwrights use certain traditional conventions like aside, soliloquy, dramatic monologue, imagery, stage directions, acts, scenes, settings etc. In this particular study the more focus has been gives to analyse the role of dramatic technics in Williams's attempt of depicting reality of the British society in the play.

Analysis of *Joe Guy* (2007):

Roy Williams's *Joe Guy* (2007) has been written on the request of his friend, Femi and for his 'theatre of Emancipated', a type of theatre mainly established to bring experiences of African black people on the stage. *Joe Guy* is mainly a story about the journey of a black premier footballer named as Joe Guy from a very poor boy working in a hotel, his life as a celebrity footballer and his later self-destruction through his imprisonment on the charges rape. Roy Williams in his own introduction to *Plays: 4*, while assuring his director friend Femi makes it very clear that his play *Joe Guy* is less about the football but mainly exposes the tensions that exist between the Caribbean and African communities in Britain¹ (ix). Here, Williams mainly writes about the conflicts between West Indian black and African blacks over the original identity of 'black Britishness' in the British society. Both of these black communities are seen fighting over the racial issues, equality and superiority of each race in the multiracial society of Britain. Williams brings real social problems and issues of the British society by depicting characters from three different origins such as white, West Indian and African blacks who are living in the same British society. This gives Williams more freedom to write about the racial and biased relationships between all three different races of the society. Characters such as Juliet, Monique, Tel, Rod, Lauren and Sarge represent white race whereas Naomi, Marcus and Carlton belong to West Indian origin black race in the play. Williams makes Joe

Guy, a mouthpiece of the rest of African young men and Jude (Joe's father) becomes the victim of racial conflicts between these races. Williams depicts entire action of the play through seven scenes of the first act and five scenes of the second act.

In this concern, Williams's use of different dramatic techniques in the play becomes significant tool for the playwright to expose the underlying reality of the contemporary British society. Apart from the main action of the play, all the below discussed dramatic techniques help Williams to give minute detail about the real social situations that existed in the society. His sincere attempt of showing the audience the true picture of the society makes him the notable black realist playwright in the British dramatic tradition. Here, an attempt has been made to study the role and significance of Williams's dramatic techniques in the exploration of underlying reality of society of his time.

In *Joe Guy*, the playwright explores the reality through the major themes such as experiences of blacks in the British society, conflict between two different communities of blacks over the 'black British' identity and each other community's superiority in the society, racial issues and discrimination. Moreover, social and racial relationships that existed between the three different communities of whites, West Indian blacks and African blacks in the British society is also one of the major concerns of the playwright in this play. Accordingly, Williams tries to cover all his major themes throughout the action of the play, but more importantly, his skill of using certain dramatic techniques also enhance his realistic approach of depicting the real social situations in the play. The following section of this research paper deals with the study of role and significance of dramatic techniques in highlighting and enhancing the true social picture of the British society.

Here, it is very important to note that fondness for 'black Britishness' has very much influenced the life of Caribbean and African black communities in Britain. Both of the black communities are seen fighting over the real black British identity in the society since their migration to Britain after the Second World War in search of better employment and educational opportunities. Caribbean blacks always tried to claim that they possess the real identity of black

Britishness than Africans and Africans too claimed their native black British identity in the society. It is the main reason behind their struggle and conflicts in the society. Williams throughout the play shows conflict between Joe Guy (African) and Monique and Carlton (West Indian blacks) to show the superiority of each other's race in the British society. Equally important fact in the play is that whites too oppose the blacks over their true British identity by showing their racial biases and prejudices towards blacks in the society. It is represented through the relationships of white characters like Juliet (female reporter), Monique, Rod, Sarge and Tel (to some extent) with Joe in this play. All these white characters criticised and blamed Joe Guy for his attempts to gain black British identity like other Caribbeans (eg. Marcus, Carlton) living in the same society.

The first important dramatic technique in this play is Williams's use of 'radio playing technique' throughout the two acts of the play. Williams being a skilled writer and while continuing the action of the play, makes use of 'radio playing' to show real attitudes of Caribbean origin and African origin blacks over the issues of identity and superiority of each black community over other in the play. Williams's this particular 'radio playing' dramatic technique, used between some scenes of the play, gives him more opportunities to write about the racial biases and prejudiced mind sets of two different communities of blacks about each other. For example, one can get the first instance of radio playing technique at the end of scene second of the first act wherein four characters (Angie, James, Eddie and Badru) are talking on radio and giving their opinions on Angie's question, 'Who is the best, West Indians or Africans?' (20). Williams makes especially three characters speak on the question and accordingly, James and Eddie speak in favour of Caribbeans and criticise Africans but it is Badru who defends and speaks about the strengths of Africans in the society. James while answering opines that West Indians are definitely better than Africans and at the same time, he criticises African's dressing sense. Later, Eddie speaks about bad names of Africans and particularly suggests need for changing names of African mens because these names create more problems for others. James, at the same time, praises West Indian or British names like

Jermaine, Patrick or Joel and laughs at African name like Babaloodoo Oku Daiye (20). It is Badru who speaks about the superiority of Africans and opines that Africa has more to offer especially, our African women who are more graceful, sensual and beautiful. He gives example of Vogue magazine cover with the picture of African models or Nubian sisters and further opines, 'the darker the berry, the sweeter the juice' (20). In this radio playing scene, Williams, apart from his major characters, allows other minor casts from the society to speak about the African-Caribbean relations, racial views and superiority of each race over other in the play.

At the end of sixth scene of the first act, there is another example of radio playing wherein two men named Jocelyn and Yinka are talking on 'why blacks, particularly West Indian men follow and love a white woman?'. Jocelyn speaks in support of West Indians and says that not all but some West Indian men love white women. Yinka says that this is the true picture of West Indian men which he has personally seen and not only believed (39). Williams gives one more example at the beginning of the second act in the play. Here, two car mechanics are listening to the radio wherein six men named Henry, Dave, Tommy, Sue, Dennis and Riz are involved in the debate and talking about the football ('Talk Footie') and also about the realities of football game and its entire system in the society (city). All they speak is about what is happening in the entire football game of their city. Dave blames the system for the selection of wrong players in the team and for not paying attention to the foreign lot of players. Tommy says that white manager Tel is responsible for the defeat and he doesn't have proper skills about selection of right players in the team. Sue blames the system for selecting Ukrainian players who can't play the English game. Lastly, it is Riz who supports and highly appreciates the qualities African footballer Joe Guy and his performances during the matches. Based on his own observation, Sue opines that Joe Guy should be given chance to play for the club (43-44). Through this particular radio playing situation, Williams highlights the realities of football game and its working strategies in the British urban society. He is showing the fact that how mainstream white authorial system ignores the African footballers like Joe Guy even though he performs well and at

the same time giving more chances to Ukrainian players in the team. This is the result of racial discrimination against Africans in the society. In another example, Jason and Datun reveal their racial bias towards African when Jason being West Indian glorifies his community and nation for their progress and at the same time criticises Africans for their jealousy and inferior attitude towards West Indians and their negative growth in the society (63). Williams uses last radio playing wherein Angie (on radio) is glorifying entire black race, their strengths and qualities (90).

Thus, the unique dramatic technique of 'radio playing' gives more opportunities to the playwright to highlight the racial mentalities of people from different communities in the society. It gives him freedom to write about the experiences and realities of Africans within mainstream white system.

Moreover, another important dramatic technique which helped Williams in exploring the social reality is his 'shifting of time' in the play. In order to give audience the realistic experience in theatre, Williams skillfully handles time setting of his play. While looking at the play, one can definitely notice Williams's shift of time in the action of his play and when he goes back completely a decade from the second scene onwards (2007 to 1997). This particular technique gives the writer chance to show the existing social situation and problems from 1997 to 2007, a complete decade in the life of his African origin character of Joe Guy. Williams's intention to use specific time for each scene helps him to maintain continuous and natural flow of time which further resembles actual life of life of Joe Guy. It brings the reality to stage because it makes audience feel they are watching real actions on the stage. While studying the play, it is noticed that the first scene of the play takes place in the year 2007, for second scene Williams goes back to 1997, third and fourth in 1998, sixth in 1999 and seventh in the year 2000. Likewise, scenes of second act also maintain shift of time where first scene takes place in 2001, second scene in 2002, third in 2004, fourth in 2005 and the fifth scene in 2007 (the same year at the beginning of play). Williams confines the action and story of the play for a decade, maintains chronology of time frame from 1997 to 2007 and depicts social problems faced by Joe Guy in his life.

Shifting of time is significant in the play because it helps Roy Williams to highlight issues and problems of blacks in the multiracial society. But while shifting the time, Williams exposes social issue of racial conflicts between two black communities over their real black British identity in the British society. In fact, Williams's *Joe Guy* shows the progress of black African football player (Joe) from 1997 as a poor black boy working in a hotel till his becoming of celebrity footballer in 2007 and his subsequent imprisonment on rape charge. The playwright also puts on the stage Joe's bitter experiences and struggle in his journey towards celebrity footballer and his later self-betrayal through self-destructive and unlawful charges of rape. In this concern, the shift time in the play is very suggestive and reflective on the true social status of African blacks in the multiracial British society.

In short, Williams's use of dramatic technique of 'shifting time' to the past decade helped him to give audience real experience and true picture of the British society from 1997 to 2007 in the play. Particularly, with this technique Williams becomes more successful in showing people realities of life, racial and social problems of the British society and in fact, bitter experiences of Joe Guy, his African hero while living in the British society.

In addition to the above discussed two dramatic techniques, Williams also uses traditional dramatic conventions of 'aside' and 'stage directions' to show the truths of human relationships, their racial views and social situations in the British society. Particularly, asides help the playwright to record racially biased and prejudiced mentalities of characters and stage directions explore the true social problems of the society in the play. These two dramatic devices certainly help the writer to become the perfect practitioner of the drama of social realism in the contemporary British theatre. Williams gives the first instance of aside in the dialogue between Tel and Carlton about football. Here Carlton is trying to convince Tel (main Coach) about his own football playing skills and also seen talking about Tel's act of wrong selection of players and gives him the first preference in the team to play. But, Tel follows his own thoughts and rules. In despair, Carlton continues:
TEL. You better believe it. (*Calls.*) Andy, come here! Tell them all to play

tight, tight! As an arsehole.

CARLTON. (*aside*) Cunt. (27)

Here, this particular aside reveals the true biased attitude of Carlton towards his white Coach Tel and in fact, indicates disliking of West Indian black player for dominance of whites in the football game in the society. Williams highlights issues of racial relationships between white and West Indian (Caribbean) communities living in the same British society.

Moreover, especially in the second act Williams gives two asides of his African hero to reveal his true thinking and attitudes towards West Indian and white community people in the society. Particularly, Joe uses his first aside while talking with Carlton, his West Indian counterpart in the play while talking about each other's superior identities of 'black Britishness' and their sporting skills.

CARLTON. ...Joe, you know I'm the truest nigga in this room.

JOE. Truest chump.

CARLTON. You don't think I can?

JOE. No, I don't. (*Aside*) Typical Jamo! (56)

Joe's above 'aside' reveals his true thinking about another West Indian origin footballer, Carlton. Here, through this particular aside Williams shows tensed and racial relationships between two blacks of different origins and their attempts to show each other's superiority as black British citizens of the society. Both of them are trying to undermine each other's superiority which further reveals their racial and prejudiced mentalities about each other in the play. Williams perfectly makes use of this aside to highlight conflicts between Caribbean and African young men over their superiority and true identity in the British society. In the last example of aside, Williams gives lack of positive mindsets of whites towards Africans in the society. Here, Joe says to Lauren (white woman) that he had injury and need to go under the knife (surgery) in the next week. Both Lauren and Rod consider it as OP and Joe responds to Rod through his aside and informs Rod 'to shut his mouth' for thinking about him negatively (61). Thus, through all the above examples of asides Williams shows the true inner thoughts of different origin characters about each other's race in the play. In this context, the critic Lynette Goddard's opinion about the play is very much suggestive when the critic says: *Joe Guy* focuses on how racial discourses of

black masculinity impact on a West African premier league footballer's sense of belonging and identity³ (96). Through the use of dramatic techniques, Williams achieves the above said objective in a very successful manner. Apart from asides, Williams's use of stage directions plays equally important role in conveying additional effects in the action, reflecting the mood and feelings of his mixed casts in the play. Through all the stage directions, Williams becomes more successful in showing the audience that they are watching authentic actions and genuine feelings of his characters. In fact, Williams's stage directions clarify the actual feelings of his characters and their true motives behind actions of the play. The playwright Roy Williams uses another important technique of 'dramatic monologue' to reveal Joe Guy's (central character) inner thoughts and conflicts in the fifth scene of the first act in the play. During this monologue, Joe faces the audience, speaks to himself and in an attempt to show his 'black Britishness', tries to overcome his Ghanaian accent. Through Joe's monologue, audience becomes aware about the Joe's efforts to show the outer world the true identity and strengths of Africans who are living in the multicultural and multiracial British society. In the first part of the monologue Joe is seen facing difficulties in overcoming his Ghanaian accent but from the middle of the monologue his Ghanaian accents fade away. Particularly at the end Joe is seen pleased to see the drastic change in his life as an African young man. Here, Williams shows one more fact about the behavior of African people i.e. to imitate British life out of their fondness for 'black Britishness'. The scholar critic D. Keith Peacock makes right observation when he says:

'In Roy Williams's plays, English society includes different races and all these races are, on the one hand, in continuous conflict; on the other hand, young and old, male and female, black and white adapt to and even adopt each other's cultural values and lifestyles, establishing their identities in relation to racial stereotyping⁴ (531).

In this monologue, Joe Guy blames Marcus (West Indian black character) for his acts of racial discrimination against him and other Africans in the British society. According to Joe, African blacks are always the victims of racist attitudes of white and Caribbean blacks in the British society and on the other

hand, true identity and strengths of African people are always ignored by the other community people. In fact, Joe speaks on how West Indians like Marcus, Carlton are always trying to undermine African peoples' 'black Britishness' in the society. Williams, indeed, through the character of Joe Guy, is showing the fact that African blacks are equally important part of the British society just like whites and other West Indian blacks and they should be treated as equal with the same British identity. Joe expresses his bitter contempt over the Marcus' attempt to discriminate African blacks and also for giving them inferior treatment in the society. Joe asks Marcus, 'what do I look like to you...some booboo big rubber-lips monkey-faced African bin bag?...I'm oneyer you, I'm better dan you! I'm the new and improved model...' (36). This monologue gives true inner conflict and insights into the mind of Joe Guy over the racial discrimination against Africans from other communities in the society.

Thus, through Joe Guy's monologue Williams highlights the existing issue of racial discrimination against African black people equally from the West Indian blacks as well in the British urban society. Africans are still struggling to get 'black British' identity and equal opportunities in the society. Other communities like white and West Indian black tend to ignore the African peoples' existence in the British society. Thus, Joe Guy's monologue helps the playwright to represent the true issues of the society particularly racial discrimination against African blacks in the British society.

Conclusion:

Thus, after looking at the explanation, it is concluded that dramatic techniques have helped the playwright to bring the reality about the British multicultural life of people in the theatre. Through all the above dramatic devices, Williams gets more freedom to depict the real happenings, social problems and issues of the African black community. In fact, all the techniques help him to explore the African experiences, racial issues, lack of opportunities and lack of equal treatment to African people in the society. Apart from the main action of the play,

Williams's use of dramatic devices of radio playing, shifting of time, asides, stage directions and dramatic monologue have certainly played a crucial role in giving audience the authentic experience of social reality in the play. Roy Williams's all above explained dramatic techniques are significant in a sense that it helped the playwright social reality of his time particularly painful experiences and identity crisis of African blacks in the British multicultural society. His skilled use of dramatic techniques in handling and exploring of social truths makes Roy Williams one of the major exponents in continuing the realist tradition of drama in the British theatre. In this concern, Deirdre Osborne's comment about Williams is very much suggestive about his playwriting skills and his status as a skilled dramatist:

'Playwrights such as James, Newland and Williams clearly do identify themselves as black British writers and plant their work in a theatre heritage to which they claim rightful inclusion⁵ (208).

Works Cited:

1. Williams, Roy. 'Introduction', *Plays 4: Joe Guy, Category B, Sucker Punch, Baby Girl and There's Only One Wayne Matthews*. London: Methuen Drama, 2013.
2. Ibid. ix. (All quotations from the play have been taken from this edition. Page numbers in parenthesis have been given in the body of text).
3. Lynette, Goddard. *The Methuen Drama Book of Plays by Black British Writers*. London: Methuen Drama, 2011.
4. D. Keith Peacock, "The Question of Multiculturalism: The Plays of Roy Williams" Ed., Mary Luckhurst. *A Companion to Modern British and Irish Drama 1880-2005*. Oxford: Blackwell Publishing Ltd., 2006.
5. Deirdre Osborne, "Staging Belonging and Unbelonging in Black British Drama Today", May, 2020, 208. <<https://www.researchgate.net/publication/341162146>>. Accessed on 25th Sept., 2022.



STUDY OF ZOOPLANKTON DIVERSITY, ABUNDANCE AND SEASONAL VARIATIONS FROM NAKANA LAKE, DHULE (MS) INDIA

Patil, M. U.¹ Patole, S. S.²

Dept. of Zoology, Vimalbai Uttamrao Patil Arts and Late Dr. B. S. Desale Science College
Sakri Dist- Dhule (MS) Sakri- 424304.

Prof. & Head, Dept. of Zoology, VVM's S. G. Patil ASC College, Sakri Dist- Dhule.

Corresponding Author- Patil, M. U

Email:- rajmany155@gmail.com

DOI- 10.5281/zenodo.7295562

Abstract

One of the vital territories of the world is aquatic ecosystem which covers the much more area where some organisms to be inherent in it. From those zooplanktons are important ecological indicators of freshwater bodies serves as major element of aquatic food chain. The present investigation deals with zooplankton diversity, abundance with some diversity indices in different seasons into two-year study period (Feb, 2013 to Jan, 2015). The zooplankton diversity of Nakana Lake was represented by taxonomic 4 groups i.e., Rotifera, Cladocera, Copepoda and Ostracoda with total density 1512 and 1383 org/l in two years. The Copepods dominated with 9 species followed by Rotifers with 7 species then Cladocera's with 6 species and Ostracods with 3 species. Maximum zooplanktons were identified in summer season, moderate in winter and minimum in monsoon season. At the density point of view ostracods dominated, followed by rotifer, Cladocera then Copepod. The diversity indices show different values in couple of year. Polluted status of lake indicated by few rotifer species which happen due to anthropogenic activities.

Keyword: Territory, Cladocera, Locomotion, *Keratella tropica*

Introduction

Zooplankton diversity is most important ecological parameters in water quality appraisal. The zooplanktons are microscopic animals, length having 100 to 500 um, they show ciliated outgrowths at the anterior end of the body called corona. Corona used for food capturing and locomotion process (Sing and Talpade, 2018). These microscopic invertebrates can attain maturity quickly but they have very short life span. Generally, zooplankton depends to a large extent on various phytoplankton for food. Many of the superior forms feed on minor zooplankton, forming secondary consumer, while some of them are detritivore feeders, browsing and feeding on the organic matter attached to substrate or lying on the bottom sediment. As a primary consumer they link between phytoplankton and fish, some zooplanktonic species indicating the presence or absence of certain fish species. According to Manickam *et. al.* (2017) Assessment of zooplankton biodiversity will be beneficial to screen the healthy status of waterbody and productivity

of fishes. They provide food for secondary consumers which is valuable for commercially important aquaculture. These types of primary consumers constitute an important role in energy transfer from first to most advanced level in food chain of floating as well as stagnant aquatic ecosystem (Dhanasekaran *et al.*, 2017), as they are varying from one ecological area to other and even within same geographical locality. Hence qualitative and quantitative analyses of zooplankton are of huge importance in reservoir water body. No systemic analysis has been carried out regarding seasonal fluctuation and diversity indices of zooplanktons from Nakana Lake. In sort to fill up this lacuna, present investigation had undertaken in two successive years.

Material and Methods

For estimation of zooplanktons the sample was collected monthly, between 7.00 am to 9.00 am, by using 25 mm mesh size plankton net during Feb, 2014 to Jan, 2016 from Nakana lake. The two-year study data (Feb.,

2014 to Jan., 2016), for seasonal variation was polled for four months and three seasons, with respect to Summer (February, March, April and May) Monsoon (Jun, July, August and September) and winter (October, November, December and January). Mean and Standard Error of Mean (SEM) were calculated for each season and One Way ANOVA with no post test for various parameters for three seasons. 100 l of surface water were sieved, filtrate was taken in another sterilized bottle, labeled and for preservation 4% formalin was added. For further analysis sample were brought to the laboratory. Counting was completed with the help of "Sedgwick-Rafter counting cell". The systemic identification of zooplanktons was made by using slandered keys of Dhanpathi (2000) and Altaff (2004). Diversity indices estimated by (Shannon and Wiener, 1949; Simpson, 1949; Margalef, 1958 and Pielou, 1966) methods.

Data analysis

Methods to measure the diversity are based on the relationship between the different types of species present in an area and their total populations.

1. Shannon – Weiner Index (1963): (H): $H = -\sum P_i (\ln P_i)$,
2. Simpson's Dominance Index (1949) : (D): $D = \sum n(n-1)/N(N-1)$,
3. Simpson's Index of Diversity = $1-D$,
4. Simpson's reciprocal Index = $1/D$,
5. Margalef's Index (1958): (MD): $MD = R/S - 1/\ln(n)$
6. Pielou's evenness Index (1966): (J): $J = H/\ln*S$

Result and Discussion

Mostly zooplankton depends to a large extent on various phytoplanktons for foodstuff. Many of the larger forms feed on minor zooplankton, forming secondary consumer, while some of them are detritivore feeders, browsing and feeding on the organic matter particles attached to substrate or lying on the underneath residue. Communities of freshwater Zooplankton belong to four main taxonomic groups Rotifera, Cladocera, Copepoda and Ostracoda. The recorded values indicate Copepoda > Rotifera > Cladocera > Ostracoda during both years, shown in fig. -1

Zooplanktons from Nakana Lake are represented by 25 species. Total (1512 and 1383) org. /l were recorded two repeated

years, during Feb, 2014 to Jan, 2016 shown in table-1.

Total 473 Rotifer recorded during year 2014-15 and 422 in year 2015-16, viz; *Brachionus angularis*, *Brachionus candatus*, *Tricocera cylindrica*, *Tricocera smiles*, *Lapadella ovalis*, *Lecane luna* and *Keratella tropica*. The rotifer exhibits very wide range of morphological variations and adoptions, and are a known indicator of water quality, Gannone and Stremberger (1978). *Lapadella ovalis* record maximum density in month of February (16 org/L and 15 org/L) at both years while minimum density *Lecane luna* in month of June and September in 2014-15 and *Keratella tropica* in month of September and December during 2015-16, coincided with (Rao, 2016)

Abundance of Cladocera varies between 283 to 271 in two-year study periods, reported with 6 species like *Alona pulchella*, *Ceriodaphnia sp.*, *Daphnia carinata*, *Daphanosoma sp.*, *Monoclapnia sp.* and *Simocephalus sp.* Ecologically Cladocera can be classified as the most important component of zooplankton community (Panvar and Malik, 2016). In this group *Alona pulchella* found to be dominant in month of November at both years.

Freshwater Copepods represent most important zooplankton communities, they provide as food to numerous fishes and participate a major role in the energy makeover the furthestmost tropic levels. They found to be governing by 9 species (373 to 399 org/l) at the whole study period, viz *Cyclops bicuspidatus*, *Cyclops viridis*, *Cyclopoid sp.*, *Cyclocypria sp.*, *Clanoid sp.*, *Heliodiaptomus sp.*, *Daptomu sp.*, *Mesocyclops leuckarti* and *Zoea Larva*. Maximum abundance of *Heliodiaptomus sp.* in month of January in year 2014-15 and *Clanoid sp* had shown maximum number in same month of year 2015-16, correlated with (Singh *et al.*, 2021).

Ostracods represents by 3 species with dominant genera at the density point of view i. e. 305 to 369 org/l. Cypris. *Cypris*, *Stenocypris* and *Srandesia* had maximum abundance. Maximum population of *Cypris* (25 org/l) in occur month of December and *Srandesia* species absent in month of August during 2013-14, corroborated with (Kar and Kar, 201)

Seasonal Variation

Zooplankton is good indicators of the changes in water quality because they are strongly affected by climatic fluctuations and respond rapidly to changes in water quality, recorded in Table- 2.

Present study observations showed that highest population of total zooplanktons (142.66 ± 24.90 and 131.56 ± 30.02) in winter season as well as lowest at monsoon (135.5 ± 44.15 and 123.25 ± 40.47) in year 2014-15 to 2015-16 respectively. Pick point recorded about Rotifer population in February and Minimum in July during 2013-15. Maximum abundance was recorded during summer (7.07 ± 3.63 and 6.42 ± 3.25) and decline in monsoon season (4.28 ± 1.87 and 3.96 ± 1.87) and moderately recorded in winter (5.53 ± 2.07 and 4.67 ± 2.07), present record corresponding with (Kumar *et al.*, 2015). In cladocera maximum occurrence in February (35 org/l and 32 org/l) and minimum at November in both repeated years. About copepoda pick population (39 org/l and 36 org/l) in April and least in December in couple of years. Both groups showed highest values in winter season (4.75 ± 2.78 and 4.87 ± 2.25 ; 4.41 ± 2.25 and 4.08 ± 2.06) and lowest in Monsoon (3.95 ± 2.09 and 4.12 ± 1.96 ; 3.61 ± 1.97 and 3.51 ± 1.57). According to Singh *et. al.* (2021) pick residence of Cladocera and Copepoda in winter season due to easy availability of food, favorable abiotic factor and plentiful development of phytoplanktons, reduction in summer due to unavailability of food. Group Ostracoda shoed same result about seasonal variation, uppermost on winter (11.91 ± 6.82 and 11.25 ± 6.10) while buck in monsoon (8.92 ± 5.97 and 6.66 ± 3.96) in couple of year. In the present study monsoon season records minimum values because of turbidity due to soil erosion and surface run-off. Our findings related with (Dede and Deshmukh, 2015).

In the present study, Rotifers were the most abundant throughout the study period however Ostracoda group dominated over the other groups in density point of view.

Diversity Indices

Biological diversity can be measured by many different ways i.e. Richness and Evenness. Different kinds of animals are present in an exacting area is called richness while evenness compares the resemblance of inhabitants of each species. Diversity depends on those, both things are increases,

diversity involuntarily increases. Shannon and Wiener index is also significant contrivance for analysis diversity of particular territory. By using different formulae, we calculated values of six types of indices given in Table- 3 and graphical representation in fig.- 2.

The present estimation paid attention' at richness, abundance and different diversity indices of freshwater body, Nakana Lake. The lake represents more affluent value about zooplankton species i. e. 25 and abundance is 1512 and 1383 during 2014-15 and 2015-16 respectively. The value of the Shannon-Weiner index was (60.999 and 49.1047) shows greater diversity in couple of the year. The index of dominance is useful for shaping meticulous zooplankton species ruled by that territory. In Simpson's Dominance Index quantify the possibility that two individuals indiscriminatingly selected from a sample will belongs to the same species. The value of this index was (0.053 and 0.049) in both years. This varies between 0 and 1. If a value of this index was 0 stands for infinite diversity and 1 indicates no diversity (Patil *et al.*, 2016). When value of lake is low, the allegation is that "Dominance is shared by all the species of that community" Cummins (2002). To get over this problem 'D' is subtracted from 1 to give the Simpson's index of diversity (1-D) which was (0.9469 and 0.9509) and Simpson's reciprocal Index (1/D) was (18.8556 and 20.3729). These three are the closely related indices shows the same diversity. The species richness is calculated by Margalef's Index (MD) was (3.2781 and 3.3185) Pielou's evenness index (J) was (18.9504 and 15.2564) in year 2014-15 and 2015-16 respectively. Our observations are correlated with studies like Sharma and Sharma, (2011); Panwar and Malik (2016) is calculated the values of diversity of Loktak lake, Manipur, India and Bhimtal lake of Kumaun region, Uttarakhand respectively.

Conclusion

In nutshell, diversity of zooplanktons of Nakana Lake maintains in both the years but density decreases in next year as compare to earlier. They show higher level abundance in summer season because of high temperature water evaporates and water body enriches with nutrients whereas falls in monsoon due to dilution of water by rainfall and turbid by agricultural runoff. This

manmade lake suitable for fishery hence zooplanktons is the better food for the larval form of the fishes. But some anthropogenic activates disturbs this natural food chain. Hereafter the steps should be taken for the protection of this territories.

References

- Sing, A.S. and Talpade, M.B., (2018). Studies on zooplankton diversity in Pawai reservoir, Mumbai, *Int. J. of Zoo. Studies*. ISSN: 2455-7269.
- Shannon, C E., and Wiener, W. (1963). The Mathematical theory of communication, *University of Illinois Press Urbana, IL*, PP., 125.
- Simpson, E. H. (1949). Measurement of diversity, *Nature, Lond.* 163, (4148) -688.
- Pielou, E.C. (1966). The measurement of diversity in different types of biological collections, *J. Theor. Bio.* 13: 131-144.
- Marglef, R., (1958). Perspective in ecological theory, *Univ. Chicago Press, Chicago, USA IL*-111.
- Panwar, S. and Malik, D. S., (2016). Zooplankton diversity, species richness and their distribution pattern in Bhimtal lake of Kumaun region, (Uttarakhand), *Hydrol. Curr. Res.*, 7:219.1000219.
- Gannone, J. E. and Stremberger, R. E., (1978). Zooplankton (especially crustacean and rotifer) as indicator of water quality. *Trans Am Micros Soc.*, 97: 16-35.
- Patil, M. U., Patole, S. S., Bhoi, S. S. and Ahirrao, K. D., (2016). Malacofaunal distribution, abundance and diversity of the Nakana Lake, Dhule (MS) India, *J. of Res. in Biol.*, 6(1): 001-007.
- Rao, K. R., (2016). Zooplankton diversity and seasonal variation in Thandava reservoir, Visakhapatnam, India, *Int. J. of Aqa. Studies*, 5(1): 90-97.
- Cummins, H. (2002). Paleoecology Problem Set.
- Altaff K. A manual of Zooplankton University Grants commission, New Delhi. and management, 2004, 5:31-43.
- Sharma, C. and Tiwari, R. P. (2011). Stidies on Zooplanktons of fresh water reservoir at Lony Dam, Theonther Rewa, *Int. J. of Pharma. Life Sci*, 2: 492-495.
- Kumar, K. H. and Kiran, B. R. (2015). Population dynamics of Rotifers in Janna Pura tank, Karnataka, *Int. J. of Fisheries and Aqua. Studies*, 3(1): 165-168.
- Dhanasekaran, M., Bhaven, P. S., Manickam, N. and Kalpana, R. (2017). Physicochemical characteristics and zooplankton diversity in a perennial lake at Dharmapuri (Tamil Nadu, India). *J. of Entom. and Zoo. Studies.*, 5(1): 285-292.
- Dede, A. N. and Deshmukh, A. L. (2015). Study on zooplankton composition and seasonal variation in Bhima River near Ramwadi Village, Solapur District (Maharashtra) India. *Int. J. of Curr. Micro. and Appl. Sci.*, 4(3): 297-306.
- Manickam, N., Bhaven, P. S. and Santhanam, P. (2017). Evaluation of nutritional profiles of wild mixed zooplankton in Sulur and Ukkadam Lakes of Coimbatore, South India. *Turkish J. of Fisheries and Aqua. Sci.*, 17: 509-517.
- Kar, S., and Kar, D. (2016). Zooplankton Diversity in a freshwater lake of Cachar, Assam, *Int. J. of Appl. Bio. And Pharma. Tech.*, 7(1): 301-305.
- Singh, S., Kumari, V., Monalisa, Gupta B. S. and Mohammad, A. (2021). Study of Zooplankton Diversity in A Freshwater Pond (Raja Bandh) of Jamtara, Jharkhand, India, *Int. J. of Adv. Life Sci. Res.*, 4(2): 05-13.

Table:-1, Species wise percentage of Zooplankton from Nakana Lake.

Sr. No.	Name of Species	% of org./l	
		2013-14	2014-15
Rotifera (7)			
1	<i>Brachionus angularis</i>	16.5	14.9
2	<i>Brachionus candatus</i>	12.9	11.1
3	<i>Tricocera cylindrica</i>	16	15.4
4	<i>Tricocera smiles</i>	13.5	14
5	<i>Lapadella ovalis</i>	15.6	15.8
6	<i>Lecane luna</i>	11.8	13.3
7	<i>Keratella tropica</i>	13.5	13.5
Cladocera (6)			

8	<i>Alona pulchella</i>	24	21.2
9	<i>Ceriodaphnia sp.</i>	17.3	16.2
10	<i>Daphnia carinata</i>	16.2	16.6
11	<i>Daphanosoma sp.</i>	10.7	11
12	<i>Monoclapnia sp.</i>	14.3	17.7
13	<i>Simocephalus sp.</i>	17.3	16.6
Copepoda (9)			
14	<i>Cyclops bicuspidatus</i>	12.2	12.9
15	<i>Cyclops viridis</i>	11.2	10.5
16	<i>Cyclopid sp.</i>	11	13.4
17	<i>Cyclocypria sp.</i>	10.2	10.4
18	<i>Clanoid sp.</i>	14.5	13.4
19	<i>Heliodiaptomus sp.</i>	14.5	14.2
20	<i>Daptomu sp.</i>	10.3	9.1
21	<i>Mesocyclops leuckarti</i>	8.8	8.3
22	<i>Zoea Larva</i>	7	7.2
Ostracoda (3)			
23	<i>Cypris</i>	56.3	45.4
24	<i>Stenocypris</i>	31.7	26.8
25	<i>Srandesia</i>	11.9	10.2

Table- 2, Seasonal variation of zooplankton from Nakana Lake.

Sr. No.	Group	Year	Average \pm SD		
			Summer	Monsson	Winter
1	Total Zooplanktons	2013-14	135.5 \pm 44.15	99.75 \pm 25.77	142.66 \pm 24.90
		2014-15	123.25 \pm 40.47	90.00 \pm 20.11	131.56 \pm 30.02
2	Rotifera	2013-14	7.07 \pm 3.63	4.28 \pm 1.87	5.53 \pm 2.07
		2014-15	6.42 \pm 3.25	3.96 \pm 1.87	4.67 \pm 2.07
3	Cladocera	2013-14	3.95 \pm 2.09	2.58 \pm 1.74	4.75 \pm 2.78
		2014-15	4.12 \pm 1.96	2.79 \pm 1.35	4.87 \pm 2.25
4	Copepoda	2013-14	3.61 \pm 1.97	3.05 \pm 1.62	4.41 \pm 2.23
		2014-15	3.51 \pm 1.57	2.83 \pm 1.59	4.08 \pm 2.06
5	Ostracoda	2013-14	9.91 \pm 5.91	8.92 \pm 5.97	11.91 \pm 6.82
		2014-15	8.07 \pm 4.88	6.66 \pm 3.96	11.25 \pm 6.10

Table- 3, Zooplanktonic species richness, abundance, dominance and diversity indices of Nakana Lake.

Sr. No.	Zooplankton	2013-14	2014-15
1	Species Richness (S)	25	25
2	Species abundance (N)	1512	1383
3	Shannon-Weiner Index (H)	60.999	49.147
4	Simpson's Dominance Index (D)	0.053	0.049
5	Simpson's Index of Diversity (1-D)	0.9469	0.9509
6	Simpson's Reciprocal Index (1/D)	18.8556	20.3729
7	Margalef's Index (R)	3.2781	3.3185
8	Pielou's Evenness Index (J)	18.9504	15.2564

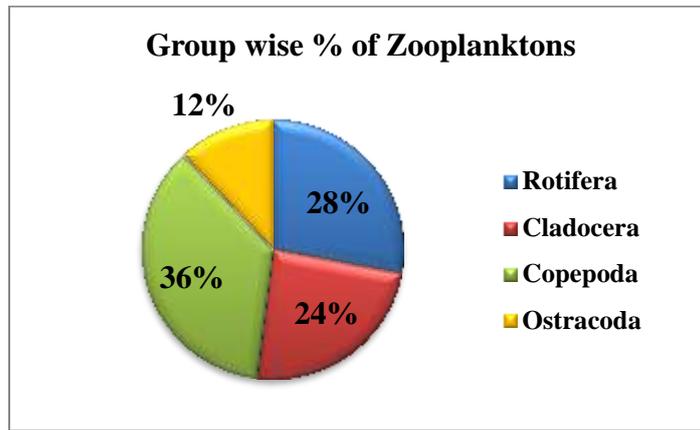


Fig. -1, Total percentage occurrence of Groups of Zooplankton from Nakana Lake, during Feb, 2014 to Jan, 2016.

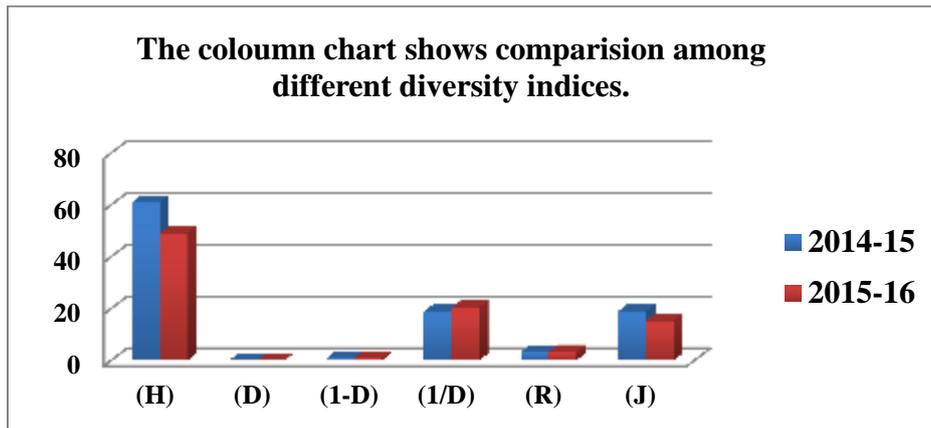


Fig.- 2 Graphical Representation of Diversity indices of Zooplanktons from Nakana Lake, during Feb, 2014 to Jan, 2016.



THE DESPERATE FEMEINSTS

Swetta Rajendra Singh Gautam¹ Dr.Vivek V.Joshi ²

Research Scholar, Gondwana University, Gadchiroli

Hod English Department, Gondwana University, Gadchiroli, Maharashtra

Corresponding Author- Swetta Rajendra Singh Gautam

Email:- swettasinghgautam@gmail.com

DOI- [10.5281/zenodo.7295564](https://doi.org/10.5281/zenodo.7295564)

Abstract

People have become more open about their ways of life and also there is an increase in the level of tolerance towards others ways of life and ideologies than it was ever before. Among various ideologies that has been featuring now and then feminism has one to be most talked about. Feminism has been trending fashionably for past couple of years. Individuals and also the businesses and various companies are in desperate need to stand as feminists for several reasons which are presented below. The aim of this paper is to understand and analyses the various aspects of feminism wherein feminism is used to portray oneself as feminists, ergo the limners do not believe in the ideology much. This paper also presents scope for further research in various fields with various courses of actions.

Introduction

The fight for equality in all aspects of our life is everlasting and with the advent of postmodernism our society has not only seen many drastic changes in social and political sides but in literary aspects also; especially about equality in life. The demand for equal rights increased drastically and has gotten substantial attention too. Many historical judgments have been passed that provide the genders in our society equal rights. Cultures of the society have gotten tolerant and have learned to keep to their affairs. Educational systems have started to incorporate gender equality content in their curricula and are teaching the young minds to accept the new world. People all over the world are aware of the latest updates in their concerns and with the help of social media these enlightened beings boldly representing their views as well. People are more open about their personal likes and dislikes and their sexual orientations and are becoming more tolerant than ever before. There is a visible awareness about (now not only fight for our) rights but about space for others too; people jump into conversations or situations which are not related to them just to protect those who cannot protect themselves. Sometimes, the thought to be offended himself does not feel offended at all. There has been an upsurge

about awareness among societies with respect to feminism and feminist ideology. There has been an increase in the study of feminist school of thought and people get ample exposure about feminist ideology through media. Though people may not be well educated in feminism they tend to develop an understanding and hold opinions about it. The increased coverage of the feminist ideology in the social media has helped even the lay men to develop their own understanding about feminism. There has been rise in the supporters of this ideology horizontally as well as vertically. Horizontally when feminists are supporting each other and vertically when other ideologies come forward to offer their support; for example, Marxist ideology has tried to accommodate feminist ideology as Marxist feminism (Yahu, 2014) Feminism is not only popular on media platforms but now is part of school Curricula; and it has been increasing its support system further (Poole & Zeigler, 1981) Fighting for what one believes is very crucial because it gives one's life meaning, but supporting anything without being fully aware it kills the purpose of the entire struggle. The level of awareness about rights of equality, freedom to express oneself is never fully gauged. One sees and perceive things according to our level of

understanding. According to philosopher Peter Carruthers conscious though itself is an illusion, awareness is different from consciousness; and apparently, we can be aware of our thoughts but not of others (Carruthers, 2017)

Review

Recently, Disney released its long-awaited movie "Aladdin (2019)", which was filled with spectacular visuals and audios in 3D and it was like the anime movie that was released in 1993 namely- "Aladdin" produced by Disney earlier. The movie was an exact copy of the original Aladdin 1993 but it presented the audience with a twist in the end. The princess is made the Sultan! People who went to watch the movie to relive their childhood memories of the original series came out disappointed because of the one twist in the end (Ritchie, 2019) The desperation to come out as pro feminists the franchise changed the entire end and empowered Jasmine. The noble change is welcomed but the audience is presented a time where there is tradition, a culture in which women wore niqab, there are magic carpets and Genies, and then the desperate movie creators made the princess "The Sultan", which hardly seems consistent and clashes with Aristotle's Theory of Drama. The franchise should take note of the intelligence of the audience it is catering to and their ability to understand what is being presented to them. The franchise seems to be correcting the scripts and giving the princesses a chance to freedom. Likewise, in another Disney movie "Wreck it Ralph 2: Ralph breaks the Internet", various Disney princesses are shown in their original attires and are later enlightened about casual clothes by one of the lead female character 'Venelope'. The princesses are then later shown in casual clothes displaying their powers to save Ralph (a giant man) from a fall (Jhonston & Moore, 2018) Again, trying to turn the freakishly famous Disney princesses from 'damsels in distress' to 'knights in casual clothing'. The audience especially the labelled weaker gender is strong enough to take what it is and what it was. People do not need rectifications done to old stories; we can accept what it has been; what is expected is new stories of women empowerment and not sugar coating of the

old ones. (Evidently Disney is desperate to come out as pro girls and cash in from it to get some praise for its feministic approach) Similarly, in an incident in France police officers asked a Muslim woman to remove her niqab while she was enjoying on the beach claiming that she is oppressed and unaware that she is oppressed. When she claimed that she does not feel oppressed and asked the officer to leave her alone the officer reacted more fiercely on to her, asking her to remove the niqab. After the passing of a ban on burkinis in France similar incidents were on rise and these women were made to pay fine even for wearing a headscarf. *Operation burkini* was inspired by Rosa Sparks and launched by the group Citizen Alliance of Grenoble to defend the rights of Muslim women in May 2018 (Quinn, 2016)

Though the root behind this drastic change in the law in France appears to be 'Secularism', many women would disagree. It is said by the authorities in France, that France is a secular nation and they want to change the old undignified tradition where laws dictate what a women can or cannot wear; but by punishing the Muslim women for wearing burkini they are indeed doing the same thing. Likewise, a petition has been filed in India by Subharna Ghosh who is known to have filed many petitions on various issues, appealing country's prime minister to intervene in domestic matters. The petitioner asked the PM to talk to Indian men in his next speech to share household work equally. This online petition has so far received 79,511 signatures and at 1,50,000 signatures it will be one of the top signed petitions on Change.org (Change.org) (Apparently, Ghosh is known to have filed many petitions on various issues and is clearly seeking recognition for the same)

Though not much has been achieved through it, the petition has paved the way and brought up the domestic work sharing debate out in the open. The petition has received mixed responses where some supported it and others objected to it. Furthermore, the petitions page features a picture of Arjun Kapoor from his film in which he dreams to be a homemaker and has no objection to be with a wife who is workaholic (R.Balki, 2016) This, sparks yet another desperate attempt to project a household life where it is possible for a man to be a homemaker, which is a rare

view. The Director and producers are trying to stand out from main stream and produce films that portrait strong female characters.

Conclusion

Flooding media with films and series where men are shown doing domestic work and it is not portrayed in a comic way but in serious terms and women taking up office work is getting common but the result of these desperate attempts are yet to be gauged. Various Indian brands and marketing companies have tried their best to come out as feminists and produce femvertisings-advertisements that support or elaborate on female characters or feminist traits. that has failed to do what it was supposed to and the companies had to revise them. The examples of such advertisings are advertisements of Kellogg's, Fair and lovely, Dove, Dalda, and Airtel (Maniyamkott, 2020) (But the concealed motives can be assessed as fame, recognition, insertion of authority, or cashing ins.)

Further study

This research work can be expanded by undertaking research on more detailed manner by segregating the study on political, psychological, economic, etc. aspects mentioned above.

Further research can also be conducted for understanding the relationship between companies femvertising and its annual growth reports to analyse the impacts of such advertisements on their profits. Another research can be conducted on analysing the

portrayal of men in household work as act of comedy.

Bibliography

1. Carruthers, P. (2017). The Illusion of Conscious Thought. *Journal of Consciousness Studies*, 9(10), 228-252.
 2. Jhonston, P., & Moore, R. (Directors). (2018). *Wreck it Ralph 2: Ralph Breaks the Internet* [Motion Picture].
 3. Maniyamkott, M. J. (2020, December 4). *These Ad Campaigns that Attempt at Being Feminist are Simply Cringeworthy*. Retrieved from Yahoo.com: <<https://in.makers.yahoo.com/these-ad-campaigns-that-attempt-at-being-feminist-are-simply-cringeworthy-030012228.html>>
 4. Poole, K. T., & Zeigler, H. L. (1981). The Diffusion of Feminist Ideology. *JSTOR*, 3(3), 229-256.
 5. Quinn, B. (2016, August Wednesday). *French police make woman remove clothing on Nice beach following burkini ban*. Retrieved from The Guardian: <https://amp.theguardian.com/world/2016/aug/24/french-police-make-woman-remove-burkini-on-nice-beach>
 6. R.Balki (Director). (2016). *Ki & Ka* [Motion Picture].
 7. Ritchie, G. (Director). (2019). *Aladdin* [Motion Picture].
- Yahu, V. T. (2014). Spivak, Feminism, and Theology. *Sage Journals*, 22(2), 144-156.



**ENVIRONMENTAL ACCOUNTING AND REPORTING: A
DISCLOSURE OF BUSINESS IMPACT ON ENVIRONMENT**

Lt. Dr. VIJAY KUMAR MADUGU

Head, Department of Commerce, M.V.S Govt. Degree & PG College (Autonomous),
Mahabubnagar-509001 Telangana

Corresponding Author- Lt. Dr. VIJAY KUMAR MADUGU

Email:- vk509001@gmail.com

DOI- 10.5281/zenodo.7295568

Abstract

There is growing awareness and concern of the impact of human activity on the ecosystem. Environment concerns play a significant role in the long-term survival and development of business systems. Business entities are being expected to fully integrate with environmental considerations in their life. Environmental Accounting at organization level aims to address the needs of organizations to measure the economic efficiency of environmental conservation. Environmental accounting consists of environmental resource accounting, which attempts as a best possible to consistently and comprehensively record information on environmental pollution and natural resources using an accounting framework. Environmental accounting also encompasses eco balance, in which table of input and output data for environmental impact is created to measure and report the amount. Environmental accounting at the corporate level helps the management to know whether corporate has been discharging its responsibilities towards sustainable development while meeting business objectives. The corporate business organizations have to shoulder the responsibilities; they must disclose the impact of their activities on environment and must quantify the environmental impact and recognition of environmental expenses and losses. This paper is intended to focus on the objectives such as to identify the basic need, scope of environmental Accounting and other issues related to the Environmental Accounting and reporting, to analyze impact of environmental costs on sustainable development, to describe advantages of environmental accounting, to describing new concept of green Accounting. The study is a conceptual and based on the secondary data collected from various magazines, books, journals etc.

Key words: Environment Accounting, Environmental costs, Green Accounting Sustainable Development, Green Accounting.

Introduction:

Environmental Accounting is important tool for understanding the role played by the natural environment in the economy. Environmental accounts provide data, which highlight both the contribution of natural resources to economic well-being and the costs imposed by the pollution or resource degradation. Due to ignorance of environment problems such as Global warming rapid changes in climate glacier meltdown soil erosion, land degradation, deforestation and loss of biodiversity and pollution of all kinds such water, air, marine, noise, light etc are commonly experiences in the world for which both developed and developing nations may be

held responsible. In this context, there is an urgent need for protecting our environment, because the environment is responsible for the survival of human beings. In recent trend is to judge an enterprise in relation to the community, in which it operates just as a responsible citizen judged by his actions in relation to the community in which he lives. The impact of the business activities of the organizations on the environment with reference to pollution of water, air land and abuse of natural resources are coming under the scrutiny of governments, shareholders and citizens. The concerns of environmental responsibility and the sustainable development have given birth to a new branch of accounting i.e. Environmental

Accounting. It is relatively a recent concept in the domain of accounting. Either without the proper accounting work by individual organization or by the government, it is not possible to determine that both have been fulfilling their responsibilities towards environment. Therefore, the environmental accounting has been focused.

Environmental accounting aims at address the needs of organization to measure the economic efficiency of its environmental conservation and the business activities of the company as whole. It is the framework for integration of the accounting concepts of both the physical units and monetary values and addresses the issues of the cost performance. It also consists of environmental resource accounting which attempts as best possible, too consistently and comprehensively record information on environmental pollution and natural resources using an accounting framework. Environmental accounting also encompasses eco-balance, in which table of input and output data for environmental impact is created to measure and report the monetary value.

Environmental Accounting is process of Identification measurement and communication of information on the environmentally responsible performance of a business entity to permit economic decisions. Every organization to implement the concept of sustainable development as it facilitates to take into account ecological activities of an organization in economic measurement. Environmental accounting first adopted by Norway in 1970s and in India, it is applied only in the cement, oil and petroleum, power and electronics steel, engineering and textile industries.

Environmental reporting used for environmental related data verified or not, regarding environmental risks, environmental impacts & policies. Corporate environmental protection should include environmental reporting initiatives taken by the enterprise, the adverse impact of its production process and products on the environment both quantitative and qualitative terms and its initiatives in process and process and product innovations in order to achieve sustainable growth. Environmental accounting and reporting

consists of various issues related to present and future costs for products as well as processes redesign, present and future capital expenditures for pollution and control, physical data related to the reduction of toxicity and waste, estimates of future environmental costs and benefits.

Review of literature:

Environmental concerns and requirements integrated into corporate objectives. Economic decisions of the firm recognize the entire life cycle of the product, from raw material acquisition to component production to recycling or the disposition of the product (Naser Nour, 2000)

Consideration of the environmental factors a key strategic variable for the design of products, process-operating procedures. With this shift, environmental performance viewed as a source of competitive advantage (Bonifant et al., 1995).

Progress in environmental accounting depends on the re-examination of the target audience the expansion of information reported and the ability to account for completely new activities (Senghe, 1993)

Questions and uncertainties associated with environmental outlays create significant challenges for accountants, in terms of how to depict environmental outlays, how to attribute them to accounting periods, when to recognize them as liabilities that may require future outlays and how to measure those expected outlays (Johnson, 1993)

Corporate executives are responsible to numerous internal and external stockholders. The owners of the business are immediate audience. The owners seek to protect themselves against environmental liabilities. Expanding the owner's interest into meeting legal environmental obligations brings an extended audience; the extended audience has a varied appetite for the environmental reporting of business activities (freeman, 1984).

Shcoemaker and shcoemaker (1995) observe that information about the company's potential future environmental liability can be used in various aspects i.e. to encourage defensive and prudent operations and waste reduction, to improve manufacturing, waste disposal and shipping practices, to negotiate and settle disputes with insurance carriers, to influence regulators and public policy

makers, to reassess the corporate strategy and management practices(think green), to articulate a comprehensive risk management programme, to improve citizenship, to assess hidden risks involved in takeovers and acquisitions.

Objectives of the study:

The present paper intended to focus on the following objectives related to environmental accounting and reporting.

To identify the basic need, scope of environmental accounting,

To discuss the issues related to the environmental accounting and reporting,

To analyze impact of environmental costs on sustainable development,

To describe advantages of environmental accounting,

To focus on a new concept of green accounting.

Methodology:

The present paper is in descriptive and conceptual in nature and based on the secondary data collected from journals, reference books, magazines, newspaper evidences on the issues related to environmental protection and environmental accounting and reporting.

Need for Environmental Accounting:

Environmental accounting is helpful to know whether business entities have been discharging its responsibilities towards environment or not. Environmental accounting leads towards sustainable development by meeting its responsibilities. Environmental Accounting addresses the following:

- Meeting regulatory requirements or exceeding that expectation.
- Operating in a way the environmental damage does not occur.
- Promoting business entities having wide environmental attitude
- Control over operational & material efficiency gains driven by the competitive global market.
- Control over increases in costs for raw materials, waste management and potential liability.
- Cleaning up pollution that already exists and properly disposing of the hazardous material
- Disclosing to the investors both potential & current the amount and nature of the

preventative measures taken by the management.

- Promote culture and attitude of environmentally safe working amongst its employees.

Scope of Environmental Accounting:

The scope of environmental accounting is very wide and extended to corporate level, national and international level, the present study intended to focus on the corporate level only. The investment made by corporates internally for minimization of losses to environment, investment made on equipment helpful in reducing the potential losses to environment. All types of loss are indirectly due to business operation/ activities like degradation and destruction like soil erosion, loss of bio diversity, air pollution, water pollution, voice pollution, problem of solid waste, coastal & marine pollution, depletion of nonrenewable natural resources, loss emerged due to over exploitation of nonrenewable natural resources like minerals water gas etc., deforestation and land uses. Environmental accounting is not easy, as losses to environment cannot be measured exactly in terms of monetary values and it is hard to decide that how much loss was incurred to the environment due to the particular industry and business activity. Difficulties are involved in assessing the loss /damage to environment.

Issues related to the Environmental Accounting and reporting:

Environmental Accounting & Reporting emerged with various forms of accounting methods in recording the impact of the business activities on environment as a whole. Progress in environmental Accounting depending on the re-examination of the target audience, the expansion of information reported and the ability to account for completely new activities. The focus is on accounting issues like new information to be recorded, reported and new transactions related to environmental activities. Several questions, uncertainties and challenges are arising for accounting, in terms of how to depict environmental outlays, how to attribute them to accounting period, when to recognize them as liabilities that may require future outlays and how to measure those expected outlays.

Environment Management Accounting (EMA) is one of the methods particularly focus on material and energy balance aspects and environmental cost information. Its works like a tool to select an Investment activity or a project related to environmental conservation from all processes of operations and it also evaluate environmental effects for a specified period. Eco- balance environmental accounting is another accounting tool to support for sustainable environmental management activities. Corporate environmental accounting tool is to inform the public of relevant information compiled in accordance with the environmental accounting this could be referred to as corporate environmental reporting.

Environmental financial accounting (EFA) concentrates on reporting environmental liability costs and other significant environmental costs.

Environmental National Accounting (ENA) focus on the natural resources stock & flows environmental costs and externality costs.

Impact of environmental costs on sustainable development:

In environmental accounting and reporting non-financial data will be more important. The physical measures, statistical analysis and narrative information are also essential tools for analyzing the impact of business activities on sustainable development. The environmental product cited in terms of total life cycle costing. It includes internalizing all costs in the life cycle of a product. Life cycle implies conscious effort to anticipate negative environmental impacts and design them out of the product and the process. Environmentalists argue that the life cycle environmental analysis, coupled with life cycle costing, supplies information that helps managers develop strategies that prevent pollution at the source rather than filter or capture it downstream. Due to increasing importance of environmental protection and regulations, financial reporting poses additional challenges to accounting standards and procedures. The connection between environmental effects and financial results is of great concern, making this connection is the challenge to business and the accounting profession and to the broad

audience whose interest is environmental protection.

Advantages of Environmental Accounting:

Environmental accounting yields various advantages to corporate business entities and for society.

Corporate level

Environmental accounting is helpful in effective use of environmental resources by management. With the use of environmental accounting tools, companies can monitor factors such as environmental conservation cost, environmental conservation benefit, economic benefit associated with environmental conservation activities. Environmental accounting is associated with internal management, it allows the managers to monitor account balance⁴ to reduce waste disposal cost and recycling expenditure and to take decisions related to Investment, risk management to avoid lawsuits and improve performance effectiveness.

Environmental accounting results promote environmental communication to stakeholders with which company can build trust with them. By adopting, the environmental accounting company can avail benefits in diverse range of areas, it serves as a positive catalyst in buildup company stock price.

Society Level

Regular practice of environmental accounting and reporting can help to nurture stakeholders interested in environmentally conscious companies, contribute to the establishment of an environmentally conscious social system, and promote environmental conservation activities through the society.

Green Accounting: A new concept of accounting is emerging across globe is 'green accounting' whereby national accounts are adjusted to include the value of nature's goods and services. This poses the conceptual and practical difficulties. From the environment perspective, the key challenges lies in defining, quantifying and value natural capital. It involves putting a value on a country's natural resources, like forests and seas. Green Accounting entails the estimation of prices for all natural assets, including natural and human capital assets

and their inclusion in the financial statement of the nation. Green accounting

Conclusion:

Environmental accounting deals with the accounting of environmental transactions of business entities. The challenge of environmental accounting is to deliver meaningful disclosures, within accounting practices and standards. Another challenge of environmental accounting is to extend practices to include new accounting procedures for costing out for instance, pollution control methods, comparing alternative materials to be used in manufacturing and investigating possible recycling alternatives.

References

1. Avik Ranjan Roy, "Environmental accounting & Environment Management Accounting", in the Management Accountant, June, 2008.
2. Banerjee.B "Accounting for corporate Environmental Management in India", the Management Accountant, Dec 2002.
3. Bonifant, Benjamin C, " Gaining Competitive advantage through Environmental Investment" in Business Horizons(July/August, 1995,) 37-47.
4. Freeman, R.E "Strategic Management: A Stakeholder Approach", Pitman publishing company.
5. Johnson, L.Todd, "Research on Environmental Reporting," Accounting Horizons, Sept, 1993
6. S.P Jain & K.L Narang, "Corporate Accounting" Kalyani Publishers, Vol. II, 2015.
7. Sarkar,S., "Valuation of natural resources", the Indian Journal of Commerce, Vol.57,2004.
8. Schoemaker and Schoemker, "Estimating Environmental Liability: Quantifying the unknown" The CPA Journal (January 1996), 36.50-52.
9. Senghe, S.V "Accounting for the Environment: an analysis of Issues" the Ohilo CPA.
10. Siegel, "Environmental Costs: Accounting and Disclosure", Price Waterhouse, 1992.



UNDERSTANDING LIFELONG LEARNING AND ITS PREVALENCE AMONG
COLLEGE STUDENTS

Swati Tulshan¹ Susmita Neogi²

Human Development, J.D.Birla Institute, Jadavpur University

Human Development, J.D.Birla Institute, Jadavpur University

Corresponding Author- Swati Tulshan

Email:- tulshanswati@gmail.com

DOI- [10.5281/zenodo.7295574](https://doi.org/10.5281/zenodo.7295574)

Abstract:

Lifelong Learning may be defined as ongoing learning in formal, non-formal and informal ways, cradle to grave learning and knowledge building (CANDO, 2011). Lifelong Learning can be considered as a continuous development of skills and knowledge to enhance quality of life and employment prospects. The present study has been conducted among college students in order to find out the prevalence of lifelong learning potentials of our adult population. Data of this study have been collected virtually through google forms by using a standardized tool titled 'Characteristics of Lifelong Learner' by Cropley and Knapper (2000). This tool is a Likert scale comprising 14 statements which assess the five characteristics (Goal Setting, Application of Knowledge and Skills, Self-Direction and Evaluation, Locating Information, and Adaptable Learning Strategies) of lifelong learners. The total number of respondents is 101, 88 female and 13 male students of second and final year of graduation and they are located pan India. Statistical measures of mean, standard deviation have been applied. The results indicated that the participants do have lifelong learning dispositions and they are especially potent in the domains of 'Application of Knowledge and Skills' and 'Self Direction and Learning' Thus this study implies that lifelong learning characteristics are prevalent among our college students.

Key Words : Lifelong Learning, Dispositions, College Students

Introduction:

The commission for a Nation of Lifelong Learners in late 1997, define Lifelong Learning as s “a continuously supportive process which stimulates and empowers individuals...to acquire all the knowledge, values, skills and understanding they will require throughout their lifetimes...and to apply them with confidence, creativity, and enjoyment in all roles, circumstances, and environments.” This definition emphasizes lifelong learning as (a) continuous (it never stops); (b) supportive (it isn't done alone); (c) stimulating and empowering (it's self-directed and active, not passive); (d) incorporating knowledge, values, skills, and understanding (it's more than what we know); (e) spanning a lifetime (it happens from our first breath to our last); (f) applied (it's not just for knowledge's sake); (g) incorporating confidence, creativity, and

enjoyment (it's a positive, fulfilling experience); and (h) inclusive of all roles, circumstances, and environments (it applies not only to our chosen profession, but to our entire life)

The Cedefop glossary (Tissot, P., 2004) defines core concepts of various forms of learning as follows: ·Formal learning consists of learning that occurs within an organized and structured context (formal education, in-company training), and that is designed as learning. It may lead to formal recognition (diploma, certificate), (p. 70); ·Non-formal learning consists of learning embedded in planned activities that are not explicitly designated as learning, but which contain an important learning element such as vocational skills acquired at the workplace, (p. 112); · Informal learning is defined as learning resulting from daily life activities related to family, work or leisure. It is often

referred to as experiential learning and can, to a degree, be understood as accidental learning (p. 76).

Among many other traits, the traits mainly exhibited by a Lifelong Learner are – Setting effective goals, applying appropriate knowledge and skills, engaging in self-direction and self-evaluation, locating required information and adapting learning strategies to different conditions. Globalization and the growth of the fast-changing knowledge economy mean that people require upgrading their skills throughout their adult lives to cope with modern life, both in their work and in their private lives. Nowadays, there is an increasingly important basic skill in ever-changing technological universe: ability to learn and adapt to the needed new skills and training (OECD, 2007). The present study seeks to examine the prevalence of Lifelong Learning Dispositions among college students along the various domains and factors and analyzing their future outcomes.

Methodology: A standardized Likert scale titled 'Characteristics of Lifelong Learner' by Cropley and Knapper (2000) was administered virtually, via google forms was administered upon 101 participants. The tool consisted of 14 statements which assessed the respondent on the five domains of Lifelong Learning Namely Goal Setting, Application of Knowledge and skills, self-direction and Evaluation, locating Information and Adaptable Learning Strategies.

The sample profile was as follows – The participants were 2nd and final year graduation students, who were selected irrespective of their discipline. As the administration was virtual, the locale of the sample was Pan India. The sampling technique used was purposive sampling. Amongst the participants, 88 were females while 13 were male students. The age of the participants ranged from 18-23. Various statistical measures of Mean and Standard Deviation were applied to the obtained data and analyses of the found results were done understand the lifelong learning dispositions among college students.

Results and Discussion:

The results obtained from the sample indicated towards the following. The first domain which was analyzed was Goal

Setting. A goal is an object or aim that an individual strives to attain (Locke&Latham,1984). The goal setting theory by the above authors states that a high specific goal leads to higher performance than an easy goal, no goal or vague goal such as "do your best". Given the goal commitment, the higher the goal, the higher the performance and variables such as feedback or knowledge of results, participation in decision making competition and incentives only affect an individual's commitment to their goal. Five statements from the scale corresponded to the domain of Goal Setting. The first statement was 'I prefer to have others plan my learning' The mean score obtained was 3.178. This indicated that the students had a neutral opinion on the above statement. While they were wanting others to do the planning for them, they also liked being in control of the same. The sixth statement in the tool also corresponded to the domain of goal setting. The statement was 'I seldom think about my own learning and how to improve it'. The mean score was 2.584 which was slightly tilting towards the fact that the students do not deliberate upon their learnings and do not put in the required effort to strategize their enhancement in the same. The seventh statement in the tool also measured goal setting. The statement was 'I feel I am a self-directed learner'. The mean score obtained by the participants was 3.594. This reflected that the subjects felt that internally motivated regarding their academics and wanted to learn without feeling any social pressure being induced upon them. Statement nine also explored the domain. The statement was 'I love learning for its own sake'. The mean score was 3.772 indicating that on an average the students loved the learning process and did not only study or learn for marks and examination, rather gathering knowledge and enhancement of the existing knowledge was their priority. The last statement covering the domain of goal setting was statement fourteen, which was 'When I learn something new I try to focus on the details rather than the big picture'. The mean score of the respondents was 2.248 indicating that the students' learning is not done keeping in mind their purpose of learning, or the contribution of their subjects to the

advancement of their careers, rather it is done on a short term basis, to pass the forthcoming examinations or to move on to the next semester. It can thus be said that the domain of Goal setting saw a range of responses, but overall the goal setting of the subjects was having a neutral standpoint, while many students were self-directed learners and liked learning for the sake of it, they could not place their learning in the big picture and did not give the due diligence to improving their own learning.

The next domain analyzed to understand the Lifelong Learning Dispositions among college students was Application of Knowledge and Skills. This relates to the use and utility of the already learnt information in real life situations and also using the same to derive the relation between theory and practice. The individual high on this domain will know how to practically use it in a day to day situation, whatever is learnt in the classroom. The fifth, tenth and twelfth statements in the tool were pertaining to this domain.

The statement 'I am able to impose meaning upon what others see as disorder' had a mean score of 3.376. This shows a central value tendency among the participants. They do see order in seemingly vague and subjective issues and situations, however this is only an occasional occurrence, not a regular phenomenon. Other times, they conform to the masses and find no sequence in disorderly things and objects. Another statement measuring this domain was 'I try to relate academic learning to practical issues'. This statement had a mean score of 4.040 emphasizing on the fact that on an average the respondents tried and equated the academic learning with its practical counterparts and did not isolate their learning from its real life and real world application. The final statement under this domain stated 'When I approach new material, I try to relate it to what I already know'. The mean score obtained was of 3.941 reemphasizing the behavior and mindset among the subjects of assimilating new knowledge within the context of what is already known, indicating towards a strong basic educational foundation and building new knowledge on already known information. The domain of Application of Knowledge and Skills is one domain where

the respondents have scored relatively high showing the eagerness they have to relate theory with practical, relating new knowledge with existing information and imposing meaning in disorder.

The third domain of Lifelong Learning which was measured was self-direction and learning. The Cambridge dictionary defines self-direction as making one's own decisions and organizing one's own work rather than being told what to do by other people. A self-directed learner knows what he/she wants to study. They do not wait for the pressure or imposition from their parents, teachers or peers to feel motivated to study or to go beyond the textbook to understand a particular concept. The self-directed individual will explore every arena of a topic or subject not just what is instructed. Evaluation on the other hand refers to the self-gauging the student does regarding their own learning and performance. This is in two contexts, the primary being their performance in relation to their previous performance and the secondary being their performance in relation to others studying the same subject/curriculum.

Two statements, namely the eighth and the thirteenth statements measured the same. The eighth statement was 'I feel others are in a better position than I am to evaluate my success as a student.' The mean score obtained was 2.882. The scoring for this statement was reverse and thus although the tendency of the students is to conform to the middle most score, yet there is a slight disposition where they disagree to the statement implying that they themselves can also evaluate and assess their own learning and believe that they can do the same pragmatically, without being biased. The other statement 'It is my responsibility to make sense of what I learn in school/college' had a mean score of 4.040. This indicated that on average the subjects' agreed to the statement and felt that relating information was a necessity as a good learning practice. Understanding concepts in isolation was not a good predictor of Lifelong Learning capabilities among the students and on an average they did not exhibit the scores pertaining to the same. The scores obtained by the students indicate their understanding of the same and working towards making sense of what they have learnt. The domain

of Self Direction and Evaluation therefore is a strong domain among the participants of the study and they do not usually require external motivational forces to guide their academic pursuits.

The domain next covered and measured by the tool for understanding Lifelong Learning better is Locating Information. This refers to the knowledge and resourcefulness of an individual in finding the correct and relevant information as per the need and requirement of the situation and also reflects upon how the individuals manage to maneuver through unknown situations by knowing where and how to locate information. This domain only had one statement - 'I often find it difficult to locate information when I need it' and the coding was reversed. The mean score received was 3.317. The average score received points towards the fact that the respondents can locate information when they require it, they know what to look for and where to look for the required information to help them in their learning. The point of contention however may be the fact that the above does not always take place and/or they may not always be sure of their information locating capabilities.

The last domain which indicated the Lifelong Learning Dispositions among the subjects was Adaptable Learning Strategies. This reflects the pliability of an individual to mold himself/herself according to the requirements of the subject/discipline being learnt. An individual having adaptable learning strategies will be demonstrating divergent thinking and show logical reasoning and problem solving attributes. Three statements, namely the second, third and fourth statements of the scale explored this domain. The second statement was 'I prefer problems for which there is only one solution'. The statement was reverse coded. The mean score obtained was 3.406 which shows that the candidates were neutral about the questions having one solution or more than one solution. They had an equivocal opinion on the same and were comfortable with both problems having only one solution or problems having more than one solution. The next statement pertaining to this domain was 'I can deal with the unexpected and deal with problems as they arise'. The mean score obtained was 3.644.

Although the scores were again ranging around the middle value, there was a tilt towards the option 'agree'. This means the students were not scared to face the unknown and had confidence in their own strength and capabilities to sail through vague situations. The final statement assessing this domain was 'I feel uncomfortable under conditions of uncertainty'. This statement was also coded in the reverse. The mean score obtained by the participants was 2.475. This showed their comfort with uncertainty to a degree. The scores throw light upon the fact that although not too much, the students are comfortable with situations of uncertainty and know they will be able to come out of it and find a way.

Conclusion

It may thus be concluded from the above results and discussion that most of the scores of the individuals are around the neutral standpoint, which indicates that while the respondents may not be showing Lifelong Learning Dispositions currently, they do have the inherent potential to exhibit the same in great amounts. Glimpses of the same have been observed by their mean scores in the domains of 'Application of Knowledge and Skills' and 'Self Direction and Learning' where the scores have been relatively higher than the other domains.

References:

1. Kirby, J. R., Knapper, C., Lamon, P., & Egnatoff, W. J. (2010). Development of a scale to measure lifelong learning. *International Journal of Lifelong Education*, 29(3), 291-302.
2. Laal, M., & Salamati, P. (2012). Lifelong learning; why do we need it?. *Procedia-Social and Behavioral Sciences*, 31, 399-403.
3. Latham, G. P., & Lee, T. W. (1986). Goal setting. *Generalizing from laboratory to field settings*, 101, 117.
4. Collins, J. (2004). Education techniques for lifelong learning: principles of adult learning. *Radiographics*, 24(5), 1483-1489.
5. *self-directed definition: 1. making your own decisions and organizing your own work rather than being told what to do by. . . Learn more.* (2022, September 21). Retrieved September 27, 2022, from <https://dictionary.cambridge.org/dictionary/english/self-directed>



FEATURE AND USE OF OPEN SOURCE SOFTWARE FOR LIBRARY

Mr. Satish K. Chandel¹ Dr. Kishorsingh R. Chungade²

Research Scholar, Librarian, Shree Pandharinath Arts & Commerce College, Narkhed.

Research Supervisor, Librarian, Government Vidarbha Institute of Science, & Humanities (Autonomous), Amravati, (MS), India.

Corresponding Author- Mr. Satish K. Chandel

Email:- satish1chandel@gmail.com

DOI- 10.5281/zenodo.7295578

Abstract:

There is various open source software available for the library applications. Open source software can manage the library repository system, which enhance the quality of any institutional library. It has made easy the library automation system. In this study researcher has explain the definition, short history, feature and advantages of the open source software. There is various kind of open source software for the library. In this study researcher has mainly focused on the study of Koha, Dspace, Greenstone, Fedora, Eprint open source software.

Introduction:

Information Communication Technology changed the face of the world. Information Technology affects the life of people. It also affected the library professional. Now day library are facing the new challenges of digital era. Because of the digital information, traditional way of library automation and management has been changed. Open source software has provided an opportunity to library to change its automation and services. Library automation and management became easier for the library and library staff, and for users. It reduces the stress of the librarian professional and the users also. Because of the changing climate books are also changes its form. For the management of such resources library need to take the advantages of available software. There is different software available for library automation and services such as Koha, Greenstone, DSpace, Newgenlib, Eprint, Fedora, Invenio. Open Source software helps library construction and administrations. It has provided lot of opportunities to capture, catalogue, storage,.

Keyword: Open Source Software

Objectives:

1. To study about the Open Source Software
2. To study about the feature of Open Source Software

3. To study about the need of Open Source Software to library.

4. To study about the usefulness of open source software for the library

Methodology:

For this study primary and secondary data has been used. For the present study various types of data has been use such as e-journals, reports, books, e-papers. Data has been collected from the given sources and find out the advantages, disadvantages, history and feature of particular software.

Open Source Software:

The term “Open Source Software” (OSS) refers to computer applications and operating systems released under terms allowing users to use, modify, or redistribute the software in any way they see fit, without requiring users to pay the creators a fee. It is known as “open source” because the source code – the programming instructions that make the software function – is made available for examination or alteration along with the ready – to – use software itself. (Puckett, 2018)

Need Of Open Source Library software:

Open Source Software helps library in different activities and it makes easier the library activities and the method of housekeeping. It helps library in acquisition, circulation, cataloging and management of different types of material available in the

libraries. It means that open source software enhance library services for the users and for self. It has enhanced the speed and accuracy of the library. Lubanski (2012) rightly stated that, “the use of machines or technologies to optimize productivity in the production of goods and delivery of services.” It means that there is a need of Open Source Software for the library automation and services.

Advantages of Open Source Software:

Open Source Software are free to use.

There is a freedom to study and modify the program.

There is no need of license fees.

There is no limitation for open source software.

Open Source Software allow us to work with different system.

Open Source Software High quality software.

Open Source Software are helpful in creating integrated management.

Open Source Software are available in lower costs.

1. Koha:

Koha is the first open source integrated library system create by Kapito for Horowhenua Library Trust in New Zealand in 1999. The cataloguing module of Koha allows adding new bibliographic records to Koha. Koha is very useful software for the library which allows adding new bibliographic records. It allow to access circulation functions in various ways. It also allows transferring the data to the branch of library. It is also facilitated with the Fast Add Cataloging tools. (Yogesh Sharma, Alka Sharma, Manju Sharma, 2018)

Features of Koha:

Koha allows the users to use Online Public Access Catalog for 24x7.

The users can search the fields such as Keyword, Subject, Title, Class, Author, Publisher etc.

It allows the members to reserve library items for future issue.

Member can add an item to the cart. (Yogesh Sharma, Alka Sharma, Manju Sharma, 2018)

2. Greenstone:

Greenstone Software has been developed and distributed in cooperation with UNESCO and Human Info NGO in Belgium. It is open-source, multilingual software, issued under the terms of the GNU General Public License. (<http://www.greenstone.org>) It is

software for library which help library in creation of digital library and distribution of collection. It provides a new way to library to organize and publish information. Greenstone software runs under UNIX and Windows. This software is very easy to use. User can create own files in various formats.

Features of Greenstone Software:

Greenstone software runs all versions of windows, UNIX.

It is highly interoperable using contemporary standards.

Provides full-text searching and metadata based browsing.

It is widely accessible and the collections are accessed through a standard web browser.

It provides the reader interface and librarian interface.

3. Dspace:

The DSpace is a joint project of the MIT Libraries and HP Labs. (Shankar Trambo, Humma, S. M. Shafi, Sumeer Gul, 2012). It is a management system which provide an opportunity to library to collect, archive, index and allow to spread the intellectual creation of the community. Dspace is able to manage data in text, video, audio and data form and able to distribute over the web. It can preservers our data for long time. (www.dspace.org, 2018)

Feature of Dspace:

Dspace is flexible in use.

Dspace manages digital data.

It is use to create institutional repositories.

Dspace helps to retrieve different kind of digital content.

Dspace can support and deposit in any form of file. (www.dspace.org, 2018)

4. Eprint:

Eprint software is developed by the Electronic and Computer Science department at the University of Southampton. It is available freely under the General Public License (GPL). This software initially designed to create a pre-print institutional repository for research. They have explain about the Eprint Software that, “Eprint software has a flexibility to create high quality repositories. It is known as an easiest and fastest way to set up repositories of research literature, scientific data, student theses, and project reports, multimedia, teaching materials, scholarly collections, digitized records, exhibitions and performances.” (Wei, 2011)

Features of Eprint Software:

Eprint Software is available freely.

It is high quality repository.

It can manage various types of data.

It is run on any UNIX system. (Wei, 2011)

5. Fedora:

Flexible Extensible Digital Object and Repository Architecture (Fedora) software has been developed by Virginia University and Cornell University. Andrew W. Mellon Foundation was provided fund for development of this software. This software is able to manage digital documents. It can manage institutional repositories, archives, published documents in digital forms. With added new feature Fedora released in May 2003 and in June 2004 developed Fedora Phase 2 which funded by Andrew W. Mellon Foundation. (Rajawat, 2017)

Feature of Fedora:

Fedora is easy to managed repository

It enables the storage, access and management of all kind of digital content.

It provides collaboration between creations, management in repository.

It provides easy tools to manage and deliver complex digital objects.

It provides an opportunity of information and services for various kinds of users. (Rajawat, 2017)

6. Evergreen:

Evergreen is a coordinated library framework for public libraries created by the Georgia Public Library Service for use by the Georgia Library PINES Program. It first launched in 2006 and available for every types of libraries such as public libraries, academic and school libraries. The Software is using for classifying, course and support access index applications in the public libraries of Georgia. It is available freely under GNU. It is library automation software using for every types of libraries. It encourages the administration, and indexing. With the help of online public access interface evergreen software users can search their materials. It facilitated to the users to download, view, modify and share the required document.

Feature of Evergreen:

Evergreen Software is available freely.

It encourages the administration and indexing.

Users can download, view, modify and share the required document.

It is facilitated with add item to the library collection.

it is facilitated to the users to find and their required information, books.

Conclusion:

From the above study we came to know that Open Source Software is very useful for the library automation system. Library can enhance its management and repository system with the help of open source software. Each software has it's unique feature and advantages. The software is free and easy to use for the users and library professionals. The software enhanced the library work. It has increased the speed and accuracy of the library automation and services.

Reference:

1. Puckett, Jason, (2018), "Open Source Software and Librarian Values", University Library Faculty Publications, Georgia.
2. Wei, Zhaohui, (2011), "Research on the Application of Open Source Software in Digital Library", Procedia Engineering, Elsevier, Fujian University of Technology, Fuzhou, China.
3. Rajawat, Dr. Kumkum, (2017), "Open Source Software Special Reference to Libraries", International Journal of Digital Library Services, pp. 146-157.
4. Sharma, Yogesh, Sharma, Alka, Shama, Manju, (2018), "Open Source Integrated Library Management Software KOHA: Overview & Features", Journal of Advanced Research in Library and Information Science, Vol. 5, Issue 4.
5. Ukachi, Ngozi B. (2014), "Library Automation and Use of Open Source Software to Maximize Library Effectiveness." Information and Knowledge Management, Vol. 3, No. 4. pp. 52-65.
6. Research at Dspace. www.dspace.org
7. Research at Greentone. <http://www.greenstone.org>



**THE ROLE OF PHOTOJOURNALISM IN EMPOWERING WOMEN TO
ACHIEVE SUSTAINABLE DEVELOPMENT**

Nithish P

Research Scholar Department of Communication Bangalore University

Corresponding Author - Nithish P

Email:- nithishpbyndoor@gmail.com

DOI- [10.5281/zenodo.7295582](https://doi.org/10.5281/zenodo.7295582)

Abstract

Sustainable Development; a responsible approach towards preserving and encouraging development is a futuristic approach proposed by the United Nations Organizations. The roots of Sustainable Development lie in making keen choices for the present as well as the future. There are numerous goals proposed by the United Nations Organizations such as zero poverty, no hunger, good health, and well-being, etc. Women Empowerment is also a vital goal of Sustainable Development. This goal proposed by the United Nations Organizations impules the government or the ruling body of countries across the Globe to initiate appropriate measures to empower the marginalized section of the society. Photojournalism as a remarkable medium of visual communication aims to reach out to a large and heterogenous group of audience and enlighten them on the several approaches towards eradicating gender inequality in the society that prevails at various levels. Through this paper, the researcher aims to understand how photojournalism as a medium of communication can reduce inequality and promote empowerment among women. The researcher also aims to comprehend the problems and difficulties encountered by women from different walks of life. The researcher discusses the need and importance of women empowerment as well as the impact it has on society.

Introduction

Photojournalism is a vital wing as well as a novel form of communication. This visual medium of communication plays a prominent role in the field of media that includes, newspapers, television, digital media, etc. Photojournalism is an effective channel of communication because of its ability to shape the minds of every individual with the aid of visuals such as photography videography, etc. and photojournalism has the ability to persuade and educate a common man through the depth and intensity of the photograph. The primary goal of photojournalism is to educate, inform and persuade common people about various news events effectively through visual aid. Sustainable Development has risen to prominence in recent years. In the process of understanding the concept of sustainable development, it becomes vital to understand development. Development can be understood as a phenomenon that is channeled towards change. The two primary objectives of development include the

purposes and aim of development and the process of achieving the established goals, aims, and purposes. Sustainable development can be comprehended as a development procedure that fulfills the requirements of the present without altering the abilities of the future generation, in the means of achieving the present requirement. Because the idea of SD somehow doesn't lend itself to measurement, the indicator structure should describe not just what to evaluate but also how to evaluate it. Several approaches for assessing sustainability have previously been created, tested, and implemented. (Singh et al., 2009). Sustainable development initiatives have been launched in different areas of society by many governmental as well as non-governmental organizations (Gericke et al., 2019; Lele, 1991). The Sustainable Development Commission defines, Sustainable Development as "Sustainable development is defined as "development that satisfies the requirements of the present

without jeopardising future generations' ability to satisfy their own needs."

The concept of women's empowerment has witnessed several changes over the past few decades. According to the United Nations Organisation, the concept of gender equality is not only crucial for the overall development of nations, but gender equality is important to preserve the peace and prosperity of the nations. Women Empowerment leads to a growing intrinsic capability- greater self-confidence, and an inner transformation of one's consciousness that enables one to overcome external barriers (Sen and Baltiwala, 2000). The concept of Empowerment refers to possessing control over their own lives and having equal opportunities to contribute to society effectively. Women Empowerment can be understood as the channel through which women or females across the globe obtain encouragement and equivalent prospects to follow personal, social, and economic ventures, and participate in all aspects of society on the same level as a man. Though empowerment is not limited to women, it is distinct in that it cuts throughout all classes and castes, as well as inside families and homes. (Malhotra et al, 2002).

Importance of Women Empowerment:

- Guarantees rounded progress
- Provides equal opportunities for the overall growth of the country
- Solves Unemployment
- Contributes to the progress of any country
- Offers a creative and novel perspective on various aspects.

Review of Literature Purusottam Nayak and Bidisha Mahanta conducted a study on Women Empowerment in India (2009). The study revealed that women of India are relatively disempowered, and they enjoy somewhat lower status than that men despite many efforts undertaken by the government. Tomáš Hák Svatava and Janoušková Bedřich studied Sustainable Development Goals: A need for relevant indicators (2016). According to their study, it was understood that there was a need to operationalize the Sustainable Development Goals targets and evaluate the indicators' relevance, the characteristic of utmost importance among the indicators' quality traits. The researchers also argue that the

foundation of a conceptual framework for selecting appropriate indicators for targets from existing sets or formulating new ones. Experts should focus on the "indicator-indicated fact" relation to ensure the indicators' relevance in order for clear, unambiguous messages to be conveyed to users (decision- and policy-makers and also the lay public)..

Adrian Hadland & Camilla Barnett, conducted a study to comprehend The Gender Crisis in Professional Photojournalism (2018). The findings of the study found that women photojournalists face even more demanding circumstances than their male counterparts, in spite of the fact that they are more likely to have higher education and have more often received a higher level of training in photography. The researchers argue that this pattern of underrepresentation will likely continue in the future meaning an even smaller proportion of women photographers presenting visual stories on the world's most pressing issues and the further decline of the female gaze.

Yetunde A. Aluko and Oluwakemi B. Okuwa analysed the Innovative solutions and women empowerment: implications for sustainable development goals in Nigeria (2018).

The results of the study demonstrated that interactions of the sampled respondents generated three types of innovation: process, products, and marketing innovations, which promote the livelihood of marginalized women. It also identified a well-defined pathway that connects innovation to empowerment and how marginalized women can improve and control their earnings. The study concludes that interactions at the community level, that addressed livelihood problems of a typical marginalized community in an informal setup, can help in achieving sustainable development goals, especially that of women empowerment in Nigeria.

Wendy Kozol conducted a study to understand Photojournalism, Women's/Human/Rights, and the War in Afghanistan (2020). According to the findings of the study, it was revealed that Affective instabilities turn the witnessing gaze back onto the viewer in ways that

expose some of the complex visual politics of witnessing precarity. The study analyses how Associated Press news photographs of Afghan women mobilize each term in the concept of women's/human/rights in order to explore more deeply the contours of relationality within media witnessing the war on terror. It considers how effects within photographic texts open up space for the potential recognition of differences, spaces that can potentially destabilize hegemonic scripts about populations at risk

Objectives

The objectives of the study are:

To understand the effectiveness of the Sustainable development program initiated by the United Nations Organization.

To Analyze the efficacy of women empowerment

To study the efficiency of women empowerment in the field of Photojournalism.

Methodology

The primary focus of this study is to understand the extent to which photojournalism has contributed empowering women and the effectiveness of sustainable development programs in empowering women. The researcher also adopted the interview method where the researcher interviewed female photojournalists of Urban Bangalore to get an insight into the photojournalism of women photojournalists. To get a detailed understanding, the researcher adopted a survey method to gather the required information. Through the chosen survey the researcher aimed to understand the effectiveness of women empowerment as a vital sustainable development goal, the role of photojournalism in encouraging sustainable development as well as women empowerment.

Data Analysis

For this study, 76 women were asked to fill out a questionnaire. Through the course of the questionnaire, the researcher aimed to understand the levels of women empowerment in various aspects such as remuneration, career opportunities, and representation in society. Understanding the nature of Photojournalism, the researcher also focused on understanding how this visual medium of communication helped in

promoting women empowerment. The researcher aimed to understand the stages of women empowerment in the field of photojournalism.

From the gathered information it was revealed that the respondents thought that women empowerment played a prominent role in uplifting the overall development of the country. During the course of the survey, it was understood that the concept of empowering women has indeed come a long way from its origin, however, there was scope for a lot of improvement in various fields such as medicine, education, MBA, etc. According to the gathered responses, it was unanimous that women irrespective of their careers felt discriminated against by their male co-workers or superiors because of their gender. Some women were made to feel inferior and were not rightfully rewarded in their respective fields. Some women also expressed the importance of women empowerment among housemakers in the context to the sharp increase in domestic violence against women during the pandemic. Most of the respondents agreed that photojournalism was an effective medium of communication. Photojournalism as a medium of communication effectively narrated crucial and critical events for easy understanding. The power of visuals was used for the benefit of educating women about the happenings of the world. When it comes to photojournalism, the researcher found that there was a sharp rise in the employment of women photojournalists which resulted in creating more space for creativity and novel perspectives on the story or event narrated. Some women photojournalists expressed that they felt extremely empowered to visually narrate a story to a large audience. However, women photojournalists expressed their concern about the pay gap that still exists in numerous media organizations in comparison to male photojournalists. The lack of proper facilities that are convenient for women to use was of concern.

Findings of the study:

The findings of the study include:

Women from different walks of life have been empowered in numerous ways.

According to the respondents there is massive scope for empowerment

Some women employees feel unsafe in their workspace

Female employees feel discriminated against based on their gender

Most respondents expressed their concerns over the discriminated pay-gap

Photojournalism has been playing an active role in encouraging women photojournalists

Most women believed that photojournalism is a male-dominated career and needs more women photojournalists to narrate stories from a novel perspective.

Conclusion

The concept of Sustainable development has been prominent since the 20th century. However, the very idea of fulfilling the needs of the present without compromising the needs of the future drew a lot of attention over the past few years. The primary goal of Sustainable development is to encourage development to the fullest without hampering the future and forthcoming prospects for the upcoming generations. This remarkable initiative must be channelized rightfully in order to bring about the desired outcome. Media as we all know has the power to shape the minds of the society. It becomes vital to utilize media effectively to communicate about the numerous outcomes of sustainable development. Women empowerment as we all know focuses on empowering women economically, physically, socially, and psychologically. Throughout history, society has always looked down upon women and has considered women as the weaker section of the society. However, it is important to change this wrong perception about women and their abilities. In order to empower women, it becomes vital to identify their potential. Photojournalism, a visual medium of communication that uses photographs to reach out to the audience, plays a very important role in promoting women empowerment. The power of photojournalism is such that it reached out to a heterogeneous group of audiences without any barriers remarkably. Having such dynamic powers and potential it is vital to use this effective medium of communication to educate common people about the fundamentals of women empowerment and increase the scope of empowerment.

References:

Nithish P

1. Lele, Sharachchandra. (1991). Sustainable Development: A Critical review. *World Development*. 19. 607-621. 10.1016/0305-750X(91)90197-P.
2. Sen and Batliwala (2000): "Empowering Women for Reproductive Rights", in H.B. Presser and G. Sen (eds.) *Women's Empowerment and Demographic Processes: Moving beyond Cairo*, Oxford University Press, Oxford, pp.15-36
3. Malhotra, A., S.R. Schuler and C. Boender (2002): "Measuring Women's Empowerment as a Variable in International Development" Unpublished Paper for the World Bank.
4. R.K. Singh, H.R. Murty, S.K. Gupta, A.K. Dikshit An overview of sustainability assessment methodologies *Ecol. Indic.*, 9 (2) (2009), pp. 189-212
5. Adrian Hadland & Camilla Barnett (2018) *The Gender Crisis in Professional Photojournalism*, *JournalismStudies*, 19: 13, 20112020, DOI: [10.1080/1461670X.2018.1500871](https://doi.org/10.1080/1461670X.2018.1500871)
6. Aluko, Y. A., & Okuwa, O. B. (2018). Innovative solutions and women empowerment: Implications for sustainable development goals in Nigeria. *African Journal of Science, Technology, Innovation and Development*, 10(4), 441-449.
7. Kozol, W. (2020). Witnessing Precarity: Photojournalism, Women's/Human/Rights and the War in Afghanistan. In *The Violence of the Image* (pp. 193-210). Routledge.
8. <https://www.un.org/sustainabledevelopment/gender-equality/>



A SURVEY ON IMPACT OF CEMENT INDUSTRY IN GADCHANDUR IN
CHANDAPUR DISTRICT

Dr. Farukh Ahemad Sheikh¹ Prof Rima Potdukhe²

Sau Leena Kishor Mamidwar Institute of Management Studies & Research Chandrapur

Corresponding Author- Dr. Farukh Ahemad Sheikh

Email:- farukhahemadfa@gmail.com

DOI- 10.5281/zenodo.7295584

Abstract:-

Industrial pollution is considered an important factor to contaminate the environment. It results in environmental degradation and imposes heavy costs on society as well as on human health and safety. Textile, cement, glass, plastic, sugar, tanning, petroleum are major polluting industries. Little or no attention is paid to this grave issue of industrial pollution. There is no systematic approach used by many industrial sectors for proper disposal and drainage of their harmful effluent. The industrial sector should be held accountable for their responsibilities towards proper management of waste effluent, as it contributes to about 50% of the environmental pollution. Some studies show that cement dust can cause respiratory and non-respiratory diseases. Cement dust also affects plant productivity due to reduced chlorophyll content of the leaves which obstruct the photosynthesis process. It has adverse impact on agriculture in nearby areas. It creates great social costs in a developing country like India. Currently there is no effective management and controlled practices for pollution prevention and control, but authorities have started to pay attention in this regard. Pollution control has become the primary concern of the environment today. The objective of this paper is to explore the impact of environmental pollution on the environment and society. To Study the various problems faced by people residing in nearby areas.

Key words: - Pollution, Social Issues, Respiratory problems.

Introduction:-

The third largest industrial source of pollution, emitting more than 500,000 tons per year of sulfur dioxide, nitrogen oxide, and carbon monoxide. The manufacturing process of cement also causes dust pollution which may reduce visibility and quality of air. When the dust has been drained, it can contaminate the water and cause adverse effects on human wellbeing or even to animal as clearly stated by the Centers for Disease Control and Prevention. Nitrogen oxide (NO_x) can cause or contribute to a variety of health problems and adverse environmental impacts, such as ground-level ozone, acid rain, global warming, water quality deterioration, and visual impairment.

Some studies show that cement dust can cause respiratory and non-respiratory diseases. Cement dust also affects plant productivity due to reduced chlorophyll content of the leaves which obstruct the

photosynthesis process. It has adverse impact on agriculture in nearby areas.

Profile of Gadchandur

Gadchandur is a city and Municipal Council in Korpana Tashil Chandrapur district, Maharashtra, India. Gadchandur is named after the fort Chandur. Gadchandur is surrounded by cement factories, Manikgarh Cement, Ultratech Cement, Dalmia Cement and Maratha Cement Works (Ambuja Cement). There is a Beautiful dam called as Amalnala Dam with Overflow point are the major attraction for locals. One can also visit Shiv Mandir which is near to Amalnala dam. If you are attracted towards ancient architecture, then there is Old vishnu mandir and Manikgarh Fort to be visited.

Profile of Chandrapur city:

Chandrapur district is known for its cleanliness. Now Chandrapur city is in the top 10 cleanest cities India and 2 in Maharashtra after Navi Mumbai by The

minister of housing and urban affairs rank cities based on the cleanliness index. Tadoba Andhari Tiger Reserve in the district is one of India's twenty-eight Project Tiger reserves. The 2015 census of tigers found that 120 of Maharashtra's 170 tigers were located in Chandrapur district.

Objective

To Study the social problem face by people residing near Cement Industry (Gadchandur)
 To study the effect of pollution on health.
 To study the effect of pollution on property.

Hypothesis

There are certain problem like damages to property and agricultural land.
 Respiratory problems are prominent.

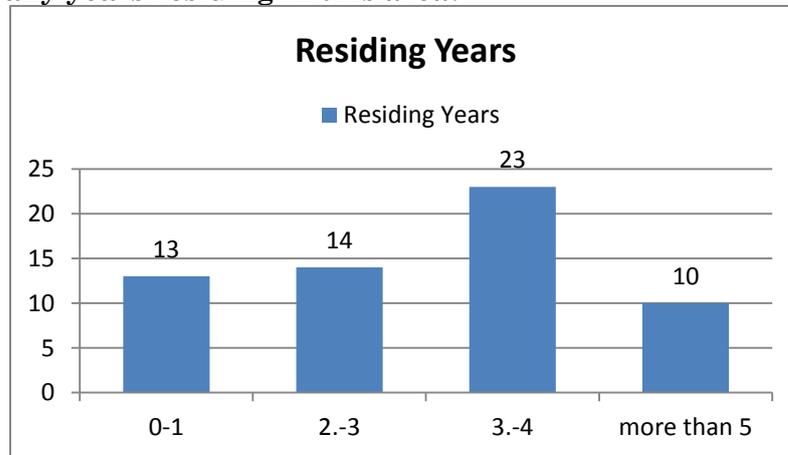
Research Methodology:-

The study under taken is descriptive in nature, for the collection of data following resources were used.

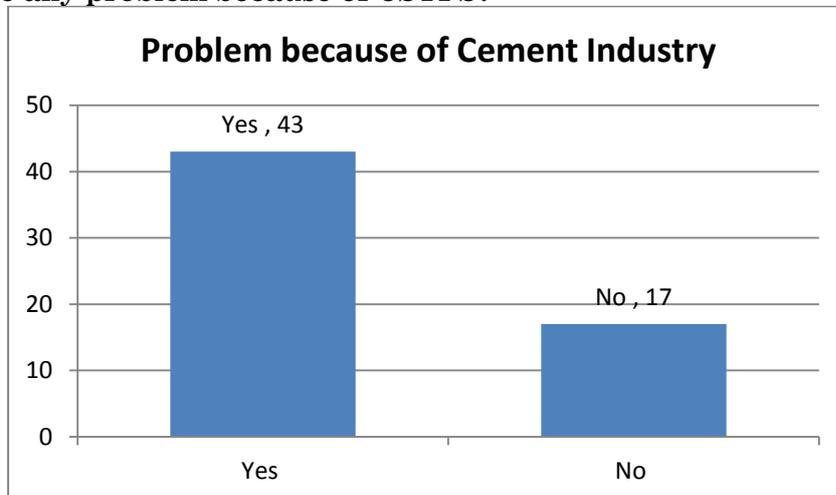
1) Primary Data

Data Analysis

1. Since how many years residing in this area?



2. Did you face any problem because of CSTPS?



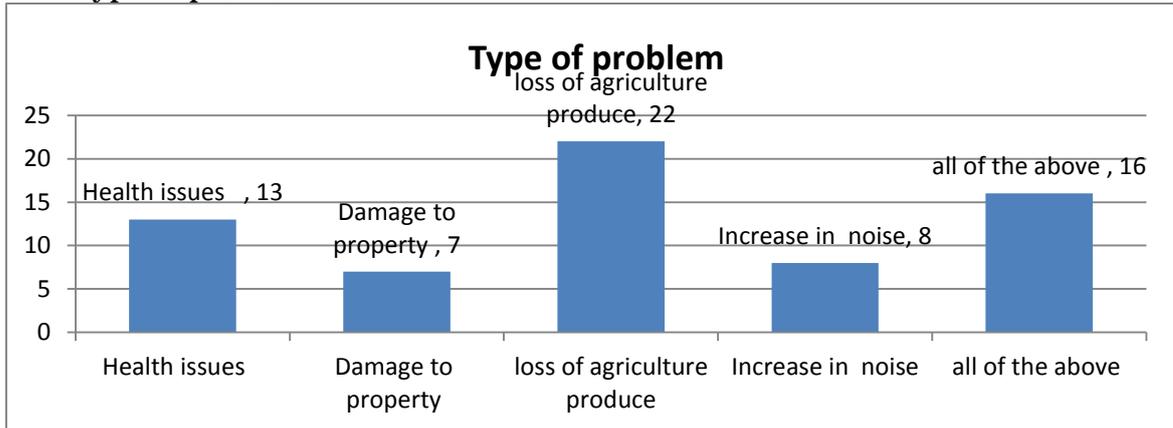
2) Secondary Data.

1) Primary Data: - Primary data collection methods can be divided into two groups: quantitative and qualitative. Primary data was collected through close ended questionnaire.

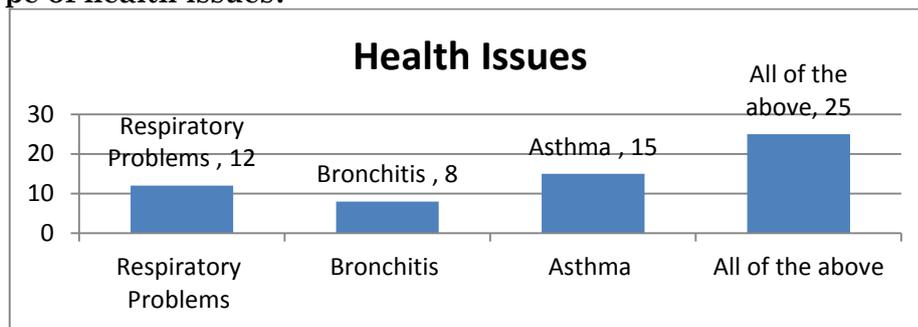
Sampling: - The universe of the study covers Chandrapur city as its population. The sampling is selected by using convenient sampling and the sample size was confined to 60. The present study is restricted to health issues due to pollution only other categories will be eliminated due to time and cost constraints,

2) Secondary Data:- Secondary data is a type of data that has already been published in books, newspapers, magazines, journals, online portals etc. There is an abundance of data available in these sources about research area, almost regardless of the nature of the research area.

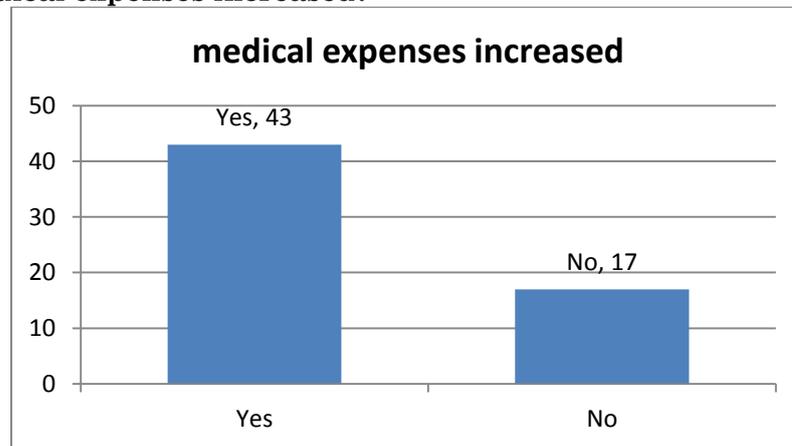
3. What type of problem?



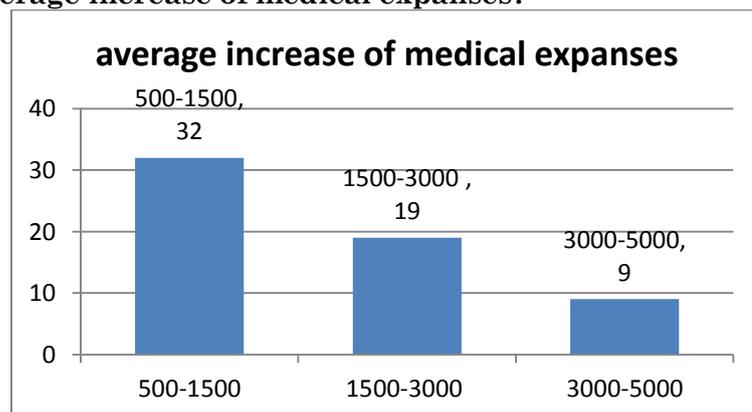
4. Which type of health issues?



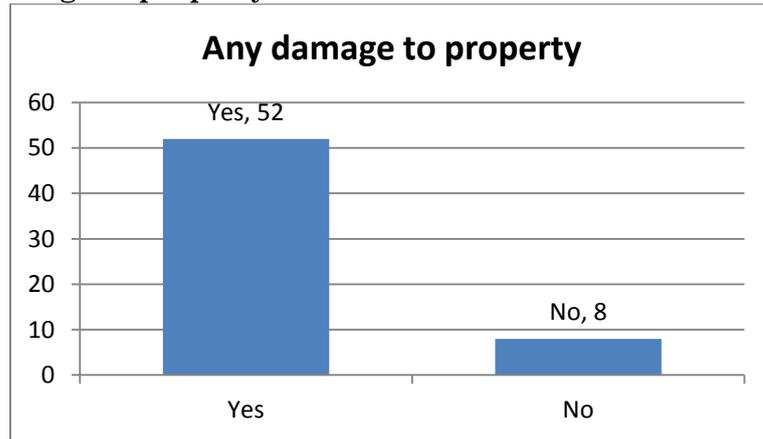
5. Did your medical expenses increased?



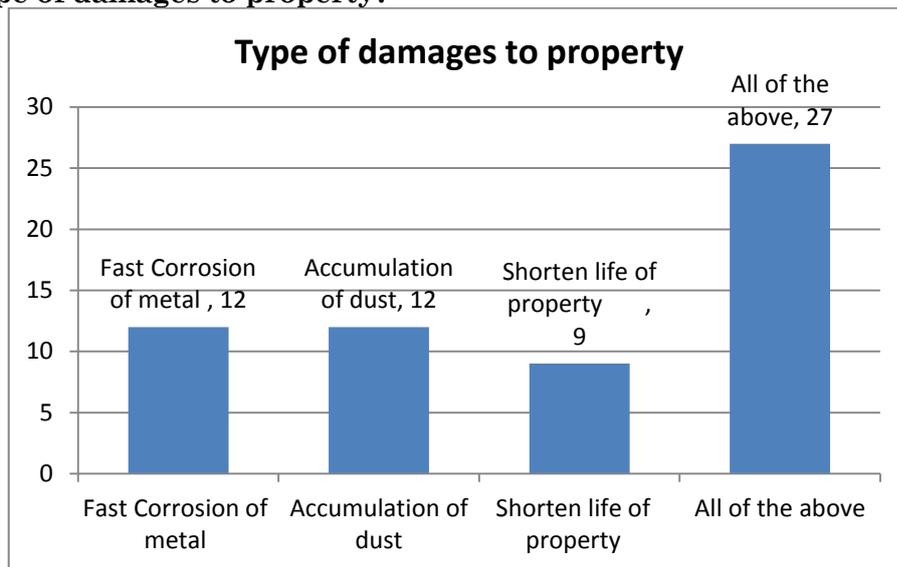
6. What is the average increase of medical expenses?



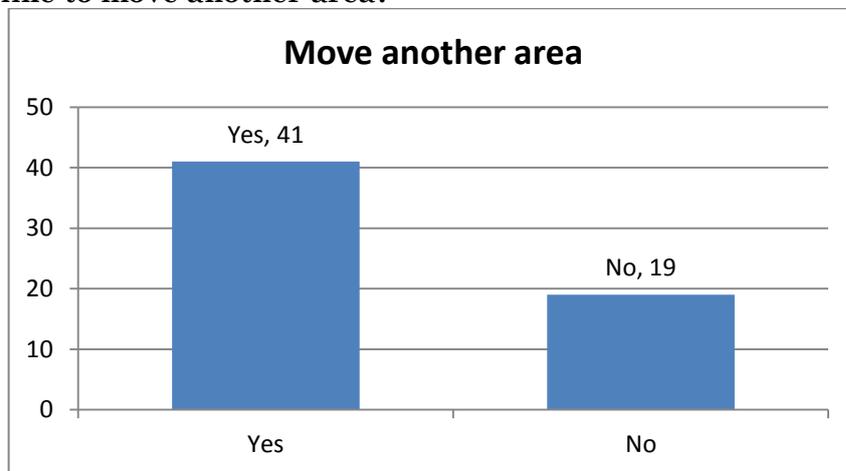
7. Is there any damage to property?



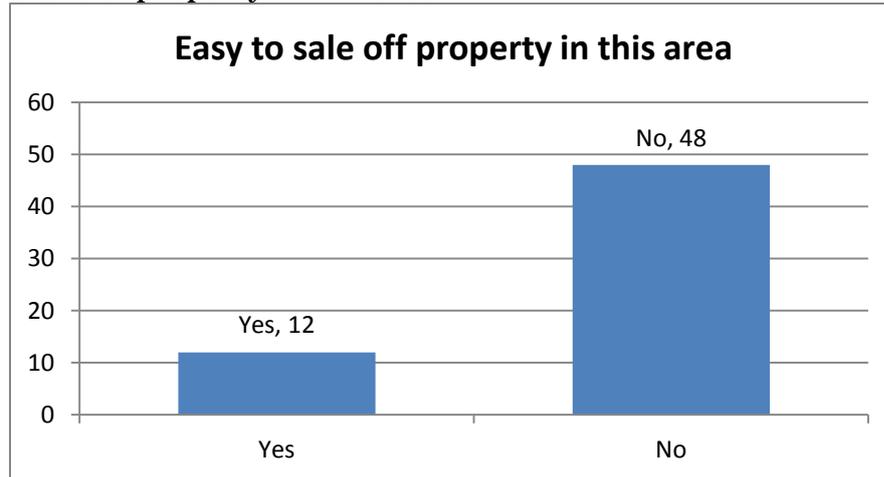
8. Which type of damages to property?



9. Would you like to move another area?



10. Is it easy to sale of property in this area?



Finding & Conclusion:-

On the basis of data analysis it can be concluded that

People residing nearby cement industry are suffering

There are major health issues, damage to property, loss of agricultural produce, and increase in noise.

In health issues respiratory problems, asthma and bronchitis are prominent

Medical expenses have increased because of health issues

But cannot leave the area altogether because of job, business or profession.

Literature review: -

The pollutants commonly emitted by cement plants are dust or particulate matter, NO_x, SO_x, carbon oxides and methane, among others. Cement being the major contributor to air pollution, an approximate number of 4,90,000 annual deaths may be

attributed to emissions from the cement industry (Vidya Srineevasan 18 Aug 2022)

Exposure to a mixture of air pollutants associated with adverse respiratory health of the adults living in the industrial areas of the district. Clinical manifestations of the study includes: Presence of multiple industries in or near the village is more harmful than the single industry. Additionally, it also shows that the presence of steel, cement and paper industry in or near a village has caused more ill-effects as compared to coal and thermal industry. This definitely shows that, the health effects of ambient air pollution are visible at symptomatic level and for Asthma. If necessary steps are not taken at right time, the conditions may worsen.(Uddhao Gawande^{1*}, Abhijit Khanvilkar, Suhas Kadam, Gurudatt Potdar, Hrushikesh Salvitthal 2016)



ISSUES AND CHALLENGES OF CHILD LABOUR

Dr. Nandini N

Guest Faculty Department of Education Bangalore University, Bangalore

Corresponding Author- Dr. Nandini N

Email:- nandinivinay1213@gmail.com

DOI- [10.5281/zenodo.7295586](https://doi.org/10.5281/zenodo.7295586)

Abstract

Many reasons contribute to child labour and exploitation, including poverty, societal norms that support it, a lack of appropriate jobs available for adolescents and adults migration, and emergencies. These elements are both the source and the result of socioeconomic inequalities exacerbated by prejudice. The perpetuation of child workers and exploitation endangers economic systems and has serious immediate and long-term effects for children, including denial of schooling and deterioration of physical and mental well-being. Kid labour must be prohibited to ensure that every child has the opportunity to attend school, play, and have the greatest future possible. These youngsters are frequently forced to labour in abhorrent and dangerous situations. Their rights are infringed on a regular basis. If children are employed, they are unable to attend school! This implies that these youngsters will grow to be adults with no education and no capability to read or write, depriving them of critical life skills. The vast majority of kids who work as children are from underprivileged origins, minority groups, or are taken from their families. They have no defense. Furthermore, their employers do everything possible to make them utterly hidden, so that no one understands or cares about them. They will have complete control over these youngsters this way. Slave labour also serves as an impediment to being a child, to playing and doing anything you want. This article discusses child labour, the causes of child labour, and the abolition of child labour.....

Keywords: *child labour, poverty, inequality, eradication, protection...*

Introduction

Children are the nation's future citizens, and their proper development is the country's top priority. A nation's richness is found not so much in its commercial and natural resources as it is in its young people and children. They will be the architects and moulders of a nation's future. Children now will become adult citizens tomorrow. Students today will become attorneys, physicians, engineers, teachers, leaders, and activists of the future. The youngsters have an endless quantity of energy, will, aptitude, devotion, and excitement, and they have the capacity to shape the nation's fate. The growth and social advancement of youngsters is a critical step, particularly for disadvantaged and low-income youngsters. Investing in children throughout their formative years will provide the groundwork for future success, with lasting rewards for individuals as well as social and economic

benefits for society. Global estimates of the International Labour Organisation (ILO) show that 152 million children are working worldwide and the incidence is very high for the developing countries (International Labour Organisation, 2017). The Indian government has recognised the fact and has begun efforts to effect change. It has been demonstrated that if impoverished children are given the proper assistance, they can outperform non-poor children. Previously, children assisted their parents with fundamental agricultural activities such as planting, reaping, harvesting, caring for animals, and so on. However, with the expansion of industry and urbanisation, the concern of child labour is becoming more prevalent. Children are hired at a very young age for a variety of unsuitable occupations, and they are driven to produce dangerous items with their quick fingers. They work in

the garment, suede, jewellery, and sericulture sectors, among others.

Child labour

Child labour is defined as the utilization of children in any type of job that impairs their cognitive functioning and deprives them of essential educational and leisure needs. Many youngsters are forced to labour in hazardous and non-hazardous sectors such as agriculture, glass factories, carpet industries, brass industries, matchbox manufacturers, and as domestic assistance. It is a stain on our society and says volumes about our society's incapacity to offer a conducive environment for children's growth and development. Formative is said to be the finest time of one's life, however this is not the case for certain children who are struggling to survive throughout their childhood years. Based on the Child Labour Project and the 2011 statistics, 10.2 million children in India are involved in child labour, with 4.5 million of them being girls. Child labour denies children the right to a normal upbringing, a suitable school, and psychological and physical well-being. It is prohibited in certain nations, but it is still a long way from being totally abolished.

Causes of child labour

Child labour occurs for a variety of causes. Although some of the causes may be universal in certain countries, others are unique to specific places or regions. We will indeed be able to combat child labour more effectively if we understand what causes it. For starters, it occurs in nations with high levels of poverty and unemployment. Mines were notorious for their use of underage labour.

Liten (2010) mentioned that during industrialization, 50% of the factory labour force was children and 30% were working in coal mines. When a family's earnings are insufficient, they put their children to work to ensure that they have sufficient money to survive. Similarly, if the elders in the household are unemployed, the children must fill their shoes. Furthermore, when individuals lack access to education, they will eventually force their kids to work. The ignorant are only concerned with the immediate term, resulting in they force children to work in order to exist in the present. Furthermore, the cost-cutting mindset of numerous companies is a big contributor to child labour. They recruit

youngsters since companies pay them less than adults for the same task. They favour youngsters since they labour harder than adults and for less money. They have the ability to effortlessly influence and control them. They are just concerned with profit, which is why they employ youngsters in factories.

As previously said, there are several causes for this phenomena to occur. Economic issues are thought to exert the most significant influence. It is often assumed that juvenile labour rates are greater in locations where people are compelled to live in poverty. It can apply to both developing countries and troublesome regions inside affluent countries. Youngsters are most likely associated in working children when their guardians or parents believe it is 'normal' for youngsters to work, and occasionally for the children's own and their families survival. It is critical to understand child labour from the standpoint of the children, families, and communities themselves. The following are a few fundamental issues that make children especially vulnerable.

Poverty

Poverty is without a doubt the most powerful single influence propelling youngsters into the labour force.' When families are unable to cover basic requirements such as food, water, education, or health care, they are forced to put their kids to work to boost the household income. Some empirical studies ([Chaitanya, 1991](#); [Chamarbagwala, 2008](#); [Emerson and Knabb, 2006](#)) also suggest that inequality of opportunity is the reason for the intergenerational transmission of child labour rather than poverty. Poverty is seen as one of the most significant factors behind child labour since it is related to other variables such as poor literacy and math rates, a lack of adequate employment options, natural catastrophes and climate change, wars, and mass relocation. Unemployment and child labour are inextricably linked; if we don't address one, we won't be able to address the other.

Lack of access to quality education

'Among the most essential elements are the accessibility and quality of education.' School should be a friendly atmosphere with suitable student numbers, a curriculum tailored to the given context, and prices that are reasonable for rural areas. Getting kids to school and away from dangerous jobs is one thing, but maintaining them there requires making great education available to all.

Poor access to decent work

'Children who have been engaged in child labour frequently lack the fundamental educational foundation that would allow them to learn skills and enhance their chances for a respectable adult working life.' If youthful people cannot find employment that is safe, provides welfare support, fair pay, fairness for men and women, and allows employees to voice their thoughts, they are frequently forced to conduct dangerous job. When youngsters over the legal working age perform dangerous employment, this is also called child labour.

Limited understanding of child labour

'The belief that employment is beneficial to children's character development and skill development.' Families are more inclined to put their children to work if they are unaware of the hazards of child labour and how they affect their kid's health, safety, well-being, and future. Child labour can also be motivated by cultural ideas and social conventions.

Natural disasters & climate change

'In rural places, farmers who have had their crops damaged by climate change have no alternative but to put their children to work.' The impacts of natural catastrophes and environmental degradation are a growing source of worry. Rural households that rely on predictable periods for farming are more vulnerable to changes in rainfall patterns, soil erosion, or harsh weather. When crops or farming land are damaged, families must struggle to survive and are more prone to send their kids to work on neighbouring farms.

Conflicts and mass migration

'There is a clear association between child labor and war and catastrophe circumstances.' Due to an increase in market turmoil, a collapse in social support, education, and basic amenities, and a disruption in child protection services, these children are more exposed to types of exploited, including child labour. Child

labour is nearly twice as prevalent in conflict-affected countries as it is elsewhere. Children are also at risk of getting involved in armed warfare, that is one of the Worse Forms of Child Labor.

Eradication of child labour

Child exploitation is a major source of worry. It is a poison that is deeply ingrained in society. The abolition of child labour in The country may appear to be a monumental endeavour, yet it is not insurmountable. To eradicate child labour, different parts of society must come together. Whether it is household activity or begging or prostitution; working at the expense of education can never be helpful for any child (Orrnert, 2018). The efforts of government programs and federal officers can only take them so far. Even when greater options are available, poor and ignorant families may be hesitant to abandon their old habits.

That is when ordinary individuals and volunteers must come up to help. NGOs funded by well-meaning individuals will be required to guarantee that government policies are properly followed and that all types of corruption are exposed.

Education campaigns and conferences for the underprivileged must be organised to promote awareness. Parents must comprehend the long-term advantages of their children receiving an education. It has the ability to improve the lives of people and help them get out of poverty.

The detrimental emotional and physical effects of child labour on children must be taught in workshops. Government appeals can also encourage younger children to attend school by providing healthy food and other incentives.

Family planning education is very important in trying to regulate the population. If reduced parents have more offspring, they are more likely to send them to work to help support the family. Having fewer children indicates that they are treasured, and parents prioritize their nutrition, schooling, and long-term well-being.

Having fewer children makes them more valuable, and families will just not transfer them to dangerous job conditions where they may sustain lifelong harm or death. The government should provide incentives to families with one or four children in order to convince low earners to have smaller families

and reap the advantages while still providing a comfortable life for their children.

When parents allow or even compel their children to work, they may be unaware of the serious implications. They only consider the short to medium term and allow the youngster to work because they require the money to buy food, clothing, or shelter. You may teach them that it is better in the long run for the youngster to be educated so that they can get a better career. Additionally, inform them that the youngster has had the option not to be compelled to labour! Organize a discussion event in your town to exchange facts and allow parents and children to discuss the issue.

Conclusion

Child employment is like a termite, harming the child's vigour and growth as an individual, as a citizen, and as the country's future. It must be eliminated from pathways so that the youngsters of the country might have a brighter future and contribute to the country's growth. A country full of impoverished children cannot progress. It should be society's and the government's common obligation to give these disadvantaged youngsters a healthful and favourable environment in which to develop their intrinsic strengths and skills. Even though the phrase sometimes applies to youngsters who work lawfully, the most fact that the phrase sometimes applies to youngsters who work lawfully, the majority of teens are involved in unlawful labor. It exists for various reasons, including an economic, societal, and psychological variety of reasons, including economic, societal, and psychological ones. It is impossible to say which of these has the greater

influence because all three introduce important arguments. Additionally, forced labour can be hazardous to persons' health and impede them from acquiring quality education. As a result, states struggle with this phenomenon since a large number of ignorant young people in bad health conditions will produce relevant challenges for a country.

References

1. Chamrbarbagwala, R. (2008), "*Regional returns to education: child labour and schooling in India*", *The Journal of Development Studies*, Vol. 44 No. 2, pp. 233-257.
2. Chaitanya, K. (1991), "*Child labour among Digaru Mishimis of Arunchal Pradesh*", *Economic and Political Weekly*, Vol. 26 No. 36, pp. 2084-2085.
3. Emerson, P.M. and Knabb, S. (2006), "*Opportunity, inequality and the intergenerational transmission of child labour*", *Economica*, Vol. 73 No. 291, pp. 413-434.
4. International Labour Organisation (2017), "*Global estimates of child labour: results and trends, 2012-2016*", International Labour Office, Geneva.
5. Liten, G.K. (Ed.) (2010), "*The worst form of child labour in Latin America*", *Hazardous Child Labour in Latin America*, Springer Media, New York, NY, pp. 1-20.
6. Orrnert, A. (2018), *Evidence on Links between Child Labour and Education*. K4D Helpdesk Report, Institute of Development Studies, Brighton.



WASTEWATER MANAGEMENT AND ITS CHALLENGES

Dr. Kavita Hingane

LKM Institute of Management Studies & Research, Chandrapur

Corresponding Author- Dr. Kavita Hingane

Email:- kavitahingane18@gmail.com

DOI- 10.5281/zenodo.7295589

Abstract

Water that has been used or contaminated by humans or the environment must undergo wastewater treatment in order to be returned to a usable state. The treatment may involve one or more of the following mechanisms: chemical, biological, physical, or a combination of these. Any level of purity can be achieved by treating water, but the expense increases as the purity increases. The needed water quality depends on the intended use of the water, such as irrigation, drinking water, or aquatic life. The purpose of research is to examine the wastewater treatment technology that is now most widely utilized. The technology selected for one application may not be the best for another. It is also easy to get, effective, and has the ability to breakdown contaminants. In this study, the use of waste water treatment technology to eliminate the most prevalent pollutants in wastewater—halogenated hydrocarbon compounds, heavy metals, dyes, pesticides, and herbicides is discussed.

Keywords: Environment, Contaminants, Technology, Waste Water.

Introduction

Wastewater is water that has had certain substances added to it that have changed its physical, chemical, or biological qualities, making it inappropriate for particular uses like drinking. Man releases "waste" into the water since he relies on it so heavily for his daily activities. Some of the things that can make people sick and harm the environment are body waste (faeces and urine), hair shampoo, hair, food scraps, fat. It is common knowledge that a significant portion of the supplied water is wasted, necessitating its treatment. In order to safeguard the environment and the general public's health, wastewater treatment is the process and technique used to remove the bulk of toxins from wastewater. Therefore, wastewater management comprises managing wastewater in a way that promotes environmental protection, public health, and political, social, and economic stability.

, laundry powder, fabric conditioners, toilet paper, chemicals, detergent, home cleansers, dirt, and microorganisms (germs).

Objectives of Wastewater Treatment

For the reasons stated above, wastewater treatment is essential. It's more important

for the:

Reduction of biodegradable organic compounds in the environment- Organic substances in organic matter such as carbon, nitrogen, phosphorus and sulphur must be broken down by oxidation into gases that are either released or stay in solution.

Reduced nutrient content in the environment- Nutrients such as nitrogen and phosphorus from wastewater in the environment enrich or make water bodies, allowing algae and other aquatic plants to thrive. These plants deplete oxygen in water bodies, causing aquatic life to suffer.

Pathogen elimination- Pathogens are organisms that cause illness in plants, animals and Human. They're also called microorganisms since they're so little that they can't be seen with the human eye. Bacteria, viruses, fungi, protozoa and helminthes are examples. Infected animals and people excrete significant amounts of these microorganisms in their faces.

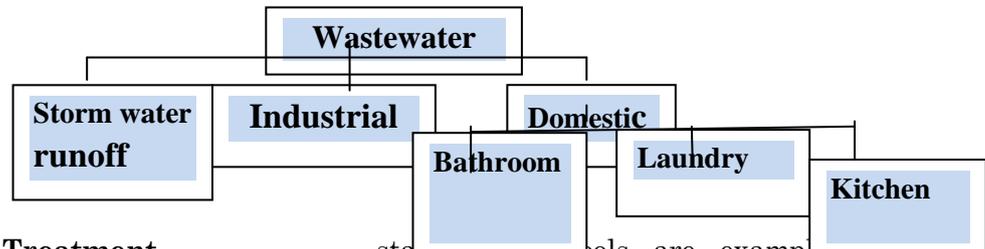
Water recycling and reuse- Water is a limited and finite resource that is frequently taken for granted. Population growth in the latter part of the twentieth century has put further strain on already precious water

supplies. The agrarian nature of many places has also changed as a result of urbanisation. Increased population means more food must be produced, and agriculture, as we all know, is by far the greatest user of available water, implying that economic expansion is putting additional demands on existing water supplies. With groundwater supplies becoming depleted, the temporal and

geographical distribution of water is also a key problem. Recycling and reuse are critical for long-term sustainability for these reasons.

Types of Wastewater

There have been found diverse kinds of the wastewaters and their sources around the globe in last decade.



Levels of Wastewater Treatment

Treatment is divided into three categories: primary, secondary, and tertiary.

Preliminary therapy is sometimes used before primary treatment.

Preliminary treatment- Removes grits and suspended ground particles from the pretreatment process. By screening and gritting the pollutants, chambers can be used to eliminate them. Future treatment units will find it simpler to operate and maintain as a result. At this stage of the treatment, flow measurement tools like steady wave flumes are required.

Primary treatment- Organic and inorganic particles from settling are removed, while floating materials are removed by skimming. This step allows for the removal of up to 50% biodegradable organic compound, 70% suspended particles, and 65% of grate and oil. Heavy metals, organic nitrogen, and organic phosphorus are also eliminated. However, at this point, neither dissolved nor colloidal components are removed. Primary effluent is the waste water produced by the main sedimentation units.

Secondary treatment- This is the process of removing any leftover organics and suspended particles from the initial effluent. By using aerobic biologic treatment methods, biodegradable dissolved and colloidal organic waste is additionally eliminated. When organic material is eliminated, harmful microbes and phosphorus and nitrogen compounds are also eliminated. Filters for trickling, activated sludge techniques are examples of mechanical treatment. Anaerobic treatment, oxidizing troughs and

stabilization pools are examples of non-mechanical treatment.

Tertiary treatment or advance treatment- Therapeutic therapy or advanced therapy is used to remove certain waste water components that cannot be removed by secondary treatment. Significant amounts of phosphate, nitrogen, heavy metals, biodegradable organics, bacteria, and viruses are eliminated during advanced treatment. Traditional sand (or similar medium) filters and more recent membrane materials can both filter secondary waste effectively. Filters and membranes remove helminths, and some filters are improved. The most recent technique is disc filtering, which uses sizable fabric discs attached to rotating tambours. At this stage, disinfection with chlorine, ozone, and ultraviolet (UV) radiation can be performed to make the water compliant with present-day international standards for re-use in agriculture and urban areas. Both conventional and unconventional wastewater treatment techniques have been shown to be successful in treating wastewater. As opposed to unorthodox techniques of wastewater treatment, traditionally used systems are more automated. Typically, power and pumping are needed. Specialized labour is required for system maintenance and operation.

Methods of Wastewater Treatment

Conventional Methods: Biological contactor rotational techniques, trickling filters, and conventional sludge processing are a few examples. Filters that need to be

Dr. Kavita Hingane

shortened are susceptible to temperature, can only remove a small amount of biodegradable organic compounds are more expensive to construct than sludge systems. Since energy is needed to run pumps and blowers, activated sludge systems are much more expensive to operate (National Technological Learning Programme). These strategies are fully explained in the following sections.

Activated Sludge Activated sludge is a biological method for treating organisms in suspension that removes biodegradable organic compound and suspended particles. It is based on the idea that excessive aeration of waste water produces bacterial flocks (active loam), which can silt and break down organic molecules. The system consists of a flow monitoring unit, aeration mixers and blowers, return and waste pumps, ventilation and installation tanks, and return and waste pumps. To maintain a concentration of active bacteria in the tank, some of the sludge activation is recycled. To create the mixed liquor, primary effluent (also known as influent plant) is combined with a return of activated sludge and aerated for a predetermined amount of time. Activated sludge uses the organic matter in the system when the system is aerated.

Trickling Filter It is a growing technique in which therapeutic microorganisms are linked to inert packaging material. It is composed of a circular tank containing a carrier material (vulcanic rock, gravel or synthetic). The organic material in the waste water is absorbed into the media as a biological film or as a slime (about 0.1 to 0.2 mm thick) adhesive or slime layer adhered to the medium as a biological or slime-like film (approximately) (approximately 0.1 to 0.2 mm thick). Organic material in the outermost layer of the slime layer is destroyed by aerobic bacteria. Anaerobic organisms are present, since oxygen cannot reach the medium face if the thickness of the layer is caused by microbial growth.

Rotating Biological Contactors

Vertically stacked plastic media moving on a horizontal shaft make up rotating biological contactors. The polymers have a diameter of 2 to 4 metres and can be up to 10 millimetres thick. The biomass-coated media are alternately exposed to wastewater and

atmospheric oxygen, with about 40% of the media submerged, as the shaft gently rotates at 1-1.5 rpm needed to provide hydraulic shear for sloughing and maintain turbulence to keep solid in suspension. The enormous surface area enables the growth of a sizable, consistent biomass population. Although RBC systems are relatively new, they have been installed in a number of petroleum plants because of their ability to quickly recover from unfavourable conditions, despite their apparent suitability for treating municipal wastewater. Should the requirement for volatile organic content containment emerge, the RBC system is easily expandable and RBCs are also very simple to encapsulate. RBCs are extremely energy-efficient and may even be run on compressed air, which aerates the system. Since they work using fundamental principles, they require rather skilled labour. In contrast, RBCs require expensive installation and are temperature-sensitive.

Membrane Bioreactors

This method involves multiple therapeutic procedures. Membrane bioreactor (MBR) systems are unique processes that merge anoxic and aerobic biological treatment with an integrated membrane system that may be used with almost any suspended-growth, biological wastewater-treatment system. Sewage is filtered before it goes into the biological treatment tank. Aeration maintains solids suspended while supplying oxygen for biological respiration within the aerobic-reactor zone. In MBR, active biomass is maintained via submerged membranes. As a result, the biological process can operate for longer than the typical sludge ageing times (about 20–100 days for an MBR) and generate more mixed sludge.

MBRs use less land because they don't need additional clarifiers, which saves a lot of money on both the footprint and the cost of concrete. Compared to conventional treatment procedures, they can function at higher biomass concentrations. The facility may be expanded by simply putting more membranes in the existing basins, without changing the land cover. To meet criteria for reuse quality, it does not need tertiary treatment, polymer addition, or any other kind of treatment. With fewer unit processes, the system is more dependable while

operating expenses are also reduced. The high effluent quality reduces the need for disinfection throughout the whole treatment process.

Non-conventional Methods: These are low-cost, low-tech biological wastewater treatment systems that are also simpler to operate and maintain. These systems require more land than conventional high-rate biological processes, but if the system is properly designed and not overloaded, they are usually more effective at eradicating infections and do so reliably and continuously. Some unconventional methods include soil aquifer treatment, oxidation ditches, artificial wetlands, stabilisation ponds, and so on.

Waste Stabilization Ponds

Stabilization of Waste Ponds are small, artificial basins with one or more anaerobic, facultative, or maturation ponds in them. This low-tech treatment technique employs four or five ponds with different depths and levels of biological activity. During the treatment process, the components of wastewater are either altered by biological and chemical processes or removed via sedimentation. Anaerobic ponds' primary functions include settling and removing suspended matter and decomposing specific organic waste. By using the oxygen produced by the pond's algae, organic matter is further broken down in facultative ponds into carbon dioxide, nitrogen, and phosphorus. Anaerobic ponds receive primary treatment, facultative ponds receive secondary treatment, and maturation ponds receive tertiary treatment because maturation ponds frequently remove nutrients and dangerous microorganisms. Anaerobic conditions can be found throughout anaerobic ponds. If built properly, anaerobic ponds can remove 60% of biodegradable organic at 200°C. Facultative ponds often accept wastewater from anaerobic ponds and are 1-2 metres deep. In some designs, they serve as a primary facultative pond that accepts untreated sewage. Because facultative ponds have lower organic loads, an algal bloom can occur, which is what gives the effluent its dark green colour. Algae and aerobic microbes, which produce oxygen, break down BOD₅. Typically shallow ponds

with a depth of 1.0 to 1.5 metres, maturation ponds enable the establishment of aerobic conditions for the treatment of facultative Pond wastes. Here, dangerous bacteria, nutrients, and organic elements are further diminished. The algal population is more diverse and nitrogen and ammonia removal is more prevalent in maturation ponds.

Constructed Wetlands

Built wetlands are intentionally created systems that use wetland plants in a more controlled setting than wild wetlands to help treat wastewater. Municipal and industrial wastewater can be effectively and sustainably treated using secondary and tertiary processes. Organic materials, suspended particles, nutrients, germs, heavy metals, and harmful contaminants can all be removed. In order to preserve the ecological equilibrium of the wetland ecosystem, they cannot be employed for the pre-treatment of raw sewage or industrial wastewater. Free Water Surface (FWS) and Subsurface Flow (SSF) are the two types of Constructed Wetlands. In contrast to plants that are, as the name implies, planted beneath the water column in the sediment layer, water spills over the ground into Free Water Surface. A porous medium, such as gravel, that is rooted in plants, receives water flow.

Challenges of Wastewater Management

Although the management of waste water is not technically complicated, socio-economic issues may occur. Some of the problems are discussed below.

Infrastructure:

In most governments, wastewater infrastructure is not regarded as a priority and very little investment is therefore made. However, because almost all water is produced as wastewater it is equally as essential as water treatment facilities.

Pollution of Water Sources

The consequences of wastewater discharge on the water quality are considerable; the aquatic environment is affected and the aquatic ecosystem is therefore interrupted. The urine and faeces of the food we eat contain carbonaceous components, nutrients, trace elements, and salts. Medicines, chemicals and hormones are also available in the waste water treatment plant. The letter must comply with the

discharge standards. This ensures that water supplies are viable for the long run. The precautionary and environmental ideas for the prevention or reduction of waste water contamination have been highly beneficial and should be applied in developing nations.

Choice of Appropriate Technology

Because the economy of most developed countries is donor based, donors are responsible for the bulk of wastewater treatment plants. As a result, the technology to be employed is more likely to be suggested. Through a lack of technical knowledge, power requirements and other reasons the recipients take over the plant, the management and maintenance of operations are exceedingly challenging.

Sludge Production

Wastewater treatment produces wastewater sludge. A reliable disposal method must be available. The hazards connected with it have to be addressed when utilised in agriculture. As heavy metals are found in wastewater, farm usage is often thought to lead to the build-up of heavy metals in soils that contaminate the crops.

Reuse

Effluents that meet the discharge conditions, such as aquaculture or irrigation, may be used in agriculture. This is because reuse becomes risky if wastewater treatment systems are not adequately maintained and monitored to ensure adequate effluent quality.

Conclusion

Without water you cannot survive, thus waste water is with us and always will be with us. Where water is used for a range of human activities, its characteristics are contaminated or modified, leading to waste water. Waste water may and should be treated to provide a healthy environment and enhance public health. The technique of wastewater treatment is traditional and non-conventional and the choice of one should be based on criteria such as the characteristics of the wastewater whether from a municipality or an industrial sector (chemical, textile, pharmaceutical, etc.). In majority of the cities, low-cost low

technology solutions like waste stabilization ponds have proven successful, but older approaches such as filter trickling and sludge activated systems have failed. The wastewater which meets specific discharge standards can benefit from both aquaculture and irrigation. Despite various barriers to the handling of waste water, adequate attention and financial support.

References

1. L. H. A. Ait Melloul, "Salmonella infection in children from the wastewater-spreading zone of Marrakesh city (Morocco)," *J. Appl. Microbiol.*, vol. 87, p. 4, 2001.
2. Audrey D. Levine, Harold L. Leverenz, Takashi Asano, "WATER RECLAMATION AND REUSE," *WATER Heal.*, vol. 2, p. 11, 2002.
3. L. S. M Albonico 1, P G Smith, E Ercole, A Hall, H M Chwaya, K S Alawi, "Rate of reinfection with intestinal nematodes after treatment of children with mebendazole or albendazole in a highly endemic area," *Trans. R. Soc. Trop. Med. Hyg.*, vol. 89, p. 4, 1995.
4. R. Armon; C. G. Dosoretz; Y. Azov; G. Shelef, "Residual contamination of crops irrigated with effluent of different qualities: a field study," *Water Sci. Technol.*, vol. 30, p. 8, 1994.
5. S. A. S. R. M. Ayres, R. Stott, D. Lee, D. Mara, "Contamination of Lettuces with Nematode Eggs by Spray Irrigation with Treated and Untreated Wastewater," *Water Sci. Technol.*, vol. 26, p. 9, 1992.
6. B. J.-C. J. Anderson¹, A. Adin², J. Crook³, C. Davis⁴, R. Hultquist⁵ and B. S. and B. van der M. W. Kennedy⁷, "Climbing the ladder: a step by step approach to international guidelines for water recycling," *Water Sci. Technol.*, vol. 43, p. 8, 2001.
7. H. Fujii and S. Managi, "Wastewater management efficiency and determinant factors in the Chinese industrial sector from 2004 to 2014," *Water (Switzerland)*, 2017, doi: 10.3390/w9080586.



**ISOLATION OF ANTIMICROBIAL RESISTANCE BACTERIA
FROM THE EXTERNAL BODY SURFACE OF HOUSEFLIES
COLLECTED FROM CIVIL HOSPITAL MALEGAON**

Mohammad Ismail Ansari¹ Fariha Shafaq, Azra Ghayasuddin²

Department of Zoology, J.A.T. Arts, Science and Commerce College (for Women),
Malegaon

Corresponding Author- Mohammad Ismail Ansari

Email:- ismailansari249@gmail.com

DOI- [10.5281/zenodo.7295591](https://doi.org/10.5281/zenodo.7295591)

Abstract:

Background: Antimicrobial or antibiotic resistance (AMR) bacteria is a serious problems to public health globally that adversely affects both animals and humans. Houseflies act as common transmitting biological agent for the spreading of these AMR bacteria.

Objective:

The primary objective of this study was to isolate AMR bacterial species from the external body surface of the houseflies collected from civil hospital Malegaon and to assess susceptibility of these bacterial strains to various antibiotics.

Materials and methods:

Houseflies were captured by simple sweep net method from civil hospital Malegaon. Gram's staining methods were used for the identification of bacteria. Cultures were prepared in xylose lysine deoxycholate (XLD) agar, mannitol salt (MS) agar and eosin methylene blue (EMB) agar and antibiotic resistance was performed by Kirby–Bauer test.

Results:

A total of 72 flies were captured and two bacterial species were isolated. Of these 37 (51.4%), and 29 (40.3%) isolates of *Salmonella* spp., and *E. coli* were detected respectively. These bacterial strains showed antibiotic resistance for routinely used antibiotics like amoxicillin, azithromycin and erythromycin. *Salmonella* spp. is resistance to more than 80% of antibiotics used in the present study. However, *E. coli* showed sensitivity to some antibiotic.

Conclusion:

Houseflies collected from civil hospital in the present study carries pathogenic multi-

drug resistance bacteria which causes substantial increase in morbidity and mortality and socioeconomic burden. Utmost attention of health care policy maker is needed in this regard.

Keywords:

Antimicrobial resistance (AMR), *Salmonella* spp., *E. coli*, Amoxicillin, Azithromycin

Introduction:

Antimicrobial resistance (AMR) is a worldwide public health problem and it is the prime concern of all the prominent research institutions. AMR affects both animals and humans (Odonkor & Addo, 2011; Ansari et al., 2013). Every year, roughly 700,000 fatalities occurred from AMR bacterial infections (O'Neill, 2014). In 2016 alone approximately 126,000 people died from severely drug-resistant and multi-drug-resistant tuberculosis (Dunachie, et al., 2020). AMR is a term that describes the ability of bacteria (typically pathogenic) to develop physical or biochemical mechanisms and processes that turn antimicrobial therapies, such as antibiotics, ineffective (Livermore, 2009). This creates new challenges for microbiologists and pharmacologists to find new antibacterial formulations (Coates et al., 2002; Thomson et al., 2004). Houseflies are among the most common vectors for spreading these bacteria frequently found in close proximity to human

habitation (Fotedar et al., 1992). Their numbers are very high in and around garbage yards, restaurants, homes, hospitals, crowded areas and villages with inadequate sanitary facilities and unsanitary situations (Oothuman, et al., 1989). Moreover, their feeding and breeding habits make them perfect hosts for pathogenic microorganisms. Houseflies have also been discovered to carry multidrug-resistant bacteria in hospital environments and may have a role in the transmission of human diseases (Fotedar, et al., 1992; Khalil, et al., 1994). There has been no research in Malegaon city of district Nashik on the susceptibility of human pathogenic bacteria that are carried by the *Musca domestica*. In the present study, *Musca domestica* were collected from civil hospital and human pathogenic bacteria were isolated from their external body surfaces. The susceptibility of the bacterial strains to various antibiotics was then determined.

Materials and methods:

The study was conducted in civil hospital of Malegaon. Houseflies were caught by sweep net method for a period of 30 days, from visiting places of houseflies. A total of 72 flies were captured and transported to the Department of Zoology laboratory in well-labelled specimen bottles. Isolation of bacteria:

Collected houseflies were taken in a 10 mL vial half-filled with Phosphate buffered saline, sealed, and tagged, and left to stand for 10 minutes. To dislodge bacteria adhered externally to the body surface; the tube was rapidly shaken by hand for 2 minutes. The solution then transferred in a test tube containing nutrient broth and incubated for 6-8 hours at 37°C for culture (Fotedar et al.,

2001).

Identification of bacteria:

A sterile loop was used for inoculation of the culture using xylose lysine deoxycholate (XLD) agar, mannitol salt (MS) agar and eosin methylene blue (EMB) agar (HiMedia, Mumbai, India). Colonies that were black in the centre in XLD media, golden yellow in MS

media and had a metallic sheen in EMB agar, were recognised as *Salmonella* spp., *S. aureus* and *E. coli* after 24-48 hours of incubation at 37°C (Bergey et al., 1974). Morphological identification was carried by Gram's staining method (Cheesbrough, 1985).

Antimicrobial testing:

Antimicrobial resistance was tested for isolated bacterial species using Kirby-Bauer test (Bauer et al., 1966), which included amoxicillin (30 g), azithromycin (30 g), ciprofloxacin (5 g), ceftriaxone (30 g), streptomycin (10 g), erythromycin (5 g) (HiMedia, Mumbai, India).

Results:

Prevalence of bacteria:

A total of 72 flies were captured and two bacterial species were isolated. Of these 72 houseflies, 37 (51.4%) isolates of *Salmonella* spp., and 29 (40.3%) isolates of *E. coli* were detected respectively (Table-1). Antibiotic resistance patterns for various antibiotics of isolated *Salmonella* spp., and *E. coli* are indicated in Table 2.

These bacterial strains showed antibiotic resistance for routinely used antibiotics like amoxicillin, azithromycin and erythromycin. *Salmonella* spp. is resistance to more than 80% of antibiotics used in the present study. However, *E. coli* showed sensitivity to some antibiotic.

Table 1: Number of bacterial isolates from houseflies collected from civil hospital

Sampling site	Bacterial isolates identified	
	<i>Salmonella</i> spp.	<i>E. coli</i>
Civil hospital (72)	37 (51.4%)	29 (40.3%)

Salmonella spp. isolates were 81.1% resistant to amoxicillin, while 75.7% to ciprofloxacin and 62.2% to azithromycin, however it is susceptible to other antibiotics (Table2).

Table-2: Resistance pattern of *Salmonella* spp. and *E. coli* to various antibiotics

Bacterial Species	Amx	Azt	Cip	Cft	Str	Ery

Salmonella spp. (37)	30	23	24	11	10	14
E. coli (29)	20	25	21	13	09	10

However, *E. coli* isolates were 86.2% resistant to azithromycin, 72.4% to ciprofloxacin, and 69.0% to amoxicillin (Table-2). Whereas ceftriaxone (44%), erythromycin (34%) and streptomycin (31%) resistance were found in fewer isolates.

Discussion:

Houseflies due to their eco-biology are suitable mechanical vector for transmission of wide range of animal and human bacteria, viruses, and fungus (Kassiri, et al., 2012). As a result, several bacterial species have been isolated from the external body surface of housefly, as they pick up these bacteria through their mouths, legs, wings, and other body parts during the feeding process, and then transmit the pathogen back to the animal and humans, where they complete their life cycle (Khamesipour, et al., 2018). Two bacterial species viz *Salmonella* spp., and *E. coli* were isolated in the present study. Additionally, it was discovered that every fly was a carrier of at least one pathogenic bacteria, most likely as a result of poor hygiene and sanitation in the environment from where they were collected. It is consistent with a prior study that discovered *Shigella*, *E. coli*, *Salmonella* Typhimurium, and *Klebsiella* on the outer body surfaces of houseflies that were circulating in a Bangladeshi university canteen (Parvez, et al., 2016). Houseflies were gathered from the civil hospital for this study. This region is vulnerable to mutations and the development of antibiotic resistance. The recent findings are similar to those of Nazari et al. (2017) who discovered that flies around a hospital in Hamadan, Iran, had more bacterial strains than expected.

In a study, different types of Gram positive and Gram negative bacteria were isolated from houseflies that were caught in canteens, restaurants, and indoor food preparation facilities (Ibrahim, et al., 2018). But compared to the current investigation, the frequency of these identified bacterial spp. was slightly lower. According to all of these investigations,

houseflies have the capacity to transmit these harmful bacteria to people and animals through their external body surfaces (De Jesús et al., 2004).

Due to their resistance to the bulk of the antibiotics now in the market, antibiotic-resistant bacteria are currently posing a hazard on a worldwide scale. By 2050, antimicrobial resistance is predicted to kill around 10 million people annually (O'Neill, 2016), putting both people and animals in grave danger of going extinct. The majority of the isolates in this investigation showed resistance to more than three antibiotics (amoxicillin, azithromycin, erythromycin, and streptomycin) that are often used in the current study region. Since hospital areas is typically filled with ill patients carrying antibiotic-resistant bacteria and where the majority of biological products used in hospitals are simply thrown into dustbins and open spaces without proper treatment. This is consistent with a study by Nazari et al. (2017), who discovered multiple bacterial species from a hospital that were resistant to various medications. Antibiotics are frequently and carelessly used, and this has almost led to an increase in the number of resistant bacterial strains on the external body surface of houseflies that live near human and animal habitation. The latest research expands the body of evidence showing that houseflies spread bacteria that are resistant to a variety of antibiotics, which may be harmful to both human and animal health.

Conclusion:

Houseflies that were collected from a civil hospital had AMR bacterium species isolated from their exterior body surfaces. A hospital authority must restrict flies from hospital environments using the proper administrative procedures in order to prevent the spread of pathogenic organisms. A fly net should be used to close off the entrance to the kitchen to stop flies from entering. It's

essential to properly dispose of human and animal waste as well as other things that are rotting to stop the spread of filth flies. The development of regional empirical treatment strategies may benefit from an understanding of the epidemiology of AMR bacterial species in a certain region.

References:

1. Ansari, M.J., Al-Ghamdi, A., Usmani, S., Al-Waili, N.S., Sharma, D., Nuru, A., Al- Attal, Y., 2013 Jul 1. Effect of jujube honey on *Candida albicans* growth and biofilm formation. *Arch. Med. Res.* 44 (5), 352–360.
2. Bergey, D.H., Buchanan, R.E., Gibbons, N.E. and American Society for Microbiology. (1974) *Bergey's Manual of Determinative Bacteriology*. Williams and Wilkins Co., Baltimore.
3. Cheesbrough, M. (1985) *Microbiology*. In: *Medical Laboratory Manual for Tropical Countries*. 1st ed. English Language Book Society, London. p400-480.
4. Coates, A., Hu, Y., Bax, R., Page, C., 2002. The future challenges facing the development of new antimicrobial drugs. *Nat. Rev. Drug Discovery* 1 (11), 895–910.
5. De Jesús, A.J., Olsen, A.R., Bryce, J.R. and Whiting, R.C. (2004) Quantitative contamination and transfer of *Escherichia coli* from foods by houseflies, *Musca domestica* L. (Diptera: Muscidae). *Int. J. Food Microbiol.*, 93(2): 259-262
6. Dunachie, S.J.; Day, N.P.; Dolecek, C. The challenges of estimating the human global burden of disease of antimicrobial resistant bacteria. *Curr. Opin. Microbiol.* 2020, 57, 95–101.
7. Fotedar R (2001) Vector potential of houseflies (*Musca domestica*) in the transmission of *Vibrio cholerae* in India. *Acta Trop* 78: 31-3
8. Fotedar R, Banerjee U, Shrinivas SS, Verma A (1992) The house fly (*Musca domestica*) as a carrier of pathogenic micro-organisms in a hospital environment. *J Hosp Infect* 20: 209-15.
9. Ibrahim, A.W., Ajiboye, T.O., Akande, T.A. and Anibaba, O.O. (2018) Isolation and identification of pathogenic microorganisms from houseflies. *Glob. J. Sci. Front. Res.*, 18(1): 57-64
10. Kassiri, H., Akbarzadeh, K. and Ghaderi, A. (2012) Isolation of pathogenic bacteria on the house fly, *Musca domestica* L. (Diptera: Muscidae), body surface in Ahwaz hospitals, Southwestern Iran. *Asian Pac. J. Trop. Biomed.*, 2(2): S1116-S1119.
11. Khalil K, Lindblom GB, Mazhar K, Kaijsher B (1994) Flies and water as reservoirs for bacterial enteropathogens in urban and rural areas in and around Lahore, Pakistan. *Epidemiol Infect* 113: 435-44.
12. Khamesipour, F., Lankarani, K.B., Honarvar, B. and Kwenti, T.E. (2018) A systematic review of human pathogens carried by the housefly (*Musca domestica* L.). *BMC Public Health*, 18(1): 1049
13. Livermore DM. Has the era of untreatable infections arrived? *J Antimicrob Chemother.* 2009;64:29–36
14. Nazari, M., Mehrabi, T., Hosseini, S.M. and Alikhani, M.Y. (2017) Bacterial contamination of adult house flies (*Musca domestica*) and sensitivity of these bacteria to various antibiotics, captured from Hamadan city, Iran. *J. Clin. Diagn. Res.*, 11(4): DC04
15. O'Neill J. *Tackling drug-resistant infections globally: final report and recommendations*. London: Review on Antimicrobial Resistance, 2016.
16. Odonkor, S.T., Addo, K.K., 2011. Bacteria resistance to antibiotics:

- Recent trends and challenges. *Int. J. Biol. Med. Res.* 2, 1204–1210.
17. Oothuman P, Jeffery J, Aziz HA, Baker EA, Jegathesan M (1989) Bacterial pathogens isolated from cockroaches transported from pediatric wards in peninsular Malaysia. *Trans Roy Soc Trop Med Hyg* 83: 133-135.
 18. Parvez, M.A.K., Marzan, M., Khatun, F., Ahmed, M.F., Mahmud, S.A. and Rahman, S.R. (2016) Isolation of multidrug-resistant pathogenic bacteria from common flies in Dhaka, Bangladesh. *J. Entomol.*, 13(4): 141-147
 19. Thomson, C.J., Power, E., Ruebsamen-Waigmann, H., Labischinski, H., 2004. Antibacterial research and development in the 21st Century—an industry perspective of the challenges. *Curr. Opin. Microbiol.* 7 (5), 445–450.



**IMPACT OF MIGRATION ON THE SUGARCANE CUTTER
LABOURERS IN MAHARASHTRA**

Supriya Chandrakant Gaikwad

Assistant Professor Department of Commerce Savitribai Phule Mahila Mahavidyalaya,
Satara

Corresponding Author- Supriya Chandrakant Gaikwad

Email:- supriya.gaikwad1992@gmail.com

DOI- 10.5281/zenodo.7295593

Abstract:

Maharashtra is the second largest sugar producing state of India after Uttar Pradesh and is known for its high efficiency. The sector relies on informal workers, migrating from drought-prone Marathwada region, working as cane-cutters. Living and working conditions of these workers are exploitative, which keep them in a circle of poverty and indebtedness. Women and children face the hardest brunt of these exploitative conditions with basic rights and dignity denied. This paper is an attempt to highlight the impact of migration on the sugarcane cutter labourers in Maharashtra.

Keywords: Migration, indebtedness, sowing, hysterectomy, uterus, Menstruation.

Introduction:

The term migration means movement of an individual, a family, a group or a community from one place to another. Harvesting sugarcane is a labour-intensive process. Sowing of sugarcane in Maharashtra begins with the onset of monsoons in July or August, followed by harvesting that happens the following next year between October and March. Western Maharashtra region is politically dominant and developed in terms of irrigational facilities, loan availability, and other basic infrastructure in comparison to Vidarbha and Marathwada regions. The result is that every year lakhs of people from these drought-prone regions in Marathwada are forced to migrate to Western and Northern Maharashtra for their survival and further development. Sugarcane cutters usually migrate in families and are recruited by a contractor against an advance payment. The contractor provides very basic accommodation without proper sanitation. Access to fuel and drinking water are difficult and this increases the work burden on women. While the earnings from such work are good compared to work in the village, the working and living conditions are so poor that they have been named as one of the most exploited labour groups in India by researchers such as Jan Breman who

famously said that even dogs are better off (Breman 1990). But the most serious cost of such migration is that their children. Every year, beginning around Diwali (November), families move to the sugarcane farming areas and stay there for six months, and after the sugarcane cutting season is over, they return back to their native villages in late April or May. This circular migration of labourers consists of families and children, resulting in discontinuity in scholastic achievement for the children and health hazards, which have an impact on the child's overall development. The government of India has implemented strategic Five Years Plan for the development of agriculture. Today, Indian agriculture has achieved a milestone in the economy of the nation therefore, it is recognized as the backbone of Indian economy. Two-third of India's population is still dependent on agriculture. The nature of Indian agriculture has become commercial now a day. Farmers in India are taking cash crops like sugarcane, tobacco, banana etc. in the farm. Agriculture has more importance in term of industrial perspective. The growth and development of industries especially agro-industries are dependent on the agricultural sector. Agro-industry means is an industry engaged in processing, preservation and, preparation of agricultural

production for intermediate and final consumption. Generally agro-industries are located in rural areas due to the heavy and perishable natures of raw material. Sugar industry is one of the most important agro-based industries in India and is highly responsible for creating a significant impact on the rural economy and agricultural landscape. Sugar industry ranks second amongst the major agro-based industries in India. The Indian sugar industry is growth-centre of rural transformation in rural India.

Literature review: Chaudhari, M. and Jaggi, R. (2020) study the Documenting Migrant Lives of Sugarcane Harvesting Labourers in Maharashtra—Autoethnographic Reflections. It studies their ethnographic exploration on migrant labourer's challenges.

Objectives of research:

- To find out the reasons of migration.
- To find out the impact of migration on children.
- To find out the impact of migration on women.

Research Methodology: The main source of data is secondary. Secondary sources include government and non-government reports, magazines, newspaper clippings, thesis from shodhganga etc.

Data Collection and Main Body:

Reasons for migration:

- It is true that there is no single reason for migration as the study also reveals variety and combinations of reasons for migration.
- The present research attests that indebtedness, economic hardship, unemployment and backwardness at source forces migration.
- At source the migrants' income-expenditure balance shows a high inclination towards indebtedness which naturally constitutes a reason for migration.
- The important reasons for migration as stated by the migrants are: unemployment - reported by 33 %, lack of water for agriculture- reported by 13 %, or landlessness- reported by 5 %, not enough land- 3 % and inability to repay loans/settle advance reported by 1 % while the rest migrants have given combinations of these reasons for migration.

- Drought conditions and work unavailability at their native places were the main reasons to migrate towards the sugar belt.

Impact of Migration on Children:

During the post monsoon period, every year children in the age group 0-18 years migrate with their parents to sugarcane farms. Adult migrant labourers (i.e., the parents of these children) take monetary advances from Mukadams to work at the sugarcane farms during the lean season on a piece rate. The whole family is involved in harvesting as the process involves typical optimizing behaviour which implies: higher the production, higher the earning.

The head of the families employ all available hands, including children, in order to increase production. The children work along with their parents, but remain invisible on the muster rolls, and thus remain unaccounted for. These children have little opportunity to enjoy their childhood and become child labourers.

Migration of children to work in sugarcane harvesting activities is basically an economic decision. Children are forced into migration for an increase in production and higher family earnings. Questions were put to the children regarding the major factors responsible for their migration.

Education Children working in sugarcane farms are at a higher risk of becoming school dropouts.

Due to forced migration, children enrolled in school can attend school for only six months in a year, resulting in discontinuation in scholastic attainment, and eventually exclusion from the formal educational system.

Distribution of children in school at the place of origin, and also at the place of work, i.e., destination, is given in More than 50 percent children did not go to school at the place of origin. The situation is even grimmer at the destination - only 10 children are found to be in school.

When access to education is considered as a basic human right, the situation indicates a violation of child rights, even at their place of origin.

Occasionally, if the grandparents are unable to take care of the grandchildren in the village, workers take their children along with them. The safety and security of girl

children is a concern both at home and at the worksite. This has led to a very high rate of early child marriages in the community.

Children of migrant cane cutters are among the most excluded from and deprived of their Right to Education.

Children of migrant cane-cutting workers are unable to restart school after returning to their villages after migration season due to non-attendance and discontinuation of studies for six months; this results in dropouts.

Impact of Migration on Women:

Female labour participation rate in the sugarcane farms of Maharashtra is high owing to the Jodi practice of hiring worker couples. However, it makes it difficult for women without a male member in the family to find employment.

Wage payments are calculated and paid as a couple rather than individual workers. Wages for the Jodi are usually paid to the male member thereby diminishing women's control over finances and also reducing women's agency as a worker.

Childcare and care work responsibilities are borne by women or adolescent girls. Nursing mothers carry their children to the sugarcane farms in the absence of any crèche or Aanganwadi facilities.

Safety concerns lead to young girls migrating with parents to work and help with care-work. This leads to a higher dropout of girls from schools.

Domestic violence, gender-based violence, and verbal, physical, and sexual abuse is also common. Alcoholism and multiple sexual partners for men is also common adding to family conflict and violence.

Inter-generational abuse, exploitation and vulnerability of women and girls without agency and control over finance or property rights has led to a societal bias against girls.

Living Conditions on Reaching their Destination:

workers live in large colonies of Self-constructed makeshift tents. tents made of tarpaulin sheets. The tents are small and inadequate to give complete shelter.

These workers' colonies do not have water, electricity supply or toilets.

Women and girls have to fetch water from a public water supply for the entire family, and have no option but to bathe in the open.

Workers usually wake up between 3-4 a.m. Women get up earlier to get ready for work before sunrise (in the absence of toilets) and to prepare meals for the family before leaving for the work.

Children of workers are often engaged in activities such as weeding, collecting firewood and tying of sugarcane tops into bundles to sell.

Adolescent girls have additional duties such as fetching water, and looking after their younger siblings and cattle.

Women removed their uterus only after getting involved in the sugarcane cutting and achieving their expected family size by giving birth to children.

Work During Menstruation Women carry loads of sugarcane and walk on the slippery trash of sugarcane towards the parked vehicle even during their menstrual cycle. There is no exemption from work during the menstrual cycle even if they face pain, so they have to bear the pain and work.

Most women use cotton clothes as their pad material, repeatedly. Because of those clothes, women get wounds between the thighs.

the reasons like no money, fear of getting less salary, and unawareness about health service availability at the destination were the reasons for not accessing the health services. A vital fact is that neither the authorities of sugar factories nor the public health services have recognized the unique health needs of these workers. Nobody is to take responsibility or provide health services to workers.

Conclusion: As education is the only hope for further generations of migrant workers, satisfactory arrangements for the education of the migrants' children must be made.

The living and working conditions of the cane harvesting labourers are harsher than imagination. Woman, child and old labourers are exploited to the fullest inhuman possibilities. Women possibly decide to remove their uterus because of deplorable working conditions and subsequent unbearable pain during the menstrual cycle. However, women's reach to the level of that decision is the result of the deplorable nature of work. Additionally, the sugar industries or authorities ignore the presence of women in such risky work and their particular needs after the migration.

References:

1. Chaudhari, M., Jaggi, R. (2020) Documenting Migrant Lives of Sugarcane Harvesting Labourers in Maharashtra–Autoethnographic Reflections. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, Volume 12.
2. *OXFAM (2020)* Human cost of sugar: Living and working conditions of migrant cane cutters in Maharashtra. OXFAM India Discussion Paper. Retrieved from https://www.oxfamindia.org/sites/default/files/2020/02/%23Human%20Cost%20of%20Sugar_Maharashtra%20Case.pdf
3. Bansode, P. Seasonal Rural Migration: Quality of Life at Destination and Source. Gokhale Institute of Politics and Economics.
4. Shinde, S., Rakshase, B. (2022) Gatha Cognition. Insights on the Practice of Hysterectomy among the Women Sugarcane Cutters in Maharashtra (India). *Feminist Research*.



**AUTOMATION IN ESTIMATION OF LAND SURFACE
TEMPERATURE BASED ON LANDSAT SATELLITES IN THE UPPER
MUTHA BASIN, PUNE DISTRICT**

Kishor R. Sonawane¹ Jyotiram C. More²

¹(Research Student) Post-graduate Research Centre in Geography, Agasti Arts, Commerce and Dadasaheb Rupwate Science College, Akole-422601, Ahmednagar, Maharashtra, India

² (Research Guide) Research Guide, Head, Department of Geography, B. J. S. College, Wagholi-412207, Pune, Maharashtra, India

Corresponding Author- Kishor R. Sonawane

Email:- sonawanek86@gmail.com

DOI- 10.5281/zenodo.7295595

Abstract:

Land Surface Temperature (LST) is a unique method to analyze change in worldwide temperature, estimate urban heat balance, forest suitability, monitoring glaciers, etc. Landsat satellite has capabilities to collect thermal energy data from Thermal Infrared Sensors (TIRS). This sensor device collecting thermal radiation data of Earth Surface through different satellite sensor and bands i.e., Landsat-7 Enhanced Thematic Mapper Plus ETM+ (Band-06) and Landsat-8 Optical Land Imager OLI & TIRS (Band-10 and Band-11). Basic need of geospatial analysis urge automation in routine research methodologies. Automation in geospatial technologies adding values like reduction in throughput time and improve yield in decision making processes. Feature Manipulation Engine (FME) platform has capabilities to automate the processes through the combination of Artificial Intelligence (AI) and Machine Learning (ML). Integration of different transformers together has performed LST estimations on Landsat-7 and Landsat-8 satellites. The result has shown the output were surfaces like rocky land, barren land, and settlement, etc. has maximum reflection with high temperature in the study area.

Keywords: Land surface temperature, Landsat, FMEWB, AL & ML, Automation

Introduction:

Earth surface temperature mapping through satellite data has major advantages to understand the change in planetary near surface atmosphere. Present day LST Yuan & Bauer (2007), is one of the major components of remote sensing technologies to measure and uncover surface temperature. Surface temperature data has utilized in decision making in the earth sciences, environmental studies and ecosystems. Different studies like change in worldwide temperature, estimate urban heat balance, forest suitability, monitoring glaciers, agricultural activities, and hydrological impact monitoring, etc. depending upon the Geographical Information System (GIS) methodologies Kale N. and More J. (2015), Sonawane K. and Bhagat V. (2017). Estimations of surface temperature using

remote sensing satellite images has increased due to accuracy and holistic view since as an emphasizing factor which controlling biological, physical and chemical processes on the earth. The present study has uncovered the feasibilities to automate the LST estimations using FME algorithms. An estimations of surface temperature had studied by many researchers in variety of studies. In this study LST has estimated for upper Mutha basin in Pune district, Maharashtra state, India. The Split Window (SW) algorithm has integrated in FME and automated using satellite band-3 (RED), band-4 Near Infrared (NIR), band-6 (TIR) from Landsat-7 ETM+ and Satellite band-4 (RED), Band-5 Near Infrared (NIR), Band-10 & Band-11 (TIR) from Landsat-8 OLI & TIRS respectively for the LST estimations Bhagat & Sonawane (2010). Split-window algorithm

a dynamic mathematical tool provides the Land surface temperature (LST) information using brightness temperature of thermal bands of TIRS sensor.

Study Area:

The current study is executed in the study area Upper Mutha basin of Pune district. Upper Mutha basin situated (Figure 1) between latitude $18^{\circ} 17' 53.01''$ to $18^{\circ} 28' 45.33''$ N and longitude $73^{\circ} 25' 03.57''$ to $73^{\circ} 48' 2.98''$ E as per Survey of India (SOI) Toposheets scaled at 1:50000 i.e., 47 F/7, 47 F/11 and 47 F/15. The Total Geographical

Area (TGA) has covered 78,428.62 ha. Geographically the study area has covered with the Sahyadri mountain range at the west region, loamy soil at the middle and plain area at eastern region of the study area. Most of the area covered with the basaltic lava as a part of deccan trap. The area is irrigated/drained by Mutha river and its tributaries. Average annual rainfall is 1208.5 mm as per Indian Meteorology Department (IMD) basically characterized by hot in summer, dry and cold in winter and rainy during south west monsoon seasons.

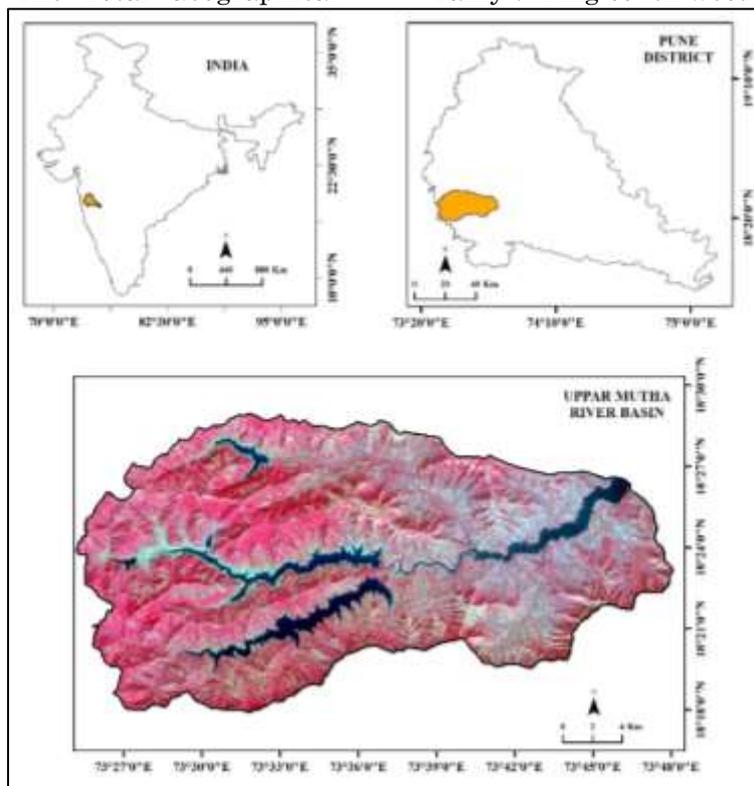


Figure 1: Location map of the study area

Data and Software used:

Landsat series data i.e., Landsat-7 ETM+ and Landsat-8 OLI & TIRS were downloaded from open source USGS website. Area of Interest (AOI) processed through ArcGIS Pro, ERDAS Imagine, and FME software. Area shape has generated in ArcGIS Pro, Raster operations such as subset, layer stack, etc. processed in ERDAS Imagine and automation through ML like define algorithms, variety of mechanism, services integration, configuration validation, etc.

has designed in the FME software. The NDVI has been calculated by using visible Band-4 (RED) and Band-5 (NIR) (Figure 2), on the other hand Band-10 and Band-11 were calculate the brightness temperature (Data acquisition date 04th Dec. 2021). The satellite images have contained metadata file which has information e.g., thermal constant K_1 and K_2 , radiance, reflection, and quantize which utilized while processing LST (Table 1, Table 2, and Table 3).

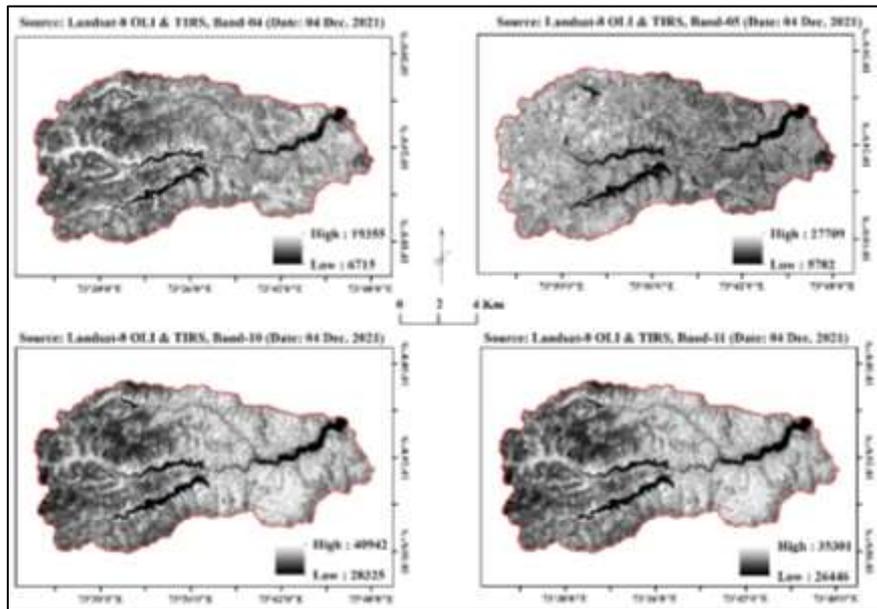


Figure 2: Landsat 8 image of band-4, band-5, band-10, and band-11

Table 1: Characteristics of Landsat-7 and Landsat-8 satellite

Satellite	Sensor	Spectral Resolution (μm)	Spatial Resolution (m)	Path & Row
Landsat-7	ETM+	Band 2: Green: 0.509 To 0.601	30 x 30	147 – 047
		Band 3: Red: 0.631 To 0.692	30 x 30	
		Band 4: Near Infrared (NIR): 0.772 To 0.898	30 x 30	
		Band 6: Thermal Infrared (TIR): 10.31 To 12.36	60 x 60	
Landsat-8	OLI	Band 3: Green: 0.533 To 0.590	30 x 30	
		Band 4: Red: 0.636 To 0.673	30 x 30	
		Band 5: Near Infrared (NIR): 0.851 To 0.879	30 x 30	
	TIRS	Band 10: Thermal Infrared (TIR): 10.60 To 11.19	60 x 60	
		Band 11: Thermal Infrared (TIR): 11.50 To 12.51	60 x 60	

Source: Landsat-7 and Landsat-8 Data User Handbook, NASA

Table 2: Statistical constants of Landsat-7 and Landsat-8 satellite

Components	Landsat-7: ETM+: Band-6	Landsat-8: OLI &TIRS: Band-10	Landsat-8: OLI &TIRS: Band-11
Radiance Multiplier (ML)	17.04	0.0003342	0.0003342
Radiance Add (AL)	0.1	0.1	0.1
K1(Thermal Constant)	666.09	774.89	480.89
K2 (Thermal Constant)	1282.71	1324.08	1201.14

Source: Landsat-7 and Landsat-8 Data User Handbook, NASA

Table 3: Emissivity values

Emissivity	Band 10	Band 11
ϵ_s	0.971	0.977
ϵ_v	0.987	0.989

Source: Sobrino et. al. (2001); Zhao et. al. (2009); Skokovic et. al. (2014)

Methodology:

The process and the methodology flow has described a high level (in brief) and low level (in detailed) algorithm of LST estimations has accomplished based on Landsat-7 ETM+

visible (Band-03 and Band-04) for NDVI and TIR (Band-06) for LST estimations and on the other hand for Landsat-8 OLI (Band-04 and Band-05) for NDVI & TIRS (Band-10 and

$$\text{Brightness Temperature} = T_B = \frac{K_2}{\ln\left(\frac{K_1}{L\lambda} + 1\right)} \dots (2)$$

where,

TB: At-satellite brightness temperature (K)

Lλ: Top of Atmospheric (TOA) spectral radiance (Watts/ (m² * srad * μm))

K₁: Band-specific thermal conversion constant from the metadata (K1_CONSTANT_BAND_x, where x is the thermal band number)

K₂: Band-specific thermal conversion constant from the metadata (K2_CONSTANT_BAND_x, where x is the thermal band number)

Step Three: Raster image estimation of Normalized Difference Vegetation Index (NDVI) using the Landsat-7 visible Band-3, Band-4 of ETM+ sensor and Landsat-8 Band-

4, Band-5 of OLI sensor individually post-processing of layer stacking of Band 2,3,4,5 using algorithm shown in equation-3 NDVI. It has range between -1 To +1.

$$NDVI = \frac{(NIR-RED)}{(NIR+RED)} \dots (3)$$

where,

NDVI: Normalized Difference Vegetation Index

NIR: Near Infrared (Band-4 of Landsat-7 & Band-5 of Landsat-8 satellite)

RED: Visible wavelength (Band-3 of Landsat-7 & Band-4 of Landsat-8 satellite)

Step Four: Landsat-7 and Landsat-8 satellite based Fractional Vegetation Cover (FVC) estimation generated from an image NDVI receive from Step-3 using the equation-4. FVC estimate the segregation of area covered by vegetation. Fig-3 demonstrate the flowchart to execute FVC.

Split-Window algorithm apply FVC to figure out Land Surface Emissivity (LSE). The calculation of LSE processed per algorithms in FMEWB using NDVI imageries which has defined soil and vegetation layers as per equation-4.

$$FVC = \frac{NDVI-NDVI(Soil)}{NDVI(Vegetation)+NDVI(Soil)} \dots (4)$$

where,

FVC: Fractional Vegetation Cover

NDVI: Normalized Difference Vegetation Index (Soil and Vegetation)

Step Five: In this stage Land Surface Emissivity (LSE) has estimated from the output of previous step four i.e., FVC layer. The algorithm and logical modelling have developed based on equation-5 Sobrino et. al. (2001); Zhao et. al. (2009); Skokovic et. al. (2014). LSE assess the underlying

characteristic of earth surface land covers. And has ability to convert thermal energy into radiant energy. LSE calculation involved emissivity of soil and vegetation of Landsat-8 TIR Band-10 and Band-11 are given in Table-3. The estimation of LSE for Band-10 and Band-11 have calculated separately.

$$LSE = \epsilon_s * (1 - FVC) + \epsilon_v * FVC \dots (5)$$

where,

ε_s: Emissivity for soil

ε_v: Emissivity for vegetation

FVC: Fractional Vegetation Cover

Step Six: In this final stage Land surface temperature (LST) has estimated and implemented in the algorithm of equation-6. LSE is a mandatory component while processing LST.

$$LST = \frac{BT}{1} + w * \left(\frac{BT}{p}\right) * \ln(e) \dots (6)$$

where,

BT: At -satellite brightness temperature

w: wavelength of emitted radiance(11.5um)

p: h*c/s(1.438*10⁻²mk)

h: Planks Constant (6.626*10³⁴ Js)

s: Boltzmann Constant (1.38×10^{-23} J/k)

c: Velocity of light (2.998×10^8 m/s)

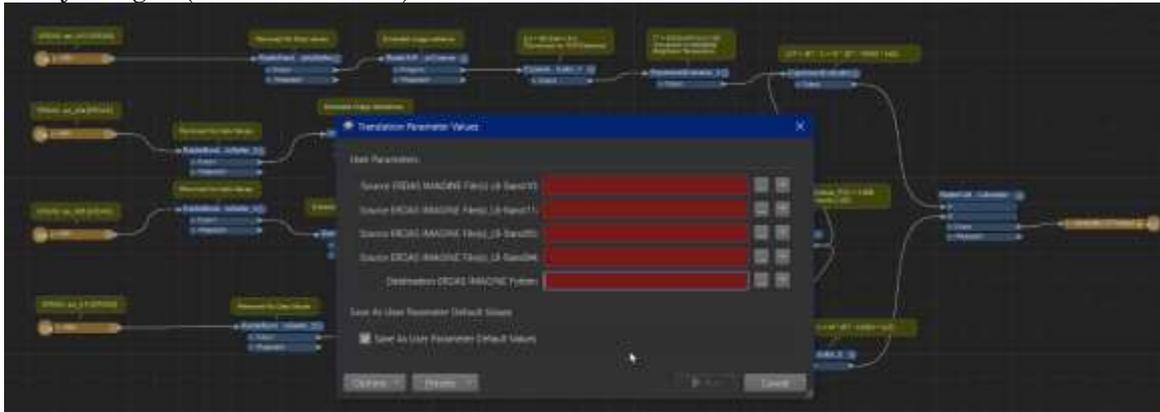


Figure 5: The configured input parameters of FME workbench

Result and Discussions: The current research has described the estimation of LST through AI and ML automation abilities and their active involvement in Geographical Information System (GIS) and Remote Sensing (RS) technologies. FME Workbench (FMEWB) automation tool (Figure 3) has designed based on the SW dynamic mathematical algorithms to estimate the LST from Landsat satellite series multispectral band i.e., Landsat-7 ETM+, Landsat-8 OLI & TIRS, and Landsat-9 OLI & TIRS, etc. The approach has divided into multiple steps to understand the methodology gradually (Figure 4 and Figure 5).

Estimation of TOA generated based on the algorithm of equation 1, where Band-6 from Landsat-7 TIR and Band-10, Band-11 from Landsat-8 used to transform TIR imageries into spectral radiance. TB has calculated in Degree Celsius ($^{\circ}\text{C}$) applying equation 2. This tool caters the LST estimation by applying integrated algorithmic equations 1 to 6 by using NIR, RED, and TIR spectral band combination with LSE components derived from the Proportional Vegetation cover (Pv). Final Land Surface Temperature (LST) of study area upper Mutha basin, district Pune (Figure 6) indicate the temperature variation from below 23.89°C minimum to above 29.59°C maximum in 04th December 2021.

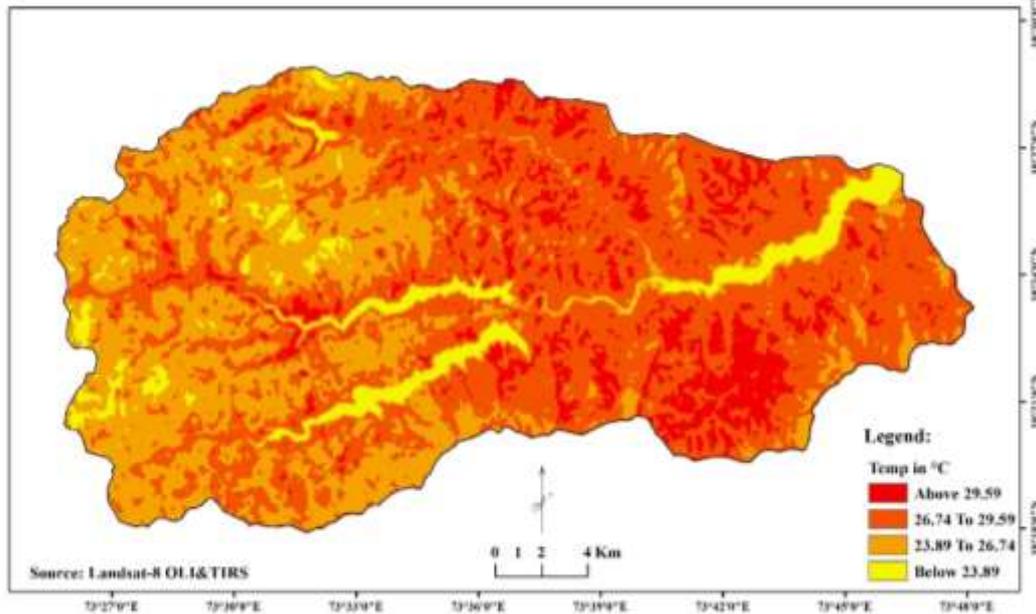


Figure 6: Land Surface Temperature upper Mutha basin

Conclusion:

SW dynamic mathematical algorithmic approach cater allows to process LST wisely

with value added details. The estimations of LST can be processed through Landsat satellite series from 7 to 9 with this new

FMEWB tool. LST widely used in worldwide temperature, estimate urban heat balance, forest suitability and sustainability, monitoring glaciers, hydrology, etc. The analyses intelligibly brought out that in western side high vegetational cover in mountainous areas (Figure 6) has low temperature as compare with eastern part. The eastern part has barren land, rocky land

in top hills and settlement where LST high. Waterbodies indicating low temperature.

Conflict of Interest: The authors declare no conflict of interest.

Acknowledgments: The anonymous authors are thanked for rigorous reviews and suggestions for better draft.

Abbreviations:

°C	Degree Celsius
AI	Artificial Intelligence
AOI	Area of Interest
DN	Digital Number
ERDAS	Earth Resource Data Analysis System
ETM+	Enhanced Thematic Mapper Plus
FME	Feature Manipulation Engine
FVC	Fractional Vegetation Cover
GIS	Geographical Information System
IMD	Indian Meteorology Department
LSE	Land Surface Emissivity
LST	Land Surface Temperature
ML	Machin Learning
NDVI	Normalized Difference Vegetation Index
NIR	Near Infrared
OLI	Optical Land Imager
PV	Proportional Vegetation
RS	Remote Sensing
SW	Split Window
TGA	Total Geographical Area
TIR	Thermal Infrared
TIRS	Thermal Infrared Sensors
TOA	Top of Atmospheric Spectral Radiance
WB	Workbench

References:

1. Bhagat V. S. and Sonawane K. R. (2010). Use of LANDSAT ETM+ Data for delineation of water bodies in hilly zones. *Journal of Hydroinformatics*. 13:661-671. <http://dx.doi.org/10.2166/hydro.2010.018>
2. Chander G. and Markham B. (2003). Revised Landsat-5 TM radiometric calibration procedures and postcalibration dynamic ranges. *IEEE Transactions on Geoscience and Remote Sensing*. 41:2674-2677.
3. Julien Y., Sobrino J. A., Mattar C., Ruescas B., Jimenez-mun J. A., Sorai G., Hidalgo V., Atitar M., Franch B. and Cuenca J. (2011). Temporal analysis of normalized difference vegetation index (NDVI) and land surface temperature (LST) parameters to detect changes in the Iberian land cover between 1981 and 2001. *International Journal of Remote Sensing*. 32:2057-2068.
4. Kale N. P. and More J. C. (2015). Hybrid Classification of Landuse Landcover in change detection of upper Ghod basin in Pune (Maharashtra) using remote sensing techniques. *Maharashtra Bhugolshastra Sanshodhan Patrika*. 32:9-16.
5. Skokovic.D, Sobrino.J.A, Jimenez-Munoz.J.C, Soria.G, Julien.Y, Mattar.C and Jordi Cristobal, "Calibration and

- Validation of Land Surface Temperature for Landsat 8 – TIRS Sensor”, Land product Validation and Evolution, ESA/ESRIN Frascati (Italy), pp 6-9, January 28-30, 2014.
6. Sobrino J.A., Reillo S., Cueca J. and Prata A. J. Algorithms for Estimating Surface Temperature from ASTER-2 Data. Remote Sensing for Agriculture, Ecosystems, and Hydrology II. <https://doi.org/10.1117/12.413933>
 7. Sonawane K. R. and Bhagat V. S. (2017). Improved Change Detection of Forests Using Landsat TM and ETM+ data. Remote Sensing of Land. 1:18-40. <http://dx.doi.org/10.21523/gcjl>
 8. Website: Landsat-7 data users handbook. <https://www.usgs.gov/media/files/landsat-7-data-users-handbook>
 9. Website: Landsat-7 data users handbook. <https://www.usgs.gov/media/files/landsat-8-data-users-handbook>
 10. Yuan F. and Bauer M. E. (2007). Comparison of impervious surface area and normalized difference vegetation index as indicators of surface urban heat island effects in Landsat imagery. Remote Sensing of Environment. 106: 375-386.
 11. Zhao S., Qin Q., Yang, Y., Yujiu X., and Guoyu Q. (2009). Comparison of two split-window methods for retrieving land surface temperature from MODIS data. Journal of Earth System Science. 118: 345-353. <https://doi.org/10.1007/s12040-009-0027-4>



Effect of Cypermethrin and Oxyfluorfen on alimentary canal of earthworm, *Eisenia foetida*

D. S. PATIL¹, P. K. BAGUL² P. A. SURYAWANSHI³ AND B. C. MORE⁴

¹Department of Zoology, NTVS's G. T. Patil Arts, Science and Commerce College, Nandurbar,

²Department of Zoology, K.A.M.P. Arts, Commerce and N.K.P. Science Sr. College, Pimpalner, India.

³Department of Zoology, NTVS's G. T. Patil Arts, Science and Commerce College, Nandurbar, India.

⁴Department of Zoology, K.A.M.P. Arts, Commerce and N.K.P. Science Sr. College, Pimpalner, India.

Corresponding Author- D. S. PATIL

Email:- patildhananjay2007@gmail.com

DOI- 10.5281/zenodo.7295599

Abstract

Agriculture is the cornerstone of our Indian economy, and the usage of pesticides is an inseparable part of this trade. Pesticidal residues does not degrade in soil, it remains in the soil and indirectly enters the gut of earthworms through their feeding. Earthworms are soil engineers feed on soil and humus. These residues have negative impact on tissues of alimentary canal. In present piece of work lower and higher sublethal doses of Cypermethrin (Insecticide) and Oxyfluorfen (Herbicide) are administered to earthworm species *E. foetida* and kept for 90 days. At the end of the experiment the animals were kept on wet filter paper to remove the dust from the alimentary canal and cut into small pieces. Permanent histological slide preparation was done. Slides were selected and histological damages were recorded. Normally the wall of alimentary canal consists of four layers i.e. peritoneum, muscular, enteric epithelium and cuticle. In control worm all the histological structures of foregut, midgut and hindgut were normal but the worms treated with Cypermethrin shown breaks in foregut. While in midgut inner cuticle shown damages, eroded epidermis. Damages are also observed in peritoneum. Accumulation of foreign bodies are seen in chloragogen cells. In hindgut several damages are seen in peritoneum, vacuolization in coelom. In the worms treated with oxyfluorfen, foregut shown unfolded cuticle. Slight injury is observed in longitudinal muscles and detached peritoneum. Similarly, the midgut and hindgut is not much affected in the treatment of oxyfluorfen. It means cypermethrin is much toxic causes histological damages. It my effect on absorption while comparatively oxyfluorfen is less toxic. Histological endpoints are very important for eco-toxicological studies.

Keywords: *Eisenia foetida*; Cypermethrin; Oxyfluorfen; histology; tissue; gut; etc.

Introduction

Increasing population growth and urbanization, especially in a developing country like India, necessitates producing more food. Food crops require fertile soil to grow. For terrestrial ecosystems, soil serves as a medium of entry to the nutrients. Continuous agricultural activities tend to decrease the soil fertility. However, the increasing application of herbicides and pesticides has also threatened the human environment and the ecosystems with

deleterious consequences. Insecticide residues reach the soil in a variety of ways, causing toxicity to beneficial organisms. Earthworm represent the greater fraction of biomass of invertebrates in the ground (>80%). They can play a variety of important roles in agro-ecosystems. Their feeding and burrowing activities incorporate organic residues and amendments into the soil, enhancing decomposition, humus formation, nutrient cycling, and soil structural development (Kladivko *et al.*, 1986).

Earthworms have a direct impact on pesticide persistence in soil by metabolising a parent compound in their gut (Gilman & Vardanis, 1974), carrying herbicides to depths in soil, or absorbing herbicide residues in their tissues (Edwards & Lofty, 1982). Apart from the role of earthworms in preparing and absorbing nutrients, the intestine is the first line of defence against chemical insults through the oral route. A major factor favouring absorption in the intestine is the presence of microvilli and in the case of earthworms the typhlosole, which increases the surface area. Histological end points are very important in toxicity study, therefore the histological damages are studied.

Effect of sub lethal concentration of monocrotophos on histology of intestine of the earthworm (*Lampito mauritii*) shown vacuolization, degenerated nuclei and damage to the lining of villi. (Kavitha *et al.*, 2011). Histology is the most important tool for determining the influence of agricultural pesticide, industrial pollutant, organic waste etc. at tissue level of an organism because it provides useful information concerned with the growth, damage and disorganizations of tissues (Kavitha *et al.*, 2008). Recently, many researchers involved in assessing the toxicity of pesticides and herbicides to earthworm mortality, growth and reproduction. A very few studies have been reported on the histopathological effects of pesticides on earthworm (Gobi *et al.*, 2005).

Material and Method

Test Chemicals: The pesticides used in the experiment were commercial grade insecticide Cypermethrin (10% EC) and herbicide Oxyfluorfen (23.5% EC).

Preparation of Stock solution: The stock solutions were prepared using the insecticide Cypermethrin (10% EC) and herbicide Oxyfluorfen (23.5% EC) separately. All the standards were prepared using distilled water.

Collection of material:

A month-old cow dung and black cotton soil were obtained from an agriculture field and a cow shed, respectively.

Test animals:

The earthworm *Eisenia foetida* was purchased from the vermicompost unit of the Government Agriculture Nursery, Tal - Sakri

(Dhule) M.S., India. They were carefully brought to the laboratory with moist soil. These worms were kept in a large container / breeding box prior to testing, as per OCED guidelines (1984).

Experimental set up:

The experiment was carried out in a plastic container with a capacity of 5 kg. A dried soil was thoroughly ground and sieved. In a trough 800 g of fine soil, 200 g dried Cow dung (CD) was completely mixed with an appropriate amount of deionized water to moisten the mixture. The set were kept for 48 hours.

Treatment:

The median lethal concentration (LC₅₀) of Cypermethrin for 7 days was falls in between 0.3 to 0.4 ml/kg while LC₅₀ for 14 days was between 0.2 to 0.3 ml/kg. Similarly, median lethal concentration (LC₅₀) for Oxyfluorfen for 7 days falls in between 0.5 to 0.6 ml/kg and for 14 days it falls between 0.4 ml/kg to 0.5 ml/kg. The graphical LC₅₀ value of cypermethrin for 14 days were 0.24 ml/kg and for oxyfluorfen it was 0.42 ml/kg.

Therefore, the sub lethal concentrations i.e. 1/4th and 3/4th doses of Cypermethrin are 0.06 and 0.18 ml/kg respectively, while the sub lethal doses (i.e. 1/4th and 3/4th) of Oxyfluorfen is 0.105 and 0.315 ml/kg respectively. The dose concentrations of both pesticides were separately added in 100 ml of distilled water that was mixed in the experimental groups only. The mixture was uniformly mixed to ensure that all contaminants were evenly distributed throughout the entire mixture. Control group was treated with an equal quantity of distilled water.

Selection and release of worms:

The adult clitellar earthworms *E. foetida* was collected by hand sorting method and worms washed with distilled water. All these worms were kept in the plastic trough on wet filter paper for 24 hours aim is to clear their alimentary canal so that the worms will get fully expose to the contaminant externally as well as internally. On the next day 20 worms were released to each trough. The experiment was performed in triplicate for each treatment and for control also. All these troughs were kept in the laboratory at room temperature for 90 days and for maintaining 70 ± 5% moisture dechlorinated water was

sprinkled at the interval of 3 to 4 days.

Preparation of permanent slides:

The control and treatment worms were removed from the trough at the end of the experiment and placed in another plastic trough with moist filter paper for 24 hours to clean their intestine. Later, the animals were cut into small pieces of the body ranging from 15 to 20 segments and were placed for 24 hours in Bouins fixative immediately. Fixation was carried out at room temperature for 24 hours, after which the tissues were transferred to 70% alcohol. The disappearance of yellow colour from the tissue was achieved after several changes of 70% alcohol. The tissues were subsequently dehydrated by passing them through ascending grades of alcohol, cleaned in xylene, cold and hot infiltration done by paraffin and finally embedded in paraffin wax (58°C M.P.) Transverse tissues sections of 6mm thickness were obtained using a rotary microtome. Harries haematoxyline and eosin were used to stain the sections, which were then dehydrated in alcohol, cleaned in xylene, and mounted in DPX. Under the microscope, the stained slides were examined. Quality pictures were acquired for the histology interpretations using a Coslab Research Microscope, STD-9, Binocular attached with camera.

Result and Conclusion

a) Control worm

Foregut- Control foregut of *Eisenia foetida* reveals normal epithelial layer, the intermediate layer of longitudinal and circular muscles and blood vessels and other chloragogenous layer. The lumen of the intestine not much harmed.

Midgut- The cuticle and the epidermis are intact. The circular and longitudinal muscles are also unaffected. The typhlosole and the nephridopore are visible.

Hindgut - The cuticle and the epidermis are intact. Villi are clearly visible.

b) Worm treated with cypermethrin

Foregut – Cuticle is observed distinct. Few breaks are seen in some places. Slight damage is observed in epidermis and lumen is clearly visible.

Midgut – Cuticle shown damage, epidermis is eroded in few places. The circular and longitudinal muscles are not much affected. The peritoneum is damaged in most of the sections. Accumulations of foreign bodies are seen in chloragogen cells.

Hindgut – Slight damage in several areas of cuticular and epidermis. Circular and longitudinal muscles have shown damage and cracks. Much damage is seen in peritoneum. Vacuolization of coelom were observed. It means cypermethrin has marked effect on the histology of alimentary canal of earthworm *Eisenia foetida*.

c) Worm treated with oxyfluorfen

Foregut: Histology of tested foregut shows untouched cuticle. Slight injury is observed in longitudinal muscles and detachment of peritoneum. The lumen of the intestine is not much harmed and with intact epithelial lining.

Midgut: The peritoneum shows the disconnection at several places. The typhlosole is clearly visible. The chloragogen cells crumble. Generally, the tissue of the oxyfluorfen individuals were not much affected.

Hind gut: Slight destruction is seen in some parts of circular muscles and longitudinal muscles. Cell debris originated due to necrotic cell rupture. The chloragogen tissue devastated weak reserve inclusion. In some places epithelial layer of villi was fused. Pyknotic nuclei were observed in epithelial layer. In short oxyfluorfen has very less effect on the histology of alimentary canal of earthworm *Eisenia foetida*.

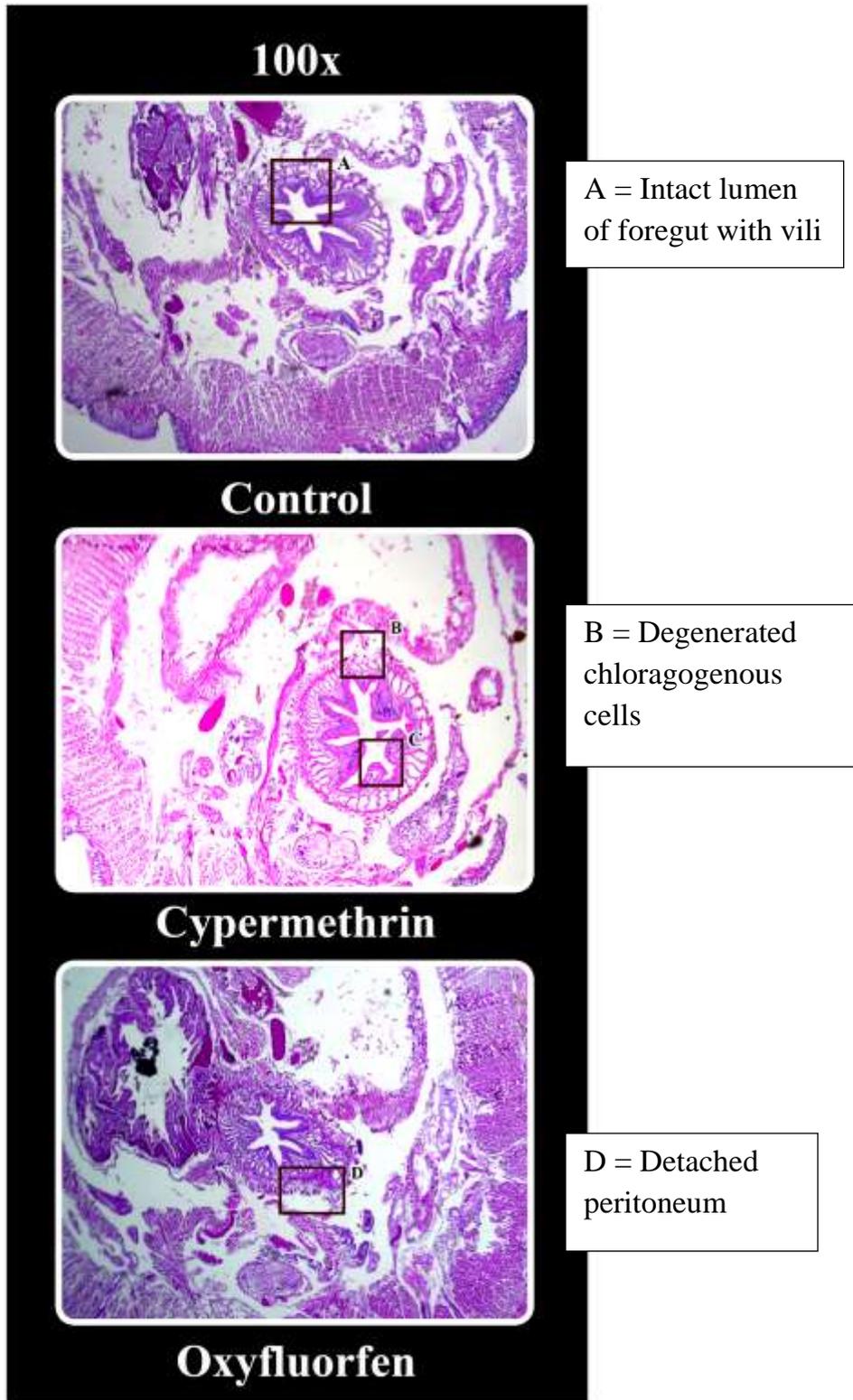


Fig 1: Histological slides of foregut of the earthworm *Eisenia foetida* (100x)

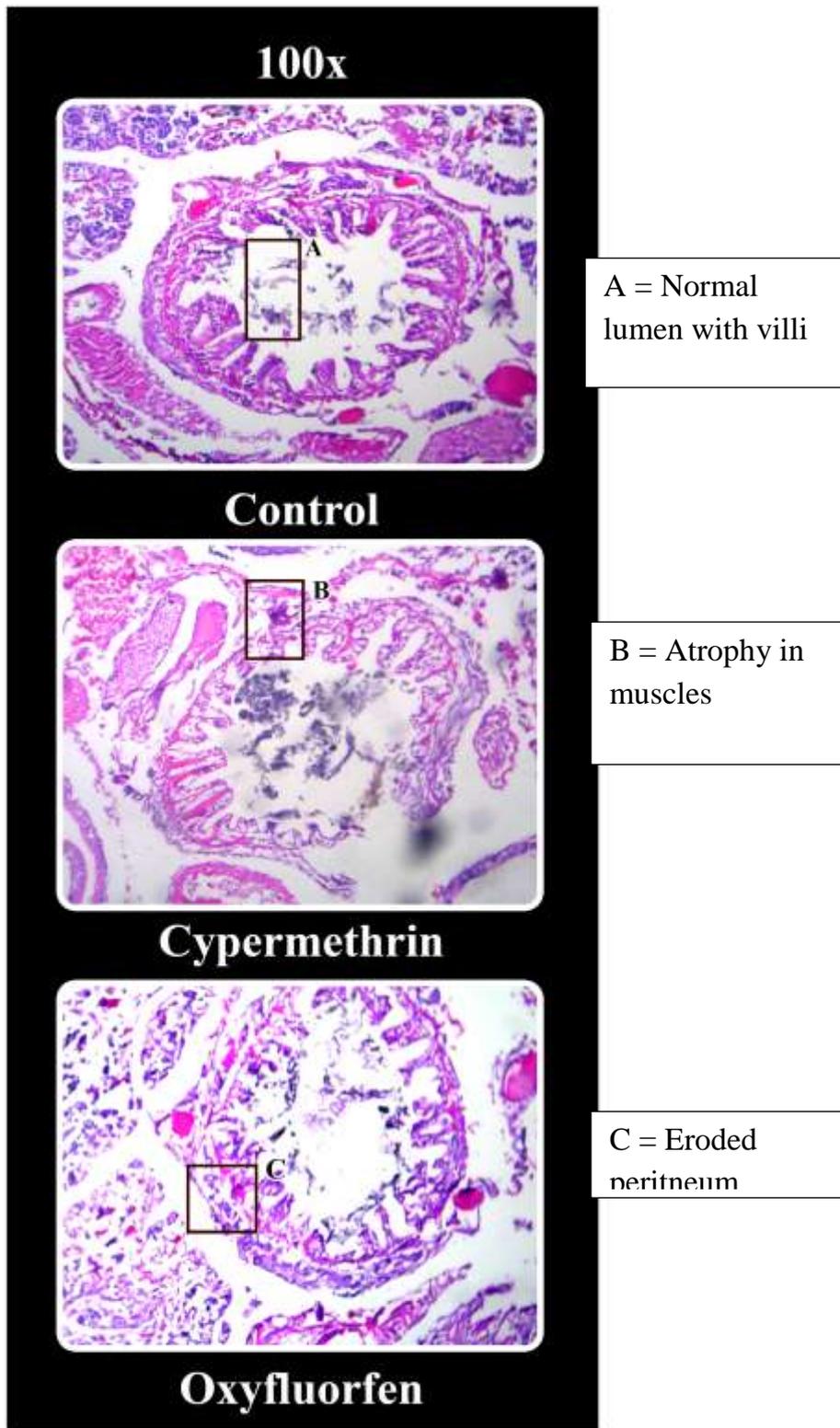


Fig 2: Histological slides of Midgut of the earthworm *Eisenia foetida* (100x)

D. S. PATIL , P. K. BAGUL P. A. SURYAWANSHI B. C. MORE

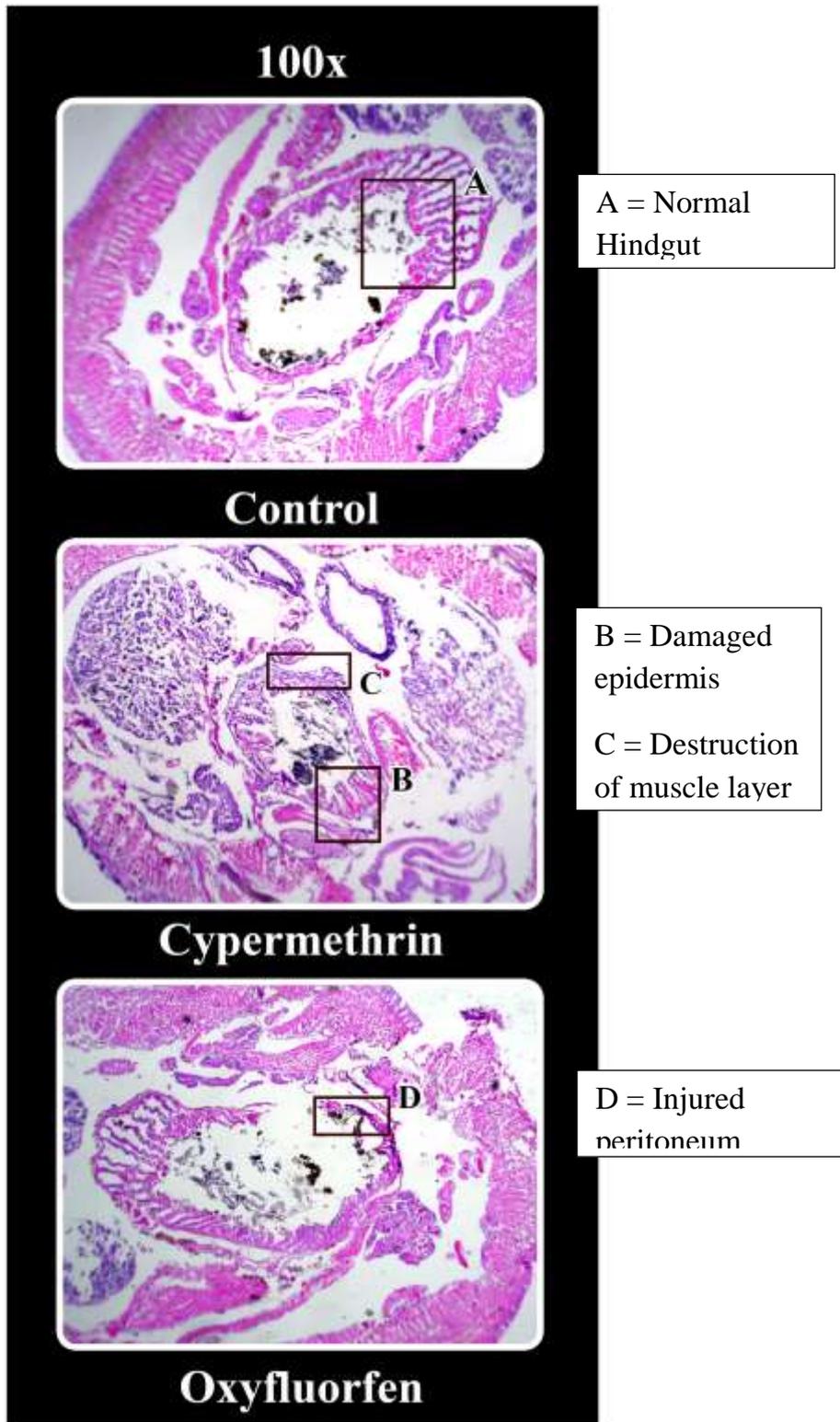


Fig 3: Histological slides of Hindgut of the earthworm *Eisenia foetida* (100x)

D. S. PATIL , P. K. BAGUL P. A. SURYAWANSHI B. C. MORE

In short, the sub lethal concentrations of insecticide and herbicide have shown more effect on soft peritoneal membrane and chloragogen cells. Similarly, insecticide Cypermethrin caused much more histological damages as compared to herbicide Oxyfluorfen.

Shaikh *et al.*, (2021) tested the effect of insecticide coragen and herbicide 2,4-D ethyl ester and noticed the marked histological changes in coragen 3/4th sublethal treatment than 2,4-D-ethyl ester. Kavitha and Anandan (2018) tested the toxic effect of Atrazine on the intestine of the earthworm *L. mauritii*. A sub-lethal concentration of Atrazine (1/5th of 96 hours LC₅₀ value-1.99 mg/kg) was applied for 30 days. The changes such as vacuolization, degenerated nuclei, damaged epithelial lining of villi and congestion of blood sinuses were observed in the intestine of 1st, 5th and 15th day of Atrazine exposure. In the 30th day of exposure, slight damages were observed. Muthukaruppan *et al.*, (2005) have reported the glandular cell enlargement in the intestine of the earthworm exposed to sub lethal toxicity of herbicide butachlor and they have further observed that changes in the intestinal region may massively affect food intake and which in turn may indirectly inhibit earthworm reproductive capacity. An extreme (2-fold) nuclear swelling has been reported in *E. foetida* exposed to herbicides under different experimental conditions (Molnar, 1992). Morowati (2000) has reported that *Pheretima elongata* exposed to a field dose of herbicide glyphosate showed loss of epithelial cell structure in intestine, lacking regeneration of the cells and total loss of chromatin from first week to the third week of exposure and a marked regeneration of the cells in the fourth week of exposure. Bangarusamy *et al.*, (2014) studied histopathological effects on earthworm *Nsukkadrilus mbae* exposed to atrazine (herbicide) shows damages to the chloragogenous layer, epithelial tissues, glandular enlargement of the epithelial tissues, prominent vacuolations and pyknotic cells. Effect of butachlor herbicide was studied by Gobi, M.,

Gunasekaran, P. (2010). In their findings, Butachlor cause damage to epithelial tissue especially fusion of intestinal villi that probably leads to the reduction of nutrient absorption area from food. Kavitha and Ramalingam (2011) has investigated the toxic effect of monocrotophos on the intestine of the earthworm *L. Mauritii*, sub lethal concentration causes damage to cells, such as vacuolization, degenerated nuclei, damaged epithelial lining of villi.

References

1. Bangarusamy, V., Karpagam, S., Martin, P. (2014). Toxicity and histopathological effect of different organic waste on the earthworm (*Eudrilus eugeniae* and *Eisenia foetida*) under laboratory conditions. International Journal of Ethnomedicine and Pharmacological Research, 2 (1): 18-22.
2. Edwards, C. and Lofty, J. (1982). The effect of direct drilling and minimal cultivation on earthworm populations. Journal of Applied Ecology, 19: 723-734.
3. Gilman, A.P. and Vardanis, A. (1974). Carbofuran. Comparative toxicity and metabolism in the worms *Lumbricus terrestris* and *Eisenia foetida*. Journal of Agricultural and Food Chemistry, 22(4): 625-628.
4. Gobi, M., Suman, J. and Ganesan, S. Vijayalakshmi, (2005). Sublethal toxicity of the herbicide butachlor on the earthworm *Perionyx sansibaricus* and its histological changes. Journal of soils and sediments, (2): 82 -86.
5. Gobi, M., Gunasekaran, P. (2010). Effect of butachlor herbicide on earthworm *Eisenia fetida* - its histological perspicuity. *Appl Environ Soil Sci*, Article ID 850758.
6. Kavitha, V., Shoba V., and Ramalingam R. (2011). Histopathological changes in the intestine of the earthworm *Lampito mauritii* (Kinberg) exposed to sublethal concentration of monocrotophos. International

- Journal of Recent Scientific Research, Vol. 2(12): 302 -305.
7. Kavitha, V. and Anandan, R. (2018). Sublethal effect of Atrazine on the intestine of an Indian earthworm *Lampito mauritii* (Kinberg) (Annelida; Oligochaeta) International Journal of Zoology and Applied Biosciences, Vol. 3(4): 322-326.
 8. Kavitha, V., Ramalingam, R. and Anandi, V., (2008). Effect of endosulfan on the bacterial and fungal populations in the gut of the Indian earthworm *Lampito mauritii* (Kinberg). J. Sci. Trans. Environ. Technov., 2(2): 78-81.
 9. Kavitha, V., Shoba, V. and Ramalingam, R. (2011). Histopathological changes in the intestine of the earthworm *Lampito mauritii* (Kingberg) exposed to sublethal concentration of Monocrotophos. International Journal of Recent Science and Research, 2(12): 302-305.
 10. Kladvko, E. J., Mackay, A. D. and Bradford, J. M. (1986). Earthworms as a Factor in the Reduction of Soil Crusting 1. Soil Science Society of America Journal, 50(1): 191-196.
 11. Molnar, L. (1992). Environmental aspects of the chloragogenous tissue of earthworms. Soil Biology and Biochemistry, 24(12): 1723-1727.
 12. Morowati, M. (2000). Histochemical and histopathological study of the intestine of the earthworm (*Pheretima elongata*) exposed to a field dose of the herbicide glyphosate. Environmentalist, 20(2): 105-111.
 13. Muthukaruppan, G.; Janardhanan, S. and Vijayalakshmi, G. (2005). Sublethal toxicity of the herbicide butachlor on the earthworm *Perionyx sansibaricus* and its Histological Changes (5 pp). Journal of Soils and Sediments, 5(2): 82-86.
 14. OECD. (1984). Organization for Economical Cooperation and Development. Guideline for Testing of Chemicals. No.207, Earthworm Acute Toxicity. Paris, France.
 15. Shaikh, H.M. More, B. C., Patel N.G. (2016). Effect of Sub Lethal Doses of Coragen and 2, 4-D ethyl Ester on Digestive Enzymes of Earthworm Species *Eudrilus eugeniae*, Kinberg 1867. IJIRSET. Vol. 5(12): 21174-21177.



**STATUS OF ACADEMIC COLLEGE LIBRARIES REGARDING
SUSTAINABLE LIBRARY SERVICE PROVISION TO ITS USERS**

Shyamkumar S. Gorde¹ and Prof. Dr. Harshal R. Nimbhorkar²

¹ Sant Gadge Baba Amravati University, Amravati

² Narayanrao Rana College, Badnera, Amravati

Corresponding Author- Shyamkumar S. Gorde

Email:- shyamgorde20@gmail.com

DOI- 10.5281/zenodo.7295601

Introduction

We all know that academic libraries are today an integral part of all the educational institutions and enjoy a significant place as far as the development of the institution is considered. The college libraries are types of academic libraries that support educational and research activities in a college setting. Thus, a college library is, therefore, the best place for the students to develop their ability to locate and utilize information, which is necessary for their academic success. Moreover, the establishment of well-equipped libraries and their closer integration with the teaching programs is of paramount significance for any college. The college library must meet the reading, the referencing and the academic needs of its users by providing appropriate and useful information materials, which is necessary to meet those needs. A well-balanced collection that is made accessible to the college teachers and the students via modern technological tools enriches the teaching programs and makes classroom work more stimulating and efficient for all. In addition to above, skilful and competent staff equipped with the latest resources is a pre-requisite for any successful academic institution. Thus, nothing can be more harmful to a developing institution than to ignore its library, as it plays a pivotal role in promoting the overall intellectual and emotional development of its users. A paradox of modern academic libraries is that, while they strive to introduce new technologies to respond to evolving user information needs, they are still mostly organized around traditional information formats. Also, presently a large part of the library building's spaces are dedicated to shelving for books, print, and digital materials. Although a major public perception survey demonstrates that books continue to be the library's brand, in order to be sustainable for longer period its periodic evaluation with respect to various attributes needs to be carried out. In the digital age, this poses a challenge for the economic sustainability of libraries, since brands are difficult and costly to change. The value and utility of the book is coming under increased scrutiny, largely due to the fact that users are trading off physical access to print books and research journals for the convenience and speed of virtual access to digital materials. Considering the trend toward digital collections and social networking services, the key concern is whether the blended model of traditional plus hybrid and a new Library 2.0 model are sustainable. In view of the above, present study was conducted to determine the status of academic college libraries in view of sustainable library service provision.

Methodology

Research Design

The present study is conducted by using a descriptive research design.

Sample Size

In the present investigation data was collected from 86 librarians working in academic colleges affiliated to Sant Gadge Baba Amravati University, Amravati.

Primary data collection

The primary data was collected using a reliable and valid short structured questionnaire and by following survey method.

Secondary Data

In this study, the secondary data was collected from different National and International Magazines, Journals, Books of the reputed authors, internet and other sources.

Statistical Analysis of Data

Analysis of the data was carried out with the help of various statistical tests. All the statistical analysis was carried out by using SPSS 18.0 Software. The descriptive statistics, such as frequency, mode,

percentage, etc were determined from the collected data.

Observations/Results

Adequacy of various library sections in view of sustainability of services

Table 1: Adequacy of various library sections in view of sustainability of services

Library Sections	Adequate		Inadequate		Don't Know		Total	
	Nos.	Per	Nos.	Per	Nos.	Per	Nos.	Per
Reading Room	24	27.9	53	61.6	9	10.5	86	100.0
Reference Section	18	20.9	61	70.9	7	8.1	86	100.0
Reprography Section	59	68.6	21	24.4	6	7.0	86	100.0
Back volume Section	62	72.1	13	15.1	11	12.8	86	100.0

Above table 1 shows opinion of the librarian about adequacy of various library sections in view of sustainability of services.

Reading Room: According to 27.9% librarians reading room have adequate services while for 61.6% librarians they are inadequate. However, 10.5% librarians are not aware about adequacy of reading room in view of sustainability of services.

Reference Section: According to 20.9% librarians reference section have adequate services while for 70.9% librarians they are inadequate. However, 8.1% librarians are not

aware about adequacy of reference section in view of sustainability of services.

Reprography Section: According to 68.6% librarians reprography section have adequate services while for 24.4% librarians they are inadequate. However, 7.0% librarians are not aware about adequacy of reprography section in view of sustainability of services.

Back volume Section: According to 72.1% librarian's back volume section has adequate services while for 15.1% librarians they are inadequate. However, 12.8% librarians are not aware about adequacy of back volume section in view of sustainability of services.

3.2 Manpower availability for sustainable service rendering

Table 2: Manpower availability for sustainable service rendering

Response	Nos.	Per
Adequate	18	20.9
Inadequate	56	65.1
Don't Know	12	14.0
Total	86	100.0

Above table 2 shows opinion of the librarian about manpower availability for sustainable service rendering. 20.9% libraries have adequate manpower available for sustainable service rendering while 65.1% libraries have

inadequate manpower availability. However, 14.0% librarians are not aware about manpower availability for sustainable service rendering.

3.3 Library computerization for sustainable service rendering

Table 3: Library computerization for sustainable service rendering

Computerization	Nos.	Per
Complete	31	36.0
Partial	51	59.3
Not done yet	4	4.7
Total	86	100.0

Above table 3 shows opinion of the librarian about library computerization for sustainable service rendering. 36.0% libraries are completely computerized for sustainable

service rendering while 59.3% libraries are partially computerized. However, 4.7% libraries are not computerized.

Equipments (computers, printers, scanners, photocopiers, etc.) availability for sustainable library service rendering

Table 4: Equipments (computers, printers, scanners, photocopiers, etc.) availability for sustainable library service rendering

Response	Nos.	Per
Adequate	11	12.8
Inadequate	70	81.4
Don't Know	5	5.8
Total	86	100.0

Above table 4 shows opinion of the librarian about availability of various equipment (computers, printers, scanners, photocopiers, etc.) for sustainable service rendering. 12.8% libraries have adequate no. of equipment's for

sustainable service rendering while 81.4% libraries do not have adequate equipment. However, 5.8% librarians are not aware about availability of various equipments.

3.5 Adequacy of collection (books, journals, thesis, research reports) for sustainable library service rendering

Table 5: Adequacy of collection (books, journals, thesis, research reports) for sustainable library service rendering

Response	Nos.	Per
Adequate	30	34.9
Inadequate	49	57.0
Don't Know	7	8.1
Total	86	100.0

Above table 5 shows opinion of the librarian about adequacy of collection (books, journals, thesis, and research reports) for sustainable library service rendering. 34.9% libraries have adequate collection for sustainable

service rendering while 57.0% libraries do not have adequate collection. However, 8.1% librarians are not aware about adequacy of collection.

3.6 Adequacy of budget for sustainable library service rendering

Table 6: Adequacy of budget for sustainable library service rendering

Response	Nos.	Per
Adequate	6	7.0
Inadequate	78	90.7
Don't Know	2	2.3
Total	86	100.0

Above table 6 shows opinion of the librarian about adequacy of budget for sustainable library service rendering. 7.0% libraries have adequate budget for sustainable service rendering while 90.7% libraries do not have adequate budget. However, 2.3% librarians are not aware about adequacy of budget.

Conclusions

Adequacy of various library sections in view of sustainability of services

On the basis of the study results it is evident that back volume sections of most of the academic college libraries are adequate in view of sustainability of services.

Manpower availability for sustainable service rendering

On the basis of the study results it is evident that most of the academic college libraries do not have adequate manpower available for sustainable service rendering.

Library computerization for sustainable service rendering

On the basis of the study results it is evident that most of the academic college libraries are partially computerized for sustainable service rendering.

Equipments (computers, printers, scanners, photocopiers, etc.) availability for sustainable library service rendering

On the basis of the study results it is evident that most of the academic college libraries do not have adequate equipment's for sustainable service rendering.

Adequacy of collection (books, journals, thesis, research reports) for sustainable library service rendering

On the basis of the study results it is evident that most of the academic college libraries do not have adequate collection for sustainable service rendering.

Adequacy of budget for sustainable library service rendering

On the basis of the study results it is evident that most of the academic college libraries do not have adequate budget for sustainable service rendering.

References

1. Bueno, D. C. (2019). Sustainability of Academic Library Services and Areas for Endless Enhancement in the Graduate School of a Higher Educational Institution, CC The Journal: A Multidisciplinary Research Review,14, pp. 1-7.
2. Hutua, S. R. (2020). Changing mode of Library functions for its sustainability, Sustainable Library, Librarian Special Seminar, 26(1/2), pp. 11-36.
3. Jankowska, M. A and Marcum, J. W. (2010). Sustainability Challenge for Academic Libraries: Planning for the Future, pp. 160-169.
4. Jones, F. P and Umoh, M. (2022). The Role of ICT In The Provision Of Library Services: A Panacea For Sustainable Development, Academic Journal of Library And Information Science, 4(1), pp. 45-56.
5. Mahmood, K., Ahmad, S., Ur Rehman, S and Ashiq, M. (2021). Evaluating Library Service Quality of College Libraries: The Perspective of a Developing Country, Sustainability, 13, p. 2989.
6. Michnik, Katarina. (2015). Public libraries digital services and sustainability issues. The Bottom Line. 28(1/2), pp. 34-43. 10.1108/BL-12-2014-0034.
7. Mohammed, B. A., Abubakar, U and Abdullahi, A. D. (2020). Library Services in the 21st Century for Sustainable National Development in Nigeria: An Overview, Jewel Journal of Librarianship, 15(2), pp. 79-87.



IMPACT OF NATYASHASTRA ON INDIAN FOLK THEATRES

Dr.Sarika Sinha¹ Akash Dahariya²

Assistant Professor, Department of Linguistics Dr. C.V. Raman University
Kota;Bilaspur(C.G)

Research Scholar Dr.C.V.Raman University Kota; Bilaspur (C.G)

Corresponding Author- Dr.Sarika Sinha

Email:- drsarika.absf@gmail.com

DOI- 10.5281/zenodo.7295605

Abstract:

Considering the world-wide spectrum and fascination of Indian Folk theatre our research is an attempt to cover the Journey of Indian Folk art from Ancient times till now. This paper is going to shed light on the multidimensional Contribution of Indian Folk art to film industry and will also highlight the contribution of Folk Theatres. Traditional Indian Folk Theatres like Yakshagana, Tamasha, Koodiyattam, and Jatra are our traditional Folk Theatres. As we belong to Chhattisgarh we will also try to cover the contribution of Chhattisgarhi Folk Theatres and Folk Culture. The paper is also a message to the forth-coming scholars and youngsters to protect their rich Dramatic Treasure by making it a carrier or by contributing in this field. As we are focusing on the extraordinary contribution of Folk art it will also attract more and more men of letters, research scholars and youngsters to come forward and preserve and exhibit our rich and cultural heritage through performing art.

Keywords: Drama, Folk art, Folk Theatres, Culture, Performing art.

Introduction:

From the ancient times till now Indian Folk art has occupied the world stage. We noticed the emergence of Indian Folk art from the ancient Rig-Vedic times. When we talk about Indian Drama and performance. According to Hindu Mythology, Natyashastra is composed by Lord Brahma. In Natyashastra Bharata Talks about the creation of Theatre (natyagriha), Patron of Theatre (sutradhara) . From the very beginning Indian Theatre Includes all the other forms of literature like Sculpture, dancing, Singing, recitation, painting, music, movement, Architecture etc. When we mix all these together then it is called 'Natyā' or 'Theatre' in English. So we can say that Indian Drama begins its classical stage in the third and fourth century B.C. Bharata Muni is called the father of Indian Theatre, He has written 36 books of the Natyashastra. From the ancient India till now many playwrights contributed a lot to Indian Drama. A well known Indian playwright Kalidas has written many Sanskrit plays at that time including Malvikagnimitra, Vikramorvasi and Abhijanashakuntalam. All these plays reflect the ancient India very well. In the olden times there were no written scripts for the actors they all perform the play verbally, singing and recitation were also used as presenting

techniques by the ancient Dramatists. When the Britishers came to India western style theatres came. In 1837 a work came entitled the persecuted, this play was written by Krishnamohan Banerjee, who is known as the first Indian Dramatist. Another play came by Michael Madhu Sudan named 'This is called civilization' in 1871. In our present paper we are trying to cover the journey of Indian Drama and folk art from Classical till modern times. We would like to like to cover the different types of Indian Dramatic Performances in different regions of India and also its influence abroad. As we belong to Chhattisgarh, we would like to speak about Folk Theatres of Chhattisgarh and its contribution to fine arts. Indian people use to enact stories from many legendary tales and epics , various scenes from Indian cultural life is beautifully presented through various short live performances, festivals of Indian fields, Folk tales etc is shown through folk theatres. Ancient Dramas also began in Folk Theatres. Folk Theatres include many elements from music, ballads, arts, religion, and culture. Folk Theatre traditions developed in India from the very ancient times, Traditional Folk Theatres presents the beliefs, practices and rituals of the time. Folk Theatres flourished in the fifteenth and sixteenth century A.D. As it continues its

journey stories of local heroes and love stories also got included in Folk art.

Our present research paper is going to highlight the contribution of Folk Theatres in preserving Indian culture. As we will proceed in this journey we will also highlight Chhattisgarhi Folk Theatres. We will speak about Gammat Theatre and Pandvani Folk Ballads of Chhattisgarh. Pandvani is the lyrical form of Theatre. Another form of Folk Theatres Naccha. It is one of the notable theatre forms of Chhattisgarh. It is performed in almost all parts of Chhattisgarh. Chhattisgarhi rural people perform this art. Four types of Naccha is famous:

Khairesaj Naccha
Gandhawa Naccha
Dewar Naccha
Baithesaj Naccha

Among all these forms of Naccha the most popular is Baithesaj Naccha. Female roles are performed by women's in Dewar Naccha. In all the other forms of Naccha all the female roles are played by men who disguise themselves as women and perform. Comedy plays a vital role in Naccha; sometimes social themes were also used to create social awareness among the people. Naccha has received Organization of the year award. It is formed by the non-resident Indians from Chhattisgarh. This is the first award for NACCHA, Which was set up in Chicago in 2017 to promote the heritage and culture of Chhattisgarh outside India. Naccha is also a form of Indian Dramatic History all these forms prevalent in India plays an important role in shaping and nurturing Indian Drama. We notice the advent of Indian English Drama in the eighteenth Century with the advent of Britishers. A social play named "The Persecuted" by Krishna Mohan Banerjee was published in 1813. Then came another Drama named "Is This Civilization". Indian Drama also flourished with some Sanskrit dramatists like Ashwaghosha who composed "Buddhacharita", it is the first Drama by Sanskrit Dramatist. Then in the fourth and fifth century we have our greatest Dramatist Kalidas, the famous plays written by him includes: "Malvikagnimitram",

"Vikramorvasiyam", and "Abhijanashakuntalam". In this Journey when we see the post-independent Dramatist we got many famous men of letters like Asif Currimbhoy, Badal Sircar, Habib Tanveer, Harindranath Chattopadhyaya, Javed Siddique, Mohan Rakesh Pratap Sharma, Rabindranath Tagore, Sharad Jhoshi, Shri

Aurobindo, Vijay Tendulkar all these great Indian Dramatists contributed a lot in the Journey of Indian Drama. Religious and secular type of Folk Theatres was very popular in India. These type of Theatres works mainly with vocal singing and dance. They express various Human sentiments by singing, dancing and through various facial expressions. The south Indian folk Theatres mainly use the Dance medium as their expression. Their Dance forms Include **Katthakali** and **Krisnattam**. In Maharashtra the Folk Art is presented Through Dialogues and it is called Tamasha. In Rajasthan this art is presented Through Songs and It is named as **Khyal**. Many other states also use song as the medium of Expression in Folk art like: **Swang** of Punjab, **Bhavai** of Gujarat, **Nautanki** of Uttarpradesh, and **Jatra** of Bengal. In India from the very ancient times Folk Theatres were the medium of communication. The village people use to learn a lot from the Folk art presented through Short Dramas. They came to know about many knowledgeable as well as entertaining things through Folk Art. In India many reformative policies were advertised through Folk art in the regional language so it is easily understood and accepted by the village people. Folk Art is very near to the Indian way of Life. In a way it the reservoir of Indian Culture. The social values are easily presented by Indian Folk art. Folk art is a way of inter-village communications from ancient times. For example if we want to know more about the Maratha Heroism we have to notice the Folk Theatre of Maharashtra. All the Indian Theatrical Styles portray the local customs and traditions of the particular region. If we closely observe **Tamasha**, we see that it is a performance full of energy. The audience plays a very vital role in Tamasha. This performance shows the victory of good over bad. Loud gestures and drumming id used to present Tamasha. At the end of the performance Aarti and Puja is done. Many Maharashtra people came to Bombay for earning their livelihood and they bring this art with them. With the passage of time this art keeps evolving. Many customs, rituals and traditions were included in this art. It beautifully presents the lifestyle and emotions of the people. And thus protects our Indian ancient Culture. The Traditional Folk Theatres have kept fresh the essence of India. This Art develops out of situations and it is the collective expression of the people. Although the whole world is running towards modernism but

Folk Theatres are still in their original form and spreads its aroma through-out the world.

References:

1. Diana, Devlin. From Mask and Scene: An Introduction to a world of Theatre. London. Macmillan, 1989.
2. Dhavan, R.K. Flowering of Indian Drama. New Delhi. Prestige Books, 2004.
3. Ghosh Manmohan. Natyashastram. Translation. ISBN-13:9789385005831, 1951.
4. Naik, M.K.Perspectives of Indian Drama In English, Madras.O.U.P, 1997.



RETIREMENT PLANNING: AWARENESS AMONG INDIVIDUALS

Ms. Sanampreet Kaur Kapoor¹ Dr. Sangeeta²

¹Research Scholar, PCJ School of Management, Maharaja Agrasen University, Baddi (Himachal Pradesh) India,

²Assistant Professor, PCJ School of Management, Maharaja Agrasen University, Baddi (Himachal Pradesh) India,

Corresponding Author- Ms. Sanampreet Kaur Kapoor¹

Email Id: sanam.maims@gmail.com

DOI- 10.5281/zenodo.7295609

Abstract

Savings for retirement is a wise course of action. Every retiree should have a variety source of income to protect themselves from retirement savings deficit. The financial requirement during retirement has been covered by three common sources, namely social security payments, workplace pension benefits and personal savings, in industrialized nations such as the U.S. The three sources were commonly compared to a three-legged stool that many financial planners called "three-legged stool model." The three sources. Saving and investments are two major macro factors that play an important part in economic growth. Savings allow individuals to cope with emergencies and to reduce peak revenues and expenses, invest in households, families and companies and support the ageing. Savings is the surplus money invested by the people in various avenues. It is the difference between income and consumption (Abdus Salam and Umma Kulsum, 2002). It can be in the form of an investment in land, gold, insurance, financial instruments etc. Savings is important for an individual, organization and the economy as a whole (Ananda Vikatan, 1999). Savings is a habit specially embodied to women (Gnana Desigan C, KalaiSelvi S, Anusuya, April 2006). Savings will help the people to safeguard themselves from any risk in the future. Savings will also help an economy to generate more funds which will help business to flourish. The main aim of this paper is to understand the level of awareness individuals, have regarding retirement planning and to study the factors that affect their retirement planning using convenience sampling method by considering 150 responses from individuals of Delhi NCR district only.

Keywords: Retirement planning, savings, investment, financial needs and risk

1. Introduction

Saving for retirement is extremely important. Everyone expects to spend happy years after retirement. Most nations have their own pension schemes and the system differentiates between public workers and private workers (Hassan et al, 2015). Only 11% of the overall Indian population have a regular pension plan. Employees in the public sector that joined before 2004 would get a monthly pension. However, there is no similar arrangement for individuals who

joined the workforce after 2004 and those who work in the private sector. There is an important necessity for pension planning in such conditions. In India, retirement plans have just become quite important among the working population, and they have never felt as important as they are now. Everyone expects to spend happy years after retirement. Retirement financial planning involves several actions to acquire wealth to meet life's demands after retirement. Pension scheduling is vital for: preparation for

unforeseen events, maintenance of good life perspectives, successive inflation, investing in top-class medical services, The future of the safe family, Keep informed and safeguard your savings in retirement programmes and perks. Not only do people, but their extended families, have the negative repercussions of insufficient preparedness for pensions. Retirement planning is the process through which pension income objectives and measures and decisions are determined for the achievement of those objectives. To ensure a secured life after retirement, it is important to have a well-designed and realistic retirement plan. In the Indian context, one cannot retire before fulfilling their household duties. Therefore, the retirement planning process in India is a holistic process covering; savings, tax and investment; debt and risk management and estate planning. In a basic way, retirement planning is the strategy to be prepared for life after paid employment, not only economically but in every element of life. Non-financial considerations are lifestyle decisions, such how to retire, where to live, when to totally stop working, etc. All these topics are covered by a comprehensive approach to pension planning. Future research could also assess if certain employees in the public sector see their defined benefits plans as a surrogate of fixed incomes and are thus prepared to assume higher investment risk with managed pension funds.

2. Review of literature

Biswajit Acharjya S., (2018) Reviewed and explained the application of these theories in various sectors and the existing financial theories such as Personal Financial Planning Theory (PFP), Family Financial Planning Theories [FFP], Life Cyclic Hypothesis(LCH) Modern Portfolio Theory (MPT) and Capital Pricing Model(CAPM), Efficient Market Hypotheses(EMH). The theories are changing in the light of the changings in investors, updating markets and evolving with financial

markets and with the entire eco-system of behaviour finance. The detailed framework of theory given by different writers is gathered in order to enhance the researchers' financial understanding in competency finance with their practical implication. Munnell, Anek, and Geoffrey (2018) have investigated the need for the employees of today to build greater savings as the retiring environment changes. A number of adjustments to current plans are required to improve the work of portability and to protect small accounts, the protection of transfers from work to IRA and leakage reduction. **Stephen and Lachlan (2018)** examined the impact of tax and transfer system on decisions associated with retirement. The study highlights the central role that housing plays in retirement planning and the importance of the tax and transfer system. The major implication of the study is the role of housing as one of the pillars of the retirement income system **Antoine, Luc, René and Bernard (2018)** Analyzes the consequences of public pension deferment and options to transform private savings efficiently into public safe inflation-indexed pensions. The study finds that giving new possibilities does not significantly help the status of pensioners if they are not used by anybody. Reforms with education will result in more public support and a deeper sense of ownership of these programmes, which in turn will help 40 play an important role in the healthy and sustainable development of the social security components of Canada. Kim, Pak and Hyun (2018) studied the link between the usage by financial planners and the establishment of a savings target for retirement by utilising data from the 2010 and 2013 Consumer Finance Survey. They discovered that households that visited a financial advisor report retirement as a reason to save. The study shows that financial advisors assist clients accomplish their long-standing financial goals by emphasizing the importance of pension planning. G. Srinivasa

Rao (2018) studied in his report the prevalence and status of Andhra Pradesh's personal financial planning profession. Qualitative information were utilized to analyses career possibilities, work characteristics, difficulties and the demand for state financial plan experts. The research found that a career in personal financial planning is full of rising market difficulties, and provides strong chances for growth in economic jobs. A review of Indian financial literacy was carried out by Naidu (2017), utilizing material gathered from several secondary sources, including online sites, journals, research papers and articles. The research showed that financial literacy in India is extremely poor and requires effort to change the literacy level. The impacts of financial literacy on financial readiness for the retirees between permanent and pensionable workers in state-run businesses in Kenya have been examined by Mourine A et al., (2017). The study revealed that financial literacy had a favorable impact on retirement financial readiness. The study indicates that financial instrument knowledge was not relevant whereas retirement computing was significant. The results showed that positive statistical relevance existed in both demographic and financial variables. Murat Cinko (2017) investigated the relationship between academic students' financial awareness and demographics in Turkey. The study showed important disparities in financial and gender literacy, faculty, classroom, revenue, accommodation. The study concludes that males have higher literacy level than females. The students who are living with their families have shown lowest level of financial knowledge and those who are living with roommate in a separate house have shown the highest literacy levels, as they have more financial challenges like paying rent, utility, etc, which is directly their responsibility than the students who live with their families as they may not be

carrying any financial obligations. **Vibhuti Shivam Dube1 (2017)** The financial literacy of Uttar Pradesh in the pre-financial inclusion situation was evaluated and Uttar Pradesh's level of financial literacy compared with other Central Zone countries The research offers an overview of key financial literacy elements in the Indian setting and the function of financial literacy through use of the secondary data. They discovered that much still has to be accomplished in India in the field of financial literacy. Financial alphabetism among all strata of the Indian people is low that is shown in many research. Serious legislative measures must be adopted in order to increase both the fundamental and the advanced level of financial literacy, so that a person may save and invest more safely in multiple market pathways. The research suggests that further efforts must be made to remove barriers in the area of financial literacy. **Yuanshan Cheng and Philip Gibson (2017)** provided empirical evidence on the use of data from the Health, Retirement and Activity Postal Survey (CAMS) to spend time in retirement. The data reveal that pensioners spend their time on average during retirement, not considerably different. Most of the tasks such as reading the paper or magazines, listening to music, playing sports or exercising, visiting others, and house cleaning are similar among retirees in different age groups. It was also demonstrated that retirees had a medical expenditure increase at the end of retirement on average. The relationships between financial literacy and obtaining financial guidance were studied by **Martin Kim, Stuart (2017)**. The research indicated that the financial literacy and the usage of financial planners for the purposes of retirement planning were favorable. Henning Cordes, Thomas Langer (2017) explores how the attractiveness of the investment and hence the delay of consumption is impacted by different kinds of inflation communication. In an experimental

investigation, the researcher utilized a unique method to experiments that imitated a decreasing conversion rate mechanism as the distinction between nominal wealth and real buying power. The investigation showed systems that are sophisticated comportamental patterns rather than undeveloped perceptions. **Thakur and Jain (2017)** studied the preferences of the individuals to achieve the retirement planning objective in India. The survey showed that Atal Pension Yojna was no choice for investing by the respondents. In his research on individual perceptions of retirement planning, Shailesh Singh et al. (2017) discovered that financial guidance impacts saving for retirement targets. The respondents were positive towards retirement planning irrespective of age, income and occupation. **Preeti, Somesh and Aruna (2016)** focused on post retirement intention to work. The study shows intention to work after retirement is increasing and is positively led by the future prospects and is affected by the relationship with the company, colleagues and passion to work.

3. Research Methodology

Primary Data

4. Data Analysis and Interpretation

1. Occupation:

OCCUPATION	NO. OF RECONDENTS(%)
SELF-EMPLOYED	27
GOVERNMENT EMPLOYEES	11
PRIVATE SERVICE	59
OTHERS	3

The data is collected from the respondents with the help of questionnaire. The questionnaire is consisting the questions related to the personal details like age, gender, occupation, qualification, income, and questions related to the respondent's financial awareness along with the preference level are included. It is focused to have the data considering the objectives of the study.

3.1 Data Collection Method

The Survey was conducted through Questionnaire – Google Form for collection of data. The respondents were approached individually as well as the questionnaire was circulated among the working individuals from different professions.

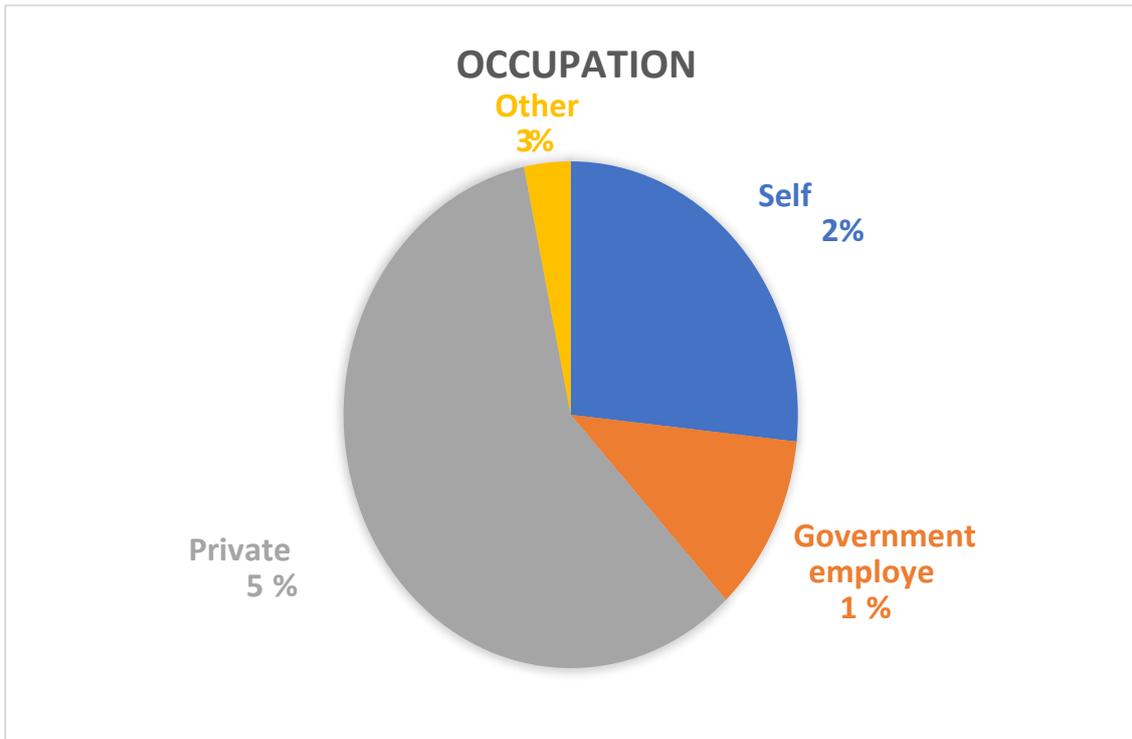
3.2 Sampling Method

In this study, we have used convenience sampling method by considering the 150 responses from individuals of Delhi NCR district only.

3.3 Objectives

The following are the objectives of this study;

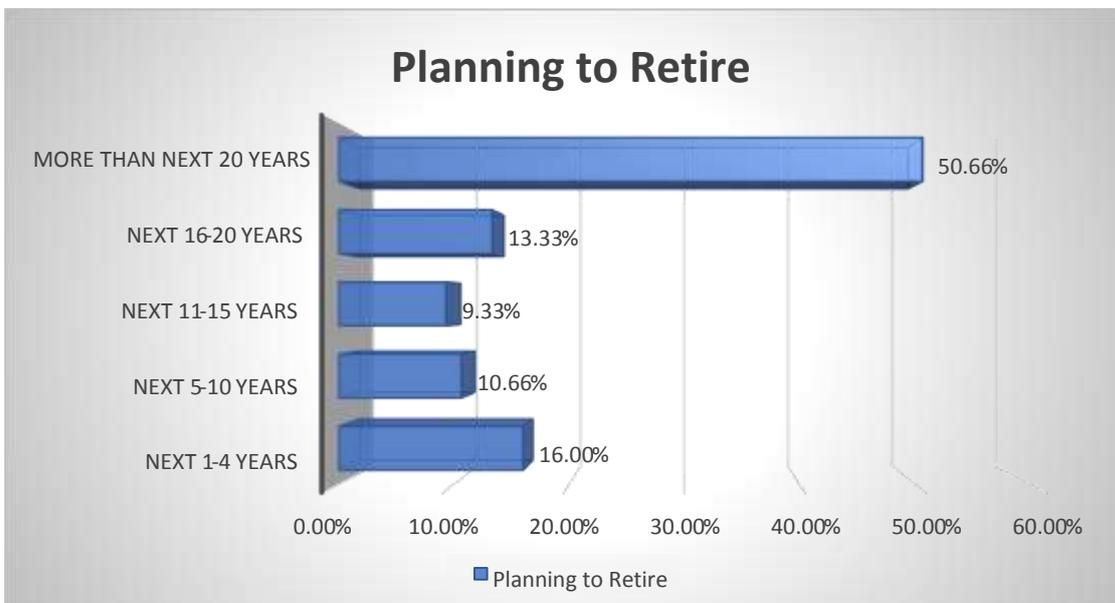
1. To understand the level of awareness individuals, have regarding retirement planning.
2. To study the factors that affect their retirement planning.



(Source: Self-Research) 150 respondents

2. What age you plan to retire?

PLAN FOR RETIREMENT(AGE)	NO. OF RECONDENTS(%)
NEXT 1-4 YEARS	16
NEXT 5-10 YEARS	10.66
NEXT 11-15 YEARS	9.33
NEXT 16-20 YEARS	13.33
MORE THAN NEXT 20 YEARS	50.66

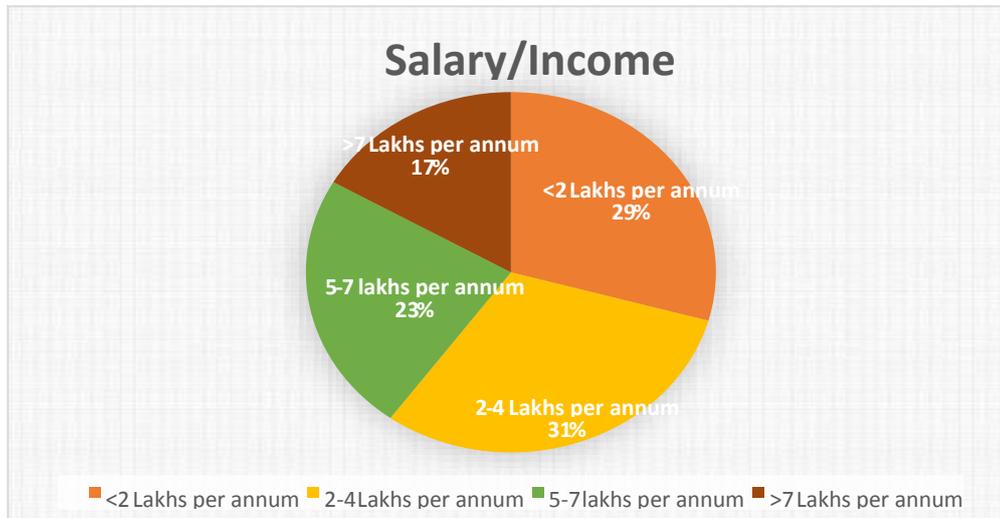


(Source: Self-Research) 150 respondents

Ms. Sanampreet Kaur Kapoor Dr. Sangeeta

3.Salary/Income:

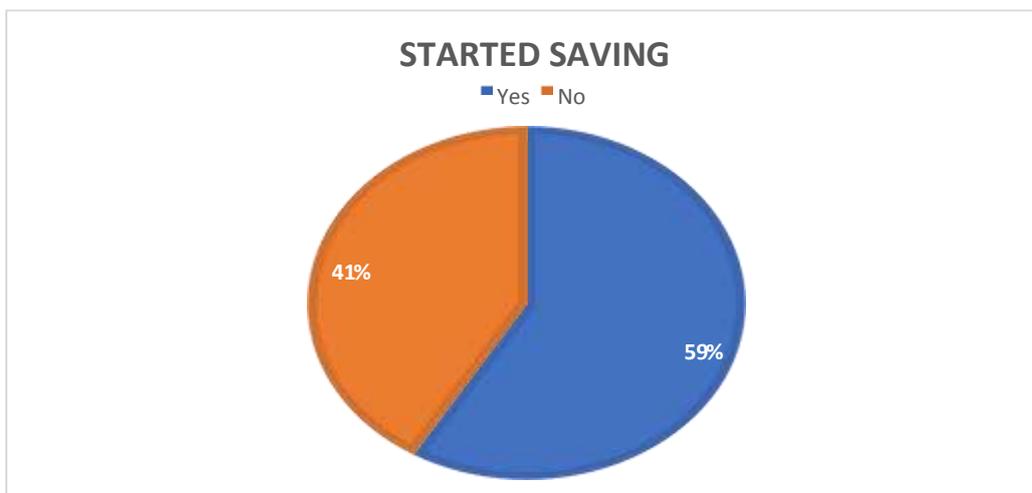
SALARY/INCOME	NO. OF REPONDENTS(%)
LESS THAN 2 LAKHS	29
2-4 LAKHS	31
5-7 LAKHS	23
>7 LAKHS	17



(Source: Self-Research) 150 respondents

4. Have you started saving for retirement?

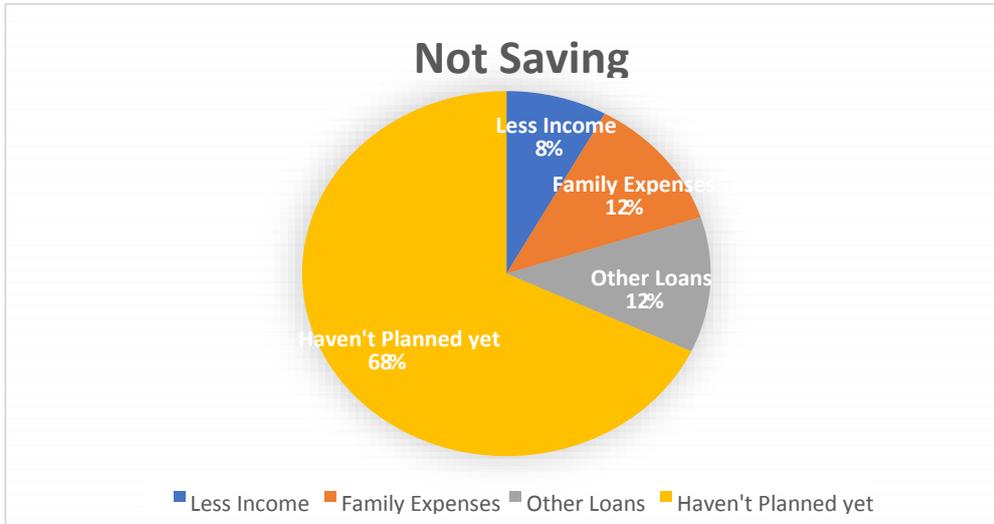
SAVING FOR RETIREMENT	NO. OF REPONDENTS(%)
YES	59
NO	41



(Source: Self-Research) 150 respondents

5. Why haven't started saving for retirement?

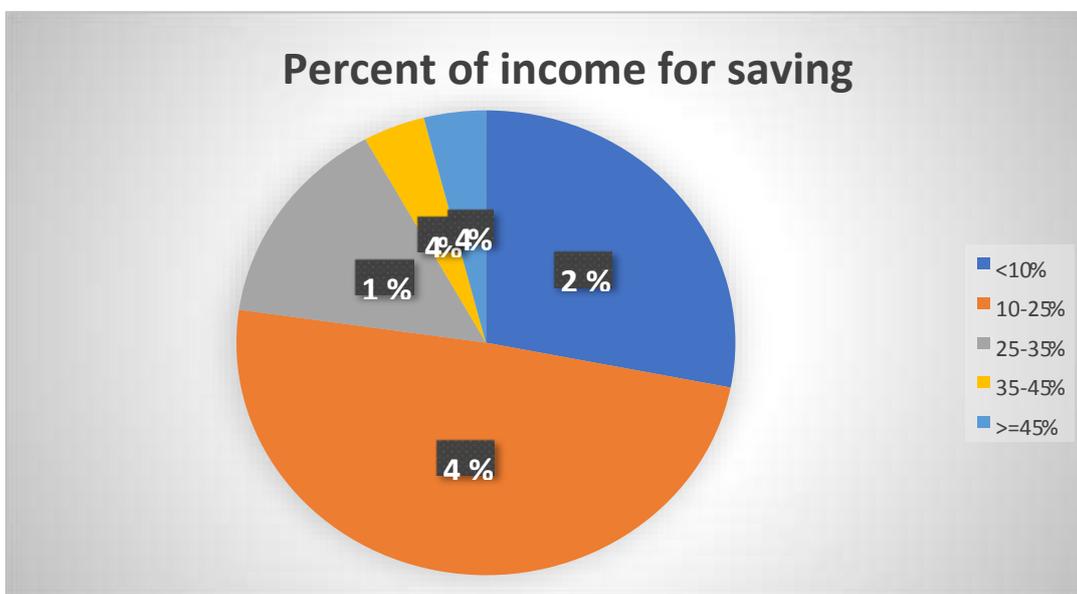
NOT STARTED SAVING FOR RETIREMET	NO. OF RECONDENTS(%)
LESS INCOME	8
FAMILY EXPENSES	12
OTHER LOANS	12
HAVEN'T PLANNED YET	68



(Source: Self-Research)

6. what percent of income you save currently as retirement saving?

%OF INCOME AS RETIREMENT SAVINGS	NO. OF RECONDENTS(%)
<10%	28
10-25%	49
25-35%	15
35-45%	4
>45%	4

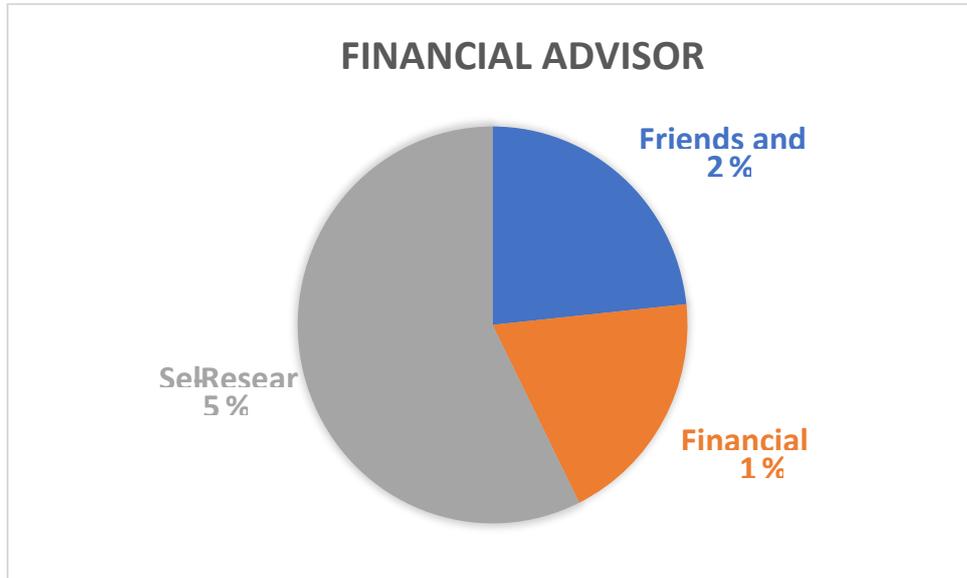


Ms. Sanampreet Kaur Kapoor Dr. Sangeeta

(Source: Self-Research)

7. Who provides you with retirement planning advice?

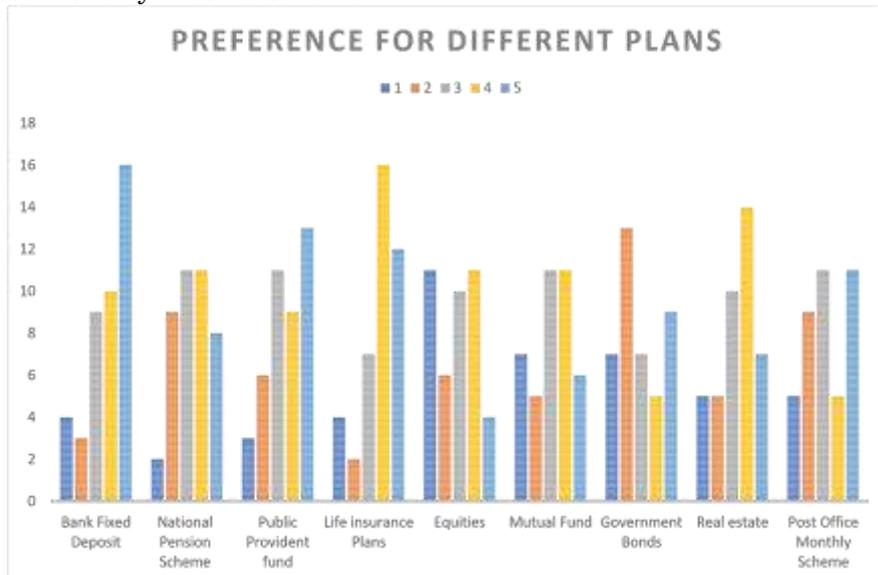
FINANCIAL ADVISOR	NO. OF RECONDENTS(%)
FRIENDS AND FAMILY	23
FINANCIAL ADVISOR	19
SELF-RESEARCH	58



(Source: Self-Research)

8. Among the following which are the different plans you are aware about and them according to your preference?

- | | |
|--------------------------------------|---------------------|
| 1. Bank fixed deposits | 6. Equities |
| 2. National pension scheme | 7. Mutual fund |
| 3. Public provident fund | 8. Government bonds |
| 4. Life insurance plans | 9. Real Estate |
| 5. Post office Monthly Income Scheme | |



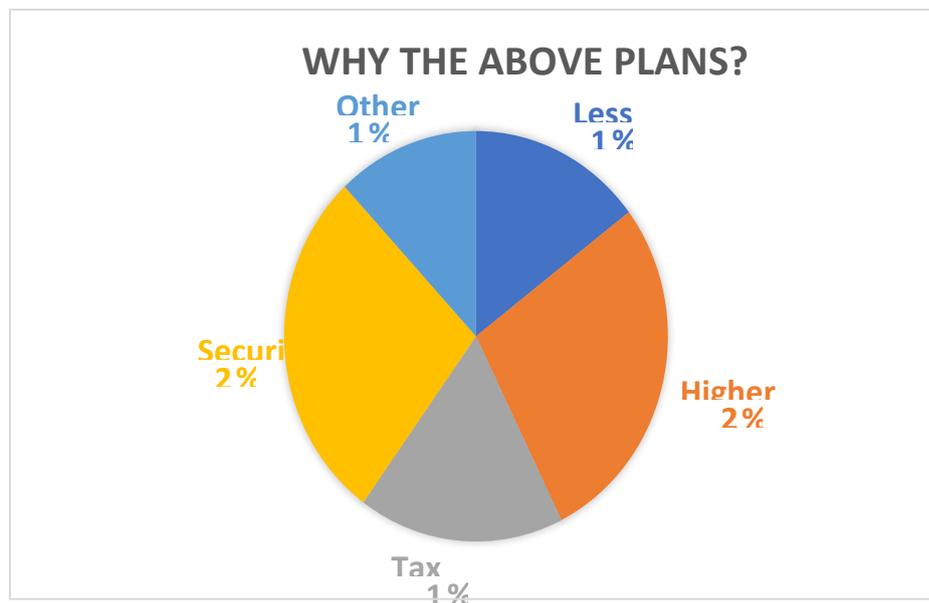
(Source: Self-Research)

Ms. Sanampreet Kaur Kapoor Dr. Sangeeta

Interpretation: Form the above listed different plans, through the data it was found that individuals mostly prefer bank fixed deposits, Monthly revenue programme for the Public Provident Fund and postal office and are well aware of this. The least preferred plans are equities and government bonds. The likely preferred or the second preference investment plans are national pension scheme, life insurance plans and real estate.

9. **Why you prefer the above plans for retirement investment?**

WHY THE ABOVE PLANS	NO. OF RECONDENTS(%)
LESS RISK	15
HIGHER RETURN	28
TAX BENEFITS	17
SECURITY	28
OTHERS	12



(Source: Self-Research)

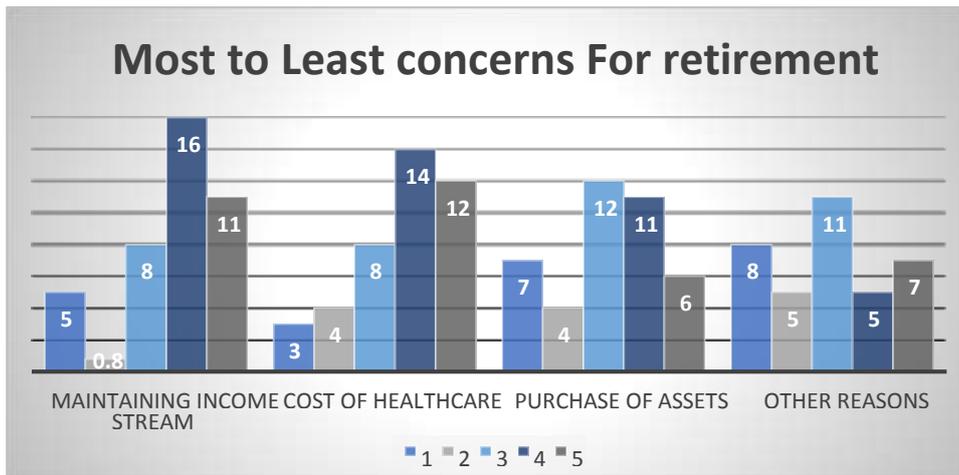
10. **Which of the following are the factors that affect your retirement planning?**



(Source: Self-Research)

Interpretation: According to the data the major factors that affect the retirement planning of individuals are Present and future needs of family and healthcare.

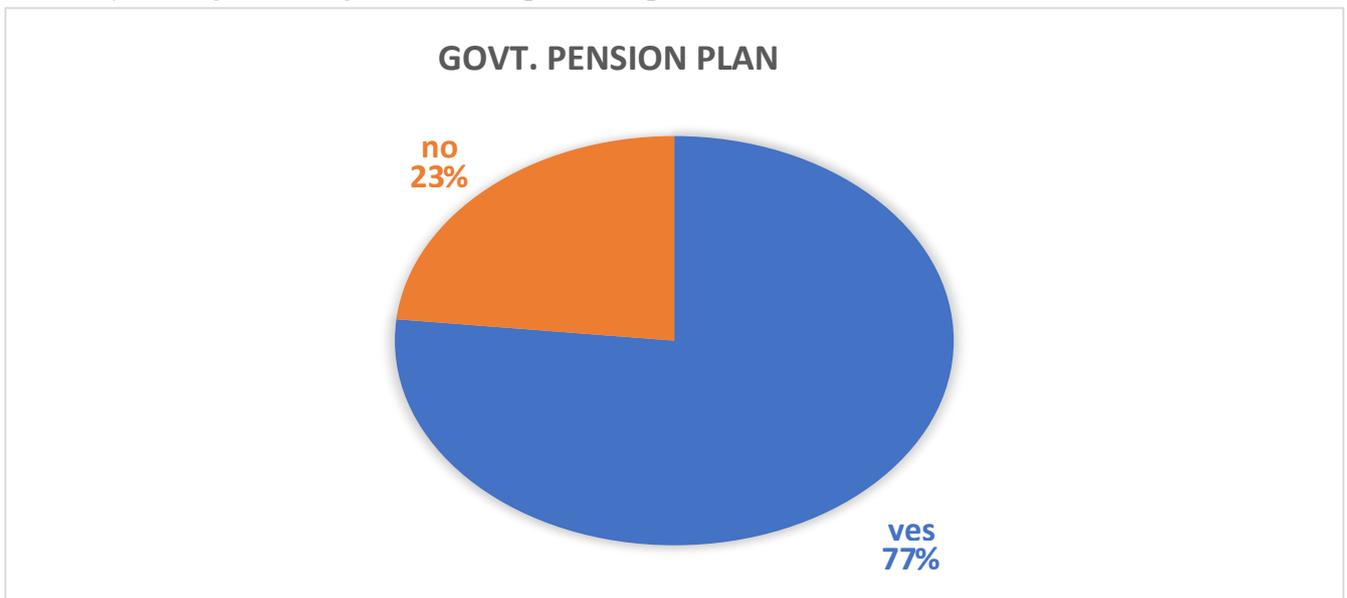
11. What is the most and least significant concerns for retirement for you from the following?



(Source: Self-Research)

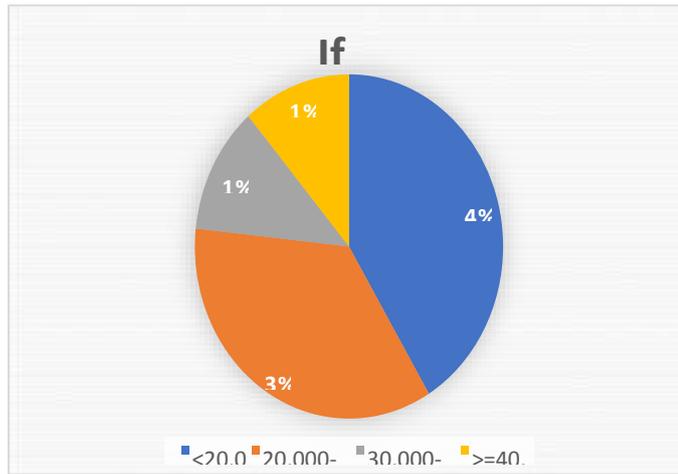
Interpretation: From the data collected it was analysed that maintaining an income stream after retirement is the major concern for the individuals to save/ invest for their retirement.

12. Are you eligible for government pension plan?



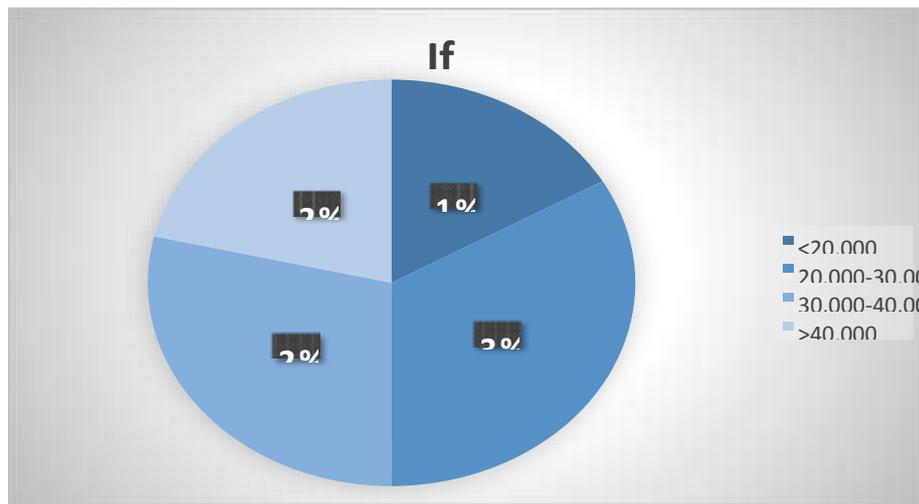
(Source: Self-Research)

13. If yes, then what will be the amount of pension you will receive after retirement monthly basis?



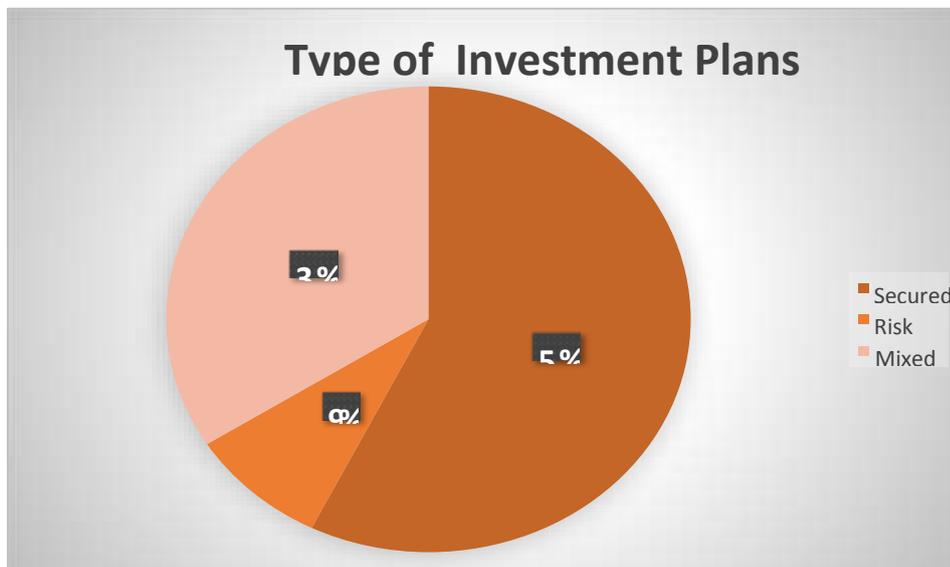
(Source: Self-Research)

14. If no, then what is the monthly income that you expect from your retirement saving plans?



(Source: Self-Research)

15. Which of the following you prefer the most to have your retirement investment in?

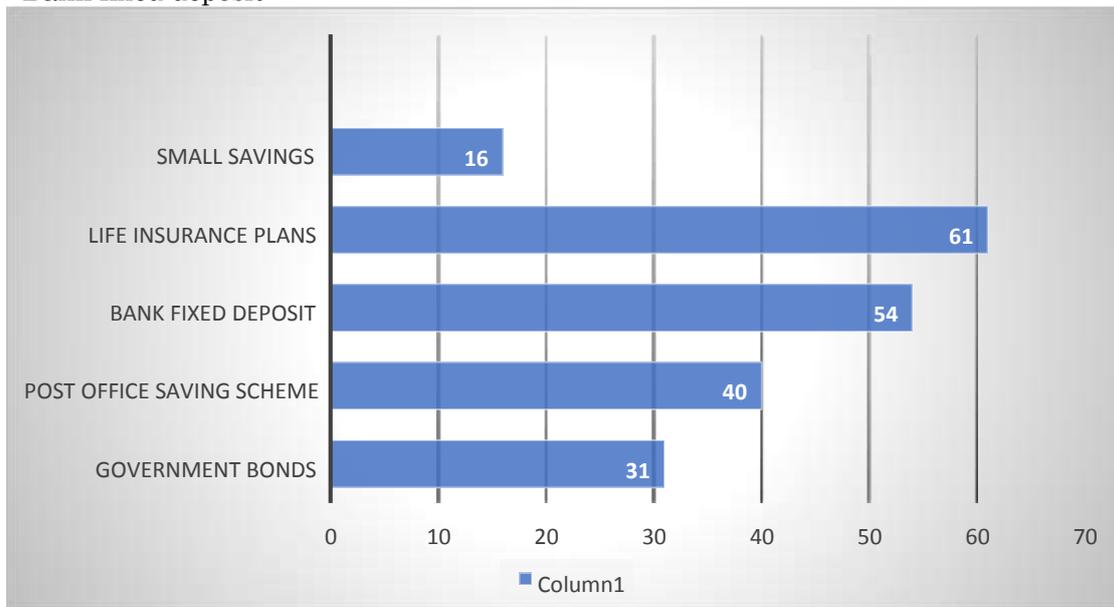


Ms. Sanampreet Kaur Kapoor Dr. Sangeeta

(Source: Self-research)

16. Which are the secured plans you prefer to have investment in?

1. Government bonds
2. Post office saving scheme
3. Bank fixed deposit
4. Life insurance plans
5. Mutual funds



(Source: Self-Research)

Interpretation: From the data that we found, it was analysed that bank fixed deposit and life insurance plans are the most preferred secured investment plans by the individuals.

Findings

1. It has been found that the individuals of 30-35 age group are more concerned about retirement planning. Apart from that as compared to females, males are more aware and plan for their retirement.

2. It has also been seen that the level of financial literacy for retirement planning varies with occupation and qualification among individuals, as individuals having private jobs i.e., 59% of the total are more involved with their retirement planning. And graduates and postgraduates are likely to focus more towards retirement as compared to others.

3. 93% of individuals prefer to save for retirement and out of that only 58% have started saving for it. While remaining i.e., 41% haven't planned yet while some of them have ongoing loans and other family expenses.

4. Out of the total 49% of individuals save 10-25% of their annual income for their retirement.

5. From the total individuals who prefer to or have started to save 57% prefer self-research for retirement planning advice.

6. It has been seen that individuals likely to invest in bank fixed deposits, The public provision fund and the postal monthly pension scheme owing to greater returns and security for their pension plan. And also prefer to invest in national pension scheme, life insurance plan, mutual funds, and real estate. While equities and government bonds are least preferred for their retirement investment plan.

7. Future and present needs of family and healthcare are the major affecting factors of the individual's retirement planning. And maintaining an income stream after retirement is the major concern for the individuals to save for their retirement.

8. During the study it was found that 77% individuals are eligible for government pension plan. And 41% individuals expect to earn <20,000 monthly basis through pension.

9. It was analyzed that 57% individuals prefer secured investment plans for their retirement, whereas 34% individuals prefer to have mixed investment plans (Risk and Secured).

Ms. Sanampreet Kaur Kapoor Dr. Sangeeta

10. Out of individuals those who prefer secured investment, 70% individuals are more likely to invest in life insurance plans and 62% to invest in bank fixed deposits.

6. Conclusion

The study reveals that awareness of retirement planning is mostly found more in male as compared to female and also individuals having private service/jobs are more involved in retirement planning. It also shows that education and occupation doesn't go hand in hand for retirement planning. That means the awareness level varies with age, education, qualification and gender, thus our null hypothesis of hypothesis 1 got rejected. The study has also concluded that there are some of the factors that affect the retirement planning of individuals such as future and present needs of family and healthcare, with this it concludes that our null hypothesis of hypothesis- 2 got accepted, which shows that there is impact of different factors affecting on retirement planning. Many of the individuals are eligible for government pension plans and those who are not they mostly prefer secured investment plans such as Bank fixed deposit, Life insurance plans, post office monthly schemes because of higher return and security as compared to other investment plans. many of them prefer to do self-research when it comes to investment plans selection. Equities and government bonds are least preferred investment plans according to the study.

References

1. Bowditch. (2005). *Study of Financial Planning among individual in select age group of 25 years to 45 years in Pune City*.
2. Douglas A. Hershey, P. ., (2000). *Psychological Determinants of Financial Preparedness for Retirement*.
3. Dr. Swati Modi, S. V. (2019). *Retirement Planning of Working Individual in Ahmedabad*. Ahmedabad: Indian journal of Applied Research .
4. Dvork, h. (2010). *Financial education and financial literacy : retirement planning*.
5. Michael Ntanlianis, V. W. (2011). *The Role of Financial Education in Retirement* . Issue 2 Special issue on Financial Planning .
6. Pant, G. (2013). *Retirement Planning of female faculty members- An expense or saving for the future*. Banasthali: Global

Journal of Management and Business Studies.

7. Parveen Kumar, D. K. (2017). *A Study of Awareness about Retirement Planning among Employees*. International Journal in management and social science .
8. Prof. Suyog chachad, D. k. (2018). *Are you making yourself retirement ready- A Study of Salaried Individual*. Pune: International Journal of Management and Social Science research review.
9. Shailesh singh Thakur, D. S. (2017). *A study on perception of individuals towards retirement planning*. Ujjain: International Journal of Applied Research .
10. Smruti Vakil, D. S. (2019). *A Study on individual's retirement planning behaviour*. Global Journal for Research Analysis.
11. Vinmalar J, D. T. (2018). *A Study on Retirement Planning of working individuals with speical reference to chennai city*. Chennai : Pacific Business Review International .



SUSTAINABLE DEVELOPMENT: A CALL FOR A CHANGE

Dr. Maneesh. B

Assistant Professor, Department of Economics, MMNSS College, Kottiyam, Kollam,
Kerala

Corresponding Author- Dr. Maneesh. B

Email:- manbpillai@gmail.com

DOI- [10.5281/zenodo.7295611](https://doi.org/10.5281/zenodo.7295611)

Abstract

Without environmental sustainability, economic stability and social cohesion cannot be achieved. Sustainable development refers to all the human developments that meet our current needs, without compromising the nature's ability to provide the resources for the future generations. India has covered 2.4 per cent of the world's land and 16 per cent of the world's population. This started creating extra pressure on the resources which are available in India. This results in severely unsustainable use of natural resources by several generations for so many years. Because of this India is experiencing rapid and widespread environmental degradation at alarming rates. To feed the massive population of the country and to meet the growing needs of it, a tremendous pressure is seen over all the resources in India, especially the land, which is overused for various socio-economic activities. In this paper, efforts are present here for various sustainability of the resources which are important for our future generation.

Key Words: Sustainable Development - Sustainable Development Goal (SDG)

Introduction

We know that development is possible only when we use the available resources around us and a man started using resources when he started settling down on the banks of rivers all over the world. Since the last few decades we cannot think of socio-economic development without the environment. So, to chart out the development of the world without the loss of an environment, in 1992 an Earth Summit (Agenda 21) was organised at Rio de Janeiro, which became a milestone event focusing the world's attention on the environmental problems faced by the entire world due to development and overuse of the resources. This agenda 21 adopted at the conference, represents a global consensus and political commitment at the highest level on socio-economic development and environmental cooperation.

The concepts of economic growth and development are closely related. From the standard of dynamic efficiency, the concept of development is subjective due to people's judgment of what a human problem is and how to explain and solve it. It is the judgment on the need to go from point A to

point B, where B is a higher state and qualitatively preferable to point A. In this sense, dynamic efficiency is a prerequisite for economic development, defined as the widening range of alternatives open to people as more and better solutions to increasingly complex human problems. The sustainability of economic development occurs due to the coordination of intertemporal preferences between the supply and demand for solutions to human problems. If economic development involves the coordination of market arrangements, there can be no unsustainable development in the real sense of the word.

Theme: Sustainable Development and various challenges faced by India to achieve it: There are many different origins and definitions of the term Sustainable Development, but the World Commission on Environment and Development's report called the Brundtland Report in 1987 stated the best and one of the most widely recognized definition, i.e., "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". As far as the main challenges to

sustainable development are concerned, they include poverty, exclusion from the main force of the society, unemployment, climate change, conflict and terrorism, building peaceful and inclusive societies, building strong institutions of governments under the guidance of the Constitution and of the Rule of Law etc.

In September 2012, political leaders of 189 member countries of the United Nations (UN) agreed to the Sustainable Development Goals (SDG) as a global plan to achieve a better future for all. Economic growth and development sustainability should address seventeen global challenges, including reducing poverty, inequality and cultivating peace and justice. The premise of the SDGs is that “poor countries are stuck in a governance crisis because they tend more to be stuck in a poverty trap”. Poor countries on their own could not generate the required capital due to the poverty trap, which inexorably condemns them to low incomes. Coactive state intervention would play a key role in bringing about the expected changes and achieving the path to higher levels of equality and prosperity.

As every nation is deeply committed to the enhancement of the living standards of its people, and actively involved with the international coalition towards sustainable development, the Summit (Agenda 21) provided India an opportunity to recommit itself to the developmental principles that have guided the nation. In India, population is a major challenge which creates many obstacles in the achievement of the sustainable development which leads to the overuse of water, land and food and create the shortages of drinking water and arable land for food production in the country. Along with the above mentioned problem, our country is also facing the problem of poverty and inequality. In India, more than 25% people of the total population are living below the poverty line. Another major challenge towards Sustainable development is social exclusion and not getting a clean and hygiene environment. This is not a good sign of sustainable development.

Some Strategies to attain the Sustainable Development:

The concept of education for sustainable development emerged to be

aware about sustainable goals on a global level. Education needs to include programs, and activities that promote sustainable development. Sustainable development goals must be integrated into education and education must be integrated into sustainable development. It promotes the integration of all issues in local and global contexts into the curriculum to prepare learners to understand and respond to the changing world. Education for sustainable development aims to achieve learning outcome that include 21st century skills which handle responsibility for the present and future generations. The learning environment itself must adapt and apply a whole-institution approach to embed the philosophy of sustainable development. Building the capacity of educators and policy support at international, regional, national and local levels helps drive changes in educational institutions. It leads to empowering Youth and local communities interacting with education institutions to become leaders in advancing sustainable development. Agenda 21 was the first international document that identified education as an essential tool for achieving sustainable development and highlighted areas of action for education. Education for sustainable development is a component of measurement in an indicator for sustainable development goal 12 (SDG) for responsible consumption and production.

Conclusion:

Sustainable development is a mission in which we are made aware of the fact so that we can save the resources and environment for our future generation. It will not be successful by imposing policies but with the awareness among the people of the country. It is clear that the development in various sectors leads to environmental degradation in which the utilisation of the resources causes the largest costs on those generations that are yet to be born. We can only improve sustainable development when each and every citizen and stakeholder will take part actively and with complete responsibility with the vision to provide everyone an economic freedom, social justice and environment protection, making our own and future generations better off than now.

References:

1. Bauer, P.T.; Yamey, B.S. *The Economics of Under-Developed Countries*; Cambridge University Press: New York, NY, USA, 1957.
2. Dang, H.A.H.; Serajuddin, U. Tracking the sustainable development goals: Emerging measurement challenges and further reflections. *World Dev.* **2020**.
3. Endres, A.M.; Harper, D.A. Carl Menger and his followers in the Austrian tradition on the nature of capital and its structure. *J. Hist. Econ. Thought* **2011**.
4. Espinosa, V.I. *Principios Modernos de Economía del Desarrollo: Teoría y Práctica*; Unión Editorial: Madrid, Spain, forthcoming.
5. Espinosa, V.I.; Carreiro, Ó.R. Old and new development economics: A reassessment of objectives. *Q. J. Austrian Econ.* **2021**.
6. Global Sustainable Development Report 2019.
7. Kulkarni, Samir Subhash and Harsha Dhule, Sustainable Development A call for A Change, in IJAAR, Volume 2, Issue – 12, May-June 2022.
8. Sustainable Development Goals in India 2030.
9. Sachs, J.D. *The End of Poverty: Economic Possibilities for Our Time*; The Penguin Press: New York, NY, USA, 2006.
10. Sachs, J.D. *The Age of Sustainable Development*; Columbia University Press: New York, NY, USA, 2015.
11. United Nations. *A New Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development: Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda*; United Nations: New York, NY, USA, 2013.



THE CONSEQUENCE OF CHEMICAL USE ON *CERASTUS*
MOUSSONIANUS HATCHABILITY

Prakash Tanaji Wankhedkar¹, Niranjan Ramesh Giri^{2*} & Shaikh Hasim
Mohammed Isak³

^{1&2}M.J.M. Arts, Commerce and Science College, Karanjali Tal. Peth Dist. Nashik

³Smt. N.N.C. College, Kusumba, Dhule- 424302

Corresponding Author- Prakash Tanaji Wankhedkar

Email:- wankhedkarpt@gmail.com

DOI- 10.5281/zenodo.7295613

Abstract

Cerastus moussonianus (Gastropoda: *Enidae*) Petit, 1851 is a land snail, found in gardens, cultivated field, compounds, road sides, underside the stones and woods etc. in Maharashtra. Its population reaches at high peak in the rainy season. They come out from the shell when environment is favorable (no matter whether it is day or night time) for the food and mating. *C. moussonianus* is known to cause severe damage to the plants, especially the vegetables in the fields and home gardens. Through regular field and laboratory observation, the mating behaviour viz. duration of mating, courtship behaviour, egg nesting behavior and oviposition were studied. The snails were supplied with fresh *Aloe vera* and *Brassica* leaves as food after every 24 hrs.

Keywords: *Cerastus moussonianus*, Imidacloprid, Cartap hydrochloride, hatchability etc.

Introduction

Cerastus moussonianus is a land snail, found in gardens, cultivated field, compounds, road sides and underside the stones and woods etc. in Maharashtra. Its population reaches at high peak in the rainy season. They come out from the shell when environment is favorable (no matter whether it is day or night time) for the food and mating. In unfavorable environment (e.g. when temperature rises) they move towards the dark region like soil crevices and underside of stones or wood where sun rays cannot reach withdrawing all their parts into the shell and remain in the same condition in summer.

Snail extends its body at the time of food searching, mating purpose and migration. When it extends fully measures about 1.5 to 2.0cm in length and nearly 0.75cm in width. It is broader in the middle and slightly tapers towards both the ends. Two pairs of retractable tentacles are present on the head. Anterior tentacles and posterior tentacles, anterior tentacles serves for smelling and posterior tentacles bear eyes. At the base broader part is present called foot. This secretes mucus while dwelling. The young snail exhibits the pale translucent color while it is dark in adult with light black spot of

mantle cavity. Shell with six whorl coils along hollow axis known as collumella. The opening is located at the frontal basal part of the head. *Monacha obstructa* (Pfeiffer, 1842) (Hygromiidae) is the most common snail species on cultivated crops and it is recorded in high population density on egyptian clover, cabbage, green beans, maize and cucumber (Shoieb, 2008). Mollusks are ecologically important and also serve as bio-indicators and they play a fundamental role in the protection of water ecosystems by recycling nutrients and existing as food for assured aquatic animals (Giri and Wankhedkar, 2022).

C. moussonianus is known to cause severe damage to the plants, especially the vegetables in the fields and home gardens. It causes extensive damage to the crop plants in India (Magare, 1991). The biochemical effect of Cartap hydrochloride and Imidacloprid on the Albumin (ALB), Alkaline phosphatase (ALP), Glucose (GLU), Total Proteins (TP) and Uric acid (UA) with the respect to toxicity and mode of action of these pesticides in the land snail *Cerastus moussonianus* was studied by Wankhedkar and Bhavsar (2015). Ecology, evolution and phylogeny, behaviour, and reproductive biology can all benefit from

understanding life strategies. Furthermore, this knowledge is necessary for defining management methods for land snail populations on the verge of extinction, as well as pest population control (Picoral and Thome, 1989). When the links between growth, reproduction, and lifespan patterns are clarified, terrestrial mollusk life history strategies may be resolved.

Few field studies have focused on apple snail population dynamics (Burky, 1974 and Lum Kong and Kenny, 1989). The majority of the studies on the longevity of terrestrial molluscs and its relationship with life history traits involve species from temperate regions (Baur and Baur, 2000; Heller, 2001; Hommay, et al., 2001 and Ocana, 2003). Reproduction is continuous in tropical areas and the duration of the reproductive period decreases with latitude to a minimum of six months in the southern limit of its natural distribution (Martin, et al., 2001). There are a finite number of resources accessible for various biological activities. As a result, tradeoffs between life history features like reproduction, growth, and lifespan must exist. Delaying reproduction by extending the time it takes to attain sexual maturity, for example, can result in greater longevity (Zera and Harshman, 2001). International concern about the Argentinean apple snail *Pomacea canaliculata* (Lamarck, 1822) rose enormously when it became established as a serious rice pest in Asia (Estebenet and Martin, 2002).

Land snail collecting can range from a form of recreation to a serious scientific effort that leads in significant contributions to scientific knowledge. Many factors potentially influence life history traits of *P. canaliculata*, but the published information allows us to discuss only the proximal effects of some of them at the organismic level (Estebenet and Martin, 2002). The aim of this study is to analyze the information on *Cerastus moussonianus* as far as the life history is concerned on which meager work has been done by the workers.

Material and Methods

Through regular field and laboratory observation, the mating behaviour viz. duration of mating, courtship behaviour, egg nesting behavior and oviposition were studied. The snails were supplied with fresh *Aloe vera* and *Brassica* leaves as food after

every 24 hrs. The unconsumed parts of the food, faecal pellets as well as the dead snails were removed regularly to maintain strict hygienic conditions. The weight and diameter of freshly laid eggs were measured with the help of an electronic balance and a centimeter scale respectively. Incubation period and hatching percentage were calculated from the emergence of juvenile snails from the eggs. The study was carried out under laboratory and natural conditions. Prevailing temperature and humidity in the laboratory were recorded. To characterize life history traits of *C. moussonianus*, we quantified for each replicate colony the pattern of survival, changes in mean animal size, the date of onset of oviposition activity and the daily reproductive output. The size of each snail was determined by measurement of shell diameter. Up to the age of 90 days shell diameters were measured at 15 day intervals. Thereafter, measurements were undertaken at 30 day intervals. The first presence of eggs in the terrarium was taken to indicate that the snails have reached sexual maturity. To record deaths, the number of oviposition events and the number and size of eggs clutches, the snails were observed daily from the first presence of eggs until death of the last individual. Growth rate was calculated as the differences in changes in shell diameter divided by number of days between the measurements. The data were expressed as mean per replicate and then averaged across the three replicates to provide parameters of life history traits applicable to groups of 30 snails. Those data were subjected to detect differences in growth of the snails during the juvenile (before the first oviposition event) and adult phases of the life cycle.

3.2.1 Collection of test animal

Adult snails of *C. moussonianus* were collected by hand picking from infested gardens, Pratap Philosophy centre, roadside area and college premises of Amalner Taluka during the rainy and winter season.

3.2.2 Preparation of terrarium

Archer (1937) gave detailed instructions for converting an aquarium or a flowerpot into a snail terrarium. Carmichael (1937) presented methods for rearing slugs, including handling instructions for their eggs and juveniles. Krull (1937) gave directions for establishing a terrarium suitable for large species, such as

Mesodon thyroidus. Sturm, et al. (2006) gave detailed information about rearing terrestrial gastropod. Grimm (1974) addressed and proposed solutions to the different challenges that snail raisers face. The obtained snails were transferred in terrarium (60×30×30cm) which is covered by sponge internally to maintain humidity and surface is covered by metal wire net for ventilation. The terrarium is filled with moist sterilized sandy loamy soil ½:1 (w:v) and fed on fresh leaves of *Aloe vera*, boiled egg pieces, chalk dust, cabbage and lettuce etc. for 14 days to be laboratory acclimatized (photoperiod 14L: 10D; temperature 27-32°C; relative humidity 90% from June to Sept.).

3.4.1 Food

Shoab, et al. (2010) used the fresh cabbage leaves as a food for *Monacha obstructa*. Omole, et al. (2011) provided the pineapple waste to *Archachatina marginata* as a food. In present study *Aloe vera* was offered to the snail and during the experiment and in culture medium chalk dust, lettuce, boiled

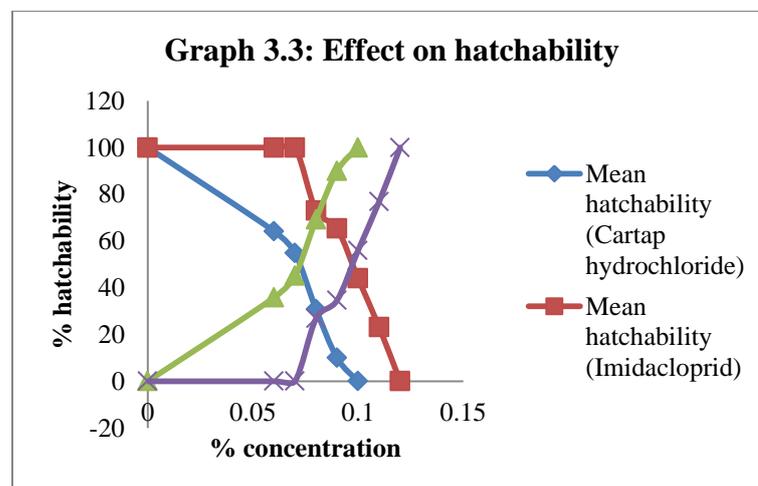
egg pieces, etc. are offered along with. The snails were treated with food diet Cartap hydrochloride concentration 0.06, 0.07, 0.08, 0.09 and 0.10% respectively and with Imidacloprid concentration 0.08, 0.09, 0.10, 0.11 and 0.12% respectively found in the previous research of Wankhedkar, et. al. (2011).

Result and Discussion

The effect on the hatchability was encountered in the eggs laid during the Treatment and % was calculated in mean±SE. Eggs hatched after 4-6 days of laying. In comparison with control 100% hatchability treated with Cartap hydrochloride, the hatchability was decreased in the snail by 35.8, 45.2, 69.2, 90 and 100% as per the concentration increases 0.06, 0.07, 0.08, 0.09 and 0.10% respectively and with Imidacloprid the food consumption was decreased in the snail by 26.8, 34.6, 56, 76.8 and 100% as per the concentration increases 0.08, 0.09, 0.10, 0.11 and 0.12% respectively (Graph 3.3) (Table 3.2).

Food treated with	Concentrations (In %)	Mean hatchability in %	Decrease in mean hatchability in %
	Control	100	00
Cartap hydrochloride	0.06	64.2±1.01	35.8
	0.07	54.8±0.96	45.2
	0.08	30.8±1.06	69.2
	0.09	10±0.70	90
	0.10	00	100
Imidacloprid	0.08	73.2±1.01	26.8
	0.09	65.4±1.28	34.6
	0.10	44±0.70	56
	0.11	23.2±0.66	76.8
	0.12	00	100

Table 3.2: Effect on hatchability



Saha and Roy (1994) stated that incubation period of eggs in *M. turgurium* ranged from 18.4 days to 22.17 days and percentages of eggs hatched were 97.10% and 99.91% under laboratory conditions (16.0-21.5°C). From the result, it is evident that the incubation periods were 14.0 to 18.4 days and percentage of eggs hatched were 94.44% to 98.66% under laboratory conditions (21.44 – 29.18°C) for *M. sequax*. Shoaib, et al., 2010 observed the effect of Nimbecidine® on the hatchability of *M. obstructa* and found that the eggs treated with highest concentration of Nimbecidine® (10 ml/l) caused 100% mortality of eggs. The mean egg production was between 20 and 50 percent at lower concentrations, based on the concentration level. Mean values of Nimbecidine® lethal concentrations LC₂₀, LC₅₀ and LC₉₀ for the eggs were 0.80 (0.50–1.28; 95% confidence interval) ml/l, 2.18 (1.71–2.78) ml/l and 10 (6.88–14.52) ml/l, respectively.

In present study the 100% mortality was recorded at 0.10% of Cartap hydrochloride and 0.12% of Imidacloprid which matches with the result of Saha and Roy, 1994 and Shoaib, et al., 2010

Reference

1. Archer, A.F., 1937. Vivarium methods for the land Mollusca of North America. In: J. G. Needham, ed., Culture Methods for Invertebrate Animals. Comstock Publishing Co., Ithaca, New York. 527-529.
2. Baur, B., Baur, A., 2000. Social facilitation affects longevity and lifetime reproductive success in a self-fertilizing land snail. *Oikos*, 88, 612–620.
3. Burky, A., 1974. Growth and biomass production of an amphibious snail, *Pomacea urceus* (Muller), from the Venezuelan Savannah, *Proc. Malac. Soc. Lond.* 41: 127-143.
4. Carmichael, E.B., 1937. Culture methods for *Limax flavus*. In: J. G. Needham, ed., Culture Methods for Invertebrate Animals. Comstock Publishing Co., Ithaca, New York. 529-531.
5. Estebenet, A.L., Martin, P.R., 2002. *Pomacea canaliculata* (Gastropoda: Ampullariidae): Life-history, traits and their plasticity. *Biocell*, 26 (1): 83-89.
6. Giri, N.R., Wankhedkar, P.T., 2022. Effect of climatic conditions on the variety of terrestrial snails (Gastropoda: Mollusca) in Maharashtra's Karanjali region. *Int. J. Adv. Multidiscip. Res.* 9(1): 68-73.
7. Grimm, F.W., 1974. Techniques for rearing land snails. In: M.K. Jacobson, ed., How to Study and Collect Shells, 4th Ed. American Malacological Union. Wrightsville Beach, North Carolina. 102-104.
8. Heller, J., 2001. Life history strategies. In: Barker, G. M. (Ed.) The biology of terrestrial molluscs. CABI Publishing, London. 413–445.
9. Hommay, G., Kienlen, J. C., Gertz, C., Hill, A., 2001. Growth and reproduction of the slug *Limaxva lentianus* Ferrusac in experimental conditions. *Journal of Molluscan Studies*, 67, 191–207.
10. Krull, W., 1937. Rearing terrestrial snails. In: J. G. Needham, ed., Culture Methods for Invertebrate Animals. Comstock Publishing Co., Ithaca, New York. 526-527.
11. Lum Kong, A., Kenny, J.S., 1989. The reproductive biology of the ampullariid snail *Pomacea urceus* (Muller). *J. Moll. Stud.* 55: 53-66.
12. Magare, S.R., 1991. Endocrine regulatios in a terrestrial snail, *Cerastus moussonianus*. Ph.D. thesis, Marathwada University, Aurangabad.
13. Martin, P.R., Estebenet, A.L., Cazzaniga, N.J., 2001. Factors affecting the distribution of *Pomacea canaliculata* (Gastropoda: Ampullariidae) along its southernmost natural limit. *Malacologia*. 43: 13-23.
14. Ocana, T.M.J., 2003. Growth, mortality and longevity in two populations of *Siphonaria pectinata* (Pulmonata) at Gibraltar. *Journal of Molluscan Studies*, 69: 162–164.
15. Omole, A.J., Ajasin, F.O., Adejuyigbe, A.D., Soetan, A., 2011. Effect of feeding snails with pineapple waste on feed consumption, growth and cost benefits. *Arch. Zootec.* 60 (229): 53-56.
16. Picoral, M., Thome, J.W., 1989. Sobre a anatomia do sistema genital de *Bradybaena similaris* (Ferussac, 1821) (Pulmonata, Stylommatophora, Bradybaenidae) ocorrentes em Porto Alegre, Estado do Rio Grande do Sul,

- Brasil. Memórias do Instituto Oswaldo Cruz, 84: 435–439.
17. Saha, T.C., Roy, S.P., 1994. Egg nesting behavior, clutch size and hatching of eggs of two hill pulmonates *Macrochlamys tugurium* (Benson) and *Cryptaustenia ovate* (Clanford) (Mollusca: Gastropoda). Journal of Bengal natural History Society. New Series. 13 (2): 15-22.
 18. Shoaib, Maha A., Mahmoud, Mahmoud F., Loutfy Nagla, Tawfic Mahamed A., Barta Marek, 2010. Effect of botanical insecticide Nimbecidine® on food consumption and egg hatchability of the terrestrial snail *Monacha obstructa*. J. Pest. Sci. 83: 27-32.
 19. Shoieb, M.A., 2008. Occurrence and distribution of terrestrial mollusks in Suez canal governorates and North of Sinai. Egypt. J. Agric. Res. 86: 25–36.
 20. Sturm, V.E., Levenson, R.W., Rosen, H.J., Allison, S.C., Miller, B.L. 2006. Preserved simple emotion and diminished self conscious emotion in fronto- temporal lobar degeneration. Brain, 129: 2508–2516.
 21. Wankhedkar, P.T., Bhavsar, S.S. 2015. Effect of Cartap hydrochloride and Imidacloprid on biochemical parameters of *Cerastus moussonianus*. Biolife, 3 (1), 125-131.
 22. Wankhedkar, P.T., Patel, N.G., Magare, S.R. 2011. Evaluation of toxicity of Imidacloprid and Cartap Hydrochloride against *Cerastus moussonianus*, *Indian Stream Research Journal*, Vol.1, Issue, VI, 222-223.
 23. Zera, A.J., Harshman, L.G. 2001. The physiology of life history trade-offs in animals. Annual Review of Ecology and Systematics, 32: 95–126.



IMPACT OF CLIMATE CHANGE ON AGRICULTURE PRODUCTION
AND ITS SUSTAINABLE SOLUTIONS

Dr. Nandini Pandurang Wagh

Assistant professor, HOD, Department of Geography, Pankaj Arts and Science College
Chopda, Dist. Jalgaon

Corresponding Author- Dr. Nandini Pandurang Wagh

Email:- nandiniwagh2012@gmail.com

DOI- [10.5281/zenodo.7295615](https://doi.org/10.5281/zenodo.7295615)

Abstract:-

Environmental changing in an accelerating pace. Climate change occurs as a result of an imbalance between incoming and outgoing radiation in the atmosphere. The global mean temperatures may increase up to 5.4°C by 2100. Climate change is mainly caused by humans, especially through increased greenhouse gas emissions. Climate change is recognized as a serious threat to ecosystem, biodiversity, and health. It is associated with alterations in the physical environment of the planet Earth. Climate change affects life around the globe. It impacts plants and animals, with consequences for the survival of the species. In humans, climate change has multiple deleterious consequences. Climate change creates water and food insecurity, increased morbidity/mortality, and population movement. Vulnerable populations (e.g., children, elderly, indigenous, and poor) are disproportionately affected. Personalized adaptation to the consequences of climate change and preventive measures are key challenges for the society. Policymakers must implement the appropriate strategies, especially in the vulnerable populations.

Keywords:- Environment, Climate Change, Global warming, Ecosystem, Agriculture Production

Objective:-

1. To assess impact of climatic change on agriculture sector.
2. To identify the various dimension of climatic change.
3. The identify the measure to prevent adverse effect of climatic change on agriculture.

Introduction:-

India is a large country with all types of climates and different kinds of soil requiring in different types of farming. Most of the agriculture land in India is dependent on rainfall for irrigation. While some parts of the country are drought prone, the other parts are prone to flooding. For many years, parts of the country have been struggling against drought and at the same time, agricultural lands in other parts of the country are submerged due to floods. In such

a country, the effects of global warming will be extreme. India has about 15 A- climatic zones with different types of farming methods and crops. As most of the population is dependent on agriculture and two-thirds of the country waits for the monsoon rains to aid in agriculture, any change in the frequency of the rains will affect these areas critically. Agriculture is the most important sector of the economic in India which provides food and livelihood security to much of the Indian population. It plays a crucial role in country's development contributing 35% of India's Gross National Product (GNP). Climate is one of the key components influence agricultural production in India and has large scale impact on food production and overall economy. The impact of climate Change on agriculture is an issue of great significance to

the lives and livelihoods of millions a poor people in India who depend on agriculture for food and livelihood.

Impact of climatic change in agriculture

The major impact of climatic change in agriculture

1. Destabilization in production and productivity
2. Less availability of irrigation.
3. Reduction in fertilizer use efficiency
4. Detrimental effect on fruits, vegetables, medicinal and aromatic plant's.

Impact of climatic change on soil health

1. Decrease in soil carbon
2. Soil erosion due to duction of forest and vegetation
3. Shift in land suitability
4. Increase in transient salinity
5. Change in soil biology and microbial population.

Impact of climatic change on water resources

1. Hydrological cycle changes leading to floods and droughts
2. Increase in water requirement of crops
3. More salinity of ground water
4. Adverse effect on aquatic ecosystems
5. Snow melt runoff leading to rise in sea level.
6. Decrease in potential yields is likely to be caused by shortening of the growing period, decrease in water availability and poor vernalization. In the long run, the climatic change could affect agriculture in several ways:
 - Productivity, in terms of quantity and quality of crops
 - Agriculture practices, through changes of water use (irrigation) and Agriculture input such as the herbicides, insecticides and fertilizers
 - Environmental effects, in particular to relation of frequency and intensity of soil drainage (leading and nitrogen leaching), soil erosion, radiation of crop diversity

- Adaptation, organisms may become more or less competitive, as well as humans may develop urgency to develop the more competitive organisms, such as flood resistant or salt resistant varieties of rice.

Impact on productivity

The effects of global warming could leave no room for man over since in many parts of India, and other developing countries, crops are already being cultivated near their maximum temperature tolerance. This is especially true in the dry land, non-irrigated areas, where vulnerabilities are high. In these regions even moderate warming of 1°C for wheat and maize and 2°C for rice will reduce yields significantly. It is known that many agricultural systems are seasonally dependent and thus sensitive to climatic change. Crop and livestock production need a specific range of weather conditions at particular times, for optimal growth. Changes in the climate can shift these optimal windows. The most vulnerable agricultural systems are the arid, semiarid, and dry sub-humid regions of the developing world. In these regions high rainfall variability and recurrent drought/ flood cycles disrupt crop development, particularly where crops are grown in marginal lands with low inputs.

More studies on the impact of climatic change on agriculture come to the same conclusion that climatic change will reduce crop yield in a tropical area. According to the IPCC, the next few decades of climatic change are likely to bring benefits to higher latitudes through longer growing seasons, but in lower latitudes, even small amounts of warming will tend to decrease yields. The regional inequality in food production resulting from climatic change will have a very great implication for global food politics. Even without the challenge of climate, food security is an issue in the tropical areas considering that almost 800 million people in the developing world are already suffering from hunger.

Conclusion:-

This analysis brings together for the first time detailed modelling of crop growth under climatic change with insights from an extremely detailed Global agriculture model. The results show that agriculture and human well-being will be negatively affected by climatic change. Crop yields will decline, production will be affected, crop and meat prices will increase, and consumption of cereals will fall, leading to reduced calorie and increased child malnutrition. Modified temperature and precipitation affect the population dynamic and activities of soil microbial communities. Future climatic change trends are therefore likely to affect carbon and nitrogen cycling and consequently agriculture production.

These stark results suggest the following policy and program recommendation:-

- Design and implement good overall development policies and programs.
- Increase funding for adaptation programs by the least an additional \$7 billion per year.
- Increase investments in agriculture productivity.
- Support community-based adaptation strategies.
- Improve Global data collection, dissemination, and analysis

Reference:-

1. Climatic change and food security in India- Dr. N. Chattopadhyay director.
2. Climatic Change and Global Crop Productivity- Readdy, K.R.,Hodges, H.F.Eds.
3. Climatic change and food security in India Indian agriculture Research institute, New Delhi- Chaudhary, Anita and and Aggarwal, P.K.
4. Indian Agriculture and Climatic Sensitivity Global Environmental Change - Kavi Kumar, K.S. and Parikh.



SYNTHESIS AND STRUCTURAL PROPERTIES OF ZINC FERRITE

Rahul Upalaikar

Assistant professor, Department of Physics,
R.N.C. Art's, J.D.B. Commerce and N.S.C. Science College, Nashik Road, India, 422101

Corresponding Author- Rahul Upalaikar

Email:- wankhedkarpt@gmail.com

DOI- 10.5281/zenodo.7295619

Abstract-

Powdered spinel zinc ferrite powder sample was synthesized by using sol-gel method. Structure of spinel zinc ferrite was confirmed by using X-ray diffraction. Average crystalline size and lattice parameter of powdered sample is calculated using X- ray diffraction.

Keywords – Zinc ferrite, X-ray diffraction

Introduction

Ferrite nanoparticles are a large group of magnetic particles have drawn a lot of attention of many researchers due to its extensive uses in variety of disciplines from biomedical to industry. Ferrite nanoparticles are particularly used for biomedical applications due to its physiochemical properties like surface functionalization feasibility, high surface to volume ratio [1]. properties like strong magnetic anisotropy, high coercivity at room temperature, moderate saturation magnetization, good mechanical hardness, chemical stability & high resistivity makes the family of ferrites is promising material for various industrial purpose such as sensors, memory devices, refrigeration, quality filter circuit, high frequency transformers, wide band transformers, high frequency electronic circuitry, microwave applications, multilayer chip conductor [2]–[4].

Spinel ferrites have face centered cubic structure and characterized by MFe_2O_4 formula where M denotes the divalent metal ions like Zn, Cu, Al. Spinel ferrites can have normal spinel structure, inverse spinel structure or mixed spinel structure. In spinel structure, all metal ions occupy tetrahedral sites, whereas all Fe^{+3} occupy octahedral sites. In inverse structure, all metal ions occupy octahedral site while Fe^{+3} ions are distributed over both tetrahedral & octahedral sites [5]. Among family of

ferrites, zinc ferrite ($ZnFe_2O_4$) having normal spinel structure is imperative due its wide applications in data recording media, adsorption, sensors, photo catalyst, lithium ion batteries, magnetic resonance imaging (MRI), biomedical applications [6]–[8] as it shows low saturation magnetization, high resistivity properties. For synthesis of zinc ferrite, many methods like co precipitation[9], hydrothermal [10], combustion [11], ball milling [12], sol gel [13] are used.

In this paper, we reported synthesis of zinc ferrite using sol gel method & structural properties of zinc ferrite are determined using X-ray diffraction.

Materials & methods

Materials

For synthesis of zinc ferrite analytical grade zinc nitrate ($Zn(NO_3)_2 \cdot 6H_2O$), & ferric nitrates ($Fe(NO_3)_3 \cdot 9H_2O$), reagents are used without further purification. Double distilled water is used throughout the synthesis & citric acid is used as reducing agent.

Method

For preparation of zinc ferrite, separate solutions of zinc nitrate & ferric nitrate are prepared in stoichiometric amount in double distilled water. These solutions were mixed into beaker & beaker is kept for constant stirring with heating at $150^\circ C$. Citric acid is added into beaker as a reducing agent. After 3 hours, solution is converted into viscous gel due to evaporation. Then, the gel was heated

to 250°C to self-sustaining combustion to produce burned brownish zinc ferrite fluffy powder. This burned fluffy brownish powder is kept for annealing in furnace for 900°C for 4 hours & used for further characterization.

Results and Discussion

Structural properties

X-ray diffraction (XRD) pattern of zinc ferrite powder is shown in figure 1. From X-ray diffraction pattern, phase, crystalline size and lattice parameter of the powdered sample is obtained. The XRD pattern shows spinel structure having Fd3m space group having peaks due to (111), (200), (311), (222), (400), (422), (511) planes that fit with JCPDS card no.82-1049. Average crystalline size is calculated using Debye-Scherrer formula $D = \frac{0.9\lambda}{\beta \cos\theta}$ where λ is the wavelength of X-ray radiation, β is full width half maxima for most intense peak, θ -Bragg's angle for the most intense peak. Lattice parameter is calculated by using formula $a = d_{hkl} \sqrt{h^2 + k^2 + l^2}$, where d_{hkl} is inter-planer spacing & hkl are Miller indices. Using given formula calculated value of lattice constant & average crystalline size are 8.48 Å and 27.12 nm.

Conclusion

In the present paper, zinc ferrite is synthesized using sol-gel method & spinel structure of zinc ferrite is confirmed by using X-ray diffraction. From X-ray diffraction, calculated values of lattice constant and average crystalline size were found out to be 8.48 Å and 27.12 nm.

References

- [1] S. D. & G. Dini, "Applications of cobalt ferrite nanoparticles.pdf," p. 18, 2019.
- [2] B. K. Kuanr *et al.*, "Frequency and field dependent dynamic properties of CoFe_{2-x}Al_xO₄ ferrite nanoparticles," *Mater. Res. Bull.*, vol. 76, pp. 22–27, 2016, doi: 10.1016/j.materresbull.2015.11.033.
- [3] R. Srivastava and B. C. Yadav, "Ferrite materials: Introduction, synthesis techniques, and applications as sensors," *Int. J. Green Nanotechnol. Biomed.*, vol. 4, no. 2, pp. 141–154, 2012, doi: 10.1080/19430892.2012.676918.
- [4] M. M. Eltabey and S. A. Gharbia,

"Enhancement of the magnetic properties of Ni – Cu – Zn ferrites by the non-magnetic Al³⁺ ions substitution," *J. Alloys Compd.*, vol. 509, no. 5, pp. 2473–2477, 2011, doi: 10.1016/j.jallcom.2010.11.056.

- [5] J. B. Goodenough and P. E. Tannenwald, "Oxide magnetic materials," *Solid-State Electronics*, vol. 7, no. 7, pp. 556–557, 1964, doi: 10.1016/0038-1101(64)90095-4.
- [6] R. M. Borade, S. B. Somvanshi, S. B. Kale, R. P. Pawar, and K. M. Jadhav, "Spinel zinc ferrite nanoparticles: An active nanocatalyst for microwave irradiated solvent free synthesis of chalcones," *Mater. Res. Express*, vol. 7, no. 1, 2020, doi: 10.1088/2053-1591/ab6c9c.
- [7] X. Biotech, "Evaluation of the Zinc Ferrite Nano particles for Bio-applications," vol. 46, no. August, pp. 2–7, 2017.
- [8] K. Wu, J. Li, and C. Zhang, "Zinc ferrite based gas sensors: A review," *Ceram. Int.*, vol. 45, no. 9, pp. 11143–11157, 2019, doi: 10.1016/j.ceramint.2019.03.086.
- [9] L. C. Sonia, M. Victory, and S. Phanjoubam, "A Comparative Study of the Properties of Zinc Ferrite Nanoparticles Synthesized by Different Techniques for Nanofluid Preparation," *Integr. Ferroelectr.*, vol. 204, no. 1, pp. 100–111, 2020, doi: 10.1080/10584587.2019.1674978.
- [10] R. Rahimi, M. Heidari-Golafzani, and M. Rabbani, "Preparation and photocatalytic application of ZnFe₂O₄@ZnO core-shell nanostructures," *Superlattices Microstruct.*, vol. 85, pp. 497–503, 2015, doi: 10.1016/j.spmi.2015.05.047.
- [11] P. M. Prithviraj Swamy, S. Basavaraja, A. Lagashetty, N. V. Srinivas Rao, R. Nijagunappa, and A. Venkataraman, "Synthesis and characterization of zinc ferrite nanoparticles obtained by self-propagating low-temperature combustion method," *Bull. Mater. Sci.*, vol. 34, no. 7, pp. 1325–1330, 2011, doi: 10.1007/s12034-011-0323-x.
- [12] S. Bid and S. K. Pradhan,

“Preparation of zinc ferrite by high-energy ball-milling and microstructure characterization by Rietveld’s analysis,” *Mater. Chem. Phys.*, vol. 82, no. 1, pp. 27–37, 2003, doi: 10.1016/S0254-0584(03)00169-X.

Naqvi, “Synthesis of zinc ferrite nanoparticles by sol-gel method and their characterisation,” *Int. J. Nanoparticles*, vol. 2, no. 1–6, pp. 388–393, 2009, doi: 10.1504/ijnp.2009.028773.

[13] A. Azam, M. Chaman, and A. H.

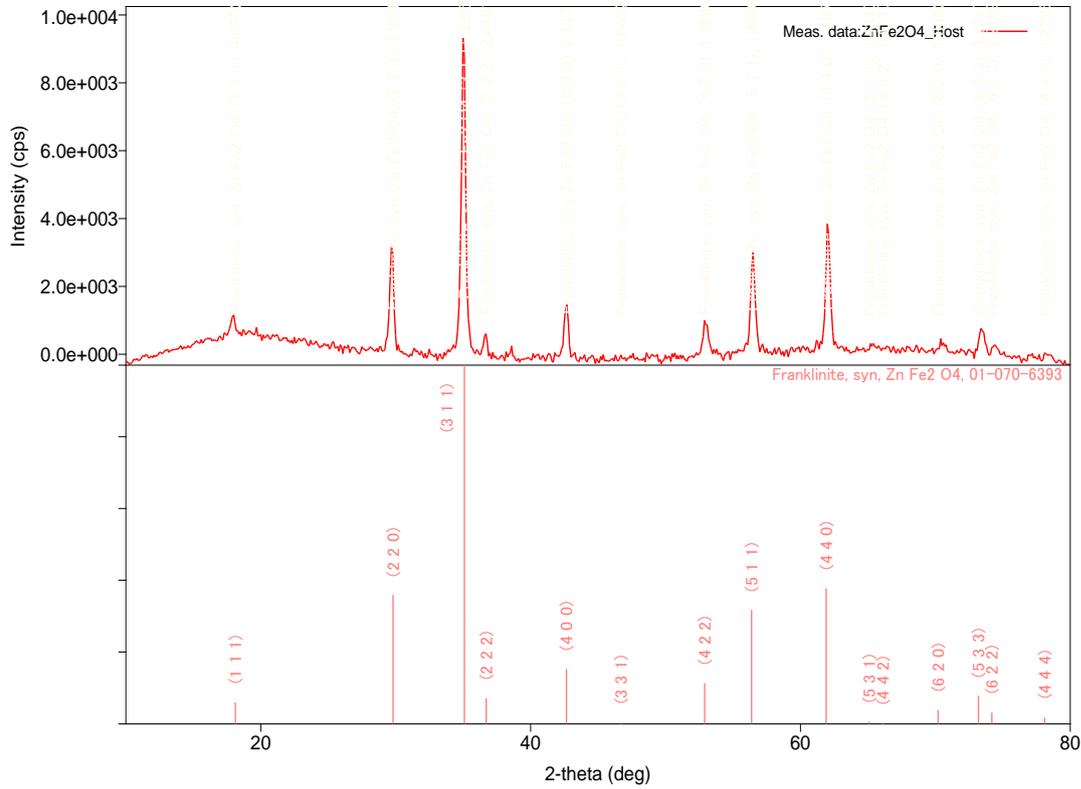


Figure 1



**A STUDY ON AWARENESS OF EARLY ADOLESCENT BOYS
REGARDING GENERAL INFORMATION AND CHANGES IN
MORALITY DURING EARLY ADOLESCENT STAGE**

Nita B. Gaikwad¹ Gaytri Tiwari²

Research Scholar, PhD (HDFS), MPUAT, Udaipur

Head, Dept. of Human Development & Family Study, College of Community & Applied
Science, MPUAT, Udaipur

Corresponding Author- Nita B. Gaikwad

Email:- prof.neetag@gmail.com

DOI- 10.5281/zenodo.7295623

Abstract

Early Adolescence study has always been an important and very interesting subject for research in Human Development as it is called as hazardous age group of Human lifespan, where risks are more and it's very difficult to cope up with all the drastic changes taking place during this age. Early adolescence usually considered as a period which is highly stressful and exciting as socially, Early adolescences are no longer a child as well as not yet the adult, as it is a period of innovations; and time to explore new things such as self-identity, establishing family, sex relationships or about choosing close friends. If awareness intervention regarding developmental changes taking place during early adolescent stage is must, if not provided many risk factors will arise, in view of above factors, awareness assessment of purposively selected 100 secondary school going early adolescent boys from two government schools of Beed city of Marathwada region, Maharashtra state, was carried out by developing research tool on it, after assessment and by following standard procedure of statistical analysis, it was concluded that the sample were showed low and medium awareness levels, whereas no one have had come under category of high level of awareness in all selected aspects of development as per hypothesis, so there is a great need of planning and execution of awareness intervention by using digital media like mobile app., which will have great impact on early adolescents boys' awareness regarding various developmental changes taking place in them which will directly positively affect on their adjustments during early adolescent stage.

Keywords- Early adolescent boy, developmental changes, awareness, moral changes,

Introduction

Adolescence -The life stage is the bridge between childhood and adulthood of human life span, where a rapid growth and development takes place, as well as most important is sexual maturity, exploring one's real self, focusing and setting new personal moral values and one's vocational and social directions. This period is called as period of young people when they extend their relationships beyond their family and parents. Research in Human Development on Adolescence has always been an important and very interesting subject as it is called as hazardous age group of Human lifespan where risks are more and it's very difficult to cope up with all the drastic

changes taking place during this age. Early adolescence, usually considered as a period which is extremely very stressful and exciting as socially. Intense influence of peers groups and the outside world is seen. Rapid growth spurt can be seen, which makes an individual mature and responsible towards his / her behavior, attitudes. As per the report of United Nations Children's Emergency Fund, 2012, about 1.2 billion adolescents today make up 18% of the world's population among them more than half of all adolescents live in Asia. In India, adolescents (10-15yrs) contribute 19.6% of the total about 1.2 billion adolescents today make up 18% of the world's population among them more than half of all adolescents

live in Asia . Early Adolescence study has always been an important and very interesting subject for research in Human Development as it is called as hazardous age group of Human lifespan where risks are more and it's very difficult to cope up with all the drastic changes taking place during this age .Early adolescence usually considered as a period which is tremendous stressful and exciting as socially, early adolescences are no longer a child as well as not yet the adult , as it is a period of innovations ; and time to explore new things such as self-identity, establishing family, sex relationships or about choosing close friends setting morality .(Prinstein and Dodge 2008) .

Early adolescence extends roughly from thirteen to sixteen or seventeen years ,and late adolescence covers the period from then until eighteen , the age of legal maturity ,Late adolescence is thus a very short period. Early adolescence is usually referred to as the “teens”, sometimes even the “terrible tens”, as this is a period of multi directional; and multidimensional changes. According to National Mental Health Survey 2016 high burden of mental illness among adolescents including depression, anxiety ,intellectual disabilities ,autism and psychotic disorders is very common .Males / boys experience their growth spurt about two years later, on an average, than females. During their peak height velocity (the time of most rapid growth), adolescents grow at a growth rate nearly identical to that of a toddler i.e. about four inches (10.3 cm) a year for boys (males) and 3.5 inches (9 cm) for girls (females). It is a period of multiple transitions which involving education, training, opposite sex relationships, employment, and unemployment, new setting up morality as well as transitions from one living circumstance to another.

Various developmental changes takes place during this crucial stage ,most important is Primary sex characteristics , are those directly related to the [sex organs](#). Specially in males, the first stages of puberty involve growth of the testes and scrotum, followed by growth of the penis , when the penis develops , the [seminal vesicles](#), the [prostate](#), and the [bulbourethral gland](#) also enlarge and develop . The first ejaculation of seminal fluid generally occurs about one year after the beginning of accelerated penis growth, in

general it is often determined culturally rather than biologically, and on the other hand , for many boys first ejaculation occurs as a result of masturbation which is again stressful situation . Early adolescent boys are generally fertile before they have an adult appearance.

Changes in [secondary sex characteristics](#) include every change that is not directly related to sexual reproduction. In early adolescent boys (males), these changes involve appearance of drastic hair growth in the areas like pubic, facial, and other body parts , increased development of the sweat glands deepening of the voice, roughening of the skin around the upper arms and thighs can be seen .

Research study showed that 66% of adolescents were aware of physical changes, only 17% were aware of emotional changes and 9% adolescent were not aware of either physical and emotional changes . Thus, biological determinants during adolescence are fairly universal. In order to effectively deal with this transition, adolescents need to be aware of their bodily changes to make their life easy and productive. Lack of awareness of early adolescent stage changes lead to unfavorable attitude towards their own bodily changes resulting in negative personality outcomes throughout their life.

Objectives

To enroll purposively selected early adolescent boys (12-14 yrs.) for conducting research

study

To assess the awareness of early adolescent boys regarding selected developmental changes such as general information about early adolescent age and moral changes .

Hypothesis

Early adolescent boys' aware about developmental changes taking place during early adolescent stage is low

Methodology

To conduct a research study on “Awareness of Early Adolescent Boys About Selected Developmental Changes during early adolescent stage ‘, the list of the government schools was procured from district education office, Beed . The required 100 Early Adolescent Boys from the age group of 12-14 yrs were purposively selected from two Government secondary schools located within municipal limits of Beed city by taking prior

permission of Principals of two selected government schools to conduct research study as well as keeping in view the delimitation of the study .

The background information , awareness regarding developmental changes during early adolescent stage were collected by using developed background information proforma and research tool on Awareness of early adolescent boys regarding selected developmental changes .The developed research tools' validity and reliability were checked by experts and reliability was calculated by using split half method before using it . The developed Background information proforma was used by the investigator to get the general information about the personal and familial details of selected samples which have direct or indirect bearings on major research variables of the study such as (name, age, address, family size and types, educational qualifications ,occupation of parents etc.) , developed research tool on awareness was

used to get the information regarding awareness of selected respondents about developmental changes such as general information about early adolescent stage and moral changes of early adolescent boys . After collecting data , it was analyzed ,coded, categorized then suitable statistical analysis were carried out as per the objectives of the study. Interpretation of scores of "Awareness research tool regarding developmental changes during early adolescent stage "

As the total questions formed in above mentioned questionnaire were 124 , with three rating scale (3,2,1) all statements were positive statements, scale was divided into six measure groups of selected developmental changes taking place during early adolescent years . As per the interpretation of scores - low , medium and high levels of awareness were decided. In this research paper two aspects has been covered viz. Information regarding early adolescent age which comprise of 8 items /statements , its' awareness levels were divided as follow .

Developmental Aspect	Low	Medium	High
General information about early adolescent stage	0-8	9-17	18-24

Second developmental change which included in this research paper was moral changes aspect which was comprised of 12 items /statements , its' awareness levels were divided as follow .

Developmental Aspects	Low	Medium	High
Moral changes	0-12	13-24	25-36

Review of literature

Barbara M. Gfellner (1986) a longitudinal research study was carried out to reveal the relation between Loevinger's measures changes in ego development and moral development in 123 purposively selected adolescents of 12 to 14 years age group . For conducting research Rest's Defining Issues Test was used . Differential rates of changes and theoretically predicted directions of changes were assessed in both boys and girls . Result shows that 60 per cent advancement and 40 per cent stability were found in substantial ego stage movements while moral growth was moderate. On the other hand girls scored 50 per cent ego stage ahead as compare to boys while directional change patterns were found to be similar Chayal et

al. (2016) conducted a research study on " Perception about pubertal changes among rural adolescent boys of Haryana ", to conduct research study , purposively 1000 boys students were selected from senior secondary schools . It was concluded after conducting research that most of the boy students had adequate knowledge regarding the pubertal changes such as rapid growth of weight and Height, facial hair ,development of sex organs, night emission, etc., it was revealed by selected sample that the pubertal changes were a normal phenomenon for them . Knowledge of students of classes 9th , 10th , and students of class 11th , 12th were similar, no difference were found in the levels of knowledge of all selected sample . Sheoran , et al. (2016) conducted research

study on" knowledge and attitude of preadolescent boys regarding pubertal changes ". The research study revealed that the pre-adolescent boys who had received intervention on Pubertal awareness programme were had significantly higher knowledge and appropriate attitude as compare to pre-adolescent boys who were not received awareness intervention on pubertal preparedness .

Result and Discussion

The results of the study which emerged as a product of statistical analysis and interpretation of data. To understand the result in better way , statistical analysis have been presented under different sections for getting a detailed and clear account of the results of the research study and presents an analytical view by discussing its various dimensions .

The results have been discussed under the following sections background Information and awareness of early adolescent boys regarding selected developmental changes like physical and social changes during early adolescent stage .

Table 1 reveals about the background information of enrolled adolescent boys . All the early adolescent boys were selected from the age range between 12 to 14 years, about family size 69 per cent sample were from small size families followed by 18 per cent belongs to medium and 13 per cent belongs to large size families .42 per cent were first born followed by 33 per cent were second born and 25 per cent were third born children in the family.78 per cent belongs to nuclear families while rest were from joint families . About fathers' educational qualification ,55 per cent had completed primary education followed by 31 per cent graduation remaining i.e. 24 per cent were high schooler similarly majority (62%) mothers had completed their preschool education followed by high school (37 %) remaining (11%)were graduated. Fifty four per cent fathers' were involved in work as labour ,whereas 33 per cent were government employee and 13 per cent were business men. In case of mothers ,78 per cent were unemployed ,12 per cent were holding business and 10 per cent were involved in labour work

Table 2 indicates about the awareness levels of selected early adolescent boys regarding

general information about early adolescent stage. It is clear from table 2 that not a single selected early adolescent boy come under the high level awareness about general information regarding early adolescent stage / years. Where as majority i.e. between 42 to 51 per cent comes under low level of awareness whereas 49 to 58 per cent were having medium level of awareness regarding general information about early adolescent stage changes .

Table 3 indicates about the awareness levels of selected early adolescent boys regarding moral changes during early adolescent stage. It is clear from table 3 that not a single selected early adolescent boy come under the high level awareness about moral changes taking place in them during early adolescent years. where as majority i.e. between 30 to 62 per cent comes under low level of awareness whereas 38 to 70 per cent were having medium level of awareness regarding moral changes taking place during early adolescent stage ,which is a danger sign for adjustments during this crucial period .

Conclusion

From the above research study it can be concluded that awareness of early adolescent boys regarding general information and moral changes taking place during early adolescent stage were found to be under low and medium levels of awareness which is going to directly negatively affect on the adjustment with these changes and adversely affect on the wholesome development of early adolescent boys .

Remedies:

Early adolescent boys' were unawareness about developmental changes and showed unfavorable attitude towards rapid changes taking place during early adolescent stage ,in view of above result and understanding the risk factors of it , there is a great need for planning and execution of need based intervention for converting their low level awareness into high level awareness regarding developmental changes during early adolescents to prevent arising problems such as depression, frustration ,stress,failure, anxiety associated with new drastic changes .

References:

1. Barbara M.Gfellner 1986.Changes in ego and moral development in adolescents ; a

- longitudinal study ,Journal of Adolescence ,ISSN/;0140-1971,Vol:9,Issue:4:281-302
- Chayal ,V., Khanna , P. and Verma , R. 2016 .Perception regarding pubertal changes among rural adolescent boys of Haryana: A school based study ,Indian J Comm Health. 2: 179-184 .Coping cited from <https://en.wikipedia.org/wiki/coping> Retrived on 04/08/2019
 - National Mental Health Survey 2015 - 2016 Prevalence ,Patterns and Outcomes ,Supported by Ministry of Health and Family Welfare,Government of India and Implemented by

Neurosciences Benglure

- Prinstein, M & Dodge, K 2008. Understanding Peer Influence in Children and Adolescents. The Guilford Press, NewYork.
- Sheoran ,P., Rani, M. Kumar , Y, and Singh, N.2016. Knowledge and Attitude Regarding Pubertal Change among Pre-Adolescent Boys: An Interventional Study in Rural Area in India. Journal of Nurs Care . 5: 2- 5 .
- Report-United Nations Children's Emergency Fund, 2012 cited from unicef.org/publications/UNICEF_Report_2017.pdf Retrived on 3/7/2019

Table 1 Background information of the selected early adolescent boys

n-100

Background variables	Respondents
Age group	
12-14	100 (100)
Sizes of families	
Small (1-4)	69 (69)
Medium (5-8)	18 (18)
Large (>9)	13 (13)
Ordinal Position of respondents	
First	25 (25)
Second	33 (33)
Third	42 (42)
Types of Family	
Joint	22 (22)
Nuclear	78 (78)
Fathers Education	
College + Under graduate	31(31)
Middle School + High School	24 (24)
Primary School	55 (55)
Illiterate	--
Fathers Occupation	
Busines	33(33)
Labor	13 (13)
Govt.servent	54 (54)
Mothers Education	
College + Under graduate	11 (11)
Middle School + High School	37 (37)
Primary School	62 (62)
Illiterate	--
Mothers Occupation	
Busines	12 (12)
Labor	10 (10)
Govt.servent	78 (78)

Figures in parenthesis indicates percentages

Table 2 Awareness of early adolescent boys regarding general information about early adolescent stage

S. No.	ASPECTS Related to Early adolescents Stage	Categories of awareness levels of Early adolescence Boys (n=100)					
		Low		Medium		High	
		F	%	F	%	F	%
1.	Information about age range of early adolescent stage	51	51	49	49	-	-
2.	Many developmental changes takes place during teenage?	48	48	52	52	-	-
3.	Physical health changes are not disease?	46	46	54	54	-	-
4.	Is it ok to gain Weight ?	43	43	57	57	-	-
5.	Weight gain is common.	42	42	58	58	-	-
6.	Due to teenage increased quarrelling	47	47	53	53	-	-
7.	Lot of developmental changes are happening	45	45	55	55	-	-
8.	Lot of adjustments are needed during teenage	42	42	58	58	-	-

Table 3. Awareness of early adolescent boys regarding moral changes during early adolescent stage

S.N o.	Aspects Related to Moral Changes of Early Adolescents Stage	Categories of awareness levels of Early adolescence Boys (n=100)					
		Low		Medium		High	
		F	%	F	%	f	%
1.	Due to developmental changes in early adolescent - Are you not following family and understanding it ?	36	36	64	64	-	-
2.	Do you think there is a need for some change in established ethical values ?	30	30	70	70	-	-
3.	Have you become less respectful of moral values ?	41	41	59	59	-	-
4.	Are you unable to control your own personality ?	50	50	50	50	-	-
5.	Is your personal relationships with people of the opposite sex should reflect the same moral values as the new ones?	62	62	38	38	-	-
6.	Do you like to follow the instructions set by the family nowadays?	57	57	43	43	-	-
7.	Are you not able to understand right and wrong person ?	54	54	46	46	-	-
8.	Do you create new moral values due to opposite gender attractiveness and relationships?	62	62	38	38	-	-
9.	Why do you misbehave because of fear of rejection rather than punishment?	49	49	51	51	-	-
10.	Are you not following the family's ethical values to keep your friend happy?	53	53	47	47	-	-
11.	Is it difficult to adapt to new situations because of the wrong person?	53	53	47	47	-	-
12.	Is it difficult to control shame and embarrassment as a teenager?	44	44	56	56	-	-



SURVIVAL OF ANKITA SHARMA IN PREETI SHENOY'S *LIFE IS WHAT YOU MAKE IT*

Harini P.

Ph.D Research scholar, PG and Research Department of English Sri Sarada College for Women (Autonomous), Salem – 16, Tamilnadu, India.

Corresponding Author- Harini P.

Email:- harinihoney269@gmail.com

DOI- 10.5281/zenodo.7295625

Abstract:

Is survival very difficult in this world? Quitting everything and dying is the only way and only solution for all the problems? It is essential to notice the number of people who have committed suicide in recent times. In the contemporary era, people acknowledge more on their problems and issues than on their happiness and joy. Balancing the emotions and controlling the mind are the two essential things to be taken care of very carefully by all human beings. Everyone should learn to handle both success and failure. The bestselling women novelist, Preeti Shenoy has discussed the importance of controlling one's mind and balancing one's emotions through the portrayal of her character Ankita Sharma effectively, in her novel *Life is What You Make it*. Ankita Sharma, a young adult, faces various problems and suffers a lot. She is unexpectedly attracted by the activities of her boyfriend Abhishek who truly is in love with her. But, she fails to continue her relationship with Abhi due to her departure to Bombay for her higher studies. Ankita tries to convince Abhi to end their relationship but his blind love towards her urges him to end his life. Then, Ankita is affected by bipolar disorder which tortures her terribly. After two suicidal attempts she luckily survives and she recovers from her disorder. Her constant hope and determination urge her to work hard for attaining her wishes and dreams. This paper aims at elaborating the successful survival of the protagonist Ankita Sharma who has successfully achieved her dreams by her constant hope and perseverance against all her adversities happened in her life.

Keywords: Survival, balancing, relationship, hope and determination.

Preeti Shenoy a passionate Indian novelist, in her famous novel *Life is What You Make It* presents the themes of love, hope, optimism, and willpower. One's life can be filled with various mixed facets and emotions like happiness, sadness, wishes, success, failures, aspirations, dreams, etc. but, how a person balances all these phases and runs his/her life peacefully, successfully and with satisfaction matters more. It is in the hands of the people who have undergone various problems to handle a situation without complicating it. Complicating and taking stress due to various issues does not bring a solution to the problem. People who handle a particular crucial situation with a peaceful and pleasant mind, easily get the solution also they learn and gain experiences

through it. People who cannot handle it might have indulged in various glitches and they fail to come out of it easily.

Shenoy has dealt with the significance of balancing emotions through her character/protagonist Ankita Sharma. Ankita sharma, a twenty year old girl lives a normal life like other young adults. But, certain sudden vicissitudes and tragic incidents in her life push her to meet crucial situations which make her struggle a lot for her survival. Survival is not easy. But, it depends upon the person, who decides 'how to survive'. The novel begins with a prologue, describing the critical situation of the protagonist Ankita Sharma who is suffering from a mental disorder called bipolar disorder, so waiting for her treatment in a

recognised mental hospital situated at Bangalore. Even though Ankita dislikes everything, she has no other option than following her parents' words. As an adult, Ankita has her own dreams and wishes. But, while remembering her past actions of suicide attempts she feels remorse and shameful. She is disheartened, depressed, and dejected.

Shenoy provides the past life of Ankita following the prologue. Ankita's school life has brought her to be in love with Vaibhav. After schooling, Ankita by observing the conventions of her family, obeys her parents and joins for her Bachelor's degree in St. Agnes College, Kerala. Her childhood boyfriend and lover Vaibhav joins in IIT Delhi. Ankita converses with him through letters and telephone calls without the knowledge of her parents.

Shenoy, through casting various circumstances, elaborates the significance of the role of parenting. Parenting is not an easy role. Parents possess the bigger responsibility of creating the right path to their children. The behaviour, action, thought process, character of the children should be shaped correctly. It results in creating good human beings. In the case of Ankita, her parents fail to have good rapport with her even though they concern her more. Ankita is not open towards her parents. She fails to express her thoughts to them. Her parents don't give her enough space for expressing the minutes. This results in hiding all the occurrences from her parents. If she is able to express her problems to her parents, she might have handled her critical situations easily without complications.

Ankita's college life moves in a smooth manner. She gets new friends named Suvi, Charu, and Janie. Suvi remains a best friend for her. She expresses everything to Suvi even though she fails to express it to her parents. Her relationship with her boyfriend Vaibhav turns thick through calling and speaking to him regularly. Her college life goes well. She is appointed as Arts Club secretary. She has a good rapport with her seniors and juniors also. She and her cultural group used to get out to various colleges in order to participate in cultural festivals. In this way, she meets Abhishek, a secretary from Mahaveer College who falls in love with

her and writes a love letter to her by blood. Even though Ankita is not ready to accept his love, she can't refuse it. She starts a relationship with him. But, she often thinks of her relationship with Vaibhav and feels guilty.

As Shenoy mentions that 'Love is Blind' Abhishek fails to understand the reality. He fails to hear the words of Ankita and her mentioning of her relationship with Vaibhav. Ankita takes everything in an easy manner. She decides to give some time to Abhi. She doesn't want to avoid Abhi abruptly. But, soon Ankita enjoys Abhi's company. They spend time with each other in attending all cultural festivals. At the end of the third year, Ankita decides to do her Master's in one of the top institutions.

Ankita is determined to achieve her dreams. She works hard with her friends. But, Abhi is not sincere in his studies, rather paying attention only to Ankita. However, Ankita has cleared the entrance exam. She is selected for her MBA course in CUSAT Bombay. Her father also is promoted to Bombay in his company. So, the total family of Ankita leaves Kerala for Bombay. But, Abhi is not ready to leave her. He is willing to marry her. But, Ankita prefers following her dream than living with Abhi, so she begins to avoid him. But this leads to a great tragedy. Abhi commits suicide due to love failure. Ankita is terrified to hear this tragedy. She doesn't expect this even in her dream.

Love failure is one of the reasons for the increasing level of the suicide rate. Today's youth fail to understand the reality. They fall in love without having the knowledge of their future. Falling in love is not wrong. But, it should not be fake and immature. Here, Ankita is not pure in loving Abhishek. But, Abhi feels that Ankita is his world. But, somehow she fails to express the reality to Abhishek. She enjoys his company and she fails to explain her perceptions towards him. Abhi turns out to be a great sufferer and can't live without Ankita. Young adults should be brought up with the courage of accepting failures and they should learn to take up challenges in life. Abhi's blind bond with Ankita urges him to end his life. But, she leaves Kerala with her family and joins a new course. She gets into a new environment,

Harini P.

new group of friends and teachers. But, the loss of Abhi remains a scar in the heart of Ankita. She fails to open up about Abhi to her parents. She has no friends to share her inner feelings; this even creates a kind of torture for her.

Slowly, Ankita finds some kind of changes in both physically and mentally. Her change in behaviour leads her to get mad in doing all activities such as doing exercises, preparing notes, studying sincerely, etc. She finds certain changes like sudden energy, ultimate memory power, strong stamina in running, change in appearance, unbalanced emotions. She considers everything to be normal and finds no wrong in that. She is hyperactive. At the same time she memorises everything she reads. She uses different visualization techniques for her studying purpose. Her mind copies everything and she feels terrific about her new power of memory. But, as long as she indulges herself in various activities her appearance declines. She reduces her sleeping time. Her face leans and she fails to give importance to her appearance. While speaking about her emotional level, it has many ups and downs. She has no consistency in her thought process as well as in physical activities. She is not stable in her emotions and fails to balance her emotions. Sometimes she is kind and sometimes she is aggressive. Even her parents fail to notice the changes which Ankita endures. They also think that Ankita is working hard and everything will be alright soon.

Her studying process is creative and different. She uses colour coded technique, sticky notes, water colours, cartoon pictures which enable her to focus to the utmost level for her study and learning purpose. For exams, she works for the whole night. Her energy level is uncontrollable. She is craving for learning. Shenoy mentions that she is called a "Memory Machine". (Shenoy 101)

Ankita's mood switches time by time. Her sense of peace, joy and happiness suddenly changes into a sense of sadness, aggressiveness and exasperating. At the same time, she also remembers the past memories of Abhishek, which even more terrifies her and makes her lose her confidence and hope to lead her life peacefully. In order to avoid her terrible

memories she decides to distract herself by writing poems. Also she writes a letter to Suvi by expressing all her thoughts which consists of nearly forty pages. This note turns out to be a key for the doctors to discover her problem in future. Her mind combines with a sense of loss and a sense of guilt. She hides all about Abhi and Vaibhav from her parents. She hides about Abhi from Vaibhav. These all make her indulge in complete sadness and misery. One day, Ankita's father discovers the love letters of Abhi and burns it in front of her in rage. This incident affects her mentally. The state of Ankita goes even more wrong. In order to overcome her mental pain, she cuts her hand and feels physical pain as even much better. Slowly, everything goes wrong. She is immersed with complete fear. She fails to attend college. She fails to read, write and understand the meaning. She is taken to various psychiatrists but gives no results. Her uncontrollable depression leads her to end her life. Thus, she tries to commit suicide. But, fortunately she is saved by her father. At last, she is taken to a recognized mental hospital, where she is diagnosed with bipolar disorder. Her doctor Madhusudhan details her about the disorder and gives hope to fight against it. Once Ankita was in a college and considered as a smart student, but now she is a mental patient. She is given various therapies and her doctor urges her to have faith in recovery. Her doctor also trains her to study slowly and slowly. By practice she is able to read and write a passage. Her constant hope and determination make her fight hard and she recovers slowly from bipolar disorder. Once her doctor says that "Faith is a strange and a powerful thing and it can work miracles" (Shenoy182). At last, through her constant fighting spirit, Ankita is recovered completely. Fifteen years later, she is found with six more degrees and joyfully married. Here, Ankita Sharma sets an example that she is a great survivor. Thus, the presence of fighting spirit with optimistic attitude towards difficulties lets a person to overcome all the hindrances effectively and easily.

Works cited:

1. Gupta, Ankita. "Book Review: Life Is What You Make It, by Preeti Shenoy." *Varnic*, 1 May 2020,

Harini P.

- <https://varnic.com/book-review-life-is-what-you-make-itby-preeti-shenoy/>.
2. "Life Is What You Make It • Preeti Shenoy." *PREETI SHENOY*, 23 Mar. 2020, <https://preetishenoy.com/book/life-is-what-you-make-it/>.
 3. "Preeti Shenoy." *Wikipedia*, Wikimedia Foundation, 30 Aug. 2022, https://en.wikipedia.org/wiki/Preeti_Shenoy.
 4. Shenoy, Preeti. *Life Is What You Make It*. Srishti Publishers & Distributors, 2011.
 5. Vadakkal, Manu Anthrayose. "A Study on the Philosophical Aspects of Preeti Shenoy's Life Is What You Make It." *Academia.edu*, 10 June 2014, https://www.academia.edu/6353144/A_Study_on_the_Philosophical_Aspects_of_Preeti_Shenoy_s_Life_is_What_You_Make_it.



“A STUDY ON INDUSTRIAL POLLUTION AND ENVIRONMENT IN GHUGUS”

Dr Sarika Baban Nande¹ Prof Rima Potdukhe²

Sau Leena Kishor Mamidwar Institute of Management Studies & Research Chandrapur

Corresponding Author- Dr Sarika Baban Nande

Email:- sarikanande@gmail.com

DOI- 10.5281/zenodo.7295627

Abstract

The aim of this paper is to focus on the industrial pollution affect on the people residing in Ghugus. This is one of the most polluted city in Maharashtra according to air quality status of the Maharashtra year 2018-19 the annual average level of respirable suspended particulate matter (RSPM) in Ghugus (2018-19) are 181 micrograms per cubic meter (mpcm). Ghugus is surrounding with Large Scale Industries such as WCL, Lloyds Metal, ACC Cement, Gupta Coal Washries. Major pollutants are Carbon dioxide, Carbon monoxide, Ozone, Nitrogen dioxide, Sulphur dioxide. These are very toxic substance to decrease level oxygen in air. For the economic growth and development Industry are required but the one side of that the big question arise that how to control that pollution, its need to analyze the environmental pollution.

Keywords: Environment, Industrial Pollution, Industrial Area, Impact

Introduction

Industrial pollution is the pollution originates from the industry. Collectively with the industrial revolution, more factories and technologies were developed, which caused a lot of air, land, and water pollution all over the world. This type of pollution is one of the most horrible due to the smoke that the industry emits in the air contributes a lot to ozone depletion, health problems to both animals and humans, and global warming. The pollution has been released from industry in a way directly or indirectly during the industrial operations. Industrial operations are a significant cause of pollutants in the air, water, and soil, resulting in sickness and death all over the world. Industrial pollution is a type of pollution that's produced by factories and industries. It produces diseases and deaths globally due to the pollutants it produces. The effects of industrial pollution are severe and widespread.

Causes

Burning fossil fuels like oil, natural gas and petroleum; chemical solvents used in dyeing and tanning industries, untreated gas and the liquid waste being released into the environment, improper disposal of

radioactive material are some of the main causes of industrial pollution.

1. Lack of Policies to Control Pollution

Lack of effective policies and poor enforcement drive allowed many industries to bypass laws made by the pollution control board, which resulted in mass-scale pollution that affected the lives of many people.

2. Use of Outdated Technologies

Most industries still rely on old technologies to produce products that generate a large amount of waste. To avoid high costs and expenditure, many companies still make use of traditional technologies to produce high-end products.

3. Inefficient Waste Disposal

Water pollution and soil pollution are often caused directly by inefficiency in the disposal of waste. Long-term exposure to polluted air and water causes chronic health problems, making the issue of industrial pollution a severe one. It also lowers the air quality in surrounding areas, which causes many respiratory disorders leaching of Resources From Our Natural World

4. Raw materials are required in large quantities by industries in order to produce finished goods. This requires the extraction of minerals from beneath the earth. The

extracted minerals can cause soil pollution when spilled on the earth. Leaks from vessels can cause oil spills that may prove harmful to marine life.

Effects of Industrial Pollution on Environment

1. Water Pollution

The effects of industrial pollution are far-reaching and liable to affect the ecosystem for many years to come. Most industries require large amounts of water for their work. When involved in a series of processes, the water comes into contact with heavy metals, harmful chemicals, radioactive waste, and even organic sludge.

These are either dumped into open oceans or rivers. As a result, many of our water sources have a high amount of industrial waste in them, which seriously impacts the health of our ecosystem. The same water is then used by farmers for irrigation purposes, which affects the quality of food that is produced.

2. Soil Pollution

Soil pollution is creating problems in agriculture and destroying local vegetation. It also causes chronic health issues for the people that come into contact with such soil on a daily basis.

3. Air Pollution

Air pollution has led to a steep increase in various illnesses, and it continues to affect us on a daily basis. With so many small, mid-sized and large-scale industries coming up, air pollution has taken a toll on the health of the people and the environment.

4. Atmospheric Deposition

Cadmium enrichment of soil can also be associated with industrial pollution.

Review of Literature:

According to the Article published in Times of India on August 4, 2019 Ghugus air most toxic in Maharashtra: Ghugus is the small town which is situated in Chandrapur district has emerged toxic substance which are affected lungs, wide range of respiratory and cardiovascular diseases. As per data Ghugus has been recording the highest concentration of the deadly pollutant in the since last three year.

According to the article of Monaj Kumar Tiwari, Samir Bajpai, U K Dewangan: Coal is the main ingredient of the power generation after burning coal fly ash are remain as the byproduct of that, which contain the harmful substances available in

the fly ash which are responsible for air pollution.

According to the article of S. N. Shah, Salman Manzoor, Dr. Muhammad Asim:

The object of this paper is to explore the impact of environmental pollution on the environment and society. To develop an understanding of environmental degradation, the study discusses the various types of effluents that impact the environment adversely.

Profile of Ghugus

Ghugus is a small town which situated 25km away from the Chandrapur City. This town is surrounded with full of pollutant generated industry. Ghugus has coal industries "WCL" and a cement company "ACC Limited", there is a Steel Plant and many coal washers, for this reason Ghugus is the most polluted town in Maharashtra. Lloyds Metals and Engineers Limited is a sponge iron plant in Ghugus. It's mostly polluted because of the pollutant are released by the Lloyds metal when the process of manufacturing still raw material During the manufacturing progress of the Industrial from the Open Cast WCL Industry, the tiny particles of the coal are mix in environment and reaction with available oxygen in air.

Objective

1. To Study the problem face by people in Ghugus due to industrial pollution
2. To study the impact of pollution on health.
3. To study the effect of pollution on property.

Hypothesis

1. There are major health issues like Respiratory Problem, Heart Problem, Bronchitis, Asthma etc.
2. There are certain problem like damages to property and agricultural land.

Research Methodology:-

The study under taken is descriptive in nature, for the collection of data following resources were used.

1) Primary Data

2) Secondary Data.

- 1) **Primary Data:** - Primary data collection methods can be divided into two groups: quantitative and qualitative. Primary data was collected through close ended questionnaire.

Sampling: - The universe of the study covers Ghugus city as its population. The sampling

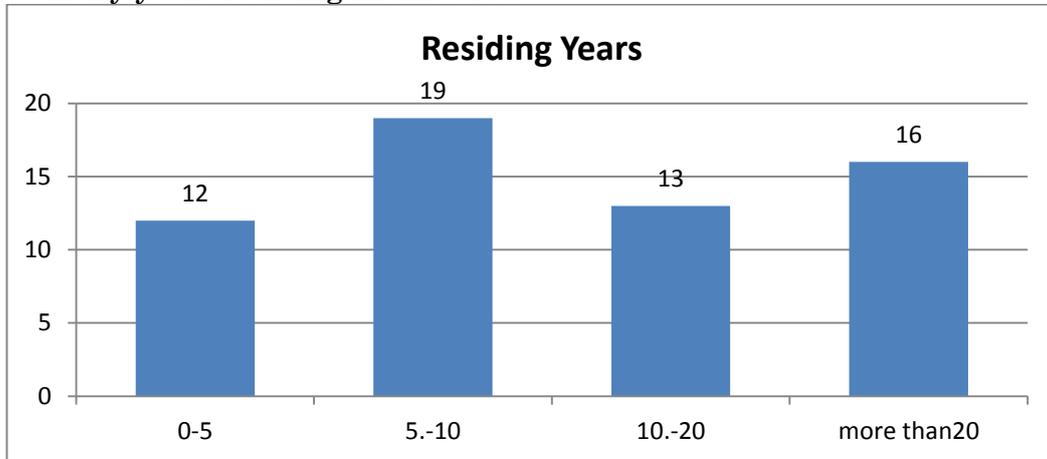
is selected by using convenient sampling and the sample size was confined to 60. The present study is restricted to Pollution Problems of Ghugus City due to Industry only other categories will be eliminated due to time and cost constraints.

in books, newspapers, magazines, journals, online portals etc. There is an abundance of data available in these sources about research area, almost regardless of the nature of the research area.

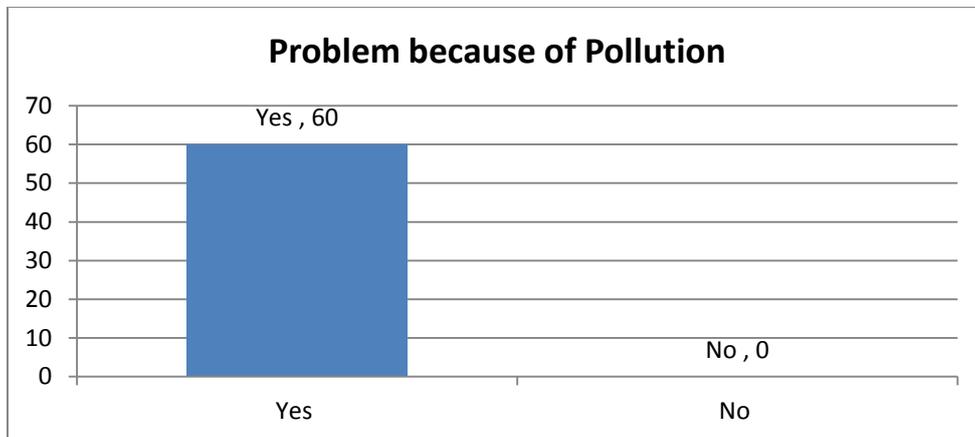
2) **Secondary Data**:- Secondary data is a type of data that has already been published

Data Analysis

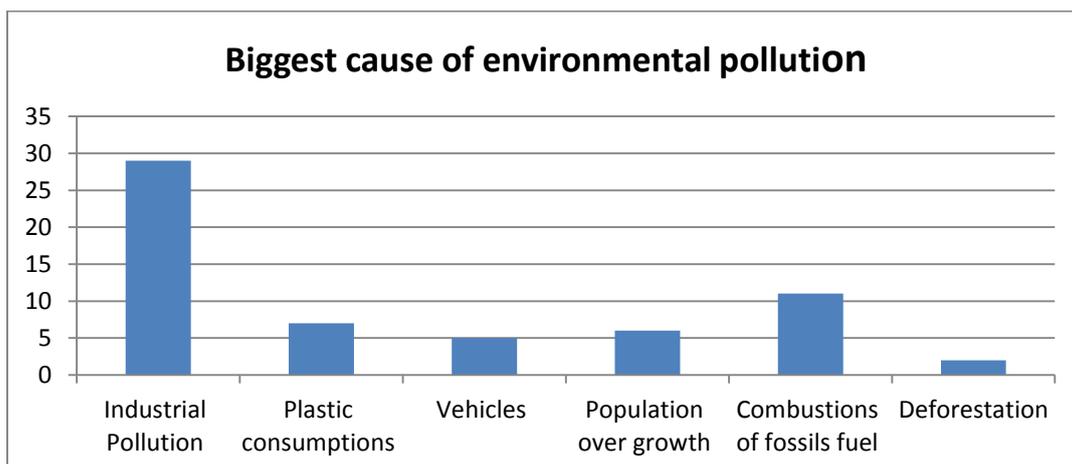
1. **Since how many years residing in this area?**



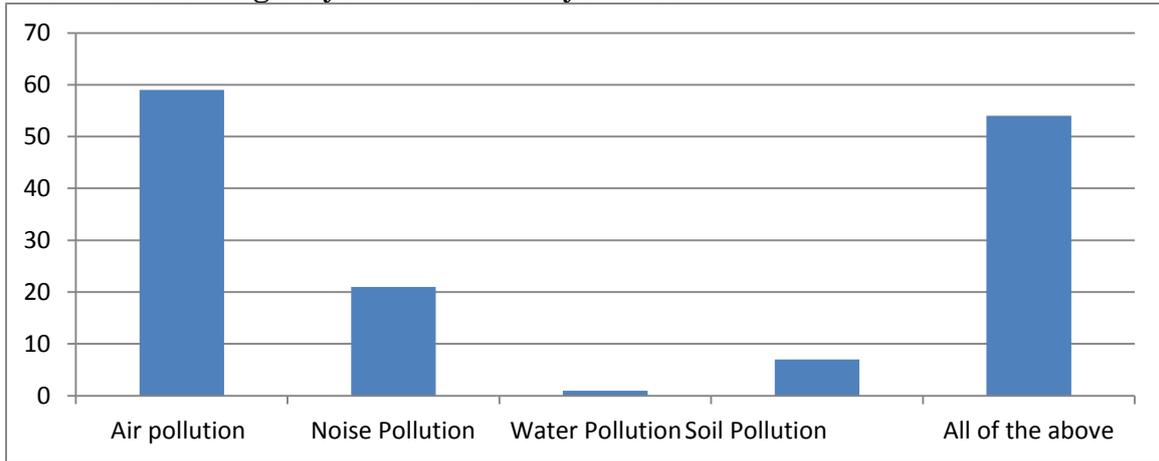
2. **Did you face any problem because of Industrial Pollution?**



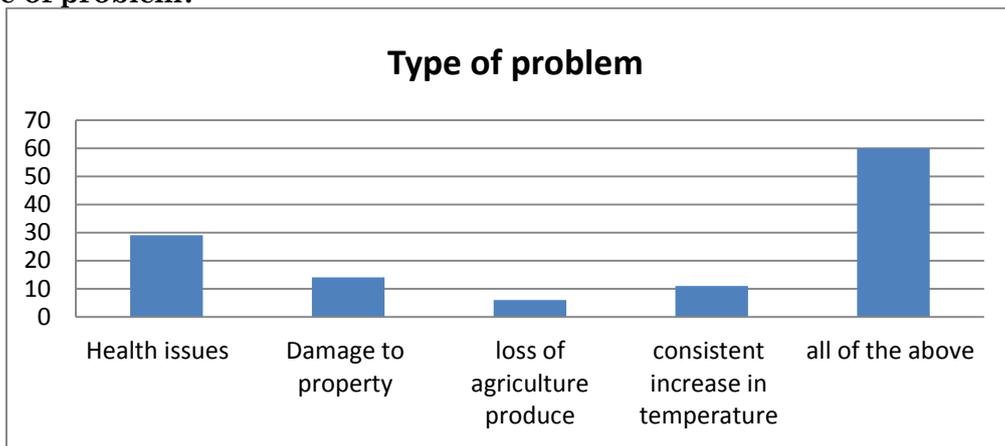
3. **Which of the following do you think biggest cause of environmental pollution?**



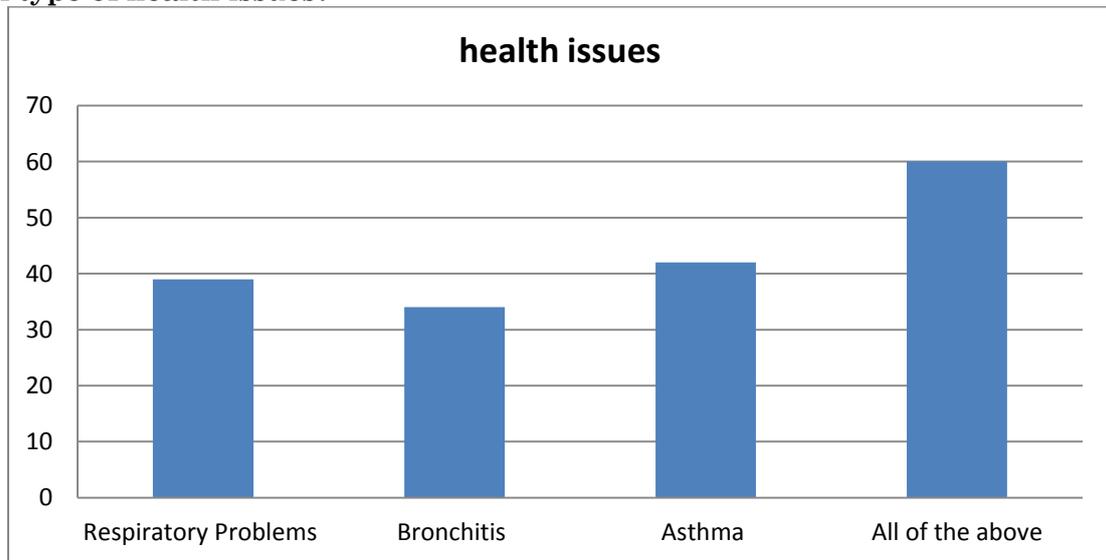
4. Which of the following do you think affect you most?



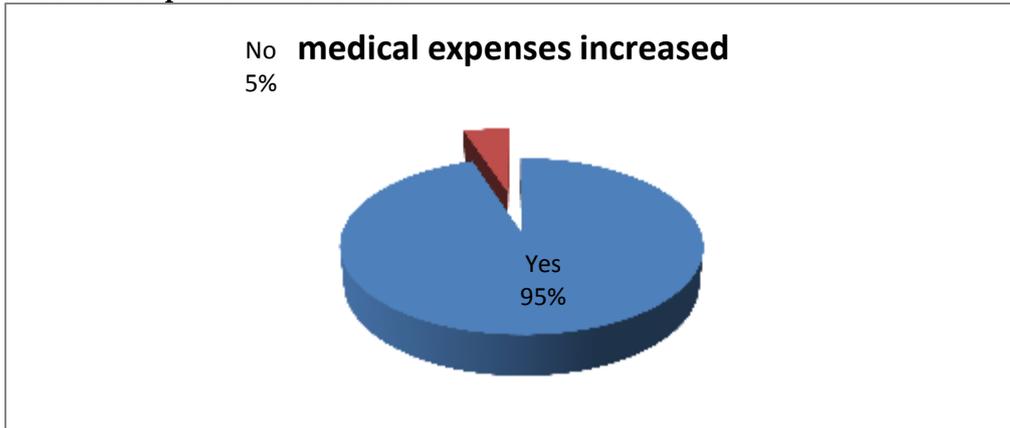
5. What type of problem?



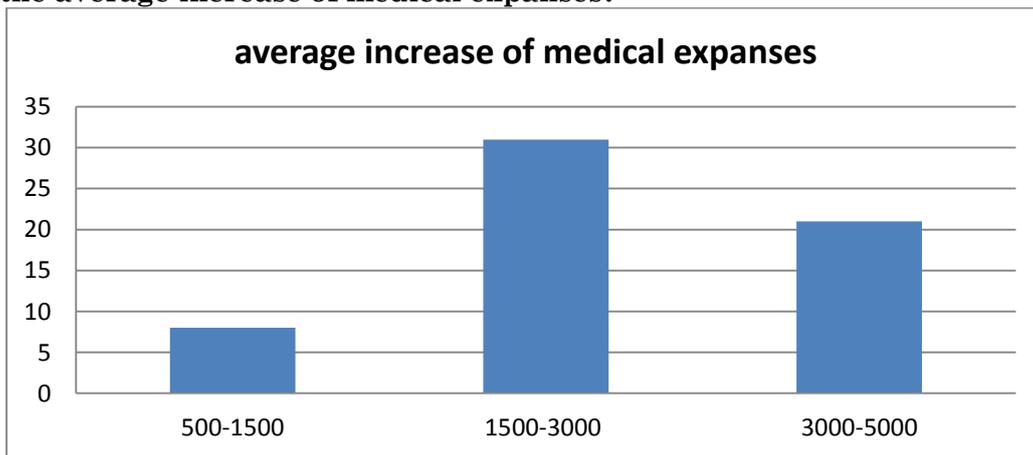
6. Which type of health issues?



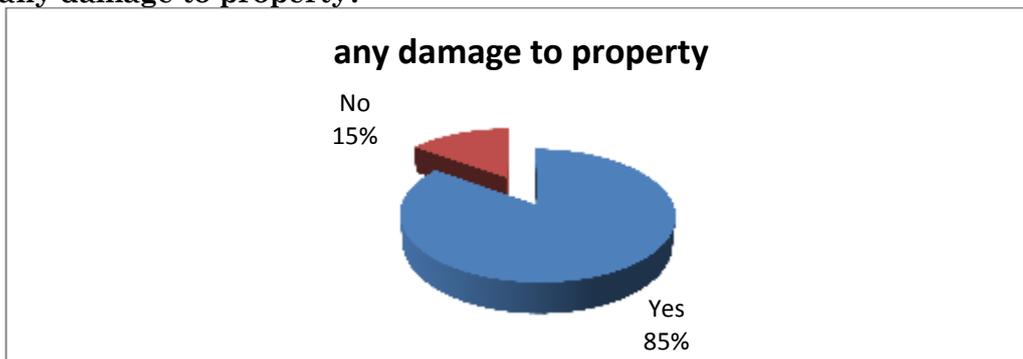
7. Did your medical expenses increased?



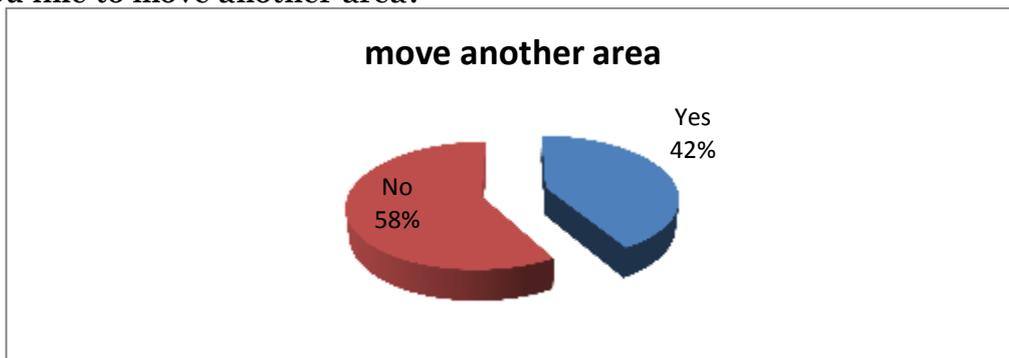
8. What is the average increase of medical expenses?



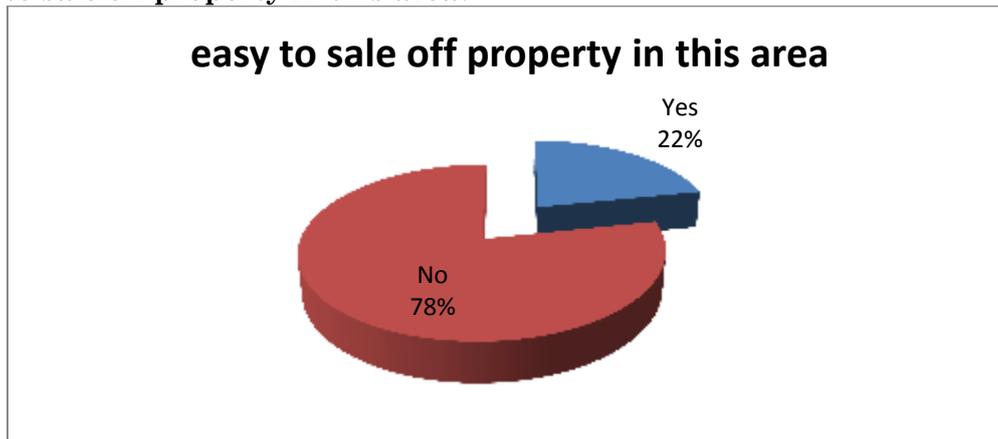
9. Is there any damage to property?



10. Would you like to move another area?



11. Is it easy to sale off property in this area?

**Finding & Conclusion**

From the above study we have find and conclude that

1. People residing in Ghugus areas suffering from serious health related issues like respiratory diseases, Asthmas and Bronchitis, Heart Problem, Nervous system Related Diseases.
2. There is significantly increase the expenses on medical treatment.
3. People are suffering due to continuous releasing pollutant in the environment so temperature of this area is always 2-4 degree high temperature as compare to other areas.
4. In Summer season people face lots of health challenges due to increasing temperature like as Sun Stokes, Diarrhea etc
5. There is a considerable damage to property because of operation of Lloyds Metal Probably.
6. It is difficult for people to move away from pollution as property rates are decreasing day by day.
7. Ghugus is one the biggest industrial area of the Chandrapur City but there were no more health and education facility as per industrial development

References:

1. <https://en.wikipedia.org/wiki/Ghugus>. (2022,, June 19). Retrieved Oct 06, 2022, from <https://en.wikipedia.org/wiki/Ghugus>: <https://en.wikipedia.org/wiki/Ghugus>
2. Joel Lalengliana Darlong Assistant Professor Agartala, T. I. (April 2012). *Social Problem*. Agartala, Tripura, India: Blogger.
3. kolkatta, C. N. (2007-08). *Social Cost of Air Pollution from Thaermal Power Station In west Bengal*. Delhi: The Energy Research Institute Delhi.
4. Manka Behl / TNN / Updated: A, 2. (2019, Aug 5). Ghugus air most toxic in Maharashtra: Study. *Times of India* , p. 22:26.
5. Monaj Kumar Tiwari, S. B. (2019). Environmental issues in Thermal Power Plants Review in Chhattisgarh Context. *Journal Of Material and Environment Sciences* , 1123-1134.
6. Narendran Kodandapani, C. f. (Jan 2007). Environmental Impacts of Thermal Power Plant: Case Study - Tamil Nadu. *Research Gate* .
7. Nelaturi, J. R. (2002, 12 31). *Industrial pollution and environmental protection A study with reference to the implementation of water act air act and environment act in Medak district Andra Pradesh*. Retrieved 09 26, 2022, from <https://shodhganga.inflibnet>: <https://shodhganga.inflibnet.ac.in/handle/10603/124109>
8. Pittsburgh, D. J. (1991). Social Issues in Management ; Theory and Research in Corporate Social Performance. *M Journal management* , 383-406.
9. Reserved, C. E. (2022). <https://www.conserve-energy-future.com/causes-effects-of-industrial-pollution.php>. Retrieved 10 06, 2022, from <https://www.conserve-energy-future.com>: <https://www.conserve-energy-future.com/causes-effects-of-industrial-pollution.php>

10. S. N. Shah, S. M. (March 2021). IMPACT OF INDUSTRIAL POLLUTION ON OUR SOCIETY. *Pakistan Journal of Science* , 73(1):222-229.
11. Tarique2, M. K. (January-March, 2015). Industrial Pollution in Indian Industries:. *Journal of Energy Research and Environmental Technology (JERET)* , 182-187.
12. Wikipedia, t. f. (n.d.). *Chandrapur Super Thermal Power Station*. Retrieved from https://en.wikipedia.org/wiki/Chandrapur_Super_Thermal_Power_Station.



**ANALYZING ENERGY EFFICIENCY IN OFFICE BUILDING: A CASE STUDY IN
RAIPUR, CHHATTISGARH**

Shanta Dash¹ Mahendra Joshi²

¹ Associate Professor, School of Architecture, Planning and Design, ITM University, Naya Raipur, India

² Professor, Lovely School of Architecture and Design, Lovely Professional University, Phagwara, Punjab, India

Corresponding Author- Shanta Dash

Email:- shantadash12@gmail.com

DOI- 10.5281/zenodo.7295629

Abstract:

The energy utilization in India is ascending in a quick scale, particularly the construction industry which adds to significant energy utilization. A need for energy proficient structures was felt in the past and quantities of structures were built with energy productive highlights in India. Endeavours have been made to study and dissect the first Energy efficient building in Raipur, Chhattisgarh to figure out how energy efficient buildings add to energy saving during inhabitancy. Likewise there is a need in the general public to grasp the significance and benefits of energy efficiency in structures, so structures should be built in enormous scope with energy efficient features regardless of whether the underlying expense of construction is more than the working expense.

Keywords: *Energy, Orientation, Energy Efficiency, Solar Panels, Egg crate devices*

Introduction:

More than 90% of the time we spend indoors is indoors, either at home or at work. Residential and commercial building energy use makes up a sizable portion of a nation's overall energy consumption. This proportion is significantly influenced by the degree of electrification, the degree of urbanisation, the amount of building space per person, the local and national policies that support efficiency, as well as the climate. Buildings use more energy than transportation and industry do in many nations. According to estimates from the International Energy Agency (IEA), the building industry accounts for 42% of all global electricity use.

The building industry includes a wide range of end use activities with various effects on energy demand. The energy efficiency of temperature control and lighting systems, which together make up the bulk of building energy usage in developed nations, depends not only on the efficiency of the structures in which they are used. For a specific group of

end applications, building designs and materials have a substantial impact on energy consumption. On the other hand, despite the fact that these end uses are nevertheless attributed to the building sector, building design has no impact on how much energy is used in cooking or by appliances. For some end users versus others, appliance efficiency matters more than for others. Due to their regular use, water heating and refrigeration each make for sizable portions of a building's energy consumption. Contrarily, due to their occasional use, cooking and small appliances (such as laptops and televisions) often account for only modest percentages of building energy consumption.

In general, industrialised nations have higher building energy use. As a result, development has a major impact on the energy demand from the building sector, suggesting that as nations get richer, building efficiency becomes more important. Due to the increasing rate of new construction and potential to use energy-efficient materials and best practices, the

importance of energy efficiency in the building sector is particularly important in emerging countries.

Due to the wide range of effects and end uses that the building industry encompasses, analysis of the sector yields contradictory results. Most building equipment, such as culinary appliances, lighting, heating and cooling systems, are produced and distributed as a result of international trade and a small number of multinational firms. The construction of buildings, on the other hand, is dominated by small regional businesses. Cement and wood are two common building materials that are important for efficiency (aluminium and steel are significant exceptions), although building procedures and materials differ greatly based on local resources, traditions, and environment. The building industry has one enduring characteristic, which is that it is heavily regulated. The usage of materials is frequently influenced by building rules, and both mandated and optional appliance standards significantly affect energy

efficiency. Insofar as they exist, regulatory regimes may thus offer a way to boost the effectiveness of both building construction and a variety of building appliances. Government activity at all levels is building-dependent, hence government operations in commercial buildings frequently account for a sizable portion of total building use. Governments may have a big impact on the building industry by using energy-efficient designs and materials themselves. To ensure economic progress, governments have a duty to guarantee a reliable energy supply. There is typically relatively little room between the current power supply and electricity demand in many emerging nations. It is necessary to bring new generations online to keep up with the rising demand due to increased power use from both existing customers and new connections. In addition, nations that rely heavily on hydroelectricity as their primary source of electricity are losing a lot of their generation capacity as a result of shifting climatic patterns and an elevated risk of drought, leading to strict power rationing.

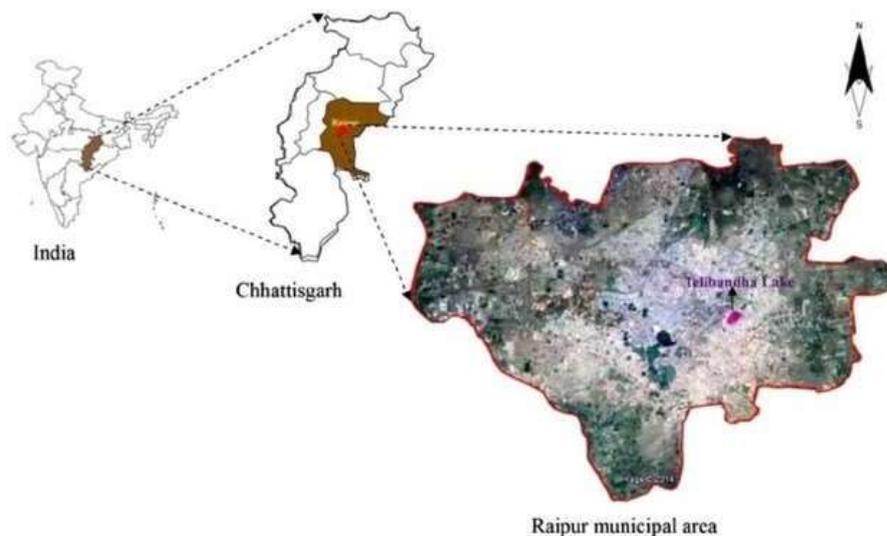


Fig 1: Showing Location of Raipur in Chhattisgarh.

About Raipur, Chhattisgarh

One of the cities in India that is rapidly rising is Raipur, the state capital of Chhattisgarh. Additionally, it serves as the district's administrative centre for Raipur. The largest city in the area is Raipur, which is also a hub of rapid growth for both industry and tourism. Near the centre of a vast plain, sometimes referred to as the "rice bowl of India," where thousands of different varieties of rice are grown, is where

Raipur is situated. From latitude 21° 23" to longitude 81° 65" is the Raipur district as shown in Fig 1.

Climate of Raipur, Chhattisgarh

Raipur has a tropical dry and wet climate. It is hot from March through June. On occasion, the temperature exceeds 48 °C (118 °F). Summertime breezes are sweltering and dry. The temperatures remain moderate for the remainder of the year. About 1,300 mm (51 inches) of rain fall on Raipur each year,

primarily from early July through the monsoon season. The South West monsoon winds bring rain to the state of Chhattisgarh. Although the minimum temperature can drop to 5 °C, winters are calm and pleasant. Winter season runs from November to January. Land surrounds the city of Raipur on all sides. The region's climate has been influenced by geographical factors such as the state's altitude and distance from the sea. As a result, the state experiences scorching summer weather with frequent gusts of dry wind. The temperature decreases somewhat in the winter.

Chhattisgarh State Electricity Regulatory commission (CSERC) Office Building at Raipur, Chhattisgarh

The Chhattisgarh State Electricity Regulatory commission (CSERC) Office

Building at Raipur, Chhattisgarh is known to be the first energy efficient building in Chhattisgarh. In the new State of Chhattisgarh, the CSERC sees itself as both a regulator and a promoter of the power sector. In order to realise the potential of this State to be a power hub of the nation, the CSERC shall work to establish the necessary conditions for the growth of the power sector in the State through increased investment in this sector, by guaranteeing the electricity industry a reasonable return, and by providing an open competitive environment. The CSERC will work to ensure that electricity is produced, transmitted, and distributed efficiently as well as supplied to customers at prices they can afford. Fig2: shows the view of CSERC building.



Fig 2: Chhattisgarh State Electricity Regulatory commission (CSERC) Office Building

Building Summary

- Location - Shanti Nagar, Raipur
- Site Area - 2400 m²
- Built up area - 2072 m²
- No. of floors - 03
- Gross Carpet Area - 1675 m²
- Total carpet area – 1334 sq. M
- Basic Architectural Signature - Southwest Umbrella
- Air conditioned office carpet area - 670m²
- Carpet area of non-conditioned service spaces -563 m²
- Occupancy hours - Day Time/ 2900hrs/Year
- Total AC installation - 59.5 TR
- Cooling option - Evaporative Type
- R.E. System Installed at site - 80KW SPV Power plant
- Net Energy Performance index (EPI) - (-)15KWh/m²/annum
- Implementation period - 2007 - 2010
- Owner - Chhattisgarh State electricity regulatory commission (CSERC)
- Executing agency - Chhattisgarh state housing board (CGHB)
- Architect - Ar. Tara Prasad Desai (Design group, Bhubaneswar)
- Structural consultant - Mr. Deepak Sanodiya (GEC Consultants)

- Renewable energy installation - Mr. Sanjeev Jain (Chief Engineer CREDA)
- Total project cost - Civil infrastructure -

3,76,00,000/-

Renewable 80 KW SPV - 1,24,92,000/



Fig 3: Site Plan of CSERC Office Building at Raipur, Chhattisgarh

Salient features of CSERC Office Building

The energy efficiency movement in non-domestic buildings like offices, schools, and factories gets underway with the CSERC building, Energy Efficient Complex. The structure has the following standout design elements:

- Optimisation of building envelope - The wall area exposed to outside – 28 Sq. M (fig 4 to 8)
- Modulation of orientation - Orientation of building made North – South for larger energy efficiency.
- Air conditioned & non-air conditioned spaces distributed effectively to rationalize heat gains for energy efficiency.
- Solar active and passive Techniques – were incorporated in the building like wall and roof insulation, shading, landscaping, natural day lighting, conductive and evaporative cooling, solar power plant, unique South west umbrella, cavity walls, energy-efficient lighting system.
- Wall insulation – double wall, air gap & thermocol (cavity insulated).(fig 11 & 19)
- Shading – Projections, overhangs, pergolas, trees and solar panels were positioned in such a way that the direct rays of the sun did not strike the building envelope. (fig 7,10,13 &15)
- Landscaping - Trees, shrubs, and grass have been used in the design of the area surrounding the structure, both within and outside of the boundary wall, as well as a large lawn in the West and South directions. Large trees around the border wall serve as a curtain to reduce noise pollution, air pollution, and to filter and chill incoming air. (fig 3)
- Natural day lighting - Office space designed to day lit with daylight.
- Conductive and evaporative cooling - Ferro cement baffles given in critical areas of façade to hinder unwanted conductive & transmitted heat gain. Evaporative duct able cooling facility for cooling non-ac spaces. (fig 9, 12 & 20)
- Unique Southwest Umbrella – An Umbrella has been designed consisting of solar panels in the Southwest position of the building which serves multiple purposes like shading of external walls, providing aesthetics to the building and at the same time collecting solar energy from the Southwest direction. (fig 7)
- Energy-efficient lighting system
- Use of low energy/ waste for construction
- Installation of energy efficient (star rated) gadgets and equipment's (fig 13 & 14)

Grid interactive Solar PV Power Plant 80 KW (fig 7, 10 & 13)



Fig 4: Front view from west side during construction



Fig 5: Front view without Southwest Umbrella



Fig 6: View from Entrance



Fig 7: View from Northwest side



Fig 7: Southwest Umbrella as shading device



Fig 8: Tower at Entrance



Fig 9: Egg crate shading device



Fig 10: Solar panels

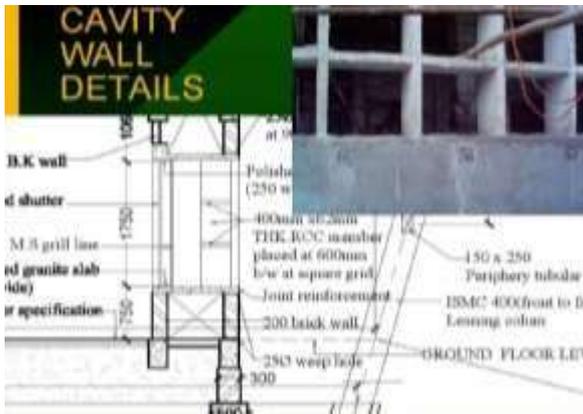


Fig 11: Cavity Wall details

Fig 12: Egg crate shading device

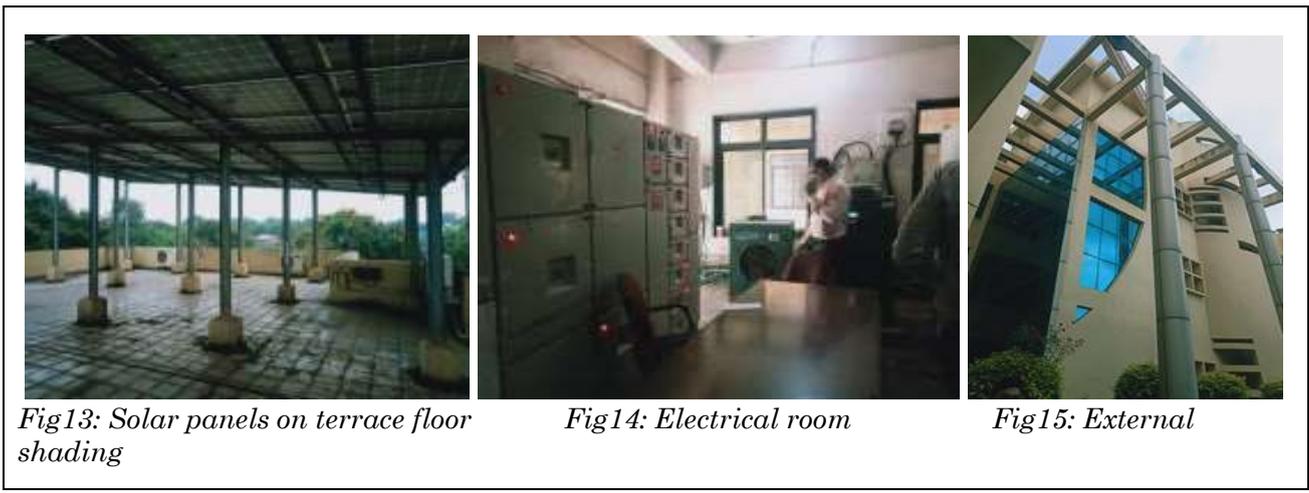


Fig13: Solar panels on terrace floor shading

Fig14: Electrical room

Fig15: External



Fig16: Window fins during construction



Fig17: West side view during construction



Fig 20: Egg crate devices during construction



SPV PP Configuration

- PCU Based rooftop off grid systems of 80 KWp
- Total number of modules - 372
- Module configuration:
 - 192 modules of 225 Wp
Stringed 16 modules in each line, 4 String junction box, 2 Array junction box and 1 Main junction box
 - 180 modules of 230 Wp
Stringed 16 modules in each line, 4 String junction box, 2 Array junction box and 1 Main junction box
- Battery bank capacity - 240 V, 300AH



Fig21: Solar panels



Fig22: Power generation room

Consumption data of CSERC Building

Table1: Consumption data of CSERC building (July 2011 - June 2012)

Month	Total Solar Generation (KWh)	Total Solar units export to CSEB (KWh)	CSEB Consumption in building (KWh)	Solar consumption in building (KWh)	Total Consumption in building (KWh)
A	B	C	D	E=(B-C)	F=(D+E)
July 11	7039	2400	4954	4639	9593
Aug 11	6311	2565	5016	3746	8762
Sept 11	6217	2646	4342	3571	7913
Oct 11	7384	3052	3890	4332	8222
Nov 11	7061	3635	2974	3426	6400
Dec 11	6478	3082	2948	3396	6344
Jan 12	6826	3546	3020	3280	6300
Feb 12	7805	4170	2562	3635	6197
Mar 12	9304	3305	4606	5999	10605
Apr 12	8682	2965	6079	5717	11796
May 12	8030	2194	7074	5836	12910
Jun 12	5512	1683	5481	4929	11410
Total	87749	35243	53946	52506	106452

Table 2: Consumption data of CSERC building (July 2012 - June 2013)

Month	Total Solar Generation (KWh)	Total Solar units export to CSEB (KWh)	CSEB Consumption in building (KWh)	Solar consumption in building (KWh)	Total Consumption in building (KWh)
A	B	C	D	E=(B-C)	F=(D+E)
July 12	5598	1055	4425	4543	8968
Aug 12	5322	1553	3578	3769	7347
Sept 12	7214	2193	4054	5021	9075
Oct 12	6975	3190	3689	3785	7474
Nov 12	6461	3255	3086	3206	6292
Dec 12	7028	3691	2869	3337	6206
Jan 13	7427	3856	2702	3571	6273
Feb 13	7484	3350	2045	4134	6179
Mar 13	8337	2874	3465	5463	8928
Apr 13	9371	2241	5391	7130	12521
May 13	8397	1055	10666	7342	18008
Jun 13	7638	1531	8389	6107	14496
Total	87252	29844	54359	57408	111767

Table 3: Consumption data of CSERC building (July 2013 - June 2014)

Month	Total Solar Generation (KWh)	Total Solar units export to CSEB (KWh)	CSEB Consumption in building (KWh)	Solar consumption in building (KWh)	Total Consumption in building (KWh)
A	B	C	D	E=(B-C)	F=(D+E)
July 13	6317	1282	6438	5035	11473
Aug 13	6234	2202	4846	4032	8878
Sept 13	6977	2045	5094	4932	10026
Oct 13	4474	1587	4897	2887	7784
Nov 13	6086	2722	3248	3364	6612
Dec 13	7279	3376	2363	3903	6266
Jan 14	6825	2574	2397	4251	6648
Feb 14	7549	3639	2304	3910	6214
Mar 14	8431	3104	3791	5327	9118
Apr 14	8412	2812	6436	5600	12036
May 14	8377	2385	9937	5992	15929
Total	76961	27728	51751	49233	100984

Energy Savings

1. Period July 2011 - June 2012

- Total generation from SPV Power plant - 87749 kWh
- Solar units exported to CSEB Grid - 35243 kWh
- Total units imported from CSEB Grid - 53946 kWh/ year
- Total floor area of the building - 2072 m²

• Net EPI - 26.04 kWh/ M²

2. Period July 2012 - June 2013

- Total generation from SPV Power plant - 87252 kWh
- Solar units exported to CSEB Grid - 29844 kWh
- Total units imported from CSEB Grid - 54359 kWh/ year
- Total floor area of the building - 2072 m²

• Net EPI - 26.24 kWh/ M²

3. Period July 2013 - June 2014

- Total generation from SPV Power plant - 76961 kWh
- Solar units exported to CSEB Grid - 27728 kWh
- Total units imported from CSEB Grid - 51751 kWh/ year
- Total floor area of the building - 2072 m²

• Net EPI - 24.98 kWh/ M²

Advantages of the CSERC Building

- Saving in overall energy consumption
- Reduction in lighting consumption
- Considerable reduction in recurring expenditure
- Clean and pollution free environment
- Considerable thermal comfort
- High Productivity

Conclusions

Energy efficiency in buildings has a crucial role to play in enhancing energy security in emerging countries given the present rate of urbanisation and the ensuing rise in energy demand. Governments should share the responsibility and cost of guaranteeing supply security with end users through energy efficiency because of the rising cost of complexity of new energy sources and the rising cost of energy. The design of buildings and appliances has benefited technologically, creating new chances for energy reduction. Furthermore, there is a great potential for savings because many of these technologies have not yet been adopted by poor nations. Without a legislative and regulatory framework in place, it is doubtful that anything will change because of resistance to change and the expense of achieving energy savings. One major obstacle is the lack of

knowledge regarding building energy consumption patterns and prospective opportunities. Therefore, it is important to comprehend and incorporate energy efficiency into building design when creating a structure.

References

1. Tombazis, A. N., & Preuss, S. A. (2001). Design of passive solar buildings in urban areas. *Solar Energy*, 70(3), 311-318.
2. Santamouris, M., & Dascalaki, E. (2002). Passive retrofitting of office buildings to improve their energy performance and indoor environment: the OFFICE project. *Building and Environment*, 37(6), 575-578.
3. Zain-Ahmed, A., Sopian, K., Othman, M. Y. H., Sayigh, A. A. M., & Surendran, P. N. (2002). Daylighting as a passive solar design strategy in tropical buildings: a case study of Malaysia. *Energy conversion and management*, 43(13), 1725-1736.
4. Campbell, J. (2003). Use of passive solar energy in offices. *Passive Solar Energy in Buildings: Watt Committee: Report Number 17*, (17), 23.
5. Tavares, P. F. D. A. F., & Martins, A. M. D. O. G. (2007). Energy efficient building design using sensitivity analysis—A case study. *Energy and Buildings*, 39(1), 23-31.
6. Chan, H. Y., Riffat, S. B., & Zhu, J. (2010). Review of passive solar heating and cooling technologies. *Renewable and Sustainable Energy Reviews*, 14(2), 781-789.
7. Verbruggen, A., Al Marchohi, M., & Janssens, B. (2011). The anatomy of investing in energy efficient buildings. *Energy and buildings*, 43(4), 905-914.
8. Stevanović, S. (2013). Optimization of passive solar design strategies: A review. *Renewable and Sustainable Energy Reviews*, 25, 177-196.
9. Zhou, Z., Zhang, S., Wang, C., Zuo, J., He, Q., & Rameezdeen, R. (2016). Achieving energy efficient buildings via retrofitting of existing buildings: a case study. *Journal of Cleaner Production*, 112, 3605-3615.
10. Bejan, A. S., & Catalina, T. (2016). The implementation of phase changing materials in energy-efficient buildings. Case study: eFdeN project. *Energy Procedia*, 85, 52-59.



RECENT TRENDS AND DEVELOPMENT IN THE LIVESTOCK SECTOR: A DESCRIPTIVE ANALYSIS

Susanthika S

PhD. Scholar, Central University of Tamil Nadu, Thiruvavur, Tamil Nadu

Corresponding Author- Susanthika S

Email:- susanthika.625@gmail.com

DOI- [10.5281/zenodo.7295631](https://doi.org/10.5281/zenodo.7295631)

Abstract:

India has a vast geographical area covered by a considerable population. The country is rich in resources while the population is diverse in language, religion, caste, taste and preference. Livestock production and consumption have both negative and positive aspects. Thus, the objective is to study recent trends and development in the livestock sector to understand the balance between the benefits and the losses of this sector. Secondary data from various government sources has been compiled for analysis. Simple descriptive statistics and tabulations have been used for analysis. The results show that the total livestock increases tremendously during 1951-2019. The largest population is cattle though the goat population grew faster than any other livestock. At the same time, the poultry population increased almost ten times. The growth in the livestock population is volatile. Even though the GVA of agriculture & allied is greater than the GVA of livestock, the percentage share of GVA from livestock is increasing, and the percentage share of GVA from agriculture & allied is falling. The amount of output from the livestock sector at the current price has increased for all the listed items during 2011-2019.

Keywords: Livestock, Production, Consumption, Employment, GHG Emission

Introduction

In the last four decades, human and livestock populations have grown at various speeds, i.e., the human population in 1997 increased twice the number it was in 1961, while the livestock population differ by their types (Tisdell & Gali, 1999). With the increasing population, there exists pressure on food production to fulfil the growing demand. Consumption of food is the most elementary need for human beings to live. Thus, there is a need to study food practices to improvise agriculture to improve human health, hygiene and a balanced ecosystem (Devi et al., 2014). A significant share of the population in India relies on agricultural activity, which is not much literate and not skilled. Agriculture is subject to season and cannot provide income all over the year; however, livestock activity is the best substitute for agriculture which can use labour in the time of emergency and earn a livelihood. Thus, livestock is known as “moving banks” for the landless population; it plays the role of assets and can even be used for taking loans from informal lenders in

rural areas (Dash, 2017). In India, approx. 20.5 million population considers livestock as their primary source of livelihood, mainly women. Even livestock accounting from one to three can also generate enough income for poor rural households to survive. The livestock sector acts as a backbone for agriculture as it increases crop quality and its nutritional value keeping account of soil health, it even provides employment at the time of distress in cultivation or even acts as a safety net or substitute of insurance in case of crop damage, and the surplus from livestock exports adds up to the foreign reserve in India (Suthar et al., 2019). Livestock production has both negative and positive impacts on the environment. The positive link is the balance between crop and animal by mixed farming, i.e., waste from cultivation is used as feed for animals and debris from the animal is used as an organic fertilizer for cultivation which restores nutritional values to soils and maintains soil quality. This mixed farming is well practised in India, which is used to prevent vast species of flora, fauna, and biodiversity and

act against soil degradation (Tisdell & Gali, 1999). The waste from livestock act as the natural manure for cultivation, while in rural India, dung is a fuel source mainly for cooking. This sector also acts as a safety net for rural households in poverty as it is helpful to sell during distress (Islam et al., 2016). The livestock sector can help reduce poverty in rural areas and advance gender equity; in the 1980s, more than half of the labour requirement in the livestock sector was fulfilled by women labourers, and it even increased to almost three-fourth in the 1990s. Although female labour participation in cultivation was the same, it even declined for non-farm activities in the same period (Ali, 2007b).

But the increasing population and demand for livestock products have created an imbalance between grazing land and cultivation land. One of the demerits of the Green Revolution was that it negatively affected the relationship between cultivation and livestock uses. On one side, the traditional technology and organic manure were replaced with tractor and chemical fertilizer. On the other side, the population of cattle is growing at a lower rate than the buffalo population from 1979-1997 because cattle as the source of draught power was replaced by tractors (Tisdell & Gali, 1999) (BIRTHAL & Rao, 2002).

An increase in the number of species variety as well as in the number of pigs, goats, buffalo and Poultry at a greater rate than other livestock. This sector is experiencing growth while adjusting to technological, economic and environmental changes (BIRTHAL & Rao, 2002). The concentration of a variety of livestock population differ according to the nature of the climate; other than buffalo and pigs, rainfed regions generally have the highest density of all the livestock populations. Buffalos are reared more in the irrigated area than other livestock (Kumar & Singh, 2008). One of the major concerns is the shift of livestock breeds from domestic/ Indian species to more yield imported breeds. This has various drawbacks, starting from more water consumption, feed, and adaptability to changing climate and battle disease (Khan & Bidabadi, 2004). The livestock sector is even responsible for a large amount of water use;

about 8% of the water used by humans is majorly utilized to irrigate feed crops. The main reason for water pollution is livestock residual, pesticides and fertilizers used in feed crops (H. Steinfeld et al., 2006). Even a large amount of carbon is emitted from deforestation for pasture, cultivating feed and fodders (FAO, 2009).

Livestock production has been intensified in the presence of feed scarcity, resulting in environmental degradation, land and water pollution, deforestation and emission of GHG (Tisdell & Gali, 1999). The livestock sector is responsible for 18% of GHG emission CO₂ equivalent (H. Steinfeld et al., 2006).

To match the growing demand for livestock products, the availability of feed and fodder is the most significant factor for growth in the livestock sector. The Indian livestock sector is highly dependent on grazing lands, plant residues and its livestock products for feeding livestock. According to NSSO (54th Round, Common Property Resources), the land assigned for fodder crops is 2% approx. Of the total cropped land. However, the difference in allotment of cropped land is conspicuous. The proportion of area cultivated for fodder is not balanced with the livestock population, which is dependent on that fodder in the rainfed region as the farmers in this region are growing fodders in the least amount of land (Kumar & Singh, 2008).

The growth in the livestock sector is greater than the growth in crop cultivation, as, in 1997-98, the share of the livestock sector in agricultural GDP increased to almost 23% from just 14% in 1980-81 (BIRTHAL & Rao, 2002).

In 2012-13, the share of agriculture and allied sector to total GDP was 15.1%, of which the percentage of livestock was almost 27.25% in India (Islam et al., 2016).

Since 1960, milk production has trebled due to the increase in milking livestock population and technological upgradation in per animal productivity. The milk production was higher in buffalo than cow as it is rich in milk yield efficiency in lactating, good quality and quantity just by using regular feeds. At the same time, milk distribution was facilitated by "Operation Flood" programs in the beginning of the 1970s, which connected poor and below marginal households engaged

in milking activity to the urban milk supplier and markets where the demand was very high for dairy cooperatives. This benefited the producer and consumer by generating regular employment and income for poor milk producers for the whole year and distributing the milk to a massive population of milk consumers (Tisdell & Gali, 1999) (Ali, 2007a). In 2017-18, India was the highest milk producer; in egg production, it was in third place, and for wool, it was in ninth place in the whole wide world (Suthar et al., 2019).

Continuous development and technological invention in the livestock sector have promoted a shift from small and marginal landholder mixed farms to a large-scale production industry, increased supply and demand in developing countries and rising importance of international marketing. All these shifts will promote sustained livestock production, food security, health and hygiene, and eradication of poverty (FAO, 2009). According to ICMR, the per capita availability of milk should be 285g per day, which is lower than the actual figure in India as it has doubled from 130g per day in 1950-51 to

299g per day in 2012-13 (Islam et al., 2016). The rise in income per capita, urbanization, taste and preference for diet nutrition significantly increase the demand for livestock products. This increasing demand for livestock and payment from export gives high scope for the agricultural sector to flourish and decrease the poor population in rural India (Ali, 2007b).

The composition of the basket of diet slowly varies from vegetarian to more livestock-based products. The share of spending on livestock products from total food spending was 14% approx. In 1972-73, which rose to 20% in 1993-94 and is expected to rise in future with increasing livelihood and lifestyle (Birthal & Rao, 2002). When the livelihood of low-income groups increases, one of the initial effects is shown in their diet as they shift their diet to more animal-based products (Khan & Bidabadi, 2004). This significant shift in consumption and production of livestock products marks the Livestock Revolution, which is primarily demand-driven. In contrast, the Green Revolution was supply-driven, technological,

seeds, fertilizer and cereal-based. All the developing countries witnessed the Livestock Revolution but were highly conquered by Brazil, China and India (Khan & Bidabadi, 2004). These three countries produce two-thirds of the meat in developing countries and more than half of the milk production (H. Steinfeld et al., 2006). During 1980-04, the income from Indian livestock exports enlarged tremendously, resulting in a growth rate of 8% per year. However, the import of livestock decreased. The highest trading partners were African and Asian countries. For further growth in the international market, there was a need to increase the hygiene and quality of products from the livestock sector. There was a visible change in the trend of exports in the initial 1990s, that is, the shift of diet from plant-based to more meat-oriented diet due to which export of meat products grew and a significant fall in import of milk products. The liberalization fuelled the exports and share of the Indian livestock sector in the international market, which led to surplus trade in this sector (Ali, 2007b). The per capita spending on cereal has been decreasing, and on livestock has been mainly increasing (Ali, 2007a). The consumption expenditure on livestock products in both rural and urban have increased significantly. However, cereal is still the primary food consumed, followed by livestock in India (V. P. Gandhi & Zhou, 2010) (Vasanth P. Gandhi & Mani, 1995).

Due to the price of Poultry, there has been a rise in its consumption in both urban and rural areas. Though the consumption of beef and buffalo is subject to traditions, recently, it has been increasing (Ali, 2007a). The consumption of livestock products, other than egg and mutton meat, is highly price elastic, signifying that lower the price will be the consumption, visa versa. With the increase in per capita income of the household, the spending on milk and milk products, prawn, fish and chicken is more than on other animals (Chengappa et al., 2016). The livestock consumers are more urban than rural (Ali, 2007a).

The livestock sector is related to various aspects starting from economic growth, employment, poverty, cultivation, soil quality, food security, exports, and most importantly, climate change. Therefore, a

need to study the recent trends and developments in the livestock sector.

Materials and Methods

The data used in this study is primarily based on secondary data, various reports and publications from the government of India. The data on livestock population for all the species (1951-2019) is taken from the livestock census, which is collected on a quinquennial basis by the Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture. The GVA from the agricultural, allied, and livestock sectors for eight years from 2011-12 to 2018-19 is collected from National Accounts Statistics by Central Statistical Organisation, GOI. Whereas the data on the value of output from the livestock sector, the current price of all the livestock products from 2011-12 to 2018-19 is gathered from National Accounts Statistics by Central Statistical Organisation, GOI. The data is analyzed using simple descriptive statistics like percentages and change. The results are presented in simple tabulation format.

Results

The livestock sector collected in the census are Cattle, Buffalo, Sheep, goats, pigs, Horses & Ponies, Mules, Donkeys, Camels, Mithun and Yak. The trend shows that the cattle population increased from 1951 till 1992 and gradually started falling and rising only after 2003. This is mainly because of technological innovations and the replacement of cattle, which were used for draught power, replaced with tractors. An increase in demand for milk and milk products is clearly shown in the rise of milking animals like adult female cattle, buffalos and adult female buffalos. The population of all three bovines increased steadily without any fall from 1951-2019. Even the people of sheep grew. There is a significant rise in the goat population, i.e., more than three-fold showing the increase in demand for mutton meat worldwide. Similar to the goat population, the pig population also increased in this period, marking the expansion of the consumption of pig meat. The highest population rise was in Poultry, as it is the least priced meat of all the livestock. At the same time, the population of horses and ponies, camels, and donkeys decreased. Overall the livestock population increased during 1951-2019, showing the

importance of the livestock sector (as shown in table 1).

The percentage of change was highest in 1956-61 as cattle increased by 10.7%. The growth in the livestock population is not steady but rather involves a fluctuating trend. Recently there has been slow down growth of the cattle population; in 2012-2019, it increased by only 0.8%, whereas buffalo grew by 1.1%; the increase in sheep population is the highest of all livestock at 14%, followed by goats population which increased by 10.1%. Other livestock shows a negative growth during 2012-19. Overall, the livestock population increased by 4.6% in 2012-19. While the poultry population increased by 16.8% (as shown in table 2). The gross value added at the current price for agriculture, allied, and livestock sectors increased from 2011-2019. In 2011-12 the total GVA from the agriculture and livestock sector was 8,106,946, which grew to 17,139,962 in 2018-19. Although the amount of GVA from agriculture and allied is much more than the livestock sector and is increasing at a higher rate, its percentage share of total GVA (17.1% in 2018-19) is falling. In the livestock sector, the amount of GVA at current price is increasing, and the percentage share of total GVA (5.1% in 2018-19) is also growing. This shows the potential of the livestock sector to support the agriculture and allied sector (as shown in table 3).

The value of the milk group at the current price has almost doubled during 2011-2019. While the value of the meat group has increased more than twice the amount, it was, i.e., from 96,219 cr. In 2011-12 to 242,629 cr. in 2018-19, making it the highest valued item in all the groups. Under meat, the highest valued out is poultry meat, and second, most are mutton, followed by beef during 2011-2019. The by-products include hides, skin and others, and the value of these outputs is increasing over the eight years (2011-19). The value of increment in stock has increased by four times. The total value of output at the current price from the livestock sector has increased tremendously from 487,751cr. in 2011-12 to 1,159,636cr. in 2018-19 (as shown in table 4).

Discussions

The livestock sector plays an important role all over the world. With the increase in the production and consumption of livestock products, there have been various impacts, both positive and negative. It is noticeable that the livestock sector is growing at a faster rate than the agricultural sector, and its contribution to GDP is also higher. There is a shift in the diet of the Indian population to the western diet, which is more meat-oriented. Livestock production is more demand-driven, i.e., with the increase in demand for livestock products, there is an increase in livestock production. Goats and buffalo are increasing at the highest rate in all the livestock populations, while cattle remain the highest in the total population, but it is decreasing over the years. The livestock sector holds a large share of GVA. And the value of output is highest for the meat group, followed by the milk group, dung and egg. This shows high demand for milk

Tables

Table1: Livestock Population in India by Species (Million numbers)

Species	195 1	195 6	196 1	196 6	197 2	197 7	198 2	198 7	199 2	199 7	200 3	200 7	201 2	201 9
Cattle	155. 3	158. 7	175. 6	176. 2	178. 3	180. 0	192. 5	199. 7	204. 6	198. 9	185. 2	199. 1	190. 9	192. 5
Adult Female Cattle	54.4	47.3	51.0	51.8	53.4	54.6	59.2	62.1	64.4	64.4	64.5	73.0	76.7	81.4
Buffalo	43.4	44.9	51.2	53.0	57.4	62.0	69.8	76.0	84.2	89.9	97.9	105. 3	108. 7	109. 9
Adult Female Buffalo	21.0	21.7	24.3	25.4	28.6	31.3	32.5	39.1	43.8	46.8	51.0	54.5	56.6	55.0
Total Bovine s	198. 7	203. 6	226. 8	229. 2	235. 7	242. 0	262. 2	275. 7	288. 8	288. 8	283. 1	304. 4	299. 6	302. 3
Sheep	39.1	39.3	40.2	42.4	40.0	41.0	48.8	45.7	50.8	57.5	61.5	71.6	65.1	74.3
Goat	47.2	55.4	60.9	64.6	67.5	75.6	95.3	110. 2	115. 3	122. 7	124. 4	140. 5	135. 2	148. 9
Horses and Ponies	1.5	1.5	1.3	1.1	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.6	0.6	0.3
Camels	0.6	0.8	0.9	1.0	1.1	1.1	1.1	1.0	1.0	0.9	0.6	0.5	0.4	0.3
Pigs	4.4	4.9	5.2	5.0	6.9	7.6	10.1	10.6	12.8	13.3	13.5	11.1	10.3	9.1
Mules	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1
Donkeys	1.3	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.7	0.4	0.3	0.1
Yak	NC	NC	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Mithun	NA	0.2	0.2	0.3	0.3	0.3	0.4							
Total Livesto ck	292. 9	306. 6	336. 5	344. 5	353. 2	369. 4	419. 6	445. 2	470. 9	485. 4	485. 0	529. 7	512. 1	535. 8
Poultry	73.5	94.8	114. 2	115. 4	138. 5	159. 2	207. 7	275. 3	307. 1	347. 6	489. 0	648. 8	729. 2	851. 8

Susanthika S

and red meat in India is increasing at a higher rate. But this increased demand has put pressure on livestock production, leading to intensification of production. This adversely affects climate, soil health, water pollution, and the health of humans and animals as well. However, the livestock sector provides livelihood to a significant share of the population and also has plenty of benefits like nutritional values, a safety net at the time of distress, etc. However, the question is, is it worth putting our environment at risk for the benefits humans derive from the livestock sector? The government should implement a suitable policy for sustainable growth in the livestock sector. There is a need for research and development in the livestock sector as it does not end with sustainability but also conserving natural resources and restoring the environmental losses incurred during livestock production and consumption.

Source: Livestock Census, DAHD&F, GoI

Table 2: Change in Livestock Population by Species from 1951 to 2019 (%)

Species	1951-56	1956-61	1961-66	1966-72	1972-77	1977-82	1982-87	1987-92	1992-97	1997-03	2003-07	2007-12	2012-19
Cattle	2.2	10.7	0.3	1.2	1.0	6.9	3.8	2.5	-2.8	-6.9	7.5	-4.1	0.8
Buffaloes	3.5	14.0	3.5	8.3	8.0	12.6	8.9	10.9	6.8	8.9	7.6	3.2	1.1
Sheep	0.5	2.3	5.5	-5.7	2.5	18.9	-6.3	11.1	13.2	6.9	16.4	-9.1	14.1
Goats	17.4	9.9	6.1	4.5	12.0	26.0	15.7	4.6	6.5	1.3	13.0	-3.8	10.1
Horses & ponies	0.0	-13.3	-15.4	-18.2	0.0	0.0	-11.1	2.5	1.2	-9.6	-18.6	2.1	-45.6
Camels	33.3	12.5	11.1	10.0	0.0	-1.8	-7.4	3.0	-11.7	-30.8	-18.2	-22.6	-37.1
Pigs	11.4	6.1	-3.9	38.0	10.1	32.5	5.6	20.3	3.9	1.7	-17.7	-7.5	-12.0
Mules	-33.3	25.0	60.0	0.0	12.5	44.4	30.8	11.8	15.8	-18.2	-22.1	43.1	-57.1
Donkeys	-15.4	0.0	0.0	-9.1	0.0	2.0	-5.9	1.0	-9.3	-26.1	-32.6	-27.2	-61.2
Yaks	-	-	50.0	33.3	225.0	0.0	-69.2	50.0	0.0	0.0	28.0	-7.2	-25.0
Total Livestock	4.7	9.4	2.6	2.8	4.4	13.7	6.1	5.7	3.1	-0.1	9.2	-3.3	4.6
Poultry	29.0	20.5	1.1	20.0	15.0	30.5	32.5	11.5	13.2	40.7	32.7	12.4	16.8

Source: Livestock Census, DAHD&F, GoI

Table 3: Share of Agriculture & Allied and Livestock Sector in GVA (₹ Crore)

At Current Prices					
Year	GVA (Total)	GVA (Agriculture & Allied)		GVA (Livestock Sector)	
		Amount	% Share to total GVA	Amount	% Share to total GVA
2011-12	8,106,946	1,501,947	18.5	327,334	4.0
2012-13	9,202,692	1,675,107	18.2	368,823	4.0
2013-14	10,363,153	1,926,372	18.6	422,733	4.1
2014-15	11,504,279	2,093,612	18.2	510,411	4.4
2015-16	12,574,499	2,227,533	17.7	582,410	4.6
2016-17	13,965,200	2,518,662	18.0	672,829	4.8
2017-18	15,513,122	2,796,908	18.0	785,180	5.1
2018-19	17,139,962	2,922,846	17.1	871,884	5.1

Source: National Accounts Statistics-2020, Central Statistical Organisation, GoI

Susanthika S

Table 4: Value of output from Livestock Sector

Value of Output from Livestock sector- At Current Prices in Rs. Crore								
Item	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
1 Milk Group	327,767	372,228	423,150	495,835	560,823	629,259	707,601	772,705
2 Meat Group	96,219	114,995	136,663	154,152	171,636	206,691	222,655	242,629
2.1 Meat	88,469	105,828	126,211	142,195	158,640	192,015	206,869	224,928
2.1.1 Beef	11,754	14,324	16,596	20,587	25,020	26,534	27,680	30,625
2.1.2 Mutton	32,667	38,878	44,212	50,176	53,396	63,184	69,695	75,668
2.1.3 Pork	4,465	4,886	5,783	6,119	5,431	6,637	6,211	6,613
2.1.4 Poultry Meat	39,583	47,740	59,620	65,313	74,793	95,660	103,283	112,022
2.2 Meat Products	3,346	3,975	4,539	5,244	5,649	6,557	7,125	7,766
2.3 By-Products	4,404	5,192	5,914	6,713	7,347	8,120	8,662	9,935
2.3.1 Hides	1,887	2,213	2,546	2,852	3,194	3,325	3,439	4,296
2.3.2 Skins	1,189	1,396	1,561	1,760	1,867	2,153	2,351	2,503
2.3.3 Other By Products	1,328	1,583	1,807	2,101	2,287	2,642	2,872	3,136
3 Eggs	16,633	19,690	22,708	24,382	26,657	29,777	32,513	36,691
4 Wool & hair	496	539	584	578	541	628	611	745
5 Dung	32,599	40,453	43,079	45,455	48,478	53,754	59,825	65,383
6 Silk Worm Cocoons and Honey	4,326	4,947	6,286	6,930	7,606	8,945	10,185	10,036
7 Increment in Stock	9,710	12,086	13,708	15,474	17,757	21,624	25,406	31,447
Value of Output from Livestock Sector	487,751	564,937	646,178	742,807	833,498	950,677	1,058,796	1,159,636

Source : National Accounts Statistics 2020, Central Statistical Organisation, GoI

References

1. Ali, J. (2007a). Livestock sector development and implications for rural poverty alleviation in India. *Livestock Research for Rural Development*, 19(2).
2. Ali, J. (2007b). Structural changes in food consumption and nutritional intake from livestock products in India. *South Asia*
3. Birthal, P. S., & Rao, P. P. (2002). *Technology Options for Sustainable Livestock Production in India*.
4. Chengappa, P. G., Umanath, M., Vijayasathy, K., Babu, P., & *Research*, 27(2), 137-151. <https://doi.org/10.1177/026272800702700201>

Susanthika S

- Manjunatha, A. V. (2016). Changing demand for livestock food products: An evidence from Indian households. *Indian Journal of Animal Sciences*, 86(9), 1055–1060.
5. Dash, S. (2017). *Contribution of Livestock Sector to Indian Economy*. 890–891. https://www.worldwidejournals.com/paripex/file.php?val=January_2017_1483613920_159.pdf
 6. Devi, S. M., Balachandar, V., Lee, S. I., & Kim, I. H. (2014). An outline of meat consumption in the Indian population-A pilot review. *Korean Journal for Food Science of Animal Resources*, 34(4), 507–515. <https://doi.org/10.5851/kosfa.2014.34.4.507>
 7. FAO. (2009). The State of Food and Agriculture. In *FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS*. <https://doi.org/10.1097/00010694-196304000-00017>
 8. Gandhi, Vasanth P., & Mani, G. (1995). Are Livestock Products Rising in Importance? A study of the Growth and Behaviour of Their Consumption in India. *Indian Journal of Agricultural Economics*, 50(3, July-sept.), 283–293.
 9. Gandhi, V. P., & Zhou, Z. (2010). Rising Demand for Livestock Products in India. *Australasian Agribusiness Review*, 18, 103–135.
 10. H. Steinfeld, Gerber, P., Wassenaar, T., Castel, V., Rosales, M., & Haan, C. de. (2006). Livestock's long Shadow environmental issues and options. In *FAO*.
 11. Islam, M. M., Anjum, S., Modi, R. J., & Wadhvani, K. N. (2016). The scenario of livestock and Poultry in India and their contribution to the national economy. *International Journal of Science, Environment and Technology*, 5(3), 956–965.
 12. Khan, A. A., & Bidabadi, F. S. (2004). Livestock Revolution in India: Its Impact and Policy Response. *South Asia Research*, 24(2), 99–122. <https://doi.org/10.1177/0262728004047907>
 13. Kumar, A., & Singh, D. K. (2008). Livestock production systems in India: An appraisal across agroecological regions. *Indian Journal of Agricultural Economics*, 63(4), 577–597.
 14. Suthar, B., Bansal, R. k, & Gamit, P. (2019). An Overview of Livestock Sector in India. *International Journal of Pure & Applied Bioscience*, 7(5), 265–271. <https://doi.org/10.18782/2320-7051.7845>
 15. Tisdell, C., & Gali, J. (1999). *Trends and Developments in India's Livestock Industry*. 31, 1–34. https://espace.library.uq.edu.au/data/UQ_315136/WP43.pdf?Expires=1558163744&Signature=NKw7nCwDIXjcRGdh-Y1SIVik4lpyO-Ow23bLiD9Isz-Or7orWA5CJFFhLerbCfKnW9HvPNjjoJRlSSJrbS9~R4xmzMpItuPAcf1KrBOSoAMDjXgPwBwmUUnOlW3r-UdRlQp8wg2Plw1-O2ShJYRdVdhEqDjPS3Jbb7jHIu4Io



NATURAL RESOURCES AND LAWS!

Dr. Prakash Laxmanrao Dompale

Shri Shivaji Law College, Kandhar, Dist.-Nanded. 431714.

Corresponding Author- Dr. Prakash Laxmanrao Dompale

Email:- prakashdompale@gmail.com

DOI- 10.5281/zenodo.7295634

Abstract:

The elements or substances in nature that are useful to humans are called natural resources. Natural resources include land, water, air, sunlight etc. It also includes locally available minerals, mineral oil, plants. These resources are needed for the existence of life. Living things use these substances available in nature to survive. Natural resources are an important part of national wealth and a source of wealth and services. The reproduction process is essentially a continuous process of interaction between society and nature, in which society subjugates the power of nature and natural resources to meet needs. Natural resources largely determine not only the socio-economic potential and social production efficiency of countries and regions, but also the health and life expectancy of the population. The development of the states of any country depends on the resources of the state of that country. Earlier only natural elements were studied as resources. Because very little resources were used. As human development progressed, the consumption of natural resources increased. How to use all the resources on earth for the economic development of the human being, how to preserve it for the future generation, eliminate environmental problems and maintain balance, proper and planned use of resources is now necessary.

Keywords: land, air, sunlight, minerals, forest

Introduction:

Primitive man lived in caves, ate forest fruits and meat, and used animal skins or tree bark as clothing. Thus, his life was totally dependent on the things he got from nature. Although the modern man lives a more comfortable and secure life, his life is as much dependent on nature as the primitive man. However, modern man has come to use many more and different kinds of things (forest resources, various metals, elements, etc.) than primitive man and has learned to control certain substances (e.g., fire, water), he has discovered new uses for certain materials and has also learned how to make synthetic materials (e.g., dyes, plastics, threads, textiles, medicines, etc.) from natural materials. Substances in nature that are useful to humans are called natural resources. Any substance in the land, ocean and atmosphere can be economically beneficial and thus become a resource. A substance has to be useful enough to become a resource, but also the following three things have to be compatible. (1) It must be capable of meeting human needs without altering the

substance or being readily convertible to human needs. (2) Human skill must be developed enough to make use of available resources. (3) This substance should be easily obtainable by rational expenditure of energy or other resources. Thus a substance that was once economically useless can become a valuable resource as technology develops. Resources are both human and material in nature. Working people are resources. Physical resources can be further classified as natural and manufactured. Generally, natural resources are plants, animals, and minerals, but they can also include energy from the sun, atmosphere, soil or land, and water. Natural resources can be both renewable (e.g., plants, water, gas) and non-renewable (e.g., minerals). A non-renewable resource is a resource that is stored and is exhausted by consumption. e.g., coal, mineral oil etc. Many metals are not completely depleted in this way. Because they can be recovered and reused in varying degrees from used goods. A resource that can be generated again can be termed as flowing or non-renewable because it can last forever if used

carefully. For example, if forests are properly managed, forest products (e.g., timber, medicinal substances, tannins, gums, honey, etc.) will continue to be produced over the years without depleting the original resources. Energy from the sun is also renewable, but nuclear energy, though infinite, can run out.

Whether the Earth's resources are sufficient to support the growing population is a matter of debate. An optimist believes that increasing human needs (e.g., increasing demand for raw materials) can be met with the help of technology. E.g., technological development can use abundant resources instead of scarce resources, use other natural energies instead of human labour, build large dams to store water, improve fertilizers, improved varieties of plants, irrigation, mechanical tools, etc. Crop yield can be increased by using geophysical methods to discover new deposits of minerals. Moreover, the optimist believes that more minerals can be obtained by using new improved methods and processes for extracting minerals and their purification.

There are different methods of classification of natural resources:

It is classified into (1) sources of resources, (2) stages of resource development and (3) renewables;

(1) Sources of resources:

Based on their origin, they are classified as biotic and abiotic. Bioresources are derived from elements of the ecosystem (e.g., forests, animals, birds, etc.). It also includes biofuels such as coal and fossil fuels. Because they are formed from the decomposition of organic matter. Inorganic types include land, water, air, heavy metals (e.g., gold, silver, copper, iron, etc.) and various minerals.

(2) Stages of resource development:

(a) Prospective Resources : Available in a particular area and can be utilized in the future. For example, India has mineral oil reserves in many places. But until the mineral oil is extracted from it, it remains a potential resource.

(b) Tangible Resources : Resources whose quality and quantity have been surveyed and determined and are currently being utilized are called tangible resources.

(c) Reserve Resources: The portion of actual resources that is reserved and can be

used beneficially in the future is called reserve resources.

(3) Renewable:

Some resources are renewable or non-renewable. Resources like water, sunlight, air etc. are never exhausted, hence they are called renewable resources. Resources which are exhaustible, resources whose availability is limited are called non-renewable resources. e.g., minerals, biofuels etc.

(a) Renewable Resources : Resources which can be regenerated naturally are called renewable resources. It includes solar energy, wind energy etc. These resources are abundant and continuously available. The decline in their abundance due to human use is negligible.

(b) Non-Renewable Resources : The resources whose generation rate is very slow and those resources which are not produced naturally are called non-renewable resources. From a human point of view non-renewable resources are those whose consumption rate is high and thus their regeneration is slow, such resources (e.g., fossil fuels). Fossil fuels take billions of years to form. Hence they become non-renewable resources. Metal ores can be recycled. However, coal and petroleum cannot be recycled. Non-renewable natural resources are limited in availability and cannot be regenerated and recycled on a large scale. Such resources are depleted and cannot be regenerated. The speed of demand for these resources is always greater than the speed of their production.

The natural resources available on earth are limited. Given the rate at which they are being consumed, many resources may be exhausted within the next few decades. Their overuse causes immense damage to nature. It also results in pollution, loss of biodiversity, reduction in availability of renewable resources etc. The balance of the environment will be maintained only if natural resources are used appropriately. Many ecologists have pointed out that if the depletion of natural resources due to the unrestricted use of human resources continues, it will threaten the survival of many species of living organisms, and the very existence of humans will be threatened.

Conservation of natural resources:

How the 'right to live in a clean and wholesome environment' has evolved under

the Constitution of India has been reviewed in detail in the chapter 'Constitution and Common Law Principles'. Provisions for injunctive orders and compensation in civil law and fines and imprisonment in criminal law are not sufficient; The process of these laws is not able to compensate the damage done to the environment. Laws to control natural resources like forest, land, water, air and their inadequacy have been discussed in separate chapters. The emphasis of environmental laws should not only be on 'prevention and control', but on preservation, conservation and revitalization of natural resources. The responsibility of avoiding 'pollution' of air, water and land seems to be imposed on the administrative system by environmental laws and regulations, but there is no legal obligation on them to take steps to preserve and revive these resources. Forests are the most important ecological resource; Because forests play a major role in connecting water and land. Forest Acts should be revised, instead of classifying encroachments like pre-1980 and post-1980, they should be classified for livelihood and commercial purposes and accordingly set different guidelines for utilization of forest-resources, and the government should support them for such afforestation schemes as would enable them to earn a livelihood from forest produce. The preservation and management of natural resources cannot be done only by law, but the participation of an informed and conscious society is also mandatory. Rather than courts, mechanisms of interaction, mediation and ultimately arbitration will be more conducive to resolving environmental disputes. The Indian Constitution does not directly contain provisions for environmental protection. The government amended the constitution in 1976 and made two important provisions, Schedule 48A and 51A (G), Schedule 48A directs the state government to 'ensure the protection and improvement of the environment, as well as the preservation of the country's forest resources and wildlife. Appendix 51 A. (g) imparts a duty on citizens to protect and conserve the natural environment and be kind to all living beings. To maintain the quality of the environment and to control the pollution, the government is making many laws and regulations from

time to time. Some of the main ones are as follows:

Regarding water pollution:

- River Boundary Act, 1956.
- Water (Prevention and Control of Pollution) Act, 1974 Water Cess (Prevention and Control of Pollution) Act, 1977.
- Environment (Protection) Act, 1986.

Regarding land pollution:

- Factories Act, 1948.
- Industries (Development and Control Act, 1957.
- Pesticides Act, 1968.

The Urban Land (Ceiling and Control) Act, 1976.

Regarding air pollution:

- Factories Act, 1948.
- Combustible Substances Act, 1952.
- Prevention and Control of Air Pollution) Act, 1981.
- Environment (Protection) Act, 1986a.

Relating to Forests and Wildlife:

- Forest Conservation Act, 1960.
- Wildlife Protection Act, 1972.
- Forests (Conservation) Act, 1980.
- Wildlife (Protection) Act, 1995.
- Bio-diversity Act, 2002.

Apart from this, more and more stringent laws to overcome the problem of environmental awareness, norms as well as policy initiatives are being implemented under the leadership of international organizations.

Under the Environmental Management Capacity Building Project, efforts have been made to strengthen the enforcement of environmental laws in India. Under this project several training workshops/discussions have been organized and are being conducted by the National Law School of India University, Bangalore to strengthen the legal framework. Government officials, judges, law teachers, advocates, training is organized for industrial managers, LSGs and NGOs.

'National Environment Policy-2006' was formulated in the country. The National Green Tribunal (NGT) was established for expeditious redressal of environmental grievances in the country. Also National Environmental Assessment and Monitoring Authority (NEAMA) and National Environmental Protection Authority (NEPA) of India were established. And this journey

will continue in such a progressive manner, but due to lack of proper implementation of laws and policies, natural resources are at risk.

Conclusion:

The natural resources available on earth are limited, given the speed at which they are being consumed, many resources may be exhausted in the next few decades, their overuse causes immense damage to nature. It also results in pollution, loss of biodiversity, reduction in availability of renewable resources etc. The balance of the environment will be maintained only if natural resources are used appropriately. The speed of production of resources is very slow. Also resources that are not produced naturally (e.g. fossil fuels) should be used sparingly and appropriately. Also, these resources can be regenerated naturally, like solar energy, wind energy and resources are abundant and continuously available, so using more of such natural and non-conventional resources does not create pollution and also saves on other fossil fuels. Utilizing resources judiciously and judiciously; this is called sustainable resource

development. It is necessary to make proper use of natural resources for their growth and development. For that it is necessary to plan and manage resources. While enjoying the available resources in the present, one should also take care of the future. It is necessary to strike a balance between the consumption of the present and the preservation of them for the future. If we overuse natural resources, the next generation will have to bear the consequences, so sustainable development of resources is necessary.

References:

1. <https://mr.vikaspedia.in/rural-energy/environment/>
2. <https://kigp.ru/mr/racionalnoe-ispolzovanie-i-ohrana-prirodnih-resursov/>
3. <https://maharashtratimes.com/editorial/column/dakhal/-/articleshow/7921598.cms>
4. <http://www.unishivaji.ac.in/uploads/distedu/2020-2021/>
5. <https://onlinetyari.com/marathi/latest-news-articles.html>



RESEARCH METHODOLOGY: AN INTRODUCTION

Dr. Vaishali E. Aher

Research Guide, Head Dept. of English Saraswati Mahavidyalaya, KaijTq. Kaij, Dist.
Beed (M.S.)

Corresponding Author- Dr. Vaishali E. Aher

Email:- vaishaliaher6555@gmail.com

DOI- 10.5281/zenodo.7295636

Introduction:-

Research in common parlance refers to a search for knowledge. One can understand that research is an endeavour to discover answers to problems through applying scientific method to the knowable world/universe. In fact, research is an art of scientific investigation. The Advanced Learner's Dictionary of current English gives the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge"¹. The Webster's International Dictionary defines research as, "a careful critical inquiry or examination in seeking facts or principles; diligent investigation in order to ascertain something". Redman and Mory define research as a "Systematized effort to gain new knowledge"³. Research as a mission or a movement (activity) from the known things to unknown means it's a voyage of discovery. Actually it is the vital instinct of inquisitiveness for unknown, undiscovered and it makes us to attain full understanding of the unknown universe.

Research is essentially a systematic enquiry seeking facts through objective verifiable methods in order to discover the relationship among them and to deduce from them broad principles or laws. It is really a method of critical thinking. It comprises defining and redefining problems, formulating hypothesis or suggested solutions, collecting, organizing and evaluating data, making deductions and making conclusions, and at last, carefully testing the conclusions to determine whether they fit the formulated hypothesis. Thus the term 'Research' refers to a critical, careful and exhaustive investigation or inquiry or experimentation or examination having as its aim the revision of accepted conclusions, in the light of newly discovered facts.⁴

Research is basically an academic activity which should be used in a technical sense. According to Clifford Woody, research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organising and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis. D. Slesinger and M. Stephenson in the Encyclopedia of social sciences define research as, "the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art."⁵ From above opinions and definitions of research, we know that the research is an original contribution to existing knowledge which pursue the truth with the help of study, observation, comparison and experiment.

According to John W. Best,⁶ "Research may be defined as the systematic and objective analysis and recording of controlled observations that may lead to the developments of generalizations, principles, or theories, resulting in prediction and possibly ultimate control of events."

Since definitions of this sort are rather abstract, summary of some of the Characteristics of research may help to clarify its spirit, meaning and methodology:

- a) Research is directed toward the solution of a problem.
- b) Research emphasizes the development of generalization of principles or theories that will help in predicting future occurrences.
- c) Research is based upon observable experience of empirical evidence.
- d) Research demands accurate observation and description.

- e) Research involves gathering new data from primary or first hand sources or using existing data for a new purpose.
- f) Research activities are more often characterized by carefully designed procedures, always applying rigorous analysis.
- g) Research requires expertise i.e. skill necessary to carry out investigation, search the related literature and to understand and analyse the data gathered.
- h) Research strives to be objective and logical, applying every possible test to validate the procedures employed, the data collected and the conclusions reached.
- i) Research involves the quest for answers to unsolved problems.
- j) Research requires courage.
- k) Research is characterized by patient and unhurried activity.
- l) Research is carefully recorded and reported.

In this way research is the process of a systematic and deep study, observation or

Search of any particular topic or subject. It may help or develop hypothesis and it involves

scientific analysis which would result in the formulation of new theories, the discovery of

new techniques a modification of old concepts or a knocking-off an existing theory, concept

and techniques.

Objectives of Research:-

The main purpose of research is to discover answers to questions through applications of scientific procedures. Aim of research is to find out the truth which is not discovered yet. Each research has its own specific purpose or objectives a follows:-

- 1) To gain familiarity with a phenomenon or to achieve new insights into it.

(exploratory or formalative research studies)

- 2) To portray accurately the characteristics of a particular individual, situation or a group (descriptive research studies)

- 3) To determine the frequency with which something occurs or with which it is associated with something else (diagnostic research studies)

Motivation of Research:-

What makes people to undertake research? This is a question of fundamental importance. The possible motives for doing research may be either one or more of the following.

- 1) Desire to get a research degree along with its consequential benefits.
- 2) Desire to face the challenge in solving the unsolved problems i.e. concern over practical problems initiates research.
- 3) Desire to get intellectual joy of doing some creative work.
- 4) Desire to be of service to society.
- 5) Desire to get respectability.

However, this is not an exhaustive list of factors motivating people to undertake research studies. Many more factors such as directives of government, employment conditions, curiosity about new things, desire to understand causal relationships, social thinking and awakening and the like may as well motivate (or at times compel) people to perform research operations.

*** Types of Research:-**

Types of research can be classified in different ways. Some major types of classifying research as given follow:-

- Descriptive versus Analytical Research
- Applied versus Fundamental Research
- Qualitative versus Quantative Research
- Conceptual versus Empirical Research

Descriptive versus Analytical research	Applied versus Fundamental research	Quantitative versus Qualitative research	Conceptual versus empirical research
--	-------------------------------------	--	--------------------------------------

<p><u>Descriptive research</u> Concentrates on finding facts to ascertain the nature of something as it exists; whereas <u>Analytical research</u> is concerned with determining validity of hypothesis based on analysis of facts collected.</p>	<p><u>Applied research</u> is to find answers to practical problems to be solved and as an aid in decision making in different areas including product design, process design and policy making. <u>Fundamental research</u> is to find out as more to satisfy intellectual curiosity than with intention of using the research finding for any immediate practical application.</p>	<p><u>Quantitative research</u> makes substantial use of measurement and quantitative analysis techniques whereas <u>Qualitative research</u> studies find out the aspects of subject which are not quantifiable, and hence not subject to measurement and quantitative analysis.</p>	<p><u>Conceptual research</u> is carried out investigation of thoughts and ideas and it is developing new ideas or interpreting the old ones based on logical reasoning. In contrast an <u>empirical research</u> based on firm verifiable data collected by either observation of facts under natural condition or obtained through experimentation.</p>
---	--	---	---

* Research Approaches:-

The above description of the types or kinds of research brings out the fact that there are two basic approaches to research i.e. quantitative approach and the qualitative approach. Quantitative involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid manner. This approach can be further sub-classified into inferential approach to research is to form a data base from which to infer characteristics or relationships of population.

This usually means survey research where a sample of population is studied (questioned or observed) to determine its characteristics, and it is then inferred that the population has the same characteristics. Experimental approach is characterized by much greater control over the research environment within which relevant information and data can be generated. Qualitative approach to research is concerned with subjective assessment of attitudes, opinion and behavior. Such an approach to research generates results either in non-quantitative form or in the form which are not subjected to rigorous quantitative analysis. Generally, this technique is used in group interviews.

Sources of Information:-

The sources of Information for a research worker on the subject of his choice or interest are various which are given as follows:

- i) Document – Such as a book, an article in a periodicals, journals, a technical report, a chart, a drawing, a map, a newspaper etc.
- ii) Discussion with a guide or supervisor, co-worker, experts and authorities on the subject.
- iii) Attendance of a conference, Seminar, discourse, Symposia etc.
- iv) Attending a formal course on research.
- v) Information dissemination Centre.

Conclusion:-

In this way the main purpose of research is to determine the status of phenomena, past and present and to ascertain the nature, Composition and process that characterise phenomena as well as to trace growth, change, developmental history, to study cause and effect relationship. As the research worker comes to the conclusion of his or her investigation, he/she would review carefully the evidence for and against each hypothesis. Each generalization must agree with the facts revealed by the investigation.

Work cited :-

- 1) The Advanced Learner's Dictionary of current English, Oxford, 1952 p. 1069.

- 2) Webster's International Dictionary.
- 3) L.V. Redman and A.V.H. Mory, The Romance of Research, 1923, p. 10.
- 4) P. Saravanavel, Research Methodology, Kitab Mahal, Allahabad, 1987, p.1
- 5) The Encyclopedia of Social sciences, Vol. IX, MacMillan. 1930.

- 6) John W. Best: Research in Education (Prentice – Hall of India Pvt. Ltd, New Delhi, 1982) p. 18-21.
- 7) C.R. Kothari, Research Methodology: Methods and Techniques, 1985, P.N. 2.



“A COMPARATIVE ANALYSIS OF HEALTH STATUS AND LEVEL OF AWARENESS IN PREGNANT WOMEN IN JIND DISTRICT ”

Poonam Lohan¹ Rinku Kharb²

Assistant Professor, Department of Geography, Chaudhary Ranbir Singh University,
Jind 126102

Student of Geography, Department of Geography

Corresponding Author- Poonam Lohan

Email:- poonam@crsu.ac.in

DOI- 10.5281/zenodo.7295642

Abstract:

The present study has been conducted to assess the health status of rural and urban pregnant women and their awareness or cure about their health. A comparative study of women in Jind district has been included in a systematic review to assess the level of knowledge and awareness about their health among rural and urban women. Most of health facilities available in an urban area then a rural area. So, identify the level of awareness and precautions in their pregnant period. The present study base on the aptitude, level of care and attentation. The research has shown that rural women are more conscious about their health than urban women. There is increasing awareness about the various programs Pradhan Mantri Maturi Yojana, Pradhan Mantri Surakshit Matritva Abhiyan, State Resource Center Scheme for Women, Awareness campaign in Haryana to strengthen post and prenatal health care, Ladle Yojana, Sukanya scheme, Aapki Beti Hamari Beti scheme, Janani Suraksha Yojana and policies run by the government related to women’s health.

Keyword: health, pregnant women, awareness, facility etc.

Introduction:

Women play an important role in influential the health of the community. Therefore, more importance should be given in understanding the health care needs of women. The World Health Organization (WHO 2006) has determined women’s empowerment to be related to quality of life, human rights and health. It’s very important for a country growth and economic development. There is a need to pay especially attention to the health of women because when the women are healthy, the new born will be healthy. If the woman does not get healthy food and arrangement facilities on time, then the newborn will also be weak, which will lead to higher maternal and infant mortality. Pregnant women should know about health check-up and its human rights during pregnancy and pregnant women should get complete diet, clean water, clean drinking water and primary health care. At present, the ability of women to conceive has become so weak that almost all mothers have to being given bed

rest. The Government of India has provided for the health and nutritional fulfillment of the women and children of the poor sections of the rural society, but whether these policies are being implemented at the right time, at which place health services are available? People need schemes related to health and nutrition, they get it or not, the facilities related to the schemes are not being given to their personal use and their relatives because those who should get the benefits of the schemes are not getting health. Steps taken for some women need good food for their daily work, disease prevention and safe and healthy delivery. But still women face more of malnutrition than any other health problem in the whole world. This can lead to fatigue, weakness and ill health. Awareness about health and nutrition is essential. There can be many reasons for starvation and not being able to eat good food. The most important of these is poverty. In some parts of the world, most of the wealth there is in the hands of a select few. Women are most affected by the poverty line. This is also

because, no matter how much food there is to eat, women get the least. The woman eats only when the man and the children have eaten, that is, she eats last. Apart from this, proper medical facilities are also necessary for pregnant women. Their health should be checked from time to time. Pregnant women should be given proper information about the rules of pregnancy. A woman's diet during pregnancy should be such as to meet the requirements for the growing fetus, maintenance of the mother's health, essential physical health during labor and successful lactation. The need of the hour is to raise awareness using locally available resources, new technologies along with appropriate health policies and adopt effective communication strategies to create greater community engagement.

Objective:

1. Health status and health care of mother during pregnancy.
2. A comparative study about maintain health of Rural and Urban areas pregnant women.
3. To find out the level of health awareness related and during the pregnancy.

Limitations Of Research:

Our research work has been done in a limited area in which we have surveyed pregnant women, whether they have undergone health check-up in Anganwadi Central Hospital for problems faced during pregnancy or not. We have surveyed women who are currently pregnant so that they can be aware of the problems faced during pregnancy at the present time. The age of women 18-40 years is considered an appropriate time. We have collected data from pregnant women at the present time. Under the research work, we have collected different data for rural area and urban area. We cannot do this research for a long time because its time limit is 9 months. After some time, the respondents change. It is during this time itself that we have to do our survey because after delivery we do not get to know about the problems faced during the pregnancy stage. We can collect this type of data only during pregnancy. With the passage of time the problem of pregnancy keeps on changing. We can collect our data within this time limit.

Research Gap:

Many researchers have done studies on pregnant women; they were done on

pregnant women. In which the use of medicines during pregnancy and making them aware and whether it has been useful to take information related to internet facility or not. Information related to nutritional status and birth weight in pregnant women has been studied. Changes in food habits in women, development of children have been studied. The post-delivery glucose levels of the women and the weight of the newborn were presented. Information on changes in women during pregnancy was presented. Related to newborn children and how to take care of children. There is a greater difference between these research studies on pregnancy problems. Whether there is information related to pregnancy in rural and urban women from time to time during pregnancy. Only care information and child care schedule have been the main topics during these researches. They covered the problems faced by women in rural areas during pregnancy, such as whether pregnant women are parting for today, and whether they have suffered health check-up before conceiving. We have told our subject those problems like whether women in urban areas in rural areas are aware of their health or not, whether they had done health check-up before conception or not, have done a comparative study of all these. What problems did women face during pregnancy? We have tried to find out in our research whether they are aware of family planning system or not. If so, what systems do you use? How many women do in this research, we have also tried to know which women, rural and urban, are more aware of the systems related to pregnancy? Whether all the women are getting the government scheme adequately or not.

Data Collection:

In which we have collected the primary data in which we have surveyed 52 pregnant women, in which 26 women are taken from rural areas and 26 pregnant women. Considering Jind district as one unit for collection of primary data, it collected data from different villages and Jind city by simple random sampling. To collect data, a questionnaire was prepared, in which the pregnant women of the village and the city kept their awareness about their health related and medical facilities in the eye and

the data about the various schemes run by the government related to their pregnancy.

Research Methodology:

To do any research, a simple and suitable method is required. Research methodology is a specific technique to identify, process and analyze information about a topic. In this research work, we understand the events happening through quantitative techniques so primary data is collected through field survey and get the response/ collect the information or data in a scheduled questionnaire. The second steps of the methodology to present the results analysis

Location:



Map of Jind District

The district is located in Haryana between 29° 03' and 29° 51' North latitude and 75° 53' and 76° 47' East longitude. In the north, its boundary line forms the interstate Haryana-Punjab border with Patiala and Sangrur districts of Punjab. The area of Jind district is 2702 square kilometer. It is located approximately 70 miles (110 km) northwest of Delhi.

CLIMATE:

The climate of Jind district is classified as tropical steppe and hot air. It is mainly dry with very hot summers and cool winters, except during the monsoon season when sea moist air enters the district.

RAINFALL:

The average rainfall in the district is 55 cm. It is generally from south or south to west to east or northeast. Annually more than 70% is received during the monsoon months of July to September. On 11 July 1953, Jind recorded 225.5 mm of heavy rainfall in 24 hours.

TEMPERATURE:

with the help of percentage, correlation and we use different types of quantitative methods like bar diagrams, pie diagrams, etc.

Study Area:

It is said that this region was established during the time of Mahabharata. According to an old saying, the Pandavas built a temple in honor of Jayanti Devi (Jeetkidevi) and prayed for success there and then began a war with the Kauravas. The city of Jind grew up around the temple and was named Jayantpuri (Jayanti Devi) residence, which later came to be known as Jind.

The temperature is highest on average in June, at around 33.4 °C. The lowest average temperatures in the year occur in January, when it is around 13.0 °C in the Jind district.

HUMIDITY:

The relative humidity is high during the monsoon season, from July to September. Which is higher in the morning and more in the afternoon. April and May are the driest months of the time.

SOIL:

Soil of Jind district is sandy and loamy. According to the physical experts, these soils are divided into sandal, Kalar and Rehi soils. Sandy soil is locally called sandy soil. This is found in all the blocks of the district. Kalar and Rehi soils are found in the Safidon block of the district.

POLITICS: Jind is the center of Jats and former deputy CM Devi Lal has been a testimony to the political beginnings of stalwarts like former CM Bansi Lal and present government Deputy CM Mr. Dushyant Chautala belong this region.

Social & Culture:

It is a stronghold of Haryana with rich cultural heritage. Its population is 13,34,152 as per 2010-11 census. The major religions of Jind are Hindus (95.69%) and Sikhs (2.18%)

of the total population. The main languages spoken are Hindi (95.69%) and Punjabi (2.18%) Nepali (0.05%).

Result Analysis: 1. A Comparison On Occupation Level And Number Of Visits Of Pregnant Women In The Study Area

Sr. No	Occupation	Rural (%)	Number of visits	Respondent (%)	Urban (%)	Number of visits	Respondent (%)
1	House maker	15 (57.69)	No	3 (20)	14(53.84)	No	0
			1	4 (26.66)		1	13 (92.85)
			2	5(33.33)		2	1 (7.14)
			3	3 (20)		3	0
2	Pvt. Job	5 (19.23)	1	2 (40)	2(7.69)	1	0
			2	1 (20)		2	2(100)
			3	2 (40)		3	0
3	Labor	4 (15.38)	No	2 (50)	7(26.92)	No	1(14.28)
			1	2 (50)		1	2(28.57)
			2	0		2	4(57.14)
4	Other	2 (7.69)	1	1(50)	3(11.53)	1	1(33.33)
			2	1(50)		2	2(66.66)
5	Total	26 (100)			26(100)		26(100)

Interpretation:

According to the given data, In Jind district, among the pregnant women who go to the maximum health checkup, 40% of pregnant women doing private jobs are such that they have gone to any hospital to get their checkup, whereas in urban areas 66.66% pregnant women are who has gone to get her checkup 4 to 6 times. Among the least visited pregnant women in rural areas, 50% of the working pregnant women are such that they did not go to any hospital for their checkup even once, whereas in urban areas, 14.28% of the wage-earning pregnant women with the least visits. From this comparison of rural

and urban women, we have come to know that the number of pregnant women in rural areas, who are housewives, did not go to the hospital even once to get their checkup done, their number of pregnant women in urban areas is more than them. Apart from this, the number of working women who do not go to the hospital to get their checkup done is more than the pregnant women working in urban areas. They such that pregnant women even once did not go to get their checkup done. In rural areas, women are more engaged in wages and less educated, they are unable to pay attention to their health and do not go to get their checkup done.

2. A comparison on OCCUPATION LEVEL AND CONSULTIENCY BEFORE CONCEIVING OF PREGNANT WOMEN IN THE STUDY AREA

SR. No	Occupation	Rural respondent (%)	Consult before Conceiving	Respondent (%)	Urban respondent (%)	Consult before Conceiving	Respondent (%)
1	House maker	15(57.69)	Yes	8(53.33)	14(53.84)	Yes	4(28.57)
			No	7(46.55)		No	10(71.42)
2	Pvt. Job	5(19.23)	Yes	5(100)	2(7.69)	Yes	0
			No	0		No	2(100)
3	Labor	4(15.38)	Yes	3(75)	7(26.92)	Yes	2(28.57)
			No	1(25)		No	5(71.42)
4	Other	2(7.69)	Yes	2(100)	3(11.53)	Yes	2(66.66)
			No	0		No	1(33.33)
5	Total	26(100)		26(100)	26(100)		26(100)

Interpretation:

According to the given data, In Jind district, 100% pregnant women in private jobs who consulted the doctor before conceiving a child in rural areas. Whereas in urban areas, 66.66% pregnant women engaged in other business are such that who consulted a doctor before conceiving. In rural areas, 46.55% of housewives who do not consult a doctor before conceiving a child and in urban areas 71.42% of pregnant women working as laborers. From this comparison of rural and urban women, we have come to know that the pregnant women of rural areas who are housewives consult the doctor more before conceiving a child than the housewives' pregnant women of urban areas. Apart from this, women doing private jobs in rural areas consult a doctor more before conceiving a child than pregnant women doing urban private jobs. The number of pregnant women working in rural areas, who consult a doctor before conceiving a child, is more than that of pregnant women in urban areas. In this way, women are able to take good care of their health when they are engaged in a good business. Whereas the working women are not able to take good care of their health and neither do they consult the doctor.

A comparison on EDUCATION LEVEL AND NO. OF CHILDREN OF PREGNANT WOMEN IN THE STUDY AREA

Sr. No	Education	Rural respondent (%)	Respondent (%)	No. Of children	Education	Urban respondent (%)	Respondent (%)	No. of children
1	Middle	2(7.69)	1(50)	1	Middle	9(34.61)	1(11.11)	Pregnancy continues
			1(50)	2			2(22.22)	1
							3(33.33)	2
							3(33.33)	3
2	Secondary	5(19.23)	3(60)	Pregnancy continues	Secondary	6(23.07)	2(33.33)	Pregnancy continues
			2(40)	1			3(50)	1
							11(16.66)	3
3	Senior – secondary	6(23.07)	1(16.66)	Pregnancy continues	Senior-Secondary	3(11.53)	1(33.33)	Pregnancy continues
			1(16.66)	1			2(66.66)	2
			3(50)	2				
			1(16.66)	3				
4	Graduation	7(26.92)	5(71.42)	Pregnancy continues	Graduation	2(7.69)	2(100)	2
			2(28.57)	1				
5	Post-graduation	6(23.07)	2(33.33)	Pregnancy continues	Post-graduation	3(11.53)	3(100)	Pregnancy continues
			2(33.33)	1				
			2(33.33)	2				
6	Professional	0	0	0	Professional	1(3.84)	1(100)	1
7	Diploma\degree	0	0	0	Diploma\ Degree	2(7.69)	1(50)	Pregnancy continues
							1(50)	1
	Total	26	26(100)			26	26(100)	

Interpretation: According to the given data, In Jind district, 16.66% of pregnant women studying up to senior secondary school in rural areas have three children while 33.33% pregnant women studying up to middle level in urban areas have three children. 33.33% pregnant women who do post graduation in rural areas have only one child and

100% pregnant women who do post graduation in urban areas have only one child. Similarly, women engaged in professional business are also preferring a child. From this comparison, we get to know that women are preferring a child more in urban areas than in rural areas. But with this we can also say that with the increase in education, the

number of children is less or one child is being preferred more. Earlier, due to less educated women, they used to give birth to more children or apart from this, some social factors also work like women produce

more children even in the desire of a girl. But today this concept of women is changing due to the education of women and they prefer only one or two children.

4. A comparison on OCCUPATION LEVEL AND PLACE OF DELIVERY OF PREGNANT WOMEN IN THE STUDY AREA

Sr. No.	Occupation	Rural Respondent (%)	Place of Delivery	Respondent (%)	Occupation	Urban respondent (%)	Place of delivery	Respondent (%)
1	House maker	15(57.69)	Pregnancy continues	5(33.33)	House Maker	14(53.84)	Pregnancy continues	5(35.71)
			Govt. Hospital	8(53.33)			Govt. Hospital	5(35.71)
			Pvt. Hospital	1(6.66)			Pvt. Hospital	4(28.57)
			Both	1(6.66)			Both	1(50)
2	Pvt. Job	5(19.23)	Pregnancy continues	1(20)	Pvt. Job	2(7.69)	Pregnancy continues	1(50)
			Govt. Hospital	4(80)			Govt. Hospital	1(50)
			Pvt. Hospital	0			Pvt. Hospital	0
			Both	0			Both	0
3	Labor	4(15.38)	Pregnancy continues	2(50)	Labor	7(26.92)	Pregnancy continues	2(28.57)
			Govt. Hospital	1(25)			Govt. Hospital	2(28.57)
			Pvt. Hospital	1(25)			Pvt. Hospital	3(42.85)
			Both	0			Both	0
4	Other	2(7.69)	Pregnancy continues	1(50)	Other	3(11.53)	Pregnancy continues	0
			Govt. Hospital	1(50)			Govt. Hospital	2(66.66)
			Pvt. Hospital	0			Pvt. Hospital	1(33.33)
			Both	0			Both	0
5	Total	26(100)				26(100)		

Interpretation:

According to the above given data, In Jind district, there are 80% pregnant women doing private jobs in rural areas and 66.66% pregnant women engaged in other business in urban areas, who have more deliveries in the government hospital. 53.33% housewives' pregnant women in rural areas and 35.71% housewives' pregnant women in urban areas have been delivered in Government Hospitals. Among the pregnant women who have more deliveries in private hospitals, 25% are pregnant women and 42.85% pregnant women in urban areas. Apart from this, 28.57% of pregnant women in urban areas are such who have been delivered in private hospitals. From this comparison of rural and urban areas, we can say that

5. A comparison on Education Level and Pregnant Women Know about Family Planning Method in the Study Area

Sr No	Education	Respondent (%)	Know Family Planning Method	Respondent (%)	Urban Respondent	Know Family Planning Method	Respondent (%)
1	Middle	2(7.69)	Yes	2(100)	9(34.61)	Yes	9(100)
			No	0		No	0
2	Secondary	5(19.23)	Yes	3(60)	6(23.07)	Yes	6(100)
			No	2(40)		No	0
3	Senior Secondary	6(23.07)	Yes	6(100)	3(11.53)	Yes	3(100)
			No	0		No	0
4	Graduation	7(26.92)	Yes	7(100)	2(7.69)	Yes	2(100)
			No	0		No	0
5	Post-graduation	6(23.07)	YES	6(100)	3(11.53)	Yes	3(100)
			NO	0		No	0
6	Professional	0	YES	0	1(3.84)	Yes	1(100)
			NO	0		No	0
7	Diploma\Degree	0	YES	0	2(7.69)	Yes	2(100)
			NO	0		No	0
8	Total	26(100)		26(100)	26(100)		26(100)

Interpretation:

According to the above given data, in Jind district in rural areas, 7.69% of the pregnant women who have studied up to middle class 100% women who know about the family planning method. Out of the 19.23% pregnant women who have studied up to senior secondary level, 60% are pregnant women who are aware of the family planning method and 40% pregnant women who do not know about the family planning method. Out of the 23.07% pregnant women who have

pregnant women of rural areas get their deliveries done more in government hospitals than pregnant women of urban areas. But on the contrary, we also see that pregnant women of rural and urban areas are preferring more and more government hospitals for their delivery. Pregnant women in urban areas prefer private hospitals for more medical facilities, health facilities and proper care. From this comparison of rural and urban areas, we have come to know that pregnant women in urban areas know more about family planning methods than pregnant women in rural areas. In this we also see that education is one of the main reasons in this. With the advancement of education, women are becoming more aware about the methods of family planning.

studied up to senior secondary level, 100% know about the family planning methods. Out of 26.92% pregnant women who have studied till graduation, 100% pregnant women are such who know about family planning methods. Out of 23.07% pregnant women who have studied till post-graduation, 100% pregnant women are such, who know about family planning method. While in the Urban areas, 34.61% of pregnant women who have studied up to middle school, 100% pregnant women who know about family

planning methods. Out of the 23.07% pregnant women who have studied up to senior secondary level, 100% are pregnant women who are aware of the family planning methods. Out of the 11.53% pregnant women who have studied up to senior secondary level, 100% know about the family planning methods. Out of 7.69% pregnant women who have studied till graduation, 100% pregnant women are such who know about family planning method. Out of 11.53% pregnant women who have studied till post-graduation, 100% pregnant women are such, who know about family planning method. 3.84% of pregnant women 100% who know about family planning methods. 7.69% of pregnant women with diploma, 100% pregnant women are such who are aware of family planning methods. From this comparison of rural and urban areas, we have come to know that pregnant women in urban areas know more about family planning methods than pregnant women in rural areas. In this we also see that education is one of the main reasons in this. With the advancement of education, women are becoming more aware about the methods of family planning.

Conclusion

The current research has an investigation achieved on pregnant women who are currently pregnant. A challenge has been complete to know the problems faced by pregnant women during pregnancy. What are the problems faced during pregnancy in the present time because the problems faced during pregnancy keep on changing according to the time? It has also been seen that before conception, how many women get their health checked or not and, in this research, we have done a comparative study of pregnant women in rural areas and urban areas. Women have been taken from the urban area. In this, we have studied how many women get their health check-up done in government hospital and private Anganwadi center and what is the effect of their economic conditions on their health check-up. According to research, it has been found that 57% pregnant women in rural areas have housewives, out of which 20% women have gone to the hospital once for examination, 26% four times, 33% of women have gone to the hospital thrice. The business of 19% pregnant women is private job, out of which 40% of women have gone once, 20% of

women have gone again, 40% of women have gone more than three times. 15.38% women work in rural areas out of which 50% women never went for health check-up and 50% women went to hospital for health check-up once. 2% women do other work out of which 50% women go once 50% women go twice. In urban areas, 53.84% women are housewives, out of which 92.85% women have gone to the hospital once and 7.14% twice. 7.69% of women do private jobs, out of which all women have gone to the hospital once. 26.92% of the women are laborers out of which 14.28% women did not go for health check-up and 28.57% pregnant women went for hospital check-up once. 57.14% pregnant women have gone out more than 2 times. 11.53% women do other work out of which 30% once for 33 minutes 66.66% women went to hospital twice Out of 50% of rural women, 40.15 women have got health check-up done before conceiving 53.84 % women have not done it at all. 65.38% of women in urban areas have undergone health check-up before conceiving 34% of women did not undergo health check-up The data shows that women in urban area are more conscious about getting health check-up done. Pregnancy can be a very special time in a woman's life. The nine months of pregnancy, as well as labor and delivery, are filled with many physical and psychological changes as well as lifestyle changes. Each change presents a challenge that can be successfully met when the woman shares her feelings and experiences with her partner or other support person and with her doctor, midwife, nurse and delivery teacher. The importance of health care during pregnancy is highlighted, as proper health care increases the chances of a healthy pregnancy, healthy baby and satisfied parents. Many references, notably the Human Relations field files, describe cultural variations in beliefs about pregnancy and birth and related behaviors. Health-related quality of life refers to the subjective assessment of patients with respect to physical, mental and social dimensions of well-being. Improving the quality of life of pregnant women requires better recognition of their difficulties and guidance which provides support whenever possible. There is a need to restructure the Health Education programmers relating to pregnancy delivered through PHCs and the mass media for better

knowledge among women of childbearing age can decrease pregnancy-related problems and improve perinatal outcome. Based on the results, pregnant women experienced personal, social and structural barriers to access to health information. Therefore, policy makers and health planners must remove barriers, encourage self-care and enhance the quality of life for pregnant women, thus, ultimately promoting their health status. Women experienced personal, social and structural barriers to access to health information. Therefore, policy makers and health planners must remove barriers, encourage self-care and enhance the quality of life for pregnant women, thus, ultimately promoting their health status. Women experience considerable changes in health status during and after pregnancy. These data should guide the prospect of women, their health care providers, and public policy. Several small studies suggest that the functional status of reproductive-age women is lower throughout pregnancy and the postpartum period than at other times. This work extends prior work by investigative the health status of a large cohort of ethnically miscellaneous women. It was conducted to describe changes in the health status of women during and after pregnancy.

Suggestions

1. Health can be maintained by providing proper nutritious food to women during pregnancy.
2. In the diet of pregnant women, essential nutrients should be in proper quantity so that their health remains intact.
3. For the good health of pregnant women, good health related programs should be organized from time to time.
4. Women's health during pregnancy Special care should be taken.
5. Periodic Health During Pregnancy of Keep checking.
6. Tasks to pregnant women during pregnancy Weight reduction, proper rest and proper sleep should be taken.
7. Pregnant women should take proper care of personal hygiene during pregnancy.
8. Alcohol, Smoking and other intoxicants during pregnancy Substances should not be used.

9. Pregnant women of any type one should stay away from mental stress etc., for this meditation yoga exercises should be done.
10. During pregnancy, pregnant women should keep getting their health-related information from the doctor from time to time.

References

1. AHHDA Alani, BAR Hassan Atl. (2020), Use, Awareness, Knowledge and Beliefs of Medication During Pregnancy in Malaysia, *Osong public health and research perspectives*, vol.11 (6), pp 373.
2. A Das, M Sarkar (2014) Pregnancy-related health information-seeking behaviors among rural pregnant women in India: validating the Wilson model in the Indian context, *The Yale journal of biology and medicine* vol.87 (3), Pp 251.
3. AJ Idrovo, R Velandia, J Franky, Atl. (2019), Zika virus infection during pregnancy and sensorineural hearing loss among children at 3- and 24-months post-partum, *Journal of tropical pediatrics* vol. 65 (4), pp 328-335.
4. Briege M Lagan, Marlene Sinclair, Atl. (2010), Internet use in pregnancy informs women's decision making: a web-based survey *Birth* vol.37 (2), Pp 106-115.
5. F. Bert, M.R. Gualano, S. Brusafarro, Atl. (2013), Pregnancy e-health: a multicenter Italian cross-sectional study on Internet use and decision-making among pregnant women, *J Epidemiol Community Health* vol. 67 (12), Pp1013-1018.
6. H Chen, J Guo, Chen Wang, Atl. (2020), Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records, *The lancet* vol. 395 (10226), Pp 809-815.
6. I Mogren, J Ntaganira, atl. (2018), Quality of antenatal care services in Rwanda: assessing practices of health care providers, *BMC health services research* vol.18 (1), Pp 1-10.
7. L Yang, KYamamoto - Hanada, K Ishitsuka atl. (2020), Medical and surgical complications in pregnancy and obstetric labour complications in the Japan Environment and Children's Study (JECS) cohort: a birth cohort study, *Journal of Obstetrics and Gynaecology* vol. 40 (7), pp 918-924.

8. L.J. Peterson, C M Peterson (1991), Maternal postprandial glucose levels and infant birth weight: the Diabetes in Early Pregnancy Study, American journal of obstetrics and gynecology 164 (1), 103-111.
9. M Javanmardi, M Noroozi, Atl. (2018), Internet usage among pregnant women for seeking health information: a review article, Iranian journal of nursing and midwifery research vol.23 (2), Pp 79.
10. M Verma, J Chhatwal, Atl. (1995), Antenatal period; an educational opportunity, Indian pediatrics vol. 32, Pp 171-171.
11. M.O. and Marisha N. Wickremsinhe (2017), Research with pregnant women: A call to action, Reproductive Health 14(S3), Article no.156.
12. RK Prasty, S Begum, A Patil Atl. (2021), Raising breast cancer awareness and breast screening practices among women through health education and capacity building of primary healthcare providers: an earlier post, BMJ Open vol.11(4), pp E045424.
13. Sayakhot, M Carolan-Olah (2016), Internet use by pregnant women seeking pregnancy-related information: a systematic review, BMC pregnancy and childbirth vol.16 (1), pp 1-10.
15. S Noursi, B Saluja, Atl. (2021) Using the ecological systems theory to understand Black/White disparities in maternal morbidity and mortality in the United States, Journal of racial and ethnic health disparities vol. 8 (3), Pp 661-669.
16. S. Rahayu (2020), Determinant Analysis of Stunting Events in Toddlers Aged 6-24 Months Judging from The Nutritional Status of Pregnant Women, Birth Weight and Eksklusiv Breast Feeding at Garum. European Journal of Molecular & Clinical Medicine vol. 7 (2), pp 4733-4742.
17. SR JL, GF MI (1999), Maternity education in primary care. Efficacy, utility and satisfaction of pregnant women, Atencion Primaria vol 24 (2), Pp 66-70, 72.
18. S. Nasrollahzadeh (2014), Health information-seeking behavior of pregnant women: A grounded theory study, Human Information Interaction vol. 1 (4), Pp 270-281.



**ZINC OXIDE NANOPARTICLES: INVESTIGATION ON THE
PARAMETERS AFFECTING THE STRUCTURE OF ZNO NPS IN SOL -
GEL SYNTHESIS**

JOSÉ, Basílio José Augusto¹ SHINDE, Mahendra Devidas²

^[1] Licungo University- Mozambique; Faculty of Science and Technology,

^[2] Sandip University Nashik,

Corresponding Author- JOSÉ, Basílio José Augusto

Email:- basyjoseindia@gmail.com

DOI- [10.5281/zenodo.7295646](https://doi.org/10.5281/zenodo.7295646)

Abstract

The process of synthesis, characterization and application of zinc oxide nanoparticles have been widely discussed in the last decades in the nanotechnologies and material science researches. In order to perform a high quality of these nanoparticles, the investigation of parameters which directly affect the formation is crucial and few studies describe and discuss this matter. In this research 6 samples of ZnO NPs were synthesized from $[\text{Zn}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}]$ as precursor through chemical route. Six parameters were observed (molarity, sonication type, environmental conditions, annealing process, medium and characterization process). ZnO was performed considering the color and matches of the samples from XRD measurement and the standard patterns from the previous researches. The crystallite size calculated was between (7,56 nm – 56,88 nm) by using the use of Debye Scherer formula, confirming as well the NPs character of the material. It was detected that molarity; sonication type and environment of experiment were more evidenced in the samples compared to other variables. These parameters affect in the properties and applications of nanoparticles. Applying W-H plot method it was observed that the particle looks scattered with negative strain in the sample 2. More studies are needed to understand the optical, electrical and thermal properties of the materials produced.

Keywords: Zinc Oxide Nanoparticles; synthesis; parameters; sol-gel method; properties.

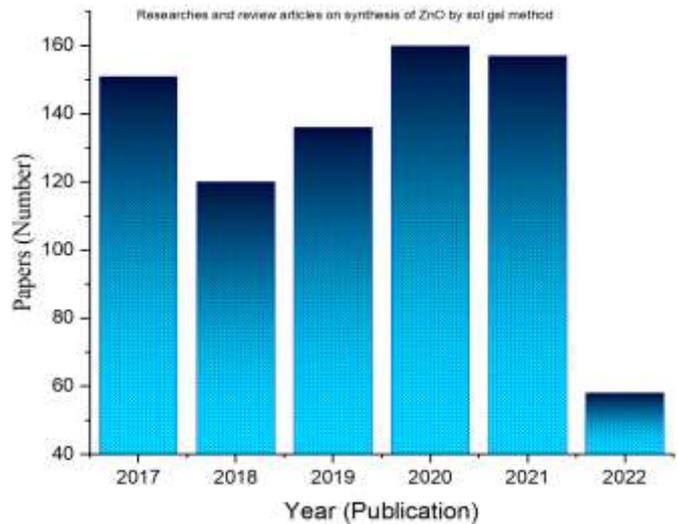
Introduction

Nanotechnology deal with highly sensitive materials in the small-scale level. In this domain, infinitesimal change of parameters influences the performance of the nanomaterials. Among various processes to prepare Zinc Oxide nanoparticles, chemical route has showed to be the chosen right way, considering the cost and possibility to controlling the range particle size[1]. Nontoxic materials which properties allow a wide range of applications and easily combined to enhance their utility are highly recommended for investigation in their nanoscale form. Zinc oxide nanoparticles is known as GRAS of band gap 3,37eV, semiconductor of II-IV group with good

electrical, optical and thermal properties[2]. Optimization of ZnO NPs parameters is still a challenge in order to control the chattels that a directly connected to reactivity, looking into surface to volume ratio; combinations, known (gas sensors, coolants, EOR, forensic science, renewable energy and electronic devices, textile, water & environmental clean and biomedicine) and novel applications [3]; [4];[5]; [6]. Different synthesis of ZnO NPs were performed among none and ecofriendly materials such as fruits, peels, leaves, chitosan, wastes and chicken skin [7]; [8];[9], [10]. Still the researches are much more focused on the synthesis and applications than knowing the optimal parameters of ZnO [11].

Theoretical framework

Chemosynthesis can be considered as one of the first approach on the preparation of ZnO NPs. Are some of the examples of chemosynthesis or chemical route methods: sol-gel, hydrothermal, CVD and CBD)[12] . The advantages of chemical route compared to other methods is the possibility to control parameter during the formation of nanoparticles also is simple, none toxic, possibility to work at room environment, time saving and inexpensive[1]; [13]. The ability to control the particle size in sol gel method optimizing the parameters, allow to produce a very small-scale particle of ZnO that have potential in enhancing the antimicrobial activity due to high surface to volume ratio [14]. The role of sol gel method to perform ZnO NPs is also evident through the data extracted from Scopus index in the journals and conference proceeding of the last five years as given in the chart. Survey done on the Scopus database through Mendeley for the last 5 years reported 10540 researches about ZnO NPs among synthesis and review articles. Among them 1% were discussing about the



effect of parameters on synthesis and application of ZnO. Most of the researches were focused on ecofriendly process of performing Zinc Oxide and applications. It was also reported the authors with more publications: Ahamad Umar (48), Naritatsu Tsubaki (34), Jing Wang (21), Martin Muhler (20), Hui Zang; Lei Wang and Li Mulher with (16) each, Anukorn Phurugruati and Wei Zhang (15) papers published.

EFFECT OF Parameters	Scopus Total	Number of papers per years					
		2022	2021	2020	2019	2018	2017
Molarity	5	0	4	1	0	0	0
Sonication Type	2	0	0	0	1	1	0
Experiment Environment	16	1	5	1	6	2	1
Annealing process	49	2	11	6	9	8	13
Medium of reaction	53	4	3	12	10	20	4
total: Synthesis of ZnO	10540	736	2052	2004	1780	2311	1657

Table 1:: Papers reported in Scopus through Mendeley reference manager on October 3rd, 2022

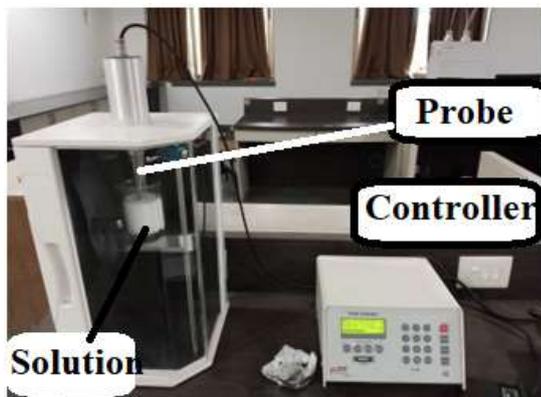
The role of parameters molarity, environment annealing process and medium in synthesis

Molarity also known as relation between the volume of solution in liter and moles of solute play crucial role in the reaction of synthesis

of nanoparticles. Regarding to this parameter [15] prepared 6 samples of different molarity solutions [0.25M-0.6M] during synthesis of BiFeO3-bismuth iron oxide via sol gel to make thin films. It was observed that films of 0.3M and 0.5M showed optimal results by performing pure hexagonal phase. Even though instead of pure hexagonal phase of perovskine structure, 0.5M showed good

magnetic properties at room temperature compared to other concentrations. In the preparation of thin films of complementary metal oxides (CMOS) a concentration of 0.75M of $[\text{Zn}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}]$ showed optimal transparency and high band gap allowing wide range of application [16].

Sonication is one of the important processes during synthesis of nanoparticles to control



the particle size by vibration and sound coming from the conversion of electrical into mechanical signal[17]. Depending on the type of sonication the effect can be deep or shallow. Probe sonicate by direct contact with the solution might provoke more disturbance through the sounder compared to Ultrasonic bath where the vibration is transmitted to the solution by the container

The control of temperature during synthesis of nanoparticles is one of the fundamental factors to avoid the formation of some toxic products that are harmful for microbial elimination. Most of the experiments in sol gel method are performed at room temperature to avoid the formation of these hazard derivative products. For this purpose, ecofriendly approaches are taking place because they allow reactions of less heat. In order to control the good formation of ZnO nanostructure [18] used milk protein casein and concluded to be good mediators at low temperature. Annealing process is considered one of the last stages when preparing nanoparticles. This process allows the removal of some impurities, VOCs and help to defining the size and morphology of nanostructures. The role of annealing process was applied to change different seeds by exposing $[\text{Zn}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}]$ at different temperatures ranging from $[90^\circ\text{C}-180^\circ\text{C}]$. It was observed that considerable uniform structure of ZnO was formed at 150°C even though 180°C was the temperature of ZnO Wurtzite purity that influenced the change of the seed[19].

It was noticed that, when the annealing temperature increase the grain size of ZnO also goes high (Doğan et al., 2022, 2017; Ng et al., 2012; Pandey et al., 2014), affecting the reactivity of nanoparticles due to surface

to volume ratio when the temperatures move away from $[500^\circ\text{C}-600^\circ\text{C}]$ (Neha Verma et al., 2017) a well reported calcination temperature. The equal way that molarity and temperature are important in the reaction of synthesis, the medium of the reaction also play role in modifying the reactivity of the precursor or other radical indirectly. This parameter might also influence in the Ph consequently in size, shape and the aggregation of nanostructure [21].

Methodology and materials

The experiment was performed in the nano laboratory of Sandip University in two periods. The first period was in the summer 08-12 of April for [S3 and S6] and the second period was in begin of rainy season 18-22/06/2022 for [S1, S2, S4 and S5]. All reactions reactions were performed with double distilled water as solvent in a standard procedure. The reactions occurred at room temperature and magnetic stirrer at 660 rpm. In overall the synthesis of each sample took 4 days to be performed. The annealing process were done in the muffle at 500°C during 3h.

Label	Percursor	Medium	Reagent
S ₁	0,25M [Zn(CH ₃ COO) ₂ .2H ₂ O]	4, 0 M NaOH	100ml CH ₂ COOH
S ₂	0,25M [Zn(CH ₃ COO) ₂ .2H ₂ O]	4, 0 M KOH	100ml CH ₂ COOH
S ₃	0,5M [Zn(CH ₃ COO) ₂ .2H ₂ O]	4, 0 M NaOH	100ml CH ₂ COOH
S ₄	0,75M [Zn(CH ₃ COO) ₂ .2H ₂ O]	4, 0 M NaOH	100ml CH ₂ COOH
S ₅	0,75M [Zn(CH ₃ COO) ₂ .2H ₂ O]	4, 0 M KOH	100ml CH ₂ COOH
S ₆	1,0 M [Zn(CH ₃ COO) ₂ .2H ₂ O]	4, 0 M KOH	100ml CH ₂ COOH

Table 2: Chemicals used to perform the synthesis of ZnO NPs



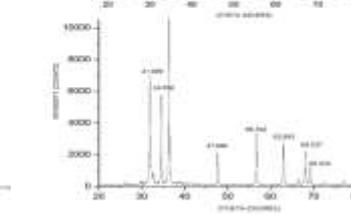
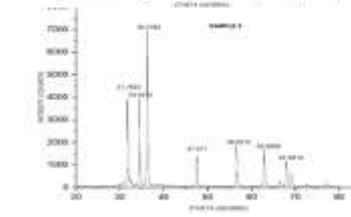
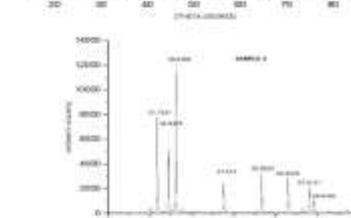
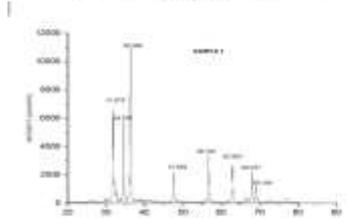
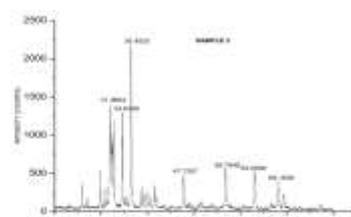
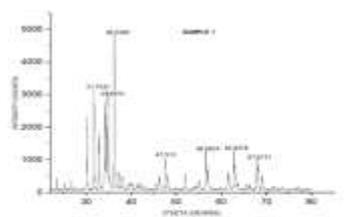
To start the synthesis molar concentration was calculated according to the above equations and link:

$$n = \frac{\text{Weight}(g)}{\text{Molar Weight}\left(\frac{g}{\text{mol}}\right)} \quad C = \frac{\text{Weight}(g)}{\text{Volume}(L)} \quad M = \frac{n(\text{mol})}{\text{Volume}(L)} \quad (1)$$

<https://www.technologynetworks.com/tn/tools/molaritycalculator>

Quantities of M₁=5,48g, M₂=10,97g, M₃=16,46g and M₄=21,951g of precursor and [Zn(CH₃COO)₂.2H₂O] and corresponding proportions of medium was measured in the analytical balance then mixed with solvent to make 100ml of solution then stirred at room temperature during 20 minutes until homogeneous solution was formed. Temperature and Ph was measured.

The solution of medium was poured dropwise in the solution of precursor until the gel was formed and then continue stirring 20 minutes where temperature, reagent was added and Ph was measured. In order to control the particle, size all solutions was sonicated in the ultrasonication bath for 1 hour each. While instead of only sonication 4 samples were submitted to probe sonicator for 30 minutes. All solutions remained 18h until white precipitate was formed, solvent and reagent carefully removed and white substance removed to crucible and dried during 24 horas. The white substance was then grinded by mortal pastel and then annealed in the muffle during 3h at 500°C and then grinded until the white powder was formed and labeled as [S₁, S₂, S₃, S₄, S₅ and S₆] for characterization.



Results and discussions

The findings of this research a related to synthesis and XRD characterization of Zinc Oxide considering different molarities of Zinc Acetate Dehydrate, mediums (NaOH and KOH) and probe. The graphs were plotted in Origin 2022b and almost all peaks are matching with the standard graphs structure in the literature. Notable case was noticed in the samples of low molar where more peaks were observed with no shift of major the ones. These phenomena lead to the first confirmation of ZnO NPs. XRD of specification: d8 Advanced XRD 40KV, 2.2KW sealed x-ray tube (Cu K α), up to 9 samples with samples rotation, Powder, thin

film, pallet samples, Theta-2Theta geometry, LynxEye 1D-PSD (Gain of ~200 as compared to a single detector) was applied to the samples. The bellow shows the XRD patterns of ZnO prepared by sol gel method and annealed at 500°C during 3h. Looking to all 6 samples the change on the peaks was less than 0.2°.

Determination of particle size

The particle size was calculated by Debye Scherrer equation. To plot the graphs, determine FWHM (β) and 2theta peak values was used Origin 2022b software. There was identified 7 major peaks in the graphs and the values of θ and β are given bellow

Peaks	SAMPLE 1		SAMPLE 2		SAMPLE 3		SAMPLE 4		SAMPLE 5		SAMPLE 6	
	0.25M		0.25M		0.5M		0.75M		0.75M		1.0 M	
	θ	β	θ	β	θ	β	θ	β	θ	β	θ	β
1	15,8 8	0,15	32,2 9	1,09	31,8 8	0,25	31,7 9	0,18	31,81	0,23	31,88	0,25
2	17,2 7	0,99	34,6 3	0,19	34,5 3	0,19	34,4 4	0,18	34,47	0,19	34,53	0,19
3	18,1 2	0,16	36,4 6	0,26	36,3 7	0,23	36,2 8	0,20	36,30	0,24	36,37	0,23
4	23,7 7	0,19	47,7 8	0,29	47,6 6	0,25	47,5 7	0,24	47,59	0,27	47,66	0,25
5	28,3 6	0,60	56,8 3	0,33	56,7 1	0,26	56,6 3	0,29	56,65	0,32	56,71	0,26
6	31,4 5	0,31	63,1 2	0,33	62,9 7	0,28	62,9 0	0,32	62,93	0,34	62,97	0,28
7	34,0 1	0,39	68,2 0	0,36	68,0 6	0,30	68,0 0	0,35	68,02	0,39	68,06	0,30

The θ and β values were applied to the Debye Scherrer equation to determine the crystallite size. It was considered wavelength ($\lambda=0.1506\text{nm}$) given by the machine and Scherrer constant ($K=0.9$).

From Scherrer equation crystallite size was calculated

$$D = \frac{k \cdot \lambda}{\beta \cdot \cos(\theta)} \quad (2)$$

Table 3: Determination of theta and beta per sample

The crystallite size determined did not differ much between samples as given bellow.

SAMPLES	<D> (NM)	D _{MIN} (NM)	D _{MAX} (NM)	AMPLITUDE
1	34,05	8,44	56,88	48,44
2	27,75	7,56	42,81	35,25
3	35,46	32,26	44,81	12,55
4	35,71	27,24	47,23	19,99
5	31,43	24,47	43,77	19,3
6	35,015	32,26	42,81	10,55

Table 4: Determination of crystallite size
In this experiment of synthesis, the crystallite size is in the nano range <100nm. Even though, for low values of molar in the precursor samples {1,2} the range between

was higher compared to the one of high molar.

Determination of hkl values per sample

The 7 peaks were matched with the findings in JCPDS 36-1471 card [22] to determine hkl values given in the below table.

PEAKS	SAMPLE 1		SAMPLE 2		SAMPLE 3		SAMPLE 4		SAMPLE 5		SAMPLE 6	
	2 θ	hkl										
1	31,76301	100	32,2942	100	31,8838	100	31,7856	100	31,8087	100	31,8838	100
2	34,54887	002	34,6338	002	34,5349	002	34,4435	002	34,4654	002	34,5349	002
3	36,24954	101	36,4616	101	36,3672	101	36,2750	101	36,2973	101	36,3672	101
4	47,54526	102	47,7790	102	47,6576	102	47,5708	102	47,5939	102	47,6576	102
5	56,72088	103	56,8343	103	56,7103	103	56,6315	103	56,6536	103	56,7103	103
6	62,89901	110	63,1187	110	62,9701	110	62,9043	110	62,9287	110	62,9701	110
7	68,02741	112	68,2008	112	68,0590	112	67,9987	112	68,0234	112	68,0590	112

Table 5: Determination of hkl values per sample in the major peaks

The results indicate that in all samples off growth ZnO in this experimental procedure,

the major peak in 2 θ (36°) was located in the plane 101 results also achieved by [22]–[24] When the molarity was increasing from 0.25M to 1.0 M the ZnO patterns was more

appropriate with no many noises easily to match with standard patterns. Looking into particle size, lattices, molarity and the graphs the influence of medium was not strongly noticed. Considering the particle size determination, probe sonicate were important to reduce the size in overall but the effect was not as it was expected. As [S1, S2, S4 and S5] samples used ultrasonic bath and probe sonicate and the particle size was ranging [27.75-35.71] nm. The samples [S4, S6] used only ultrasonic bath and the crystallite size was 35nm.

Determination of micro strain and particle distribution

The micro strain and particle distribution was done by method of Williamson -Hall also known as (W-H) in the six samples. This strategy allows to visualize the scattering of particle size dispersal. The (W-H) method consider that XRD peaks wide (β_{Total}) is function of angle of diffraction (2θ) which is assumed to be the effect of crystallite size (β_D) effect and strain which is intrinsic (β_ϵ)[25]. This combination is given by $\beta_{Total} = \beta_D + \beta_\epsilon$ (3)

Due to the origin, β_D is given from Scherrer equation (2)

$$\beta_D = \frac{k.\lambda}{D.\cos(\theta)} \quad (4)$$

And

$$\beta_\epsilon = 4\epsilon \tan(\theta) \quad (5)$$

The equation (5) is given by the model of uniform deformation (UDM) [26]–[28]

Effecting basic mathematical transformations with the equations (3-5) is possible to reach to the conclusion of

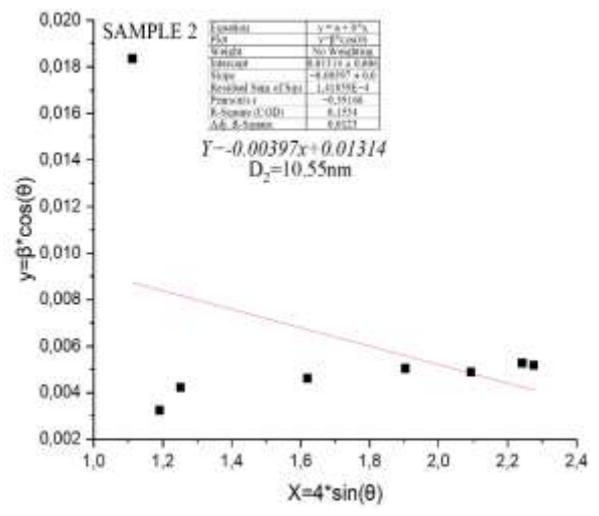
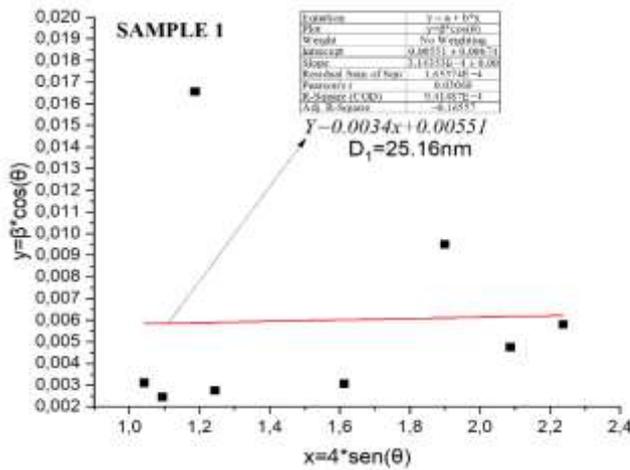
$$\beta_{hkl} \cdot \cos(\theta) = \frac{k.\lambda}{D} + 4\epsilon \cdot \sin(\theta) \quad (6)$$

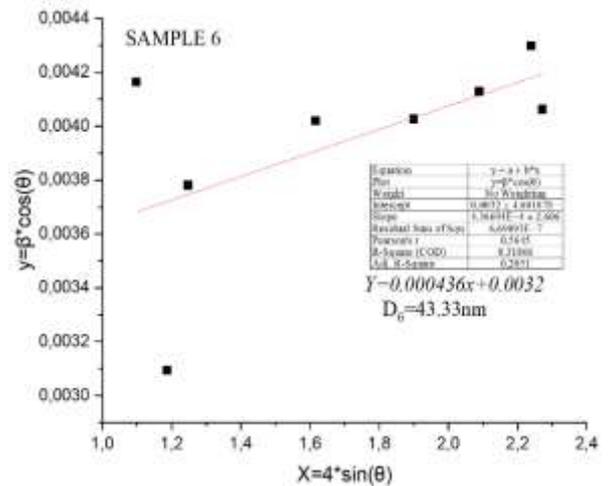
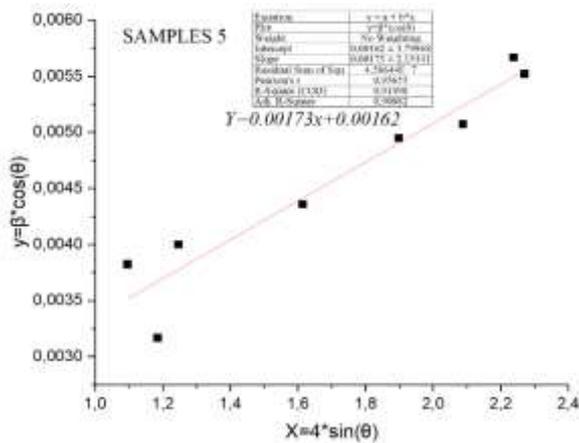
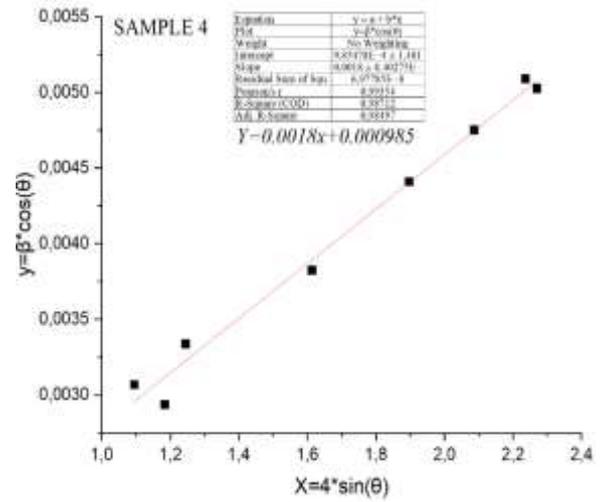
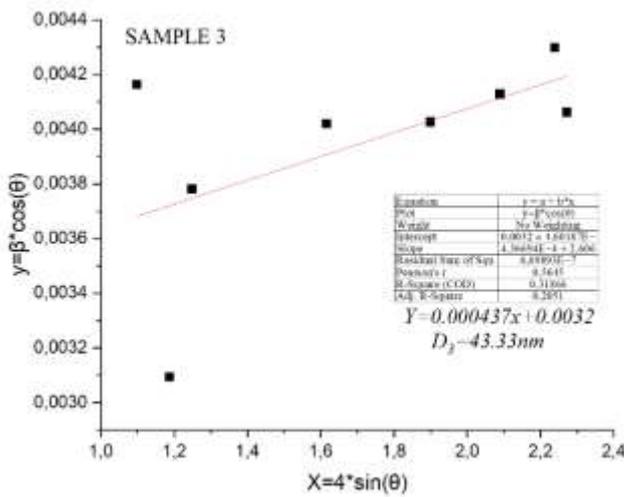
This is a form of linear equation given by

$$Y = m \cdot x + c \quad (7)$$

Where $m = \epsilon$ (slope or angular coefficient); $x = 4 \cdot \sin(\theta)$ where θ is a half of 2θ given on the peak position in x-axis of XRD graph; $Y = \beta_{hkl} \cdot \cos(\theta)$ where the line graph crosses Y axis; $C = \frac{k.\lambda}{D}$ from where is calculated crystallite size $D = \frac{k.\lambda}{C}$

From the graph is possible to understand that the particles are scattered. The slope which defines the trends of the linear function was determined and is negative for sample 2.





Conclusions

Zinc oxide nanoparticles was performed from Zinc acetate dehydrate as precursor, NaOH, KOH as medium, Ethanol as reagent and Double distilled water as solvent looking into the white color of the powder, the particle size [27.75nm-35.71nm] and XRD patterns (Graph. 2). Differences among samples was noticed in the molarity where noise reduced from 0.5M-1.0M of the precursor. There was observed change in particle size for samples applied probe sonicate compared to those without in terms of homogeneity over 0.25M as observed in the (Tab.4). Medium did not strongly affect the formation of ZNO NPs leading the idea of performing these materials in different mediums according to the application. From the hkl given in table 5, values all samples matched more on hexagonal wurtzite form of ZnO. Regarding to particle distribution they are scattered and angular coefficient (slope) was negative for sample 2.

More studies are needed to understand the optical, electrical and thermal properties of the materials applying UV-Vis, FTIR, four probe method and TGA.

References

1. M. Parashar, V. K. Shukla, and R. Singh, "Metal oxides nanoparticles via sol-gel method: a review on synthesis, characterization and applications," Journal of Materials Science: Materials in Electronics, vol. 31, no. 5. 2020. doi: 10.1007/s10854-020-02994-8.
2. H. W. Kim et al., "Synthesis of zinc oxide semiconductors-graphene nanocomposites by microwave irradiation for application to gas sensors," Sens Actuators B Chem, vol. 249, pp. 590-601, 2017, doi: 10.1016/j.snb.2017.03.149.
3. H. Fu et al., "Zinc oxide nanoparticle incorporated graphene oxide as sensing coating for interferometric optical microfiber for ammonia gas detection," Sens Actuators B Chem, vol. 254, pp.

- 239–247, 2018, doi: 10.1016/j.snb.2017.06.067.
4. M. H. S. Bargal et al., “Experimental investigation of the thermal performance of a radiator using various nanofluids for automotive PEMFC applications,” *Int J Energy Res*, vol. 45, no. 5, 2021, doi: 10.1002/er.6274.
 5. H. Soleimani et al., “Synthesis of ZnO nanoparticles for oil–water interfacial tension reduction in enhanced oil recovery,” *Appl Phys A Mater Sci Process*, vol. 124, no. 2, 2018, doi: 10.1007/s00339-017-1510-4.
 6. R. A. Venis and O. D. Basu, “Silver and zinc oxide nanoparticle disinfection in water treatment applications: synergy and water quality influences,” *H2Open Journal*, vol. 4, no. 1, 2021, doi: 10.2166/h2oj.2021.098.
 7. P. P. Singh, T. Bhatnagar, S. M. P. Khurana, and S. Chaturvedi, “Ecofriendly Approach for the Biosynthesis of Zinc Oxide Nanoparticles and their Applications in Agriculture: A Review,” *JOURNAL OF SCIENTIFIC RESEARCH*, vol. 65, no. 05, 2021, doi: 10.37398/jsr.2021.650515.
 8. H. J. Jo, S. M. Joo, J. Y. Kim, K. H. Yu, S. W. Kim, and B. Peng, “Development of a Hybrid Chitosan- And Niacinamide-Coupled ZnO Nanoparticle Composite for Sun Protection Application,” *J Nanomater*, vol. 2019, 2019, doi: 10.1155/2019/5957606.
 9. N. A. Mirgane, V. S. Shivankar, S. B. Kotwal, G. C. Wadhawa, and M. C. Sonawale, “Waste pericarp of ananas comosus in green synthesis zinc oxide nanoparticles and their application in waste water treatment,” in *Materials Today: Proceedings*, 2020, vol. 37, no. Part 2, pp. 886–889. doi: 10.1016/j.matpr.2020.06.045.
 10. K. Dulta, G. Koşarsoy Ağçeli, P. Chauhan, R. Jasrotia, and P. K. Chauhan, “Ecofriendly Synthesis of Zinc Oxide Nanoparticles by Carica papaya Leaf Extract and Their Applications,” *J Clust Sci*, vol. 33, no. 2, pp. 603–617, Mar. 2022, doi: 10.1007/s10876-020-01962-w.
 11. S. Arya et al., “Review—Influence of Processing Parameters to Control Morphology and Optical Properties of Sol-Gel Synthesized ZnO Nanoparticles,” *ECS Journal of Solid State Science and Technology*, vol. 10, no. 2, p. 023002, Feb. 2021, doi: 10.1149/2162-8777/abe095.
 - A. Kolodziejczak-Radzimska and T. Jesionowski, “Zinc oxide—from synthesis to application: A review,” *Materials*, vol. 7, no. 4, pp. 2833–2881, 2014, doi: 10.3390/ma7042833.
 12. S. Taghavi Fardood, A. Ramazani, S. Moradi, and P. Azimzadeh Asiabi, “Green synthesis of zinc oxide nanoparticles using arabic gum and photocatalytic degradation of direct blue 129 dye under visible light,” *Journal of Materials Science: Materials in Electronics*, vol. 28, no. 18, 2017, doi: 10.1007/s10854-017-7199-5.
 13. J. Podporska-Carroll et al., “Antibacterial properties of F-doped ZnO visible light photocatalyst,” *J Hazard Mater*, vol. 324, 2017, doi: 10.1016/j.jhazmat.2015.12.038.
 - A. Awan, M. Nadeem, S. Riaz, S. S. Hussain, F. Majid, and S. Naseem, “Molarity dependent oscillatory structural and magnetic behavior of phase pure BiFeO₃ thin films: Sol–gel approach,” *Ceram Int*, vol. 45, no. 4, 2019, doi: 10.1016/j.ceramint.2018.08.069.
 14. N. ben Moussa et al., “Synthesis of ZnO sol-gel thin-films CMOS-Compatible,” *RSC Adv*, vol. 11, no. 37, 2021, doi: 10.1039/d1ra02241e.
 15. D. Meroni, C. Gasparini, A. di Michele, S. Ardizzone, and C. L. Bianchi, “Ultrasound-assisted synthesis of ZnO photocatalysts for gas phase pollutant remediation: Role of the synthetic parameters and of promotion with WO₃,” *Ultrason Sonochem*, vol. 66, 2020, doi: 10.1016/j.ultsonch.2020.105119.
 16. M. Joseph, V. P. N. Nampoori, and M. Kailasnath, “Low temperature structure tunability of zinc oxide nanostructures using milk protein casein,” *Surfaces and Interfaces*, vol. 24, 2021, doi: 10.1016/j.surfin.2021.101157.
 17. V. Huynh Tan, Q. Pham My, L. Nguyen The, and T. Huynh Thi Thien, “Synthesis of ZnO material: A new approach by hydrothermal method,” *Science and Technology Development Journal - Natural Sciences*, vol. 5, no. 1, 2020, doi: 10.32508/stdjns.v5i1.963.

18. Neha Verma, Sonik Bhatia, and Bedi, "Effect of Annealing Temperature on ZnO Nanoparticles and its Applications for Photocatalytic Degradation of DR- 31 dye," *International Journal of Pure and Applied Physics*, vol. 13, no. 1, 2017.
19. S. O. Alayande, A. A. Akinsiku, O. B. Akinsipo (Oyelaja), E. O. Ogunjinmi, and E. O. Dare, "Green synthesized silver nanoparticles and their therapeutic applications," in *Comprehensive Analytical Chemistry*, vol. 94, 2021. doi: 10.1016/bs.coac.2021.01.009.
20. K. al Abdullah, S. Awad, J. Zaraket, and C. Salame, "Synthesis of ZnO Nanopowders by Using Sol-Gel and Studying Their Structural and Electrical Properties at Different Temperature," in *Energy Procedia*, 2017, vol. 119. doi: 10.1016/j.egypro.2017.07.080.
21. C. Boukaous, A. Telia, D. Horwat, M. S. Aida, B. Boudine, and S. Ghanem, "Influence of solvent on humidity sensing of sol-gel deposited ZnO thin films," *EPJ Applied Physics*, vol. 65, no. 2, Feb. 2014, doi: 10.1051/epjap/2013130471.
22. P. M. Perillo, M. N. Atia, and D. F. Rodríguez, "Studies on the growth control of ZnO nanostructures synthesized by the chemical method," *Revista Materia*, vol. 23, no. 2, 2018, doi: 10.1590/S1517-707620180002.0467.



**RECENT CHANGES IN MSMEs SECTOR AND ITS IMPACT ON
ECONOMIC DEVELOPMENT IN INDIA**

Miss SUBHALAXMI JOSHI¹ Dr. Bandana Pathak²

¹M.Phil Research Scholar

²asst Professor In Economics Shailabala Women's (Auto) College, Cuttack, Odisha

Corresponding Author- Miss Subhalaxmi Joshi¹

Email:- subhalaxmijoshi1998@gmail.com

DOI- 10.5281/zenodo.7295653

India is expected to emerge as one of the leading economies of the world over the next decade in the light of a positive political and economic scenario. The Micro, Small and Medium Enterprises (MSMEs) segment is expected to play a significant role in the emergence of the Indian Economy. In recent years, the significance of the MSME has been recognized in the world's countries for its major contribution in various socio economic objectives such as higher economic growth and employment, output, nurturing entrepreneurship and encouragement and support for exports. MSME play a vital role in the industrial development of any country. The MSME sector is a backbone of Indian economy. This sector is very much important for moves towards a faster and inclusive growth of country. The MSME sector can help for achieving the target of Nation Manufacturing policy that manufacturing should contribute 25% in India's GDP by 2022. The MSME sector in India is vast heterogeneous in terms of the size, variety of product and level of technology. This sector is large contributes to the socioeconomic development of the country. The MSME sector is an important pillar of Indian economy as it contributes greatly to growth of Indian economy with a vast network of around 30 million units, creating employment of about 70 million, manufacturing more than 6000 products, contributing about 45% to manufacturing output and about 40% of exports, directly and indirectly. This sector even assumes greater importance now as the country moves towards a faster and inclusive growth agenda.

Industrial units are generally classified between small scale, medium scale and large-scale units; considering their size, capital resources and the number of laborer's engaged upon. There is difference between small scale and cottage industries on two different issues:

(a) Small scale industries are mostly located in urban centers as separate units, but the cottage industries are normally associated with agriculture and provide subsidiary employment in rural areas; and

(b) Small scale industries produce goods with mechanized equipment, partially or fully, but the cottage industries involve activities mostly by hand and are performed primarily with the help of household workers.

Review Of Literature:-

Dr. Meera vali S. K. Ramesh et al. (March 2017) found that through MSME total working enterprises, employment and market value of fixed assets grown at CAGR of 4.39%, 4.75%, and 6.64% respectively, that contribution from manufacturing and service sector MSME contribution to GDP is -1.5% and 1.82% respectively. Researchers also suggest that Government has to adopt integrated policy.

Davinder Singh, J.S. Khamba, and Tarun Nanda (2019) composed an exploration paper

on "Justification of technology innovation implementation in Indian MSMEs using AHP." The examination investigates the significance of different elements affecting the assembling execution improvement of small and medium ventures utilizing the scientific order measure. The analysts found that, for the most part, small firms contribute altogether to work age in immature nations. So the public authority of those nations underscores the improvement of SME's efficiency and execution through innovation execution.

Olufemi Aladejebi (2019) wrote an article on "The Impact of Microfinance Banks on the Growth of Small and Medium Enterprises in Lagos Metropolis." The study aimed at examining the effects of Micro Finance Banks (MFBs) on the progression of SMEs. The study found that SMEs with MFB products are growing faster than those without MFB products. Moreover, the MFB savings rate is higher than that of other commercial banks. MBFs loan disbursement duration is also faster than other commercial banks. Besides, SMEs having MBFs training showed better performance in their growth. Finally, the study concluded that MBFs are influencing the progress of SMEs significantly.

A.Satish and S.Rajamohan (2020) directed exploration on "An Impact of Re-Engineering on Entrepreneurship and Employment in Indian MSMEs." The researchers analyzed the effect of reengineering practices on MSMEs. The examination tracked down that the two significant reengineering practices like globalization and MSMED Act, 2006, fostered a legitimate plan and design that is a reasonable answer for unemployment in India.

Waseem Khan (2020) wrote an article entitled "Understanding the Dynamics of Small Industries. A case study of Indian context." The study was conducted to determine the performance of MSME related to units' establishment, production, employment generation, and exports. The researcher tracked down that the MSME are impacts industrialization in India. He likewise saw that MSMEs contributed fundamentally to the development and improvement of industrialization during the investigation time frame.

Chaturvedi P. et al. (2021) had a research paper on "Technological Innovation : a Necessity for Sustainable MSME sector in India." The study explores the innovation in the MSME sector to improve productivity. The researcher found that the personnel engaged in MSMEs' industrial job capabilities heavily affect the industry's productivity performance. Finally, the researcher suggested that the technical institutions create high-tech innovations in the MSME sector to improve productivity and make them sustainable in the competitive market.

Industrial Resolution in India:-

In India, the small-scale industrial sector has been growing at a very rapid scale. Industrial Policy Resolutions, 1948, 1956, and more particularly the Industrial Policy Statement, 1977 have offered a special favor for the development of small-scale industries in India.

In India, the MSMEs sector has played a vital role in the country's economic and social development as there are essentially dependent on traditional inherited skills and mostly use local resources (Indra Kumar, 2020). As on fact, MSMEs particularly widen their sphere in rural and industrially underdeveloped areas by fostering entrepreneurship in resources poor communities and manufacturing over more than 6000 quantity products in national and global markets. In recent years, the MSMEs have been mounting significance for their rolling contribution to employment and income growth with export earnings and their ability to be reactive to alteration in the market and innovation practices in local or global spheres (World Bank Group, 2018). According to the National Sample Survey (NSS) 73rd round conducted during 2015-16, beyond the agricultural sector, MSMEs were the only sector to generate huge employment opportunities of 11.10 crore jobs through 6.34 crore MSME units. It generates backward and forward linkages in the economy by promoting non-agricultural livelihood and appealing more investments to the sectors (Ministry of MSMEs, 2018-2019).

The MSMEs sector has been widely accepted as the backbone of the Indian economy. But the hard below of COVID-19 has made this sector to struggle for its sustainability. The threat of lockdown has become conscious in the MSMEs sector, bringing plentiful problems in financial crisis, demand, supply chain trouble, freezing of import and export opportunity, etc. (Banu & Suresh, 2020). The Government has shown its concern in need of attention in the form of monetary and fiscal support to induce economic activity in the sector.

Objectives:-

This article highlights as follows:

- The Contribution of the MSMEs sector to the Indian economy in terms of output,

employment, income, investment and export.

- The challenges encountered by the MSMEs segment before and during the COVID-19 pandemic.
- The policy initiatives to revive the MSMEs sector by the Government.
- To suggest revival strategy of MSMEs to sustain in post-pandemic situation.

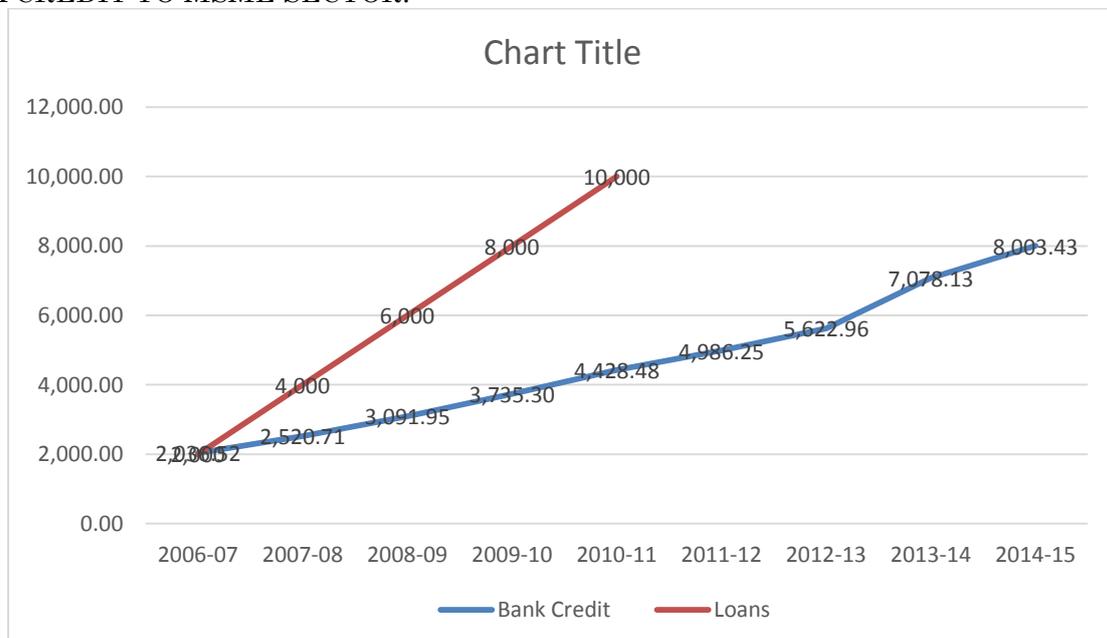
Contribution of MSMEs Sector:-

MSMEs, predominantly in developing countries, occupy an imperative and strategic place. From the beginning of the planned Bank credit to MSME Sector:-

economy in 1951, MSME’s role was earmarked in the Indian Economy. There are over 6000 goods from traditional to technologically advanced items, which the MSMEs in India are manufacturing. In the recent time period, the MSMEs sector has shown a higher growth rate compared to Indian’s overall industrial sector. The growth rate of the MSMEs sector was registered 13% on average. The MSMEs sector employed nearly 114 million people (Sipahi, 2020). In employment, MSME is the second largest sector after agriculture.

Year	Bank Credit
2006-07	2,036.52
2007-08	2,520.71
2008-09	3,091.95
2009-10	3,735.30
2010-11	4,428.48
2011-12	4,986.25
2012-13	5,622.96
2013-14	7,078.13
2014-15	8,003.43

[Sources: Statistical tables relating to banks in India different years RBI]
BANK CREDIT TO MSME SECTOR: -



[Sources: Statistical tables relating to banks in India different years, RBI]

Miss SUBHALAXMI JOSHI¹ Dr. Bandana Pathak²

This graph depicts the trend of MSME credits provided by commercial banks in India from 2006-07 to 2014-15. And we see an increasing trend in this lending to MSMEs. This graph shows that there is around 4 times increase in the bank lending to MSMEs in 2014-15 than 2006-07.

Impact of COVID-19 on MSMEs: -

The MSMEs sector plays a substantial role in stimulating the growth of the Indian economy. Prior to the COVID-19 turmoil, this sector is experiencing sluggish growth due to multitude of challenges like lack of financial support, absence of proper infrastructural facility, non-availability of advanced technology etc. But the problems have been provoked more by the process of demonetization (2016) and Goods and service tax (2017). As most of the MSMEs have a rural unskilled labor base, smaller problems have a larger influence on these units, and such a health crisis puts there potentiality and sustainability to further distress.

COVID-19 has changed the operational environment for MSMEs. The strictest lockdown to decontaminate the spread of the COVID-19 crisis resulted in the biggest shock for the MSMEs sector, particularly for the smallest firms. The MSMEs sector experiences its worst situation as 55% loss in employment, production falling from an average of 75% of capacity of just 11%, about 17.2% of annual sales loss, delay in raw material received, less possibility of paying wage, more labor shortage and lost the access to credit. Overall, 70% of firms report that they will not survive the crisis beyond the next 3 months if the lockdown continues, and smallest one might collapse in 1 month.

Government Policy Initiatives: -

Executing the MSME development act 2006 that renders laws and regulations for MSME. Reservation along with de-reservation of the items in manufacturing in MSME sector for accomplishing socio-economic development to improve technology and to accomplish the economies of scale.

National manufacturing competitiveness program- for development of supportable skills to tackle universal competitiveness and better development with eight factors that comprise of: incubator, intellectual property awareness, quality management, technology

up gradation, marketing assistance design expertise and promotion of ICT.

Public purchasing policy with execution of technology in proposals.

E-Governance: - To simplify employment, virtual cluster, share database, B2B portal and mobile friendly.

Key challenges faced by the MSME sector: -

Small and Medium Scale enterprises go through serious issues that are mostly based on extent of economic and social growth of India. India, being a developing nation is different from the aforementioned situation. Even through the issues related to MSMEs are endless, a few of them are stated as follows:

Issues with acquiring credit, competition with imported goods, recognizing paper technology and technical support, investment promotion and disturbed project groundwork and assessment. Incapability in providing liberal credit terms in selling the products, indecent of management proficiency, under capitalization and administrative red tapism and rules. Insufficient industrial training and skill development, quality control and testing services, appropriate market promotion of domestic as well as export, scientific and industrial study, insufficient management and rearrangement of small and medium scale enterprises with different proposals and efficiency growth via modernization.

As per the survey of Ministry of MSME, around two thirds of small business takes insufficient market information into the account as quite serious restriction.

High cost of credit.

Insufficient access to proper timely credit.

Insurance supplies. Incomplete access to equality capital. Obtaining raw material at competitive cost. Difficulties of storage, designing, packaging and product display.

Improper access to universal markets. Insufficient infrastructure services that includes power, water, roads etc. Low technology levels and improper access to modern technology. Improper expert manpower for manufacturing services, marketing etc. Variety of labour rules and complex processes related to pursuance with these rules and regulations.

Conclusion: -

This sector plays an important role in the economy by contributing to a great extent to national GDP, industrial output, export earnings, regional development, and social stability. The export potential of MSMEs should be improved by providing training to entrepreneurs regarding export procedures, export documentation, market research, negotiation with buyers, foreign standards, foreign demand patterns etc. The MSMEs in India face a tough situation due to extreme competition from large industries due to withdrawal of subsidy, lack of infrastructure, anti-dumping policy, challenges on product standardization, total quality management etc. Though Globalization has increased competitiveness in Indian MSMEs are not adequately prepared to compete with the global players. There has been a definite change in attitude of Government from protection to promotion of the MSMEs. The Government has taken several policy initiatives but needs to ensure proper co-ordination and implementation of such schemes. The MSMEs must convert the threats of globalization into opportunities through increased productivity, product diversification, supply chain management, research and development activities. The MSMEs sector in India is growing at good pace and even is providing employment opportunities to masses of the people. The contribution of manufacturing sector as well as service sector of MSMEs is significant to the total GDP of the country. The Government of India has taken number of initiatives and is in the process of gearing up the growth of these Micro, Small and Medium Enterprises in the country. The new wave initiatives consider potential opportunities for creating significant support for the MSME sector to develop over the next decade and facilitate partnership approach by the various stakeholders by way of incentives, rather than compliance, thereby channelizing the much-needed resources and infrastructure.

References: -

1) Annual Report 2010-11, Govt. of India, Ministry of Micro, Small and Medium Enterprises

- 2) Bhavani, T.A. (2011), "Dynamic Business Environments: What These Mean for Indian Small Enterprises" in "Micro and Small Enterprises in India: Era of Reforms: Keshab Das (Ed)
- 3) Morris, S.; R. Basant; K.Das; K.Ramchandran; and A.Koshy(2001)The Growth and Transformation of Small Firms in India. New Delhi: Oxford University Press.
- 4) MSME Development Act 2006, Ministry of the District Industry Centre (DIC) MSME, Government of India.
- 5) Lahir Rajib, Financing Micro, Small and Medium Enterprises (MSMES) In India During Post Liberalization Period: A Study on Traditional and Unconventional Approaches of Financing: India Streams Research journal, Vol.2, Issue 8(Sept.;2012)
- 6) Sande Sara, J.C. (1993)" Modern Small Industry ,1972 and 1987-88: Aspects of Growth and Structural Change." Economic and political Weekly, Vol.28.
- 7) Sonia and Kansai Rajeev (2009)," Globalisation and its impact on small scale Industries India ", PCMA Journal of Business, Vol. 1, No. 2 (June ,2009) pp. 135-146, ISSN0974-9977, (Available in <http://publishingindia.comUpload/sample Article/PCMA-Sample - Article.pdf> ,Accessed
- 8) Subrahmanyam, Bala (2011)," Small-scale Industry Development for Export Promotion: India's Experience under Liberalisation" in "Micro and small Enterprises in India: Era of Reforms: Keshab Da (Ed) pp.46-66.
- 9) Venkatesh,K. Muthiah,' SMEs in India: Importance and Contribution', Asian Journal of Management Research, Volume 2,Issue 2,2012.
- 10) Srinivas K T (2013): International Journal of Engineering and Management Research.3 (4) August 2013 ISSN No.: 2250-0758.
- 11) Srinivas, K.T. (2013) Role of micro, small and medium enterprises in inclusive growth. International Journal of Engineering and Management Research, 3 (4)
- 12) Venkatesh,K. Muthiah,' SMEs in India :Importance and Contribution', Asian Journal of Management Research, Volume 2,Issue 2,2012.
- 13) Srinivas K T (2013): International Journal of Engineering and Management Research.3 (4) August 2013 ISSN No.: 2250-0758.



INVESTIGATION ON THE TUBE WELL WATER QUALITY OF A
VILLAGE FROM DARYAPUR TALUKA, DIST. AMRAVATI,
MAHARASHTRA, INDIA

S.R.Bansod

Dept. of Botany, Arvindbabu Deshmukh Mahavidyalaya, Bharsingi, Ta-Narkhed, Dist-Nagpur (M.S.) India.

Corresponding Author- S.R.Bansod

Email:- shailesh.bansod@gmail.com

DOI- 10.5281/zenodo.7295656

Abstract

Present investigation planned to assess the tube well water quality of a village Peth Jahanpur of Daryapur Taluka, Amravati District Maharashtra for its potability by evaluating the physico-chemical parameters and its comparison as per the WHO and ICMR standards for water quality. Overall results revealed significant difference in the values of water quality parameters like Total Hardness, Alkalinity, pH, TDS, DO which exceeded the desirable limit whereas Sulphate, Chloride and COD values were reported within the desirable limit of water quality standards. Seasonal comparison showed increased concentration of water quality parameters during summer season followed by rainy and winter season. On the basis of present investigation it can be concluded that the elevated values of water quality parameters Total hardness and Alkalinity affects tube well water quality which might be due to the geology of the region where sampling site is located.

Keywords: water quality, physico-chemical parameters, tube well, water standards, ICMR, WHO.

Introduction

Water is an important component in an ecosystem required for all life supporting activities, Ayibatele (1992) but deteriorates by the continuous unplanned urbanization and industrialization, Singh et. al. (2002) & Nanoti (2004) in terms of its quality. On considering the availability of water on the globe it is estimated that about 97.2% of water is salty and only 2.8% is fresh water from which about 20% constitutes highly valued groundwater rather than surface water due to certain properties, Goel (2000). Only 1% part of surface and ground water resources is available on land for various purposes, Mishra et. al. (2002) & Gupta et. al. (2009). In India, majority of the population is dependent on ground water for various domestic purposes. Since in recent years increased population needs much more clean and pollution free drinking water supply. Therefore the knowledge of the occurrence, replenishment and recovery of this natural resource available in the form of groundwater is of great importance in

regions where quality is deteriorated and surface water scarcity is a major problem. In spite to this, adverse climatic condition such as low rainfall with regular incident of dry spells, high rate of evaporation, unsuitable geological set up and the efficacy of surface and subsurface reservoirs in the region is of great concern. Many studies has been carried out to assess ground water quality of open well and tube well water, Reza & Singh (2010), Tambekar & Neware (2012); Rathod et. al. (2011); Warhate et. al. (2006); Rajankar et. Al. (2010); Gopkar (2012) & (2013) by means of different water quality parameters like pH, TDS (Total Dissolved Solids), DO (Dissolved Oxygen), Alkalinity, Total Hardness, Chloride, Sulphate and COD (Chemical Oxygen Demand).

2. Material and Methods

2.1 Sampling site

Tube well in a village Peth Jahanpur of Daryapur Taluka, Amravati District Maharashtra was selected for study as village population depends on the tube well

water in order to fulfill their need of drinking water.

2.2 Collection of Water Samples and Analysis

Collection of water samples was carried out fortnightly during a month in previously cleaned polythene bottles. Water samples collected monthly between January 2015 and December 2015 from sampling site and analyzed on site and in laboratory as per the guidelines and standard methods prescribed by American Public Health Association, APHA (2005). The obtained monthly and seasonal analyzed values of physico-chemical parameters were compared with the ICMR (Indian Council of Medical Research) and WHO (World Health Organization) water standards for drinking water.

2.3 Statistical analysis

The data obtained in triplicate were analyzed by SPSS statistical package (Window version 17) and Microsoft software Excel 2007 and represented as mean values with standard deviation in figures and tables.

3. Results and discussion

The monthly analyzed values and seasonal mean values of water quality parameters were given in table 1 and Table 2 respectively.

3.1 pH

pH is one of the most important parameter that shows acid-base neutralization and water softening. The fortnightly mean value of pH ranges from 5.9 to 7.44 in the month of May and June respectively (Table 1). Seasonal mean values of pH during different season shows acidic nature of water and below the limit value 7.0 – 8.5 of ICMR for drinking water (Table 2 & Fig.1) during rainy and summer season while winter season experiences values under desirable limit.

3.2 Total Dissolved Solids (TDS)

TDS is a direct measure of organic and inorganic substances dissolved in waters especially inorganic substances that are dissolved in water. The fortnightly mean value of TDS ranges from 757 mg/l to 888 mg/l in the month of March and September respectively (Table 1). A seasonal variation of TDS values exceeds the desirable limit value 500 mg/l of WHO for drinking water (Table 2 & Fig.2) during all season. Hence unsuitable for drinking purpose.

3.3 Dissolved Oxygen (DO)

Dissolved oxygen is one of the basic parameters in water, which is required by the aerobic aquatic organisms to perform the metabolic activities. The fortnightly mean value of DO ranges from 2.3 mg/l to 4.8 mg/l in the month of May and December respectively (Table 1). Observed seasonal mean values of DO in both sampling sites were below the desirable range 5.0 mg/l of ICMR (Table 2 & Fig.3).

3.4 Alkalinity

Alkalinity of water is a measure of its capacity to neutralize acids and provides an index for the nature of salts present in the water samples. The fortnightly mean value of Alkalinity ranges from 99 mg/l to 151 mg/l in the month of September and February respectively (Table 1). Seasonal variations in the mean values of Alkalinity showed its suitability during only rainy season whereas winter and summer season values exceeded the desirable range of ICMR 120 mg/l (Table 2 & Fig.4)

3.5 Total Hardness

Most commonly hardness is associated with the ability of water to precipitate soap. Chemical point of view it is often defined as the sum of polyvalent cation (Ca^{++} and Mg^{++}) concentrations dissolved in the water. The fortnightly mean value of Total hardness ranges from 332 mg/l to 529 mg/l in the month of November and April respectively (Table 1). The increase in the hardness during all seasons revealed that the water is not suitable for drinking purpose as it exceeds the desirable range 300 mg/l of ICMR during all seasons (Table 2 & Fig.5).

3.6 Chloride

Presence of chloride in all types of water is a natural one and it is mainly contributed by the the minerals like, mica, apatite, and hornblende in case of ground water. The fortnightly mean value of Chloride ranges from 101.08 mg/l to 281.18 mg/l in the month of September and February respectively (Table 1) whereas seasonal mean values of Chloride does not exceeds the desirable range 250 mg/l of ICMR in all seasons (Table 2 & Fig.6).

3.7 Sulphate

All living organisms utilize Sulphate in the form of mineral as well as organic sulphates. The fortnightly mean value of Sulphate ranges from 99 mg/l to 242 mg/l in the month

of August and May respectively (Table1). A seasonal mean values remains in the desirable range 250 mg/l of WHO during all seasons hence indicating suitability of tube well water for drinking purpose (Table 2 & Fig.7).

3.8 Chemical Oxygen Demand (COD)

COD is considered as a measure of the oxygen equivalent of the organic matter content of a sample that is susceptible to oxidation by a strong chemical oxidant, WHO (1984). It is widely used index for the waste water quality monitoring and control.

The fortnightly mean values of COD ranges from 17 mg/l to 21 mg/l in the month of September and April respectively (Table 1) whereas seasonal variation in the values of COD seems to be of less concern as it remains in the desirable range of 20 mg/l prescribed by ICMR (Table 2 & Fig.8).

Present study on tube well water quality of village Peth Jahanpur indicated problematic scenario with respect to the water quality parameters studied. The monthly observed values of pH, DO, TDS, Alkalinity, Total Hardness were of more concern as they seems to be exceeding the desirable limit of water standards and could be the governing factors of water quality however parameters like pH, DO remained within limit up to certain extent. Chloride, COD and sulphate were also remained within desirable limit during all seasons implies little role in deteriorating water quality but the parameters like TDS, Total Hardness and Alkalinity contributed more in disturbed water quality because of their increased concentration. Seasonally all water quality parameters were reported with an elevated concentration during summer while somewhat moderate concentration during rainy and less concentration during winter but study revealed on the basis of observed values of all water quality parameters does not support potability of tube well water in all season unless it is treated with some monitoring measures of water quality. Variations in the monthly and seasonal values might be due to the anthropogenic activities, Singh (1992) associated with recharge point of tube well water in that particular area also the, geology and hydrological activities of that region, Tiwary, et. al.(1995); Tiwary & Dhar (1994). Findings

on the assessment of ground water quality of Amravati District has revealed that the hardness and alkalinity governs the nature of water quality and deteriorates its potability, Tambekar & Neware (2012); Gopkar (2012) & (2013) which is observed in present study.

Conclusion

The findings on the water quality parameters of tube well water revealed increased concentration of almost all the parameters except sulphate, chloride and COD. Among the studied water quality parameters Total Hardness, Total Dissolved Solids and Alkalinity majorly contributed a lot in deterioration of water quality pertaining to its use for the potability purpose. Therefore requires treatment of water before its use with proper monitoring control and measures.

References

1. APHA, (2005). Standard Methods for the Examination of Water and Wastewater. 21st. APHA, AWWA and WEF, American Public Health Association, Washington D.C.
2. Ayibatele, N.B. (1992). First Season Environmental Baseline Survey, in proc. of internal. Conf. on water and environ. 1, 4-26.
3. Goel, P.K. (2000). Water Pollution - Causes, Effects and Control, New Age Int. (P) Ltd., New Delhi, 2000.
4. Gopkar, N.S. (2012). Ground Water Quality Of Two Villages Of Daryapur Taluka, Dist. Amravati, Maharashtra, India *Indian Research Journal*, 2 (XI):1-9.
5. Gopkar, N.S. (2013). Seasonal Water Quality Index of Tube Well Water of Villages in Daryapur Taluka, Amravati District, Maharashtra, India. *Golden Research Thoughts*, 3(4):1-7.
6. Gupta, I., Dhage, S. and Kumar, R. (2009). Study of variation in water quality of Mumbai coast through Multivariate techniques. *Indian Journal of Marine Sciences*, 38(2);170-177.
7. Mishra, K.R., Pradip and Tripathi, S.P. (2002). Groundwater Quality of Open Wells and Tube Wells, *Acta Ciencia Indica*, XXXIIC, 2,179.
8. Nanoti M, (2004). Importance of water quality control in treatment and

- provision of safe public water supply”, *National workshop on control and mitigation of excess fluoride in drinking water*, 5-7th Feb, 2004. Nirmal Gram Puraskar Guideline, 2010. Government of India, Ministry of Rural Development Department of Drinking water supply. 1-7.
9. Rajankar, P.N., Tambekar, D.H. and Wate, S.R. (2010). Groundwater quality and water quality index at Bhandara District. *Environ Monit Assess*, (Published online 2010).
 10. Rathod, S.D., Mohsin, M. and Farooqui, M. (2011). Water Quality Index In & Around Waluj –Shendra Industrial Area Aurangabad. (M.S.) *Asian Journal of Biochemical and Pharmaceutical Research*, 2 (1): 368-378.
 11. Reza, R. and Singh G. (2010). Assessment of Ground water quality status by using water quality index method in Orissa, India. *World applied Science Journal*, 9(12): 1392-1397.
 12. Singh, D.F. (1992). Studies on the water quality index of some major rivers of Pune. Maharashtra. *Proc Acad Environ Biol*, 1(1):61–66.
 13. Singh, S.P., Pathak, D. and Singh, R. (2002). Hydrobiological studies of two ponds of Satna (M.P.), India. *Eco. Env. Cons.*, 8(3): 289-292.
 14. Tambekar, D.H. and Neware, B.B. (2012). Water Quality Index and multivariate analysis for groundwater quality assessment of villages of rural India. *Science Research Reporter*, 2(3): 229-235.
 15. Tiwary, R.K. and Dhar, B.B. (1994). International J. of Surface Mining, Reclamation and Environment 8, 111.
 16. Tiwary, R.K., Gupta, J.P., Banerjee, N.N., and Dhar, B.B. (1995). Impact of Coal Mining Activities on Water and Human Health in Damodar River Basin, 1st World Mining Environment Congress, New Delhi, India, (1995).
 17. Warhate, S.R., Yenkie, M.K.N., Chaudhari, M.D. and Pokale, W.K. (2006). Impacts of mining activities on water and soil. *Journal of Environ. Science & Engg.* 47(4): 326-335.
 18. WHO, (1984). World Health Organization, Water Quality Standards for Drinking Water, World Health Organization, Geneva.

Table 1: Fortnightly water analysis of sampling site

WQP	Feb	Mar	Apr	May	June	July
pH	6.5 ±0.17	6.3 ±0.25	6.2 ±0.30	5.9 ±0.26	6.5 ±0.212	6.5 ±0.27
TDS	845 ±28.27	757 ±21.53	846 ±26.36	866 ±22.32	851 ±20.11	835 ±31.79
DO	2.6 ±0.18	2.8 ±0.14	2.7 ±0.33	2.3 ±0.24	4.4 ±0.25	4.1 ±0.22
Alkalinity	151 ±6.11	141 ±5.10	146 ±4.35	135 ±4.21	103 ±5.18	111 ±4.28
TH	429 ±14.11	438 ±11.02	529 ±7.03	526 ±10.41	528 ±6.09	431 ±9.29
Chloride	281.18 ±4.61	258.47 ±3.88	272.14 ±5.10	258.61 ±4.46	212.08 ±5.09	216.81 ±3.56
Sulphate	208 ±4.31	214 ±5.42	226 ±4.27	242 ±4.86	159 ±4.03	152 ±3.49
COD	18 ±1.08	20 ±1.12	21 ±1.06	20 ±0.93	18.5 ±0.96	19.5 ±1.01

*All values are in mg/l except pH, ±SD n=3

Contd....

WQP= Water Quality Parameters, TDS= Total Dissolved Solids, DO= Dissolved Oxygen, TH=Total Hardness, COD=Chemical Oxygen Demand

Aug	Sept	Oct	Nov	Dec	Jan	Water Std.
6.8 ±0.20	6.9 ±0.24	6.8 ±0.29	7.18 ±0.23	7.44 ±0.27	6.9 ±0.29	7-8.5(ICMR)
811 ±24.26	888 ±31.02	841 ±38.03	868 ±10.32	872 ±29.10	854 ±41.06	500 (WHO)
4.2 ±0.28	3.7 ±0.31	3.5 ±0.16	4.2 ±0.26	4.8 ±0.29	4.3 ±0.32	5.00 (ICMR)
116 ±5.08	99 ±3.93	122 ±6.54	118 ±4.52	126 ±4.14	137 ±4.96	120 (ICMR)
441 ±8.70	491 ±8.12	349 ±6.39	332 ±7.34	468 ±8.58	464 ±7.93	300 (ICMR)
191.12 ±5.21	101.08 ±4.15	196 ±4.08	161.10 ±4.36	102.23 ±4.49	242.9 ±5.11	250 (ICMR)
99 ±4.91	115 ±5.01	161 ±4.18	213 ±3.40	184 ±4.19	179 ±4.78	250 (WHO)
18 ±0.99	17 ±0.95	17.5 ±0.98	18 ±0.96	19 ±1.10	18 ±0.97	20 (ICMR)

Water Quality Parameters	Seasons			Water Std.
	Rainy	Winter	Summer	
pH	6.675 ±0.20	7.08 ±0.28	6.225 ±0.25	7-8.5(ICMR)
Total Dissolved Solids	846.25 ±32.3	858.75 ±14.1	828.5 ±48.6	500 (WHO)
Dissolved Oxygen	4.1 ±0.29	4.2 ±0.53	2.6 ±0.21	5.00 (ICMR)
Alkalinity	107.25 ±7.67	125.75 ±8.18	143.25 ±6.84	120 (ICMR)
Total Hardness	472.75 ±45.2	403.25 ±72.8	480.5 ±54.4	300 (ICMR)
Chloride	180.27 ±53.9	175.55 ±59.2	267.6 ±11.09	250 (ICMR)
Sulphate	131.25 ±28.8	184.25 ±21.5	222.5 ±15	250 (WHO)
Chemical Oxygen Demand	18.25 ±1.04	18.12 ±0.62	19.75 ±1.25	20 (ICMR)

*All values are in mg/l except pH, ±SD n=4 ,

Fig. 1. Seasonal variation in pH

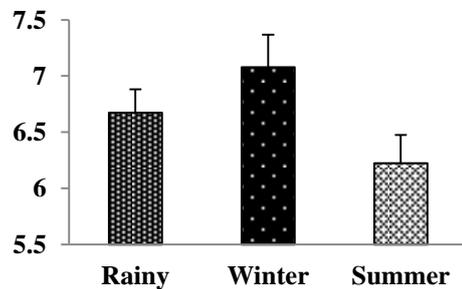


Fig. 2. Seasonal variation in TDS

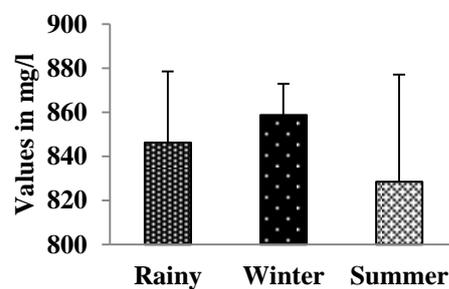


Fig. 3. Seasonal variation in DO

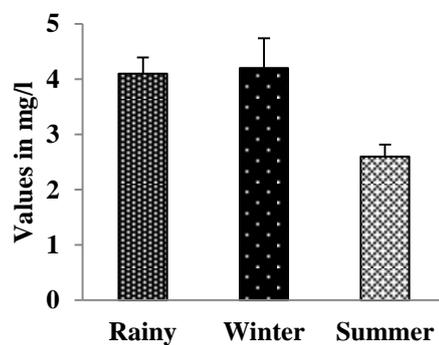


Fig. 4. Seasonal variation in Alkalinity

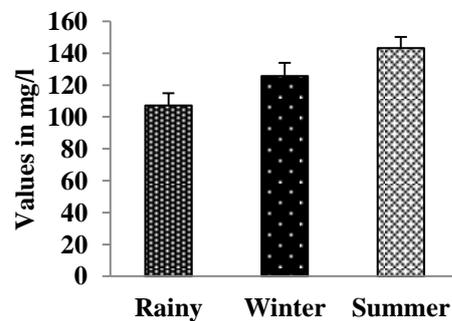


Fig:5.Seasonal variation in Total Hardness

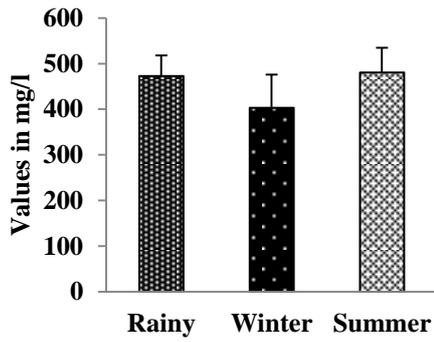


Fig:6.Seasonal variation in Chloride

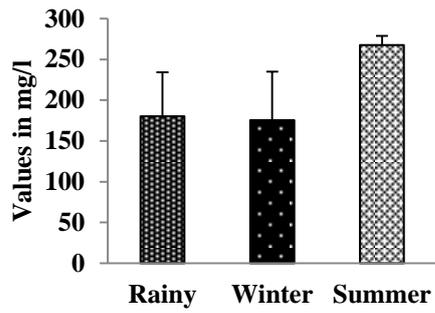


Fig:7.Seasonal variation in Sulphate

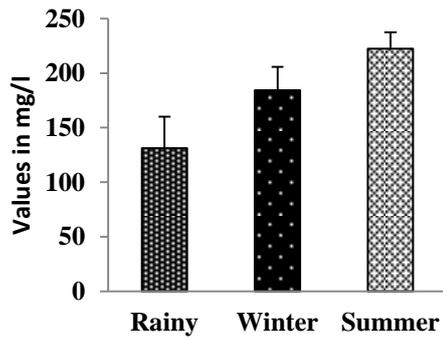
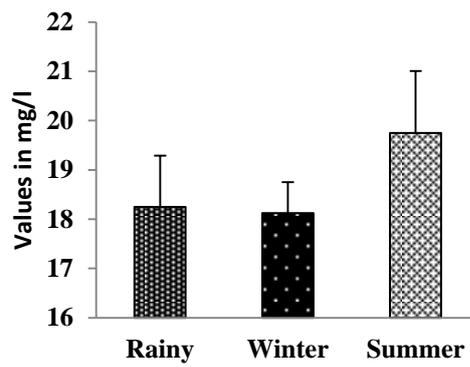


Fig:8.Seasonal variation in COD





SOCIAL AND CULTURAL CRISES BETWEEN THE ARVIND ADIGA'S THE WHITE TIGER AND LAST MAN IN TOWER

Ashwini M.Ingale¹ Prof. Dr. Kishor K. Wagh²

Research Scholar, Department of English, Dr.Babasaheb Ambedkar University.
Research Guide, Department of English, Dr. Babasaheb Ambedkar University.

Corresponding Author- Ashwini M.Ingale

Email:- ashwiniingale1238@gmail.com

DOI- 10.5281/zenodo.7295660

Abstract:

Arvind Adiga the winner of the Man Booker Prize 2008, for his debut novel *The White Tiger*. He is an Indo-Australian writer who is popular for his novels. His novels show social evils, injustice and poverty things of the society. He expresses the reality of modern India and exposes the defining exploitative hierarchy of the people. When we look for our India's economical growth, it is now same as America but if you observe the status of poor people of India, you will find that they are in same situation as before. The research paper is an attempt to understand the stark and different truths of India in Arvind Adiga's novel 'The White Tiger' and 'Last man in Tower'. He mainly focused on the opposed bitter pictures of Indian social order and chase a man for freedom from wrapped slavery of human kind. Adiga's novels target understanding the realistic picture and actuality of incredible India but it also explains the globalization has influence and affected the life of poor people too.

Keywords: The White Tiger, Last Man in Tower, culture, reality, freedom, equality.

Introduction:

Literature is one of the fine art that utilize the language as a medium of expression. It evokes imaginative worlds through the conscious arrangement of words that tell a story. Literature is the key to express the human feelings, emotions and thoughts through this medium. Good literature can not be outdated and knows no borderline of place or time as it is everlasting. It is also worldwide, it attracts the readers across the national or linguistic boundaries. Culture may be differs but human feelings, sentiments remain the same in all literary work of the world. Literature stands for the culture and tradition of language or people. Literature is mostly in the form of poetry, drama, fiction, nonfiction and novel. Indian writing in English has given one of those voices in which India speaks about their own tradition, culture, heritage, legacy and modernization of values and systems. In spite of the fact, English is not their mother tongue and many Indians writes in English are able to realize and understand the creative effort through the

medium of English. Indian English writing is divided into two parts. First pre-independence and second After independence. In pre-Independence Raja Rao, R.K.Narayan, Mulk raj Anand, Rabindranath Tagore and other novelist have mainly focused on the subjects of Indian traditions, Gandhian movements and freedom struggle. The novelist had cast light on socio-political concern that raised before 1947. The novels written after independence have highlighted a real picture of the socio-political issues, customs, illiteracy and patriotic uprising. Indian English literature has always been actively taking part in the nation building process. Arvind Adiga is well known for his novel 'The White Tiger' that tells about the economical outline of India and also the mindset of the people about economy has changed. Adiga, an ex employee of Time magazine, began his professional career as financial journalist an author of five novels. He has turned up as a new voice in the galaxy of Indian English writing. The researcher have selected Arvind Adiga's *The White Tiger* (2008) awarded the

Man Booker Prize and Last Man in Tower to explore the social and cultural crises of India.

Adiga's debut novel *The White Tiger* (2008) won Man Booker Prize in two ways first "an India of Light, and India of Darkness" (TWT14). The story is divided into seven letters. In his confession letter to Chinese Premier Wen Jiabao who is going to visit India, Balram shows the ironic image of Indian villages dwell with the object poverty. The story starts with Balram Halwai, a son of Rikshaw puller he explained his journey from village to Delhi and then Bangalore. He wrote how he left the school for earning money for cousin's dowry, works at tea stall after that became a driver. He worked for Mr. Ashok, Laxmangarh's landlord and moved to Delhi with Mr. Ashok and his wife Pinky madam. When Pinky madam killed one boy accidentally, Ashok's family forced Balram to take the blame. Ashok bribes police and officers for coal business. Balram decided to kill Ashok and stole his large bribe to move on to Bangalore. For set up Balram also bribes police and started a taxi service. Through the story Balram Halwai explained the clashes between the superior and working class, the problems of backward class. He exposed the extensive corruption especially in government. The corrupted faces of politicians who sucked the blood and made the Indian economy helpless. Balram symbolize himself as one of the darkest lives in global India and far away from social benefits.

In Balram's confession every stream of value, every place he might look for support for his personal growth from the political sphere to family, religion, and gradually turns him into force to fraud. At a young age, for instance he found the corrupt politicians who accepted bribes from rich businessman who want to save himself by paying taxes but they also hang the picture of Gandhiji in their offices to call themselves idealist. The novel represents a realistic yet practical image of India with Balram Halwai the unsophisticated, rustic, under control groups of the Indian civilizations against the privileged class. Balram shows the class difference and social inequality with a variety of metaphors in his letter. He stated that,

To explain this division he uses the metaphor of the "coop: Go to old Delhi Hundreds of pale hens and brightly coloured roosters, stuffed tightly into wire-mesh cages.....". They know they are next, yet they cannot rebel. They can't try to get out of the coop, same thing is happening with humans in this country (TWT173)

Last Man in Tower is published by HarperCollins India. It was third published book and second published novel by Adiga in 2011. The novel takes up a major issue of the mafia builders in cosmopolitan city like Mumbai. The novel starts in a small cooperative housing society in Mumbai which is generally settled by the middle class families. A strong bond breathe between them. The situation takes a tragic turn when a builder make conversation with them to buy the entire apartment. All were ready for the proposal except for Masterji. The novel portrays the mindset of the unsettled middle class and their dreams. It is a story of Masterji and his struggle against the real, moving and growing world. A world which is changing with time, a world which is now not following the principles, a world which is now not taking care for human emotions and now people are running behind the money, status, prestige and 'a flock of pink birds flying around' (LMIT116). But it is the reality which can't be ignored by us. And it has been depicted very clearly in this novel. It has been portrayed that how money becomes powerful and get success in turning good people into bad (LMIT319). This novel revolves around the life of common people in middle class society in strike over the neighbourhood of Mumbai.

Conclusion:

Arvind Adiga's *The White Tiger* and *Last man in Tower* came out when the old custom of society was losing ground and rise of materialism, development, growth of technology, modernization, social mobility, climbing the corporate ladder, disloyalty, change in rules and regulations of social institution, separation, globalization, extent of urbanization, and so on are some of the characteristics which comprise the mode of new generation causing changes in the humans psychology of new generation. These elements are mainly responsible for social, cultural and economic changes. Balram Halwai, The police officer and Mr. Ashok

(The White Tiger) and Dharman Shah and Masterji's neighbours (Last Man in Tower) are the major characters through which the change of the new generation can be seen. His pen writes about the facts of the dark side of the society. Indians under the sway of modernism affects the Indians physically, mentally, and psychologically by pressurizing them. The origin of Indian culture is its values like love, unity, kindness, respect, brotherhood, sacrifice, honesty but this race of becoming rich, to be a powerful person and for a luxurious life make everyone forget these valuable culture of our elders and make all cold blooded. Adiga fights and wanted to call of this modern modified generation who are yet sleeping under the dark dome of modernization.

Reference:

1. Adiga, Aravind. The White Tiger. New Delhi: Harper Collins. 2008. Print.
2. Adiga, Aravind. Last Man in Tower. New Delhi. Harper Collins. 2011. Print. Adiga, Aravind. "Between The Assassinations". New Delhi. Picador. 2008. Print. [https://www.bookbrowse.com/author_interviews/full/index.cfm/author_number/1552/author/aravind-Aravind Adiga #interview](https://www.bookbrowse.com/author_interviews/full/index.cfm/author_number/1552/author/aravind-Aravind%20Adiga#interview)
3. Fiction writers review.com. 15 April 2009. <<http://www.fictionwritersreview.com/interviews/interview-with-aravind-adiga-the-white-tiger> April 15 2009>.
4. Singh, Satpal. "Linguistic Imperialism: Aravind Adiga's The White Tiger", The Criterion, An International Journal in English. Aug 2013, Vol 4, Issue IV



**A STUDY OF DRINKING WATER QUALITY IMPACT ON HUMAN HEALTH :
SPECIAL REFERENCE TO BALAPUR TAHISAL DISTRICT AKOLA IN THE
STATE OF MAHARASHTRA**

Dr. Alpana Deokar

Assistant Professor in Home Economics (Humanities)

Dr. Manorama & Prof Haribhau S. Pundkar Arts, Commerce & Science College Balapur

Corresponding Author- Dr. Alpana Deokar

Email:- alpanabiniwale@gmail.com

DOI- [10.5281/zenodo.7295666](https://doi.org/10.5281/zenodo.7295666)

Abstract:

More than 80% of sewage generated by human activities is discharged into rivers and oceans without any treatment, which results in environmental pollution and more than 50 diseases. 80% of diseases and 50% of child deaths worldwide are related to poor water quality. This study studied how drinking water quality impact human health. This study uses the normative survey method to collect the respective data on the field of research. The population of this study all the households and heads of the family in the Tahisal of Balapur is the population for this study. In this population total, 100 respondents/head of the family has been selected for this study to collect data on the quality of drinking water and the health status of their family. In this study indicated The significant impact of the quality of drinking water on human health. Those families have to use the quality of drinking water if their health status is good and if those people or family does not maintain the drinking water quality their family member's health status is not satisfactory.

Introduction:

Water is an essential resource for human survival. According to UNESCO's World Water Development Report 2021, global freshwater use has increased sixfold over the past 100 years and has been growing at around 1% per year since the 1980s. As water consumption increases, water quality faces serious challenges. Industrialization, agricultural production, and urban life result in environmental degradation and pollution, adversely affecting water bodies (rivers and oceans) necessary for life, which ultimately affects human health and sustainable social development (Xu et al., 2022a). Globally, an estimated 80% of industrial and municipal wastewater is discharged into the environment without any prior treatment, with adverse effects on human health and ecosystems. This proportion is higher in the least developed countries, where there is a significant lack of sanitation and wastewater treatment facilities.

Impact of Water Pollution on Human Health:

Unhealthy water has serious effects on human health. According to UNESCO's World Water Development Report 2021, an estimated 829,000 people die annually from diarrhea caused by unsafe drinking water, sanitation, and hygiene, including 300,000 children under the age of five, nearly 100,000, and includes 5.3% of all deaths in this case. age category. Data from Palestine show that people who drink tap water directly are more susceptible to diseases such as diarrhea than those who use desalinated and purified drinking water at home (Yasin et al., 2006). In a comparative study of tap water, filtered water, and bottled water, tap water was one of the most important causes of gastrointestinal diseases (Payment et al., 1997). The lack of water and sanitary facilities also increases the incidence of diseases such as cholera, trachoma, schistosomiasis, and helminthiasis. Data from studies in developing countries show that there is a clear relationship between cholera and contaminated water and that household water treatment and storage can reduce cholera (Gundry et al., 2004). In

addition to disease, unhealthy drinking water, and poor environmental sanitation can lead to digestive diseases, inhibited nutrient absorption, and malnutrition. These effects are especially evident in children.

Objective of the study :

1. To Study the Drinking water quality in the respective field in the study.
2. To Study the Drinking water processing and use in the family.
3. To Study the Drinking water quality impact on health.

Hypothesis of the study :

There is no significant impact of drinking water quality on human health.

Material and Method :

Normative Survey methods were used for the present research., the citizens of Balapur tahisal of Akola districts have been selected for this research and a survey has been conducted to obtain the necessary facts regarding the source of drinking water, the treatment of drinking water, its quality, and their health status. Thus, for this research, the quality of drinking water used by people in the target area and their health have been studied.

Population and sample of the study :

In the present research, a total of 100 family heads from Balapur tahisal of Akola districts were selected as a sample for this research.

Tools :

A questionnaire was created to collect the necessary facts for the present research.

Quality of Drinking water Questionnaire :

In this questionnaire, what is the source of drinking water, is drinking water boiled and cooled, is water purifier used for drinking water at home, is cans used for drinking

water, is river water used for drinking without any treatment, well or tap water for drinking A questionnaire was used to observe the quality of drinking water on the basis of consumption, public tap water only for filtered drinking and necessary facts were collected from the stakeholders.

Testing of Drinking water quality :

In the households of the respondents selected for the research, the quality of water used for drinking was checked by TDS. It was done through the meter.

Health Status Questionnaire:

What is the health status of the household members of the respondents selected for the research? For this, a questionnaire has been developed and necessary facts have been collected. This questionnaire includes information about diseases caused by drinking water and the symptoms of those diseases, as well as collecting essential facts about the health of children, youth, and the elderly in the family. This mainly includes whether the family members always have a stomach ache, whether there is always a problem of diarrhea, whether there is a high rate of impaired digestion, frequent visits to the doctor, whether there is a problem of flatulence in the family members, whether there are digestive diseases in the family members, whether the family members feel weak. On the basis of the type of questions, the necessary facts regarding the health condition of the persons in the household of the respondents have been collected.

Observation of Result :

Percentage ratio, variance analysis, etc. statistical techniques were used to analyze and interpret the facts obtained in the context of the present research.

Table no. 1.1

Table showing details of processes to be carried out on drinking water

Sr. no	Water Quality	N	%
1	Purified water used for drinking regularly	71	71%
2	Purified water used for drinking sometimes	20	20%
3	Without Purified water used for drinking regularly	09	09%
	Total	100	100%

Above table no. 1.1 shows that among the surveyed respondents, 71% of the household drinking water is treated and used for drinking, while 20% of the household uses the water as it is brought without any treatment and 09% of the household sometimes, i.e. when someone in the family

falls ill. Or it is processed after being told by the doctor, mainly the drinking water is heated and cooled and given to the said sick person. All members of the family do not drink boiled and cooled water, so one after the other members of their family also fall ill.

Table no. 1.2, Table showing details of drinking water quality

Sr. no	TDS in Drinking Water	N	%
1	Less than 300 T.D.S. in Drinking Water	49	49%
4	T.D.S. in Drinking Water 301 to 500	29	29%
6	Greater than 501 T.D.S. in Drinking Water	22	22%
Total		100	100%

Above table no. 1.2 shows that TDS in households of surveyed respondents checks the quality of water used for drinking. The amount was checked. Among them, 49% of TDS is in the drinking water of households. More than 300 were found. 29% of households using water for drinking have

TDS in their drinking water. TDS levels were found to be between 301 to 500 and 22% of households using water for drinking had TDS levels above 500 in their drinking water. This shows that most households have TDS in drinking water. This number is less than 300.

Table no. 1.3, Table showing details of the health status of household members of respondents

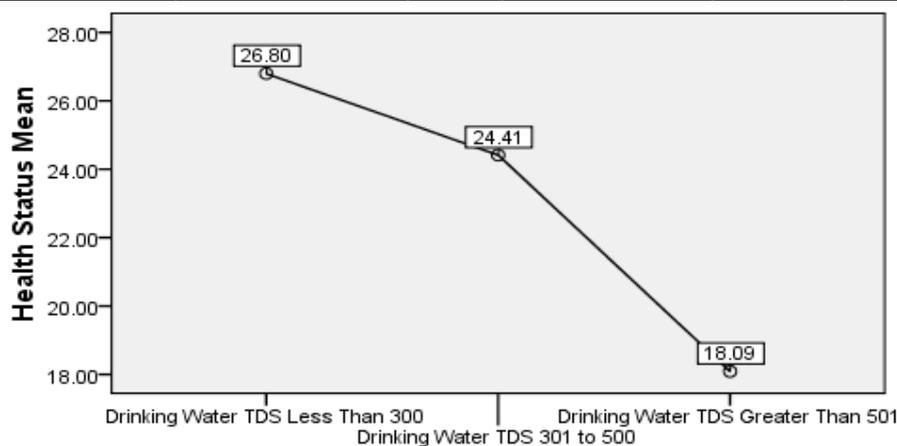
Sr.No	Drinking Water & Health Problems	N	%
1	Persistent abdominal pain	22	22%
2	diarrhea	08	08%
3	Hepatitis	05	05%
4	Degenerative diseases	06	06%
5	Gastro	16	16%
6	Diaries	20	20%
7	Diarrhea and vomiting	23	23%
Total		100	100%

Table no. 1.3 An analysis is made with respect to water-related health status among the families of the individuals selected for the research. Among them 22% of family members have problems of constant abdominal pain due to contaminated drinking water, 08% of family members have diarrhea, 05% family members have

hepatitis, 06% family members have the putrefactive disease, 16% family members have gastro problem, 20% family members have diarrhea problem, 23 % of the family members experience constant diarrhea and vomiting problem. All the above health problems arise in their families due to contaminated drinking water.

Table no. 1.4, TDS in drinking water an effect on health status

Dependent Variable Health Status					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1152.578	2	576.289	54.653	0.01 level of sig
Within Groups	1022.812	97	10.544		
Total	2175.390	99			



Above table no. 1.4 TDS in drinking water and the health status of their family members show that TDS in drinking water. The amount has a significant impact on the health status of the family members. In that the family in which TDS is in drinking water. The average health status of the family

members is 26.80 (high) in households where the ratio of TDS in drinking water is less than 300. The ratio of 301 to 500 has a health status ratio of 24.41 (Normal) and in households in which TDS is in drinking water The mean of the health status of their family members is 18.09 (Low).

Table no. 1.5

A table detailing the use of treated drinking water for drinking purposes and its impact on health status

Dependent Variable Health Status					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	982.376	2	491.188	39.937	0.01 Level sig
Within Groups	1193.014	97	12.299		
Total	2175.390	99			

Above table no. 1.4 shows that household-level treatment of drinking water has a significant impact on the health status of household members who treat drinking water in relation to the health status of their household members. Among them, the average health status of the family members in the families which always treat the drinking water and use it for drinking is 26.14 (High). Households that sometimes treat drinking water and use it for drinking have the highest average health status of household members at 20.30 (normal). The average health status of the family members in the family who never treats the drinking water and use it for drinking is 17.44 (Low).

Conclusion & Discussion :

Among the surveyed respondents 71% of households use drinking water only after treatment, 20% of households use it without any treatment and 09% of households sometimes use it after treatment.

TDS in drinking water of the highest 49% of households. is more than 300, 29% of households have TDS in drinking water. The concentration of TDS is between 301 to 500 while 22% of households have a TDS concentration of more than 500 in their drinking water.

Among the surveyed respondents, 22% of the family members have constant abdominal pain, 08% of the family members have diarrhea, 05% of the family members have hepatitis, 06% of the family members have putrefactive diseases, 16% of the family

members have gastonchi, 20% of the family members have diarrhea, 23% of the family members have diarrhea and vomiting. Constantly felt.

The quality of drinking water has a significant impact on the health status of family members. Family members who use good quality water for drinking have good health which means that health problems caused due to water are less common among them, on the contrary, in families which use contaminated water for drinking, various problems are caused in the family due to drinking water, mainly diarrhea, abdominal pain, vomiting, diarrhea. These are the major ones.

Bibliography :

1. Afroz, R., Rahman, A., and Rahman, A. (2020). Health Impact of River Water Pollution in Malaysia. *Int. J. Adv. Appl. Sci.* 4 (5), 78–85. doi:10.21833/ijaas.2017.05.014
2. Ahmed, S., and Ismail, S. (2018). Water Pollution and its Sources, Effects, and Management: a Case Study of Delhi. *Int. J. Curr. Adv. Res.* 7 (2), 10436–10442. doi:10.24327/ijcar.2018.10442.1768
3. Cantor, K. P., Hoover, R., Mason, T. J., and McCabe, L. J. (1918). Associations of Cancer Mortality with Halomethanes in Drinking Water. *J. Natl. Cancer Inst.* 61 (4), 979.
4. Clasen, T., Schmidt, W.-P., Rabie, T., Roberts, I., and Cairncross, S. (2022). Interventions to Improve Water Quality

- for Preventing Diarrhoea: Systematic Review and Meta-Analysis, doi:10.1136/bmj.39118.489931.be
5. Dwivedi, S., Mishra, S., and Tripathi, R. D. (2018). Ganga Water Pollution: A Potential Health Threat to Inhabitants of Ganga Basin. *Environ. Int.* doi:10.1016/j.envint.2018.05.015
 6. Ferreccio, C., González, C., Milosavljevic, V., Marshall, G., Sancha, A. M., and Smith, A. H. (2000). Lung Cancer and Arsenic Concentrations in Drinking Water in Chile.
 7. Landrigan, P. J., Fuller, R., Fisher, S., Suk, W. A., Sly, P., Chiles, T. C., et al. (2018). Pollution and Children's Health. *Sci. Total Environ.* 650 (Pt 2), doi:10.1016/j.scitotenv.2018.09.375
 8. Victora, C. G., Smith, P. G., Vaughan, J. P., Nobre, L. C., Lombard, C., Teixeira, A. M. B., et al. (1988). Water Supply, Sanitation and Housing in Relation to the Risk of Infant Mortality from Diarrhoea. *Int. J. Epidemiol.* 17 (3), doi:10.1093/ije/17.3.651
 9. Vladeva, S., Gatseva, P., and Gopina, G. (2000). Comparative Analysis of Results from Studies of Goitre in Children from Bulgarian Villages with Nitrate Pollution of Drinking Water in 1995 and 1998. *Cent. Eur. J. Public Health* 8 (3), 179.
 10. Waddington, H., Snilstveit, B., White, H., and Fewtrell, L. (2009). Water, Sanitation and Hygiene Interventions to Combat Childhood Diarrhoea in Developing Countries. New Delhi India Global Development Network International Initiative for Impact Evaluation Aug.



**STATUS OF AGRO-TOURISM CENTERS: A GEOGRAPHICAL STUDY
OF SELECTED AREA OF MAHARASHTRA**

Prof. Santosh Maruti Shinde

Sanskar Mandir Sanstha's Arts & Commerce College, Warje-Malwadi, Pune- 58

Corresponding Author- Prof. Santosh Maruti Shinde

Email:- santoshshinde395@gmail.com

DOI- 10.5281/zenodo.7295670

Abstract-

The present study status of Agro-tourism development of rural areas in western Maharashtra. The study region is mainly agrarian having 82.24 percent net sown area of the total geographical area. Agro tourism is one such form of tourism which has recently emerged in Maharashtra. Agro tourism for farmers is considered as “A range of activities, service and amenities provided by farmers and rural people to attract tourist to their area in order to generate extra income for their business”. Agro tourism for tourist is considered as anything that connect tourist with the heritage, natural resource unique to the agricultural industry. Agro tourism involves any agriculturally based operation that brings visitors to farm a ranch. Western Maharashtra has great potential to the development of agro tourism, because of natural conditions and different type of agro products as well as variety of natural traditions, festivals. It gives an opportunity to the tourists to experience rural life, taste the traditional food and to live a peaceful environment.

Keywords: Agro tourism centres (ATDC, MART, MTDC), Agriculture, Tourism etc.

Introduction:

Agro-tourism is a new concept, it promotes foreign and domestic urban tourists to visit agro-tourism centres which are located in rural areas for leisure and escape the tension. Agro-tourism is mainly influenced by various factors climate, geomorphic features, transport and communication network, safe accommodation, entertainment, natural flora and fauna and infrastructure facilities, publicity, online booking facilities, etc. Agro Tourism Development Company (ATDC), Maharashtra State Agro and Rural Tourism Cooperative Federation Ltd. (MART), and Maharashtra Tourism Development Corporation (MTDC) website have provided information on tourist centres in the study area. Apart from this information, data was collected through by field survey by using questionnaires for finding the current status of agro-tourism centres in Western Maharashtra.

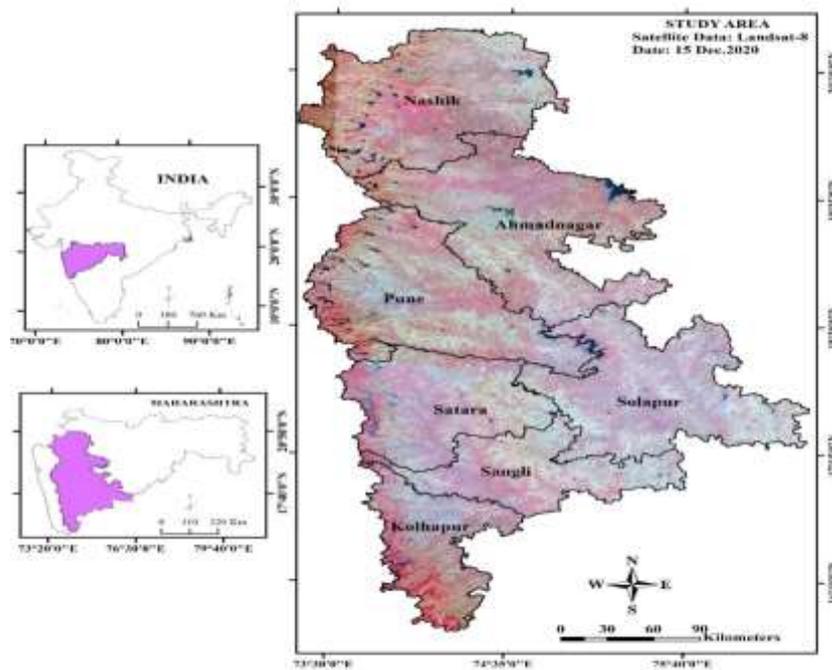
Study Area

Western Maharashtra has been selected for the present research work

covering Nashik, Ahmednagar, Pune, Satara, Solapur, Sangali, and Kolhapur districts. The present study has been focused mainly on the development of agro-tourism centres (ATC) in districts of Western Maharashtra.

Location of the study area

Western Maharashtra extends from 15° 40' N to 20° 53' N, and 73° 16' E to 76° 45' E. The study area is about 500 km. from north to south and 100 km. from east to west. Western Maharashtra covers seven districts with a total geographical area of 89,911 sq. km. Territorially, it has Gujarat to the north, Dule and Jalgaon district to the northeast, Jalana, and Beed to the east, and Karnataka, and Goa to its south, whereas Kokan to the west. The Western Ghats lies in the study area is well known as 'Sahyadri', which runs from the mouth of Tapi southwards along the western edge of the Deccan plateau to the southern boundary of Maharashtra. The average elevation of 1200 m (Arunachalam, 1967), found more than 1600 m in the northern part while declining towards the south



Location of the study area

Western Maharashtra is blessed with rich natural, cultural, and historical diversity, many world-famous ancient caves, temples, forts, monuments, pilgrim centres, wildlife sanctuaries, and national parks are attracting foreign and domestic tourists. This diversity boosts the agro-tourism business, there are about 220 agro-tourism centres affiliated with Agro-Tourism Development Corporation (ATDC), and 49 agro-tourism centres affiliated to Maharashtra State Agri and Rural Tourism Co-operative Federation Limited (MART), and 9 agro-tourism centers registered under Maharashtra Tourism Development Corporation Ltd. (MTDC). Presently these centers are spread over seven districts, Nashik, Ahmednagar, Pune, Solapur, Satara, Sangli, and Kolhapur but unevenly distributed. About 53.24 percent ATCs are located only in the Pune district followed by 18.71 percent in the Satara district, 10.79 percent in the Ahmednagar district, 6.12 percent in the Kolhapur district, and 4.68 percent in Nashik district. The highest numbers of ATCs (148) are located in the Pune district while the lowest numbers of ATCs (9) are operating in the Sangli district.

1) Agro-Tourism Development Company (ATDC) -

Agro Tourism Development Corporation (ATDC) prime organization founded by Mr.

Objectives

The main aim of the study to present experiment for the development of rural area is which are not rich with historical or natural wealth. Being an agricultural land, most of the farmers are bound to depend on the seasons. This thought or an idea will create an alternative source of income, engagement and pride. to find out ways and means to develop agro-tourism in Western Maharashtra so that the agricultural sector can be benefited from the following specific objectives:

To evaluate and the status of agro-tourism of rural areas.

To evaluate the Benefits of agro-tourism in rural areas.

Methodology

After a review of the literature, the following methods have been adopted to investigate the status of the agro-tourism business and rural development and distribution of agro tourism centres based on classification in terms of geographical point of view. An understanding of tourist options on infrastructure and facilities is needed. Hence, field data about ATCs and tourists were collected and various techniques have been applied. The methodology applied in the study is briefly presented.

Status Of Agro-Tourism In Western Maharashtra -

Pandurang Taware, the pioneer of the agro-tourism concept in India at Palshiwadi in Baramati tahsil of Pune District in 2005. ATDC was founded to encourage more farmers to start Agro Tourism Center (ATC) by conducting workshops, training programs, and conferences (Taware, 2016). ATDC launched the 'Agri Tourism Vistar Yojana' training program in 2007 where 52 farmers were selected to start up the Agri-Tourism Centres in Maharashtra. This agro-tourism model is implemented in 328 ATCs across the 30 districts of the state which enhances the farmer's income by showcasing village traditions, culture, and farm practices to visitors (ATDC, 2020).

The ATDC is known as an umbrella organization that promotes all affiliated ATCs in the target markets and also conducts training and capacity-building programs for farmers to gain technical knowledge to diversify their farm products.

The great regional diversity in the distribution of agro-tourism centres has been observed across the districts of Western Maharashtra. Table 3.1 reveals that 220 agro-tourism centers are operating with affiliated ATDC, among them 104 ATCs are located only in the Pune district. Most of these ATCs are concentrated on the western side of Maval, Mulshi, Velhe, and Junnar tahsils (Fig.3.1). Satara district ranks second after Pune district with 46 ATCs located on the western side of Jaoli, Wai, and Mahabaleshwar tahsils. Followed by Ahmednagar district with 24 ATCs, most of these centers are lies in the western hilly areas of Akole, Sangamner, Kopargoan, Rahata, and Parner tahsils. In the western side of the study area, natural beauty, plenty of water reservoirs, nearness to urban areas, a better road network, etc. factors are playing a vital role in attracting tourists therefore a large number of ATCs are located on the western side. While the eastern side of the study area experiences a dry and hot climate which is unfavorable to attracting tourists, hence the number of ATCs is limited.

2) Maharashtra Agri and Rural Tourism Cooperative Federation Ltd.- (MART)

Maharashtra State Agri & Rural Tourism Cooperative Federation Ltd. (MART) a cooperatives governing body was registered on 12th December 2008 to bring all ATCs under one umbrella for financing, marketing,

planning, and promoting agro-tourism. MART helps ATCs in getting finance from the National Bank for Agriculture and Rural Development (NABARD) for the development of infrastructure facilities in rural areas which boosts agribusiness. MART is a Public and Private Partnership (PPP) with the Maharashtra government as a facilitator. MART is an apex body for monitoring the delivery of farm services provided by ATCs.

MART is a network of 140 ATCs across the state, the agro-tourism centers affiliated with MART of Western Maharashtra are shown in Table 3.2. Out of 140 centers, 47 ATCs are situated in Western Maharashtra, among these Pune district noted 39 agro-tourism centers. Most of the ATCs are located in the western hilly areas of Maval, Mulshi, Velhe, and Junnar tahsils whereas very few centers are found on the eastern side of the district (Fig.3.2). Followed by Ahmednagar (03), Satara (02), and Solapur (01) districts.

3) Maharashtra Tourism Development Corporation - (MTDC)

Maharashtra Tourism Development Corporation (MTDC) is established by the Government of Maharashtra in 1975 for the expansion of tourism in the state. MTDC is an umbrella that manages 29 resorts 25 restaurants and 3 aquatic sports centers across the state. It provides an opportunity for aquatic sports, adventure activities, heritage tourism, etc. in the state. Recently, a trend of tourism is changing, most the tourist interested in 'Experiential tourism' involves natural tourism, eco-tourism, agro-tourism, rural tourism, food tourism, etc. Hence, MTDC launched the 'Mahahraman' scheme for promoting tourism in the state. In the study area, nine ATCs are affiliated with MTDC, three are located in Bhimashankar, Karla, and Panshet of the Pune district, two ATCs are situated in Bhandardara and Shirdi in Ahmednagar district, Grape Park, Bramhanwade, Trimbakeshwar are two ATCs located in Nashik district and Koyna Lake, Mahabaleshwar these two ATCs belong to Satara district.

Benefits of Agro-tourism in Rural Areas- Agro tourism brings major primary sector agriculture closer to major service sector tourism. Benefits for agro -

The cost of food, accommodation, recreation and travel and tourism is low, widening the Status of tourism.

Agro-tourism, which involves villages and agriculture, has the capacity to satisfy the curiosity of the urban segment by providing scope for re-discovering the rural life, which is rich in diversity.

Through rural games, festivals, food, dress. Peace and tranquillity are in-built in Agro-tourism.

For tourists it is like returning back to their roots.

Educational value of Agro-Tourism spreading knowledge about Agriculture science where urban students are moving with the pace of technology.

The urban population having roots in villages always have had the curiosity to learn about sources of food, plants, animals, raw materials like wood, handicrafts, languages, culture, tradition, dresses and rural lifestyle. Agro Tourism which revolves around farmers, villages and agriculture has the capacity to satisfy the curiosity of this segment of population.

Strong demand for wholesome family oriented recreational activities to all age groups i.e. children young, middle and old age, male, female, in total to the whole family at a cheaper cost. Rural games, festivals, food, dress and the nature provides variety of entertainment to the entire family.

Health consciousness of urban population and finding solace with nature friendly means - Modern lifestyle has made life stressful and average life span has come down. Hence, people are in constant search of pro-nature means to make life more peaceful. Ayurveda which is a pro-nature medical approach has roots in villages. Indigenous medical knowledge of villagers is respected. Organic foods are in greater demand in urban areas and foreign countries. In total, health conscious urban population is looking towards pronators villages for solutions.

Modern life is a product of diversified thinking and diversified activities. Every individual attempts to work more, in different directions to earn more money to enjoy modern comforts. Hence, peace is always out of his system. Tourism is a means for searching peaceful location. Peace and tranquillity are inbuilt in Agro-Tourism as it is away from urban areas and close to nature.

1) Busy urban population is leaning towards nature. Because, natural environment is always away from busy

life. Birds, animals, crops, mountains, water bodies, villages provide totally different atmosphere to urban population in which they can forget their busy urban life.

2) In resorts and cities, overcrowded peace seekers disturb each other's peace. Hence, peace is beyond cities and resorts. Even though efforts are made to create village atmosphere in the sub urban areas through resorts, farm houses, it looks like a distant replica of the original.

Conclusion-

- 1) Western Maharashtra has a great potential to the development of agro-tourism, because of natural conditions and different types of agro products as well as variety of rural traditions, festivals. It gives an opportunity to the tourists to experience rural life, taste the traditional food and to live in a peaceful environment.
- 2) Agro Tourism Centres are commercially operated in this Districts. So there is a need to promote the concept to attract the farmers to get involved in the agro tourism service industry. As this is a service industry farmers need to be oriented on maintenance of facilities, hospitality and public relation. Urban customers demand for the facilities like safe and clean accommodation, clean water and hygienic food from the agro tourism service provider. To increase awareness amongst urban customers' mass media like television and radio can be beneficial.
- 3) Agro Business companies should promote the services in consultation with the farmers, government agencies, farmer's co-operatives and NGOs. It is a good opportunity to develop an agro-tourism business in western Maharashtra. The study area will definitely in general popular as well as a good agro-tourism spot in Maharashtra. Hence, the agriculture departments and Agriculture Universities should try to give orientation about it and provide some innovative ideas regarding to the Agro-tourism.
- 4) The government should try to provide optimum financial aids to the agro-tourism activities in the Maharashtra by the grants and institutional finance. The various banks should provide optimum financial help for the agro-tourism activities in the area.
- 5) The paper has focused on the existing agro-tourism centres the western part of the study

area is rich in biodiversity, natural beauty, and top historical, socio-cultural destinations which attract a large number of tourists every year. The study has assessed the 278 existing agro-tourism centres affiliated with ATDC, MART, and MTDC, out of these 220 centres are associated with ATDC, 49 centres are affiliated with MART, and only 9 centres are allied with MTDC.

Reference -

1. Bhandari and Bhattarai (2018): Agritourism: A Step Further for Economic and Sustainable Development in Nepal, International Journal of Graduate Research and Review, Vol-4, Issue-3: 67-69.
2. Jagtap, M. D., Nichit, M. B., and Benke, S. R. (2010): Agro-tourism: The Performance, Problem, and Prospect for the Farmers in Maharashtra, International Journal of Commerce And Business Management, Vol-3, Pp 153-156
3. Kiran J, Lakshmi Prasad, and C Kavya, (2014): Investment opportunities in agritourism in India, International Journal of Commerce and Business Management, Vol- 7, Issue-2, pp:400-405.
4. Malkanthi and Routry (2011): Potential for agritourism development: Evidence from Sri Lanka, The Journal of Agricultural Sciences, volume 6, issue
5. Mane, S. A., and Patil, D. K. (2017): Infrastructural Facilities- Key Aspect of Agro Tourism, ETHOS, Vol-10, Issue-1, pp: 13-19.
6. Patil, U. (2011): Tourism Opportunities in Maharashtra. Golden Research Thoughts, Vol-1(6), pp.1-4.
7. Taware, P. (2010): Agro-tourism: New Revenue Stream for Farmers through Rural-Urban Reunion, Financing Agriculture, Vol-42, Issue-5, pp: 20-21.
8. Thorat, S. D., and Suryawanshi, R. S. (2017): Assessment of Agro-tourism Potential in Junnar tehsil, Maharashtra, India, Scholarly Research Journal for Interdisciplinary Studies, Vol.4, Issue 36, pp. 6872-6881.
9. Walke, S.G. (2013).Critical Study of Agri-tourism Industry in Maharashtra. Ph.D. Unpublished Thesis, Symbiosis University, Pune.



Vaishnavism in West Bengal and its Environmental Ethics

Mrs. Ipsita Chakraborty¹ Dr. P. Ganesan² Dr. Debaprashad Chatterjee³

¹Research Scholar, Dept. of Sociology and Social Work, Annamalai University, Tamil Nadu.

²Assistant Professor, Dept. of Sociology and Social Work, Annamalai University, Tamil Nadu.

³Associate Professor, Department of Sociology, Moulana Azad College, Kolkata, West Bengal.

Corresponding Author- Mrs. Ipsita Chakraborty

Email:- chakrabortyipsita448@gmail.com)

DOI- 10.5281/zenodo.7295682

Abstract:

Vaishnavism is one of the major sect of the Hindu religion. In West Bengal, most of the Bengali Hindu people are practicing Vaishnav culture and mostly they are vegetarian. These Vaishnava people unlike the other sects of Hinduism never harm any plants and animals; they maintain that each and every plant and animal are created by God as well as Lord Vishnu, the Creator. Even in Vaishnavism, it is clear that there is no caste discrimination. So, environmental protection has strong environmental ethics existing in Vaishnav culture. Environmental ethics believe that humans are a part and parcel of society as well as other living creatures, which include plants and animals. Since Vedic times the main motto of social life was "to live in harmony with nature". In accordance with the environmental sociological perspective, we can judge the two views: one is the dominant view where people use the environment as they want and lead their comfortable life. But the new environmental perspective where an ethical value of the environment and individuals are maintaining a few ethical codes of conduct to protect our environment by using religion and other institutional practices. Thus, religion is a fundamental factor to protect our ecological balance and control environmental degradation mostly Vaishnavism. Vaishnavism of the Hindu religion has a very soft and protective view towards environmental elements.

Key Words: Vegetarian, Lord Vishnu, harmony, nature, code of conduct.

Introduction:

The Bengal Vaishnava school proclaims a relation between the Creator and His Creation or the Brahman and the world composed of both spirit and matter as a relation of inconceivable difference in identity and identity in difference. The absolute or the Ultimate Reality in Bengal Vaishnavism is both the Knower and the Object of His own knowledge. By cultivating bonafide spiritual science, we can be free from anxiety and come to a state of pure, unending, blissful, consciousness, in a lifetime. They consider Krishna as eternal, all-knowing, omnipresent, all-powerful, all-attractive, and all-pleasing. He is the seed-giving father of all beings, and He is sustaining the energy of the entire cosmic creation. The essence of the Vedas is found in Bhagavad Geeta, a literal

record of Krishna's words. Environmental ethics believe that humans are a part and parcel of society as well as other living creatures, which include plants and animals. These items are a very important part of the world and are considered a very much functional part of human life. It is essential that every human being respect and honor this and use morals and ethics when dealing with these creatures. As per Nature, "Environmental ethics is the conceptual foundations of environmental values as well as more firm issues surrounding societal attitudes, actions and policies to protect and stabilize biodiversity and ecological systems.

Classification of Hindu Sects: The Bhakti cult in Bengal is one of the distinct features of the genius and character of the Bengalee people. Bhakti means love of God. It's an old

Hindu cult. In ancient Hindu in the Vedic Age, the Sutra period of Vedic history where a cult called Shandilya-Vidya were the authoritative scripture of the old Bhakti cult. In Shandilya Sutra, Bhakti is defined as supreme devotion to Lord or Isvara. There are *four* cults of Hindu religion; which are Saivism, Shaktism, Smartism & Vaishnavism.

Saivism: Saivism is one of the important religious currents of classical and modern centers based on the worship of God Siva. In classical Hindu mythology Siva is the god of destruction portrayed a yogin who lives on mount Kailasa in the Himalayas. His body is smeared with ashes, his hair piled up in matted locks. He wears an animal skin and carries a trident. A cobra often serves as his garland and the crescent moon as his hair ornament. His third eye which is in the middle of his forehead is kept closed always. He possesses a beautiful wife Parvati, daughter of the Himalayas and their two sons Skanda, the six-faced, and Ganesha, the elephant-headed.

Shaktism: Shaktism is the third Hindu sect that denotes the worship of Sakti (the female part) of the Gods. These gods have personified forms of these Shaktis. Siva's Sakti is in the form of Durga or Kali the object of adoration of the Shaktas. The way in which Shaktas perform their acts of adoration or worship is mysterious, full of rites and rituals which is filthy and obnoxious. They consume wine and perform the worship of female sex organ through different filthy rites. The yoni worship of the Shaktas is depicted in the Kamakhya temple of Assam where in the name of the deity Kamakhya a mere cleft in a rock is adored as yoni of the Sakti.

Smartism: Smartism are the two groups which is important and named as Brahma Samaj and Arya Samaj. The founder of the former is Ram Mohan Roy and the founder of the latter one is Dayanand Saraswati. These are the two most remarkable reform movements under Hinduism. Ram Mohan Roy had preached the return of Hinduism to restrict monotheism to the adoration of one and only supreme, eternal, immutable and infinite God who is the creator and the preserver of the world. Brahma Samaj is a society of Hindus believing in one Supreme

God. Ram Mohan decried and discouraged pilgrimage, sacrifices and different rites and rituals. Brahma Samaj and the Arya Samaj seems to believe in the oneness of God which is back to the Vedas implying a faith in polytheism.

Environmental Ethics:

Environmental ethics is a branch of ethics that explores the relationship between human beings and the environment and how ethics plays a crucial role in this. Environmental ethics is a part of environmental philosophy considering extending the traditional boundaries of ethics from solely including human beings to including the non-human world. Environmental ethics is a subdiscipline of philosophy originating in the early 1970s. It deals with questions of nature and the value of the human and non-human world with and human to the non-human relationship as humans interact with nature. The consciousness of ethical principles can definitely bring out a new beginning towards nature. Hindu religious doctrines as a foundation for environmental ethics provide us with certain normative criteria for our attitude towards nature. Environmental ethics is theory and practice about appropriate concern for, values in and duties regarding the natural world. Environmentalism ethics applies ethics to the environment, analogously to ethics applied to business, medicine, engineering, Law and technology. Such humanist applications may be challenging: limiting population growth or development, questioning consumerism and the distribution of wealth, advocating the inclusion of women or aboriginal peoples, or fearing global warming. In the last decade, an explosion in the structural and functional abilities of non-government organizations. Various efforts have been taken by NGOs at the global level. International organizations provide an essential forum for international cooperation in relation to environmental issues. Two important roles to play are environmental policymaking and the development of international environmental laws.

Krishnavatara, the Miraculous:

Janmashthami is celebrated all over India and all over the Krishna Consciousness world in memory of Lord Krishna's birth around

5000 years ago. In the Hindu epic, Mahabharata we find the Bhagavatam where a systematic account of the graphic details of Krishna's birth of his life. Vyasa's account is the earliest record of the oldest events of human history that mankind is remembering and celebrating. Krishna is remembered by two types of people: the first is being of emotional and sentimental who are charmed and mesmerized by Krishna's miraculous birth and exploits and the second type being that of the intellectual and analytic who are fascinated by Krishna's Bhagavad Gita. During the great war between the Pandavas and Kauravas, Lord Krishna was a dominating personality who elaborates on the explanations on Karma Yoga, how actions are fulfilled in total desireless attitude, do not bind the person, how Karma Yoga is the only resort of mankind since man cannot but keep acting. Lord Krishna talks of great truths of the Vedanta embodied in the Upanishads how the Self has nothing to do with what happens to the body and mind, and how one has to carry out his duties. Gita acts as a religious work; in the Western world religion and philosophy are considered to be independent facets of human activity.

Vaishnavism:

The literal meaning of Vaishnavism is the religion or cult of Vishnu, the second deity in the Hindu triad- Brahma, Vishnu, and Maheswar. Vishnu means all-pervasive; in this meaning, the term is used in the Vedas, where it is said that the gods always see the Supreme Presence of Vishnu as an extended object. Vishnu is considered the logic of all visions of material objects. Vishnu has been identified with the Sun God and also as a Sky God of the Vedas, the Jupiter of the Greeks. In the Hindu tradition, Vishnu is the Preserver of the universe and is conceived as Brahman from Whom all objects have come to be coming to being by whom all objects continue to be and towards whom all objects move, and into whom all objects enter the final dissolution. Vishnu holds within himself both Brahma the Creator, and Shiva the Destroyer of the Hindu triad. The Vaishnavas worship Him not as a God but as the God. Vaishnavism stands for appropriately Hindu theism.

Environmental Ethics and Bengal Vaishnavism:

Bengal Vaishnavism accepts the Upanishads, the Brahma Sutras, and the Bhagavad Geeta as its highest scriptural authority. The universally accepted scriptures have developed through denominational interpretations, different theologies, and spiritual cultures. The Upanishads, the Brahma Sutras, and the Bhagavad Geeta, Bengal Vaishnavas claim the scriptural authority for the Sreemad Bhagavat which is designated as the fifth Veda. Since Vedic time the main motto of social life was "to live in harmony with nature". Sages, saints and great teachers of India lived in forests, meditated and expressed themselves in the form of Vedas, Upanishads, Smritis and Dharmas. The Hindu religion enshrined a respect for nature, environmental harmony and conservation.

Bengal Vaishnava school considers certain texts of ancient scriptures as Mahavakyas or supreme revelations. In the Upanishads, the Brahmananda Balli of the Taittiriya Upanishad represents the Brahman as Anandam as Mahavakyas. Parama Tattva or the Ultimate Reality is on the Mahavakyas that the entire thought and realizations have been built up by evidently a process of reasoning which is impossible to refute consistently with the actualities of experience. Paramatman is the Unity explaining the multiplicity and changes of inner life Who as the In dweller holds together the thread of inner life and relations. The cosmic life and the individual or personal life stand isolated but these are also bound up in a net of intimate relations. The task of ethics is to judge the human action if it is right or wrong; ethics is not a principle of Hedonism which says that it produces pleasure or happiness is good and right. Ethics as a moral philosophy aims to discover the highest order and most general moral principles which serves as general theories of morality. To be an environmental ethicist man seems to be an integrated moral practitioner rather than an isolated exploiter of natural resources.

Paramatman is the basis of individual personality, Bhagavan is the ground and explanation of cosmic life and experience on one side, and our society includes domestic life and experiences on the other. Bhagavan is not impersonal but the Supreme Person holding together our smaller and

differentiated individual theological or philosophical position of Bengal Vaishnavism. In Vaishnavic terminology unity or identity between the Absolute and particular is called Pralaya or dissolution meaning the cancellation of all relations. The process of self-differentiation is called sristi or creation. It is an eternal process; it is an outward movement. It has culminated in the return of self to itself, to use a Hegelian expression. This is pralaya is known as Leela or the Sport of the Lord. Leela or sport removes the suspicion of any necessity or compulsion. The Knower, the Enjoyer, and the Agent or the Actor are called Purusha while the Object of the Lord's knowledge, enjoying, and willing is known as Prakriti. Bengal Vaishnavism has repudiated the Samkara Vedantic doctrine of Maya or illusion as rank. All social relations are real; nature and man are both real. The former is the eternally realized aspect and the latter is the progressively realizing aspect. The world is a progressive realization. All objects are natural or human and all relations in the world exist in the eternally realized state in the Being of the Lord. The Sun, the Moon the starry heaven, the vegetable world, the animal, and the human world all exist in their eternally realized perfection in the Being of the Lord. All these are the elements of the Prakriti. In creation, all objects like nature and humans exist as progressively realizing themselves moving from less perfect to more perfect. Bengal Vaishnavism has found the multiplicity of human relations of love and affection and service has not been realized in God by the ordinary Christian consciousness. They believe that as we are domestic and social beings we have to realise ourselves in an organised society, so the Lord is an organised spiritual society of His own composed of endless multiplied forms of His Prakriti. In Bengal Vaishnavic culture, the Ultimate Reality is Shree Krishna. Shree Krishna is the Supreme Reality or Purusha and Shree Radha is His Prakriti. They both are One. Shree Chaitanya's philosophy of the Absolute has replied to the Samkara Vedantic doctrine of absolute monism derived from the examinations and analyses of universal psychological experiences.

#Role of ISKCON in Bengal Vaishnavism:

The International Society for Krishna Consciousness (ISKCON) is known as the Hare Krishna movement. The society is based on the message of Vedic literature and upon the teachings of Lord Chaitanya Mahaprabhu, the sixteenth-century incarnation of Lord Krishna. ISKCON is an organization founded by **Srila Prabhupada**, a Bengali born at Kolkata, who at the age of 69 embarked on this mission of spreading the message of Krishna in foreign countries as per the orders of his spiritual master Bhaktisiddhanta Sarasvati Thakura. ISKCON has grown in popularity and influence and is known and respected all over the world. ISKCON is a spiritual, cultural, and educational institution with branches throughout the world. Devotees have taken a vow of initiation refraining from meat consumption, intoxication, illicit sex, and gambling.

Mayapur ISKCON temple, the birthplace of **Sri Chaitanya Mahaprabhu**, is the headquarter of ISKCON. ISKCON devotees follow a disciplined line of Gaudiya Bhagavata Vaishnavas and are the largest branch of Gaudiya Vaishnavism. Vaishnavism means worship of Vishnu and Gauda refers to the area where this particular branch of Vaishnavism originated, in the Gauda region of West Bengal. ISKCON is hundreds of thousands strong, with over 400 centers worldwide, self-sufficient farming communities, movies, recording studios, publishing companies, restaurants, scientific organization, and even their own school system. It is a worldwide non-sectarian movement dedicated to propagating the love of God through the yoga practice of chanting the holy names of God, "*HARE KRISHNA, HARE KRISHNA, KRISHNA KRISHNA, HARE HARE! HARE RAMA, HARE RAMA, RAMA RAMA, HARE HARE!*"

Conclusion:

In the concluding part, we can say that Hinduism is an eminent sect of the Hindu religion. But here we have enumerated the significant role of Vaishnavism and their ethical code of conduct to protect our environment and ecological balance already that has been mentioned above. Environmental ethics as a principle imposes risks on others for the acceptability and desirability of moral judgments. Environmental ethics needs to be informed

Mrs. Ipsita Chakraborty, Dr. P. Ganesan, Dr. Debaprashad Chatterjee

by changes in political efforts to ameliorate environmental problems. Environmental ethics concerns formulating our moral obligations regarding the environment. Except for environmental protection, the follower of Vaishnavas are treated as a man of peace and love where there is no scope and intuition of coercion and conflict. We are aware that the incarnation of Sri Chaitanya has been an eminent personality in spreading the doctrine of love and peace and has also played a pioneering role in the expansion of Vaishnavism all over India mostly in Bengal. Thus, it is quite clear that where has an empathetic and fellow feeling towards other living creatures by protecting and not harming them. Vaishnav religious practices can reveal a scientific and ethical code of conduct to save our environment.

Bibliography:

1. Krishnamurthy, V (1992). *Hinduism For the Next Generation*. Delhi: Wiley Eastern Limited.
2. Pal, Bipin Chandra (1933). *Bengal Vaishnavism*. Calcutta: Modern Book Agency.
3. Radhakrishnan, S. (1995). *Indian Religions*. Delhi: Orient Paperbacks.
4. Rolston, III Holmes (Eds.). (2003). *Environmental Ethics*. (2nd ed.). Oxford: Blackwell Publishing.
5. Shastri, Satish C. (2015). *Environmental Law*. Lucknow: Eastern Book Company.
6. Sharma, Dr. Rajesh Kumar and Mrs. Sandhya Dixit (2010). *Environmental Crisis & the Role of ISKCON in its Mitigation*.
7. Vijayalakshmi, R. (1993). *Viewpoints: Environmental Awareness: The Hindu Perspective*. *Journal of Hindu-Christian Studies*. Vol.6; Article12.
8. <https://www.thebastion.co.in/politicsandenvironment>.
9. <https://www.esamskriti.com/e/culture/Indian-culture/Indian-epics-and-environment-conservation-1>
10. www.politybooks.com/Giddens.



Carrier Mobility in The Field Effect Transistor Channel in The Single Walled Carbon Nanotubes

Jay Shankar Kumar¹ Versha Joshi² Vimal Sagar³

¹Research Scholar, University Department of Physics, Bhupendra Narayan Mandal University, North Campus, Singheshwar – 852128, Madhepura, Bihar, India.

²Research Scholar, University Department of Physics, Bhupendra Narayan Mandal University, North Campus, Singheshwar – 852128, Madhepura, Bihar, India.

³Research guide, University Department of Physics, Bhupendra Narayan Mandal University, Madhepura, North Campus, Singheshwar- 852128, Bihar, India.

Corresponding Author- Jay Shankar Kumar

Email- jayphysics108@gmail.com

DOI- [10.5281/zenodo.7295686](https://doi.org/10.5281/zenodo.7295686)

Abstract:

We have studied about a field effect transistor channel carrier mobility in semiconducting single walled carbon nanotubes. The mobility applies only to channel-controlled metal oxide semiconductor field effect transistor like carbon nanotube field effect transistors. We have used the energy dispersion of one - dimensional sub-bands that is based on the band structure of semiconducting single walled carbon nanotubes. The energy dispersion approaches a metallic single walled carbon nanotube. We have found the induced charge density, conductance and field effect mobility as a function of the gate voltage in which the scattering time is proportional to the diameter of single walled carbon nanotube and inversely proportional to the temperature. The obtained results were found in good agreement with previous results.

Keywords: Single Walled Carbon Nanotube, Field Effect Transistor Channel, Energy Dispersion, Conductance, Scattering, Gate Voltage.

Introduction:

In a field effect transistor channel, carrier mobility is such an important parameter that determines the performance of device, frequency and current delivering and carbon nanotubes are used as the active elements [1]. The effective or field effect mobility is measured and reported for semiconducting single walled carbon nanotubes [2]. In semiconducting single walled carbon nanotubes, the scattering mechanisms are expected to be high and low energy phonons and have been studied theoretically and the induced charge density varies with the gate voltage in semiconducting single walled carbon nanotubes [3-5]. High energy phonon gives rise to the phonon emission and the absorption with electron back scatterings [6-9]. In the experiment the mobility values for carbon nanotube field effect transistors at room temperature have been $> \sim 4000$ cm²/Vs, with the highest value of $\sim 100,000$ cm²/Vs [10]. The field effect mobility of a semiconducting single walled carbon

nanotube field effect transistor can be estimated on the band structure of semiconducting single walled carbon nanotubes [11]. The electrostatic potential by the distribution of charge density is expressed on the surface of single walled carbon nanotubes [12]. Kumar and Kumar studied the Interbrand conductivities of the armchair carbon nanotubes and the effect of surface conductivities based on Hellen's integral equation [13]. F. Leonard and et.al., studied about negative differential resistance and the charges transfer from electrodes [14].

Method:

The carrier mobility is the transport properties of a semiconducting material. Mobility is defined as

$$\mu = \frac{V_d}{E} = \frac{\sigma}{ne}$$

(1)

Where V_d is the drift velocity of the charge carriers, E is the applied electric field, σ is the conductivity and ne is the surface charge density. The distribution of charge on the

surface of single walled carbon nanotube continuously described by conductivity as

$$\sigma = \frac{qne}{\epsilon} \left[1 - \frac{aR\sqrt{3}}{\pi AV_0} \int |\epsilon + eV| \sqrt{(\epsilon + eV)^2 - (\epsilon_g)^2} d\epsilon \right] \quad (2)$$

Where ϵ is the dielectric constant, R is the radius of carbon nanotube, ϵ_g is the energy gape. The intraband conductivity of the armchair carbon nanotube expressed as

$$\sigma = -j \frac{2e^2 v_f}{2\pi^2 \hbar a (\omega - j\nu)} \quad (3)$$

Where v_f is the Fermi velocity and ω is the operated frequency. The mobility of a semiconducting material is measured by the method utilizes the Hall effect or Hall mobility and other method is based on the transfer characteristics of the field effect transistors or effective and field effect mobility. Hall mobility cannot be measured for one dimensional system but effective and field effect mobility is measured for semiconducting single walled carbon nanotubes. The effective mobility (μ_{eff}) and field effect mobility (μ_{FE}) are defined as in linear region

$$\mu_{eff} = \frac{L}{C_g} \frac{G}{|V_g - V_t|} \quad (4)$$

$$\mu_{FE} = \frac{L}{C_g} \left| \frac{\partial G}{\partial V_g} \right| \quad (5)$$

Where L represents the length of the device, C_g is the gate capacitance per unit length, G is the conductance, V_g is the gate voltage, V_t is the threshold voltage. For evaluation of mobility, the equations (4) and (5) are used and apply to channel - controlled metal oxide semiconductor field effect transistor like carbon nanotube field effect transistors. The energy dispersion of the lowest one - dimensional sub - bands of semiconducting single walled carbon nanotube is written as

$$\epsilon = \pm \sqrt{(m^* v_f^2)^2 + (\hbar k v_f)^2} \quad (6)$$

Where v_f is the Fermi velocity of electrons in the single walled carbon nanotubes and equal to 8×10^5 m/s. The equation (6) approaches

the metallic single walled carbon nanotube ($\epsilon = \pm v_f k$) when k becomes large. The induced charge density in the semiconducting single walled carbon nanotube is given by

$$ne = C_g |V_g - V_t| \quad (7)$$

The difference between gate voltage threshold voltage $|V_g - V_t|$ is expressed as

$$|V_g - V_t| = \int K(z - z') \sigma \quad (8)$$

Where K is Kernel. The conductance and field effect mobility as the function of gate voltage can be derived as

$$G(V_g) = \frac{4e^2 l_0}{h L} \frac{(\Delta V_g/a)^2}{1 + (\Delta V_g/a)^2} \quad (9)$$

$$\mu_{FE} = \frac{e\tau_0}{m^*} \frac{(\Delta V_g/a)}{(1 + (\Delta V_g/a)^2)^2} \quad (10)$$

Where $\Delta V_g = |V_g - V_t|$, $a = \frac{8e}{3\pi d C_g}$, l_0 and τ_0 are the mean free path and the scattering time at the high energy. The maximum conductance and the peak mobility of the semiconducting single walled carbon nanotube as written as

$$G_{max} = \frac{4e^2 v_0}{\hbar \alpha L} \frac{d}{T} \quad (11)$$

$$\mu_{peak} = 0.48 \frac{e v_0}{\hbar \alpha} \frac{d^2}{T} \quad (12)$$

Where α is the proportionality factor, d is the diameter of single walled carbon nanotube and T is the temperature.

Results and Discussion:

The conductance (G) saturates at high gate voltage and the field effect mobility (μ_{FE}) peaks at a gate voltage near threshold voltage (V_t) is shown in figure 1. The dominant scattering at low (V_{DS}) is due to the acoustic phonons similarly metallic single walled carbon nanotubes. The experimental results have the diameter and temperature dependence predicted by the equations (11) and (12). The experimentally measured effective mobility values scatter at low as they are also different from theoretical values.

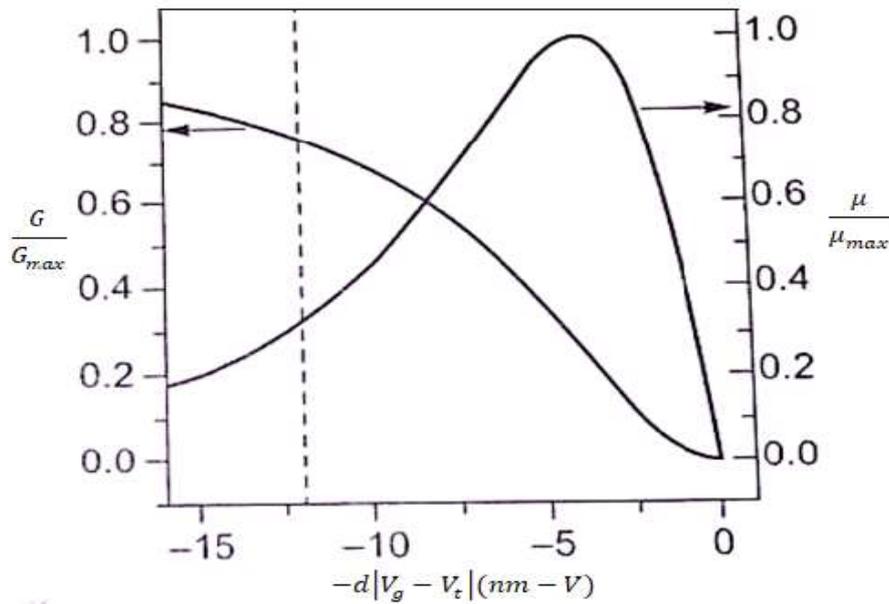


Figure 1: Conductance and mobility plot of the single walled carbon nanotube field effect transistor.

The drain current versus the drain voltage characteristics of the transistor is shown in figure 2. The device changes from a high to

low conductance from the gate voltage of -3V to +6V, thus the switching action of the transistor provides. There has been much experimental and theoretical progress governs the transistor action and device performance.

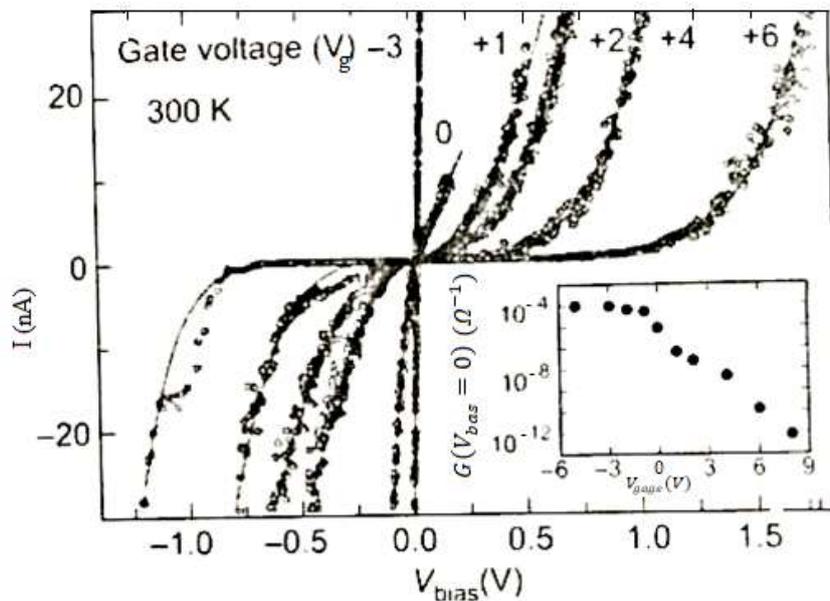


Figure 2: Current - voltage characteristics of carbon nanotube transistor.

Theoretical work explains the behaviour of the Ohmic contacts that governs the transistor action is the bending of the bands by applying the gate voltage. Results of this work are presented in figure 3; based on calculations on quantum transport. Figure 3(a) represents the calculation zero bias conductance as function of the gate voltage (V_g). the device shows the three regimes; regime I shows the high conductance

corresponding to the ON state of the transistor. In this regime, the bands are straight [Figure 3(b)] so that little scattering of electrons is at the Fermi level. The band - bending creates the electrostatic quantum dot in middle of the carbon nanotube to appearance of localized energy levels. The carbon nanotube transistors consist of resonant tunnelling through the discrete levels to the peak in the conductance in the regime III. This regime is expected to have

intriguing behaviour such as the high frequency responses.

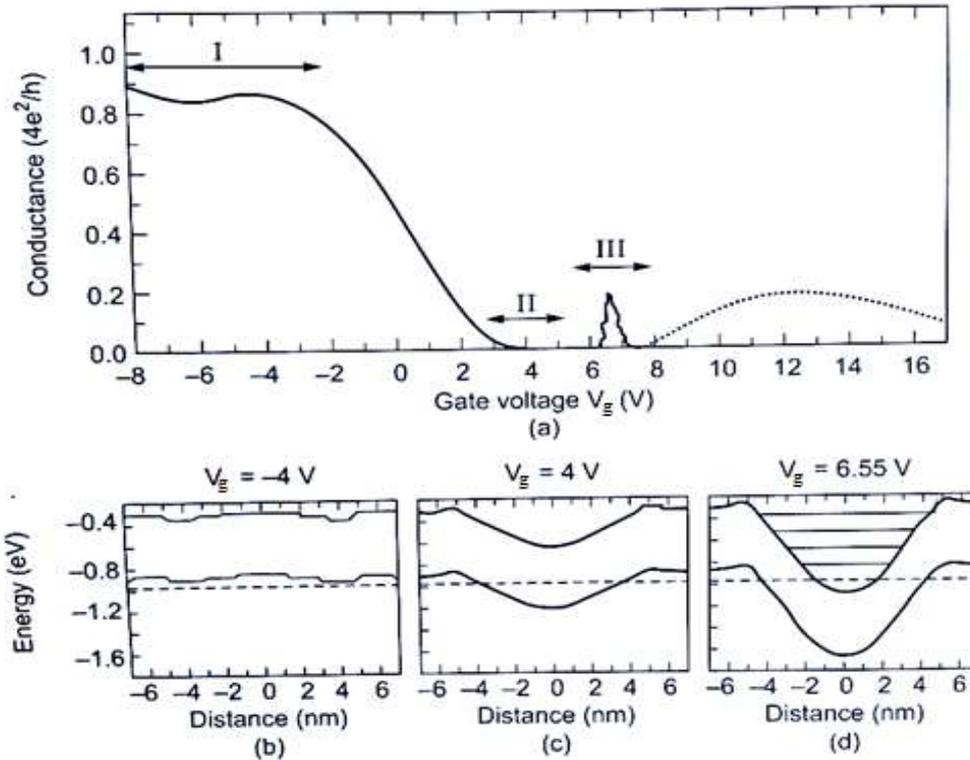


Figure 3: Plot of zero – bias conductance of carbon nanotube field effect transistor and band – banding associated with the regimes I, II, and III of (a) shown by (b), (c), and (d).

The effect of the operation of Schottky Barrier carbon nanotube field effect transistors is shown in the figure 4. If the band – banding near the Schottky contact is very sharp, electrons can tunnel across the

sharp band – banding to increased current. Figure 4(a) shows the band – banding for OFF state transistor. At this gate voltage, the tunnelling length and tunnelling current are long and small respectively. Figure 4(b) shows the increasing gate voltage in the middle of the carbon nanotube to reduced tunnelling distance at the contacts and the large current.

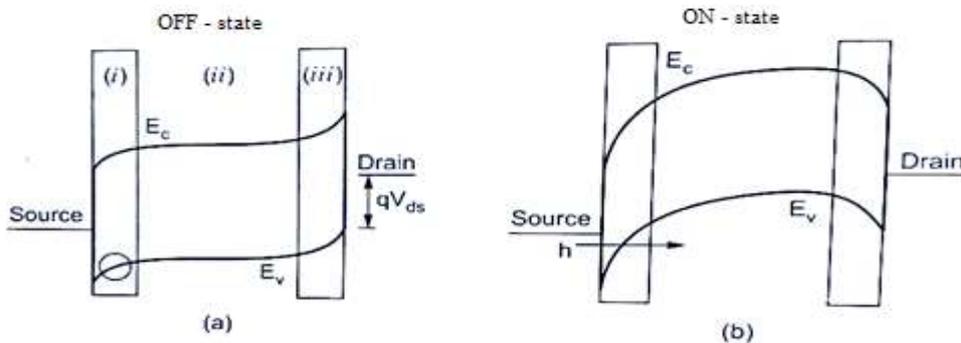


Figure 4: Band – banding for the Schottky Barrier carbon nanotube field effect transistor for the two values of the gate voltage.

Conclusions:

We have studied the carrier mobility in the field effect channel in the single walled carbon nanotubes. We have introduced the physical interpretation of the transport properties based on the relation between mobility and surface conductivity and conductance which is function of the gate voltage. The energy dispersion relation also

obtained with Fermi velocity. By the equation (11) & (12), we have the scattering time is proportional to diameter of single walled carbon nanotube and is inversely proportional to the temperature i.e., $t_s \propto \frac{d}{T}$. The theoretical calculation based on the multi – band Boltzmann equation is obtained

similar to function from as equation (11) & (12).

The effect of contact characteristics (Ohmic, Schottky barrier or Tunnelling) and in homogeneous response to the gate voltage may for variations and different measurements. An important outcome of this work is the fact that the Ohmic contact and the Schottky contact have influence on the behaviour of device. As increasing the gate voltage, decreasing the conductance and the channel is driven into the inversion. This inversion leads to a permanent turn – on of the conductance and for nanometre sized channels, the condition may be quite different. The main conclusion is that the behaviour of the Ohmic carbon nanotube transistor is determined by the changes in the band – bending of the carbon nanotube in the channel region. The device operation is controlled by the modulation of tunnelling at the Schottky contacts and the mechanism is entirely different from the Ohmic contact.

References:

- [1] F. Leonard, *The Physics of Carbon Nanotube Devices*, William Andrew Inc. (Elsevier), (2009).
- [2] T. Dürkop, et al., Properties and applications of high – mobility semiconducting nanotubes, *J. Phys: Con. Matt.* 16, 553 (2004).
- [3] V. Perebeinos, et al., Electron – Phonon Interaction and Transport in Semiconducting Carbon Nanotubes, *Phys. Rev. Lett.* 94, 086802 (2005).
- [4] G. Pennington and N. Goldsman, Semiclassical transport and Phonon Scattering of electrons in Semiconducting Carbon nanotubes, *Phys. Rev. B* 68(4), 045426 (2003).
- [5] A. Verma et al., Ensemble Monte Carlo transport simulations for semiconducting carbon nanotubes, *J. Appl. Phys.* 97, 114319 (2005).
- [6] E. Pop, et al., Negative Differential conductance and Hot phonon in suspended Nanotube Molecular wires, *Phys. Rev. Lett.* 95, 155505 (2005).
- [7] M. Lazzeri, et al., Electron Transport and Hot Phonons in carbon nanotubes, *Phys. Rev. Lett.* 95, 236802 (2005).
- [8] M. A. Kurodo, et al., Nonlinear Transport and Heat Dissipation in Metallic Carbon Nanotubes, *Phys. Rev. Lett.* 95, 266803 (2005).

[9] M. Lazzeri and F. Mauri, Coupled dynamics of electrons and phonons in metallic nanotubes: current saturation from hot – phonon generation, *Phys. Rev. B* 73, 165419 (2006).

[10] T. Durkop, et al., Extraordinary Mobility in Semiconducting Carbon Nanotubes, *Nano Lett.* 4, 1, 35 – 39, (2004).

[11] X. Zhou, et al., Band Structure, Phonon Scattering, and the Performance Limit of Single – Walled Carbon Nanotube Transistors, *Phys. Rev. Lett.* 95, 146805 (2005).

[12] J. S. Kumar and A. Kumar, Theoretical Characteristics of A Bundle of Carbon Nanotubes P – N Junction, *JORD*, 13(5), 74-75, (2022).

[13] J. S. Kumar and A. Kumar, Surface Wave Propagation on Carbon Nanotube Bundle and Characteristics by High Attenuation, *BPAS*, 40D(1), 49-55, (2021).

[14] F. Leonard and J. Tersoff, Roll of Fermi – Level pinning in nanotube Schottky diodes, *Phys. Rev. Lett.* 83, 5174 (1999).

[15] S. J. Tans, et al., Electrical/optical dual-function redox potential transistor, *Nature*, 393, 49 (1998).

[16] R. Martel, et al, Single and Multi-wall carbon nanotube field-effect transistors, *Appl. Phys. Lett.* 73, 2447 (1998).

[17] F. Leonard and J. Tersoff, Multiple Functionality in Nanotube Transistors, *Phys. Rev. Lett.* 88, 258302 (2002).

[18] J. Appenzeller, et al., Field - Modulated Carrier Transport in Carbon Nanotube Transistors, *Phys. Rev. Lett.* 89, 126801 (2002).



INFORMATION LITERACY: - AN OVERVIEW

Mr. Ashok B Nagare

Librarian, M J M Arts, Commerce and Science College, Karanjali, Tal. Peth, (Nashik).

Corresponding Author-

Mr. Ashok B Nagare

Email:- ashoknagare.2008@gmail.com

DOI- [10.5281/zenodo.7295688](https://doi.org/10.5281/zenodo.7295688)

Abstract:-

The goal of this article is to describe what is Information Literacy? State the component of information Literacy and explain factor which are useful to achieve Information Literacy also guide readers to important resources for understanding information literacy and to provide tools for readers to advocate for information literacy.

Key-words: - Information, Information Literacy.

Introduction:-

The originating concept of information literacy is generally attributed to Paul Zurkowski in 1974. Since 1974 information literacy has been area of interest to librarians, library professionals and information professionals. Information Literacy is related to information technology skills, but has wider implications for the individuals, the educational system, and society. Information literacy is a natural extension of the concept of literacy. Information literacy education is the activator required to transform the information society of today into the learning society of tomorrow. Information literacy is key element and contributor to lifelong learning process. Information literacy competency ensures maximum utilization of the information resources as well as optimization of information handling capabilities. Information literacy competencies extends learning beyond formal class room settings and provide practice with self directed investigations and individuals move into internship, first professional positions, and increasing responsibilities in all arenas of life. Because information literacy augments students ability with evaluating, managing, and using information.

Definition of Information Literacy: -

According to American Library Association
“**Information literacy is a set of abilities**

requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.”

Information literacy is an intellectual framework for recognizing the need for understanding, finding, evaluating, and using information these are activities which may be supported in part by fluency with information technology in part by sound investigative methods but most importantly through critical discernment and seasoning.

Need for Information Literacy:

Today there is a need to make society aware of the overflow of information being generated in different forms and formats, people should be taught to use these electronic gadgets by conducting information literacy programmes at different educational levels, Information Literacy initiative have to be designed to concentrate on the outcome of the development of ICT's. Information Literacy is a prerequisite for lifelong learning and is common to all disciplines, to all learning environments, and to all levels of education. It makes learners to engage critically with content and extend their investigations, become more self-directed, and assume greater control over their own learning. Information is the basic requirement for every users activity. The need of information literacy may be essential due to the following reasons.

- 3.1 Rapid increase in the stream of information due to information revolution;
- 3.2 Advent of information and communication technologies;
- 3.3 Vast variety of information sources;
- 3.4 Changing shape of libraries;
- 3.5 Wide dispersal of information;
- 3.6 Increase in number of users;
- 3.7 Research on complex and interdisciplinary topics.

Objectives of Information Literacy

Objectives of information literacy programmers may include the development of skills and competencies, which enable a client:

- 4.1 To recognize an information gap;
- 4.2 To construct alternative strategies to reduce the information gap;
- 4.3 To select a strategy;
- 4.4 To act on a strategy to find and retrieve information;
- 4.5 To assess the effectiveness of a strategy;
- 4.6 To acknowledge the sources of information; ideas and store the information for future use.

Scope of Information Literacy

Information Literacy includes a range of literacy. The range of literacy may be:

- 5.1 **Traditional Literacy:** to read and write;
- 5.2 **Computer Literacy:** to understand and operate computers those are interfaces between

Information and end-users;

- 5.3 **Media Literacy:** to understand different media storing networked information and use them;

- 5.4 **Network Literacy:** Network literacy for library users consists of two aspects: knowledge of

networked Information and skills to locate, select, evaluate and use the networked information.

- 5.5 **Traditional Information Literacy:** to locate, select, evaluate and use information effectively.

- 5.6 **Visual Literacy:** to see and understand the information, and

- 5.7 **Web Literacy:** to locate, select, retrieve and use the information from web

An information literate person should have ability to

- 6.1 Determine the extent of information needed.

- 6.2 Access the needed information effectively and efficiently.

- 6.3 Evaluate information and its sources critically.

- 6.4 Incorporate selected information into one's knowledge base.

- 6.5 Use information effectively to accomplish a specific purpose.

- 6.6 Understand the economic, legal and social issues surrounding the use of Information and access and use information ethically and legally.

Components of Information Literacy:-

Information literacy standards and rubrics provide behavioral descriptions to guide curriculum design and evaluation of students learning. The Information literacy Standards include three basic component i.e. access, evaluation, and use of information. These core components are found in most of the standards created by library associations, such as the relevant contribution of ACRL, ALA, ALIA, ANZIIL, etc. Followings are the component of information literacy.

Determine information needs.

The first step in the Information Literacy strategy is to clarify and understand the requirements of the problem or task for which information is sought. Basic questions asked at this stage: What is known about the topic? What information is needed? Where can the information are found?

Locating:-

The second step is to identify sources of information and to find those resources. Depending upon the task, sources that will be helpful may vary. Sources may include books, encyclopedias, maps, almanacs, etc. Sources may be in electronic, print, social bookmarking tools, or other formats.

7.2 Selecting:-

Step three involves examining the resources that were found. The information must be determined to be useful or not useful in solving the problem. The useful resources are selected and the inappropriate resources are rejected.

7.3 Organizing :-

It is in the fourth step this information which has been selected is organized and processed so that knowledge and solutions are developed. Examples of basic steps in this stage are:

Discriminating between fact and opinion.

Basing comparisons on similar characteristics.
 Making various interpretations of data.
 Finding more information if needed.
 Organizing ideas and information logically.

7.5 Presenting:-

In step five the information is presented to the appropriate audience in an appropriate format. A paper is written. A presentation is made. Drawings, illustrations and graphs are presented.

7.6 Evaluating:-

The last step in the Information Literacy strategy involves the critical evaluation of the completion of the task. Was the problem solved? Was new knowledge found? What could have been done differently? What was done well?

8 Information Literacy Activities can be achieved in following way:

8.1 By organizing various Information Literacy activities through bringing out various

orientation programs,

8.2 By making familiarity of library tools like library catalogue, classification schemes, indexing and abstracting sources,

8.3 By distributing brochures, Pamphlets, Sheets, tutorials,

8.4 By organizing and also attending Conferences, seminars, invited talks, for the faculty, students, library staff and also for librarians.

Conclusion: -

Information literacy guidelines can be reviewed and changed by librarians according to the priorities of their institution so that Information literacy elements can be better suited to local or national needs. Local budget policies procedures and priorities need to be taken into account in their

application. The guidelines are a checklist of subject to keep in mind during the planning and implementation of Information literacy programme. Information literacy is a survival skill in the Information Age. Information literate people know how to find, evaluate, and use information effectively to solve a particular problem or make a decision.

References:

- 1) Amudhavalli, A., 2008, 'Information Literacy and Higher Education Competency Standards,' *DESIDOC Journal of Library and Information Technology* vol.no.28, pp.45- 63.
- 2) Banu, Ramesh B, 2008, 'Information Literacy Competency Standards and Performance Indicator' *DESIDOC Journal of Library and Information Technology* vol.no.28, pp.56-65.
- 3) Karisiddappa, C. R. Information literacy and capabilities building. In World Social Forum- 2004. Proceedings of International Workshop on Democratization of Information: Focus on Libraries Organized by NIGD and TISS, 2004.
- 4) IFLA: UNESCO Public Library Manifesto revised 16 July 1998. <http://www.ifla.org/VII/58/unesco/eng.htm>.
- 5) American Library Association. Presidential Committee on Information Literacy. Chicago, IL: American Library Association, 1989
- 6) Brehan S J. A conceptual analysis and historical overview of information literacy. *Coll Res Libr.* 1994. Jul; 55(4):309-22.



‘SHIVA’ THE HERO OF ‘THE SHIVA TRILOGY’ – BY AMISH TRIPATHI

Kavita Vasantrya Kakde¹ Dr.Kishor K Wagh²

¹Research Scholar

²Asst.Professor. R.s.Arts,Comm & Sci College Pathri Dist – Aurangabad

Corresponding Author -Kavita Vasantrya Kakde

Email:- shrikanttalekar2010@gmail.com

DOI- 10.5281/zenodo.7295692

Abstract:

Amish Tripathi is an Indian rising Contemporary writer. Indian mythology inspired him to write about Hindu Mythology upon Hindu God and Goddesses. He is one of the best selling author in English literature, written about mythological stories. All the novels of Amish Tripathi are modernized in such a way that it can match with the interest of Today's generation. Amish Tripathi is known best for his 'Shiva Trilogy and Ram Chandra' series. Amish Tripathi constructed his three novels in the form of 'Shiva Trilogy' These novels are 'The Immortals of Meluha', 'The Secret of Nagas' and the 'Oath of Vayuputras' on the revolutionary thought that all gods were once humans who lived in the ancient times because of their experience and intellectual achievements. In his work The Shiva Trilogy, he focuses on more knowledge about myth and other aspects related to it. Amish Tripathi creates the attention of the people towards current hurdle that affect the society. The mythical Characters and their attempt serve to be a source for explanation from social, political and many more problems.

According to the Hindu mythology there are trinity gods such as Brahma, Lord of Creation, Vishnu, Lord of Protection and Shiva, Lord of destruction. Of them Amish Tripathi has chosen the mythological character 'Lord Shiva' Shiva the 'Mahadev' The Hero, The God of Gods. Destroyer of Evil. Passionate lover, fierce warrior, consummate dancer charismatic leader. All powerful, yet incorruptible. A quick wit, accompanied by an equally quick and yearsome temper⁽¹⁾. Shiva gets the position of hero by his actions and noble thoughts. The Mythological god is brought down to the level of a human being to lighten the path of truth.

Keywords: Hero, Mythical Character, Trinity, Mythology, Shiva .

Introduction:

Amish Tripathi is a Contemporary Indian novelist who was born on 18 October 1974 in Mumbai, India. His upbringing in the religious household recall his passion about Hindu religion particularly in Lord Shiva. Amish Tripathi started his career as a banker but soon he left the Job to chase his passion for writing novels. Amish Tripathi wrote Shiva Trilogy it includes 'The Immortals of Meluha' followed by 'The Secret of Nagas' And then 'The Oath of Vayuputras'. In Shiva Trilogy story starts about Shiva the hero in the first novel and it continues in second and end in the third novel. It's a chain of incidents. The first novel introduce the readers to all the main characters of the novels about 'Somras' history and their ancient culture. The Second

novel talks on 'goods and evil'. The third novel contains some philosophical concepts from the Gita and the Upanishads like 'Karma and Rebirth'. The Immortals of Meluha by Amish Tripathi is a journey of a man becoming the destroyer of evil Shiva stays at Mount Kailsh with his tribe but their struggle with pakratris forced them to migrate to Meluha. It is considered heaven and a peaceful Society The people are followers of lord Ram called suryavanshis In the Shiva Trilogy, Where the place Meluha, the empire of the king Daksha Flourished its culture and heritage. Meluha is the place of the 'Suryavanshis'. In the shiva trilogy the Mythical Place Meluha has a reference to history. In this novel the king of the Meluha Empire 'Daksha' looked only as a thirty years old man. 'Daksha's daughter sati, with

shiva was love in the age of 85 years. The novel portrate the war between the suryavanshis and the chandravanshis for 'Somras' Amish Tripathi through his novel tries to show how even today we fight among ourselves for something. According to Hindu Mythology the story of samudra Manthan is related to the Mahadeva and somras In the samudra Manthan at the time of churning of the sea, a poison Came in gorce Shiva swallowed the poiscn to save the life of many People. Shiva swallowed the poison because of that poison his throat became blue. He became ' Neelkanth' In the novel ' The Immortals of Melaha' Amish Tripathi retells an another story of an young boy Shiva. But Shiva of this novel is quite different⁽¹⁾.

Amish Tripathi started writing 'The Secret of the Nagas' While the first part of the Trilogy was being released. It means ' The secret of Nagas' picks up just from where its predecessor 'The Immortals of Meluha' left. In Amish Tripathi's Second novel ' The Secret of Nagas' the protagonist, Shiva to confront with the Nagas should know their residing Place. Wheras, king chandraketu who was the ruler the land of Branga in Eastern India.though has huge respect for Shiva refuses to answer about the Nagas because they provide him the life saving Medicine. Shiva travels to panchavati under the guidance of kali Who is the Naga queen and knows how to reach the capital through the treacherous.on their joureny, the companions is attacked from the river side by a collection of ships containing the weapons of mass destruction known as Daivi Astra that was once for bidden by lord Rudra. The legendary supreme ruler of India. Shiva has led the suryavanshis to the victory over the chandravanshis and has been married happily to the princess of Meluha Sati, But later on. he realizes that it is not chandravanshis who are evil, it was just a matter of perspective. Then begin his journey to discover. What is really evil because as being the legendary Neel kanth. he was supposed to do so. The first thing that comes to the mind of an Indian when he reads the title of the book ' The Secret of the Nagas' is that it will be about snake. But this is not the case ⁽²⁾.

The Novel reaches the climax in the third part of the trilogy revealing the ultimate twists. Shiva in his attempt to destroy evil and restore righteressness lost shiva misunderstands the Naga Community and

looks upon them as evil. At the end it is understood that not the Naga community but the somras is the terrible evil that resulted in causing the abnormality in people and damage the environment. The Oath of the vayuputras is the third book of Amish Tripathi, third book of Amish verse and also the third book of Shiva Trilogy. It is preceded by the secret of Nagas it is Mythical story about an imaginary land Meluha and how its inhabitants were saved by a barbarian named ' Shiva ' the hero of this story. The story starts from where the previous installment left off, Shiva discovers what is the true evil in the Oath of the vayupatras Shiva then declares a holy war on those who seek to continue to use it mainly the emperors Daksha and Dillipa who are being controlled by the sage Bhrigu. The battle rages on the Shiva travels to the land of pariha to consult with Vayuputras, a legendary tribes by the time he returns, the war has ended with sati his wife, being murdered. An annoyed Shiva destroys the capital of Meluha and somras is clear out of history. In the end , Shiva retires to Mount Kailash where he lives the rest of his days peacefully though missing sati every day. Ganesh Kali and kartik become renowned as gods for their skill all over India, They take revenge for sati's death by wiping out the whole tribes of the Egyptian assassins. In Shiva Trilogy, Amish Tripathi Cautiously spreads out areas that are picture immaculate as in kids writing, Amish belives that ' Legends are only scrambled recollection of a valid past. Shiva in the novel is typical man whom legend transforms in to God.He is admired to such a degree, that he is by all accounts much over the humankind when all said is done, He is a straight forward man whose karma recast him as Neelkanth, the Mahadeva the divine foree of divine beigns. The concept of tribes is fantasy. There Characters likewise assume a critical job in the novel. Amish Tripathi's Shiva Trilogy manages the rich Mythological legacy of ancient India.

All the Principle characters works for the welfare of all. The Shiva Trilogy is Interesting to study.

References :

- 1) Amish Tripathi (2010) Immortals of Meluha , Westland : Print.
- 2) Amish Tripathi (2012) The secrets if Nagas. Westland Lt d: Print.

- 3) Amish Tripathi (2013) The Oath of Vayupatras .Westland Ltd : Print.
- 4) Compbell, Joseph. The hero with a thousand faces Yogi impressions 2018.
- 5) Mythology in Amish Tripathi's The Immortals of Meluha :A Study – G-Aisharya and Dr.P.Madhan .



A Geographical Analysis of LULC in Pachora Tehsil of Jalgaon District (MH)

Prof. Rahul V. Patil¹ Dr. S. N. Bharambe²

Department of Geography, PSGVPM'S A.S.C. College Shahada, Dist. Nandurbar
Department of Geography, KCES Moolji Jaitha College, Jalgaon

Corresponding Author- Prof. Rahul V. Patil

Email- patilrah30@gmail.com

DOI- 10.5281/zenodo.7295694

Abstract:

Land use & Land Cover is very effective analysis for identifying features on satellite data. Many a times it finds difficulties to identify related features such as agriculture & natural vegetation. At such times we have to take help of interpretation elements. It also helps researcher to find change detection over a certain period of time. This further helps to get a future trend of LULC change. It also guides for future planning if any natural resource comes under threat. In the given research researcher choose Pachora tehsil of Jalgaon district for LULC study. Researcher has taken satellite-based data of two years i.e. 1998 & 2021. Landsat images of study area had chosen and many features such as water body, Natural vegetation, agriculture, settlement & Barren or Fellow land has been identified. The research has shown that there is a drastic change in every land use.

Introduction:

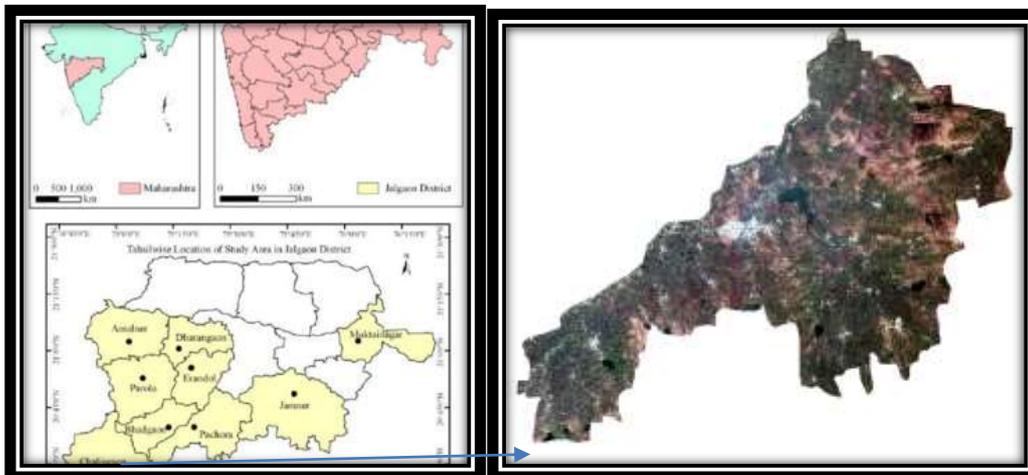
The main focus in the given study is Land use and Land cover analysis on micro i.e., tehsil level. Pachora tehsil of Jalgaon district has been selected. Land use patterns changes over time. But in future, it will change at more rate that it was changed before. Hence it becomes a widely accepted tool for calculating change detection. It is observed that the tehsil had been through sequential

changes as far as Land use is concern. Landsat images of Landsat 5 & 9 had been selected for proper and detailed identification land cover features. Many changes has been observed in study area over a period of time

Aim & Objective:

The main aim of the study is to find out change detection in Land use pattern in Pachora tehsil of Jalgaon district over a period of 23 years.

Location of Study Area:

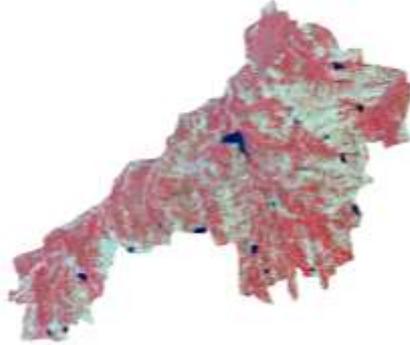


Jalgaon District

Pachora Tehsil

Database:

As per the requirement of result Landsat images year 1998(Landsat 5) and 2021(Landsat 9) of Study area has been taken. It helped good identification of features as per research criteria. The following images has been taken:



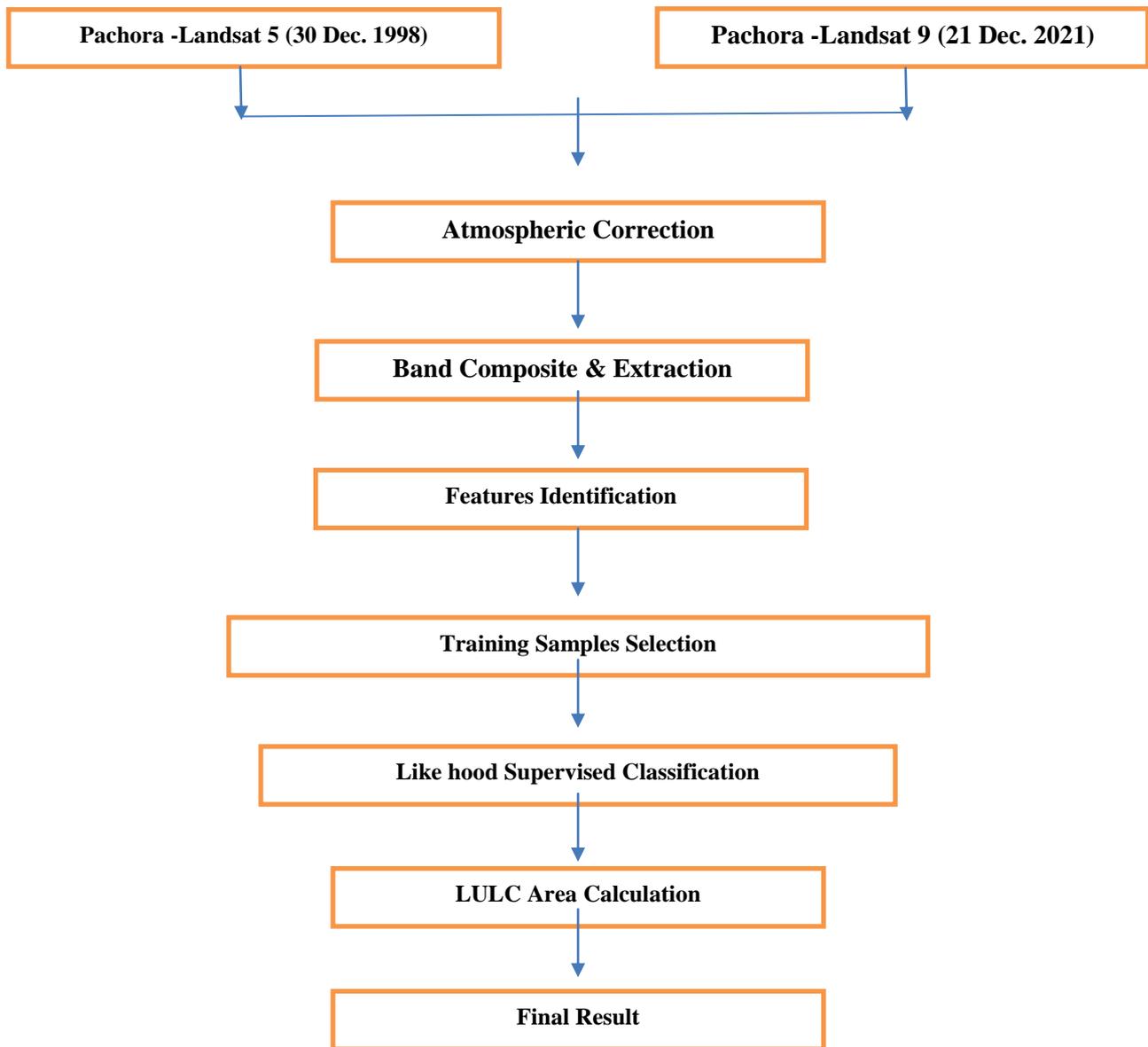
Pachora -Landsat 5 (30 Dec. 1998)



Pachora -Landsat 9 (21 Dec. 2021)

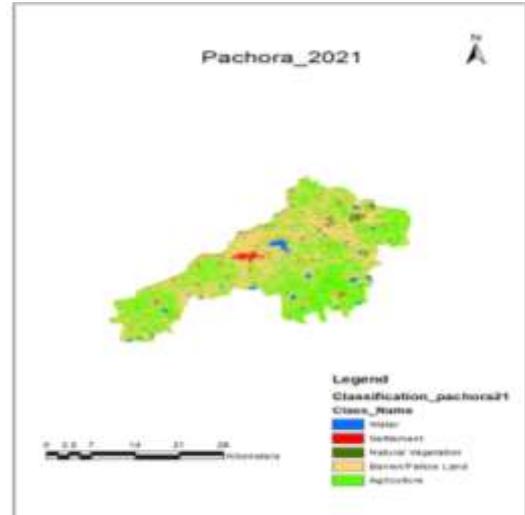
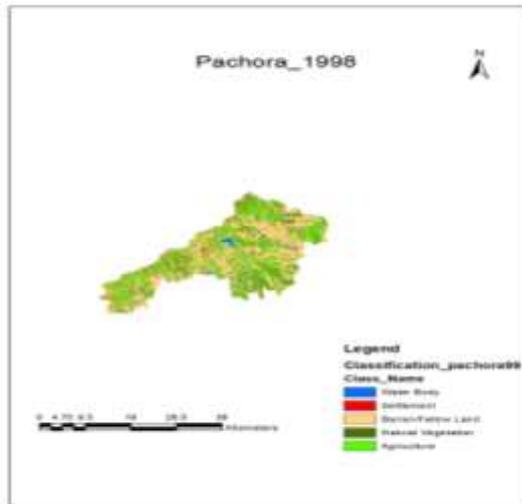
Methodology:

Following methodology is being adopted for study:



Result & Conclusion:

Study reveals that, area under natural vegetation has been decreased, while area under barren or fellow land, water body, settlement & Agriculture has been increased. Majority of land under natural vegetation is converted into agriculture and barren land. Area under water body is increased due to construction of dams in recent years.



Sr. No	Land use Type	1998 (Area in sq.km.)	2021 (Area in sq.km.)
1	Agriculture	195.00	351.10
2	Fellow/Barren Land	415.64	419.39
3	Natural Vegetation	176.40	11.19
4	Water Body	20.80	23.32
5	Built UP	13.90	16.74
	Total	821.76	821.76

References:

1. Meiyappan, P., P.S. Roy, Y. Sharma, R.M. Ramachandran, P.K. Joshi, R.S. DeFries, and A.K. Jain. 2016. Dynamics and determinants of land change in India: Integrating satellite data with village socioeconomics, In review
2. Chauhan H. B. and Nayak S., "Land use/ Land cover changes near Hazira region, Gujarat," Journal of the Indian Society of Remote Sensing, pp. 413-420, 2005.
3. Kotharkar R. & Surawar M., "Land Use, Land Cover, Nagpur Urban Area," Journal of Urban Planning and Development, ASCE, vol. 142(1) , 2015



RECORD OF THE PREDATORY STINK BUG *ANDRALLUS SPINIDENS* (FABRICUS) (HETEROPTERA: PENTATOMIDAE: AESOPINAE) FROM GOA STATE, INDIA

Ayesha E. Shetkar¹, Vijaykumar S. Gadekar², Aishwarya S. Naik³, S. V. More⁴

^{1,3,4} Department of Zoology, ADK Science College, Dodamarg, Sindhudurg, Maharashtra,

² Department of Zoology, Sangola College, Sangola, Solapur, Maharashtra, India

Corresponding Author- S. V. More

Email:- sadamore6046@gmail.com

DOI- 10.5281/zenodo.7295698

Abstract:

During the field visit the predatory stinkbug *Andrallus spinidens* Fabricus, 1787 was recorded from Miramar beach. This is reported for the first time from the Goa state. A few diagnostic characters, some digital images, and the current geographical distribution is given.

Keywords: Hemiptera, Pentatomidae, Aesopinae, *Andrallus*, Goa

Introduction: The carnivorous bug, *Andrallus spinidens* Fabricus, belongs to the subfamily Aesopinae of the family Pentatomidae. This bug was recently observed on Miramar beach, Panaji during the field visit in 2020, in the Goa state. The observed specimen were identified with the help of diagnostic characteristics given in Distant (1902). It is a predator bug, and it is a single species under the genus *Andrallus* Bergroth. *A. spinidens* is easily identified with its dorsal pale yellow color body pattern and dark coarse punctures. It is a carnivorous bug that acts as a biocontrol agent, mainly on lepidopteran larvae, Manley (1982). Previously, this species was recognized as *Audineta spinidens* in “Fauna of British India” by Distant (1902), after that Distant’s nomenclature, Thomas (1994) has given the currently valid name of this predator bug as *Andrallus spinidens*. The predator bug *Andrallus spinidens* is widely distributed in India in the following states, Sikkim, Assam, Meghalaya, West Bengal, Zarkhand, Karnataka and Maharashtra, Ghate *et al* (2012) and is even occurs in abroad viz. Malaya Archipelago, China, Japan, Turkey, Greece, Africa, Syria, Equatorial Guinea, Malawi, Madagascar, Australia, North America and Central America (Thomas 1994). Based on various publications and available literature, this species is not reported previously from the

Goa state. The current short communication adds this species to the Pentatomidae diversity of Goa state.

***Andrallus spinidens* (Fabricius, 1787) (Figures 1-5)**

Specimens examined: Male, 10. i. 2020, Single specimen, the total length of the bug is 13.7 mm (head to the end of the apical segment of the abdomen), and the breadth between pronotal angles is 8.2 mm, Coll. Gauresh Aayeer, near Miramar beach, Panaji, elevation (3m), coordinates (15.4775°N, 73.8121° E).

Diagnostic characters:

The body is slightly elongated, color all over is pale yellow, with a distinct color pattern. The head is somewhat long and its lateral lobes (=mandibular plates) slightly extending beyond the median lobe (=clypeus), punctures are less on median lobe, with pale brownish color, ocelli brown. Antennae are long, brown in colour, five segmented, with brownish hairs; the basal segment is short, not extending beyond the apex of the head. Pronotum brown with whole area covered with thick black punctures, its anterolateral margin is crenulate; lateral angles of pronotum have pointed black spine, with its base having black punctures and short blunt spine; the pale yellow colored median transverse line is seen between the two lateral spines with black punctures near the pronotal calli. Scutellum long, triangular,

with black dense punctures, with pale colored line extending from middle of scutellum to the distal end, its apical tip brownish white. Corium is brownish or brownish to black with dense black punctures and its lateral margin is creamy white; membrane brownish, which is extending beyond the apex of the abdomen with nearly parallel dark veins. Ventrally, head is pale brownish with punctures. Rostrum (=labium) is pale yellow, four segmented, long and extends beyond mesosternum; with robust incrassate basal segment. The sternum is with dense punctures, brown punctures in the middle area, and black punctures in the lateral region of the sternum. All legs are covered with fine brownish white hairs. All femora and tibiae are pale yellow colored, with tarsal segments dark brownish black, and claws widely separated. The abdomen is pale yellow and coarsely punctured, and its anterior region has a series of black spots, dense brownish hairs on genital appendages, with slightly rounded black spots near the spiracle.

Acknowledgment:

The authors are extremely grateful to Dr. Hemant Ghate, Modern College Pune, who helped in the identification, and also read the first draft of this short communication and provided us very valuable suggestions that we have improved in the contents. We are grateful to the authorities of ADK Science College, Dodamag for their facilities and encouragement.

References:

1. Distant, W.L. (1902). The Fauna of British India including Ceylon and Burma - Rhynchota—Volume 1 (Heteroptera). Taylor and Francis, London, 438pp. (Indian Reprint Today and Tomorrows Printers and Publishers New Delhi 1977).
2. Ghate, H.V., G.P. Pathak, Y. Koli and G.P. Bhawane (2012). First record of two Pentatomidae bugs from Chandoli area, Kolhapur, Maharashtra, India. *Journal of Threatened Taxa* 4(4): 2524–2528.
3. Manley, G.V. (1982). Biology and life history of the rice field predator *Andrallus spinidens* F. (Hemiptera: Pentatomidae), *Entomological News* 93: 19–24.
4. Thomas, D.B. (1994). Taxonomic synopsis of the Old World asopine genera (Heteroptera: Pentatomidae). *Insecta Mundi* 8(3–4): 145–212.



Ayesha E. Shetkar, Vijaykumar S. Gadekar, Aishwarya S. Naik, S. V. More



QUANTUM MACHINE LEARNING - A STUDY

Mr. K. VigneshKumar¹, Dr. N. Sumathi², Mrs. B. Vidhya³, Ms. A. Subhasheni⁴

¹Research Scholar (PhD) / Department of Computer Science, Sri Ramakrishna College of Arts & Science, Coimbatore

²Head / Department of Information Technology, Sri Ramakrishna College of Arts & Science, Coimbatore

³Assistant Professor / Department of Information Technology, Sri Ramakrishna College of Arts & Science, Coimbatore

⁴Assistant Professor / Department of Computer Science, Sri Ramakrishna College of Arts & Science, Coimbatore

Corresponding Author- Mr. K. VigneshKumar

Email:- krishvigneshkumar@gmail.com

DOI- [10.5281/zenodo.7295706](https://doi.org/10.5281/zenodo.7295706)

Abstract:

This lecture explains Quantum Machine Learning, or QML (Quantum Machine Learning). QML combines Learning Algorithms, Quantum Computing, and Quantum Information (QI). QML is now one of the key streams for scholars focusing on the foggy boundaries of Physics, Math, and Computer Science owing to QC's rapid expansion and ML's reputation and success. These factors helped create QML. A hypothetical QML classifier might be built on techniques that apply ML (Machine Learning) in a quantum testing and research atmosphere, as well as ones that use QC (Quantum Computing) and QI to uncover alternative and enhanced solutions to data-driven difficulties, often delivering a large speedup and continuing performance improvement. This basic classification of QML techniques is likely accurate.

Keywords: Quantum machine learning (QML), quantum computing (QC), artificial intelligence (AI), machine learning (ML)

Introduction

To make sense of unknown inputs, machine learning generates patterns from facts. Machine learning algorithms, which are part of AI and mathematics, manage massive amounts of data for tasks such as image and audio identification, pattern discovery, and strategy optimization. These issues are becoming more relevant in our digital age; Larry Page's Page algorithms for machine learning for search results, created in 1997, led to the development of one of the world's greatest IT firms. Other applications of machine learning include spam email filtering, iris recognition for security devices, evaluating customer behavior, and assessing financial risk. Machine learning assists computers in analyzing data based on prior experience. Because big data includes previously collected input-output data pairs, machine learning approaches must be

efficient. Because global stored data is increasing by 20% each year (currently several hundred exabytes [1]), there is a growing need for breakthrough machine learning techniques. Academics and IT companies are investigating quantum computing to boost existing machine learning approaches. In recent decades, physicists have shown quantum systems' ability to process information. Quantum computers may use a qubit pair of quantum systems 0 and 1 (e.g., encoded in two independent energy levels) to follow several different processing paths at the same time. Quantum laws restrict our access to data in quantum states, therefore designing quantum algorithms that outperform traditional ones is difficult. Quantum algorithms are well-established and supply remarkable examples that accelerate standard techniques [2]. Many believe that it is just a matter of time until

hypothetical quantum computing principles may be tested on practical machines [3]. Quantum technology has the potential to

transform intelligent information handling in this application.

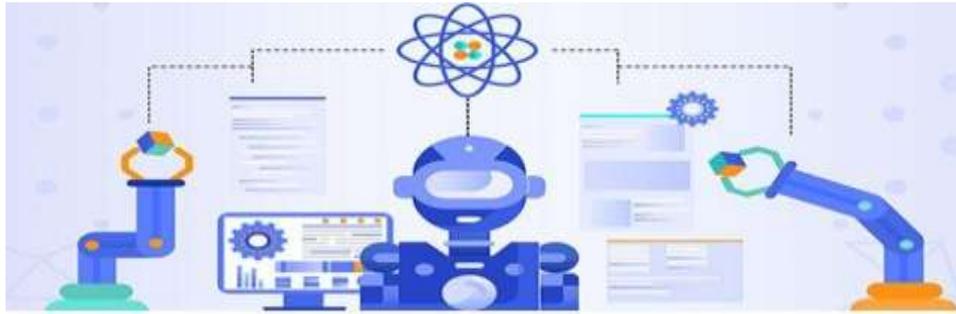


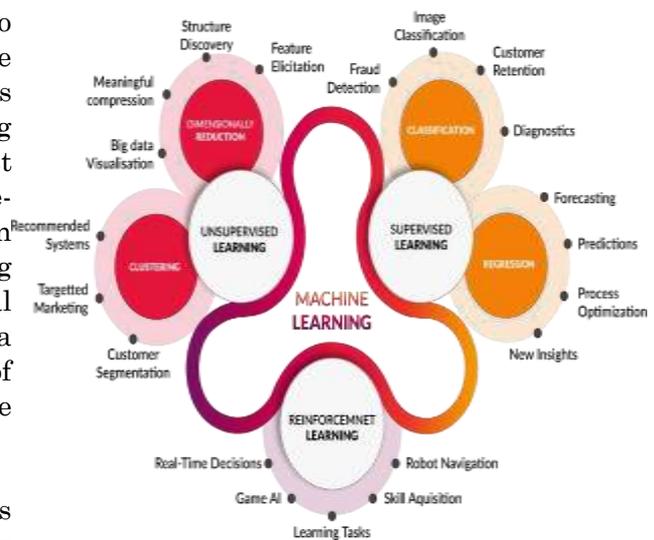
Fig 1. Quantum Machine

Learning2.Classical and quantum learning

2.1 Classical Machine Learning

Deep learning models need massive datasets to achieve high performance levels. Each of the previously mentioned pre-trained networks was evaluated on 1.2 million distinct images. Such big datasets are not readily available for most applications and getting them will indeed be time- and labor-intensive, as well as expensive. On smaller datasets, traditional machine learning approaches often outperform deep neural networks. To train deep neural networks in a reasonable period with massive quantities of data, high-end graphics processing units are needed

(GPUs). Although these graphics processing units (GPUs) are costly, deep neural networks cannot be trained to reach high performance without them. In addition to high-end graphics processing units, a fast central processing unit (CPU), storage media (SSD), and both a quick and a large quantity of RAM are needed (GPUs). Traditional machine learning techniques do not need the most modern computer hardware to be trained; all that is needed is a decent central processing unit. Because they are less computationally expensive than other approaches, they can also be repeated more rapidly and tested on a wider range of options in less time. The uncomplicated feature engineering that is a part of classical



machine learning makes analyzing and understanding the algorithms employed in this subject quite simple. We can now change the hyper-parameters and make other changes to the model designs much more easily now that we have a better understanding of the data and the algorithms that power it. On the other hand, networking activities are often referred to as a "black box" since researchers still do not fully understand what happens "inside" deep networks. The lack of a theoretical foundation creates a variety of difficulties, not the least of which are hyper-parameters and network design.

2.2 Quantum Machine Learning

Quantum machine learning is a branch of study that studies how quantum computing and machine learning concepts connect with one another. For instance, we may look to figure out if supercomputers can reduce the time needed to construct or assess a machine-learning model. On the other hand, we may use machine learning techniques to help us discover quantum error codes, estimate the characteristics of quantum states, and create innovative quantum algorithms. Our algorithms' ability to learn current information has always been bound by the limitations of the computer equipment they are used on. For instance, concurrent GPU clusters enable the success of modern deep learning employing neural networks. As a result of quantum machine learning, a brand-new type of computing

hardware, known as a quantum computer, is introduced to the pool of hardware that may be used for machine learning. Quantum computing employs a vastly distinct set of physical rules to process information; these laws are known as quantum theory. Supercomputers may be used and trained in the same manner as neural networks from a modern perspective. Adjusting the physiological controller parameters, such as the intensity of an electromagnetic field or the frequency of a laser pulse, can help us discover a solution to a problem. By encoding the image into the device's physical shape and recording measurements, for example, a trained network may be used to classify the content of images.

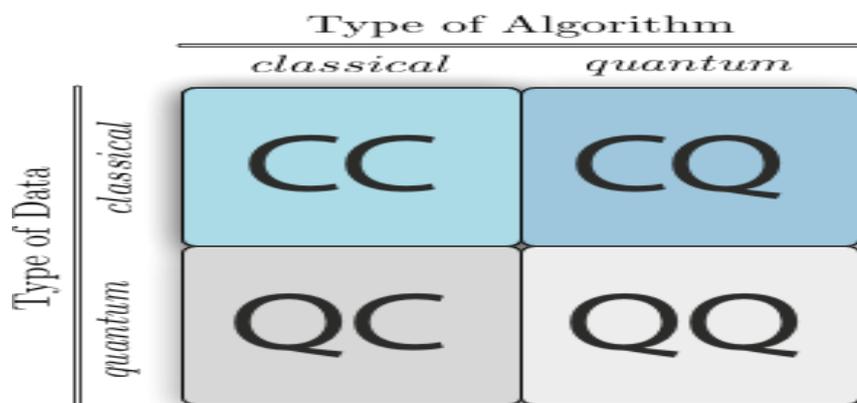


Fig 3. Quantum machine learning

3. Quantum Versions of Machine Learning Algorithms

Before delving into the subject of classical algorithms for machine learning and their quantum equivalents, we must first look at the genuine issues that these approaches are intended to answer, as well as present the formalism that will be used throughout this essay. The goal of pattern categorization is the most significant application, and there are many distinct classical methods that address this problem. The computer must properly categorize an unknown feature

vector based on a series of training samples forming of characteristic vectors⁴ and their related class properties. The feature vector, for example, might include preprocessed information on individuals and their accurately diagnosed condition. A machine learning system must then figure out which ailment a new patient has. Other tasks closely related to pattern classification include pattern finalization (adding missing details to an imperfect input), input-output mapping (retrieving one of several stored memory vectors in response to an input), and pattern recognition (finding and

Mr. K. VigneshKumar, Dr. N. Sumathi, Mrs. B. Vidhya , Ms. A. Subhasheni

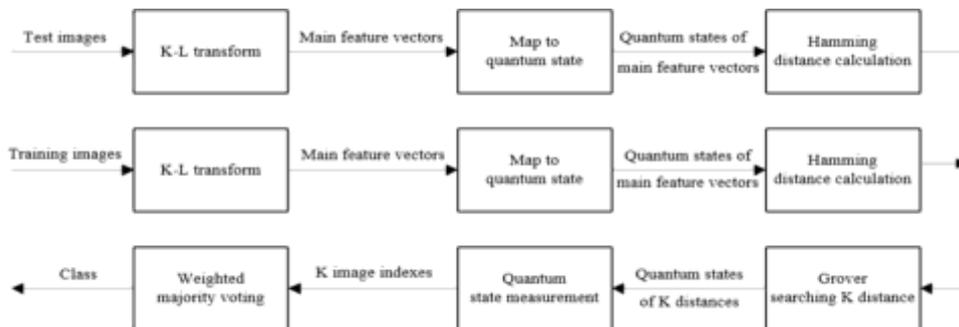
evaluating the shape of structures; this term is often used as a synonym for pattern classification). Clustering data is the core difficulty in unsupervised learning. Given a collection of feature vectors VP, the aim is to distribute each vector to one of k distinct clusters so that comparable inputs are assigned to the same cluster. Other machine learning challenges involve figuring out the greatest methods in the context of an unknown optimization method, given a series of successive observations of choices and outcomes. As previously shown, we will not focus on strategy learning here.

3.1 Quantum Versions of K-nearest Neighbor Methods

KNN is a popular supervised machine learning technique. Its working mechanism is straightforward: Give a trial sample, discover its nearest neighbors using some distance measure, and then classify it using the information from these neighbors. In the

end, the algorithm employs "majority voting." In other words, the testing sample is tagged with the leading subcategory tag of its nearest Neighbors. The concept of this method is depicted in Figure 1. When k=1, the tested sample (represented by a question marking) is assigned to the category "blue star." When k=3 and k=5, the experimental sample is classified as the "red triangle" majority category. Obviously, K is a critical part. The categorization result differs because we changed the value of k. It should be noted that if k=1 is used, KNN will be degraded into the nearest neighbor method. This oversimplified assumption does not hold up, particularly in the Big Data situation. Because inevitable outliers (for example, dirty data) might lead to mistaken judgment in huge data sets in the actual world. In contrast, "majority voting" is statistically more successful.

3.2 Quantum Computing for Support Vector Machines



Classification techniques and data mining need machine learning classification algorithms. Support vector computers and artificial neural have flourished in the earlier two decades because of increases in hardware computing capabilities and speed. This increase in computer power allowed the use of approaches proved in the mid-20th century to more difficult categorization issues. Kernels are important in categorization. In their original space, hyperplanes cannot segregate data. A non-linear scaling factor is often employed to discover hyperplanes. This function is termed a feature map because it alters the

phenomenon's or subject's raw features. Characterizing in this new space of features - and any other, including the raw original - is just seeing how near data points are. This is equivalent to calculating the kernel function for each set pair. So, we need simply calculate the integral of each pair of values in the new features space, not the non-linear features map for each datum. It is conceivable to have hard-to-compute feature maps yet easy-to-compute kernels. In this notebook, we offer an example of a classification problem requiring an extracted features for which calculating the kernel is not classically efficient - that is, the necessary computational resources grow

Mr. K. VigneshKumar, Dr. N. Sumathi, Mrs. B. Vidhya , Ms. A. Subhasheni

dramatically with the complexity of the problem. We illustrate how a quantum processor can do this via a direct kernel estimation. We employed supervised learning, which consists of a training phase

(when the kernel and support vectors are created) and a testing or classification method (where new unlabeled data is classified according to the solution found in the training phase).

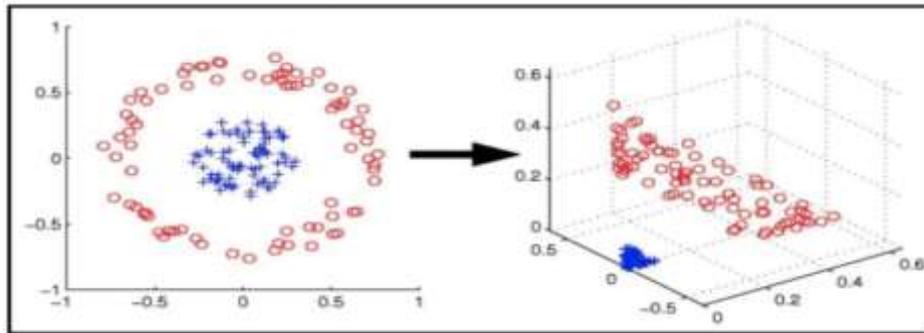


Fig 5. Quantum computing for support vector machines

3.3 Quantum Algorithms for Clustering

QC center is a multidimensional Gaussian kernel on each n-dimensional data point. These Gaussians create a data distribution. (This phase is a Parzan-Rosenblatt windows estimator for kernel density.) This is the data set's QMWF. The wave function describes data point locations. QC introduces the quantum potential and using the data set's wave equation, a potential surface was produced as a protective measure. Potential surface characteristics are more resistant to Gaussian width changes than wave function details. This potential surface stands for the 'landscape'

of data collecting, where 'low' places equate to high data density. QC uses gradient descent to bring each piece of data "downhill," driving points to gather in close minima to find data clusters. Gaussian distribution width around each data point is QC's primary hyperparameter. For a small enough sigma, each data point forms its own indentation, and no lines migrate, preventing clusters. For sufficiently large sigma, the terrain becomes a homogenous smooth bowl, and data points cluster around the one minimization issue. Lower sigma values suggest more perfect local organization, while higher sigma values imply global structure.

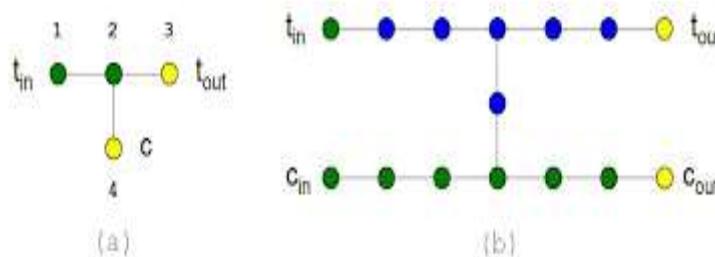


Fig 6. Quantum algorithms for clustering

3.4 Searching for a Quantum Neural Network Model

There are two primary reasons to talk about quantum neural networks. One stems from arguments supporting the critical role that quantum phenomena play in the live brain. For example, Roger Penrose has claimed that

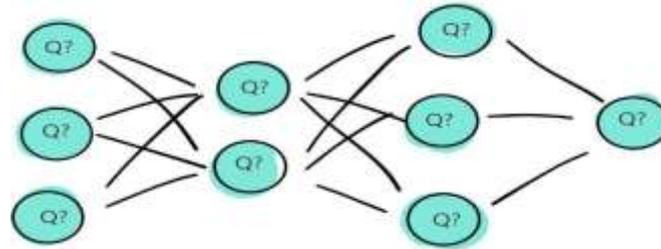
a superstring theory combining quantum phenomena and general relativity may explain mental skills such as comprehension, awareness, and consciousness. This technique, however, favors the study of internal parts such as tubulin rather than the network of neurons themselves. A second

Mr. K. VigneshKumar, Dr. N. Sumathi, Mrs. B. Vidhya , Ms. A. Subhasheni

incentive is the prospect of generalizing the field of classic artificial neural networks to the quantum realm by an eclectic marriage of that area with the exciting new subject of quantum computing. Both aspects point to a novel understanding of the mind and brain function, as well as hitherto unseen talents several techniques for implementing quantum multiple processors and propose that, as with quantum computing, Everett's many-worlds interpretation of quantum mechanics may be used as a broad

in information processing. In this paper, we look at quantum neural network models as the following logical step in the development of neurocomputing systems, with an emphasis on artificial instead of biological systems. We describe

foundation for building quantum analogs of well-known conventional artificial neural networks. We also discussed some future views on quantum neurocomputers.



3.5 Towards a Quantum Decision Tree

Decision trees show the way to achieve a goal in industrial engineering and machine learning. Simple binary trees. Nodes have two or fewer children. A Quantum decision tree is a quantum querying algorithm or quantum black-box approach (like Grover's algorithm) that calculates $f: 0, 1 \rightarrow 0, 1$ using quantum superpositions. QAs are not trees. With us quantum trees are real. Classical trees can have discrete or continuous real-number features. Complete test node outputs are continuous attribute values or attribute intervals. This approach is not proper for quantum decision trees since attribute values may overlap, resulting in too much diverse data. We would get an overtraining syndrome classifier and a larger tree if we divide the training data by

discrete values. This study divides attribute states by faithfulness. We stand for the subclass's centroid. R is a rooted tree with such a root of the tree that has not exactly one incoming edge. Nodes with one incoming edge. a_i A is an internal node with outward edges. Class C leaves and decisions are the rest. Each node in a quantum tree structure divides the training dataset. Every test in this study analyses a different attribute, which is why the training data is subdivided. Each leaf's class describes its attribute state. Quantum decision trees categorize objects from root to leaf. Test the node's attribute, then go down the branch matching to the attribute's subclass in the provided object. The subtree repeats this possibility.

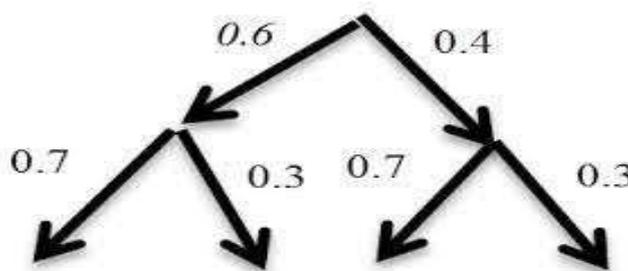


Fig 8. Quantum decision tree

4. Conclusion

This primer on quantum machine learning covered themes and approaches. Our goal is to Thus, classification, both supervised and unsupervised, and clustering It's far from a full assessment. There are two approaches to Quantum ML. Authors commonly use quantum algorithms in place of traditional machine learning techniques to address problems of increasing complexity. Nearest neighbor, kernel, and clustering are usually true. Accelerating distance calculations Quantum computation. Alternatively, quantum theory can be probabilistic. To describe stochastic processes. Bayesian theory generalizes theories using hidden quantum Markov models. Employed quantum information Discrimination of quantum states. A good many contributions are currently being researched. Bringing together quantum formalisms Flowcharts of deep learning theory and techniques based on quantum neural networks. Outstanding learning quantum theories persist. Despite this, there have been few contributions that address how to employ quantum machine learning. The learning process of machine learning may be duplicated. quantized. Parameter optimization has yet to begin. quantum-wise. Quantum computing may be applied in a variety of ways. Parameterization is critical in unified quantum gate-based quantum computing. Unitary transformations should be adapted definition of an algorithm Several ideas have been considered. A Quantum control loop might be beneficial. Hamiltonian quantum learning. The use of thermal quantum mechanics may improve learning. Options for quantum computing include viscous dissipation and measurement-based quantum computing. Framework for quantum learning. Overall, Quantum needs further development, although it is promising.

References

[1] Martin Hilbert and Priscila L'opez. The world's technological capacity to store, communicate, and compute information. *Science*, 332(6025):60–65, 2011.
 [2] Michael A Nielsen and Isaac L Chuang. *Quantum computation and quantum information*. Cambridge University Press,

2010.

- [3] I. M. Georgescu, S. Ashhab, and Franco Nori. Quantum simulation. *Review of Modern Physics*, 86:153–185, 2014.
 [4] Gerasimos G Rigatos and Spyros G Tzafestas. Neurodynamics and attractors in quantum associative memories. *Integrated Computer-Aided Engineering*, 14(3):225–242, 2007.
 [5] Elizabeth C Behrman and James E Steck. A quantum neural network computes its own relative phase. *arXiv preprint arXiv:1301.2808*, 2013.
 [6] Sanjay Gupta and RKP Zia. Quantum neural networks. *Journal of Computer and System Sciences*, 63(3):355–383, 2001.
 [7] Maria Schuld, Ilya Sinayskiy, and Francesco Petruccione. The quest for a quantum neural network. *Quantum Information Processing*, DOI 10.1007/s11128-014-0809-8, 2014.
 [8] Dan Ventura and Tony Martinez. Quantum associative memory. *Information Sciences*, 124(1):273–296, 2000.
 [9] Carlo A Trugenberger. Quantum pattern recognition. *Quantum Information Processing*, 1(6):471–493, 2002.
 [10] Ralf Schützhold. Pattern recognition on a quantum computer. *Physical Review A*, 67:062311, 2003.
 [11] Seth Lloyd, Masoud Mohseni, and Patrick Rebentrost. Quantum algorithms for supervised and unsupervised machine learning. *arXiv preprint arXiv:1307.0411*, 2013.
 [12] Patrick Rebentrost, Masoud Mohseni, and Seth Lloyd. Quantum support vector machine for big feature and big data classification. *arXiv preprint arXiv:1307.0471*, 2013.
 [13] Nathan Wiebe, Ashish Kapoor, and Krysta Svore. Quantum nearest-neighbor algorithms for machine learning. *arXiv preprint arXiv:1401.2142*, 2014.
 [14] Hartmut Neven, Vasil S Denchev, Geordie Rose, and William G Macready. Training a large scale classifier with the quantum adiabatic algorithm. *arXiv preprint arXiv:0912.0779*, 2009.
 [15] Kristen L Pudenz and Daniel A Lidar. Quantum adiabatic machine learning. *Quantum Information Processing*, 12(5):2027–2070, 2013.
 [16] Rodion Neigovzen, Jorge L Neves, Rudolf Sollacher, and Steffen J Glaser. Quantum pattern recognition with liquid-

Mr. K. VigneshKumar, Dr. N. Sumathi, Mrs. B. Vidhya , Ms. A. Subhasheni

- state nuclear magnetic resonance. *Physical Review A*, 79(4):042321, 2009.
- [17] G Sentís, J Calsamiglia, Ramón Muñoz-Tapia, and E Bagan. Quantum learning without quantum memory. *Scientific Reports*, 2(708):1–8, 2012.
- [18] Lewis A Clark, Wei Huang, Thomas M Barlow, and Almut Beige. Hidden quantum markov models and open quantum systems with instantaneous feedback. *arXiv preprint arXiv:1406.5847*, 2014.
- [19] Stuart Jonathan Russell, Peter Norvig, John F Canny, Jitendra M Malik, and Douglas D Edwards. *Artificial intelligence: A modern approach*, volume 3. Prentice Hall Englewood Cliffs, 2010.
- [20] Frank Rosenblatt. The perceptron: a probabilistic model for information storage and organization in the brain. *Psychological Review*, 65(6):386, 1958.
- [21] Arthur L Samuel. Some studies in machine learning using the game of checkers. *IBM Journal of research and development*, 44(1.2):206– 226, 2000.
- [22] Ethem Alpaydin. *Introduction to machine learning*. MIT press, 2004.
- [23] Richard O Duda, Peter E Hart, and David G Stork. *Pattern classification*. John Wiley & Sons, 2012.
- [24] Steven E Landsburg. *Quantum game theory*. Wiley Encyclopedia of Operations Research and Management Science, 2011.
- [25] Jens Eisert, Martin Wilkens, and Maciej Lewenstein. Quantum games and quantum strategies. *Physical Review Letters*, 83(15):3077, 1999.
- [26] Hans J Briegel and Gemma De las Cuevas. Projective simulation for artificial intelligence. *Scientific Reports*, 2, 2012.
- [27] Jiangfeng Du, Hui Li, Xiaodong Xu, Mingjun Shi, Jihui Wu, Xianyi Zhou, and Rongdian Han. Experimental realization of quantum games on a quantum computer. *Physical Review Letters*, 88(13):137902, 2002.
- [28] Edward W Piotrowski and Jan S ladkowski. An invitation to quantum game theory. *International Journal of Theoretical Physics*, 42(5):1089–1099, 2003.
- [29] Christopher M Bishop et al. *Pattern recognition and machine learning*, volume 1. springer New York, 2006.
- [30] Geoffrey Hinton, Simon Osindero, and YeeWhye Teh. A fast learning algorithm for deep belief nets. *Neural Computation*, 18(7):1527–1554, 2006.
- [31] David E Rumelhart, Geoffrey E Hinton, and Ronald J Williams. Learning representations by back-propagating errors. *Cognitive Modeling*, 1988.
- [32] Masahide Sasaki and Alberto Carlini. Quantum learning and universal quantum matching machine. *Physical Review A*, 66(2):022303, 2002.
- [33] Esma A`imeur, Gilles Brassard, and S`ebastien Gambs. Quantum speed-up for unsupervised learning. *Machine Learning*, 90(2):261–287, 2013.
- [34] Markus Hunziker, David A Meyer, Jihun Park, James Pommersheim, and Mitch Rothstein. The geometry of quantum learning. *arXiv preprint quant-ph/0309059*, 2003.



**Land Resources of Wasteland Development in Mizoram State, India-
A Geographical Perspective**

Dr. Amol S. Shinde

Assistant Professor, Dept of Geography, (UG & PG) Walchand College of Arts and Science (Autonomous), Solapur, (MS)

Corresponding Author- Dr. Amol S. Shinde

Email:- asshinde23@gmail.com

DOI-10.5281/zenodo.7295708

Abstract:

Wasteland means the lands which degradation unproductive as well as under productive with the soil which alkalinity, acidity water logging etc. This land which are lying fallow, found to cause ecological imbalanced due to soil erosion. Land degradation is a process in which the value of the biophysical environment is affected by a combination of human-induced processes acting upon the land. It is estimated that up to 40% of the world's agricultural land is seriously degraded. Land Resource of Wasteland Development (LRWD) in Mizoram State in presented paper by going out of cultivation due to social and economic reasons are replenished by reclaiming these lands and by arresting further loss of production potential.

Key Words: Waste development, Land Resource of Wasteland Development

Introduction:

Today's in world there is a with relationship between living within the environment and the community that area as the community wise derives sustenance from it and Increasing in pressure biotic leads to over-exploitation as well as degradation of natural resources. The people to realized the intrinsic relationship between population, poverty and degraded environment they live in the poor, in the developing country like India are left with not option but to degrade their own environment for their very own survival. Still, it is only they who can restore the health to environment thus ruined; outside actors can only facilitate but never substitute for stake holders. It is a natural contain different types of lands namely, forest lands, community lands, government lands and private lands.

Study Area:

Mizoram, literary known as the „land of highlanders“ lies in the eastern extension of the

In India Mizoram state is literary known as the “land of highlanders” lies in the eastern extended of the Himalayan part of Arakan-Yoma mountain ranges of Myanmar. and shares 0.64% of the country's geographical area. Mizoram state lies

between the latitudes 21°56' to 24°31' North latitudes and 92°16" to 93°21' East longitudes covering an area of 21081 sq.km. The average altitude ranges from 500 m to 800 m and Climatic conditions vary from the moist tropical to the moist sub-tropical. The annual average rainfall ranges from 2160 mm to 3500 mm. The actual tree covered area is about 75%. The rural population was 48.49% and urban population was 51.51%. as well as The population density was 52 persons per km².

Objectives:

1. To Distribution of Total Wasteland Area and Total Geographical Area in study area
2. To Finding out the category wise wasteland in study area
3. To Finding out the Consequence and Strategy to Development of wasteland of study area

Database and Methodology:

The Study work is based on Secondary data. it collected from Website of Land Resource and Wasteland development of Mizoram State. (2008-09 to 2015-16) on website and other data collect from Published, unpublished, various Research papers. The all data collected information is analyzed

with the help of suitable map, table and their interpretation in research paper.

Result and Discussion:

A) Distribution of Total Wasteland Area and Total Geographical Area of Wasteland in Mizoram State (2008-2016)

Table No.01 Distribution of District - wise Wastelands Mizoram State (Area in sq.km)

District	Aizawl	Champhai	Kolasib	Lawngtlai	Lunglei	Mamit	Saiha	Serchhip	Total
TWA (Area in Sq.km)	1668.92	1978.64	354.37	780.57	644.30	871.30	1044.01	836.10	9178.21
TGA (Area in Sq.km)	3576	3185	1382	1991	4536	3025	1965	1421	21081
% to TGA	46.67	62.12	25.64	39.20	36.25	28.80	53.13	58.83	43.53

Source: Dept. of Land Resource, Mizoram State (2008-16) (* TWA-Total Wasteland Area)
(** TGA-Total Geographical Area)

As per Above the Table No.1 and Fig.01 shows that the situation of wastelands in Mizoram State in 2008-2016 that is 9.17 lakh sq.km of land was categories as total

wasteland. Highest Wasteland area is found Champhai district (62.16%), Low Wasteland area is Mamit (28.80%). Total comparison of the district wasteland area 43.53 %.



Fig.01

B) Categories wise Wasteland in Mizoram State

Table No.02: Mizoram -Category-wise distribution and changes in wastelands (2008-2016)

Sr.	Categories wise Wasteland	* TWA (Area in Sq.km)		Change Volume Wasteland in % (2008-09 to 2015-16)
		2008-09	2015-16	
	Land with Dense Scrub	2225.61	1586.84	-638.78
	Land with Open Scrub	460.80	466.88	6.08
	Shifting Cultivation – Current Jhum	602.08	691.55	89.47
	Shifting Cultivation – Abandoned Jhum	1034.28	1011.39	-22.90
5.	Under utilised/degraded forest land Scrub dominated	554.78	544.00	-10.78
	Total	877.55	4300.66	-576.90
	** TGA		21081	

development of wasteland of the sustainable development.

References:

1. **Chaturvedi, Arun (2010):**“Land Degradation–its socioeconomic implication” State level Seminar On Sustainable Soil health and food security. Indian Society of Soil Science, Akola, MS. pp 97-103.
2. **Lokhande T.N. (2018):** “Land Recourse of Wasteland Development in Meghalaya State (North-Eastern Part region)” AMIERJ, International Research journal, Issue-III, Vol-VII, pp-151-154.
3. **Shinde Amol S. (2021):** “A Geography Study of Land Resources of Wasteland Development in Sikkim State, India.” International Journal of Advance and Applied Research Issue-03,Vol-I. pp-52-54.
4. **Gautam, N.C., Narayan L.R.A (1988):** Wastelands in India, Pink Publishing house, pp.96.
5. **Rana,K.PC,Wadia,C.S,Sindhu,G.S.,Singh,S.P.,Velayutham,M. and Sehgal J (2000):**Solis of Jammu & Kashmir for optimizing land use, NBSS Publisher, Nagpur, pp.71-62.
6. www.dolr.nic.in
7. [www.Mizoram_Land resource.com](http://www.Mizoram_Land_resource.com)



श्रीकृष्ण जन्मलीला विमर्शः

डॉ.रुरुकुमार महापात्र

पुराणेतिहास विभाग, राष्ट्रिय संस्कृत विश्वविद्यालयः, तिरुपति

Corresponding Author- डॉ.रुरुकुमार महापात्र

Email:- rurukumar4@gmail.com

DOI-10.5281/zenodo.7295710

(शोधपत्रस्य सारांशः ----

सर्वशक्तिमान् सर्वकारणकारणं सर्वेश्वरो भगवान् यद्यपि स्वसंकल्पमात्रेण सर्वं सृष्ट्यादिकं सम्पादयति, तथापि स एव लीलारसमास्वादयितुं कदा कदा स्वलोकात् अधः अवतरति । इदमेवाऽवतरणं आविर्भावशब्देन शास्त्रेषु कथ्यते । अजन्मनोऽप्ययमाविर्भावः मरणधर्मिभिरस्माभिर्भगवज्जन्म इत्यपि कथ्यते । किन्तु वास्तवतः अस्माकमिव तस्य जन्म नास्ति । एवं भगवान् श्रीकृष्णः स्वयं रूपेणाऽऽविर्भूय यज्जन्मादिचरितं प्रकाशितवान् तदत्र यथाग्रन्थमनुसृत्य ग्रन्थान्तरान् आश्रित्य च विचार्यते ।)

श्रीकृष्णजन्मनः पूर्ववृत्तम् -

आदिपुराणेषु स्मिन् १ कृष्णावतारस्य पूर्ववृत्तं कृष्ण-नारदसंवादमाध्यमेन प्रकाशितं वर्तते । महर्षिः नारदः स्त्रीरूपजिहासया गंगानद्यां स्नात्वा पुरुषरूपं प्राप्तवान् । अनन्तरं स ब्रजभूमिं पश्यन् ब्रजेशसदनं प्राप । तत्र स श्रीकृष्णमवदत्, हे प्रभो ! त्वया नन्दालये, वृन्दावने, गिरौ, वाल्यकौमारपौगण्डवयःसु च या लीलाः कृताः ताः सर्वाः मां विस्तरतया वदेति । श्रीकृष्णोऽवदत्, हे मुनिशार्दूल । अहं भवन्तमात्मकौतुकं कथयामि । अहं कथं ब्रजभूमिमागतवान् तदपि वदामि । ब्रजस्तु नित्यस्तथा नित्या एते ब्रजवासिनः । गोपाः, गोप्यः, वनं, गावः सर्वे नित्या एव । अहमत्र नित्यं विहरामि । किन्तु मायया नष्टक्षुषो मूढनरा एतद्रष्टुमसमर्थाः । विशेषतः कामक्रोधाभिभूता मनुष्याः कलौ युगे मामवजानन्ति । सर्वे जनाः केवलायां विषयलिप्सायां मग्ना एव । श्रुतिस्मृत्यादिभिर्विर्वर्जितो मनुष्यो मद्भक्तिशून्यः सन् दिनं यापयति कलौ युगे । अतः कलौ युगे मनु

ष्याणामात्यन्तिककल्यार्थमहम् अवतरामि । कलावसुराः यवनांशेषु जन्म प्राप्य लोकोपतापिनो भवन्ति । अतः केवलस्याऽत्याचारस्याऽविचारस्य च प्रादुर्भावो भवति । वैश्याः कूटवृत्तिमवलम्ब्य केवलं विषयमेव सर्वस्वं मन्यन्ते । ब्राह्मणा धर्मनष्टा, वेदरहिताः, सदाचारविवर्जिताश्च भवन्ति । क्षत्रियास्त्यक्तराज्याः, शूद्राः स्वामिष्वभक्ताश्च जायन्ते । स्त्रियः पररताः, सुताः त्यक्तमातृपितृस्नेहाः तच्छुश्रूषारहिताश्च भवन्ति । तदाऽतिभारा धरा गोरूपं धृत्वा ब्रह्मसदनं संप्राप्य ब्रह्मणे स्वदुःखानि निवेदितवती । धरण्याः दुःखमवगम्य ब्रह्मा क्षणं विचिन्त्य देवताभिः धरण्या च सह ममालयं (श्रीकृष्णालयं) क्षीरसागरमागतवान् । ब्रह्मा मत्समीपमागत्य वेदरूपैः वाक्यैः मम स्तुतिं चकार । अहं तस्य स्तुस्त्या सन्तुष्टो भूत्वाऽवदम्- हे ब्रह्मन् ! अहं लोकेषु मे मनोहररूपं प्रदर्श्य भुवो भारं हरिष्यामीति । एवं ब्रह्मणे प्रदत्तवचनानुसारमहं वसुदेवतो देवक्यां जातोऽस्मीति । इत्थमादिपुराणे श्रीकृ

ष्णजन्मनः पूर्ववृत्तं स्वयं भगवता श्रीकृष्णेनैव वर्णितमस्ति ।

श्रीमद्भागवते २ अवतरणलीलायाः पूर्ववृत्तस्य विशदं वर्णनमुपलभ्यते । एतद्विषये भागवतेन साकमादिपुराणस्य साम्यं वर्तते । आदिपुराणवत् भागवतेऽपि सर्वे देवाः गोरूपधारिण्या भूम्या साकं ब्रह्माणं पुरस्कृत्य क्षीराब्धितीरमगच्छन् इति वर्णितमस्ति । भागवतेऽधिकतया देवकीवसुदेवयोः पूर्वजन्म सूचयित्वा भगवान् श्रीकृष्णः स्वजन्मनः पूर्ववृत्तमपि सूचयति । तद्यथा -

सुतपाः पृश्निश्च भगवन्तं विष्णुं पुत्ररूपेण प्राप्तुं परमं तपः चक्रतुः । तयोर्भक्त्या प्रसन्नेन विष्णुना वरः प्रदत्तो यत् अदितिकश्यपरूपेण, देवकीवसुदेवरूपेण च जातयोस्तयोः पुत्रत्वमवश्यं स यास्यतीति ।

गर्गसंहिता श्रीकृष्णस्यावतरणलीलामेवं वर्णयति । तद्यथा-

यदा धर्मस्य ह्लासो भवति, अधर्मः प्रवर्धते, गावः सीदन्ति, ब्राह्मणानां पीडनं भवति, भूमिः दुर्जनानां पापाचारैः सततं भाराक्रान्ता भवति, तदा भगवान् स्वयमाविर्भवति । भुवः भारहरणाय कंसादीनाञ्च वधाय ब्रह्मा-विष्णु-

महेशादयः देवेश्वराः धरण्या सह गोलोकं गत्वा श्रीकृष्णाय सर्वं निवेदयामासुः । श्रीकृष्णोऽपि भुवि अवतीर्य दुर्जनान् निहत्य सज्जनानां पालनं कर्तुं वचनं दत्तवान् । पुनश्च तस्याज्ञया सर्वदेवाः यादवेषु जनिष्यन्तीति श्रीकृष्णः आदिष्टवान् । अवतरणस्य पूर्ववृत्तवर्णने आदिपुराण-

गर्गसंहितयोर्मध्ये इत्यत्र वैषम्यं परिलक्ष्यते यत्-

संहितायां वर्णितमस्ति धरण्या सह देवगणाः राधाकृष्णौ क्षीरसागरे दृष्टवन्तः इति । किन्तु आदिपुराणे केवलं श्रीकृष्णं दृष्टवन्त इति उल्लेखोऽस्ति ।

विष्णुपुराणे ३ पूर्ववृत्तमिदं भिन्नरूपेण वर्णितम् । तत्र वर्णितं यत् गोरूपधारिणीं महीं नीत्वा देवैः परिवेष्टि-

तो ब्रह्मा शंकरेण साकं क्षीराब्धितीरं गतवान् । तत्र श्रीविष्णुः स्वविश्वरूपप्रदर्शनपूर्वकं देवान् आश्वास्य श्वेतकृष्णौ द्वौ केशौ तस्मै अददात् । श्वेतकेशः बलरामरूपेण श्यामकेशः श्रीकृष्णरूपेण च अजायतमिति ।

हरिवंशे ४ वर्णितेन कृष्णजन्मपूर्ववृत्तेन सहाऽदिपुराणवर्णितस्य पूर्ववृत्तस्य पर्याप्तं वैषम्यं परिलक्ष्यते । गोरूपधारिण्याः पृथिव्याः देवैः साकं क्षीरसागरतीरगमनमत्र हरिवंशे नोपलभ्यते ।

वायुपुराणे ५ वर्णितमवतारपूर्वकृतम् आदिपुराणवर्णितेन सह साम्यमर्हति ।

ब्रह्मवैवर्तपुराणे ६ अवतरणलीलावर्णने वैशिष्ट्यं परिलक्ष्यते । अत्र ब्रह्मणः भूभारहरणाय श्रीकृष्णपुरसरं प्रार्थना-

व्यतिरिच्य अन्यत्प्रयोजनमपि चर्चितमस्ति । तच्च प्रयोजनं राधाश्रीदाम्नः कलहः एव । श्रीदाम्नः शापात् भीता सती राधा श्रीकृष्णं सर्वं निवेदितवती । श्रीकृष्णः राधामाश्वस्य कथयति-

महीतलं ७ गमिष्यामि वाराहे च वरानने ।

मया सार्धं भूगमनं जन्म तेऽपि निरूपितम् ॥ इति ।

श्रीआनन्दवृन्दावनचम्पूकाव्ये श्रीकृष्णस्य अवतरणे त्रीणि प्रयोजनानि निर्णितानि सन्ति । तद्यथा ८-

आत्मारामान्मधुरचरितै भक्तियोगे विधास्यन् ।

नानालीलारसरचनयाऽऽनन्दयिष्यन् स्वभक्तान् ॥

दैत्यानीकैर्भुवमतितरां वीतभारां च करिष्यन् ।

मूर्त्तानन्दो ब्रजपतिगृहे जातवत् प्रादुरासीत् ॥ इति ।

एवं कृष्णजन्मनः पूर्ववृत्तं बहुशास्त्राण्यवलोक्य सम्यगालोचितम् ।

श्रीकृष्णाविर्भावो गोकुलगमनं जन्मोत्सवपालनञ्च

महर्षिनारदस्याऽग्रहेतोः श्रीकृष्णः स्वकीयजन्मवृत्तान्तं ९ गोकुलगमनञ्च तस्मै निगदति । श्रीकृष्णः कथयति-

हे ऋषे ! द्वापरयुगान्ते तथा कलियुगस्य प्रारम्भे अर्थात् युगद्वयस्य सन्धिकाले भाद्रे मासि कृष्णपक्षेऽर्धरात्रौ

रोहिणीनक्षत्रे मम जन्माऽभूत् । तदानीं लग्नस्य स्वामी उच्चस्थाने आसीत् । साधूनां मनासिं प्रसन्नानि, दशदिशः निर्मलाः तथाऽऽकाशे तारागणा विचित्रशोभावन्तः आसन् । तस्मिन् काले गृहे गृहे भगवन्नामकीर्त्तनं पूजनञ्च भवति स्म । इत्थं भूमौ सर्वत्र आनन्दः अनुभूयते स्म । सर्वे जनाः भगवत्भक्तौ लीनाः आसन् । पूर्वं जन्मनि देवकीवसुदेवाभ्यां दिव्यसहस्रवर्षपर्यन्तं बहुकठिनतपस्याऽऽचरिता । अतोऽहं ताभ्यां वरं दत्तवान् यदहं तयोः पुत्ररूपेण जन्म नेष्यामीति । अतोऽस्मिन् समयेऽहं तयोर्गृहे जन्म नीतवान् । तत्परमरूपं धारयन् अहं ताभ्यां दर्शनं दत्तवान् । माता देवकी तथा पिता वसुदेवो मां दृष्ट्वा प्रसन्नतापूर्वकं मम स्तुतिमकुरुताम् । तद्यथा-

श्रीवसुदेव उवाच-

दृष्टं १० मे परमं रूपं श्यामकञ्जविलोचनम् ।

चतुर्भुजं शंखचक्रगदापद्मविभूषितम् ॥

अलौकिकं कुण्डलिनं किरीटांगदशोभितम् ।

त्वमेव विष्णुपरमं ब्रह्म त्रैलोक्यनायकम् ॥ इति ।

देवकी मां स्तुतवती । तद्यथा-

एतद्रूपं ११ ध्यानगम्यं योगिनां योगसिद्धये ।

वेदैरपि न वक्तव्यं तद्दृष्टं मे सुरेश्वरः ॥

प्रलये जठरे यस्य विश्वं यात्यखिलं लयम् ।

स त्वं मया कथं गर्भे धृतो लोकविडम्बनम् ॥ इति ।

एवं प्रकारेण देवक्याः स्तुतेरनन्तमहं प्रसन्नो भूत्वा सा धारणबालकरूपं धृतवान् । एवञ्चाऽवदम् यत् हे पितः

। भवान् मां नन्दालये स्थापयन् तस्य गृहे जाता कन्यामत्राऽनयतु । अतो भवतो भयं किमपि न स्थास्यतीति । तदानीं कारागारस्य द्वाराण्युन्मुक्तान्यभवन् । आकाशे मेघगर्जनमारब्धं तथा मन्दमन्दवृष्टिरप्यभवत्

। वसुदेवो मां शिरसि धारयन् तस्यामेव रात्रौ नन्दा लयाभिमुखे यात्रां कृतवान् । सर्पाणां राजाऽऽगत्य मम मस्तकोपरि स्थित्वा मां जलधारातः दूरे स्थापितवान् । कियदनन्तरं वसुदेवो यमुनातीरं प्राप्तवान् । तदा

नीं यमुना वृष्टिजलेन परिपूर्णाऽऽसीत् । किन्तु तत्क्षणात् यमुना वसुदेवाय मार्गं ददती भागद्वयेन परिवर्तिताऽभूत् । वसुदेवो यमुनापारं गत्वा गोकुलनगरं प्राप्तवान् । तत्र सर्वे मायया निद्रिता आसन् । वसुदेवो मां यशोदायाः समीपे शाययित्वा तत्कन्यामानीय अतिशीघ्रं मथुरापुरीं प्रत्यागतवान् । अनन्तरं गोकुले महोत्सवः आरब्धः । सर्वे गोकुलवासिनो मां दृष्ट्वा आनन्दिता अभवन् । नन्दमहोदयो बहुदानादिकं कृतवानिति । एवं प्रकारेण श्रीकृष्णमुखेनैव तज्जन्म गोकुलगमनञ्चादिपुराणे वर्णितमस्ति ।

श्रीकृष्णाविर्भावविषये आदिपुराणात् गर्गसंहिता भिन्नमतं पोषयति । आदिपुराणानुसारमाविर्भावकाले स भगवान् आसीत् शंखचक्रगदापद्महस्तः चतुर्भुजो विष्णुरूपः । परन्तु संहितायां वर्णितमस्ति यत् जन्मसमये भगवान् श्रीकृष्णमूरलीधररूपेणाऽजयतेति । पद्मपुराणे १२ अवतरणलीलावर्णने किञ्चित् पार्थक्यं नोपलभ्यते । अत्राऽपि देवक्युदरे षड्गर्भस्थापनं योगमायया कृतमिति वर्णितम् ।

हरिवंशे १३ कंसस्य देवकीपुत्रद्वारा मरणविषये नारद एव कंसं सूचयति । अत्र वसुदेवस्य गोकुलगमनं न वर्णितम् । कन्यापुत्रयोः परिवर्तनं स्वयमेव भगवदिच्छया अभवदिति वर्णितमस्ति ।

वायुपुराणे १४ वर्णितमवतारपूर्वकृतम् आदिपुराणवर्णितेन सह साम्यमर्हति । श्रीकृष्णजन्मनस्तथा तात्कालिकपरिस्थितेः सम्यग्वर्णनं श्रीमद्भागवते १५ समुपलभ्यते । तद्यथा-

अथ सर्वगुणोपेतः कालः परमशोभनः ।
यर्ह्येवाजनजन्मर्क्षं शान्तर्क्षग्रहतारकम् ॥
दिशः प्रसेदुर्गगनं निर्मलोडुगणोदयम् ॥

मही मंगलभूयिष्ठपुरग्रामव्रजा



नगरीय आकारिकी की अवधारणा और नगरों/नगरीयकरण की उत्पत्ति एवं विकास का अध्ययन

डॉ. भूपेन्द्र कुमार जॉंगिड.

सहायक आचार्य, (भूगोल विभाग) राजकीय स्नातकोत्तर महाविद्यालय, बारौ, जिला-बारौ (राजस्थान)
संबद्ध : कोटा विश्वविद्यालय, कोटा (राजस्थान)

Corresponding Author- डॉ. भूपेन्द्र कुमार जॉंगिड.

Email:- dr.jangir79@gmail.com

DOI - 10.5281/zenodo.7295720

लेख सार : - आकारिकी अथवा आकार विज्ञान (अंग्रेजी में मोरफोलॉजी) शब्द वनस्पति विज्ञान तथा जंतु विज्ञान के अंतर्गत उन सभी अध्ययनों के लिए प्रयुक्त होता है, जिनका मुख्य विषय जीवपिण्ड का आकार और रचना है। पादप आकारिकी में पादपों के आकार और रचना तथा उनके अंगों (मूल, स्तंभ, पत्ती, फूल आदि) एवं इन अंगों के परस्पर संबंध और संपूर्ण पादप से उसके अंगों के संबंध का विचार किया जाता है। आकार विज्ञान का अध्ययन जनन तथा परिवर्तन के विभिन्न स्तरों पर जीवपिण्ड के इतिहास के तथ्यों का केवल निर्धारण मात्र हो सकता है। आजकल जैसा सामान्यतः समझा जाता है, आकारिकी का आधार अधिक व्यापक है। इसका उद्देश्य विभिन्न पादप वर्गों के आकार में निहित समानताओं का पता लगाना है। इसीलिए यह तुलनात्मक अध्ययन है जो उद्विकासात्मक परिवर्तन और परिवर्धन के दृष्टिकोण से किया जाता है। इस प्रकार आकारिकी पादपों के वर्गीकरण की स्थापना और उनके विकासात्मक अथवा जातिगत इतिहास के पुनर्निर्माण में सहायक है। नगर पृथ्वी पर मानव निर्मित अधिवास है। इसका भीतरी भूगोल बहुत ही दिलचस्प होता है। चूंकि इनका आकार काफी बड़ा होता है इसलिए ये अपना अलग ही भीतरी भूगोल रखते हैं। किसी बड़े नगर को देखने पर दो बातें देखने को मिली हैं, प्रथम - कहीं पर रिहाइशी इमारतों की अधिकता देखने को मिलेगी तो कहीं पर दुकानें ही दुकानें और कहीं पर कारखानों का ही जमघट मिलेगा। इस प्रकार हमें नगरीय भूमि का अलग-अलग ढंग से उपयोग होता हुआ दिखाई देगा। दूसरा - इमारतों का बाहरी रूप और उनका स्थान के अनुसार क्रम भी हमारा ध्यान अपनी ओर आकर्षित करेगा। कहीं-कहीं पर मकान एक मंजिल के हैं, कहीं-कहीं आकाश से बातें करते हैं, कहीं मकान सड़कों के किनारे बसे हैं, कहीं कारखाने बस्तियों के बीच में बसे हैं, दुकानें रिहाइशी क्षेत्र में प्रवेश कर गयी हैं, कहीं-कहीं पर गन्दी बस्तियों का विकास हो गया है आदि सब बातें हमें नगर के गठन अर्थात् आकारिकी को ही बताती हैं। नगर में हमें औद्योगिक इकाइयाँ, व्यापारिक क्षेत्र, रिहाइशी मकान आदि देखने को मिलते हैं जो नगर की भूमि पर अपना विस्तार कर लेते हैं अर्थात् नगर की भूमि का इन कार्यों के लिए उपयोग होता है। इसके कारण नगर में विभिन्न प्रकार के भूमि-उपयोग क्षेत्र बन जाते हैं जिनको हम नगरीय क्षेत्र या कार्यात्मक कटिबंध का नाम देते हैं। इसमें नगर की भूमि का उपयोग तथा उस पर स्थापित इमारतों की भौतिक संरचना व उनका विभिन्न कार्यों में उपयोग का अध्ययन करते हैं।

लेख शब्द : आकारिकी, मोरफोलॉजी, संरचना, जमीन, लिंगेज, प्लेसथ्योरी, रिलेशनल आकारिकी, प्रतिमान, दृष्टिकोण, उत्पत्ति, विकास, नगरीकरण, अभ्युदय, आधिक्य, भग्नावशेष, पुरातात्विक।

प्रस्तावना : -

आकारिकी/मोर्फोलॉजी शब्द की संकल्पना

: नगरीय आकारिकी का अर्थ "नगरों के आकार या स्वरूप के विषय में विवेचना करना है।"

"डवतवीवसवहल" अंग्रेजी भाषा का शब्द है। इसकी

उत्पत्ति ग्रीक भाषा के दो मूल शब्दों से मिलकर हुई है यथा, डवतवील . इसका अर्थ है श्वतउ अर्थात् "रूप का आकार", और दूसरा स्वहवे इसका अर्थ है "विवरण देना"। वपेववनेम वद तिवउ आकार के बारे में विवरण। इस प्रकार इसका शाब्दिक अर्थ है "आकारों या स्वरूपों के विषय में बात करना।"

"आकारिकी" शब्द का सर्वप्रथम प्रयोग जीवविज्ञान में किया गया था। हेण्डरसन ने इसकी परिभाषा देते हुए बताया था कि "यह पौधों व जन्तुओं के रूप तथा संरचना का विज्ञान है।" बाद में इस शब्द का प्रयोग अन्य विज्ञानों जैसे भूगर्भशास्त्र, भूगोल व अनेक सामाजिक विज्ञानों द्वारा किया जाने लगा। भूगोल में इस शब्द का अभिप्राय 'प्रारम्भ में पृथ्वी के धरातल का रूप या मानवीय बस्तियों के अध्ययन से लगाया गया।' डडले स्टाम्प ने इसकी व्याख्या करते हुए बताया कि "यह रूप व संरचना का विज्ञान है तथा उस विकास से सम्बन्धित है जो रूप पर प्रभाव डालता है।"

आकारिकी शब्द का प्रयोग मुख्यतः जीव विज्ञान में पादपों व जन्तुओं के रूप तथा संरचना के सम्बन्ध में किया गया है। लेकिन भूगोल में इसका प्रयोग भू-आकृतिक विज्ञान व बस्तियों के भूगोल में किया जाने लगा है। नगरीय आकारिकी के अन्तर्गत नगरों की आकृति व आन्तरिक संरचना का वैज्ञानिक अध्ययन किया जाता है।

आंग्ल भाषा के शब्द 'आकारिकी' शब्द का हिन्दी रूपान्तरण 'आकारिकी' है। जिसका शाब्दिक अर्थ है "आकारों या स्वरूपों के विषय में चर्चा करना।" नगरीय भूगोल में नगर की आकारिकी के अन्तर्गत नगर में आन्तरिक विशेषताओं-मार्गों तथा गृहों की स्थिति, कार्यात्मक संरचना, जनांकिकीय विशेषताओं आदि का नगर में अध्ययन किया जाता है। वास्तव में नगरीय आकारिकी का अध्ययन नगर की शल्य क्रिया है, जो नगर की सीमा के भीतर बनावट (संरचना) को प्रकट करती है। नगर में हमें औद्योगिक ईकाइयाँ, व्यापारिक क्षेत्र, रिहायशी मकान, प्रशासनिक क्षेत्र, पर्यटन क्षेत्र, शैक्षणिक क्षेत्र आदि देखने को मिलते हैं जो शहर की भूमि पर अपना अतिक्रमण कर लेते हैं अर्थात् शहर की भूमि इन विभिन्न प्रकार के कार्यों में बटी होती है। इसके कारण नगर में विभिन्न प्रकार के भूमि उपयोग क्षेत्र बन जाते हैं। जिनको हम नगरीय क्षेत्र या कार्यात्मक जोन का नाम देते हैं। इससे हम शहर की भूमि का उपयोग तथा उस पर स्थित अधिवासों की भौतिक संरचना व उनके विभिन्न कार्यों में उपयोग का अध्ययन किया जाता है।

इस प्रकार नगरीय आकारिकी नगर के पूर्ण स्वरूप के विभिन्न आन्तरिक घटकों (भौतिक,

कार्यात्मक) तथा जनांकिकीय के स्वरूपों की व्याख्या से संबंधित है। नगरीय आकारिकी या आन्तरिक संरचना के अन्तर्गत मार्गों की स्थिति, गृहों की स्थिति एवं बनावट, कार्यात्मक क्षेत्र, जनसंख्या के घनत्व प्रतिरूप आदि सम्मिलित होते हैं। इसीलिए, नगरीय भूगोल में नगरीय आकारिकी और नगरीय संरचना का प्रयोग प्रायः समानार्थी के रूप में किया जाता है।

डॉ. कुसुमलता के अनुसार - "नगर की आकारिकी नगर के कार्यों का प्रतिबिम्ब है। इससे नगर की नियोजना सम्बन्धी बातों तथा निर्मित क्षेत्र के बारे में अध्ययन किया जाता है। इनका नगर के कार्यों पर क्या प्रभाव पड़ा है तथा नगर के निर्माण का विकास क्रम किस प्रकार का रहा है आदि सब बातों को नगर के स्वरूप में शामिल किया जाता है।"

ए. ई. स्मेल्स के अनुसार - "नगरीय आकारिकी नगर के मौलिक स्वरूप, स्थान व भवनों की व्यवस्था से निर्मित नगरीय भू दृश्य के अध्ययन से सम्बन्धित है।"

आर. ई. डिकिन्सन के अनुसार - "नगरीय आकारिकी का सम्बन्ध नगरीय अधिवास की योजना व ढाँचों से है जिसे नगर की उत्पत्ति, विकास एवं कार्यों के सन्दर्भ में देखते व व्याख्या करते हैं।"

इस प्रकार नगरीय विकास के साथ-साथ उसकी आकारिकी में भी कालिक परिवर्तन देखने को मिलता है। अतः नगरीय आकारिकी का अध्ययन विकास से घनिष्ठ रूप से सम्बन्धित है। इस प्रकार व्यवहार में आकारिकी, कार्य और विकास तीनों परस्पर इतने घनिष्ठ रूप से सम्बन्धित हैं कि किसी एक को अन्य से बिल्कुल पृथक नहीं किया जा सकता। अतः एक पक्ष का अध्ययन करते समय अन्य दो पक्षों के प्रभावों को भी ध्यान में रखना आवश्यक हो जाता है।

शहरी/नगरीय आकारिकी :

शहरी/नगरीय आकारिकी मानव बस्तियों के निर्माण और उनके गठन और परिवर्तन की प्रक्रिया का अध्ययन है। अध्ययन एक महानगरीय क्षेत्र, शहर, कस्बे या गांव की स्थानिक संरचना और चरित्र को उसके घटक भागों के प्रतिरूप और स्वामित्व या नियंत्रण और व्यवसाय की जांच करके समझने का प्रयास करता है। आमतौर पर

भौतिक रूप का विश्लेषण सड़क के प्रतिरूप, लॉट (या यूके में प्लॉट) प्रारूप और भवन पर केंद्रित होता है। प्रारूप जिसे कभी-कभी सामूहिक रूप से शहरी अनाज के रूप में संदर्भित किया जाता है। विशिष्ट बस्तियों का विश्लेषण आमतौर पर कार्टोग्राफिक स्रोतों का उपयोग करके किया जाता है और विकास की प्रक्रिया ऐतिहासिक मानचित्रों की तुलना से ली जाती है।

इस बात पर विशेष ध्यान दिया जाता है कि किसी शहर का भौतिक स्वरूप समय के साथ कैसे बदलता है और विभिन्न शहर एक-दूसरे से कैसे तुलना करते हैं। इस उपक्षेत्र का एक अन्य महत्वपूर्ण हिस्सा उन सामाजिक रूपों के अध्ययन से संबंधित है जो किसी शहर के भौतिक स्वरूप में व्यक्त किए जाते हैं और इसके विपरीत, भौतिक रूप विभिन्न सामाजिक रूपों का उत्पादन या पुनरुत्पादन कैसे करता है।

आकारिकी के विचार का सार शुरु में **महान कवि और दार्शनिक गोएथे (१७९०)** के लेखन में व्यक्त किया गया था। हालाँकि इस तरह के शब्द का इस्तेमाल पहली बार **बायोसाइंस** में किया गया था। हाल ही में भूगोल, भूविज्ञान, भाषाशास्त्र और अन्य विषय क्षेत्रों में इसका तेजी से उपयोग किया जा रहा है। भूगोल में अध्ययन के एक विशेष क्षेत्र के रूप में शहरी आकृति विज्ञान की उत्पत्ति **लुईस ममफोर्ड, जेम्स वेस और सैम बास वार्नर** के कारण हुई है। **ब्रिटेन के पीटर हॉल और माइकल बैटी और फ्रांस के सर्ज सलात** भी केंद्रीय व्यक्ति हैं।

गैरीसन (१९६२) - गैरीसन ने १९६२ में कोलकत्ता की आंतरिक संरचना का अध्ययन करते हुए "संयुक्त वृद्धि सिद्धांत" का प्रतिपादन किया। इनके अनुसार एक ही नगर में संकेन्द्रीय वलय प्रतिरूप, खंड स्तर प्रतिरूप एवं बहुनाभिक प्रतिरूप संयुक्त रूप से पाया जाता है। यदि कोई नगर वृहद आकार का हो और लम्बे समय से विकास की प्रक्रिया में हो तो वहाँ प्रारंभ में संकेन्द्रीय प्रतिरूप का विकास होता है। पुनः खंडीय प्रतिरूप विकसित होते हैं और बाद में बहुनाभिक प्रतिरूप का विकास होता है। इस तरह की प्रकृति भारत के अधिकांश महानगरों में पायी जाती है। बैंगलोर, वाराणसी, कानपुर जैसे नगरों में तीनों प्रतिरूप संयुक्त रूप से पाए जाते हैं। शहरी आकारिकी को शहरी ऊतक या कपड़े

के अध्ययन के रूप में माना जाता है, जो आमतौर पर शहरी आकारिकी से जुड़े पर्यावरणीय स्तर को समझने के साधन के रूप में होता है। ऊतक में सुसंगत पड़ोस आकारिकी (खुले स्थान, भवन) और कार्य (मानव गतिविधि) शामिल है। आस-पड़ोस इमारतों, रिक्त स्थान और कार्यों (विषयों) के क्रम में पहचानने योग्य प्रतिरूप प्रदर्शित करते हैं, भिन्नताएँ जिसके भीतर सिद्धांतों के एक व्यवस्थित सेट के अनुरूप होती हैं। यह दृष्टिकोण शहरीकरण में अंतर्निहित संरचनाओं और प्रक्रियाओं को समझने के माध्यम से अनियोजित या अस्पष्ट रूप से जैविक के रूप में अनियोजित वातावरण की आम धारणा को चुनौती देता है। जटिलता विज्ञान ने आगे स्पष्टीकरण प्रदान किया है जिसमें दिखाया गया है कि कैसे शहरी संरचनाएँ अत्यधिक नियमित तरीकों से कई व्यक्तियों की असंगठित कार्रवाई से उभरती हैं। अन्य बातों के अलावा यह इन संरचनाओं को बनाए रखने के लिए स्थायी ऊर्जा और भौतिक प्रवाह से जुड़ा है।

शहरी आकारिकी की अवधारणाएं :

शहरी आकारिकी मानव बस्तियों को आम तौर पर अचेतन उत्पादों के रूप में देखती है जो निर्माण गतिविधि की क्रमिक पीढ़ियों के संवय के माध्यम से लंबी अवधि में उभरती हैं। यह निशान छोड़ देता है जो बाद की इमारत गतिविधि की संरचना के लिए काम करता है और शहर-निर्माण प्रक्रियाओं, जैसे भूमि उपखंड, आधारभूत संरचना विकास या भवन निर्माण के लिए अवसर और बाधाएं प्रदान करता है। इन निशानों के तर्क को स्पष्ट करना और उनका विश्लेषण करना शहरी आकारिकी का केंद्रीय प्रश्न है।

शहरी आकारिकी आम तौर पर वस्तु-केंद्रित नहीं होती है, जिसमें यह शहर के घटकों के बीच संबंधों पर जोर देती है। भाषाविज्ञान के साथ समानांतर बनाने के लिए, एक सक्रिय शब्दावली और उसके वाक्य-विन्यास पर ध्यान केंद्रित किया जाता है। इस प्रकार शहर के सामान्य, गैर-स्मारकीय क्षेत्रों की जांच करने और किसी भी राज्य या वस्तु पर प्रक्रिया और इसकी संरचनाओं पर जोर देने के लिए रूपात्मक तकनीकों का उपयोग करने की प्रवृत्ति है, इसलिए वास्तुकला से परे जाकर पूरे निर्मित परिदृश्य और इसके आंतरिक तर्क।

रोजर ट्रांसिक ने शहरी स्थानिक आकारिकी और शहरी पौराणिक कथाओं के तीन प्रमुख सिद्धांतों पर चर्चा की जो विश्लेषण का मार्गदर्शन कर सकते हैं :

१. चित्र और जमीन सिद्धांत २. लिंकेज सिद्धांत ३. प्लेस थ्योरी

के रूप में खुले रिक्त स्थान (जमीन) प्रत्येक शहरी वातावरण में ठोस और रिक्तियों का एक मौजूदा स्वरूप होता है और स्थानिक आकारिकी के लिए आकृति और जमीनी दृष्टिकोण है प्रारूप की भौतिक ज्यामिति को जोड़कर, घटाकर या बदलकर इन संबंधों में हेर-फेर करने का प्रयास। इन जोड़-तोड़ का उद्देश्य एक शहर या जिले में शहरी आकारिकी की संरचना को अलग-अलग आकार के रिक्त स्थान की पदानुक्रम स्थापित करके स्पष्ट करना है जो व्यक्तिगत रूप से संलग्न हैं लेकिन एक दूसरे के संबंध में सीधे आदेशित हैं। **लिंकेज सिद्धांत**, सड़कों, पैदल मार्ग, रैखिक खुली जगहों या अन्य लिंकिंग तत्वों द्वारा बनाई गई लाइनों पर केंद्रित है जो शहर के हिस्सों को भौतिक रूप से जोड़ते हैं। **स्थान सिद्धांत**, मानव आवश्यकताओं और उपयोग की संरचित प्रणालियों पर कार्य करता है। नगरीय भूगोल की महत्वपूर्ण संकल्पना नगरीकरण है। नगरीय भूगोल के अन्तर्गत नगर विशेष की स्थिति, नगर विन्यास, नगर की भव्यता और महत्ता आदि पक्षों का अध्ययन किया जाता है। नगरीय भूगोल, भूगोल की नवीनतम और स्वतंत्र शाखा है जिसके अन्तर्गत नगरों का व्यवस्थित भौगोलिक अध्ययन किया जाता है।

शहरी योजना/आकारिकी : -

शहरी आकारिकी शहर की भौतिक विशेषताओं को आकार देने की प्रक्रिया है शहरों, कस्बों और गांवों और नियोजन निवासियों और आंगंतुकों के लिए नगरपालिका सेवाओं के प्रावधान के लिए। यद्यपि यह वास्तुकला की तुलना में बड़े पैमाने के मुद्दों से संबंधित है। इसे अनुसंधान और आकारिकी के पूरी तरह से अलग क्षेत्र के रूप में नहीं समझा जा सकता है, क्योंकि एक की गुणवत्ता दूसरे की गुणवत्ता पर निर्भर करती है। वास्तव में यह बहुत ही अन्योन्याश्रितता है, जिसे बार्सिलोना द्वारा "रिलेशनल आकारिकी" कहा गया है। आधारित वास्तुकार एनरिक मैसिप-बॉश, जो शहरी आकारिकी और वास्तुकला को कई

विश्वविद्यालय शिक्षा कार्यक्रमों में विशेष रूप से यूरोप में अटूट रूप से जोड़ता है। वास्तु अध्ययन में पुनः एकीकरण की यह प्रवृत्ति संयुक्त राज्य अमेरिका में भी गति प्राप्त कर रही है। शहरी आकारिकी इमारतों, बुनियादी ढांचे, सड़कों और सार्वजनिक स्थानों, पूरे पड़ोस और जिलों और पूरे शहरों के समूहों के बड़े पैमाने पर शहरी वातावरण बनाने के लक्ष्य के साथ संबंधित है, जो न्याय संगत, सुंदर, प्रदर्शनकारी और टिकाऊ हैं।

अशोक दत्ता (१९७४) - अशोक दत्ता ने १९७४ में "भारतीय नगरों की आंतरिक संरचना" का अध्ययन किया। उन्होंने बताया कि "मुम्बई, दिल्ली, कोलकत्ता तथा चेन्नई जैसे महानगरों में विकसित देशों की तरह ही केन्द्रीय व्यापारिक क्षेत्र का विकास हुआ है। लेकिन अन्य नगरों में केन्द्रीय व्यापारिक क्षेत्र मिश्रित क्षेत्र के रूप में है। इनके अनुसार, भारतीय नगरों के अधिवासीय क्षेत्र सामाजिक विलगाव पर आधारित हैं जिसका निर्धारण क्षेत्र या प्रदेश में धर्म, जाति एवं भाषा के आधार पर हुआ है। उन्होंने ब्रिटिश काल से पूर्व के सभी निर्मित क्षेत्रों को अनियोजित माना है।"

शहरी आकारिकी एक अंतःविषय क्षेत्र है जो प्रक्रियाओं और वास्तुकला और अन्य संबंधित व्यवसायों के तत्वों का उपयोग करता है, जिसमें लैंडस्केप आकारिकी, शहरी नियोजन, सिविल इंजीनियरिंग और नगरपालिका इंजीनियरिंग शामिल हैं। यह लोक प्रशासन, समाजशास्त्र, कानून, शहरी भूगोल, शहरी अर्थशास्त्र और अन्य संबंधित विषयों से सामाजिक और व्यवहार विज्ञान, साथ ही प्राकृतिक विज्ञान से वास्तविक और प्रक्रियात्मक ज्ञान उधार लेता है। हाल के दिनों में शहरी आकारिकी के विभिन्न उप-क्षेत्र उभरे हैं। जैसे रणनीतिक शहरी आकारिकी, परिदृश्य शहरीकरण, जल-संवेदनशील शहरी आकारिकी और टिकाऊ शहरीकरण। शहरी आकारिकी भौतिक भूगोल से लेकर सामाजिक विज्ञान तक विषयों की एक विस्तृत श्रृंखला की समझ और रियल एस्टेट विकास, शहरी अर्थशास्त्र, राजनीतिक अर्थव्यवस्था और सामाजिक सिद्धांत जैसे विषयों की सराहना की मांग करता है।

शहरी आकारिकीविद् समावेशी शहर बनाने के लिए काम करते हैं जो आम लोगों की रक्षा

करते हैं, सार्वजनिक वस्तुओं की समान पहुँच और वितरण सुनिश्चित करते हैं और सभी निवासियों, विशेष रूप से महिलाओं, रंग के लोगों और अन्य हाशिए पर रहने वाली आबादी की जरूरतों को पूरा करते हैं। आकार हस्तक्षेपों के माध्यम से, शहरी आकारिकी जिस तरह से हम अपने सामाजिक, राजनीतिक और स्थानिक प्रणालियों को एक अधिक न्यायसंगत और अभिनव भविष्य का उत्पादन और पुनः पेश करने की रणनीतियों के रूप में अवधारणा के रूप में क्रांतिकारी बनाने के लिए काम करते हैं।

विजय गुप्ता (१९९०) - विजय गुप्ता ने १९९० में कोटपूतली शहर पर शहरी आकारिकी का नई दृष्टिकोण नामक विषय पर लघु शोध कार्य प्रस्तुत किया। जिसमें उन्होंने, "नगर के ऐतिहासिक विकास, नगरीयकरण की विभिन्न अवस्थाओं में नगर का विकास तथा नगर की प्रमुख समस्याओं के बारे में बताया।"

शहरी आकारिकी लोगों और स्थानों, आंदोलन और शहरी रूप, प्रकृति और निर्मित कपड़े के बीच संबंध बनाने के बारे में है। शहरी आकारिकी अलग-अलग सुंदरता और पहचान वाले स्थानों के निर्माण में जगह बनाने, पर्यावरण प्रबंधन, सामाजिक समानता और आर्थिक व्यवहार्यता के कई पहलुओं को एक साथ खींचता है। शहरी आकारिकी इन और अन्य पहलुओं को एक साथ खींचता है, एक क्षेत्र के लिए एक दृष्टि बनाता है और फिर दृष्टि को जीवन में लाने के लिए आवश्यक संसाधनों और कौशल को तैनात करता है। शहरी आकारिकी सिद्धांत मुख्य रूप से सार्वजनिक स्थान (यानी 'सार्वजनिक वातावरण', 'सार्वजनिक क्षेत्र' या 'सार्वजनिक डोमेन') के आकारिकी और प्रबंधन से संबंधित है और जिस तरह से सार्वजनिक स्थानों का उपयोग और अनुभव किया जाता है। सार्वजनिक स्थान में सड़कों, प्लाजा, पार्कों और सार्वजनिक बुनियादी ढाँचे जैसे आम जनता द्वारा दिन-प्रतिदिन के आधार पर स्वतंत्र रूप से उपयोग किए जाने वाले रिक्त स्थान शामिल हैं। निजी स्वामित्व वाली जगहों के कुछ पहलू, जैसे भवन के अग्रभाग या घरेलू उद्यान, भी सार्वजनिक स्थान में योगदान करते हैं और इसलिए शहरी आकारिकी सिद्धांत द्वारा भी माना जाता है। शहरी आकारिकी सिद्धांत पर महत्वपूर्ण लेखकों में क्रिस्टोफर अलेक्जेंडर,

पीटर कैलथोरपे, गॉर्डन कलन, एंड्रस ड्यूनी, जेन जैकब्स, मिशेल जोआचिम, जान गेहल, एलन बीजैकब्स, केविन लिंच, एल्डो रॉसी, कॉलिन रेवे, रॉबर्ट वेंदुरी, विलियम एच. व्हाइट, कैमिलो सिट्टे, बिल हिलियर (स्पेस सिंटेक्स) और एलिजाबेथ प्लेटर-जायबर्क शामिल हैं।

शहरी आकारिकी में क्रांतिकारी बदलाव :

शहरी आकारिकी अनुशासन के युवा अस्तित्व के दौरान कई प्रतिमान बदलाव हुए हैं जिन्होंने सिद्धांत और व्यवहार के क्षेत्र के प्रक्षेप वक्र को प्रभावित किया है। ये प्रतिमान बदलाव पारंपरिक आकारिकी विषयों के बाहर कई विषय क्षेत्रों को कवर करते हैं।

• **टीम १०** - पहला प्रमुख प्रतिमान बॉड से बाहर टीम १० का गठन था-"कांग्रेस इंटरनेशनल डी'आर्किटेक्चर मॉडर्न।" उनका मानना था कि "शहरी आकारिकी को 'ह्यूमन एसोसिएशन' के विचारों को पेश करना चाहिए, जो सामूहिक शहरी आबादी पर ध्यान केंद्रित करने के लिए व्यक्तिगत संरक्षक से आकारिकी फोकस को पिवव करता है।"

• **द ब्रंटलैंड रिपोर्ट और साइलेंट स्पिंग** - एक अन्य प्रतिमान बदलाव ब्रंटलैंड रिपोर्ट का प्रकाशन और राहेल कार्सन द्वारा 'साइलेंट स्पिंग' पुस्तक का प्रकाशन था। इन लेखों ने इस विचार को पेश किया कि "मानव बस्तियों का पारिस्थितिक प्रक्रियाओं के साथ-साथ मानव स्वास्थ्य पर हानिकारक प्रभाव पड़ सकता है, जिसने क्षेत्र में पर्यावरण जागरूकता के एक नए युग को जन्म दिया।"

• **द प्लानर्स ट्रायंगल** - द प्लानर्स ट्रायंगल, जिसे स्कॉट कैबेल द्वारा बनाया गया था, ने नियोजन प्रक्रिया में तीन मुख्य संघर्षों पर जोर दिया। इस आरेख ने आर्थिक विकास, पर्यावरण संरक्षण और समानता और सामाजिक न्याय के बीच जटिल संबंधों को उजागर किया। पहली बार, समानता और सामाजिक न्याय की अवधारणा को आकारिकी प्रक्रिया के भीतर आर्थिक विकास और पर्यावरण संरक्षण के समान ही महत्वपूर्ण माना गया।

• **आधुनिकता की मृत्यु (पुड्ट इगोई का विध्वंस)** - पुड्ट इगोई एक स्थानिक प्रतीक और सामाजिक आवास के संबंध में आधुनिकतावादी सिद्धांत का प्रतिनिधित्व था। इसकी विफलता और विध्वंस में,

इन सिद्धांतों को सवालों के घेरे में रखा गया और आकारिकी क्षेत्र के भीतर कई लोगों ने आधुनिकता के युग को मृत माना।

• **नव-उदारवाद और रीगन का चुनाव** - राष्ट्रपति रीगन के चुनाव और नव-उदारवाद के उदय ने शहरी आकारिकी अनुशासन को प्रभावित किया, क्योंकि इसने पूँजीवादी लाभ और स्थानिक निजीकरण पर जोर देने के लिए योजना प्रक्रिया को स्थानांतरित कर दिया। रीगनॉमिवस के ट्रिक्ल डाउन दृष्टिकोण से प्रेरित होकर, यह माना जाता था कि आकारिकी के भीतर पूँजीवादी जोर का लाभ सभी को सकारात्मक रूप से प्रभावित करेगा। इसके विपरीत इसने बहिष्करणीय आकारिकी प्रथाओं का नेतृत्व किया और जिसे कई लोग "सार्वजनिक स्थान की मृत्यु" मानते हैं।

• **शहर का अधिकार** - शहर के लिए हमारे नागरिकों के अधिकारों पर स्थानिक और राजनीतिक लड़ाई चल रही है। डेविड हार्वे, डैन मिशेल और एडवर्ड सोजा के साथ, ऐतिहासिक सोच को बदलने के मामले के रूप में शहर के अधिकारों पर चर्चा की, कि कैसे एक महत्वपूर्ण रूप में स्थानिक पदार्थ निर्धारित किया गया था। सोच का यह परिवर्तन तीन रूपों में हुआ - औपचारिक रूप से, सामाजिक रूप से और इस सामाजिक-स्थानिक बोली का संयोजन। सामाजिक-स्थानिक संदर्भ में क्या मायने रखता है, इसे मापने में सक्षम होने के लिए एक साथ लक्ष्य स्थानांतरित हो गया।

• **ब्लैक लाइव्स मैटर (फर्न्यूसन)** - ब्लैक लाइव्स मैटर आंदोलन ने आकारिकी सोच को चुनौती दी क्योंकि इसने शहरी अंतरिक्ष में रंग के लोगों के साथ अन्याय और असमानताओं पर जोर दिया, साथ ही बिना भेदभाव और क्रूरता के सार्वजनिक स्थान पर उनके अधिकार पर जोर दिया। यह दावा करता है कि अल्पसंख्यक समूहों में कुछ स्थानिक विशेषाधिकारों की कमी होती है और इस कमी के परिणामस्वरूप जीवन और मृत्यु के मामले हो सकते हैं। शहरीकरण की एक समान स्थिति तक पहुँचने के लिए, हमारे शहरी क्षेत्रों के भीतर सामाजिक-आर्थिक जीवन की समान पहचान की आवश्यकता है।

शहरी आकारिकी के नए दृष्टिकोण :

शहरी आकारिकी के अभ्यास के लिए कई अलग-अलग सिद्धांत और दृष्टिकोण लागू किए गए हैं। नया शहरीकरण एक दृष्टिकोण है जो १९८० के दशक में उप-नगरीय फैलाव से निपटने के लिए एक जगह बनाने की पहल के रूप में शुरू हुआ था। इसका लक्ष्य कॉम्पैक्ट और संपूर्ण कस्बों और पड़ोस बनाकर घनत्व बढ़ाना है।

नए शहरीकरण के १० सिद्धांत हैं - १. चलने योग्यता, २. कनेक्टिविटी, ३. मिश्रित उपयोग और विविधता, ४. मिश्रित आवास, ५. गुणवत्ता वास्तुकला और शहरी आकारिकी, ६. पारंपरिक पड़ोस संरचना, ७. घनत्व में वृद्धि, ८. स्मार्ट परिवहन, ९. स्थायित्व और १०. जीवन की गुणवत्ता। नया शहरीकरण और इसके द्वारा किए गए विकास अनुशासन के भीतर बहस के स्रोत हैं, मुख्य रूप से परिदृश्य शहरीवादी दृष्टिकोण के साथ, बल्कि सुखद वास्तुशिल्प ट्रॉप के पुनरुत्पादन के कारण जो संदर्भ का जवाब नहीं देते हैं। एंड्रस ड्यूनी, एलिजाबेथ प्लेटर-जायबर्क, पीटर कैलथोरपे और जेफ स्पीक सभी दृढ़ता से न्यू अर्बनवाद और वर्षों से इसके विकास से जुड़े हुए हैं। लैंडस्केप शहरीकरण एक सिद्धांत है जो पहली बार १९९० के दशक में सामने आया था, यह तर्क देते हुए कि शहर वस्तुओं और इमारतों की व्यवस्था के बजाय परस्पर और पारिस्थितिक रूप से समृद्ध क्षैतिज क्षेत्र की स्थितियों से निर्मित है। चार्ल्स वाल्डहेम, मोहसेन मुस्तफवी, जेम्स कॉर्नर और रिचर्ड वेल्डर इस सिद्धांत से निकटता से जुड़े हुए हैं। लैंडस्केप शहरीकरण साइटों, क्षेत्रों, पारिस्थितिक तंत्र, नेटवर्क और बुनियादी ढाँचे को सिद्धांतित करता है, हालांकि कॉर्नर के अनुसार लैंडस्केप अभ्यास, शहरों के लिए एक गतिशील अवधारणा को लागू करते हुए पारिस्थितिक तंत्र के रूप में जो विकास के चरणों को विकसित, सिकुड़ते या बदलते हैं।

श्याम शर्मा (२०००) - श्याम शर्मा ने २००० में श्रमवहनवीपस। वचतपेस वी श्रपचनतण डेंजमत व्संद१ ;। जनकल पद नतइंद व्संदपदहद१ नामक विषय पर अपना शोध कार्य प्रस्तुत किया। जिसमें जयपुर शहर के मास्टर प्लान नगरीय सिद्धान्त एवं नगर नियोजन के मुख्य सिद्धान्तों का उल्लेख किया गया।

रोजाना शहरीकरण एक अवधारणा है जिसे मार्गरेट क्रॉफर्ड द्वारा शुरू किया गया है और

हेनरी लेफेब्रे से प्रभावित है जो शहरी निवासियों द्वारा साझा किए गए रोजमर्रा के अनुभव का वर्णन करता है जिसमें शामिल हैं : आना, काम करना, आराम करना, शहर की सड़कों और फुटपाथों से गुजरना, खरीदारी करना, खाना खरीदना और खाना, काम चलाना। रोजमर्रा के शहरीकरण का संबंध सौंदर्य मूल्य से नहीं है। इसके बजाय, यह विशेषज्ञों और सामान्य उपयोगकर्ताओं के बीच की दूरी को समाप्त करने के विचार का परिचय देता है और आकारिकीयों और योजनाकारों को 'शक्ति के बदलाव' पर विचार करने और सामाजिक जीवन को प्रत्यक्ष और सामान्य दृष्टिकोण से संबोधित करने के लिए मजबूर करता है।

सामरिक शहरीकरण (जिसे वल्ल शहरीकरण, योजना-दर-डूङ्ग, शहरी एवयूपमेंट या शहरी प्रोटोटाइप के रूप में भी जाना जाता है) पड़ोस के निर्माण के लिए एक शहर, संगठनात्मक या नागरिक-नेतृत्व वाला दृष्टिकोण है जो अल्पकालिक, कम लागत और स्केलेबल हस्तक्षेप का उपयोग करता है और दीर्घकालिक परिवर्तन को उत्प्रेरित करने के लिए नीतियाँ।

टॉप-अप शहरीकरण शहरी आकारिकी में दो तकनीकों का सिद्धांत और कार्यान्वयन है : टॉप-डाउन और बॉटम-अप। ऊपर से नीचे शहरीकरण तब होता है जब आकारिकी को पदानुक्रम के ऊपर से लागू किया जाता है - आम तौर पर सरकार या योजना विभाग। नीचे से ऊपर या जमीनी स्तर पर शहरीकरण लोगों या पदानुक्रम के निचले हिस्से से शुरू होता है। टॉप-अप का अर्थ है कि दोनों विधियों का उपयोग एक अधिक सहभागी आकारिकी बनाने के लिए किया जाता है, इसलिए जितना संभव हो उतना सफल होने के लिए व्यापक और अच्छी तरह से माना जाना सुनिश्चित है।

वर्धमान महावीर खुला विश्वविद्यालय, कोटा द्वारा प्रकाशित पुस्तक "नगरीय भूगोल" में जयपुर शहर के मास्टर प्लान २०२५ में जयपुर रीजन की स्थिति एवं भविष्य के सम्भावित नया जयपुर के बारे में वर्णन किया गया है।

अवसंरचनात्मक शहरीकरण इस बात का अध्ययन है कि कैसे बुनियादी ढांचा प्रणाली बनाने में जाने वाले प्रमुख निवेशों को समुदायों के लिए अधिक टिकाऊ बनाने के लिए लाभ उठाया जा सकता

है। सिस्टम केवल लागत और उत्पादन दोनों में दक्षता के बारे में होने के बजाय, ढांचागत शहरीकरण इन निवेशों का उपयोग सामाजिक और पर्यावरणीय मुद्दों के लिए भी अधिक न्यायसंगत होने का प्रयास करता है।

लिंगा सैमुअल्स एक आकारिकी है जो यह जांच कर रही है कि बुनियादी ढांचे में इस बदलाव को कैसे पूरा किया जाए, जिसे वह "अगली पीढ़ी के बुनियादी ढांचे" कहते हैं, जो कि "बहुक्रियाशील है, सहलोक, दृश्यमान, सामाजिक रूप से उत्पादक, स्थानीय रूप से विशिष्ट, लचीला और अनुकूलनीय, इको-अर्थव्यवस्था के प्रति संवेदनशील, आकारिकी प्रोटोटाइप या प्रदर्शन परियोजनाओं से बना, सहजीवी, तकनीकी रूप से स्मार्ट और सभी विषयों और एजेंसियों में सहयोगी रूप से विकसित हुए हैं।"

सतत् शहरीकरण १९९० के दशक का अध्ययन है कि कैसे एक समुदाय पारिस्थितिकी तंत्र, लोगों और उस अर्थव्यवस्था के लिए फायदेमंद हो सकता है जिसके लिए वह जुड़ा हुआ है। यह स्कॉट कैपबेल के योजनाकार त्रिकोण पर आधारित है जो अर्थव्यवस्था, इविवटी और पर्यावरण के बीच संतुलन खोजने की कोशिश करता है। इसकी मुख्य अवधारणा शहरों को जितना संभव हो उतना आत्मनिर्भर बनाने की कोशिश करना है, जबकि इसके आस-पास के पारिस्थितिकी तंत्र को नुकसान नहीं पहुँचाना है, आज जलवायु स्थिरता पर ध्यान केंद्रित करना है। टिकाऊ शहरीकरण के साथ काम करने वाला एक प्रमुख आकारिकी डगलस फर् है।

नारीवादी शहरीकरण इस बात का अध्ययन और आलोचना है कि समाज में पितृसत्तात्मक सामाजिक और राजनीतिक संरचनाओं के कारण निर्मित वातावरण लिंग को अलग तरह से कैसे प्रभावित करता है। आमतौर पर, टेबल पर आकारिकी निर्णय लेने वाले लोग पुरुष होते हैं, इसलिए सार्वजनिक स्थान और निर्मित वातावरण के बारे में उनकी अवधारणा उनके जीवन के दृष्टिकोण और अनुभवों से संबंधित होती है, जो महिलाओं या बच्चों के समान अनुभवों को प्रतिबिंबित नहीं करते हैं। डोलोरेस हेडन एक विद्वान हैं जिन्होंने १९८० से लेकर आज तक इस विषय पर शोध किया है। हेडन के लेखन में

कहा गया है, "जब सभी वर्गों और जातियों की महिलाएँ, पुरुष और बच्चे सार्वजनिक डोमेन की पहचान उस स्थान के रूप में कर सकते हैं जहाँ वे नागरिकों के रूप में सबसे अधिक आरामदायक महसूस करते हैं, तो अमेरिकियों के पास अंततः घरेलू शहरी स्थान होगा।"

शहरी नियोजन, शैक्षिक योजना और शिक्षाशास्त्र के चौड़े पर शैक्षिक शहरीकरण एक उभरता हुआ अनुशासन है। एक दृष्टिकोण जो इस धारणा से निपटता है कि आर्थिक गतिविधियाँ, कार्यस्थल पर नए कौशल की आवश्यकता और कार्यस्थल की स्थानिक विन्यास शैक्षिक रिक्त स्थान के आकारिकी और शैक्षिक योजना के शहरी आयाम में स्थानिक पुनर्रचना पर निर्भर करती है।

ब्लैक अर्बनिज़्म एक ऐसा दृष्टिकोण है जिसमें अश्वेत समुदाय सक्रिय निर्माता, नवप्रवर्तक, और महानगरीय क्षेत्रों के पड़ोस और रिक्त स्थान को आकारिकी करने और बनाने की प्रक्रिया के लेखक हैं, जिन्होंने पिछली आधी सदी में पुनर्जीवित करने में मदद करने के लिए बहुत कुछ किया है। लक्ष्य काले लोगों के लिए काले शहरों का निर्माण करना नहीं है, बल्कि तथाकथित काले क्षेत्रों में मौजूद रचनात्मक ऊर्जा का पता लगाना और विकसित करना है: जिसमें पूरे शहर के सतत विकास में योगदान करने की क्षमता है।

नगरों/नगरीयकरण की उत्पत्ति, विकास : -

इसमें नगरों की उत्पत्ति, विकास और आर्थिक-सामाजिक आधार के अनुसार नगर की कार्यात्मक व्यवस्था एवं नगर संरचना का अध्ययन किया जाता है। नगरीकरण शब्द संस्कृत शब्द 'नगर' + 'करण' से मिलकर बना है जिसका शाब्दिक अर्थ होता है, नगरीय करना या बनाना। नगरीकरण वह प्रक्रिया है जिसके द्वारा ग्रामीण जनसंख्या नगरीय जनसंख्या में परिवर्तित हो जाती है। किसी ग्राम प्रधान समाज के नगरीय प्रधान समाज में रूपान्तरण की प्रक्रिया को "नगरीकरण" कहते हैं। इससे किसी भी क्षेत्र की कुल जनसंख्या में नगरीय जनसंख्या के अनुपात में वृद्धि होती है। नगरीकरण, नगरीय जनसंख्या की तीव्रतर तुलनात्मक वृद्धि की एक प्रक्रिया है, लेकिन इसका उपयोग उस अनुपात के लिए भी किया

जाता है जो किसी प्रदेश की नगरीय बस्तियों में रहने वाली जनसंख्या या नगरीय जनसंख्या उस प्रदेश की कुल जनसंख्या में किसी निश्चित समय पर बनाती है। वस्तुतः इस अनुपात को (प्रायः प्रतिशत में व्यक्त होता है) नगरीकरण की "मात्रा" कम-हलकम-हलक या "पैमाना" बस-म-हलक अथवा उसका "अनुपात" कहते हैं। यह प्रदेश में नगरीकरण स्तर का सर्वोत्तम सूचकांक होता है। वास्तविक एवं मूल अर्थ में "यह एक प्रक्रिया अथवा दशा है जिसमें नगरीय जनसंख्या की वृद्धि दर कुल प्रादेशिक वृद्धि दर से अधिक होती है।"

किंग्सले डेविस के अनुसार "नगरीकरण सामाजिक जीवन के समूचे क्षेत्र में क्रांतिकारी परिवर्तन को प्रदर्शित करता है। स्वयं में आधारभूत अर्थव्यवस्था एवं प्रौद्योगिक विकास का उत्पाद होते हुए यह अस्तित्व में आने पर जीवन के प्रत्येक पहलू को प्रभावित करता है। नगरीकरण एक चक्रीय प्रक्रिया है, जिसमें देश कृषि से औद्योगिक समाज की ओर अग्रसर होता है।

देश या समाज में पाए जाने वाले आर्थिक, सामाजिक, राजनीतिक एवं धार्मिक स्वरूप को समझने में नगरों का अध्ययन हमें काफी सहायता करता है। अंग्रेज शासन काल के अधिकांश इतिहासकारों ने राजा, रानी, मंत्री, जमींदार आदि ऊँचे वर्गों के लोगों एवं एक राजा से दूसरे राजा के बीच की लड़ाई को इतने विशाल स्वरूप में बताने का प्रयास किया है कि इतिहास का निर्माण का मुख्य आधार जैसे - किसान, व्यापारी, कर्मचारी, शिल्पकार, शूद्र, विद्यार्थी, गरीब मजदूर आदि की स्थिति इन राजाओं के भार से दब कर रह गई। लगभग १९६० के बाद भारतीय इतिहासकारों का एक समूह इस बात को ढंग से बताने का प्रयास करने लगा कि मात्र राजा-रानी और युद्ध ही इतिहास नहीं बनाते। इतिहास बनाते हैं गरीब, मजदूर, किसान, शिल्पकार, व्यापारी, सेना में काम करने वाला एवं अपने राज्य को दुश्मनों से बचाने के लिए जान की बाजी लगा देने वाला युवा सिपाही। समाज का यही वर्ग राजा-रानी को पैदा करता है, न कि राजा से प्रजा का जन्म होता है। वैसे भारतीय धार्मिक ग्रन्थ "राजा" का अर्थ "पिता, ईश्वर, मालिक" और "प्रजा" का अर्थ

"पुत्र" बताते हैं। यह बात धर्म के धरातल पर ही सत्य हो सकती है। वास्तविक धरातल पर तो हम पाते हैं कि प्रजा ही पिता है। यही कर के रूप में राजा को अपने उत्पादन का एक भाग नगद या वस्तु के रूप में देती है जिससे राजा का भरण-पोषण करने में समर्थ हो पाता है।

डी. डी. कोसाम्बी का कहना है कि यदि प्रमुख महत्वाकांक्षी लोगों के नामों और बड़ी-बड़ी लड़ाईयों की सूची ही इतिहास है तो यह अर्थ गलत होगा किन्तु यदि यह जानना अधिक महत्वपूर्ण समझा जाए कि उसके पास हल था या नहीं तो भी भारतीय इतिहास को समझने में अधिक सुविधा होगी। जहाँ तक नगरों के निर्माण में असल महत्व हल और चक्का का है जिसने आम आदमी को प्रभावित किया और अतिरेक की ओर उत्पादक वर्ग निर्देशित हुआ। जहाँ तक नगरों के निर्माण का प्रश्न है, इस पर दो प्रमुख विचार इतिहासकारों के बीच पाए जाते हैं।

गिडेन जोबर्ग का कहना है कि विश्व के प्राचीन नगरों का जन्म मुख्य रूप से वैसे ही स्थानों में सबसे पहले हुआ जहाँ की जलवायु एवं मिट्टी पौधों एवं जानवरों की जिन्दगी की सुरक्षा के लिए अनुकूल थी। इन्हीं पौधों एवं जानवरों के कारण बड़े पैमाने पर लोग एक जगह इकट्ठा हो सके। इतना ही नहीं, शिल्पकला निर्माण की जानकारी रखने के बावजूद लोग वैसे ही स्थानों पर मुख्य रूप से बसने लगे जो पौधों एवं जानवरों के लिए अनुकूल वातावरण वाले हों, भले ही वह स्थान काफी छोटा क्यों न हो। इसी अनुकूल वातावरण से आगे चलकर शिल्पकला को विकसित किया गया और भोजन की आपूर्ति होने के कारण शिल्पकारों ने ऐसे ही स्थानों को पसन्द किया। जीवन धारण के लिए जिस तरह पौधे एवं जानवरों की आवश्यकता महसूस की गई उसी तरह वैसे स्थानों को ज्यादा पसंद किया गया जहाँ जल की पूर्ति भी आसानी से हो सके, क्योंकि जल भी नगरों के निर्माण के लिए आवश्यक तत्व था। नगर जीवन के लिए दूसरी मौलिक आवश्यकता एक विकसित शिल्पकला निर्माण को मानता है जिसका महत्व उसके अनुसार, कृषि उत्पादन एवं अन्य उत्पादन के लिए काफी है। कृषि उपकरणों की विकास की आवश्यकता केवल इसलिए नहीं पड़ी कि जोतने के लिए औजार चाहिए, बल्कि इसलिए भी की

काफी फसल लग सकें तथा काफी अन्न प्राप्त हो सके। इसके लिए भी कृषि के नए उपकरणों की आवश्यकता पड़ी। ऐसा इसलिए जरूरी था कि एक निश्चित मात्रा में खाद्य पदार्थ आवश्यकता से अधिक या अतिरेक के रूप में पैदा हो सकें, क्योंकि नगरों में रह रहे लोग तो शिल्पकला विज्ञान में व्यस्त थे, अतः अन्न नहीं पैदा करते थे। जब अन्न-उत्पादक अतिरेक पैदा करेगा, तभी तो कुछ लोग खाद्य-पदार्थ पैदा करने से मुक्त हो सकते हैं और ये लोग जहाँ पर रहकर शिल्पकला, विज्ञान एवं कुँ-दूसरे से मदद लेकर कच्चे सामान से तैयार माल बनाएंगे वहाँ, नगरों का जन्म होगा। खाद्य पदार्थ में न केवल खेतों से उत्पन्न वस्तुएँ ही थीं बल्कि शिकार द्वारा जानवरों का मारना एवं मछली मारने का काम भी उत्पादक वर्ग के ही हाथों में था जो प्रायः नगर निवासियों को इसका भी अतिरेक देते थे। जो वर्ग के अनुसार प्राचीन शहरों के निर्माण में तीसरी चीज महत्वपूर्ण प्राक-स्थिति राजनीतिक एवं आर्थिक क्षेत्र में विकसित सामाजिक संगठन का होना भी है। नगरीय जीवन के प्रारम्भ में ही आर्थिक व्यवस्था ऐसी होनी चाहिए जिसमें नगर का तैयार माल आसपास के समुदायों या दूर के समुदायों में वितरित किया जा सके। इससे भी पहले यह आवश्यक है कि खेती से उत्पन्न अतिरेक अतिसुविधापूर्वक अन्य आबादी में पहुंचाया जा सके।

इसके अलावा अनेक पेशेवर कार्य जिसमें कुछ विशेष ज्ञान एवं प्रशिक्षण की आवश्यकता हो जैसे खान से धातु निकालना, यातायात एवं खनिज मात्रा को साफ करने की विधि ये सारे काम एक-दूसरे से जुड़े हुए भी सुचारु एवं व्यवस्थित रूप से हो सकें। इस तरह एक शासक वर्ग की आवश्यकता पड़ती है जो नियमित रूप से इन कार्यकलापों को चलाने में एक विशेष नियम के अनुसार शासन करे ताकि अतिरेक की उपलब्धि व्यवस्थित ढंग से हो सके तथा सामाजिक शक्ति एवं कार्यकुशलता का प्रसार हो जिससे नगरों का विकास हो सके। जोबर्ग के नगरीकरण के इस सिद्धान्त के अनुसार सामाजिक शक्ति का प्रभुत्व आर्थिक वातावरण पर होता है। उसका मानना है ठीक से बनाए रखने के लिए सबसे पहले सामाजिक स्थायित्व

आवश्यक है। जोबर्ग यह तर्क देता है कि प्राचीनतम शहरों के निर्माण में एक राजनीतिक स्वरूप या बनावट की उपस्थिति आवश्यक है। यह राजनीतिक स्वरूप नगर में हो रहे पेशों से वसूले गए कर एवं आस-पास के गांवों में रह रहे किसानों से अतिरिक्त के रूप में जो अन्न प्राप्त करेगा उसी से शहर में रह रहे अनुत्पादक वर्ग के भरण-पोषण करने के लिए खाद्य सामग्रियाँ मिलेंगी।

"दी अरबन रिवॉल्यूशन" नामक अपने लेख एवं अपनी पुस्तक "प्रोग्रेस एंड आर्थोर्गॉजी लन्दन" में गॉर्डन चाइल्ड बताते हैं कि शहर के आकार-प्रकार सरकारी काम, आदि के लिए लेखन-पद्धति बहुत आवश्यक था। उनका कहना है कि लेखन क्रिया के आधार पर ही नगर में एक ऊँचे दर्जे के लोगों, (जो खेती का काम नहीं करते हो एवं नगर में अलग-अलग पेशे के विशेषज्ञ हों तथा शिल्प, विज्ञान, कला को विकसित करने की क्षमता रखते हों), का रहना सम्भव है सारे तत्वों के ऊपर वे लेखन पद्धति को ही एक ऐसा बिन्दु मानते हैं जिसके आधार पर नगर एवं गाँवों में अन्तर किया जा सकता है। गार्डन चाइल्ड महोदय का यह विचार पूर्ण रूप से स्वीकारते हुए जोबर्ग का कहना है कि लेखन-क्रिया की उपस्थिति का अर्थ है शिक्षित समुदाय की उपस्थिति, जो शिक्षा के आवश्यक सिद्धान्तों को नगरीय वातावरण में फैलाता है और इसके आधार पर एक ऐसे राजनीतिक औजार का निर्माण होता है जो नगरीय जीवन को सुचारु रूप से चलाने में प्राथमिक रूप से महत्वपूर्ण भूमिका अदा करता है। इसी लेखन-पद्धति के आधार पर व्यापारियों, शिल्पकारों एवं अन्य कर्मचारियों को आवश्यकतानुसार वस्तुएँ एवं नई वस्तुओं के उत्पादन के लिए उचित सहायता मिल पाती है।

दी सिटी इन हिस्ट्री, (१६९१) न्यूयार्क के लेखक लेवीस मॉशर्ड नगरों की उत्पत्ति पर प्रकाश डालते हुए बताते हैं कि विकेंद्रित ग्रामीण अर्थव्यवस्था को ऊँचे दर्जे की एक संगठित नगरीय अर्थव्यवस्था में परिवर्तन करने का सबसे प्रमुख प्रतिनिधि राजा या शासक वर्ग होता है। नगरीय प्रसार में राजा को ध्रुव के समान एक चुम्बकीय शक्ति के रूप में वे मानते हैं कि जो शहर रूपी मानव के शरीर का दिल होता है एवं

सभ्यता की नई शक्तियों के विकास पर उसी का नियन्त्रण रहता है "सिटी इन अर्ली हिस्टोरिकल इंडिया, शिमला" (१९७३) के लेखक आमलानन्द घोष (प्रथम भारतीय इतिहासकार जिन्होंने भारतीय इतिहास का अध्ययन नगरों के उदय, विकास एवं पतन के आधार पर किया है) ने भी उपर्युक्त तथ्यों को स्वीकार है। उपर्युक्त तथ्यों को पूर्ण रूप से स्वीकारते हुए जोबर्ग का कहना है कि इसमें कोई दो मत नहीं कि आर्थिक कारण से ज्यादा महत्वपूर्ण राजनीतिक कारण है जिसकी मदद से ही नगर केन्द्रों का जन्म हो सका। यद्यपि जोबर्ग इस बात से इनकार नहीं करते हैं कि राजनीतिक कारण को नगर के उदय के लिए मौलिक कारण मानते हैं।

लन्दन का विद्वान ब्रुश ट्रिगर ने अपने एक लेख "डिटरमिनेंट्स ऑफ अरबन ग्रोथ इन प्री इंडस्ट्रियल सोसायटी" में गीडेन जोबर्ग के उपर्युक्त विचारों को बहुत ढंग से काटते हुए बताया है कि गीडेन जोबर्ग लेखन क्रिया और नगरीयकरण को इतना ज्यादा एक-दूसरे से सम्बद्ध बताते हैं कि ऐसा लगता है कि लेखन क्रिया के अलावा नगर उदय के लिए कोई दूसरा तत्व अतिआवश्यक है ही नहीं। गीडेन जोबर्ग के मत से ऐसा लगता है कि नगर वही पर है जहाँ शिक्षित संस्कृति है, जहाँ लेखन नहीं है, वहाँ नगर में हम पाते हैं कि शैक्षणिक केन्द्र होने के बावजूद नालन्दा या विक्रमशिला भारत के सबसे प्रमुख शहर कभी नहीं रहे।

गीडेन जोबर्ग द्वारा नगर के उदय के लिए राजा की प्रमुखता को काटते हुए ट्रिगर कहता है कि बहुत सी आवश्यकताओं में से नगर के लिए एक आवश्यक तत्व राजा हो सकता है, न कि केवल राजा या राजा की शक्ति से ही नगर का निर्माण। फिर हम देखते हैं कि जोबर्ग नगर के महत्व एवं लम्बी जिन्दगी के लिए शिल्पकला, विज्ञान एवं व्यापारिक चहल-पहल को महत्व देता है; लेकिन स्पष्ट रूप से शिल्प, विज्ञान, कला एवं व्यापारिक तत्वों के महत्व की नगरों के उदय के लिए मानने से इनकार कर देता है। ऐसा लगता है कि यह इस बात को बिल्कुल नहीं समझ पाता है कि शिल्प, विज्ञान, कला एवं आर्थिक विकास ने ही मानव को एक समुदाय का रूप दिया और एक साथ मिलकर जीवन की आवश्यकताओं की पूर्ति में एक-दूसरे की मदद

करने या व्यवितगत जीवन व्यतीत करने का पाठ पढ़ाया। इस तरह नगर के उदय का पहला बीज शिल्प, विज्ञान, कला एवं व्यापारिक आवश्यकता एवं उत्थान के ही कारण हुआ, इन्हीं तत्वों के कारण एक क्षेत्र में स्थित कई गाँवों में से कोई एक गाँव, नगर के रूप में बदला; जहाँ कुछ विशेष प्रकार के लोग जो शिल्प, कला, विज्ञान एवं व्यापार से किसी-न-किसी तरह जुड़े थे, आकर रहने लगे और एक साथ मिलकर एक सुचारु जिन्दगी बिताने लगे और यही वह विकसित सामाजिक स्थिति थी जब लोगों ने प्रशासन की आवश्यकता महसूस की। सामाजिक एवं आर्थिक व्यवस्थित स्थिति के अभाव में प्रशासन मात्र उसी स्थिति में आवश्यक समझा जाता है जब समाज की बनावट आर्थिक एवं शिल्प, विज्ञान, कला में उन्नति होने के कारण काफी बड़ी हो जाए। इसी स्थिति में समाज इस बात की आवश्यकता महसूस करता है कि धन एवं जन की सुरक्षा के लिए तथा सामाजिक संबंध को अच्छे बनाने के लिए राजनीतिक संगठन की आवश्यकता पड़ती है। इन तथ्यों से यह प्रमाणित होता है कि शिल्पकला, विज्ञान, आर्थिक एवं सामाजिक विकास के बाद ही राजनीतिक साधन की आवश्यकता पड़ती है, न कि राजनीतिक साधन से प्रारम्भिक अर्थ एवं शिल्प, विज्ञान, कला का जन्म होता है। नगर की उत्पत्ति के उपर्युक्त कारणों एवं विभिन्न विद्वानों के मतों एवं विचारों के अध्ययन से हमें इतिहास में नगरीय विषयों के प्रारम्भिक विकास को जानने में सुविधा मिलती है।

भारत में नगरीयकरण की शुरुआत सिन्धु घाटी में पाए गए नगरों से आरम्भ होती है। सिन्धुकाल की नगरीय अवस्था के पतन के पश्चात ऋग्वैदिक एवं वैदिक काल में अर्थात् ईसा पूर्व छठी शताब्दी के पहले हमें नगरों के प्रमाण नहीं के बराबर देखने को मिलते हैं। खुदाई से प्राप्त सिक्के, लिखित सामग्री एवं अन्य पुरातात्विक सामग्रियों अध्ययन से पता चलता है कि लगभग ९०० ई.पू. से भारत की आर्थिक व्यवस्था में महत्वपूर्ण परिवर्तन आने लगे। इसके परिणामस्वरूप नगरों का प्रादुर्भाव होने लगा। गंगा के किनारे उपजाऊ प्रदेश के कारण श्रावस्ती, चम्पा, राजगृह, अयोध्या,

कोशाम्बी और काशी जैसे कुछ नगर बहुत महत्वपूर्ण बन गए। आवश्यकता से अधिक उत्पादन के कारण कुछ अन्य नगर भी विकसित हुए। नगरों का जन्म वैसे हुआ जहाँ आरम्भ में कुम्हारगीरी, बढईगीरी, वस्त्रों की बुनाई जैसे शिल्पों में विशिष्टता प्राप्त करने वाले ग्राम ज्यादा पाए गए। जैन धर्म ग्रन्थों में कई प्रकार के नगरों की चर्चा हमें देखने को मिलती है, जैसे-अवारीत नगर, मिट्टी की चारदीवारी वाला नगर, छोटी दीवार वाला नगर, बड़ानगर, समुद्रनगर और राजधानी नगर। दक्षिण के कुछ शहरों के लिए पुर, स्कन्धावार, विजय-स्कन्धावार, नगर, महानगर, सार्वभौम (महानगर से भी ज्यादा महत्वपूर्ण नगर) पट्टन, महापट्टन, आदि की चर्चा अभिलेखों एवं लिखित स्रोतों में मिलती है।

नगरीय विकास :

प्राचीन काल के नगरों के विकास में मुख्य रूप से तीन आधार हमें देखने को मिलते हैं-आर्थिक, राजनीतिक और धार्मिक। छठी शताब्दी ईसा पूर्व से लेकर कुषाण एवं सातवाहन काल तक के नगरों के अध्ययन से हम पाते हैं कि इस काल में कुछ अपवादों को छोड़कर मुख्य रूप से आर्थिक एवं राजनीतिक कारणों का ही हाथ नगरों के विकास में रहा। धार्मिक प्रधानता वाले शहरों की संख्या इस काल में नगण्य है। खुदाई से प्राप्त सिक्के, लिखित सामग्री एवं अन्य पुरातात्विक सामग्री के अध्ययन से पता चलता है कि छठी शताब्दी ईसा पूर्व में भारत की आर्थिक व्यवस्था में महत्वपूर्ण परिवर्तन का आधार था। लौहे का व्यापक उपयोग (भारत में लौहे का उपयोग ८०० ईसा पूर्व से पाया जाता है)। धान, ईख और कपास की बड़े पैमाने पर खेती तथा शिल्प विज्ञान में काफी उन्नति होने लगी। परिणामस्वरूप आवश्यकता से अधिक उत्पादन ईसा काल की मुख्य विशेषता थी। इस काल में लगभग ६० सुविख्यात नगरों की चर्चा तट में भृगु कच्छ तक और दक्षिण में कावेरी-पट्टनम से लेकर उत्तर में कपिलवस्तु तक फैले हुए थे। श्रावस्ती जैसे बड़े नगरों की संख्या २० थी। इनमें से छह नगर तो इतने महत्वपूर्ण थे कि वहाँ बुद्ध ने पर्यटन भी किया था। ये छह नगर थे- चम्पा, राजगृह, साकेत, कोशाम्बी, वाराणसी और कुशीनगर। वस्तुतः नगर का महत्व उसकी

कला एवं शिल्प से होता था। राजगृह क बारे में उस काल के ग्रन्थों में चर्चा है कि वहाँ अट्ठारह शिल्पी संघ थे। बौद्ध ग्रन्थ में वर्णित इन परम्परागत अट्ठारह शिल्पी संघों में से केवल चार का ही उल्लेख है बर्दई, लौहकार, चर्मकार और चित्रकार। हमें यह ठीक-ठीक ज्ञात नहीं कि नगर और गाँवों के बीच कैसा संबंध था। उत्पादन के अच्छे साधनों के कारण ग्राम सात प्रकार के अन्न और सात प्रकार के दलहन पैदा करते थे और अतिरिक्त खाद्य सामग्री नगर में भारी संख्या में रहने वाले शिल्पियों, वणिकों और सैनिकों के लिए तथा राजा और उसके सामन्तों को डयोदियों के लिए आपूर्ति करते थे। अतिरिक्त अनाज के बदले जनपद के लोग नगरों से शायद वस्त्र पाते थे क्योंकि कहते हैं कि वाराणसी के आस-पास रूई उपजाई जाती थी जिसमें वस्त्र बुना जाता था।

नगरों के उद्भव से तात्पर्य, नगरों की उत्पत्ति के कालिक पक्ष से है। जब कोई अधिवास नगर बन जाता है तो वह उसकी उत्पत्ति का समय होता है। नगर की उत्पत्ति दो प्रकार से होती है। कुछ अधिवास छोटी बस्ती के रूप में बसाये जाते हैं लेकिन अनुकूल परिस्थिति में अपने क्रियाकलाप बढ़ाकर नगर का रूप धारण कर लेते हैं। जिस समय वे नगर कहलाने लगते हैं। यह अवस्था उनके उद्भव की प्रतीक है। अधिकांश नगरों की उत्पत्ति इसी प्रक्रिया से होती है। परन्तु कुछ विशेष प्रयोजन से नगर बसाये जाते हैं। यह उनकी उत्पत्ति की दूसरी विधा है। अधिकांश राजधानी, प्रशासकीय और कुछ व्यापारिक-औद्योगिक नगरों की उत्पत्ति एवं निश्चित कालखण्ड में हो जाती है। स्पष्ट है कि कुछ अधिवास नगर बनते और कुछ बनाये जाते हैं। सभी युगों में यह प्रक्रिया क्रियाशील रही है।

नगरों के विकास से तात्पर्य, उनके स्वरूप और कार्य में वृद्धि से है। सीमित कार्यों के चलते उनका आकार और विस्तार मन्द गति से वृद्धिमान रहता है जबकि अधिक कार्य सम्पादन से जनसंख्या बढ़ती है तो उनकी आकृति को विकसित करती है। नगरीय जनसंख्या की बढ़ती आवश्यकता के साथ परिक्षेत्र की जनसंख्या की मांग भी बढ़ने लगती है क्योंकि नगर केन्द्र स्थल होता है। मांग के बढ़ने से नगर की वृद्धि होती है फलतः एक छोटा नगर महानगर में बदल

जाता है जो उसके कालिक और स्थानिक पक्ष को रेखांकित करता है। कुछ विपरीत परिस्थितियाँ भी उत्पन्न हो जाती हैं जिससे विकास रुक जाता है या नगर का आस्तित्व मिट जाता है। नदी किनारे पर जन्मा नगर बाढ़ या अपरदन से नष्ट हो जाता है। प्राकृतिक प्रकोप के अतिरिक्त मानवीय कारणों से भी ऐसी घटनाएँ हो जाती हैं। प्राचीन नगरों के भग्नावशेष इसके प्रमाण हैं।

नगरों के विकास का स्थानिक पक्ष भी महत्वपूर्ण है जो नगर बसाये जाते हैं उनका धरातलीय विन्यास पूर्व नियोजित होता है जबकि जो अधिवास विकसित होकर नगर बनते हैं उनका धरातलीय विन्यास विकास अवस्थाओं के अनुसार बहु-आयामी होता है। चण्डीगढ़ के धरातलीय विन्यास और दिल्ली के धरातलीय विन्यास में इसीलिये अन्तर है जो नगर प्राकृतिक या कृत्रिम घेरे में जन्म लेते हैं जैसे तंग घाटी, सर्पिल मोड़, जलीय या स्थलीय अवरोध तथा कृत्रिम खाई या चहारदीवारी उनका स्थलीय विन्यास विशिष्ट रूप ग्रहण कर लेता है जबकि बाधा रहित समतल धरातल पर जन्में नगर का फैलाव सहज होता है जैसे पटना और वाराणसी। प्राचीन कालीन नगरों के विस्तार प्रारूप की तुलना में आधुनिक कालीन नगरों का धरातलीय फैलाव भिन्न पाया जाता है क्योंकि तकनीकी उन्नति से स्थलीय अवरोधों को कम कर दिया जाता है जिससे नगर का फैलाव सुगम हो जाता है।

नगरों की उत्पत्ति और विकास के कारक :

नगर क्यों और कहाँ जन्म लेते हैं और उनके विकास को कौन कारक प्रमुख रूप से नियंत्रित करते हैं, इस पर भी विचार करना आवश्यक है। प्राचीन काल से आधुनिक काल तक नगरों के अभ्युदय और विकास के लिए विविध कारक क्रियाशील रहे हैं। यह स्वीकारीय तथ्य है कि नदियों की समतल, उपजाऊ और सिंचित भूमि में अधिक उत्पादन के संवय संरक्षण और वितरण के लिए आदि नगरों का अभ्युदय हुआ। सुरक्षा, पेय जल और परिवहन की सुविधा के कारण ऐसे नगरों को नदी तट पर बसाया गया। कालान्तर में प्रशासनिक नियंत्रण के लिए मुख्यालय एवं राजधानी नगर बसाये गये जैसे अयोध्या, काशी, मथुरा, इन्द्रप्रस्थ आदि। सामाजिक संगठन और शिक्षा-संस्कृति के उत्थान के लिए भी नगरों को

बसाया गया जैसे तक्षाशिला, नालन्दा आदि। अनेक नगर धार्मिक क्रियाकलाप के कारण अस्तित्व में आये जैसे - चन्देल कालीन नगर खजुराहों, भारत के अतिरिक्त यूनान, मिश्र, चीन, मेसोपोटामिया और भूमध्य सागर के तटवर्ती भागों में कृषि, सुरक्षा, व्यापार, उद्योग, धर्म और राजनीति के कारण नगरों का अभ्युदय हुआ। यूनान में नगर राज्यों का अभ्युदय उसी क्रम में हुआ। एथेन्स, स्पार्टा कोटिन्थ आदि इसी प्रक्रिया में जन्में। रोम नगर का अभ्युदय यूरोप की महान ऐतिहासिक घटना है जिसने रोमन साम्राज्य और सभ्यता को जन्म दिया। रोमन साम्राज्य के वास्तुविदों ने सम्पूर्ण यूरोप में नगर रचना की अनूठी प्रक्रिया शुरू की। उस युग के नगर यूरोपीय इतिहास और संस्कृति के विरासत हैं। मध्यकाल में प्रशासन, युद्ध, व्यापार, परिवहन, धर्म, शिक्षा और कृषि विकास के कारण नगर निर्माण की प्रक्रिया चलती रही। इस युग में सुरक्षा की प्रधानता के कारण सुरक्षित स्थानों पर चारदीवारी के अन्दर नगर बसाये गये। भारत के 'गढ़नगर' और यूरोप के बार्गे या वॉर्ग नाम से युवत नगरीय अधिवास ऐसे ही नगर थे।

आधुनिक युग में परिवर्तित अर्थतंत्र, नये परिवहन के साधन, वृहद औद्योगिक विकास, व्यापार, राजनीति, उत्खनन, सामाजिक चेतना और सामरिक स्थिति में बदलाव के कारण नगरों का अभ्युदय और विकास तेजी से होने लगा। इस युग में उन क्षेत्रों में अधिक नगर अस्तित्व में आये जहाँ उद्योग, व्यापार, परिवहन के साधन, उत्खनन पर्यटन और कृषि का विकास हुआ।

इस प्रकार नगरों के अभ्युदय और विकास के लिए उत्तरदायी कारकों को निम्नवत सूचीबद्ध किया जा सकता है : -

१. उत्पादन का आधिव्य : - कृषि तथा अन्य प्राथमिक उत्पादनों के आधिव्य के कारण भण्डारण, संरक्षण और वितरण की प्रक्रिया उदित हुई, जिसके लिए एक सुगम और सुरक्षित केन्द्र की आवश्यकता ने नगर रचना के लिए मानव समुदाय को उत्साहित किया। प्राचीन कालीन नगरों की उत्पत्ति में यह कारक बहुत महत्वपूर्ण था। यह प्रक्रिया आज भी क्रियाशील है। उत्तर भारत के नगरों के अभ्युदय में इस प्रक्रिया का महत्वपूर्ण योगदान है।

२. राजनीतिक कारक : - सामन्तों, राजाओं और प्रशासकों ने सभी युगों में अपने प्रशासकीय कार्यों के सम्पादन के लिए राजधानी एवं मुख्यालय नगरों की स्थापना की। ऐसे नगर प्रशासन के साथ आर्थिक और सांस्कृतिक सत्ता के केन्द्र बन गये जैसे खजुराहो। यह प्रक्रिया सभी युगों में क्रियाशील रही है। आज भी अनेक नगरों का अभ्युदय इस प्रक्रिया से हुआ है जैसे दिल्ली, जयपुर और चण्डीगढ़ आदि।

३. धार्मिक और सामाजिक कारक : - धर्म प्राचीन और मध्यकाल में नगरों के अभ्युदय का एक सशक्त कारक रहा है। यूरोप एवं एशिया के अनेक नगरों के अभ्युदय में धर्म की अहम भूमिका रही है। चन्देल कालीन नगर खजुराहो इसका उदाहरण है। काशी और हरिद्वार जैसे नगरों का अभ्युदय ऐसे ही हुआ है। आधुनिक काल में धर्म के स्थल पर सामाजिक कारक अधिक सक्रिय हैं। वाराणसी इसका सबसे अधिक अच्छा उदाहरण है।

४. सुरक्षा : - प्राचीन एवं मध्य युग में नगर निर्माण में सुरक्षा एक प्रधान कारक था। स्थल के चुनाव से लेकर नगर परकोटा के निर्माण तक नगर की सुरक्षा का विचार प्रधान रहा है। भारत के गढ़नगर ऐसे ही स्थापित किये गये। बुन्देलखण्ड में स्थित कांतिंजर एवं अजयगढ़ ऐसे ही नगर हैं। आज सुरक्षा की परिभाषा बदल गई है। आज सामरिक दृष्टिकोण से मूल्यांकन कर छवनी नगर, नौसेना केन्द्र और वायुसेना केन्द्र स्थापित किये जाते हैं। अम्बाला कैम्प और विशारखापटनम् जैसे नगरों की स्थापना इसी उद्देश्य से की गई।

५. क्षेत्रीय केन्द्रीयता : - किसी स्थान की केन्द्रीयता नगर अभ्युदय की आधारशिला बन जाती है। दिल्ली नगर प्राचीन काल से आधुनिक काल तक कई बार उजड़ने के बावजूद बसता रहा क्योंकि इसके लिए इसकी केन्द्रीयता उत्तरदायी रही है। कानपुर अपनी केन्द्रीयता के कारण एक छवनी केन्द्र से महानगर बन गया।

६. आर्थिक-व्यापारिक कारक : - आदिकाल से आधुनिक काल तक आर्थिक और व्यापारिक कार्य नगर अभ्युदय के सशक्त कारक रहे हैं। मण्डी और बन्दरगाह नगर इसके प्रमाण हैं। बम्बई, कलकत्ता और हापुड़ का अभ्युदय इसी प्रक्रिया से हुआ।

७. औद्योगिक कारण : - प्राचीन और मध्य काल में भी नगर शिल्प और कला के केन्द्र थे लेकिन आधुनिक काल में औद्योगिक क्रान्ति ने नगरों के अभ्युदय में सबसे सशक्त कारक के रूप में कार्य किया है। इस कारक ने जंगल में नगर रचना के लिए उत्साहित किया है। विश्व के कुछ देशों की अधिकांश नगरीय बस्तियों की स्थापना में यह कारक सर्वोपरि रहा है। जमशेदपुर, रुरेकेला जैसे नगर इसके प्रमाण हैं।

८. सांस्कृतिक कारक : - सामाजिक व्यवस्था ने सांस्कृतिक उत्थान को जन्म दिया और सांस्कृतिक क्रिया कलाओं ने नगर बसाने के लिए उत्साहित किया। मनोरंजन, शिक्षा, स्वास्थ्य और कला कौशल के कारण अनेक नगरों का उदय हुआ। शिमला, नैनीताल, दर्जीलिंग, आवसफोर्ड, हलीउड आदि नगरों का अभ्युदय इसी प्रक्रिया से हुआ।

९. उत्खनन : - खनिजों के उत्खनन के कारण भी नगरों की स्थापना की गई है। भारत में कोलार, झरिया, आसनसोल, सिंगरौली आदि नगरों का जन्म उत्खनन के कारण ही हुआ है।

१०. परिवहन : - परिवहन सभी युगों में नगर अभ्युदय का एक सशक्त कारक रहा है। नदी, परिवहन के कारण तटों पर नगर बसाये गये लेकिन अब स्थलीय, जलीय और वायु परिवहन के विकास ने नगर बसाव की दिशा को मोड़ दिया है। आज परिवहन चौराहें नगर स्थापना के लिए सबसे उपयुक्त माने जा रहे हैं। मुगलसराय, कटनी, डटारसी इसका सबसे अच्छा उदाहरण है।

इतिहास के विभिन्न स्रोतों एवं घटनाओं के अध्ययन से पता चलता है कि नगरों का उत्थान विस्तृत रूप से अनेक कारणों के परिणामस्वरूप हुआ। इनमें सबसे प्रमुख कारण था अतिरिक्त अर्थात् आवश्यकता से अधिक उत्पादन और उसके वितरण के लिए व्यापार एवं व्यापारियों का क्रिया-कलाप। धार्मिक कारण के समान ही प्रशासक वर्ग का भी हाथ शहरों के उत्थान में रहा। व्यापारिक, प्रशासनिक, शैक्षणिक, धार्मिक आदि जो भी नगरों की चर्चा हमें देखने को मिलता है वे मात्र एक ही प्रकार के क्रिया-कलाप के केन्द्र न थे, बल्कि अन्य प्रकार की विशेषताएँ भी यहाँ पाई जाती थी। इन शहरों की आबादी अलग-अलग क्रिया-कलापों पर निर्भर करती थी, जैसे व्यापारिक नगरों की आबादी

धार्मिक या प्रशासनिक केन्द्रों की तुलना में सम्भवतः अधिक होती थी। शहरों के विकास के जिन मुख्य कारणों का अध्ययन आवश्यक है, वे हैं अधिक मात्रा में खाद्य पदार्थों की आपूर्ति, जनसंख्या में वृद्धि एवं ग्रामीण बेकारी, हस्तकला एवं कारीगरी में विशिष्टता, खरीद एवं बिक्री, सामाजिक विकेन्द्रीकरण, धर्म, धार्मिक यात्रा, शिक्षा, भूस्वामित्व, किराएदार, प्रशासन, सुरक्षा, युद्ध, सिंचाई, भौगोलिक वातावरण, व्यवितगत प्रयास आदि।

जहाँ तक अधिक मात्रा में खाद्य पदार्थ के उत्पादन का प्रश्न है, हम पाते हैं कि अधिक उत्पादन एवं नगरीय क्षेत्रों में उसका पहुँच पाना शहरों के उत्पादन का मुख्य आधार था। अपवाद वर्ग मुख्य रूप से शहरों के आस-पास स्थित गाँवों में रहता था। अपवाद के रूप में उत्पादक वर्ग का एक छोटा-सा वर्ग शहरों में भी रहता था। उत्पादक वर्ग से शहर खाद्य सामग्री एवं कच्चा माल जैसे अन्न, कपास आदि खरीदता था और बदले में शहर में निर्मित तैयार माल, जैसे कपड़ा आदि गाँवों में बेचा जाता था। इसी खरीद एवं बिक्री के आधार पर बहुत से शहरों का जन्म हुआ।

जनसंख्या की वृद्धि एवं अकाल, महामारी, सूखा आदि के कारण ग्रामीण बेकारी का भी हाथ शहर के विकास में रहा। नौकरी की तलाश में आए हुए लोगों के कारण शहरों की आबादी बढ़ती गई। फलतः शहरों के उत्पादन में वृद्धि हुई और शहरों के क्षेत्रफल में विस्तार भी होने लगा। आबादी बढ़ने के साथ-साथ तकनीकी विज्ञान में प्रगति की आवश्यकता महसूस की गई और तब नई-नई वस्तुएँ अधिक मात्रा में निर्मित होने लगी।

नगरीय अर्थव्यवस्था का मुख्य आधार व्यापार एवं हस्तकला के माध्यम से निर्मित वस्तुएँ थी। विकसित व्यापार के कारण ही हस्तकला के आधार पर निर्मित अधिक-से-अधिक वस्तुओं की आवश्यकता होती थी। नगरों में प्रायः हस्तकला विशेषज्ञ जैसे स्वर्णकार, कसेरा, कुम्हार आदि रहते थे और कई शिल्पकार एक साथ मिलकर आभूषण, बर्तन आदि वस्तुओं का निर्माण करते थे। इस तरह एक साथ मिलकर नियमबद्ध तरीके से निर्मित होने वाले सामान का केन्द्र नगर के रूप में विकसित हो जाता था। अपने

स्वार्थ की रक्षा के लिए व्यापारियों एवं शिल्पकारों में एकता आने लगी और इनके बीच अनेक व्यापारिक समूहों का विकास होने लगा।

शहरों के विकास में व्यापार एवं बाजार का बड़ा ही महत्वपूर्ण स्थान रहा। नगरीय आर्थिक स्थिति का मुख्य आधार व्यापार ही था। निर्मित वस्तुओं के वितरण के एक निश्चित नियम का विकास होने लगा। जैसे शहरों का गाँवों के साथ व्यापार का क्षेत्र काफी सीमित था। एक स्थान का दूसरे स्थान के साथ व्यापार होने के सिलसिले में बीच-बीच में कुछ ऐसे सुरक्षित स्थानों का भी जन्म होने लगा जहाँ व्यापारी अपना सामान रखकर वर्षा या अन्य संकटकालीन स्थिति में कुछ दिनों तक आराम करने के दृष्टिकोण से ठहरा करते थे। ठहरने वाला यह स्थान बाद में चलकर शहर का रूप लेता था। दूर-दूर पर बसे हुए शहरों के बीच भी व्यापार होता था। विदेशों से भी भारतीय नगरों के व्यापारिक संबंध थे। मिश्र एवं मेसोपोटामिया से व्यापारिक संबंध होने के कारण भारत में नए-नए शहरों का विकास हुआ। शहरों में तैयार माल के उत्पादन और वितरण के आधार पर हम पाते हैं कि बहुत से शिल्पियों एवं कारीगरों का व्यापारिक संबंध न केवल राजदरबार से बल्कि मन्दिर एवं सेना से भी था। ये कारीगर, कपड़ा, गहना, लड़ाई के औजार, खाद्य-सामग्री आदि पहुँचाते थे। वितरण की इस प्रथा ने उत्पादक वर्ग एवं वितरकों के बीच संगठन को दृढ़ किया। फलतः बहुत से गोदामों, यातायात के साधन, लेखा-जोखा रखने वाले शहरी लोगों का एक नया वर्ग विकसित हुआ जो भिन्न-भिन्न कार्यों के विशेषज्ञ होते थे। उद्योग एवं व्यापार में विकास के कारण नए-नए शहरी वर्गों का भी विकास हुआ। इससे मुख्य रूप से दो नए वर्गों का विकास हुआ जिनमें से एक का संबंध उत्पादन से था और दूसरा वर्ग इन वस्तुओं को थोक भाव से कम कीमत पर खरीद लेता था और उस पर मुनाफ़ा रखकर राजदरबार, मन्दिरों एवं सेनाओं आदि को बेचता था। इस प्रक्रिया में अत्यन्त धनी, कम धनी, मध्यम वर्ग एवं गरीब वर्गों का विकास हुआ और इनके जीवन स्तर में भी आर्थिक, प्रशासनिक एवं नगर-योजना के दृष्टिकोण से अलग-अलग विशेषताएँ पाई जाने लगीं।

धार्मिक कारण से भी शहरों का विकास हुआ। बहुत से गाँवों में भी अनेक प्रकार के धार्मिक केन्द्र थे लेकिन वे बड़े पैमाने पर विकसित नहीं थे। जिस गाँव में बड़े पैमाने पर धार्मिक क्रियाकलाप के लिए शहरी व्यवितियों का समर्थन आवश्यक था। धर्मस्थलों के मन्दिरों में ब्राह्मण, वलर्क, शिल्पकार, गानेवाला, बजानेवाला, नाचने वाली, नौकर, दासी आदि रहते थे। ये लोग मन्दिरों से सम्बन्धित सभी तरह के धार्मिक एवं आर्थिक कामों में संलग्न थे। अपनी आवश्यकता के सामानों की पूर्ति कुछ तो वे स्वयं करते थे लेकिन अधिक मात्रा में उन्हें शहरों से खरीदना पड़ता था।

धार्मिक यात्री जो दूर-दूर से मन्दिर में पूजा-पाठ या दर्शन के लिए आते थे, बड़ी मात्रा में मन्दिरों को दान देते थे। इससे न केवल मन्दिरों को आर्थिक लाभ होता था बल्कि यातायात के साधनों का भी विकास हुआ और ये धार्मिक यात्री जो शहर के आसपास या दूर के गाँवों से आते थे अनेक नए रास्तों का निर्माण किया करते थे। कुशीनगर, कपिलवस्तु, सारनाथ, श्रावस्ती, वैशाली आदि शहर उसी के परिणाम थे। मथुरा को भी इस श्रेणी में रखा जा सकता है। इन नगरीय स्थलों ने अनेक प्रकार के धार्मिक विचारों का विकास किया। भिन्न-भिन्न क्षेत्रों से आए यात्री अनेक प्रकार के धार्मिक विचारों से प्रभावित होकर गाँव में इन धर्मों का बड़े पैमाने पर प्रचार एवं प्रसार करते रहते थे। इतना ही नहीं, गाँव से आने वाले इन धार्मिक यात्रियों को शहरों से अनेक प्रकार के अनुभव प्राप्त हुए जिसके परिणामस्वरूप उनका मानसिक विकास हुआ।

धार्मिक यात्रा के परिणामस्वरूप ही शहर और गाँवों के बीच धर्मशाला या सरायों या ठहरने के स्थानों का निर्माण हुआ जो गाँव या शहर में रहने वाले लोगों के द्वारा चन्दा इकट्ठा करके बनवाए गए या जिन्हें प्रशासन ने बनवाया। बहुत-सी सरायों का निर्माण तो अनेक प्रकार की धार्मिक संस्थाओं ने भी किया। व्यापारियों के द्वारा भी इनके निर्माण में काफी मदद की गई। ये धार्मिक सरायें प्रायः मुख्य सड़कों पर शहरों के नजदीक निर्मित की जाती थीं। बाद में चलकर इन सरायों में व्यापारियों एवं यात्रियों के ठहरने के कारण बहुत तरह की दुकाने खुल गईं। कुछ शिल्पकार भी यहाँ रहने लगे जो अपने सामान

को नए-नए यात्रियों के हाथ बँचा करते थे। इस तरह धीरे-धीरे स्थायी रूप से बसने वाले लोगों की संख्या बढ़ने लगी और एक प्रशासनिक संगठन का निर्माण आवश्यक हो गया। धीरे-धीरे नगरीय विशेषताएँ यहाँ विकसित हुईं। उदाहरण के लिए आधुनिक छपरा के पास चिरेंड नामक शहर को ले सकते हैं।

शिक्षा के कारण भी नगरों का निर्माण हुआ। बड़े-बड़े शैक्षणिक केन्द्र असंख्य विद्यार्थियों एवं शिक्षकों (जो खाद्य उत्पादन का कार्य नहीं करते थे) के रहने के कारण छोटे-छोटे शहरों के रूप में परिणत हो गए। इस श्रेणी में हम तक्षाशिला एवं काशी को रख सकते हैं जहाँ राजपरिवार के भी लड़के पढ़ने आते थे। सारनाथ भी बौद्ध विद्या का एक केन्द्र था। नालन्दा और विक्रमशिला को इस श्रेणी में रखा जा सकता है।

बड़े-बड़े भूमिपतियों ने शहर के विकास में मदद की। काफी धनी होने के कारण इन लोगों ने आरामदायक जिन्दगी बिताने के लिए शहरों में रहना शुरू किया। शहर में ही रहकर ये लोग गाँव की आर्थिक व्यवस्था का संचालन करते थे। अपने खेतों में प्रत्यक्ष रूप से काम न करके ये मजदूरों से काम करवाते थे। इस तरह भूमिपतियों के जाने से छोटे-छोटे शहरों का भी रूप विस्तृत होने लगा। शहरों में निवास कर रहे लोगों की भिन्न-भिन्न दृष्टिकोण से सेवा करने के लिए अनेक तरह के सेवकों जैसे माली, हजाम आदि की जरूरत पड़ी और इस तरह शहरी लोगों की संख्या बढ़ने लगी। रसोइया, घरेलू नौकर, व्यवितगत नौकर, गाने वाला आदि लोग शहर में पाए जाने लगे। ऐसे लोग अधिकांश संख्या में बड़े-बड़े नगरों, प्रशासनिक केन्द्रों एवं राजधानियों में रहते थे।

प्रशासनिक आवश्यकताओं के कारण शहरों का विकास हुआ। सामान्य तौर पर हम पाते हैं कि प्रशासनिक आवश्यकताओं के साथ-साथ ही शहरों का विकास आरम्भ हुआ। यह ठीक है कि शहरों के विकास में सबसे प्रमुख तत्व आर्थिक होता, लेकिन हम यह भी पाते हैं कि जब से प्रशासनिक व्यवस्था की आवश्यकता महसूस की जाने लगती है, शहरों का विकास होने लगता है। छठी शताब्दी ई.पू. में तो हम कई वैसे ही शहरों को पाते हैं जो मुख्य रूप से प्रशासनिक केन्द्र होते थे।

सुरक्षा की व्यवस्था ने नगरों के विकास में हाथ बँटाया। क्षेत्रीय सुरक्षा के लिए जब एक निश्चित स्थान पर काफी संख्या में सैनिक, लड़ाई के औजार एवं अन्य सुरक्षात्मक उपकरण रखे गए तथा उनकी देखभाल के लिए अधिकारियों की नियुक्ति की गई तो बाद में चलकर ऐसे स्थान शहर के रूप में परिणत हो गए।

युद्ध के कारण नए-नए शहर बने। युद्ध से सुरक्षा के लिए बड़े-बड़े स्थानों पर चारदीवारी और मजबूत किले बनाए गए तथा वहाँ पर बहुत से सैनिकों, अधिकारियों एवं राजाओं के आवास निर्मित हुए। बाद में ऐसे स्थान भी जिन्हें "स्कन्धावार" भी कहा जाता है, शहर के रूप में बदल गए। जिन क्षेत्रों में सिंचाई व्यवस्था अच्छे तरीके से की गई, वहाँ आवश्यकता से अधिक खाद्य सामग्री एवं कच्चे सामान पैदा किए गए। आवश्यकता से अधिक सामानों की बिक्री के लिए बहुत से गाँवों में से किसी एक गाँव को बहुत तरह की सुविधाओं को ध्यान में रखकर खरीद-बिक्री के केन्द्र के रूप में जब उसे स्थापित किया गया तो बाद में चलकर वह स्थान शहर के रूप में परिणत हो गया।

भौगोलिक दृष्टिकोण से जिन क्षेत्रों की भूमि काफी उपजाऊ रही एवं वर्षा सन्तोषप्रद रही और बाढ़ तथा सूखा से क्षति की सम्भावना नहीं रही वैसे क्षेत्रों में व्यापारिक एवं राजनीतिक नगरों का विकास तेजी से हुआ। व्यवितगत प्रयासों से भी नगरों का विकास हुआ। सिकन्दर ने अपने नाम पर शहर बसाया। कनिष्कपुर एवं हुष्कपुर नामक शहरों के निर्माता कुषाण राजा कनिष्क एवं हुविष्क थे।

निष्कर्ष : नया शहरीकरण एक शहरी आकारिकी आंदोलन है जो आवास और नौकरी के प्रकारों की एक विस्तृत श्रृंखला वाले चलने योग्य पड़ोस बनाकर पर्यावरण के अनुकूल आदतों को बढ़ावा देता है। यह संयुक्त राज्य अमेरिका में १९८० के दशक की शुरुआत में उभरा और धीरे-धीरे अचल संपत्ति विकास, शहरी नियोजन और नगरपालिका भूमि-उपयोग रणनीतियों के कई पहलुओं को प्रभावित किया है। नया शहरीकरण शहरी फैलाव और द्वितीय विश्व युद्ध के बाद के उपनगरीय विकास से जुड़ी बीमारियों को दूर करने का प्रयास करता है।

संदर्भ सूची :

1. बंसल, एस.सी. (१९८४) : "शहरी भूगोल", मीनाक्षी प्रकाशन, नई दिल्ली
2. दत्त. ए.के. और आर. अमीन, (१९८६) : "टो एंड ए टाइपोलॉजी ऑफ साउथ एशियन सिटीज" नेशनल ज्योग्राफिकल जर्नल ऑफ इंडिया, वॉल्यूम ३२, पीपी.३०-३९।
3. गुप्ता बी.एल., (१९८७) : "मार्केट मॉर्फोलॉजी ऑफ जयपुर" ए जियोग्राफिकल एनालिसिस ऑफ मेट्रोपोलिटन सिटी, (अप्रकाशित पीएच.डी. थीसिस) यूनिवर्सिटी ऑफ राजस्थान, जयपुर एच-७३
4. गुप्ता, वी.के. (१९८९) : "सर्विस सेंटर का अध्ययन" किशनगढ़ तहसील (अलवर)" (एक अप्रकाशित एम.ए. निबंध), राजस्थान विश्वविद्यालय।
5. गुप्ता, वी. के. (१९९०) : "ए स्टडी ऑफ अर्बन मॉर्फोलॉजी", (एक अप्रकाशित एम. फिल। निबंध), राजस्थान विश्वविद्यालय, जयपुर
6. गुप्ता वी.के. (१९९६) : "विकास केंद्रों का अध्ययन अलवर" (अप्रकाशित पीएच.डी. थीसिस) विश्वविद्यालय राजस्थान, जयपुर।
7. घोष, ए. (२००३), : "शहरी पर्यावरण प्रबंधन : स्थानीय सरकार और सामुदायिक कार्रवाई संकल्पना", प्रकाशन कंपनी, नई दिल्ली
8. गुप्ता, एस.पी. (२००८), : सांख्यिकीय विधि, सुल्तान एंड संस, नई दिल्ली
9. हार्ट जे.एफ. (१९९३) : "कार्य और व्यावसायिक संरचना" अमेरिकी दक्षिण के शहरों की अमेरिकी भूगोलवेत्ताओं का संघ खंड ४७, पीपी. २६९-२८६
10. जोशी, रतन (१९९७) : "शहरी भूगोल", राजस्थान हिंदी ग्रंथ अकादमी, जयपुर जैन अक्षित २००४, "टोंक सिटी ए स्टडी इन अर्बन" मॉर्फोलॉजी" (अप्रकाशित पीएच.डी. थीसिस) राजस्थान विश्वविद्यालय, जयपुर।
11. खत्री वी.के. (२००१), : "शहरीकरण के रुझान और बीकानेर की कार्यात्मक आकृति विज्ञान" (उन्न) प्रकाशित पीएच.डी. थीसिस) विश्वविद्यालय राजस्थान, जयपुर।
12. खंडाल आभा (२००१), : "भौगोलिक विश्लेषण : जयपुर शहर में आवास संबंधी समस्याएं" (उन प्रकाशित पीएच.डी. थीसिस) विश्वविद्यालय राजस्थान, जयपुर।
13. कटारिया मनोज (२००२), : "जल प्रदूषण और इसकी जयपुर शहरी में पर्यावरणीय प्रभाव" कॉम्प्लेक्स (अप्रकाशित पीएच.डी. थीसिस) राजस्थान विश्वविद्यालय, जयपुर।
14. कुंडू, अमिताभ (२००६), : "त्रिकोण और पैटर्न : शहरीकरण और उनके आर्थिक प्रभाव " इंडियन इंफ्रास्ट्रक्चर रिपोर्ट"
15. महालावत उर्मिला (१९९९), : "औद्योगिक विकास केंद्र : अलवर जिला एक तुलनात्मक विश्लेषण" प्रकाशित पीएच.डी. थीसिस) विश्वविद्यालय राजस्थान, जयपुर
16. निगम, आर. (१९९०). : "सांगानेर : ए स्टडी इन अर्बन" आकृति विज्ञान", (एक अप्रकाशित एम. ए. निबंध), राजस्थान विश्वविद्यालय
17. परिक रश्मी (२००२), : "अलवर सिटी स्टडी इन अर्बन" जियोमरफोलॉजी" (अप्रकाशित पीएच.डी. थीसिस) राजस्थान विश्वविद्यालय, जयपुर।
18. रायगर, ए.के. (२००७), : "शहरीकरण प्रक्रिया और संबंधित अलवर शहर के मुद्दे" (एक अप्रकाशित एम. फिल निबंध), एमडीएस विश्वविद्यालय, अजमेर
19. सेनगुप्ता एस. (१९८६), : "आवास का सीमांकन : अहमदाबाद शहर के उपनगर", राष्ट्रीय भौगोलिक जर्नल, टवस.३२, व. ४९-६०।
20. सिंह सुरेंद्र (१९९९), : "झुग्गी बस्तियों की पारिस्थितिक रूपरेखा" जयपुर सिटी" (एक अप्रकाशित पीएच.डी. थीसिस), राजस्थान विश्वविद्यालय, जयपुर।



“पाचवीच्या गाण्यातील आदिवासी कोकणांच्या धारणा व संस्कार”

डॉ. मधुचंद्र लक्ष्मण भुसारे

सहाय्यक प्राध्यापक, मराठी विभाग कला, शास्त्र व वाणिज्य महाविद्यालय, चोपडा, जि. जळगांव

Corresponding Author- डॉ. मधुचंद्र लक्ष्मण भुसारे

Email:- mbhusare014@gmail.com

DOI- 10.5281/zenodo.7295732

प्रस्तावना:

नाशिक जिल्ह्यातील आदिवासी भागांमध्ये आदिवासींचे असलेली संस्कृती वैविध्यपूर्ण आहे. महाराष्ट्रातील आदिवासींच्या एकूण ४७ जमाती वास्तव्य करताना आढळतात. परंतु या सर्व जमातींच्या संस्कृती, सण, उत्सव, परंपरा यामध्ये थोडा फार फरक असल्याचे जाणवते, म्हणूनच आदिवासी समाजामध्ये लहान मूल जन्माला आल्यावर त्याच्यावर पाच दिवसांनी केले जाणारे संस्कार, या संस्कारामधील धारणा यांचा विचार आजच्या संशोधकांनी अंधश्रद्धेच्या दृष्टिकोनातून न करता वैज्ञानिक दृष्टीची जोड देऊन केला तर आदिवासींची सुसंस्कारित मूल्य जगाच्या समोर येतील यात शंका नाही. म्हणूनच संशोधकाने या विषयाचा शोध घेण्याचे प्रस्तुत शोधनिबंधात ठरविले आहे.

संशोधन हेतू किंवा उद्दिष्टे:-

- १) आदिवासी संस्कृती व जीवन मूल्य यांचे समाजाला दर्शन घडविणे.
- २) आदिवासींच्या कालबाह्य होत चाललेल्या परंपरांचा अभ्यास करून त्यांना वैज्ञानिक दृष्टिकोनाच्या आधारावर तपासून पाहणे.
- ३) आदिवासींच्या मौखिक लोकगीतांना मधील असलेली मूल्य शोधून काढणे व त्यांचा परिचय समाजाला करून देणे.

संशोधन पद्धती:

सदर संशोधनासाठी अभ्यासकांने विश्लेषण, सर्वेक्षण तसेच मुलाखत या संशोधन पद्धतींचा आधार घेतलेला आहे. त्याबरोबरच विविध ग्रंथ, मासिके, साप्ताहिके यामध्ये प्रकाशित झालेले लेख यांचा आधार घेऊन सदर विषयाचे विश्लेषण करण्यात आलेले आहे.

विषय विवेचन:

आदिवासी भागात सहसा दवाखान्यात स्त्रिया बाळंतपण करण्यासाठी पूर्वी जात नव्हते. त्यांच्या घरी केल्या जाणाऱ्या उपचारावर जास्त विश्वास होता. आदिवासी भागात गरोदर स्त्री दवाखान्यात न

जाता सुयारीन डोसीच्या (बाळंतपण करणारी म्हातारी स्त्री) मार्गदर्शनाखाली घरीच बाळंतीण होतात. मुलगा झाल्यास तीन दिवसांनी व मुलगी झाल्यास पाच दिवसांनी जो विधीवत कार्यक्रम केला जातो त्याला आदिवासी भागात 'पाचवी' असे म्हणतात. या दिवशी सुपारीन एका सुपात तांदळाच्या साह्याने एका बाईचे चित्र काढते. या चित्रालाच सतीमाता अथवा सटवाई म्हणतात. त्या चित्राच्या बाजूला दोन पातेल्यात धान्य असते त्याला 'बाळाचे भरते' म्हणतात. सटवाईच्या पूजेबरोबर घरातील कुलदैवतांची विधीवत पूजा केली जाते. यानंतर मुख्य कार्यक्रमास सुरुवात होते. त्यावेळी एका नव्या वस्त्राची हिंदोळी (झोळी) केली जाते. ती झोळी दोन कुमारिका (वयात आलेल्या मुली) धरतात. त्या झोळीत नवजात बाळाला झोपवून सुयारीन डोसी एक रुपयांच्या नाण्याने कासाचे ताट वाजवते. त्यावेळी खालील पाचवीचे गीत म्हटले जाते.

सती माता कानी अवतार घेजो
चडया मुक्या दायिनी
चुकी माकी पदरी जो

सती माता आईस बलवली
 तर धावतच येजो
 बाहास बालवील तर
 धावतच येजो
 आजी आजोळ्या बलवतील
 धावत पळत येजो
 मामास बलवतील माम्यास बलवतील
 धावत पळत येजो
 मोठा बाहास बालविल मोठ्या आईस बालविल
 धावत पळत येजो
 चुलतास बालविल चुलत्यास बालविल
 धावतच येजो
 आजो गाजो मेहूनस बालविल
 बहिण्यास बलवतील धावतच येजो
 आजो गाजो फुयास बलवतील
 धावतच येजो
 आजो गाजो चावडी चवकडी जाजो
 ज्ञाना गेनाच्या गोष्टी ऐकजो
 आई वडीला सांगून दावजो
 आई वडीला सांगून जाजो
 आज गाजो पाटी पुस्तक घेजो
 साळत जाजो साळा शिकजो
 बँकचा सायब होजो
 आजो गाजो रानी शिवारी जाजो
 तेराच्या मुळी काखत घालजो
 आळवीच्या डगळा डोक्यावर घेजो
 इजलंल गरजल पक्का पळजो
 आजो गाजो हाराळीगत येली जाजो
 पिपळज खळाळजो कापूस फुलजो
 भोरा म्हातारा होजो
 हाती काठी धरून हिंडजो 2

येल मांडवालं न जो (संदर्भ-नाशिक जिल्ह्यातील
 आदिवासींचे लोकसाहित्य-लेखक- श्री देवदत्त
 चौधरी) या गाण्यात ओळीच्या शेवटी आलेले
 हिंडजो, फुलजो होजो जाजो, घालजो, होजो,
 शिकजो, दावजो, ऐकजो, येजो या शब्दांच्या शेवटी
 येणारा 'जो' हा प्रत्यय ११ व्या, १२ व्या शतकातील
 महानुभाव पंथाच्या वाङ्मयातील आहे, तो
 मिळताजुळता आहे. याचा अर्थ असा की, आदिवासी
 कोकणा समाजाची बोली ११ व्या, १२ व्या

डॉ. मधुचंद्र लक्ष्मण भुसारे

शतकाच्या अगोदर पासून प्रचलित असावी हे सिद्ध
 होते. या गीतातील सतीमाता ही स्त्री शक्तीचे प्रतीक
 आणि दुर्गा मातेचा अवतार मानली आहे. सती मातेने
 आपल्या पतीच्या मारेकऱ्यांना मारून बदला घेतला
 व आपली इच्छा पूर्ण केली. या सती मातेचे मंदिर
 भारतातील प्रसिद्ध मंदिरांपैकी आहे.^३ म्हणूनच या
 गीताच्या पहिल्या ओळीत 'सती माता कानी अवतार
 घेजो म्हणजेच वीर ते चे प्रतीक असलेली तसेच स्त्री
 शक्तीची शक्तीचे प्रतीक असलेली सती माता तिचा
 अवतारात जन्म घे, म्हणजे गुलामी सोसावे लागणार
 नाही, हे जन्मताच आदिवासी सूयेरीन जन्मत्या
 बाळाच्या कानात सांगते. 'चेड्या मुकी दायिनी चुकी
 माफी पदरी घेजो याचा अर्थ असा होतो की मोठेपणी
 आपल्या हातून चूक झाली तर माफी मागायला सुद्धा
 कधी विसरू नकोस तसेच दुसरा चुकला असेल तर
 त्याची चूक पदरात घेऊन त्याला माफ केले पाहिजे हे
 आदिवासी जगण्याचे तत्वज्ञान संत वचना समान
 श्रेष्ठ असल्याचे दिसून येते. पुढच्या ओळीत 'सती
 माता आईस बलवली तर धावतच येजो म्हणजेच
 आदिवासी संस्कृतीत प्रत्येक मातेला सती मातेचा
 दर्जा दिलेला दिसतो. आदिवासी संस्कृती पूर्वी
 मातृसत्ताक होती. आपल्या आईची आज्ञा जन्मभर
 पाळली पाहिजे हा महत्वपूर्ण संदेश या ओळीतून
 दिला आहे. त्याबरोबरच बहास बालविल तर
 धावतच येजो, आजी-आजोळ्या बलवतील
 धावतपळत येजो, मामास बलवतील, माम्यास
 बलवतील धावतपळत येजो, मोठा बाहास बलविल,
 मोठ्या आईस बलविल धावतपळत येजो, चुलतास
 बलविल चुलतीस बलवेल धावत येजो, आजो गाजो
 मेहुणस बलविल, बहिण्यास बलवतील धावतच
 येजो, आजो गाजो फुयास बलवतील धावतच येजो'
 याचा अर्थ असा की जन्माला आल्यानंतर आजी
 आजोबा, आई, वडील, मामा मामी, मोठा बाहास
 म्हणजे चुलता चुलती, मेहुना मेहुनी, बहिण व आत्या
 यापैकी कोणत्याही वडीलधाऱ्या माणसांनी आज्ञा
 केली असता ती आज्ञा आपण पाळली पाहिजे, हे
 आज्ञाधारकता शिकविणारे जीवंत उदाहरण

पाचवीच्या गीतात रेखाटलेले दिसते. त्यानंतरच्या ओळीत 'आजो गाजो चावडी चवकडी जाजो, ज्ञाना गेनाच्या गोष्टी ऐकजों म्हणजेच मोठे झाल्यावर चावडी किंवा सभा या ठिकाणी महत्वपूर्ण निर्णय होतात, सरकारी योजना किंवा इतर माहिती मिळते याविषयीचे ज्ञान ऐकले पाहिजे व त्या ज्ञानातून इतरांनाही वैचारिक दृष्ट्या सक्षम केले पाहिजे म्हणूनच खाली चार ओळीत आई वडिलांना या गोष्टी सांगितल्या पाहिजे म्हणजे त्या ऐकलेल्या गोष्टी आपल्या घरातल्या आई-वडिलांना शिकवायला हव्यात तसेच समाजातल्या लोकांना सुद्धा दोन ज्ञानाच्या गोष्टी सांगितल्या पाहिजेत हा महत्वपूर्ण उपदेश या ओळींमध्ये सांगितलेला आहे. ते पुढच्या ओळीत 'आजो गाजो पाटी पुस्तक घेजो, शाळत जाजो शाळा शिकजों' या ओळीत आदिवासी माणूस अज्ञान असल्यामुळे त्याचा फायदा इतर लोक घेतात त्याला फसवतात, म्हणून आदिवासी भागातील सुवेरीन तसेच आदिवासी भागातील जाणकार माणसे शिक्षणाचे महत्व जाणून असावी. आदिवासी माणसाने पाटी पुस्तक घेऊन शाळेत गेले पाहिजे. शाळा शिकली पाहिजे हा महत्वपूर्ण विचार गीतातून मांडलेला आहे. आदिवासी माणूस जंगल दऱ्याखोऱ्या डोंगर यांच्या सानिध्यात राहात असला तरी तसेच शहरापासून दूर असला तरी शिक्षणाचे महत्व जाणून होता ही गोष्ट विचार करण्यासारखी आहे. हा विचार आदिवासींना मागास समजणाऱ्यांना सणसणीत मारलेली चपराक वाटते. पुढच्या ओळीत 'बँकेचा साहेब होजो' आदिवासी भागातील बँकेमध्ये आदिवासी माणसे आपली जन्मभराची आर्थिक पुंजी जमा करून ठेवतात. त्याचं रक्षण करता आलं पाहिजे तसेच लोकांची निस्वार्थपणे सेवा करता आली पाहिजे. त्यांच्या पैशांचे प्रामाणिकपणे रक्षण करता आले पाहिजे म्हणूनच बँकेचा साहेब होण्याचा सल्ला कदाचित या गीतातून देण्यात आला आहे. 'आजो गाजो रानी शिवारी जाजो, तेऱ्यांच्या मुळी काखत घालजो' म्हणजेच आदिवासी माणसाची रीत ही आयुष्यभर सांभाळली पाहिजे. निसर्गाच्या सानिध्यात आदिवासी माणसाने नेहमीच फिरले पाहिजे. यामुळे त्याचे मन प्रसन्न राहते. पुढच्या

डॉ. मधुचंद्र लक्ष्मण भुसारे

ओळीत 'तेऱ्यांच्या मुळी काखत घालजो' याचा अर्थ आपला आदिवासी माणूस जंगलात उगवणारा तेरा या वनस्पतीचा उपयोग आहारात भाजी म्हणून करतो. 'तेऱ्यांच्या कंदात प्रामुख्याने कर्बोदके २१%, प्रथिने ३% तसेच कॅल्शियम व लोह असते. पानात व देठात अ, ब, क इत्यादी. जीवनसत्त्वे, कॅरोटीन, कॅल्शियम व लोह असते. कंदाचा रस रेचक असतो. पानात कॅल्शियम ऑक्झलेटचे स्फटिक असतात. हे स्फटिक सुईसारखे टोकदार असतात. भाजी खाताना हे स्फटिक घशाला घासले गेल्यास घसा खवखवतो. देठाचा रस रक्तस्तंभक, उत्तेजक व चर्मरक्तकर (कातडी लाल करणारा); कंदाचा रस चाईवर लावतात; कंद व पाने खाद्य असून भाजीकरिता वापरतात. तेरा वनस्पतींचे फायदे अनेक आहेत.

१. तेरा थंड असल्याने ते वात, पित्त, कफ नाशक असतात.४
२. अशक्तपणा दूर करण्यासाठी तेऱ्याची पाने ही प्रभावकारी ठरतात.
३. दूध कमी येत असल्यास बाळंत्तिणी महिलेने तेऱ्याच्या पानांची भाजी खावी.
४. तापामुळे जीभेची चव जाते. त्यामुळे कोणतंच अन्न चवीष्ट लागत नाही. पण तेऱ्याच्या पानामुळे चव परत येते.
५. तेऱ्याची पाने शरिरात रक्त वाढवण्यास मदत करतात. अशा या तेरा वनस्पतींचे फायदे आदिवासी माणूस जाणून असावा म्हणूनच 'तेऱ्यांच्या मुळी काखत घालजो' असे गीतातून म्हटले आहे. पुढे 'आवळीचा डगळा डोक्यावर घेजो, इजलल गरजल पक्का पळजों ही ओळ महत्वपूर्ण अशी आहे. आवळ्याचे बी एकच व त्रिधारी, ऑक्टोबर ते फेब्रुवारीत फळे पिकतात. त्याचे फळ तुरट, शीतल, मूत्रल (लघवी वाढविणारे) व सारक; वाळलेली फळे (आवळकाठी) अतिसार, रक्तस्त्राव व आमांश यांवर उपयुक्त; लोहाबरोबर ही फळे कावीळ, रक्तक्षय, अग्निमांदा इत्यादींवर देतात. हिरडा व बेहडा यांच्या फळांच्या सालीबरोबर आवळकाठीची पूड मिसळून 'त्रिफळा चूर्ण' बनवितात. त्याची फुले थंड व

सारक; मूळ आणि साल तुरट, बिया दमा, श्वसन नलिका दाह व पित्ताधिक्यावर उपयुक्त; फळात कजीवनसत्व भरपूर व ते स्कहीं या विकारावर गुणकारी असते. सालीत, पानात व फळात टॅनीन भरपूर असते. त्याचा उपयोग चामडी कमाविण्यास होतो. आवळा (फळ) उपयुक्त खाद्य आहे. त्यापासून लोणचे, वडी, मुरंबा (मोरावळा), सुपारी इ. करतात. इमारतीच्या बांधकामात किरकोळ उपयोगासाठी लाकूड वापरतात; शेतीची अवजारे व सरपण यांसाठीही उपयुक्त, पाला व फळे जनावरे खातात. पानांपासून तपकिरी पिवळे रंगद्रव्य निघते. आदिम धर्मात आवळी पूजनीय मानली आहे. मुळे काविळीवर, पाने व मुळांचे चूर्ण गळवे व व्रण यांवर गुणकारी पाने दीपक (भूक वाढविणारी); चीक जखमांवर लावतात. आमांशावर कोवळ्या फांद्यांचा फांट (काढा) देतात. पानांत फायलॅथीन नावाचे कटुद्रव्य असते. ते बेडूक व माशांना विषारी असते.५ अशा 'आवळ्याची फांदी डोक्यावर घेजो म्हटले आहे. याचा अर्थ आवळा हा विज प्रतिरोधक वनस्पती असावी, यामुळे विजेपासून रक्षण करण्यासाठीच ही वनस्पती जवळ ठेवण्याचा महत्त्वपूर्ण सल्ला दिला आहे. प्रत्येक माणूस विजेपासून रक्षण करण्यासाठी बचावात्मक पवित्रा घेतो तसाच विजेपासून रक्षण करण्यासाठी डोक्यावर आळवेचा डगळा घेऊन दूर पळून जाण्याचा सल्ला दिला आहे. 'आजो गाजो हाराळी गत येली जाजो म्हणजेच हाराळी सारखा सदैव हिरवागार राहा व आपली वेल जशी वाढतच उंच जाते तशी प्रगती करित राहा हा महत्त्वपूर्ण संदेश दिला आहे. 'पिंपळज खळाळजो' याचा अर्थ पिंपळ पानांची जशी शांत सळसळ असते त्याप्रमाणे या जीवनातील संकटांवर मात करून शांतपणे धावत पळत व वाहत राहा असा सल्ला दिला आहे. पिंपळ हे भारतीय उपखंडातील वृक्ष आहे.... या वृक्षाला भरपूर आयुष्य असते म्हणून याला 'अक्षय' वृक्ष असे म्हणतात. ज्या वृक्षाखाली बसले असताना गौतम बुद्धांना ज्ञानप्राप्ती झाली त्या विशिष्ट वृक्षाला बोधिवृक्ष म्हणजेच 'ज्ञानाचा वृक्ष' म्हटले जाते. हा वृक्ष बिहारमधील बोधगया येथे आहे. पाने

डॉ. मधुचंद्र लक्ष्मण भुसारे

हृदयाकार, लांब देठाची, कोवळी असताना गुलाबी, तांबूस नंतर हिरव्या रंगाची, आणि वाऱ्याबरोबर सतत हलणारी, सळसळणारी, डोळ्यांना, कानांना सुखावणारी असतात. अग्रस्थ अंकुर, उपपर्णांनी झाकलेला, उपपर्णे लांबट तांबूस-गुलाबी असतात. हिरव्या रंगाची फुले, अतिशय लहान आकाराच्या गडूसारखी दिसतात याचे पुष्पाशय (फळासारखा दिसणारा भाग) पानाचा देठ आणि फांदी यामध्ये आणि फांदीवर येतो. पुष्पाशय सुरुवातीला हिरवा तर नंतर जांभळा होतो. यामध्ये तीन पाकळ्यांची नरपुष्पे व पाच पाकळ्यांची मादीपुष्पे असतात. यावर सतत कीटक बसतात. याची खरी फळे अतिशय लहान नळीच्या आकाराची असतात. ही पिकलेली फळे पक्ष्यांना खूप आवडतात. ही फळे पचण्यास कठीण असतात. न पचलेल्या फळांच्या बिया, पक्ष्यांच्या विष्टेमार्फत इतरत्र पडून सहज उगवतात. वृक्ष भोवतालचे वातावरण शुद्ध करतो. याचमुळे याला पवित्र ठरविले असावे. पिंपळाच्या झाडापासून 'लाख' बनवितात. याच्या औषधाने व्रण बरे करतात. उदरशूल व पोटाचे अन्य विकार यावर पिंपळाच्या फळांचा वापर करतात. याच्या सालींचा काढा पौष्टिक व शक्तिवर्धक असतो. पिंपळाच्या सालीपासून लाल रंग तयार होतो. बौद्ध भिक्खू या रंगाने आपले वस्त्र रंगवतात. हडाप्पा आणि मोहोजेदाडोच्या उत्खननात सापडलेल्या नाण्यांवर पिंपळाच्या पानाच्या आकृती आहेत.६ पिंपळाला भारतीय समाजात मानाचे व पूजनीय स्थान आहे. पिंपळ हा पुष्य नक्षत्राचा आराध्यवृक्ष आहे. गौतम बुद्धांनी बिहार मधील बोधगया येथे एका पिंपळाच्या झाडाखाली ध्यान केले असता, त्यांना ज्ञानप्राप्ती झाली. तेव्हापासून याला बोधिवृक्ष असे म्हणू लागले. म्हणूनच आदिवासी या पिंपळ वृक्षाचे महत्त्व जाणत असावा हेही आवर्जून उल्लेख करावा लागेल. 'कापूस फुलजो म्हणजे कापसासारखे पांढरे केस होऊन म्हातारा हो असे म्हटले आहे. म्हणजेच कापूस हा पांढरा शुभ्र असतो. आदिवासी माणसांने आपलं म्हातारपण कदाचित कापसासारखं हळवं आणि निर्मळ, शुभ्र अंतःकरणाने घालविले पाहिजे

असा जणू सल्ला दिला आहे असे जाणवते. 'कापूस या वनस्पतीच्या बोंडातून मिळणाऱ्या पांढऱ्या शुभ्र तंतूमय भागालाही कापूस असे म्हणतात. कापासाच्या रानटी अवस्थेतील काही जाती उष्ण प्रदेशांत आढळत असल्याने तो मूलतः उष्णदेशीय असावा असे मानतात.... ३००० वर्षांपूर्वी भारतात कापूस लागवडीत होता असे दिसते. वस्त्रप्रावरणाच्या निर्मितीकरिता लागणाऱ्या वनस्पतिज धाग्यासाठी उपयुक्त असलेली कापूस ही एक वनस्पती आहे. या वनस्पतीच्या बोंडातून मिळणाऱ्या पांढऱ्या शुभ्र तंतूमय भागालाही कापूस असे म्हणतात. कापासाच्या रानटी अवस्थेतील काही जाती उष्ण प्रदेशांत आढळत असल्याने तो मूलतः उष्णदेशीय असावा असे मानतात.७ याचा अर्थ 3000 वर्षांपूर्वी उत्पादन केली जाणारी कापूस या वनस्पतीच्या संदर्भात आदिवासी जाणून होते असं म्हणावं लागेल. 'हाती काठी धरून हिंडजो, येल मांडवालं न जो म्हणजेच कितीही म्हातारा झाला, कापसावानी केस पिकले तरीही हातात काठी तरी घेऊन हिंडत फिरत राहिले पाहिजे त्यामुळे अवयव शाबूत राहतात. माणूस त्यामुळे निरोगी राहतो. हा साधा पण तेवढाच प्रभावी असा तंदुरुस्त राहण्याचा फार्म्युला आदिवासींना माहिती असावा असेही समजते. वरील गीतांमधून आदिवासी भागांमध्ये जन्मलेले नवजात बालक या बालकाच्या बारशाच्या दिवशी म्हणजेच पाचवीच्या दिवशी मुलगा किंवा मुलगी यांच्या कानात जणू काही वरील गाण्याच्या रूपाने जगण्याचा प्रभावी मंत्र फुंकण्याचा प्रयत्न सुयेरीन करित आहे. आदिवासी भागातील सुयेरीन ही पृथ्वीतलावावरील पहिली विना प्रशिक्षित पण अनुभवी डॉक्टर म्हणावी लागेल. म्हणून आदिवासी गीते तेवढीच प्रभावी आणि जीवनाच्या दृष्टीने सर्वोच्च तत्वज्ञान शिकविणारी अशी आहेत. हे आजच्या संशोधक पिढीने अभ्यासाच्या माध्यमातून जाणून घ्यायला हवे ही अपेक्षा व्यक्त करतो.

संदर्भ ग्रंथ:

१) चौधरी देवदत्त, नाशिक जिल्ह्यातील आदिवासींचे लोकसाहित्य, मेधा पब्लिसिंग हाऊस, अमरावती

२) तत्रैव

डॉ. मधुचंद्र लक्ष्मण भुसारे

३) <https://www.google.com/search>

४) <https://mr.vikaspedia.in/health/>

५) तत्रैव

६) <https://www.google.com/search?>

७) <https://www.google.com/url?sa=t&source=web&rct=j&url=https://mr.vikaspedia.in/rural-energy/environment/91c94893593593f93593f92792493e-93592893894d92a924940/91593e92a942938&ved=2ahUKewjp1Lnzy0D1hUdT GwGHQKYAPQQFnoECDoQAQ&usg=AOvVaw1rlIdeXN9hWOnrxdrainWII>



पर्यटन रोजगार, विकास की संभावनाएँ नीतियाँ एवं सुझाव (बिलासपुर संभाग के सन्दर्भ में)

श्रीमति सपना नामदेव

पी.एच.डी शोधार्थी ' श्रीमति सपना नामदेव, सामाजिक विज्ञान विभाग(भूगोल), डॉ. सी.वी.रामन् विश्वविद्यालय
करगी रोड कोटा, बिलासपुर (छत्तीसगढ़)

Corresponding Author- श्रीमति सपना नामदेव

Email:- dhanrajnamdeon32@gmail.com

DOI - 10.5281/zenodo.7295750

शोध-संराश

पर्यटन से क्षेत्र विशेष के लोगों को समाजिक एवं आर्थिक लाभ होता है, और उनका जीवन स्तर ऊचा उठता है। यह उन क्षेत्रों में भी विकास का मार्ग प्रशस्त करता है। जहाँ अन्य आर्थिक गतिविधियों की गुंजाईश कम होती है। पर्यटन की दृष्टि से बिलासपुर के पर्यटन स्थलों का विकास संभव है। विशेष कर ऐसे स्थल जो अविकसित हैं उन पर भी विशेष ध्यान दिया जा रहा है। बिलासपुर के ऐतिहासिक प्राकृतिक एवं वन्य अभ्यारण आदि धरोहरो का संक्षण समस्या समाधान और उन्हें सरकारी योजनाओं सेवाओं सुनिश्चित कराने हेतु तथा पर्यटन के द्वारा रोजगार के अवसर प्राप्त कराने एवं पर्यावरण संरक्षण को बढ़ावा देने के लिए सरकार की नीतियों, योजनाओं आदि की जानकारी दी गई है। पर्यटन विकास की संभावना संबंधी उद्देश्यों की पूर्ति के लिए पर्यटन नीति बनाना एवं योजना तैयार करना प्रमुख कार्य है। भारत सरकार की पर्यटन नीति एवं छत्तीसगढ़ सरकार की पर्यटन नीति नियोजन के क्षेत्रों विशेष चरणों एवं विकास की क्रिया और अविकसित क्षेत्रों के विकास कार्यक्रमों का उल्लेख किया गया है।

शब्द संकेत- पर्यटन रोजगार, विकास की संभावनाएँ नीतियाँ एवं सुझाव।

प्रस्तावना -

पर्यटक की दृष्टि से पर्यटन जहाँ, आराम, मनोरंजन, रीति-रिवाजों संस्कृतियों आदि की विवेचना करने वाले शब्द में से एक सुन्दर शब्द है, लेकिन इसका अर्थ आनन्द और मनोरंजन के साधन के साथ-साथ रोजगार, व्यवसाय, उद्योग आदि से भी संबंधित है। पर्यटन ही एक मात्र ऐसा माध्यम जिसमें पूँजीपति, प्रबन्धक, कुशल एवं अकुशल श्रमिक, नर्तक, संजीतज्ञ, कवि और अन्य कई वर्गों को रोजगार मिला हुआ है, और आगे रोजगार की संभावनाएँ भी हैं। पर्यटन के प्रमुख विख्यात क्षेत्रों में छत्तीसगढ़ के अनेक स्थल आते हैं उन्हीं स्थलों में बिलासपुर संभाग के भी कई धार्मिक, प्राकृतिक, ऐतिहासिक पर्यटन स्थल हैं जो रोजगार के अवसर प्राप्त करा सकते हैं। हमें बिलासपुर संभाग के प्रत्येक जिले की आर्थिक सहायता पा सकती है, बिलासपुर संभाग के राजनांदगाँव, मुंगेली, रायगढ़ गौरैला, पेंडा, मरवाही, जाँजगीर, चाँपा यहाँ की संस्कृति और

कई मनमोहक पर्यटन स्थल हैं। जिनमें से कुछ का विकास हो गया है, परन्तु किन्ही उदीयमान पर्यटन स्थलों का विकास अभी विकासशील है। इनके विकास की तरफ उठाए गए सरकार, राज्य सरकार एवं केन्द्र सरकार के कदम से असीम रोजगार की संभावनाएँ प्राप्त हो सकती हैं। छत्तीसगढ़ एक ऐसा राज्य है, जहाँ पर्यटन में रोजगार की अपार संभावनाएँ हैं। इनके प्रत्येक जिले अपने में ऐसी कई खूबियों को समेटे हैं कि पर्यटक इनकी सैर करने से खुद को रोक नहीं पाते।

अध्ययन के उद्देश्य -

- (१) अध्ययन क्षेत्र में पर्यटन रोजगार विकास एवं संभावनाओं का अध्ययन करना।
- (२) छत्तीसगढ़ के पर्यटन क्षेत्रों एवं विशेष रूप से बिलासपुर के विकास के लिए नीतिगत सुझाव प्रस्तुत करना।

(3) पर्यटन के स्थिति को उत्तम बनाने के लिए शासकीय प्रयासों का विश्लेषण करना।

शोध परिकल्पना -

इस अध्ययन के लिए निम्नांकित परिकल्पनाओं का निर्माण किया गया है।

- (1) छत्तीसगढ़ में पर्यटन रोजगार विकास एवं संभावनाओं को ज्ञात करना।
- (2) छत्तीसगढ़ में पर्यटन क्षेत्र के विकास के लिए नीतिगत सुझाव प्रस्तुत करना।
- (3) पर्यटन के स्थिति को उत्तम बनाने के लिए शासकीय प्रयासों का विश्लेषण करना।

शोध विधि तंत्र :-

प्रस्तुत अध्ययन में अवलोकनात्मक व विश्लेषणात्मक विधि तंत्रों का प्रयोग करते हुए सर्वप्रथम क्षेत्रीय भ्रमण कर अवलोकन के आधार पर सरकारी नीति योजनाओं का अध्ययन विश्लेषण के आधार पर रूप रेखा तैयार किया गया।

रोजगार की क्या है बेहतर सम्भावनाएँ : हमारे प्राचीन अभिलेखों तथा ग्रंथों में भी लिख है कि हमें प्राकृति के साक्ष्य दर्शन या मन को शांत करने के लिए भ्रमण के लिए अकेले या अपने परिवार के साथ घूमना जरूरी है। इसमें न सिर्फ आपको खुशियाँ मिलती हैं। अपितु अपने देश, राष्ट्र, राज्य, क्षेत्र आदि की संस्कृति, रीतिरिवाजों, परम्पराओं के बारे में भी ज्ञात होता है। बिलासपुर संभाग भौगोलिक दृष्टि से अत्यन्त मनोरम पर्यटन स्थल में प्राप्त करते हैं, जैसे उँचे पहाड़, हरे-भरे वनाच्छिन्न क्षेत्र, धार्मिक मन्दिरों, ऐतिहासिक पुरात्व आदि के दर्शन हमें भ्रमण के उपरान्त ही प्राप्त होते हैं। पर्यटन से न केवल आनंद ही प्राप्त होता है। बल्कि कई लोगों को रोजगार भी प्राप्त होता है। आपके एडवेंचर और एवसाइटमेंट में उन लोगों को भी आगे बढ़ने का मौका मिलता है। जिनके लिए पर्यटन आय का साधन है या फिर आय का साधन हो सकता है। ट्रेनर, गाइड से लेकर हर ऑपरेटर, टूरिस्ट डेस्टिनेशन पर बने मार्केट में काम करने वाले लोग, जो आपकी यात्रा को सुखद व यादगार बनाने में लगे हुए हैं। यहाँ काम करने वाले स्थानीय लोगों के ही कौशल श्रम ही राज्य की सांस्कृतिक विरासत को बचाए हुए हैं, जरूरत हो तो बस इन्हें पहचान दिलाने की इसके प्रचार प्रसार की। पर्यटक रोजगार को ध्यान में रखते

श्रीमति सपना नामदेव

हुए संयुक्त राष्ट्र विश्व पर्यटन संगठन (UNWTO) ने 29 सितम्बर 2019 में मनाए जाने वाले पर्यटन दिवस की थीम 'पर्यटन एवं रोजगार' सभी के लिए बेहतर भविष्य रखी थी इस समारोह में पर्यटन द्वारा रोजगार पैदा करने की क्षमता और इसकी संभावनाओं पर विशेष रूप से चर्चा की गई है।

पर्यटन द्वारा रोजगार : भारत ही नहीं बल्कि पूरा विश्व पर्यटन की ओर उम्मीद भरी नजरों से देख रहा है। क्योंकि पर्यटन में प्रत्यक्ष व अप्रत्यक्ष रूप से लाखों लोगों को रोजगार देने की क्षमता है। वर्ल्ड ट्रेवल एण्ड टूरिज्म काउंसिल के आँकड़े बताते हैं कि 2019 में पर्यटन द्वारा 8 करोड़ से अधिक रोजगार मिले दुनिया की लगभग 10.8% का योगदान है। अनुमान है कि 2028 तक रोजगार का यह आँकड़ा बढ़कर 80 करोड़ तक पहुँच जाएगा। इससे यह स्पष्ट होता है कि ट्रेवल इंडस्ट्री की दुनिया की लगभग 29% हिस्सेदारी होगी इतना ही नहीं केवल भारत में 2028 तक पर्यटन के क्षेत्र में 1 करोड़ लोगों को रोजगार देने की स्थिति में होगा। यह आँकड़े हमें इशारा करते हैं कि पर्यटन के क्षेत्र में कितनी अपार संभावनाएँ और अवसर हैं। यही वजह है कि देश के एवं विश्व के अन्य देश भी पर्यटन को बढ़ावा देने की कोशिश में लगे हुए हैं।

वर्तमान में पर्यटन विभाग की कोशिश टूरिस्ट को उन जगहों की ओर खींचना है, जिनके बारे में या तो कम लोग जानते हैं या फिर जहाँ पर सुविधाओं के अभाव के कारण पर्यटक नहीं पहुँच पाते हैं। इस कड़ी में बिलासपुर संभाग के कई क्षेत्र आते हैं।

पर्यटन रोजगार से जुड़ी चुनौतियाँ : पर्यटन का संबंध कई क्षेत्रों में होता है। इसमें युवाओं, से लेकर महिलाओं और गरीबों के लिए रोजगार की संभावनाएँ हैं। पर्यटन क्षेत्र न केवल आर्थिक मजबूती का साधन है बल्कि समाज के गरीबी हटाने का एक प्रभावी तरीका है, स्थानीय लोगों को उनके क्षेत्र में पर्यटन के विकास से लाभ हो और इसके लिए हमें कौशल के विकास पर ध्यान देने की जरूरत है। हालांकि रोजगार के विषय में ध्यान देते समय हमें इस बात का ख्याल रखना चाहिए कि हमारी पर्यटन संबंधी जो भी योजनाएँ हो वो पर्यावरण के अनुकूल हो। इससे पर्यावरण

पर नकारात्मक प्रभाव कम से कम पड़े साधनों का इस्तमाल करते समय हमें वहाँ की संस्कृति और विरासत का भी ख्याल रखना जरूरी है।

पर्यटन की दृष्टि से बिलासपुर संभाग में पर्यटन विकास रोजगार व संभावनाएँ निम्नांकित है :

बिलासपुर संभाग में पर्यटन विकास से संबंधित महत्वपूर्ण कार्य किए जा रहे हैं ऐसे कई पर्यटन स्थल जो अविकसित हैं, उन पर भी विशेष ध्यान दिया जा रहा है। बिलासपुर की ऐतिहासिक धरोहरों का संरक्षण समस्या का समाधान और उन्हें सरकारी योजनाओं, सेवाओं और सुविधाओं का लाभ सुनिश्चित कराने का प्रयत्न किया जा रहा है। पौराणिक मंदिरों का संरक्षण आदि।

बिलासपुर एक मात्र ऐसा जिला है, जहाँ जल, थल आदि पर्यटक के मन को मोह लेने वाली कृतियाँ हैं जैसे व्यासगुफा, रुकमणि कुंड, ऐतिहासिक किले, कोलबांध, गोंविद सागर जैसी झीले भी हैं, इन सबको पर्यटन की दृष्टि से विकसित करना आवश्यक है। बिलासपुर पर्यटन मानचित्र में अपने अनमोल धरोहर के रूप में विशिष्ट स्थान प्राप्त कर सकता है। अलग पहचान बना सकता है। पर्यटन से जिले के लोगों खास कर युवाओं के लिए रोजगार के अवसर भी सृजित होंगे और होते जा रहे हैं।





छत्तीसगढ़ में पर्यटन विकास की असीम संभावनाएँ : पर्यटन के विभिन्न आयामों पर कार्य करने के लिए छत्तीसगढ़ सरकार ने कुछ दिशा निर्देश दिए हैं। इसी क्रम में पर्यटन स्थल ग्रामीण इलाकों में स्थित है। छत्तीसगढ़ शासन

श्रीमति सपना नामदेव

पर्यटन विकास के साथ ही ग्रामीण पर्यटन पर आधारित विकास कार्य भी कर रही है। जिसके अंतर्गत 'इको एथनिक रिसोर्ट' का लोकार्पण मुख्यमंत्री भूपेश बघेल द्वारा किया गया है। इन रिजॉर्ट्स को ग्रामीण परिवेश के अनुरूप ढाला

गया है, ताकि पर्यटकों को उच्च स्तरीय सुविधा के साथ जनजातीय समुदाय के जीवन शैली को अनुभव प्राप्त हो सके। किसी भी राज्य के आर्थिक विकास में पर्यटन का विशेष भूमिका होता है। छत्तीसगढ़ सरकार ने लॉकडाउन के दौरान भी पर्यटन क्षेत्र को विकसित करने का हर संभव प्रयास किया है।

पर्यटन नीति : पर्यटन के सभी उद्देश्यों को ध्यान में रखते हुए प्रदेश में पर्यटन नीति (२०२०) तैयार की गई है। इस पर्यटन नीति के तहत मुख्य रूप से छत्तीसगढ़ में पर्यटन विकास के साथ-साथ (१) स्थानीय लोगों को रोजगार प्रदान करना।

- (२) ग्रामीण पर्यटन का विकास करना।
- (३) स्थानीय लोगों को गाइड ट्रेनिंग प्रोग्राम के तहत पर्यटन उद्योग से जोड़ना। ताकि पर्यटन विकास के सार्थक परिणाम मिल सके।
- (४) पर्यटकों के लिए होमस्टे की योजना पर कार्य किया जा रहा है। ताकि ग्रामीण अंचल और जनजाति समुदाय की जीवन शैली, परिवेश और स्थानीय खानपान से पर्यटकों को अनुभव प्राप्त हो सके।
- (५) राज्य शासन की योजना राम वन गमन पर्यटन परिपथ निर्माण के प्रथम चरण में ९ स्थलों का चयन कर विकास कार्य हेतु ४ स्थलों का डी.पी.आर. तैयार किया गया।
- (६) भगवान राम के ननिहाल चंद्रखुरी में विकास कार्य प्रारंभ किया जा चुका है।
- (७) सिरपुर को बुद्धस्त सर्किट के रूप में विकसित किए जाने की तैयारी की जा रही है।
- (८) ग्रामीण संस्कृति, रहन-सहन, खानपान और पर्यटन को बढ़ावा देने के लिए ट्राइबल, टूरिज्म सर्किट के तहत पराठा की सुविधाएँ उपलब्ध कराने की तैयारी की गई।
- (९) स्थानीय लोगों को रोजगार के अवसर देने के लिए वाटर टूरिज्म और एडवेंचर टूरिज्म की गाइड लाईन की तैयारी की गई जिसके तहत मुरुमसिल्ली डैम धमतरी, हसदेव बागों डैम सतरेंगा-कोरबा, संजय गाँधी जलाशय, खुटाघाट, रतनपुर, गंगरेल धमतरी सरोधा डैम, कबीर धाम, कोडार डैम रायपुर, समोधा बैराज रायपुर, दुधावा डैम

श्रीमति सपना नामदेव

कांकेर में वाटर टूरिज्म के विकास की पर्याप्त संभावनाएँ हैं।

- (१०) राज्य के कूज टूरिज्म को बढ़ावा देने के लिए बोट्स और कूज के वेंडर की योजना बनाई गई।
- (११) पर्यटकों को छत्तीसगढ़ की लोक कला और संस्कृति के बारे में ज्ञान प्राप्त करना।
- (१२) छत्तीसगढ़ पर्यटन मंडल द्वारा भारत सरकार पर्यटन मंत्रालय की श्वेदेश दर्शन योजना के तहत कुरदर जिला बिलासपुर में ट्रायबल टूरिज्म सर्किट में निर्मित इको टूरिज्म रिसॉर्ट का संचालन प्रारंभ हो गया।
- (१३) छत्तीसगढ़ पर्यटन मंडल के द्वारा बिलासपुर संभाग में ४०, रायपुर संभाग में ३५, दुर्ग संभाग में २३, सरगुजा संभाग में १७ और बस्तर संभाग में १३ पर्यटन स्थल चिन्हित किया गया है।

पर्यटन विकास के सुझाव : पर्यटन विकास हेतु पर्यटन सुझाव प्रस्तुत किया जा सकता है।

- (१) कम ज्ञात पर्यटक स्थलों का विकास करना।
- (२) पर्यटन स्थलों के सड़क के किनारों सुविधाओं में वृद्धि करना।
- (३) आतिथ्य उद्योग के क्षमता निर्माण हेतु सुनियारी ढाँचा तैयार किया जाये।
- (४) अपने क्षेत्रों की यात्रा करने हेतु लोगों को प्रोत्साहित करना।
- (५) परिवहन व्यवस्था को सुनियोजित करना ।
- (६) स्थानीय लोगों द्वारा पर्यटकों को सहयोग करना।
- (७) पर्यटकों को सुरक्षा हेतु पुलिस सुरक्षा बल प्रदान करनी चाहिए।
- (८) पर्यटक स्थलों को पर्यटन मानचित्रों पर प्रचार करने को बढ़ावा देना।

सन्दर्भित ग्रंथ :

1. त्रिपाठी, के.पी. चंद्राकर (२०००) छत्तीसगढ़ एटलस, रॉयल प्रिंटिंग, बिलासपुर
2. पर्यटन नीति, (२००२) पर्यटन मंत्रालय, नई दिल्ली, सरकार
3. दास गुप्ता पापिया २००४ पर्यटन का अध्ययन मध्यांचल प्रकाशन प्रा.लि. भोपाल।
4. गुप्ता, महावीर प्रसाद एवं कुमार २००५ छत्तीसगढ़ पर्यटन एवं उसकी संभावनाएँ एक



"कृषी आणि जल संसाधन व्यवस्थापन "

सहा. प्रा .) कुमारे लक्ष्मण नागोराव¹ (सहा.प्रा.) अशोक प्रबती कांबळे²

डॉ पतंगराव कदम आर्ट्स अँड कॉमर्स कॉलेज पेन जिल्हा रायगड Pin 402107

समाजभूषण गणपतराव काळभोर महाविद्यालय लोणी काळभोर जिल्हा पुणे

Corresponding Author- सहा. प्रा .) कुमारे लक्ष्मण नागोराव¹

Email:- sbashture@gmail.comDOI

DOI- 10.5281/zenodo.7295782

गोषवारा

जल स्रोत कृषी विकासाचा प्रमुख घटक आहे.परंतु या जलस्रोतांचं योग्य व्यवस्थापन होत नाही यामध्ये भारतातील सिंचनाशी संबंधित समर्पक विषयावर चर्चा करतो . कृषीच्या सिंचनाच्या संबंधी ज्या समस्या आहेत त्या समस्यावर मात करण्यासाठी ध्येय आणि धोरण आणि व्यवस्थापन यावर सुद्धा एक दृष्टीक्षेप टाकलेला आहे.मुख्यता कृषी विकास हा सिंचनाशी निगडित आहे. प्रशासकीय धोरणे सहकार्य समन्वय आणि नियोजन यांच्या वर चर्चा करण्यात आलेली आहे.मुख्यतः कृषी विकासाठी जलस्रोत याची प्रमुख महत्त्वाची आणि निर्णय भूमिका आहे. त्यावर मात करणे हे एक मोठा आव्हान आहे .कृषीच्या विकासासाठी जलस्रोत विकास हा महत्त्वाचा आहे. भविष्यातील पाणी संकटावर मात करण्यासाठी उपलब्ध पाण्याचा काटकसरीने वापर करणे त्यासाठी पाण्याचा प्रत्येक थेंब अडून जमिनीत जिरविणे. कारण शेती , पाणी , मानवी जीवन यांचा अतिशय जवळचा संबंध आहे

प्रस्तावना ;

भारतामध्ये शेती आणि शेतकरी हा अर्थव्यवस्थेचा कणा म्हणून ओळखला जातो .कृषीविकास हा प्रामुख्याने पाऊसावर अवलंबून आहे.सिंचनाची क्षमता बहुतांश ठिकाणी आहे. योग्य व्यवस्थापन नसल्यामुळे पूर्ण क्षमता त्या ठिकाणी वापरली जात नाही. पाणी हे जमिनीपेक्षाही अधिक मौल्यवान आहे”, मान्सून योग्य झाला तर कृषी विकास योग्य होतो आणि मान्सून जर अपुरा झाला तर कृषी विकासवर प्रतिकूल परिणाम पडते.वास्तविकता अशी आहे की समस्या किंवा आव्हान म्हणजे अपुरा पाऊस नसून त्याचे एक अयोग्य व्यवस्थापन आहे समस्या पाण्याची कमतरता नसून त्याचे एक खराब व्यवस्थापन आहे, म्हणजे.पावसाचे संवर्धन केले तर त्या समस्येवर मात करता येते.आपल्या देशात 183 दशलक्ष हेक्टर जमीन शेती योग्य आहे.त्याचबरोबर 115.6 दशलक्ष शेतकरी शेती करतात आणि 400 दशलक्ष वार्षिक पर्जन्यमान आहे हे शेतीसाठी अनुकूल आहे त्या ठिकाणी योग्य पिकाची लागवड करता येते

देशातील एकूण लोकसंख्येपैकी 58% लोकसंख्या शेतीवर प्रत्यक्ष आणि अप्रत्यक्ष उदरनिर्वाह करते विशेषता देशात गरीब शेतकरी दारिद्र्य आणि कर्ज उपासमारीच्या माध्यमातून जगत असतात जर ग्रामीण गरिबी किंवा उपासमारी कर्जबाजारी बेरोजगारी यावर मात करायचा असेल तर सिंचनाची महत्त्वाची आणि उपयोगी भूमिका आहे साठी योग्य सिंचनाचे तंत्र वापरले पाहिजे विशेष करून भूजल पातळीत वाढ करून भूपृष्ठावरील पाणी त्याचे योग्य नियोजन करून व्यवस्थापनाच्या माध्यमातून गरिबी कमी करता येते उच्च उत्पन्नाची पातळी वाढते प्रती कुटुंबाची उत्पन्न पातळी वाढ होते.जसे की स्केअर पद्धतीचावापर केला तर असे दिसून आले की जशी प्रगती होते गरीबीतून प्रगती कडे वाटचाल होते तसेच दारिद्र्यापासून उच्च पातळीपर्यंत ते सिंचनाची उपलब्धता आणि सुलभता चांगल्या स्थितीत येते आणि याचा परिणाम पायाभूत सुविधांच्या विकासावर होतो सिंचनाचा अधिक वापर केला तर कुटुंबाची सरासरी उत्पन्न पातळी दुप्पट होते आणि हे

प्रमाण आजही भारतीय शेती पावसाच्या लहरीपणावर अवलंबून आहे .पाणी व्यवस्थापनाच्या माध्यमातून समस्या सोडवण्यासाठी. किफायतशीर नियोजनबद्ध पाणी व्यवस्थापन परिस्थितीला अनुकूल पद्धत अवलंबिली पाहिजे

शासनातर्फे "जलवर्ष"माध्यमातून लोकांना सतर्क करता येते तसेच सामान्य संकट आणि कृषी क्षेत्रातील समकालीन आव्हाने आहेत अपुरा पाऊस पडत आहे कोरडा दुष्काळ परिणामी अन्नधान्याची मागणी वाढत आहे जमिनी पडीत राहण्याची प्रमाण दिसून येत आहे.पाण्याची वाढती मागणी निर्माण होत आहे त्या समस्यावर मात करण्यासाठी पाणी व्यवस्थापन आणि साठवणूक क्षमता , वितरण क्षमता गुणवत्तेची क्षमता तिहेरी पाणी व्यवस्थापन समस्या दिसून येत आहे

सध्या भूतलावर जलस्रोत संकट ग्रस्त आहेत आणि भविष्यात हे जर संपले तर सजीवांचे अस्तित्व यावर प्रतिकूल परिणाम होईल सांगायचं तात्पर्य आज; आपण पाणी वाचविले नाही तर उद्या पाणी आपल्याला वाचविणार नाही. म्हणूनच जल म्हणजे जीवन पाणी जर नसेल तर सजीव सृष्टी ही अस्तित्वात असणार नाही हवामानाच्या सतत बदलत्या परिस्थितीनुसार पाणी दिवसेंदिवस कमी होत चालले . निसर्गाने दिलेले संकेत जल नियोजन आणि व्यवस्थापन करण्याची काळाची गरज आहे. कृषी उत्पादकता वाढविण्यासाठी शेती क्षेत्र सिंचनाखाली आणणे त्यासाठी तांत्रिक आर्थिक सामाजिक आणि पर्यावरण विषयक बाबीमुळे सिंचनाचे नवीन जल स्रोत निर्माण करणे यामध्ये मर्यादा आहे त्यामुळे उपलब्ध असेल सिंचनाच्या आणि पाण्याचा अधिक कार्यक्षमपणे वापर करणे याकडे लक्ष दिले पाहिजे या संपूर्ण देशालाच एकंदरीत आधुनिक सिंचन पद्धतीचा जसे तुषार सिंचन पद्धत वापर करून व शेतीत नवीन तंत्राचा समावेश करणे या सिंचन मुळे शेती क्षेत्रात एक योग्य आराखडा तयार करणे. त्यामुळे या तंत्राचा जर वापर केला तर ठिंबक आणि तुषार सिंचन पद्धतीचे नियोजन करूनअनुकूल पीक आराखडा तयार करून हवामानाचे नियोजन करून जमिनीचे नियोजन करून आधुनिक पद्धतीत आणि प्रभावी पद्धतीने पाणी किती आणि केव्हा योग्य आणि तंतोतंत आवश्यक पद्धतीने नियोजनबद्ध

आधुनिक तंत्र विकसित असलेल्या माध्यमातून नव्या तंत्राच्या माध्यमातून शेतकऱ्यांना पाण्याची काटेकोर व्यवस्थापन करता येणे शक्य आहे .पीकास पाणी किती आणि केव्हा द्यावेसाठी महत्वाच्या विविध सिंचन पद्धतीद्वारे पाणी हवे तेथे उपलब्ध असलेल्या परिस्थितीनुसार कार्यक्षमतेनुसार पाण्याची गरज आणि भौगोलिक प्रणालीचा वापर करून पाण्याची गरज निश्चित करता येते एखाद्याला अत्यंत अचूक सिंचन प्रमाण ठरवायचे असेल तर सध्याच्या वेळेनुसार शेतकऱ्यांनी हवामानाची परिस्थिती आधारित अनुकूल सिंचन व्यवस्थापन करता येते.त्याचबरोबर जमिनीचा ओलावा मोजण्याच्या पद्धतीनुसार पिक वाढीची अवस्था प्रमाण किती. केव्हा पाणी असे एक संवेदन मापक प्रणालीचा वापर आवश्यक ठरते. पाणी व्यवस्थापनाच्या संदर्भात अत्याधुनिक तंत्रज्ञानाची जोड कुठल्याही भूपृष्ठावरपिकाच्या सध्या परिस्थितीत पाण्याचा ताण पडला जातो त्यानुसार काटकसरीने पाणी व्यवस्थापन करण्याचं तंत्र विकसित केले . जल व्यवस्थापनाच्या नवीन दिशांचे परीक्षण केले पाहिजे.

शोधनिबंधाचीउद्दिष्टे

- 1) भारतीय शेती क्षेत्रासमोरील असलेली समस्या याचा अभ्यास करणे
- 2)सिंचन विकास हा योग्य जल व्यवस्थापनावर अवलंबून असते
- 3)कार्यक्षम जल व्यवस्थापन याचा मूल्यमापन करणे

शोधनिबंधाची ग्रहीतके-

- 1) भारतीय कृषिक्षेत्राचा विकास हा जलस्रोत निगडित आहे
- 2) कृषी विकास जल स्रोत यांचा सहसंबंध आहे
- 3)कृषी विकास आणि जलस्रोत याचा विकास हा सरकारी खाजगी सहकारी ध्येयधोरणासी संबंधित आहे .
- 4)जल व्यवस्थापनपरिणामकारकता ही कृषी विकासआहे
- 5)जल स्रोताच योग्य व्यवस्थापन झाले तर शेती समृद्ध होईल त्याचबरोबर देश समृद्ध होईल.

संशोधन पद्धती

संशोधनाचा अभ्यास हा प्रामुख्याने प्राथमिक आणि दितीय सामग्रीवर आधारित असून यामध्ये प्राथमिक स्रोतत्रामध्ये अवलोकन,. निरीक्षण, हे असून दितीय सामग्री मध्ये पुस्तके

लेख वर्तमानपत्रे याचाही आधार घेतला आहे .

कृषी विकास जल संसाधन संकल्पना आणि महत्त्व

कृषी विकास व जल संसाधन याचा भारतीय अर्थव्यवस्थेचा याचा जवळचा संबंध आहे पाऊस हा जनस्रोताचा प्रमुख घटक आहे अनिमित पाऊस हा जमिनीतील पाण्याची खालावत जाणारी चिंता आणि भविष्यातील वाढती पाण्याची मागणी चाहूल असल्याचे दिसून येते यासाठी पावसाचा प्रत्येक थेंब आडून जल स्रोतांचा विकास करणे जलयुक्त शिवार योजना पाणी आडवा पाणी जिरवा नदीजोड प्रकल्प धरणे ओडे नद्या यातील गाळ उपसून त्याचे स्रोत पुनर्जीवित करणे हे जल विकास संसाधनाचा मुख्य स्रोत पाऊस असल्याने कृषी विकासाला अनुकूलताकरणे विशेषता नदी , ओढे नाले विहिरी धरणे यांचा विकास होण्यासाठी पावसाच्या प्रत्येक थेंब पाणी आडवा आणि पाणी जिरवा याच्या माध्यमातून वाया न घालवता उपयोगात आणणे यांच्या माध्यमातून जल स्रोतांचा विकास करणे जेणेकरून शेतीचा विकास आणि भारतीय कृषी विकास विकसित करणे

मानवी संस्कृती मुळातच जलाभोवती उदय आणि विकसित झाली बदलत्या परिस्थितीनुसार एक समस्या आणि दुष्काळ अशी परिस्थिती असल्यामुळे मानवाला मिळालेले विनामूल्य संपत्ती म्हणजे पाणी आज काटकसरी नियोजन आणि पर्याप्त वापर करणे गरजेचे आहे परंतु आज इजराइल सारख्या देशाचे उदाहरण इतर देशाने अनुकरण करायला हवं कारण त्यांनी अपुऱ्या पावसाचे पाणी असूनही योग्य व्यवस्थापन केल्यामुळे शेतीत क्रांती घडवून आणली भारतामध्ये सुद्धा अशीच परिस्थिती विकसित करण्याची आवश्यकता आहे भारतात प्रचंड पावसाचे प्रमाण असून परंतु पाण्याचे योग्य व्यवस्थापन होत नसल्यामुळे उन्हाळ्यामध्ये पिण्याच्या पाण्याची टंचाई भेडसावते ही समस्या सोडवण्यासाठी जल व्यवस्थापन करणे गरजेचे वाटते.

जल व्यवस्थापन म्हणजे काय ? " पाणी याचा मुख्य स्रोत पाऊस असतो म्हणून पाण्याचे जतन आणि संवर्धन संरक्षण करण्यासाठी विकासाची आणि उपयुक्त वाढविण्यासाठी पाण्याची केलेले व्यवस्थापन म्हणजे जलविकास होय " किंवा" उपलब्ध पाण्याचा अपव्यय टाळणे म्हणजेच जल "

जलसंधारण ? जलसंवर्धन हे पाण्याचा कार्यक्षमतेने वापर करून त्याचा अपव्यय किंवा अनावश्यक वापर कमी करण्याचे तंत्र आहे. ताजे, स्वच्छ पाणी हे आता मर्यादित स्रोत मानले जात असल्याने,

जलसंधारण महत्त्वाचे आणि अत्यावश्यक बनले आहे.

- 1)पाणी वाटप विषम असल्यामुळेभारतात मोठ्या भागात पावसाची तसेच भूजलाची कमतरता आहे
- 2)असमान वाटपामुळे देशात बहुतांश भागात लोकसंख्येला पाणीटंचाईची समस्या आहे
- 3)ग्रामीण भागापेक्षा शहरी भागात पाण्याची गरज उपलब्ध पेक्षा जास्त आहे
- 4)भारतात पाणी मोसमी असल्यानेशेतींना सिंचनाची आवश्यकता असते पाणी पर्यावरण आणि वन्य जीवन या सजीव सृष्टीचे रक्षण करते
- 5)पाणी बचत केली तर ऊर्जेची बचत होते म्हणजेच पाणी आणि ऊर्जा याचा कार्यक्षम वापर करून पाण्याचा वापर कमी करू शकतो आणि ऊर्जाही बचत करू शकतो

कृषी विकास आणि जल संसाधनांच्या विकासासाठी उपाय
भारतीय शेती क्षेत्र हे भूजल आणि भूपृष्ठावरील जल या दोन्ही जलाचा प्रमुख स्रोत पाऊस आहे आणि या पावसावर कृषी विकास अवलंबून . दुर्मिळ नैसर्गिक साधनसंपत्ती अर्थात पाणी हे जीवनासाठी अत्यावश्यक आहे. जीवनमान, अन्न सुरक्षा आणि शाश्वत विकासासाठी पाणी ही मूलभूत गोष्ट आहे. भारत हा जगातील सर्वाधिक पाणी-आव्हान असलेल्या देशांपैकी एक देश आहे. जगापैकी 18 टक्के लोकसंख्या भारतात आहे परंतु 4% जलस्रोत भारतात आहेत. भारतातील 90% पाणी शेतीसाठी वापरले जाते आणि हे प्रमाण जागतिक सरासरीच्या 70 टक्क्यांपेक्षा जास्त आहे. वाढती लोकसंख्या आणि अकार्यक्षम पूर सिंचनाचा पारंपरिक वापर यामुळे भूजल पातळी ही गेल्या काही वर्षांमध्ये घसरलेली आहेत.पाणी वापरासाठीच्या पाण्याची टंचाई, पिण्याच्या पाण्याच्या समस्या या देशातील विविध भागात दिवसेंदिवस वाढत आहेत. सर्व आर्थिक क्षेत्रांत, शेती हाच एक असा भाग आहे जिथे पाणी टंचाईचा मोठा परिणाम दिसून येतो. भारत हा भूजलाचा प्रमाणापेक्षा जास्त वापर आणि प्रदूषण यांसारख्या संकटाकडे वेगाने झुकत आहे. हवामानात होणारे तीव्र बदल, तीव्र बदलाची

सातत्याने होणारी पुनरावृत्ती आणि इतर हवामानविषयक बदल दर्शवणारे घटक यामुळे या संकटांचा सामाना करावा लागत आहे. कोरडे हवामान आणि मुसळधार पाऊस यामुळे भूजल पुन्हा भरून काढण्यात अडथळा येत आहे.कोरडी विहीर, धरणे ,नद्या नाले जलाशय स्रोतसंपूर्ण देशात भूजलामध्ये झालेली घट यातून दिसून येते.

सिंचनासाठी पाण्याचा अयोग्य वापर

भारतात एकूण जलस्रोतापैकी 25 टक्के पाण्याचा वापर हा तांदळाचे उत्पादन घेण्यासाठी केला जातो. परंतु केवळ तांदूळ पीक हेच याला जबाबदार नाही.तर ,ऊस उसाबरोबरच खरीप आणि रब्बी पिकासाठी सुद्धापाण्याचा वापर केला जातो. भारत हा जगातील सर्वात अकार्यक्षम शेती उत्पादकांपैकी एक आहे. आणि सर्व प्रमुख पिके जसं, गहू, ऊस, कापूस यांसाठी इथे मोठ्या प्रमाणात पाण्याचा वापर केला जातो. . वाढत्या लोकसंख्येच्या देशातपाणी अपुरे दुर्दैवी आहे.पाणी उपसा या स्रोताच्या निरीक्षणातून भूजल उपसा हा एक चिंतनाचा विषय आहे कारण वेगाने उपसा होत आहे आणि घटत्या स्वरूपात साठवण होत आहे पावसाचं नूतनीकरण जल स्रोताचा अपेक्षित आहे कारण कृषी उत्पादन मोठ्या प्रमाणात पावसावर अवलंबून आहे2014 15 मध्ये मान्सून मध्ये 12 टक्के घट झाल्यामुळे अन्नधान्याच्या उत्पादनात घट झाली शेतीसाठी पाणीपुरवठा आवश्यक असल्यामुळे पाणीटंचाईला समोर जावे लागते त्यासाठी जल स्रोताच नूतनीकरण कार्यक्षम सिंचन पद्धती आत्मसात करावी लागेलसूक्ष्म सिंचन प्रणालीतंत्र वाढवावी लागेल कारण 45 टक्के भारतात सिंचन आहे140 दशलक्ष हेक्टर साठी जमिनीसाठी अपुरे पडत आहे 4 दशलक्ष हेक्टर ठिंबक सिंचन प्रमाण आहे पण देशात याच क्षमता 70 टक्के आहे तेवढी आपण वापरू शकत नाही हे दुर्दैवी आहे. तुषार सिंचन , ठिंबक सिंचन , पूर सिंचन 30 ते 40 टक्के पाणी बचत करू शकतोते 40/50 टक्के कृषी उत्पादन वाढू शकतो भारतामध्ये खऱ्या अर्थाने 2004 मध्ये सूक्ष्म सिंचनाला सुरुवात झाली तर त्यात दिवसेंदिवस वाढ करणे अपेक्षित आहे

समारोप ;कृषी विकास मध्ये अमुलाग्र बदल घडवून आणण्यासाठी जल संसाधनाचे महत्त्वाची भूमिका आहे.जलसंधारण म्हणजे पाण्याची बचत करणे आणि

अनावश्यक अपव्यय कमी करणेपाणीटंचाई जगभरातील एक गंभीर समस्या आहे शहरांमधील पाणी संपले आणि जलाशय कोरडे पडलेयाचा गंभीर परिणाम जगभरातील देशासमोर आहे भारतामध्येजवळपास 20 शहरामध्ये भूजल संपेल चिंता किंवा भीती ही परिस्थिती टाळण्याचा एकमेव उपाय म्हणजेच जलसंधारण सार्वत्रिक पद्धतीचा अवलंब करणे यांची कृती घराघरात करता येईल जलसंवर्धन वैयक्तिक पातळीवर करून मार्गदर्शन आवश्यक आहे त्यासाठी एक देशव्यापी जलसंधारण मोहीम तळागाळातील जलसंधारणाला प्रोत्साहन देण्यासाठी नागरिकांच्या माध्यमातून सुरु करावी लागेल मान्सूनपूर्व पावसाच्या पावसाळयाच्या काळात भारतातील सर्वच जिल्हा, ग्रामीण ,शहरी भागातही जलसंधारण आणि पावसाच्या पाण्याची साठवण संरचनेची निर्मिती आणि देखभाल पारंपारिक तसेच नूतनीकरण पद्धतीने बोरवेल चा पुनर्वापर पुनर्भरणा पाणलोट विकास वनीकरण यावर लक्ष केंद्रित करावे लागेल आणि जलाशय प्रकल्प हा बंधारे बांधणे सिंचन प्रणाली पारंपारिक जलस्रोताचे नूतनीकरण करण्यावर भर देण्याची गरज आहे .पाण्याची पातळी पारंपारिक पद्धतीने जलसंवर्धन पाण्याची साठवणूक वाढती जागरूकता शेतकऱ्यांचाआणि स्थानिकांच्या पाठिंबाने मोहिमेच्या माध्यमातून त्याचबरोबर महात्मा गांधी राष्ट्रीय रोजगार हमी योजना अंतर्गत जलसंधारणाच्या पद्धती कुठे आणि कोणत्या प्रकारात विविध पद्धती त्रास न होता मोठ्या प्रमाणात बचत केली जाऊ शकते . रेन वॉटर हार्वेस्टिंग हे नैसर्गिक पाण्याची बचत भूजल आणि पातळी एक अतिशय प्रभावी पद्धत आहे या जलसंधारणाच्या पद्धतीने पावसाचे पाणी गोळा करून खोल खड्ड्यात किंवा जलाशयात जाते जेणेकरून जमिनीत जिरपले जाऊन भूजल पातळी सुधारते त्याचबरोबर पाणी मीटर संकल्पना पाण्याचा अपव्य टाळण्यासाठी एक कार्यक्षम मार्ग म्हणजे पाणी मीटर स्थापित करा निवासी आणि व्यावसायिक इमारतीमध्ये वापरला जाणाऱ्या पाण्याचे प्रमाण . हे मोजले तर पाण्याची किमतीनुसारदर आकारले जाणारे उच्च दर बिलाचे निरीक्षण करून गळती शोधण्यासाठी मदत ठरू शकते

संदर्भ ग्रंथ सूची -

- 1)-भारतीय अर्थव्यवस्था वसुंधरा पुरोहित खांदेवाले(जून 2008 औरंगाबाद प्रकाशन)
- 2)भारतीय आर्थिक पर्यावरण (प्रगती प्रकाशन पुणे 2019)
- 3)kurisi jgaran com.
- 4) w.w.w.bbc. com

5)लोकराज्य जुलै 2017.

6)महाराष्ट्रशासनसिंचनदर्शकअहवाल20-11

7)महाराष्ट्रातील जलसंपदा प्रा. डॉ.एस. व्ही डमढेरे. डायमंड पब्लिकेशन पुणे 2009

8) water and related statistics 2015



भारत में समावेशी शिक्षा – एक मूल्यांकन

डॉ. राजेश मौर्य

सहा. प्रा. अर्थशास्त्र शास. नेहरू महा. वि. सबलगढ़
Corresponding Author- डॉ. राजेश मौर्य

Email:- dr.rajeshmourya@gmail.com

DOI- 10.5281/zenodo.7295796

सार –

साधारण शब्दों में समावेशी शिक्षा का मतलब उस शिक्षा से है, जो समाज के बहिष्कृत सीमांत तथा विकलांग व्यक्तियों को शिक्षा प्रदान करने का कार्य किया जाता है। जैसा कि जे.डी. सिंह ने अपने लेख में स्पष्ट किया है कि समावेशी शिक्षा में समावेशन की प्रक्रिया एक शैक्षिक दृष्टिकोण तथा दर्शन है, जो सभी प्रकार के विद्यार्थियों को एक समान रूप से शिक्षा प्रदान करती है।

भारत ने अपनी आजादी के बाद से देश के सीमांत वंचित तथा विकलांग विद्यार्थियों के लिये एक समान शिक्षा के अवसर प्रदान करने के लिये समावेशी शिक्षा की अवधारणा को अपनाया था, हालांकि स्वतंत्रता के पूर्व ही सन १९८० के दशक में समावेशी शिक्षा का कार्य आरंभ हो चुका था। इसके तहत सन १८८५ में बॉम्बे (मुम्बई) में नेत्रहीनों एवं श्रवण बाधितों के लिये स्कूल, अमृतसर में सन १८८७ में नेत्रहीनों के लिये विद्यालय आदि स्थापित हो चुके थे, लेकिन समावेशी शिक्षा पर वास्तविक कार्य भारतीय स्वतंत्रता के बाद सन १९७४ में केन्द्र द्वारा विकलांग विद्यार्थियों के लिये लागू की गयी योजना थी। उसके बाद सन १९८० में विकलांग पुर्नवास योजना, संविधान संशोधन (८६) के तहत संसद द्वारा पारित अधिनियम २००२, जो ६ वर्ष से १४ वर्ष तक के सभी बच्चों को शिक्षा प्रदान करने का मौलिक अधिकार देता है, आदि, परन्तु इन सब संभावनाओं के बावजूद एक विधान के रूप में या व्यवस्थित व क्रमबद्ध रूप से समावेशी शिक्षा पर कार्य राष्ट्रीय शिक्षा नीति सन १९८६ से प्राप्त होता है, क्योंकि इसमें विकलांग विद्यार्थियों या विशेष आवश्यकता वाले विद्यार्थियों के लिये मुफ्त एवं अनिवार्य शिक्षा प्रदान करने का निर्णय लिया गया था।

हालांकि भारत में समावेशी शिक्षा का आरंभ १८८० से हो चुका था, परन्तु फिर भी इसमें उस गति से प्रगति दर्ज नहीं हुयी थी, जिस गति से होना चाहिये था। इसका कारण देश के आम नागरिकों से लेकर समाज के प्रभुत्वशाली लोगों तक विकलांग व्यक्तियों या युवाओं के साथ दुर्व्यवहार एवं उपहास करना था। प्राचीन भारतीय परम्पराओं, रूढ़ियों, पंथाओं व लोगों की दकियानूसी सोच या विचारधारा के कारण यह संभव नहीं हो पाया था। जैसा कि संजीव कुमार तथा स्वागेन्द्र कुमार ने अपने लेख में उल्लेख किया है कि भारत में सन १९९० तक ४ से १६ वर्ष की आयु के लगभग ४० मिलियन विकलांग विद्यार्थी (युवा) के लगभग ९०: विद्यार्थी मुख्यधारा की शिक्षा से वंचित थे अर्थात् केवल १०: विद्यार्थी ही मुख्य धारा की शिक्षा प्राप्त कर रहे थे। इसके लिये कौन जिम्मेदार है, मेरे ख्याल से सरकार के साथ-साथ उनके माता-पिता भी जिम्मेदार रहे हैं। भारत में अकसर यह देखा गया है कि विकलांग बच्चों या युवाओं के माता-पिता उनकी शिक्षा के प्रति उदासीन हैं, क्योंकि उनका मानना है कि ऐसे (विकलांग) विद्यार्थियों के लिये कोई विद्यालय ही नहीं है, जबकि दूसरी तरफ भारत सरकार ने विकलांग विद्यार्थियों के लिये जिन विद्यालयों व महाविद्यालयों की स्थापना की है, वे कई प्रकार की समस्याओं, जैसे:— विशेष योग्यता प्राप्त शिक्षकों का अभाव, शिक्षकों में अध्ययन अध्यापन के प्रति अरुचि, उनके लिये पर्याप्त प्रशिक्षण संस्थानों का अभाव आदि परन्तु इस बात से भी इंकार नहीं किया जा सकता है कि भारत सरकार ने कोई भी प्रयास नहीं किये हैं। मुम्बई में राष्ट्रीय विकलांग संस्थान, राष्ट्रीय आर्थोपेडिक संस्थान कोलकाता, राष्ट्रीय दृष्टिहीन विकलांग संस्थान आदि सरकार द्वारा स्थापित किये गये हैं।

उक्त शोध पत्र समावेशी शिक्षा (विकलांग विद्यार्थियों) से संबंधित है। जिसमें हम यह जानने का प्रयास करेंगे कि इस हेतु भारत सरकार ने क्या-क्या कदम उठाये? क्या इस प्रकार की शिक्षा के विकलांग व्यक्तियों या युवाओं का सामाजिक-आर्थिक शैक्षणिक विकास हुआ है? आदि।

मुख्य बिन्दु:— समावेशी शिक्षा, ऐतिहासिक दृष्टिकोण, भारत सरकार द्वारा उठाये गये कदम।

प्रस्तावना:—

सामान्य शब्दों में समावेशी शिक्षा दो शब्दों से मिलकर बना है। समावेश (समावेशन) + शिक्षा, यहाँ समावेश का अभिप्राय सम्पूर्ण या सभी को शामिल करने से है, जबकि शिक्षा वह है, जो व्यक्तियों या बच्चों या युवाओं को अंधकार से उजाले की ओर ले जाती है, चूँकि यहाँ शिक्षा का प्रयोग समस्त या सभी प्रकार के बच्चों के लिये किया गया है, इसलिये समावेशी शिक्षा का मतलब हुआ, सभी वर्ग या शिक्षा से वंचित या कमजोर वर्गों के बच्चों या फिर ऐसे बच्चे, जो हाशिये पर हैं या किसी न किसी शारीरिक बीमारी (मूक, बधिर, नेत्रहीन, विकलांग) से पीड़ित हैं, को सामान्य या आम बच्चों की तरह शिक्षा प्रदान करने से है।

भारत में समावेशी शिक्षा को विशेष आवश्यकता वाले बच्चों, अक्षमताओं वाले बच्चों या फिर सीखने की कठिनाईयों वाले बच्चों के संदर्भ में देखा जाता है। यह एक प्रकार से नया दृष्टिकोण या सोच है, जो यह स्पष्ट करता है कि किसी भी प्रकार का बच्चा, चाहे वह हाशिये पर हो या फिर शारीरिक रूप से कमजोर अर्थात् विकलांग, सभी को एक समान रूप से शिक्षा अर्जित करने का अधिकार है। **जे.डी. सिंह (२०१६) के अनुसार —** “समावेशी शिक्षा में समावेशन एक शैक्षिक दृष्टिकोण तथा दर्शन है, जो सभी प्रकार के विद्यार्थियों को सामाजिक उपलब्धि एवं अधिक से अधिक शैक्षणिक अवसर प्रदान करने का कार्य करता है।” जिसमें खेल कूद, मनोरंजन, पाठ्येत्तर गतिविधियाँ, संगीत, बच्चे की देखभाल आदि सभी गतिविधियाँ शामिल हैं।

भारत ने अपनी आजादी के बाद अर्थात् सन १९४७ में देश में शिक्षा के स्तर को बढ़ाने के लिये अनेक प्रकार की नीतियाँ पारित की थी, लेकिन समावेशी शिक्षा, जिसमें विकलांग बच्चे शामिल हैं, पर कोई भी ध्यान नहीं दिया गया था। जिससे देश के बच्चों (विकलांग) का एक बड़ा हिस्सा वंचित रह गया था, इसलिये भारत सरकार ने सन १९४७ में विकलांग बच्चों

के लिये एक एकीकृत शिक्षा की योजना पारित की थी।^३ जिसका मुख्य उद्देश्य देश के विकलांग बच्चों को प्रारंभिक स्तर पर शिक्षा प्रदान करना था। इसी स्वतंत्रता अवधि के दौरान **कोठारी आयोग** ने विकलांग बच्चों को शिक्षित करने के महत्व पर प्रकाश डाला था।^३ लेकिन एक विधान के रूप में समावेशी शिक्षा की पहल **राष्ट्रीय शिक्षा नीति सन १९८६ से मानी गयी थी।**^४ जिसमें देश के विकलांग बच्चों के लिये लक्ष्य निर्धारित किये तथा एक समान शैक्षिक भागीदारी के साथ उनके (विकलांग) सामान्य विकास तथा साहस व आत्मविश्वास के साथ जीवन यापन करने के लिये सक्षम बनाया था।

समावेशी शिक्षा के संबंध में देश की वर्तमान कालीन प्रगति के अन्तर्गत अनिवार्य एवं मुफ्त शिक्षा का अधिकार है, जिसमें ऐसे बच्चे जिनकी उम्र ६ से १४ वर्ष तक की आयु में हैं, अनिवार्य एवं मुफ्त शिक्षा की गारंटी प्रदान करती है।

ऐतिहासिक पृष्ठभूमि:—

भारत में जब हम समावेशी शिक्षा के ऐतिहासिक परिदृश्य पर दृष्टि डालते हैं, तो हमें ज्ञात होता है कि भारतीय स्वतंत्रता से पूर्व ही समावेशी शिक्षा पर काम आरंभ हो गया था। उस समय इसे विशेष शिक्षा या विकलांग बच्चों की शिक्षा का नाम दिया गया था और यह दशक था सन १८८०, जो कि समावेशी शिक्षा के शुरुआत का दशक माना जाता है। सन १८८५ में **बॉम्बे (मुम्बई)** में नेत्रहीन तथा श्रवण बाधित बच्चों के लिये पहला स्कूल स्थापित किया गया था।^५ इसके बाद सन १८८७ में अमृतसर में नेत्रहीनों के लिये एक स्कूल स्थापित किया गया था, हालाँकि विकलांग (नेत्रहीन, श्रवण बाधित, मूक) बच्चों के लिये स्कूल स्तर पर वातावरण कायम करने तथा पर्याप्त शिक्षकों की कमी के कारण देश के लिये सवालियों के घरे थी, परन्तु फिर भी देश में समावेशी शिक्षा हेतु शिक्षण संस्थानों की संख्या में धीरे-धीरे वृद्धि की स्थिति दर्ज की

गयी थी, जिसके परिणामस्वरूप जब भारत आजाद हुआ अर्थात् १५ अगस्त सन १९४७ में नेत्रहीनों, बधिरों तथा मानसिक रूप से मंद बुद्धि वालों के लिये क्रमशः ३२, ३० व ३ की संख्या में स्कूलों की संख्या में वृद्धि हुयी थी।^६ लेकिन फिर भी समावेशी शिक्षा को लेकर कुछ कमी महसूस की जा रही थी अर्थात् केन्द्रीय सरकार की ओर से कुछ भी प्रयास नहीं किया गया था इसलिये सन १९७४ में समावेशी शिक्षा के अन्तर्गत विकलांग विद्यार्थियों के लिये एक केन्द्र प्रायोजित योजना आरंभ की गयी जिसका मुख्य उद्देश्य सामान्य स्कूलों के विद्यार्थियों के समान विकलांग बच्चों को भी शिक्षा हेतु अवसर प्रदान करना था।^७

सन १९८० में भारत सरकार के कल्याण मंत्रालय द्वारा विकलांग पुनर्वास नाम की योजना संचालित की थी। जिसका कार्य मानव संसाधन द्वारा पारित किये गये कार्यक्रमों की निगरानी तथा विनियमन करना था।^८ आपको ज्ञात होना चाहिये कि जब २६ नवम्बर १९४९ में भारतीय लोकतांत्रिक पद्धति के आधार पर संविधान लागू हुआ तो संविधान में स्पष्ट रूप से उल्लेख है कि शिक्षा के मामले में सभी (सम्पूर्ण बच्चों) को समानता का अवसर प्रदान किया जाना चाहिये। भारतीय संविधान का अनुच्छेद ४१ तथा ४३(१४) क्रमशः यह स्पष्ट करते हैं कि सभी बच्चों को शिक्षा, काम एवं ६ से १४ वर्ष के सभी बच्चों को मुफ्त व अनिवार्य शिक्षा देने का आह्वान करता है।^९ इसके (समावेशी) लिये संविधान में संशोधन भी किये गये। जिसके तहत पहला संशोधन (८६वां संशोधन) करके संसद द्वारा अधिनियम २००२ लागू किया गया। जिसमें स्पष्ट रूप से उल्लेख है कि देश के ऐसे बच्चे जिनकी आयु ६ से १४ वर्ष तक है, सभी बच्चों को शिक्षा प्राप्त करने हेतु उनको (बच्चों) मौलिक अधिकार प्रदान करता है,^{१०} परन्तु समावेशी शिक्षा हेतु वास्तविक व व्यवस्थित कार्य राष्ट्रीय शिक्षा नीति १९८६ से लगाया जा सकता है। जिसमें निम्न बिन्दु शामिल किये गये थे, जैसे:- विकलांग बच्चों को सामान्य बच्चों के समान भागीदारी करने का अधिकार, विकलांगों के सामान्य विकास हेतु नीतियों

पारित करना, विकलांग बच्चों में आत्म विश्वास बढ़ाकर सामान्य जीविकापार्जन हेतु सक्षम बनाना आदि।

सन १९९२ में भारतीयपुनर्वास परिषद अधिनियम (११) जिसका कार्य विकलांग छात्रों की जरूरतों को पूर्ण करने के लिये प्रशिक्षण कार्यक्रम शुरू किया था। इसके बाद वर्ष १९९४-१९९५ में जिला प्राथमिक शिक्षा योजना संचालित की गयी। इसके अन्तर्गत ऐसे बच्चे जो विकलांग की दृष्टि से मध्यम श्रेणी में शामिल हैं, ४० हजार मिलियन रूपये के साथ एक वित्त पोषण योजना की शुरुआत की गयी थी। बाद में भारत सरकार का यह कार्यक्रम एक प्रमुख कार्यक्रम बन गया था। वर्तमान कालीन स्थिति में भारत अपने देश के विकलांग बच्चों के लिये मुफ्त एवं अनिवार्य शिक्षा के कार्य में संलग्न है और भविष्य के लिये अनेक प्रकार की नीतियों को जारी करने की तैयारी कर रहा है।

समावेशी शिक्षा की अवधारणा:-

भारत के संदर्भ में अक्सर यह देखा गया है कि समाज के किसी एक वर्ग द्वारा (प्रभुत्वशाली) किसी विशेष वर्ग के लोगों (अनुजाति/जनजाति, सीमांत और शारीरिक रूप से बाधित) के साथ बहिष्कार, दुर्व्यवहार या उपहास किया जाता रहा है। प्राचीन भारतीय परम्पराओं, रूढ़ियों व प्रथाओं ने कभी भी इस वर्ग (शारीरिक रूप बाधित) के बच्चों के साथ सामाजिक न्याय एवं उन्हें उनके अधिकारों को प्राप्त करने नहीं दिया गया जबकि भारतीय संविधान के समानता सिद्धांत के अनुसार प्रत्येक व्यक्ति को, चाहे वह शारीरिक रूप से कमजोर हो या फिर सामान्य बुद्धि वाले, सभी को अपने अधिकारों व हितों को प्राप्त करने का अवसर प्रदान करता है, लेकिन फिर भी उनका (अनुजाति/जनजाति/सीमांत/विकलांग) उपहास होता रहा, इसीलिये उनके सामाजिक-आर्थिक व शिक्षा हेतु एक नयी अवधारणा का जन्म हुआ। जिसे समावेशी शिक्षा कहा जाता है। चूँकि यहाँ उनकी शिक्षा हेतु बात पर बल दिया गया है, इसलिये यहाँ केवल समावेशी शिक्षा संबंधी अवधारणा को स्पष्ट किया गया है।

भारत में समावेशी शिक्षा को ऐसे बच्चों के संदर्भ में स्पष्ट किया गया है, जो विशेष आवश्यकता वाले हो या सीखने की कठिनाईयों से ग्रसित हो या फिर विकलांग हो, ताकि ये विद्यार्थी भी मुख्यधारा की शिक्षा में शामिल हो सके। डॉ. नीलम चौहान तथा सुधीर मंत्री (२०१८) के अनुसार — “समावेशी शिक्षा, शिक्षा प्रदान करने का बहुत ही अलग तरीका है अर्थात् यह शिक्षा के लिये एक समग्र दृष्टिकोण है, जिसमें विकलांग छात्र अपने गैर-विकलांग साथियों (विद्यार्थियों) के साथ एक ही छत के नीचे नियमित कक्षा के माध्यम से शिक्षा प्राप्त करते हैं।”^{१२} यह अवधारणा (समावेशी शिक्षा) उस समय स्वीकार की गयी थी, जब विशेष आवश्यकता शिक्षा पर विश्व सम्मेलन में समावेशी शिक्षा की पहुँच तथा गुणवत्ता को अपनाया गया था^{१३} और “इसे विश्व शिक्षा मंच पर बहाल किया गया था।”^{१४} तब से यह सम्पूर्ण दुनिया में सतत रूप से संचालित की जा रही है और सम्पूर्ण दुनिया में समावेशी शिक्षा हेतु एक बाधा मुक्त वातावरण कायम किया जा रहा है, क्योंकि यह विशेष आवश्यकता या विकलांग बच्चों के लिये शिक्षा प्रदान करने से संबंधित है। पी. फ़ैरल (च थंततमससण २०००) के अनुसार — “समावेशी शिक्षा पर किये गये शोधों से पता चलता है कि विशेष आवश्यकता वाले बच्चों को मुख्यधारा की शिक्षा में लाने की प्रक्रिया का विशेष आवश्यकता वाले बच्चे और बिना आवश्यकता वाले बच्चे, दोनों पर सामाजिक व शैक्षणिक सीखने पर सकारात्मक प्रभाव पड़ता है,”^{१५} क्योंकि यह एक ऐसी प्रक्रिया है, जो उक्त दोनों (विशेष आवश्यकता व बिना आवश्यकता बच्चे) के संदर्भ में पारस्परिक लाभकारी सिद्ध हो सकती है।

भारत जैसे विकासशील देश, जहाँ शिक्षा संबंधी पर्याप्त मात्रा में संसाधनों का अभाव है, के संदर्भ में तो यह (समावेशी शिक्षा) बहुत ही कारगर या लाभकारी है। यह इसलिये भी लाभकारी है क्योंकि सामान्य विद्यार्थियों के साथ जब विकलांग छात्र/छात्रा अध्ययन करेंगे तो दोनों एक-दूसरे से कुछ न कुछ नया सीखेंगे जो कि उनके सामाजिक,

मानसिक व बौद्धिक विकास की दृष्टि से अहम होगा। इन सब संभावनाओं के बावजूद कुछ भारतीय दार्शनिकों एवं लेखकों (विद्वानों) ने देश में संचालित समावेशी शिक्षा संबंधी शैक्षणिक संस्थानों की कुछ कमियों पर प्रकाश डाला है। एस. बिंदल तथा शर्मा (२०१०) ने उल्लेख किया है कि भारतीय समावेशी विद्यालयों में कुछ महत्वपूर्ण विशेषताओं जैसे:— लचीला स्कूली वातावरण, ग्रामीण क्षेत्रों में गुणवत्तापूर्ण एवं पर्याप्त शिक्षकों का अभाव और समावेशी शिक्षा के अनुसार शिक्षण का अभाव इत्यादि का अभाव है।^{१६} इसी प्रकार एन. सिंघल (२००५) ने कहा है कि — “भारत में समावेशी शिक्षा का क्षेत्र बहुत ही संकीर्ण तथा सीमित है।”^{१७} इसलिये यह तर्क दिया जाता है कि यदि हमें अपने देश के सभी बच्चों (समाज से बहिष्कृत, वंचित, सीमांत, अनु. जाति/जनजाति, विकलांग) की शिक्षा पर जोर देना है और भविष्य के लिये एक शिक्षित युवाओं को तैयार करना है तो हमारी समावेशी शिक्षा संबंधी दृष्टिकोण को व्यापक करना होगा, देश के जन-जन तक इसे प्रचारित करना होगा, तभी हमारा देश समावेशी शिक्षा के मामले में अग्रणी कहा जायेगा।

भारत में समावेशी शिक्षा की स्थिति:—

जैसा कि हम पूर्व में उल्लेख कर चुके हैं कि प्राचीन काल से ही वंचित या विकलांग बच्चों के साथ दुर्व्यवहार व उपहास किया जाता रहा है। उनको मुख्यधारा की शिक्षा से महरूम करके उनके साथ अन्याय किया गया है। संजीव कुमार तथा जागेन्द्र कुमार का कहना है कि — “भारत में सन १९९० तक ४० मिलियन ऐसे बच्चे थे, जिनकी उम्र ४ से १६ वर्ष तक थी और वे विकलांग की श्रेणी में आते थे, ९०: मुख्यधारा की शिक्षा से वंचित हैं।”^{१८} जिनका कारण हमारा विद्यालय से संबंधित खराब प्रबंधन है। हमने कभी-भी यह प्रयास नहीं किया कि ऐसे विद्यालय स्थापित हो, जिसमें सभी प्रकार के विद्यार्थी शिक्षा प्राप्त कर सके, जो कि उनका अधिकार है। यदि हम उनको (विशेष आवश्यकता या विकलांग) शिक्षा अर्जन का अधिकार नहीं देते हैं, तो यह भारतीय

संविधान के समानता कानून की अवहेलना होगी। इसके लिये न केवल सरकार जिम्मेदार होगी बल्कि उनके (विकलांग) माता-पिता भी जिम्मेदार होंगे क्योंकि अकसर यह देखा गया है कि विकलांग बच्चों के माता-पिता विशेष प्रकार के विद्यालयों के अभाव में उनको शिक्षा से वंचित रखते हैं और स्पष्ट रूप से कहते हैं कि देश में विकलांग बच्चों के लिये कोई अलग विद्यालय है ही नहीं है, तो हम अपने बच्चों को कैसे व किस प्रकार शिक्षित करें, **ऑकड़े बताते हैं कि** — “देश में लगभग ३५ मिलियन बच्चे ऐसे हैं, जो विकलांग की श्रेणी में आते हैं। इनमें से केवल ५: बच्चे ही स्कूलों में उपस्थित हैं, जबकि शेष बच्चों को मुख्यधारा की शिक्षा वंचित किया गया है,^{१९} जो कि देश के विकास की दृष्टि से उचित नहीं है, क्योंकि वे भविष्य के युवा हैं, जिनके कंधों पर देश का सामाजिक-आर्थिक विकास टिका हुआ है। इस सब समस्याओं को ध्यान में रखते हुये भारत सरकार ने अपनी राष्ट्रीय शिक्षा नीति वर्ष १९८६ में स्पष्ट रूप से उल्लेख किया कि देश के लगभग दो मिलियन बच्चे, विशेष रूप से विकलांग बच्चों को विशेष देखभाल, उनके पोषण में सुधार, स्वास्थ्य सुविधाओं में विस्तार और विकलांगता को रोकने के लिये प्रभावी उपाय सुनिश्चित किये गये हैं।^{२०} इसके बाद निःशक्तता अधिनियम, जो कि वर्ष २००१ में लागू किया गया था, विशेष रूप से विकलांग बच्चों को देश की मुख्यधारा की शिक्षा से जोड़ने के लिये विद्यालय को भवनों के निर्माण से लेकर विकलांग विद्यार्थियों की शैक्षिक आवश्यकता की जाँच करता है। इसी प्रकार का एक ओर अधिनियम जिसे विकलांग व्यक्ति अधिनियम १९९५ के नाम से जाना जाता है, में अध्याय ८ यह सुनिश्चित करता है कि प्रत्येक भारतीय बच्चा, जिसकी उम्र १८ साल है, मुफ्त शिक्षा का अधिकार रखता है।^{२१} इस अधिनियम की एक महत्वपूर्ण विशेषता यह है कि भारत सरकार ने इस अधिनियम के माध्यम से सभी प्रकार के बच्चों, जिसमें समावेशी शिक्षा की अवधारणा भी शामिल है, शिक्षा तक

पहुँच को सुनिश्चित करने का प्रावधान रखा गया है।

यदि हम समावेशी शिक्षा से संबंधित शैक्षणिक संस्थानों की बात करें तो यह पता चलता है कि भारत में वर्ष १९८० तक नेत्रहीनों तथा श्रवण बाधितों के लिये क्रमशः ३२ एवं ३५ स्कूल थे,^{२२} जो कि भारतीय विकलांग जनसंख्या की तुलना में कम हैं। राष्ट्रीय सर्वेक्षण संगठन के अनुसार — “देश में विकलांग व्यक्तियों की संख्या लगभग १२० लाख है,”^{२३} परन्तु फिर भी भारत जैसे विकासशील देश के संदर्भ में यह कहा जा सकता है कि समावेशी शिक्षा को बढ़ावा देने में साधारण रूप से प्रयास जारी रखा है और दिन-प्रतिदिन विकलांग बच्चों या युवाओं को शिक्षित करने के लिये प्रयत्नशील है। यही कारण है कि आज देश में अनेक विकलांग शिक्षा से संबंधित संस्थान मौजूद हैं, जैसे:— मुम्बई में राष्ट्रीय विकलांग संस्थान, राष्ट्रीय आर्थोपेडिक संस्थान कोलकाता, राष्ट्रीय दृष्टि विकलांग संस्थान देहरादून, मानसिक रूप से मंद राष्ट्रीय संस्थान हैदराबाद आदि।^{२४} ये संस्थान न केवल उनको शिक्षा प्रदान करते हैं बल्कि उनकी विशेष देखभाल, पोषण एवं अन्य स्वास्थ्य संबंधी गतिविधियों में भी संलग्न हैं।

भारत में समावेशी शिक्षा के अन्तर्गत विकलांग बच्चों को भारत सरकार द्वारा प्रदान की जा रही सुविधाओं के तहत शिक्षकों के प्रशिक्षण से लेकर पर्याप्त विद्यालयीन ढाँचा में सुधार पर जोर दिया गया है। भारतीय स्कूली शिक्षा सर्वेक्षण (२००९) के अनुसार — “भारत में कुल विद्यालय १२,९९,९०२ हैं। इनमें से २,७४,४४५ स्कूल ऐसे हैं, जो विकलांग बच्चों को शिक्षा प्रदान करने का कार्य करते हैं, जबकि कुछ शिक्षकों (५८,७६,२७३) में से ८०,९४२ शिक्षकों को कम से कम दो सप्ताह का प्रशिक्षण प्रदान किया जा चुका है।^{२५} यह ऑकड़े बताते हैं कि भारत सरकार अपने देश के विकलांग बच्चों को शिक्षा प्रदान करने का भरसक प्रयास कर रही है जिसकी उनको सख्त जरूरत है। इसी प्रकार विज्ञान संकाय के विकलांग छात्रों के लिये विद्यालयों की ३७८९:

प्रयोगशालाओं को व्यवस्थित किया गया है और उनके लिये ७६४: विद्यालयों में पर्याप्त संख्या में शौचालय व्यवस्थित किये जा चुके हैं।^{२६}

भारत सरकार ने वर्ष २००६ में विकलांग व्यक्तियों या युवाओं के लिये एक राष्ट्रीय नीति पारित की है। जिसका कार्य विकलांग युवाओं के लिये एक ऐसा वातावरण कायम करना है, जिसमें विकलांग विद्यार्थियों को परामर्श, सहायता और शिक्षा हेतु विभिन्न उपकरणों का प्रावधान सुनिश्चित किया जा सके। इस नीति में यह भी प्रावधान रखा गया है कि विकलांग व्यक्तियों या युवाओं को समाज में सम्मानजनक जीवनयापन करने के लिये शैक्षिक पुनर्वास के साथ व्यावसायिक प्रशिक्षण के माध्यम से आर्थिक पुनर्वास की भी सुविधा प्रदान की जायेगी।^{२७}

भारत सरकार ने समावेशी शिक्षा हेतु अपने संविधान संशोधन ८६ के तहत एक बदलाव प्रस्तुत किया था, जो शिक्षा का अधिकार अधिनियम (२००९) के तहत शिक्षा को मौलिक अधिकार प्रदान करने से संबंधित था। इसके अन्तर्गत यह प्रावधान सुनिश्चित किया गया कि ऐसे छात्र/छात्रा, जो कि ६ वर्ष से १४ वर्ष की आयु की अवधि में शिक्षा अर्जन कर रहे हैं, संविधान संशोधन (८६) के नये अनुच्छेद २१। के तहत शिक्षा का मौलिक अधिकार रखते हैं।^{२८} इसका सीधा मतलब यह था कि अब सभी प्रकार के स्कूलों में सभी तरह के विद्यार्थियों (सामान्य एवं विकलांग) को शिक्षा प्रदान की जायेगी और मुफ्त तथा अनिवार्य शिक्षा के साथ-साथ अन्य सुविधायें जैसे:— पाठ्यपुस्तके, स्कूल फीस में रियासत (छूट), आवागमन की सुविधा हेतु विकलांग वाहन, छात्रवृत्ति एवं विभिन्न आर्थिक योजनाओं के तहत उन्हें वित्तीय सहायता उपलब्ध करना आदि शामिल हैं।

भारत सरकार ने बहु विकलांग (हाथ, पैर या किसी भी शरीर के हिस्से में विकलांग) व्यक्तियों और युवाओं को सशक्त या मजबूत या सक्षम बनाने के लिये दक्षिण भारत के चेन्नई महानगर में वर्ष २००५ में एक राष्ट्रीय संस्थान

की स्थापना की है। इसका मुख्य कार्य ऐसे विकलांग व्यक्ति या युवा जो किसी न किसी शरीर के हिस्से से विकलांग हैं, उन्हें प्रशिक्षण, रोजगार, शिक्षा, पुनर्वास तथा सामाजिक विकास के लिये उनके जीवन स्तर को शीर्ष पर ले जाना है। इसके अलावा यह (संस्थान) विकलांगता के क्षेत्र में शोध को बढ़ावा देकर उनके विकास हेतु विशेष रणनीतियाँ भी विकसित करता है।^{२९}

इस प्रकार कहा जा सकता है कि भारत सरकार ने अपनी स्वतंत्रता से ही विकलांग व्यक्तियों या युवाओं के लिये समावेशी शिक्षा की अवधारणा को अपना आरंभ कर दिया था। इसके लिये सरकार सराहना के पात्र है, किन्तु यह अवधारणा (समावेशी शिक्षा) भारत में कितनी सार्थक सिद्ध हुयी है, यह देश के अन्य सामान्य नागरिकों की सोच पर निर्भर करेगा। जब तक देश के आम नागरिक इस अवधारणा को स्वीकार नहीं करेंगे, तब तक देश में समावेशी शिक्षा का सफल होना संभव नहीं है।

निष्कर्ष:—

उपरोक्त विवरण के आधार पर यह कहा जा सकता है कि विकलांग व्यक्ति या युवा हमारे देश की जनसंख्या का एक हिस्सा है। जितना अधिकार सामान्य बच्चों को शिक्षा प्राप्त करने का है, ठीक उतना ही इन (विकलांग) लोगों को भी है, परन्तु यह देखा गया है कि देश के विकलांग बच्चे अन्य लोगों की यातनाओं व टीका-टिप्पणियों का शिकार होते हैं, उन्हें बार-बार सामाजिक बहिष्कार और उपहास का शिकार होना पड़ता है। पुरुषों, विशेष रूप से समाज के प्रभुत्वशाली लोगों की दकियानूसी सोच व पुरानी विचारधारा के कारण उन्हें बहुत से अधिकारों से वंचित होना पड़ा है। जिसमें से शिक्षा प्राप्त करने का भी एक अधिकार शामिल है, इसीलिये समावेशी शिक्षा जैसी अवधारणा का जन्म हुआ। जिसका मुख्य उद्देश्य विशेष आवश्यकता वाले युवाओं व विकलांग व्यक्तियों या युवाओं को शिक्षा प्रदान करना है, जो कि उनका अधिकार है।

भारत सरकार ने विकलॉग बच्चों के लिये समावेशी शिक्षा की अवधारणा को अपनाया है, उसके लिये वह (भारत सरकार) सराहना के पात्र है, परन्तु यह अवधारणा तभी सार्थक सिद्ध हो सकती है, जब देश के आम नागरिकों से लेकर प्रभुत्वशाली लोगों द्वारा स्वीकार किया जाये, उसे अमल में लाया जाये और स्वेच्छा से लोगों द्वारा आगे बढ़कर कार्य किये जाये, तभी हमारे देश के विकलॉग युवा शिक्षित हो सकते हैं।

संदर्भ ग्रंथ सूची

1. J.D. Singh (Dec.-Jan 2016) Inclusive education in India - Concept, Need and Challenges, Scholarly Research Journal for Humanity Science and English Language:- An International Peer Reviewed and Referred, Vol. 3/13, Dec.-Jan. 2016, Page 3222.
2. Ibid
3. Pandey, Y (2006) From Special Education to inclusive Education:- an Analysis of Indian Policy Paper Presented at Achieving Equality in Education:- New Challenge and Strategies for Change. Kuala Lumpur, Malaysia (16-21 July 2006) available at https://www.icevi.org/publication/inclusive_educational.html. (Retrieved 10th Jan. 2016)
4. Kumar, S and Kumar, K (2007) Inclusive Education in India, Electronic Journal for inclusive Education, Vol.2, Number 2 (Summer/Fall 2007)
5. Tripathi, K and Dr. Kapri, U.C. (2019) Inclusive Education in India:- The Perceptions of Secondary School Teachers, IJARIE - An Open-Access, Peer reviewed International Journal, Vol.5, Issue-1, 2019.
6. gtmpatra.blogspot.com/2017/11/inclusive-education-in-india-and-its.html.
7. To see the reference number (1)
8. To see the reference number (1)
9. To see the reference number (6)
10. To see the reference number (6)
11. To see the reference number (5)
12. Dr. Chauhan, N and Mantry, S (2018) Inclusive Education:- Need of the Day. International Journal of Humanities and Social Science invention, Vol.7, Issue 10, Ver.11, October 2018, pp. 24-32.
13. UNESCO (1994) Salamanca Statement. Retrieved January 17, 2016 from United Nations Educational, Scientific, Cultural Organization, <https://portal.unesco.org/education/en/ev.php-URL-ID=10379> and URL-DO=DO-Topic and URL-Section = 201.html.
14. UNESCO (2000) Dakar Framework for Action. <http://www.unesco.org/education/efa/ed-for-all/dakfram-eng.shtml>.
15. Farrell, P (2000) The Impact of research on development in inclusive education, international journal of inclusive education. 4(2), 153-162.
16. Bindal, S and Sharma, S (2010) Inclusive education in Indian Context, Journal of Indian education, 35(4), 34-45.
17. Singal, N (2005) Mapping the field of inclusive education:- A review of the Indian literature, international journal of inclusive education, 9(4), 331-350.
18. To see the reference number (4)
19. To see the reference number (4)
20. To see the reference number (5)
21. To see the reference number (1)
22. To see the reference number (5)
23. To see the reference number (5)
24. To see the reference number (5)
25. Sharma, T (2018) Reflection on current status of inclusive education in India, international journal of research culture society, vol.2, issue3, March 2018
26. NCERT (2016) Eighth All India School Education Survey (8th AISES):- As on 13th September 2009- A Concise Report, NCERT :- New Delhi Retrieved on July 18, 2017 from <https://aises.nic.in/8th%20AISE-5%20concies%20report.pdf>.
27. Ministry of Statistics and Programme Implementation (2018) Disability in India:- A Statistical Profile-2011. Retrieved from <https://mospi.nic.in/publication/disability-india-statistical-profile-2011>.
28. To see the reference number (25)
29. National institute for Empowerment of persons with multiple Disabilities (2017). Retrieved from <http://niepmd.tn.nic.in>

A FACILE SYNTHESIS OF (1R,2R)-1,2-CYCLOHEXAN DIMETHANOL, A KEY INTERMEDIATE OF LURASIDONE HYDROCHLORIDE-AN ATYPICAL ANTIPSYCHOTIC DRUG

Pramod A. Dhokrat, Pavankumar V. Solanki, Tejas C. Gaikwad, Radhakrishnan M. Tigote

Department of Process Research and Development, Megafine Pharma (P) Ltd, 201, Lakhmapur, Dindori, Nashik-422202, Maharashtra, India.

Corresponding Author- Pramod A. Dhokrat

Email:- pramod.a.dhokrat@gmail.com

DOI- 10.5281/zenodo.7295798

Abstract:

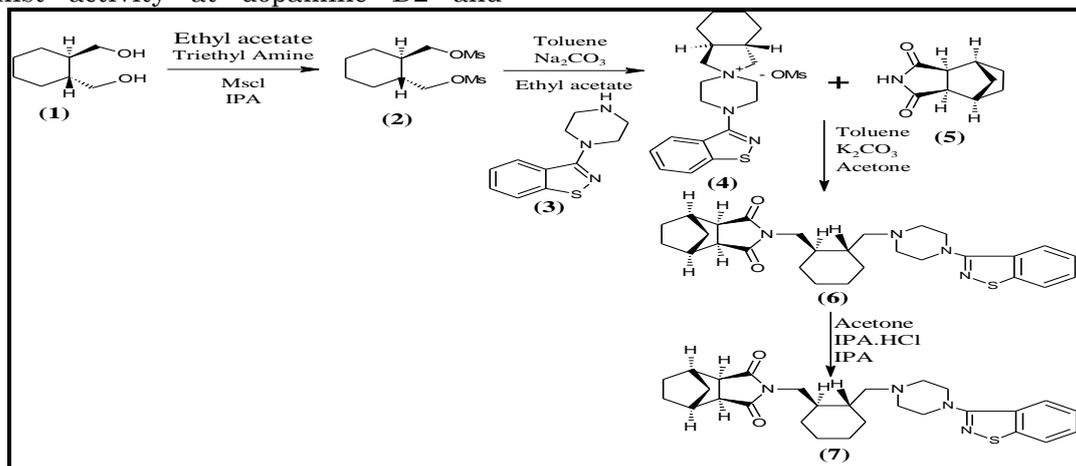
Described herein is an improved synthesis of (1R,2R)-1,2-Cyclohexanedimethanol, a key intermediate for the synthesis of Lurasidone hydrochloride. The present work provides robust and commercially viable manufacturing process for the diastereomeric resolution of racemic trans 1,2-Cyclohexane dicarboxylic acid and reduction of (1R,2R)-1,2-cyclohexandicarboxylic acid dimethyl ester to provide the pure compound (1) with an overall yield of 58% over four steps and Chiral purity of around $\geq 98\%$.

Keywords: Lurasidone, Latuda, diastereomeric Resolution, key intermediate, atypical antipsychotic.

Introduction:

Lurasidone is an atypical antipsychotic drugs chemically known as (3aR,4S,7R,7aS)-2-[(1R,2R)-2-[4-(1,2-benzisothiazol-3-yl)piperazin-1-ylmethyl] cyclohexylmethyl] hexahydro-4,7-methano-2H-isoindole-1,3-dione, is a benzisothiazol derivative, is a second-generation (atypical) antipsychotic agent that has received regulatory approval for the treatment of schizophrenia in the US, Canada, the EU, Switzerland, and Australia, and also for bipolar depression in the US and Canada. In addition to its principal antagonist activity at dopamine D2 and

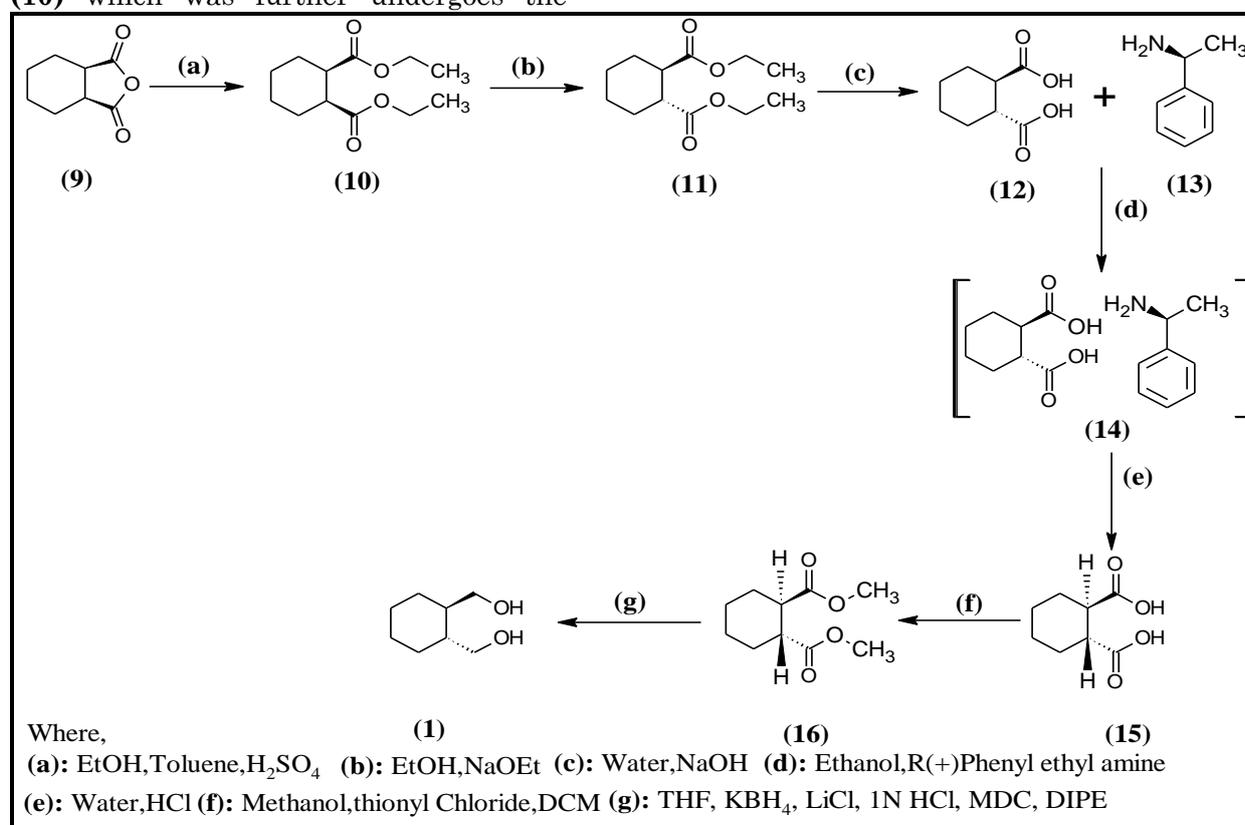
serotonin 5-HT_{2A} receptors, Lurasidone has distinctive 5-HT₇ antagonistic activity, and displays partial agonism at 5-HT_{1A} receptors, as well as modest antagonism at noradrenergic α_{2A} and α_{2C} receptors. [1-8] The reported synthetic scheme (Scheme-01) of Lurasidone involves the use of three key starting material namely (1R,2R)-1,2-Cyclohexane dimethanol (**1**), 3-Piperazin-1-yl-1, 2-benzisothiazole (**3**) and (3aR, 4S, 7R, 7aS)-hexahydro-4,7-methano-2H-isoindole-1,3-dione (**5**). [9]



Scheme-1: Reported synthetic scheme of Lurasidone hydrochloride.

In the present research work, we have developed the manufacturing process which is efficient, robust, reproducible and commercial viable for synthesis of (1R,2R)-1,2-Cyclohexanedimethanol (**1**). The synthesis of (1R,2R)-1,2-Cyclohexanedimethanol and its intermediates is disclosed in patent WO patents 2012/131606. [10] Few of the drawbacks of the literature procedure for synthesis of key intermediate (**1**) was include asymmetric synthesis technique, used of highly expensive resolving agent and formation of monomethyl impurity (**17**, Scheme 3) which may lead to the lower yield of (**16**). Slight modification to the reported synthetic route is done by keeping the developmental space and acting as a framework for commercial production in the mind. The synthesis of (1R,2R)-1,2-Cyclohexanedimethanol involves the ring opening reaction of (**8**) in the presence of sulfuric acid to provide (**10**) which was further undergoes the

isomerization reaction by using sodium ethoxide in ethanol to give (**11**). The isomerized compound (**11**) is hydrolyzed by using aqueous sodium hydroxide solution to give Racemic trans-1,2-cyclohexane dicarboxylic acid (**12**). The racemic acid (**12**) undergoes the resolution by using R(+) phenyl ethyl amine (**13**) as resolving agent to furnished crude salt which is further purified by using ethanol as solvent to obtained pure compound (**14**). The salt of compound (**14**) is break using concentrated hydrochloric acid to furnished the enantiomeric pure (1R,2R)-1,2-cyclohexane dicarboxylic acid (**15**) which is undergoes the esterification reaction using thionyl chloride and methanol to give (1R,2R)-1,2-cyclohexane dicarboxylic acid dimethyl ester (**16**). The obtained compound (**16**) is reduced using mixture of potassium borohydride, lithium chloride in tetrahydrofuran to provide the (1R,2R)-1,2-Cyclohexane dimethanol (**1**).



Scheme-2: Modified and optimized synthetic scheme of (1R,2R)-1,2-Cyclohexane dimethanol (1**).**

Results and discussion:

Pramod A. Dhokrat, Pavankumar V. Solanki, Tejas C. Gaikwad, Radhakrishnan M. Tigote

Synthesis of key intermediate **(1)** was explored from a basic key starting material cis-1,2-Cyclohexane dicarboxylic acid anhydride **(9)** by systematic understanding of reaction parameters contributing to the yield and quality and then a systematic optimization study was conducted to establish the scalable, economic and production friendly process.

The ring opening reaction of **(9)** by using sulfuric acid was explored using different solvent and its mixtures like ethanol, methanol, n-butanol, Toluene: ethanol, o-Xylene: ethanol, m-xylene: ethanol. Among the explored solvents mixtures of Toluene: ethanol furnished the good yield and quality of **(10)**. The quantity of sulfuric acid for ring opening reaction is also optimized. As per the optimized process 0.15 moles of sulfuric acid, 1.5 volumes of ethanol and 3.0 volumes of toluene were found to be optimum for the reaction. Since the purity of the compound **(10)** was over 99%. we proceed further for isomerization reaction of compound **(10)** which was explored different solvents like ethanol, methanol, isopropyl alcohol, n-butanol and various bases such as sodium hydroxide, potassium hydroxide, sodium ethoxide and sodium methoxide as bases. Among the explored combination of solvents and bases used of ethanol and sodium ethoxide furnished appreciable results and hence were chosen for further optimization. As per the optimized process of isomerization reaction is carried out at reflux temperature by using eight volumes of ethanol and 0.75 moles of sodium ethoxide to give **(11)**. Further the hydrolysis of **(11)** was explored by using

different bases like lithium hydroxide, potassium hydroxide and sodium hydroxide. Based on the exploration of bases it was observed that the potassium hydroxide is consistent results for hydrolysis of **(11)** within 5 to 6 hours at 60-65°C to furnished Racemic trans-1,2-cyclohexane dicarboxylic acid **(12)**.

The resolution of **(12)** by using R-(+) phenyl ethyl amine as resolving agent is very critical step to achieve the enantiomeric purity of **(1)**. This resolution is explored using different solvents like methanol, ethanol, isopropyl alcohol, n-butanol, acetone, and t-butanol. Among the explored solvents, ethanol furnished the appreciable results. During the optimization study we also explored different moles ratio of **(13)** for resolution process. Surprisingly it is recognized that as mole ratio of resolving agent is get decreases formerly chiral purity of the compound **(14)** get increases and vice versa. **(Table-1)**. As per the optimized process for the resolution of **(12)** fifteen volume of ethanol and 0.55 moles of resolving agents found to be optimum for the good yield and quality of the crude diastereomeric salt. The purification of crude diastereomeric salt was explored in the different solvents and its mixture like ethanol, methanol, n-butanol, acetonitrile, toluene, ethyl acetate, methyl isobutyl ketone, acetone, isopropyl alcohol, toluene: methanol and toluene: ethanol. Among the explored solvent for purification of **(14)** mixture of toluene: ethanol provides the significant results. The obtained salt was break using acid to give resolved acid **(15)**.

Table-1: Impact of varied mole ratio of R-(+) phenyl ethyl amine on the yield and quality of 14.

Sr. No.	Compound (gm.)	Ethanol (ml)	R (+) PEA	Reaction Temp.	Chiral HPLC	
					R, R Acid	S, S Acid
1	10.0	150	0.50	75-85°C	93.49	6.51
2	10.0	150	0.60	75-85°C	92.82	7.18
3	10.0	150	0.70	75-85°C	92.59	7.44
4	10.0	150	0.80	75-85°C	75.79	24.21
5	10.0	150	0.90	75-85°C	76.57	22.73
6	10.0	150	1.00	75-85°C	62.39	37.61

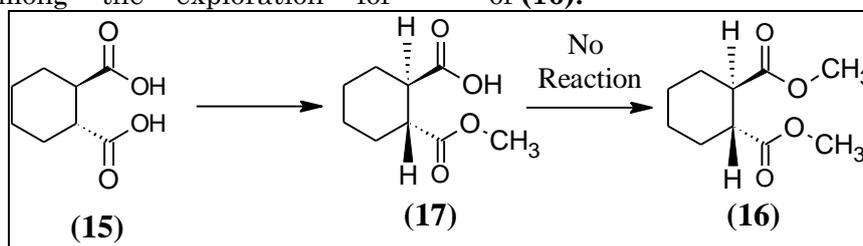
The esterification reaction of **(15)** was design as per the literature process by

using different reagents such as sulfuric acid, thionyl chloride and oxalyl chloride

Pramod A. Dhokrat, Pavankumar V. Solanki, Tejas C. Gaikwad, Radhakrishnan M. Tigote

in methanol. During the exploration it was identified that there was formation of monomethyl ester derivative (17) by using sulfuric acid & oxalyl chloride. After prolong maintaining the compound (17) does not convert into the dimethyl ester (16) which leads to the lower yield of the product. Among the exploration for

esterification reaction thionyl chloride provide significant results and hence further volume of methanol and mole ratio of thionyl chloride was get enhanced. As per the optimized process 2.10 moles of thionyl chloride and seven volumes of methanol furnished good yield and quality of (16).



Scheme-3: Synthetic scheme of monomethyl ester impurity (17).

The reduction of compound 16 is performed by using various reducing agents like sodium borohydride, lithium aluminum hydride, triethylborane and potassium borohydride. Among the explored reducing agent potassium borohydride with lithium chloride shows the promising results with respect to yield and quality of (1). As per the optimize process nine volumes of tetrahydrofuran and 3.0 moles potassium borohydride and lithium chloride provides the optimum yield and quality of (1).

MATERIALS AND METHODS:

Melting points were determined on Analab melting point apparatus, in open capillary tubes and are uncorrected. The ¹H NMR (400 MHz) spectra were recorded on a Varian Gemini 400 MHz FT NMR spectrometer. Chemical shifts were reported in parts per million (PPM) using tetramethyl silane (TMS) as internal standard and are given in δ units. The solvents for NMR spectra were deuteriochloroform (CDCl₃) and deuterodimethylsulfoxide (DMSO-d₆) unless otherwise stated. Infrared spectra were taken on Perkin Elmer Spectrum 100 in potassium bromide pallets unless otherwise stated. High-resolution mass spectra were obtained with a Shimadzu GCMS mass spectrometer with an ionization potential of 70 eV. Reactions were monitored by High performance liquid chromatography (HPLC) on Agilent Technologies 1200 series.

Synthesis of Cis-1,2-cyclohexane dicarboxylic acid diethyl ester (10):

Toluene (3.0 L), Ethanol (1.5 L) and Cis-1,2-cyclohexane dicarboxylic acid anhydride (1.0Kg) were charged into the reactor. Stirred for 10-15 min to obtained clear solution. To the obtained clear solution charged 98% sulfuric acid (10 ml) and reaction mass was heat to reflux temperature for 10-12 hrs. The completion of the reaction was monitored by HPLC. Upon completion of the reaction, reaction mass was cool to ambient temperature and add water (5.0 L). The desired product was extracted with toluene (3.0 X 2). The combined organic layer was washed with water (5.0 L) and toluene was distill out under vacuum at below 60°C to obtained residue 1.30 Kg of (10) (99.2%). HPLC purity: 99.10%. Boiling point: 128-132°C. FT-IR (KBr): 2935.44, 2669.96, 1732.52, 1635.65, 1449.53, 1303.40, 1072.29, 930.87, 862.26 (Cm⁻¹). ¹H NMR (DMSO, δ ppm): δ 1.12-1.16 (t, 6H), δ 1.35-1.41 (m, 4H), δ 1.66-1.72(m, 2H), δ 1.82-1.88 (m, 2H), δ 2.79-2.81 (t, 2H), δ 4.00-4.05 (m, 4H). MS (ESI, m/z): 229 [M+H].

Synthesis of Trans-1,2-cyclohexane dicarboxylic acid (12):

Ethanol (6.5 L) and Cis-1,2-cyclohexane dicarboxylic acid diethyl ester (1.0 Kg) was charged into the reactor. Stirred for 10-15 min to obtained clear solution. To the obtained clear solution charged sodium ethoxide (0.10 gm) and reaction mass was heat to reflux temperature for 4-6 hrs. The completion of

Pramod A. Dhokrat, Pavankumar V. Solanki, Tejas C. Gaikwad, Radhakrishnan M. Tigote

the isomerization reaction was monitored by HPLC. Upon completion of the reaction, reaction mass was cool to ambient temperature and add Aqueous solution of potassium hydroxide solution to the reaction mass. The reaction mass was heat to 75-80°C temperature for 4-6 hrs. The completion of the hydrolysis reaction of isomerized Trans-1,2-cyclohexane dicarboxylic acid diethyl ester was monitored by HPLC. After completion of the reaction, ethanol was distilled out atmospherically at below 90°C till distillation ceases. Charged water (6.5 L) to the reaction mass and cool to ambient temperature. Add concentrated hydrochloric acid solution to the reaction mass to adjust the pH between 1-2. The precipitated product filtered and wash with water (0.5 L) to give wet cake of crude Trans-1,2-cyclohexane dicarboxylic acid. The charged water (7.0 L) and above crude product into the reactor. Heat the reaction mass to reflux temperature for 45-60 min. Cool the reaction mass at 25-30°C and stirred for 60 min. The obtained solid product was filtered and wash with water (0.35L). The wet material was dried under vacuum at below 55°C to obtained pure Trans-1,2-cyclohexane dicarboxylic acid (0.65 Kg). HPLC chiral purity: 98.65%. Melting point: 228-131°C. FT-IR (KBr): 2955.77, 1695.80, 1416.18, 1281.19, 1262.69, 1211.68, 925.19, 736.43, 660.57, 570.12 (Cm⁻¹). ¹H NMR (DMSO, δ ppm): δ 1.23 (m, 4H), δ 1.68 (m, 2H), δ 1.91-1.93(m, 2H), δ 2.34 (t, 2H), δ 12.09 (bs, 2H). MS (ESI, m/z): 171 [M-H].

Synthesis of (1R,2R)-1,2-cyclohexane dicarboxylic acid (15): Ethanol (15 L) and Trans-1,2-cyclohexane dicarboxylic acid (1.0 Kg) was charged into the reactor. Heat the reaction mass at 75-85°C to obtained clear solution. To the obtained clear solution charged R(+) phenyl ethyl amine (0.60 Kg) slowly over the period of 60-90 min. The obtained reaction mass stirred for 45-60min at reflux temperature and gradually cool the reaction mass to 25-30°C between 10-12 hrs. Stirred the reaction mass for 45-60 min at 25-30°C. The obtained solid product was filtered

and wash with ethanol (0.5L) to obtained crude diastereomeric salt. Charged Ethanol (15.0 L) and obtained crude diastereomeric salt to the reactor. Heat the reaction mass at 75-85°C and stirred for 45-60 min. gradually cool the reaction mass to 25-30°C between 10-12 hrs. Stirred the reaction mass for 45-60 min at 25-30°C. The obtained solid product was filtered and wash with ethanol (0.5L) to obtained wet cake of pure diastereomeric salt. Charged Purified water (6.0 L) and wet cake of pure diastereomeric salt into the reaction. Add concentrated hydrochloric acid solution to the reaction to adjust the reaction mass pH between 1-2 and desired product was extracted by using methyl tertiary butyl ether (7.0 L X 2). The combine methyl tertiary butyl ether is washed with purified water and brine solution and methyl tertiary butyl ether is distilled out under vacuum at below 55°C to obtained enantiomerically pure (1R,2R)-1,2-cyclohexane dicarboxylic acid (0.45 Kg) chiral purity: 98.65%. Melting point: 179-183°C. FT-IR (KBr): 2952.81, 2861.41, 2652.41, 1696.89, 1457.99, 1412.49, 1271.29, 1228.80, 1202.65, 936.82, (Cm⁻¹). ¹H NMR (DMSO, δ ppm): δ 1.23 (m, 4H), δ 1.68 (m, 2H), δ 1.91-1.93(m, 2H), δ 2.34 (t, 2H), δ 12.09 (bs, 2H). MS (ESI, m/z): 171 [M-H].

Synthesis of (1R,2R)-1,2-cyclohexane dicarboxylic acid dimethyl ester (16): Charged methanol (9.0 L) and (1R,2R)-1,2-cyclohexane dicarboxylic acid (1.0 Kg) into the reaction. Stirred the reaction mass for 10-15 min to obtained clear solution. To the obtained clear solution charged thionyl chloride (1.52 Kg) and reaction mass was heat to reflux temperature for 1-2 hrs. The completion of the reaction was monitored by HPLC. After completion of the reaction, Cool the reaction mass at 45-50°C and distill out under vacuum at below 50°C to obtained residue of (1R,2R)-1,2-cyclohexane dicarboxylic acid dimethyl ester. Charged dichloromethane (5.0 L) and water (5.0) to the obtained residue. Stir the reaction mass 10-15 min. settle the reaction mass for 10-15 min and separated the lower organic layer.

Pramod A. Dhokrat, Pavankumar V. Solanki, Tejas C. Gaikwad, Radhakrishnan M. Tigote

Charged dichloromethane (5.0 L) to the reactor containing aqueous layer. Stir the reaction mass 10-15 min. settle the reaction mass for 10-15 min and separated the lower organic layer and upper aqueous layer. The dichloromethane layer is washed with 5.0% aqueous sodium carbonate solution (5.0 L X 2) and dichloromethane was distill out under vacuum to obtained residue of (1R,2R)-1,2-cyclohexane dicarboxylic acid dimethyl ester (1.05 Kg). HPLC purity: 99.80%. Boiling point:80-88°C. FT-IR (KBr): 2996.68, 2941.63, 2860.46, 2666.57, 2087.81, 1736.67, 1605.59, 1442.65, 1434.96, 1375.72, 1355.07, 1322.67, 1171.29, 1115.55, 1043.63, 1010.56, 975.92, 843.94, 760.15, 702.36 (Cm⁻¹). ¹H NMR (DMSO, δ ppm): δ 1.24-1.36 (m, 4H), δ 1.76-1.78 (d, 2H), δ 2.03-2.06(d, 2H), δ 2.59-2.61 (q, 2H), δ 3.65 (s, 6H). MS (ESI, m/z): 201 [M+H].

Synthesis of (1R,2R)-1,2-cyclohexane dimethanol (1):

Charged tetrahydrofuran (9.0L) and (1R,2R)-1,2-cyclohexane dicarboxylic acid dimethyl ester (1.0 Kg) to the reactor. Stirred for 5-10 min to the obtained clear solution. Charged Lithium chloride (0.63 Kg) to the reaction mass and stirred the reaction mass for 10-15 min at 25-30°C. Charged portion wise potassium borohydride (0.82 Kg) to the reaction mass at 25-30°C. stirred the reaction mass for 10-12 hrs at 25-30°C. The completion of the reaction was monitored by HPLC. After completion of the reaction, reaction mass is chill to -10 to -5°C and then add 1N hydrochloric acid solution to the reaction mass to adjust the reaction mass pH between 3-4. Stirred the reaction mass for 10-15 min at 25-30°C. Adjust the reaction mass pH between 8-9 by using liquor ammonia and stirred for 15-30 min at 25-30°C. Charged Dichloromethane (8.0 L) to the reaction mass at 25-30°C. Stir the reaction mass 10-15 min. Settle the reaction mass for 10-15 min and separated the lower organic layer. Charged dichloromethane (5.0 L) to the reactor containing aqueous layer. Stir the reaction mass 10-15 min. Settle the reaction mass for 10-15 min and separated

the lower organic layer and upper aqueous layer. The organic layer is washed with water (5.0 L) and solvent was distilled out under vacuum to obtained residue of (1R,2R)-1,2-cyclohexane dimethanol. To the obtained residue charged Di-isopropyl ether (1.2 L). Heat the reaction mass at 50-55°C for 45-60 min. cool the reaction mass at 25-30°C and stirred for 30-45 min. Chill the reaction mass at -15 to -10°C and stirred for 60-90 min. The obtained solid product was filtered and wash with ethanol (0.5L) to obtained (1R,2R)-1,2-cyclohexane dimethanol. GC purity: 99.80%. Melting point: 54-58°C. FT-IR (KBr): 3319.86, 3232.72, 2930.83, 2850.06, 2752.20, 2670.82, 2577.82, 2480.94, 2015.93, 1480.98, 1449.87, 1382.80, 1212.45, 1101.09, 1077.51, 1007.74, 966.90, 884.90, 776.49, 703.57, 647.66. (Cm⁻¹). ¹H NMR (DMSO, δ ppm): δ 0.96-1.35 (m, 6H), δ 1.58-1.62 (dd, 2H), δ 1.67-1.72 (m, 2H), δ 3.26 (bs, 2H), δ 3.49-3.53 (dd, 2H), δ 3.59-3.62 (dd, 2H), MS (ESI, m/z): 145 [M+H].

References:

1. Volavka J, Citrome L. Oral antipsychotics for the treatment of schizophrenia: heterogeneity in efficacy and tolerability should drive decision-making. *Expert Opin Pharmacother.* 2009;10:1917–28.
2. Leucht S, Cipriani A, Spineli L, Mavridis D, Orey D, Richter F, et al. Comparative efficacy and tolerability of 15 antipsychotic drugs in schizophrenia: a multiple-treatments meta-analysis. *Lancet.* 2013;382(9896):951–62.
3. Citrome L, Eramo A, Francois C, Duffy R, Legacy SN, Offord SJ, et al. Lack of tolerable treatment options for patients with schizophrenia. *Neuropsychiatr Dis Treat.* 2015;11:3095–104.
4. Citrome L, Johnston S, Nadkarni A, Sheehan JJ, Kamat SA, Kalsekar I. Prevalence of pre-existing risk factors for adverse events associated with atypical antipsychotics among commercially insured and Medicaid insured patients newly initiating atypical antipsychotics. *Curr Drug Saf.* 2014;9:227–35.
5. Food and Drug Administration. Drug approval package. Latuda (Lurasidone

Pramod A. Dhokrat, Pavankumar V. Solanki, Tejas C. Gaikwad, Radhakrishnan M. Tigote

- hydrochloride) tablets. Sunovion Pharmaceuticals, Inc. clinical review; pharmacology review(s); clinical pharmacology biopharmaceutics review(s). http://www.accessdata.fda.gov/drugsatfda_docs/nda/2010/200603Orig1s000PharmR.pdf.
6. Highlights of prescribing information of Lurasidone Hydrochloride Latuda. http://www.accessdata.fda.gov/drugsatfda_docs/label/2013/200603s015lbl.pdf. Accessed 3 Apr 2016.
 7. European Medicines Agency. (Lurasidone hydrochloride) Latuda. http://www.ema.europa.eu/ema/index.jsp?url=pages/medicines/human/medicines/002713/human_med_001737.jsp&mid=WC0b01ac058001d124. Accessed 3 Apr 2016.
 8. Summary Basis of Decision (SBD) for Latuda. Health Canada.2012. http://www.hc-sc.gc.ca/dhp-mps/prodpharma/sbd-smd/drug-med/sbd_smd_2012_latuda_145406-eng.php#a2. Accessed 3 Apr 2016.
 9. Megumi Maruyama, Tomoko Horisawa. SAR Study, Synthesis, and Biological Activity of Lurasidone Hydrochloride : A New Drug for Treating Schizophrenia Chemistry Research Laboratories https://www.sumitomo-chem.co.jp/english/rd/report/files/docs/2013E_6.pdf
 10. Jay Chandra S.B, Gahlot U.S, Singh T.K, Khan D.H. Process for the preparation of Antipsychotic agent Lurasidone Hydrochloride. WO patents 2012/131606, April 1, 2011.



जलवायु परिवर्तन एवं संपोषणीय विकास की ओर बढ़ते कदम

Dr. Nisha Sharma

Teaching Consultant, Faculty of Education
Mohan Lal Sukhadia University, Udaipur (Raj.)

Corresponding Author - Dr. Nisha Sharma

Email:- nishasharma06021983@gmail.com

DOI - 10.5281/zenodo.7295800

प्रस्तावना

वायु जल भूमि वनस्पति पेड़ पौधे पशु मानव सब मिलकर पर्यावरण बनाते हैं प्रकृति में इन सब की मात्रा और इनकी रचना कुछ इस प्रकार से व्यवस्थित है कि पृथ्वी पर एक संतुलन 20वीं सदी की शुरुआत से पृथ्वी की जलवायु में देखे गए परिवर्तन मुख्य रूप से मानवीय गतिविधियों, विशेष रूप से जीवाश्म ईंधन के जलने से प्रेरित हैं, जो पृथ्वी के वायुमंडल में गर्मी-ट्रैपिंग ग्रीनहाउस गैस के स्तर को बढ़ाता है, जिससे पृथ्वी की सतह का औसत तापमान बढ़ जाता है। इन मानव-उत्पादित तापमान वृद्धि को आमतौर पर ग्लोबल वार्मिंग के रूप में जाना जाता है। आंतरिक परिवर्तनशीलता (उदाहरण के लिए, अल नीनो, ला नीना और प्रशांत डेकाडल ऑसिलेशन जैसे चक्रीय महासागर पैटर्न) और बाहरी बल (जैसे, ज्वालामुखी गतिविधि, सूर्य के ऊर्जा उत्पादन में परिवर्तन, पृथ्वी की कक्षा में बदलाव सहित) जलवायु परिवर्तन में प्राकृतिक प्रक्रियाएं भी योगदान दे सकती हैं।) अतीत, वर्तमान और भविष्य के जलवायु परिवर्तन की निगरानी और अध्ययन के लिए वैज्ञानिक सैद्धांतिक मॉडल के साथ-साथ जमीन, वायु और अंतरिक्ष से टिप्पणियों का उपयोग करते हैं। जलवायु डेटा रिकॉर्ड जलवायु परिवर्तन के प्रमुख संकेतकों का प्रमाण प्रदान करते हैं, जैसे कि वैश्विक भूमि और समुद्र के तापमान में वृद्धि; समुद्र का स्तर बढ़ना; पृथ्वी के ध्रुवों और पर्वतीय हिमनदों में बर्फ की हानि; चरम मौसम में आवृत्ति और गंभीरता में परिवर्तन जैसे तूफान, गर्मी की लहरें, जंगल की आग, सूखा, बाढ़ और वर्षा; और बादल और वनस्पति आवरण परिवर्तन

भूमंडलीय तापक्रम में वृद्धि

ग्लोबल वार्मिंग, मानव गतिविधियों के कारण पूर्व-औद्योगिक काल (1850 और 1900 के बीच) के बाद से पृथ्वी की जलवायु प्रणाली का दीर्घकालिक ताप है, मुख्य रूप से जीवाश्म ईंधन के जलने से, जो पृथ्वी के वायुमंडल में गर्मी-फँसाने वाले ग्रीनहाउस गैस के स्तर को बढ़ाता है। इस शब्द का प्रयोग अक्सर जलवायु परिवर्तन शब्द के साथ एक दूसरे के स्थान पर किया जाता है, हालांकि बाद वाला मानव और प्राकृतिक रूप से उत्पादित वार्मिंग और हमारे ग्रह पर इसके

प्रभाव दोनों को संदर्भित करता है। इसे आमतौर पर पृथ्वी के वैश्विक सतह के तापमान में औसत वृद्धि के रूप में मापा जाता है।

पूर्व-औद्योगिक काल के बाद से, मानव गतिविधियों का अनुमान है कि पृथ्वी के वैश्विक औसत तापमान में लगभग 1 डिग्री सेल्सियस (1.8 डिग्री फ़ारेनहाइट) की वृद्धि हुई है, एक संख्या जो वर्तमान में प्रति दशक 0.2 डिग्री सेल्सियस (0.36 डिग्री फ़ारेनहाइट) बढ़ रही है। यह स्पष्ट है कि मानव प्रभाव ने वातावरण, महासागर और भूमि को गर्म कर दिया है।

ग्लोबल वार्मिंग औद्योगिक क्रांति के बाद से औसत वैश्विक तापमान में वृद्धि को दर्शाता है। 1880 के बाद से औसत वैश्विक तापमान में लगभग एक डिग्री सेल्सियस की वृद्धि हुई है। ग्लोबल वार्मिंग एक सतत प्रक्रिया है, वैज्ञानिकों को आशंका है कि 2035 तक औसत वैश्विक तापमान अतिरिक्त 0.3 से 0.7 डिग्री सेल्सियस तक बढ़ सकता है।

ग्लोबल वार्मिंग का कारण

कुछ गैसों, जैसे कार्बन डाइऑक्साइड और मीथेन, पृथ्वी के वातावरण में सूरज की गर्मी को अपने अंदर रोकती हैं। ये ग्रीनहाउस गैस (जीएचजी) वायुमंडल में प्राकृतिक रूप से भी मौजूद हैं।

मानव गतिविधियों, विशेष रूप से बिजली वाहनों, कारखानों और घरों में जीवाश्म ईंधन (यानी, कोयला, प्राकृतिक गैस, और तेल) के जलने से कार्बन डाइऑक्साइड और अन्य ग्रीनहाउस गैसों को वायुमंडल में छोड़ा जाता है। पेड़ों को काटने सहित अन्य गतिविधियां भी ग्रीनहाउस गैसों का उत्सर्जन करती हैं।

वायुमंडल में इन ग्रीनहाउस गैसों की उच्च सांद्रता पृथ्वी पर अधिक गर्मी बढ़ाने के लिए जिम्मेवार है, जिससे वैश्विक तापमान में वृद्धि होती है। जलवायु वैज्ञानिक मानते हैं कि ग्लोबल वार्मिंग के पीछे मानव गतिविधियां मुख्य हैं।

ग्लोबल वार्मिंग :

खतरनाक मौसम, तूफान, लू, सूखे और बाढ़

वैश्विक तापमान में वृद्धि से तूफान, बाढ़, जंगल की आग, सूखा और लू के खतरे की आशंका बढ़ जाती है। एक गर्म जलवायु में, वायुमंडल अधिक पानी एकत्र कर सकता है और बारिश कर सकता है, जिससे वर्षा के पैटर्न में बदलाव हो सकता है।

बढ़ी हुई वर्षा से कृषि को लाभ हो सकता है, लेकिन एक ही दिन में अधिक तीव्र तूफानों के

रूप में वर्षा होने से, फसल, संपत्ति, बुनियादी ढांचे को नुकसान होता है और प्रभावित क्षेत्रों में जन-जीवन का भी नुकसान हो सकता है।

ग्लोबल वार्मिंग के कारण समुद्री सतह का तापमान भी बढ़ जाता है क्योंकि पृथ्वी के वातावरण की अधिकांश गर्मी समुद्र द्वारा अवशोषित हो जाती है। गर्म समुद्री सतह के तापमान के कारण तूफान का बनना आसान हो जाता है। मानव-जनित ग्लोबल वार्मिंग के कारण, यह आशंका जताई जाती है कि तूफान से वर्षा की दर बढ़ेगी, तूफान की तीव्रता बढ़ जाएगी और श्रेणी 4 या 5 के स्तर तक पहुंचने वाले तूफानों का अनुपात बढ़ जाएगा।

बढ़ते समुद्र के स्तर से ग्लोबल वार्मिंग

ग्लोबल वार्मिंग दो मुख्य तरीकों से समुद्र के जल स्तर को बढ़ाने में योगदान देता है। सबसे पहले, गर्म तापमान के कारण ग्लेशियर और भूमि-आधारित बर्फ की चादरें तेजी से पिघलती हैं, जो जमीन से समुद्र तक पानी ले जाती हैं। दुनिया भर में बर्फ पिघलाने वाले क्षेत्रों में ग्रीनलैंड, अंटार्कटिक और पहाड़ के ग्लेशियर शामिल हैं।

जलवायु परिवर्तन पर संयुक्त राष्ट्र फ्रेमवर्क कन्वेंशन 2019 अनुसार, ग्लोबल वार्मिंग की वजह 2100 तक 80 फीसदी ग्लेशियर पिघल कर सिकुड़ सकते हैं।

दूसरा, गरमी-संबंधी (थर्मल) विस्तार, वह प्रक्रिया जिसके द्वारा गर्म पानी अधिक जगह लेता है, जिसके कारण समुद्र का आयतन बढ़ जाता है, जिससे समुद्र का जल स्तर बढ़ जाता है।

अन्य कारक समुद्र के स्तर को प्रभावित करते हैं और इन सभी कारकों के संयोजन से पूरे ग्रह में समुद्र के स्तर में वृद्धि की अलग-अलग दर होती है। स्थानीय कारक जो समुद्र के स्तर को कुछ क्षेत्रों में तेजी से बढ़ने का कारण बन सकते हैं, उनमें समुद्र की धाराएं और डूबती हुई जमीन की सतह आदि शामिल हैं।

जलवायु परिवर्तन के मुद्दे की उपेक्षा की गई तो कुछ दशकों में यह लोगों और पारिस्थिति तंत्र के लिए ऐसा संकट बन जाएगा, जिसका समाधान नहीं हो पायेगा। पृथ्वी का प्राकृतिक और मानव तंत्र गर्म होती जलवायु के प्रति संवेदनशील होता है। जलवायु परिवर्तन पर बने अन्तसरकारी पैनल की विशेष रिपोर्ट के अनुसार पारिस्थितिकी तंत्र बदल जायेगा। 2 डिग्री सेल्सियस ताप बढ़ने पर 13 प्रतिशत भू-क्षेत्र से जुड़ा पारिस्थितिकी तंत्र एक जैव क्षेत्र से दूसरे जैव क्षेत्र में तब्दील हो जायेगा। यह प्रभाव 1.5 डिग्री सेल्सियस की तुलना में डेढ़ गुना होगा।

उद्देश्य

1. जलवायु परिवर्तन के प्रति संवेदनशील होना।
2. पारिस्थितिकी तंत्र के प्रति संवेदनशीलता।
3. जलवायु परिवर्तन में वैश्विक भूमिका एवं समाधान।

तापमान बढ़ने का जो सिलसिला चल रहा है, उससे इसके वर्ष 2030 तक 1.5 डिग्री सेल्सियस तक बढ़ने की कम से कम 50 प्रतिशत संभाव्यता है। 1.5 डिग्री सेल्सियस तापमान का बढ़ना खतरनाक ताप वृद्धि का दायरा है। वर्ष 2030 के बाद जलवायु परिवर्तन से होने वाली गड़बड़ी, कोविड-19 की तरह हम सभी के घर तक पहुंच जायेगी, खासकर गरीबों के मामलों में।

तापमान बढ़ाने वाली गैसों का 50 प्रतिशत या उससे भी अधिक दुनिया के सबसे अमीर एक अरब लोगों द्वारा उत्सर्जित किया जाता है। जबकि दुनिया के तीन अरब सबसे गरीब लोगों का इसमें योगदान सिर्फ 5 प्रतिशत है। हम अपने सहज ज्ञान से जानते हैं कि इन सबसे गरीब तीन अरब लोगों के पास खुद को लू, सूखे, बाढ़, आग लगने, फसलों के बर्बाद होने, मच्छर-मक्खियों से फैलने वाली बीमारियों और पानी से हाने वाली बीमारियों से बचाने की सीमित क्षमता है। जबकि

9 साल या इससे तीन साल कम या अधिक के दौरान, जब तापमान 1.5 डिग्री सेल्सियस से अधिक बढ़ जाएगा तो ये सारी स्थितियां और खराब हो जाएंगी।

जलवायु परिवर्तन को यदि अनियंत्रित छोड़ दिया जाए तो कुछ दशक में यह लोगों और इकोसिस्टम के लिए ऐसा संकट बन जाएगा जिससे निपटा नहीं जा सकेगा। गर्मी को पृथ्वी पर बढ़ाने वाली गैसों के मुख्य स्रोतों में जीवाश्म ईंधन, कोयला, पेट्रोलियम और प्राकृतिक गैसों हैं। जीवाश्म ईंधन वायु प्रदूषण के भी बड़े कारक हैं - पीएम 2.5 कण और सतह पर मौजूद ओज़ोन। ये हर साल दिल की बीमारियों, लकवे, सांस के रोगों और फेफड़ों के कैंसर से 50 लाख से लेकर एक करोड़ लोगों को मौत के शिकार बनाते हैं।

वैश्विक स्वास्थ्य और कल्याण के लिहाज से वायु प्रदूषण से वर्ष 2013 में 5100 अरब डॉलर का नुकसान हुआ, जो दुनिया की जीडीपी का सात प्रतिशत है। भारत में प्रदूषण से होने वाली मौतों का आंकड़ा काफी ज्यादा है। इससे हर साल 25 लाख लोगों की समय से पहले मौत हो जाती है। इनमें 114,000 शिशुओं की मौत भी शामिल है। आखिर में, वायु प्रदूषण से उपज में भी काफी कमी आई है। गेहूं के मामले में यह 36 प्रतिशत तक है, तो धान के मामले में 10 प्रतिशत तक। भारत और अन्य दक्षिण एशियाई देशों को वायु प्रदूषण को कम करना भी कार्बन डाइऑक्साइड उत्सर्जन में कमी की तरह बराबर प्राथमिकता में रखना चाहिए।

सौभाग्यवश वायु प्रदूषण की समस्या का समाधान करने का दोहरा लाभ मिलता है। इससे जलवायु परिवर्तन के एक बड़े हिस्से का भी हल निकलता है, क्योंकि जीवाश्म ईंधन इन दोनों समस्याओं के बड़े कारक हैं।

फिर भारत को जलवायु परिवर्तन के मामले को हल करने के लिए क्या आगे आना चाहिए? वैश्विक तापमान वृद्धि के आंकड़े बताते हैं कि गर्म हवा अधिक नमी लिए होती है। मैंने उपग्रह से

मिले आंकड़ों के जरिये प्रदर्शित किया है कि यदि हवा में एक डिग्री की गर्मी बढ़ जाए तो नमी 7 प्रतिशत तक बढ़ जाती है। तापमान में बढ़ोतरी और नमी का यह संबंध भारत जैसे उष्णकटबंधीय देश के जलवायु परिवर्तन के मुद्दे को और परेशान करने वाला बनाता है। इससे तापमान में वृद्धि के कारण नमी वाली गर्म हवाएं चल सकती हैं, मानसून की वर्षा तीन गुना तक बढ़ सकती है और इन सबका जीवन, कृषि और संपत्ति पर विनाशकारी असर पड़ सकता है। दूसरी तरफ वायु प्रदूषण के कारण सूर्य के प्रकाश के अवरूद्ध होकर पहुंचने से मानसून चक्र धीमा हुआ है जिससे धान, गेहूं और अन्य फसलों की पैदावार में काफी कमी आई है। वैश्विक तापमान वृद्धि और सूर्य के प्रकाश के काले कार्बन कणों द्वारा रूकने से हिमालय क्षेत्र के ग्लेशियर पिघल रहे हैं जिससे बाढ़ आ रही है और पर्वतीय क्षेत्रों में रहने वाले समुदायों पर इसका बुरा असर पड़ रहा है। ऐसी अति का जन स्वास्थ्य पर बेहद बुरा प्रभाव पड़ता है, लेकिन यूनिवर्सिटी ऑफ़ कैलिफ़ोर्निया, सैन डिएगो की स्नायु वैज्ञानिक डॉ. ज्योति मिश्रा के हाल ही के एक अध्ययन के अनुसार इसका मानसिक स्वास्थ्य पर भी उतना ही बुरा प्रभाव हो सकता है।

जलवायु संकट का समाधान निकालने के लिए आवश्यकता इस बात की है कि जीवाश्म ईंधन को बीते जमाने की तकनीक घोषित किया जाए और ऐसे ऊर्जा स्रोतों की ओर मुड़ा जाए जो गर्मी को रोकने वाली गैसों पैदा नहीं करते और न ही काला कार्बन उत्पन्न करते हैं। कहीं भी तापमान बढ़ाने वाली गैसों उत्सर्जित हो रही हों तो वह वैश्विक तापमान बढ़ोतरी का कारण बनता है। जलवायु संकट के समाधान के लिए सभी जगह और सभी लोगों तक स्वच्छ ऊर्जा की पहुंच की आवश्यकता है, चाहे वे गरीब हों या अमीर। यह एक तरीके से कोविड-19 के समाधान की तरह है, जिसमें सभी को वैक्सीन लगाने की आवश्यकता है।

संपोषणीय विकास मानव विकास की वह प्रक्रिया है जिसमें पर्यावरण का निम्नीकरण किए बिना प्राकृतिक संसाधनों का उपयोग किया जाता है, साथ ही भावी पीढ़ियों की आवश्यकताओं को ध्यान में रखते हुए इनके उपयोग पर बल दिया जाता है। अर्थात् संपोषणीय विकास सुनियोजित सिद्धान्त है, जो कि मानव विकास के लक्ष्य को प्राप्त करता है, साथ ही प्राकृतिक संसाधन और पारिस्थितिक तंत्र प्रदान करने की क्षमता प्रकृति में सुरक्षित रहती है। इस विकास प्रक्रिया से पर्यावरण संरक्षण, पारिस्थितिकी एवं पर्यावरणीय विकास के साथ आर्थिक एवं सामाजिक विकास का भी अनुसरण किया जाता है। यह एक दूरदर्शी विकास योजना है।

संपोषणीय विकास में भारत की भूमिका

1. भारत के गांवों में रहने वाले लोगों की जीवाश्म ईंधन से मुक्त स्वच्छ ऊर्जा तक पहुंच सुनिश्चित की जाए जिसे कि वे खाना पकाने, खाना गर्म करने और रोशनी की अपनी मूल जरूरतों को पूरा कर सकें। इससे गर्मी को रोककर ताप बढ़ाने वाले प्रदूषकों की मात्रा तो कम होगी ही, साथ ही दिल्ली जैसे उच्च प्रदूषण वाले शहरों समेत भारत में वायु प्रदूषण एक तिहाई तक घट जाएगा।
2. कृषि अवशेषों का जलाना बंद किया जाए और इसके बदले इनसे ऊर्जा के लिए नवीकरणीय बायोमास ईंधन तैयार हो और सेहतमंद भूमि के लिए कृषि कचरे की कंपोस्टिंग हो। इस कदम से कम समय तक जीवित रहने वाले जलवायु प्रदूषकों का उत्सर्जन कम होगा और उत्तरी और मध्य भारत में नवंबर एवं दिसंबर में होने वाले जबर्दस्त वायु प्रदूषण की मात्रा भी कम होकर आधी रह जाएगी।

3. वर्ष 2030 तक डीजल ईंधन का इस्तेमाल बंद कर दिया जाए। काले कार्बन के कणों की एक टन मात्रा से उतनी ही गर्मी पृथ्वी पर अवशोषित रह जाती है जितनी कि 2000 टन कार्बन डाइऑक्साइड से। राष्ट्रीय स्तर पर इस समाधान के अमल से और बाकी दक्षिण एशिया में भी इस पर अमल से, भारत में समय पूर्व होने वाली 10 लाख मौतों को राका जा सकता है जिनमें एक लाख शिशुओं की मौतें शामिल हैं। इससे हिमालयी ग्लेशियरों के बड़े हिस्सों के पिघलने की दर आधी हो सकती है। भारत वैश्विक तापमान वृद्धि में अपनी हिस्सेदारी उस स्तर तक कम कर सकता है जो 10 करोड़ टन से 18 करोड़ टन कार्बन डाइऑक्साइड उत्सर्जन के बराबर है। इसके साथ ही भारत गेहूं का उत्पादन लगभग 35 प्रतिशत और धान का उत्पादन लगभग 10 प्रतिशत तक बढ़ा सकता है।
4. बेहतर भूमि प्रबंधन और वेदरिंग की अनूठी प्रक्रिया के जरिये भूमि की वातावरण से कार्बन डाइऑक्साइड सोखने की प्राकृति क्षमता को बढ़ाना। ये दो कदम भारत में हवा से 30 करोड़ टन कार्बन डाइऑक्साइड को पृथक कर उसे भूमि का हिस्सा बन सकते हैं, जिससे गेहूं और धान की पैदावार बढ़ेगी। इस बारे में यूनिवर्सिटी ऑफ कैलिफोर्निया और कॉर्नेल यूनिवर्सिटी के शोधकर्मियों का दल प्रोफेसर बेंजामिन हॉल्टन के नेतृत्व में बड़ी प्रदर्शन परियोजनाओं पर जुटा है।
5. शीघ्र ही, भारत और सभी राष्ट्रों को दोहरे कर्तव्य निभाने होंगे। ये हैं, 1. तेजी से बढ़ते तापमान के अनुरूप खुद को ढालना और 2. और उन प्रदूषकों की रोकथाम जो वायु प्रदूषण फैलाते हैं या

फिर गर्मी को पृथ्वी की हवा में ही रोक लेते हैं। ये दोहरे कर्तव्य निभाए जा सकते हैं और निभाने होंगे क्योंकि यह हमारे अस्तित्व के लिए चुनौती है। इसके अलावा हाईस्कूल और कॉलेज विद्यार्थियों में जागरूकता के लिए व्यापक जलवायु शिक्षा कार्यक्रम चलाना भी महत्वपूर्ण है। हमने यूनिवर्सिटी ऑफ कैलिफोर्निया में ऐसी शिक्षा-व्यवस्था तैयार की है, जिसे भारतीय विद्यार्थियों के लिए भी काम में लिया जा सकता है।

भारत दुनिया के उन कुछ देशों में है जहां नई और नवीकरणीय ऊर्जा के लिए मंत्रालय है। यह अनूठा मंत्रालय यदि वायु प्रदूषण नियमन पर निगाह रखने से जुड़े मंत्रालय, संयुक्त राष्ट्र जलवायु एवं स्वच्छ वायु गठजोड़ और अमेरिका-भारत जलवायु एवं स्वच्छ ऊर्जा एजेंडा 2030 भागीदारी के साथ समन्वय कर सके और भारत की प्रमुख, फाउंडेशन के साथ पब्लिक-प्राइवेट पार्टनरशिप कर सके, तो यह भारत को मानवता के अस्तित्व पर मंडराते खतरे को दूर करने के लिए सक्रिय वैश्विक लीडर के तौर पर प्रस्तुत कर सकता है।

संपोषणीय विकास में वैश्विक भूमिका

1. खाद्य पदार्थों की बर्बादी से पर्यावरण को खतरा :-

कई बार हम जो चीजें नहीं खाते, वे भी उतनी ही नुकसानदायक हो सकती हैं, जिनी कि वे जिन्हें हम खाते हैं - हालांकि एक अलग स्वरूप से।

भोजन की बर्बादी - भोजन जो तैयार तो हो रहा है लेकिन तमाम कारणों से उसका इस्तेमाल नहीं किया जा रहा, वह भी खाद्य सुरक्षा, पर्यावरण के साथ ही, एक तरह से हम सभी को प्रभावित करता है। इसी वर्ष मार्च में संयुक्त राष्ट्र पर्यावरण प्रोग्राम (यू.एन.ई.पी.) ने खाद्य पदार्थों की बर्बादी पर अपनी इंडेक्स रिपोर्ट-2021 को प्रकाशित किया जिसमें बताया गया कि ग्रीन हाउस गैसों के उत्सर्जन का 10

प्रतिशत हिस्सा बर्बाद हुए भोजन के कारण होता है। वैश्विक तापमान बढ़ोतरी के बड़े कारकों में से एक ग्रीन हाउस गैसों हैं।

जब खाद्य पदार्थ फेंके जाने के बाद कचरा स्थलों पर पहुंचते हैं तो अन्य पर्यावरण प्रभावों के अलावा इनसे वायु प्रदूषण और भूजल प्रदूषण का खतरा भी बढ़ जाता है।

खाद्यान्न की बर्बादी को रोकने के बहुत-से तरीके हैं, जिनमें निजी स्तर पर उठाए गए कदमों के अलावा कहीं ज्यादा व्यवस्थित सरकार के स्तर पर किए गए प्रयास गिनाए जा सकते हैं। लोगों को इस तरह से शिक्षित करने की जरूरत है जिससे उनके व्यावहारिक और तौर-तरीकों में बदलाव लाया जा सके। खासतौर पर सोशल मीडिया कैंपेन चलाने के साथ सेल-बाइ और बेस्ट-बाइ डेट की व्याख्या के बारे में लोगों को जानकारी देने और लोगों को भोजन के संरक्षण के बारे में शिक्षित करके खाद्यान्न की बर्बादी को कम करने में मदद की जा सकती है।

2. जलवायु प्रहरी बनने की पढ़ाई :-

जलवायु संकट युवाओं में आज चिंता की बड़ी वजह बना हुआ है और वे पर्यावरण संगठनों के साथ जुड़कर, सामुदायिक परियोजनाओं में प्रतिभागी बन कर या सोशल मीडिया सहित विभिन्न मंचों से इस बारे में जागरूकता फैलाकर, अपनी इस चिंता को जाहिर भी कर रहे हैं।

अमेरिका के विश्वविद्यालयों ने जलवायु परिवर्तन के अध्ययन के लिए तमाम प्रोग्राम शुरू किए हैं ताकि जलवायु के बारे में जागरूकता को युवाओं के लिए एक कैरियर के रूप में विकसित किया जा सके। जलवायु परिवर्तन पर ग्रेजुएट प्रोग्राम जैसे तो अपेक्षाकृत नए हैं लेकिन वे जलवायु परिवर्तन की रोकथाम के लिए सरकारों, गैरलाभकारी संस्थाओं और शोध एजेंसियों को जो प्रशिक्षित कर्मी चाहिए, उसका हल प्रदान कर रहे हैं।

अमेरिकी विश्वविद्यालयों में ग्रेजुएट स्तर पर जलवायु परिवर्तन विषय के अध्ययन के लिए विद्यार्थियों के पास कई विकल्प हैं। उदाहरण के लिए नॉर्दन एरिज़ोना यूनिवर्सिटी में क्लाइमेट साइंस एंड सॉल्यूशंस प्रोफेशनल साइंस में मास्टर्स

प्रोग्राम और कोलंबिया यूनिवर्सिटी का मास्टर ऑफ ऑर्ट्स इन क्लाइमेट एंड सोसायटी का प्रोग्राम उपलब्ध है।

नॉर्दन एरिज़ोना यूनिवर्सिटी का प्रोग्राम अपने अंतरविषयक दृष्टिकोण और पेशेवर प्रशिक्षण के कारण विशिष्ट है।

जलवायु विज्ञान विषय प्रोग्राम के लिए किसी खास पृष्ठभूमि की जरूरत नहीं है लेकिन आमतौर पर विद्यार्थी पर्यावरण विज्ञान और भौतिकी की पृष्ठभूमि वाले होते हैं। 18 महीनों के इस प्रोग्राम में पंजीकृत होने के बाद विद्यार्थियों को मुख्य विषयों के एक सेट का अध्ययन करना होता है जिसमें जलवायु राकथाम, जलवायु अनुकूलन, ऊर्जा नीति और पर्यावरण अर्थशास्त्र शामिल हैं। वे अपनी डिग्री को वैयक्तिक विशिष्टता देने के लिए, बिज़नेस, सांख्यिकी, इकोलॉजी, संचार, जीवविज्ञान, इंजीनियरिंग, सस्टेनेबिलिटी एंड पॉलिसी जैसे विषयों की 100 इलेक्टिव क्लास में से भी अपनी पसंद चुन सकते हैं।

मज़बूत शैक्षणिक घटक के अलावा प्रोग्राम में समग्र रूप से इसके व्यावहारिक ज्ञान की भी व्यवस्था की गई है जिसमें, इंटरनशिप और कम्युनिटी प्रोजेक्ट शामिल हैं।

3. बदलती जलवायु के साथ स्मार्ट खेती :-

मौसम के रौद्र रूप के बढ़ते संकट के कारण तूफान, बाढ़ और सूखे जैसी स्थितियां पैदा हो रही हैं और इससे विश्व भर में कृषि उत्पादन और खाद्य सुरक्षा के लिए खतरा पैदा हो गया है। इसलिए कृषि विकास की दर को बनाए रखने और एक लचीली खाद्य उत्पादन व्यवस्था को तैयार करने के लिए जलवायु परिवर्तन के प्रभाव को कम से कम करना जरूरी हो गया है। कृषि कार्यों में आ रही इन दिक्कतों को ध्यान में रखते हुए युनाइटेड स्टेट्स एजेंसी फॉर इंटरनेशनल डवलपमेंट (यूएसएड) इंडिया ने भारत के संवेदनशील इलाकों में कृषि में लचीले तौर तरीकों, तकनीकों और सेवाओं को बढ़ावा देने के लिए एक प्रोजेक्ट को धन उपलब्ध कराया है।

यह प्रोजेक्ट सितंबर 2020 में पूरा हुआ और इस पर बिहार के नालंदा, मध्यप्रदेश में बेतूल और उत्तर प्रदेश के मथुरा में अमल हुआ। ऐसा दक्षिण एशिया में जलवायु बदलाव, कृषि और खाद्य सुरक्षा (सीसीएएफएस), बॉरलॉग इंस्टीट्यूट ऑफ साउथ एशिया और इंटरनेशनल मेज़ एंड व्हीट इंप्रूवमेंट सेंटर के माध्यम से सीजीआईएआर के रिसर्च प्रोग्राम के तहत किया गया।

रेड्डी का कहना है, “इस पहल के जरिए, फसलों और पशुधन को ध्यान में रखते हुए, स्थानीय जरूरतों के अनुरूप वैज्ञानिक ज्ञान के आधार पर तमाम तरह की लचीली तकनीकों, सेवाओं और कार्यप्रणालियों का खाका बनाया गया।” वह बताते हैं, “पारंपरिक रूप से कृषि पद्धतियों का जोर हमेशा से उत्पादकता और सदाजीविता के बीच संतुलन रखने के साथ इससे जुड़े दूसरे आयामों को भी समन्वित कर देखती है।”

4. शहर बदलेंगे तभी बचेंगे :-

शहरों के लिए कई अनुकूलन रणनीतियां हो सकती हैं जो जलवायु में बदलाव को रोकने में कारगर सिद्ध हो सकती हैं। “शहर में नवीकृत ऊर्जा का इस्तेमाल कर सकते हैं। भवनों में बदलाव कर सकते हैं, कंप्रेस्ड नैचुरल गैस और जैव ईंधन का प्रयोग कर सकते हैं, पब्लिक ट्रांसपोर्ट के इस्तेमाल के चलने को बढ़ावा दे सकते हैं, कचरे से उत्सर्जन को कम कर सकते हैं, नागरिकों के लिए पूरे शहर में ऑनलाइन सेवाओं को शुरू किया जा सकता है, शहरों के लिए वन क्षेत्र बना सकते हैं, ऑक्सीजन पार्क और शीतल छतों की पहल की जा सकती है, उद्योगों से उत्सर्जन को सीमित किया जा सकता है और दूसरी चीजों के अलावा सप्लाय चैन से होने वाले उत्सर्जन को सीमित करने पर ध्यान केंद्रित किया जा सकता है।

वैश्विक तापमान वृद्धि से जुड़ी चुनौतियां काफी बेहद मुश्किल लग सकती हैं लेकिन समस्या के कारक और उसके समाधान एक ही जगह पर मौजूद है। इसीलिए एक उम्मीद की किरण भी है। “जलवायु में बदलाव अधिकतर मानव जनित ग्रीनहाउस गैस उत्सर्जन से हो रहा है। इसीलिए इसे मानव व्यवहार में बदलाव के जरिए रोका जा सकता है।”

संदर्भ सूची

1. spanmag.com /hi , वर्ष 19 अंक : 2, मई-जून 2021
2. spanmag.com/hi , वर्ष 19 अगस्त 3 ,जुलाई अगस्त 2021
3. डॉ भार्गव महेश एवं डॉ भार्गव अनिल” शैक्षिक निकुंज” 2008 राखी प्रकाशन ,आगरा ISBN 978-93-8613-20-4



म्यूचुअल फंड

डॉ. मोनिका बाबेल

मोहनलाल सुखाड़िया विश्वविद्यालय, उदयपुर

Corresponding Author- डॉ. मोनिका बाबेल

Email:- babelmonika24@gmail.com

DOI - 10.5281/zenodo.7295812

म्यूचुअल फंड क्या है ?

म्यूचुअल फंड में हमारे और आपके जैसे ढेर सारे लोगों का पैसा इकट्ठा किया जाता है। इस पैसे को मैनेज करने की जिम्मेदारी एक फण्ड मैनेजर की दी जाती है। ये फंड मैनेजर निवेश के मामलों का विशेषज्ञ होता है। ये मैनेजर शेयर या बॉन्ड में पैसे लगाकर ज्यादा से ज्यादा प्रॉफिट कमाने की कोशिश करता है। उसकी कोशिश होती है कि कम रिस्क उठाकर ज्यादा कमाई कैसे की जाए। इस तरह म्यूचुअल फंड के जरिए एक छोटा निवेशक भी विशेषज्ञ की सर्विस ले पाता है।

एसेट मैनेजमेंट कंपनी

भारत में बहुत सी Mutual Fund Companies चल रही है। इन Mutual Fund Companies को Asset Management Companies या AMC भी कहते हैं। AMC, दरअसल, SEBI में रजिस्टर्ड ऐसी कंपनी होती है, जो Mutual Fund स्कीम बनाती है और लोगों से पैसा जमा करती है। यही कंपनी फंड मैनेजर को भी नियुक्त करती है।

Mutual Fund Schemes

Mutual Fund Companies बहुत सी Mutual Fund Schemes संचालित करती है। हर Scheme में निवेश का अलग लक्ष्य (Objectives) होता है। जैसे कोई एक स्कीम सिर्फ बड़ी कंपनियों के शेयरों में पैसा लगाती है तो दूसरी सिर्फ छोटी कंपनियों में निवेश करेगी। कोई तीसरी स्कीम सिर्फ बड़ी कंपनियों के शेयरों में पैसा लगाती है तो दूसरी सिर्फ छोटी कंपनियों में निवेश करेगी। कोई तीसरी स्कीम सिर्फ Government Bonds में पैसा लगा सकती है। इस तरह से हर Company अलग-अलग उद्देश्यों वाले कई Mutual Fund Scheme शुरू करती है।

Fund Manager

हर Scheme में पैसा लगाने की जिम्मेदारी किसी Fund Manager को दी जाती है। कोई एक व्यक्ति कई Scheme का Fund Manager भी हो सकता है। किसी एक म्यूचुअल फंड कंपनी या asset Management

Company के पास निवेश की रणनीति Investment Strategy पर काम करने के लिए अपनी Research Team भी होती है।

एनएवी क्या है ? (What Is NAV)

म्यूचुअल फंड की एक यूनिट की कीमत को Net Asset Value (NAV) कहते हैं। यह Net Asset Value (NAV) ही उस mutual fund scheme की performance को बताता है। मान लिया कि आप mutual fund में निवेश करना चाहते हैं। आप 10 रुपए में NFO Period में Mutual Fund की एक Unit खरीद लेते हैं। NFO Period के दौरान इस Mutual Fund की NAV 10 रुपए होगी। अब यह भी मान लेते हैं कि आप ही की तरह और भी 9 लोगों ने Mutual Fund की यूनिट खरीदी है।

इस तरह से उस mutual fund scheme ने कुल 10 यूनिट बेचकर 100 रुपए इकट्ठा किए हैं। अब आपका fund manager इन 100 रुपयों में कुछ Shares खरीद लेता है। मान लिया, आपके 100 रुपए Investment की कीमत एक साल बाद 150 रुपए हो जाती है। तो अब उस Mutual Fund की हर Unit की कीमत हो गई $150/10=15$ रुपए। यानी कि हर यूनिट की net asset value (NAV) हो गई 15 रुपए।

अब मान लिया कि 5 और लोग उसी mutual fund scheme में निवेश करना चाहते हैं। लेकिन, अब उस mutual fund scheme की यूनिट की NAV 15 रुपए हो चुकी है। इसलिए उन्हें अब इसकी 1 यूनिट के लिए 15 रुपए चुकाने पड़ेंगे। कंपनी इन नए पांच लोगों को 5 Unit बेचकर 75 रुपए और इकट्ठा कर सकेगी। अब कंपनी के पास कुल पैसे हो गए $150+75=225$ रुपए। लेकिन, कुल यूनिटों की संख्या 15 हो गई। कोई mutual fund company नई यूनिटें जारी करके निवेश के लिए अपनी रकम (corpus) बढ़ा सकती है। इससे पुराने investors का निवेश प्रभावित नहीं होता। क्योंकि नए investors को ये नई यूनिटें नई कीमत पर प्राप्त होती हैं।

म्यूचुअल फंड कंपनियां समय-समय पर NAV की घोषणा करती रहती हैं। आप किसी NAV की जानकारी AMC's की websites या AMFI Portal के माध्यम से प्राप्त कर सकते हैं।

म्यूचुअल फंड की श्रेणियां ? (Mutual Fund Category)

निवेश (investment) और पैसा निकालने (redemption) की flexibility के हिसाब से mutual funds दो प्रकार के होते हैं।

Open-Ended Mutual Fund Scheme

Close-Ended Mutual Fund Scheme।

किसी म्यूचुअल फंड स्कीम के NFO के पहले AMC को fix तय करना होता है कि वह Open-Ended Mutual Fund Scheme ला रहा है या close-Ended Mutual Fund Scheme।

Open Ended Mutual Fund Scheme

Open Ended Mutual Fund scheme ऐसी स्कीम होती है, जिसमें Investors के कभी भी पैसा लगा सकता है और निकाल सकता है। चूंकि ऐसी स्कीम में पैसा आता जाता रहता है इसलिए ऐसी स्कीम के पास कोई fixed amount नहीं रहता है। फंड मैनेजर को परिस्थितियों के हिसाब से निवेश का फैसला लेना होता है।

Close Ended Mutual Fund Scheme

close ended mutual fund Scheme में आप सिर्फ NFO के समय ही पैसा लगा सकते हैं। इसके बाद सिर्फ

maturity पर ही अपना पैसा निकाल सकते हैं। हालांकि, close ended mutual fund scheme की यूनिटों को secondary market में खरीदा और बेचा जा सकता है। ऐसे लेन-देन से mutual fund company का कोई लेना—देना नहीं होता और न ही उस mutual fund scheme की जमा रकम पर इनका कोई प्रभाव पड़ता है।

म्यूचुअल फंड के प्रकार (Types Of Mutual Fund)

अपने investment portfolio के आधार पर mutual fund कई प्रकार के होते हैं। SEBI ने mutual funds को 5 भेदों में श्रेणीबद्ध categorized किया है। इनका संक्षेप में परिचय हम नीचे दे रहे हैं।

इक्विटी फंड (Equity Fund)

Equity mutual funds का ज्यादातर पैसा shares में लगाया जाता है। ऐसी schemes के fund manager को कम से कम 65% परसेंट रकम शेयर में ही लगानी होती है। बाकी बचे पैसे को वो बॉन्ड या फिर बैंक में रख सकता है। अब चूंकि equity mutual fund को शेयरों में निवेश किया जाता है। तो इनका return भी share market के हिसाब से मिलता है। यानी कमाई की सबसे ज्यादा संभावना होती है लेकिन रिस्क भी इसमें ज्यादा होता है। Equity fund से होने वाली Income पर long term capital gains tax नहीं लगता है, जबकि short-term capital gain को आपकी Income में जोड़कर tax calculation में शामिल करते हैं।

डेट फंड (Debt Fund)

इस प्रकार के mutual fund की रकम को मुख्य रूप से bonds और corporate fixed deposit में निवेश किया जाता है। किसी debt mutual fund के साथ यह अनिवार्य शर्त होती है कि उसका कम से कम 65 प्रतिशत पैसा बॉन्ड या बैंक डिपॉजिट में लगाया जाए। उदाहरण के लिए government bonds, company bonds, corporate fixed deposits और bank deposits वगैरह। बाकी रकम को equity यानी शेयरों में लगाया जा सकता है।

अब चूंकि debt funds को fixed return देने वाले बॉन्ड में लगाया जाता है, इसलिए इनमें risk भी तुलनात्मक रूप से कम होता है। लेकिन इनसे आपको जबर्दस्त फायदे की भी उम्मीद नहीं करनी चाहिए। वैसे अच्छे debt

funds आपको bank fixed deposits की अपेक्षा बेहतर रिटर्न दे सकते हैं।

अगर आप अपने debt fund को 3 साल बाद भुनाते हैं तो इस पर आपको long term capital gains tax चुकाना पड़ता है। इस long term capital gains tax की दर बिना indexation के 10 प्रतिशत होगी और indexation के साथ 20 प्रतिशत।

अगर आप 3 साल के पहले अपनी debt mutual fund units को बेच देते हैं तो इससे हुई आमदनी पर आपको short-term capital gains tax चुकाना पड़ेगा। इस short-term capital gain को आपकी कुल आमदनी में जोड़ा जाएगा और फिर आपके Tax Slab के हिसाब से Tax की गणना होगी।

बैलेंस्ड म्यूचुअल फंड | Balanced Mutual Fund

Balanced Mutual Fund आपके पैसे को शेयर और बॉन्ड दोनों में लगाते हैं। जैसा कि आप जानते ही हैं कि शेयर में return ज्यादा मिलता है लेकिन वो risky होते हैं जबकि bond सुरक्षित होते हैं लेकिन उसमें रिटर्न कम मिलता है। इसलिए इन दोनों में पैसे लगाकर ये म्यूचुअल फंड safety के साथ-साथ बढ़िया रिटर्न देने की कोशिश करता है।

हालांकि ये म्यूचुअल, शुद्ध शेयर में पैसा लगाने वाले equity mutual fund से कम return देते हैं और शुद्ध बॉन्ड में पैसा लगाने वाले debt fund से कम safe होते हैं।

Market के अच्छे समय में ये funds न तो Equity Funds की तरह बहुत ऊंचा रिटर्न (High Return) देते हैं और न ही Market के बुरे समय में Equity Funds की तरह ये आपको बहुत खराब return देते हैं।

ये फंड निवेश में संतुलित रवैया (balanced approach) अपनाते हैं और market की condition के हिसाब से शेयरों और बांडों में निवेश करते हैं।

Note: भारत में 'balanced' funds का झुकाव भी equity यानी शेयरों में निवेश की तरफ ज्यादा दिखता है। ज्यादातर अपने portfolio का कम से कम 65 प्रतिशत तक शेयरों में लगाते हैं। ऐसा वे इसलिए करते हैं ताकि tax बचाने में ज्यादा से ज्यादा मदद मिल सके। चूंकि, ऐसे funds, जिनका निवेश, शेयरों में 65 प्रतिशत से

अधिक होता है, उन्हें equity mutual funds माना जाता है। तो फिर उनकी आमदनी पर long term capital gains tax लागू नहीं होगा और वे ज्यादा tax benefit उठा सकते हैं।

कुछ Balanced Fund के उदाहरण

HDFC Prudence

HDFC Children's Gift Fund – Investment

ICICI PRU balanced

DSPBR Balanced

Reliance Regular Savings – Balanced

कुछ और भी ऐसे Fund होते हैं, जिन्हें तकनीकी रूप से balanced या hybrid funds कहा जा सकता है, लेकिन mutual fund कंपनियां उनके नाम के साथ 'balanced' शब्द नहीं जोड़तीं।

ये funds अपने Portfolio का 65 प्रतिशत से कम शेयरों में लगाते हैं। इनका शेयरों में निवेश 20 से 30 प्रतिशत हो सकता है। ऐसे funds से होने वाली आमदनी पर long term capital gains tax भी लगता है। भारत में इस तरह के funds मासिक आय योजना (monthly income plans) के रूप में होते हैं। ये आपको हर महीने एक निश्चित आय प्रदान करते हैं। ऐसे Funds आपकी पूंजी की सुरक्षा पर ज्यादा जोर रखते हैं और लगभग निश्चित रिटर्न (fixed return) देते हैं।

Monthly Income Plans के कुछ उदाहरण

HDFC MIP – LTP

Birla SL Monthly Income Plan

UTI MIS Adv

Canara Robeco MIP

ICICI Pru MIP

म्यूचुअल फंड के प्रकार (Mutual Fund Categories)

टैक्स सेविंग म्यूचुअल फंड (ईएलएसएस) (Tax Saving Mutual Fund-ELSS)- Tax Saving Mutual Funds को Equity linked saving scheme या ELSS भी कहा जाता है। चूंकि Equity linked saving scheme या ELSS में लगाए गए पैसे पर सरकार टैक्स छूट देती है, इसलिए इन्हें Tax Saving Mutual Funds कहा जाता है। ये टैक्स बचाने के कुछ सबसे अच्छे उपायों में से एक हैं। ELSS में निवेश किया गया पैसा कम से कम 3 साल के लिए locked हो जाता है। यानी

कि आप इनमें लगाया गया पैसा 3 साल के पहले नहीं निकाल सकते।

ELSS का पैसा मुख्य रूप से शेयरों में लगाया जाता है, इसलिए ये अक्सर आपको अच्छा-खासा returns भी दे सकते हैं। हालांकि, अन्य equity mutual funds की तरह ये risky भी होते हैं।

ELSS से section 80C के तहत tax saving होती है। जैसा कि इनकम टैक्स के सेक्शन 80सी में ऐसे निवेशों को रखा गया है जिनमें पैसा लगाने से आपकी टैक्स देनदारी घट जाती है। आप इनमें जितना पैसा लगाते हैं उतना पैसा आपकी taxable income से घट जाता है। PPF investment, Home loan principal, NSC, tax saving FD, insurance, tuition fees और EPF contribution वगैरह भी section 80C के तहत टैक्स छूट की सुविधा के हकदार होते हैं।

इन सारे tax saving निवेशों में ELSS का lock इन period सबसे कम होता है। यानी कि अगर आप कम समय के लिए अपना पैसा जाम करके ज्यादा Tax बचाने की सोच रहे हैं तो Tax Saving Mutual Funds यानी ELSS सबसे बेहतर Option हो सकता है।

Best ELSS Fund

टैक्स सेविंग म्यूचुअल फंड (ईएलएसएस) (Tax Saving Mutual Fund-ELSS)- Tax Saving Mutual Funds को Equity linked saving scheme या ELSS भी कहा जाता है। चूंकि Equity linked saving scheme या ELSS में लगाए गए पैसे पर सरकार टैक्स छूट देती है, इसलिए इन्हें Tax Saving Mutual Funds कहा जाता है। ये टैक्स बचाने के कुछ सबसे अच्छे उपायों में से एक हैं। ELSS में निवेश किया गया पैसा कम से कम 3 साल के लिए locked हो जाता है। यानी कि आप इनमें लगाया गया पैसा 3 साल के पहले नहीं निकाल सकते।

ELSS का पैसा मुख्य रूप से शेयरों में लगाया जाता है, इसलिए ये अक्सर आपको अच्छा-खासा returns भी दे सकते हैं। हालांकि, अन्य equity mutual funds की तरह ये risky भी होते हैं।

ELSS से section 80C के तहत tax saving होती है। जैसा कि इनकम टैक्स के सेक्शन 80सी में ऐसे निवेशों को रखा गया है जिनमें पैसा लगाने से आपकी टैक्स देनदारी घट जाती है। आप इनमें जितना पैसा लगाते हैं उतना पैसा आपकी taxable income से घट जाता है। PPF investment, Home loan principal, NSC, tax saving FD, insurance, tuition fees और EPF contribution वगैरह भी section 80C के तहत टैक्स छूट की सुविधा के हकदार होते हैं।

इन सारे tax saving निवेशों में ELSS का lock इन period सबसे कम होता है। यानी कि अगर आप कम समय के लिए अपना पैसा जाम करके ज्यादा Tax बचाने की सोच रहे हैं तो Tax Saving Mutual Funds यानी ELSS सबसे बेहतर Option हो सकता है।

सिस्टमेटिक इन्वेस्टमेंट प्लान या "सिप" (Systematic Investment Plan (SIP))

म्यूचुअल फंड में निवेश करने के तरीकों में Systematic investment plan या SIP काफी लोकप्रिय है। समझदार निवेशक (Smart investor) विशेष रूप से ELSS में निवेश करने के लिए SIP method का प्रयोग करते हैं। Systematic investment plan में आप नियमित अंतराल (regular interval) पर एक निश्चित रकम निवेश करते जाते हैं। ये interval आपकी सुविधानुसार दैनिक daily, साप्ताहिक weekly, पाक्षिक fortnightly या मासिक monthly, कुछ भी हो सकता है। सैलरी पाने वाले नौकरीशुदा निवेशकों के लिए monthly SIP सबसे बढ़िया है।

Mutual fund companies भी चाहती हैं कि लोग SIP के जरिए निवेश करें इससे उन्हें भविष्य के निवेश का अनुमान मिल जाता है। इसीलिए ये कंपनियां छोटी रकम से भी SIP शुरू करने की इजाजत देती हैं। आप 500 रुपए की छोटी रकम से भी SIP में निवेश शुरू कर सकते हैं।

SIP के साथ जुड़ने से से सबसे अच्छी बात यह होती है कि यह आपमें Investment की आदत डाल देता है। आपको हर बार Investment करने से पहले शेयरों की कीमत, Return वगैरह का आकलन नए सिरे से करने

की जरूरत नहीं पड़ती। एक मध्यम (Mid Term) या लंबी (Long Term) निवेश अवधि के बाद यह आपको औसतन बेहतर Return ही देते हैं। Investment Period के दौरान हो सकता है आप किसी High Return से चूक जाएं, लेकिन किसी बड़े नुकसान से भी आपको जूझना नहीं पड़ता।

नोट: systematic investment plan की तरह नियमित रूप से पैसा निकालने के भी प्लान होते हैं। इन्हें systematic withdrawal plan कहा जाता है।

SIP क्या है और कैसे काम करता है? SIP की विशेषताएं

म्यूचुअल फंड रिटर्न (Mutual Fund Return)-

Mutual funds को कुशल और प्रशिक्षित fund manager और उसकी टीम के द्वारा संचालित किया जाता है। आप इनसे बेहतर return की उम्मीद कर सकते हैं। एक debt mutual fund सामान्य तौर पर bank fixed deposit और government bond से बेहतर रिटर्न देता है। इसी तरह एक equity mutual fund से भी इंडेक्स फंड के मुकाबले बेहतर रिटर्न की उम्मीद कर सकते हैं। इसी तरह किसी hybrid mutual fund भी सामान्यतया debt mutual fund से बेहतर रिटर्न देता है।

हालांकि आप किसी mutual fund की performance को सिर्फ उसके return के आधार पर नहीं आंक सकते। पैसे की safety भी काफी important है। आपके निवेश portfolio का बहु तेज उतार-चढ़ाव ठीक नहीं होता। roller coaster ride नहीं कर सकते।

एक equity mutual fund उस स्थिति में superstar होता है, जबकि यह अपने benchmark index से बेहतर परफॉर्म करे। तेजी में इंडेक्स से अच्छा रिटर्न दे और मंदी में उससे कम गिरे।

साथ ही आप किसी equity mutual fund की performance को छोटी अवधि के प्रदर्शन के आधार पर नहीं तय कर सकते। शेयरों में निवेश एक दीर्घकालिक (long term) खेल होता है। इसलिए mutual fund की performance भी 5 साल के हिसाब से आंकी जानी चाहिए।

संदर्भ

1. Senthil, D., 2010. Financial management practices for
2. organizational sustainability, Mutual funds - An
3. investment Avenue, 27
4. Senthil, D., 2010. Financial management practices for
5. organizational sustainability, Mutual funds - An
6. investment Avenue, 27
7. Senthil, D., 2010. Financial management practices for
8. organizational sustainability, Mutual funds- An investment Avenue, 273.
9. Sudhakar, A. And Sasi Kumar, K., 2010. "Past present
10. and future of mutual funds in India: Investors
11. perception," GITAM Journal of Management,
12. Vol.8(1), pp.98-114
13. Sudhakar, A. And Sasi Kumar, K., 2010. "Past present
14. and future of mutual funds in India: Investors
15. perception," GITAM Journal of Management,
16. Vol.8(1), pp.98-114
17. Sudhakar, A. And Sasi Kumar, K., 2010. "Past present
18. and future of mutual funds in India: Investors
19. perception," GITAM Journal of Management,
20. Vol.8(1), pp.98-114
21. Sudhakar, A. And Sasi Kumar, K., 2010. "Past present
22. and future of mutual funds in India: Investors
23. perception," GITAM Journal of Management,
24. Vol.8(1), pp.98-114
25. Sudhakar, A. And Sasi Kumar, K., 2010. "Past present
26. and future of mutual funds in India: Investors
27. perception," GITAM Journal of Management,
28. Vol.8(1), pp.98-114
29. Sudhakar, A. And Sasi Kumar, K., 2010. "Past present and future of
30. mutual funds in India: Investors

- perception,” GITAM Journal of Management, Vol.8(1), pp. 98-114
29. Kothari, C., 2004. Research methodology - methods and techniques, New Delhi: New Age International Publishers
30. Ippolito, R., 1992. “Consumer reaction to measures of
31. poor quality: Evidence from the mutual fund
32. industry,” Journal of Law and Economics, Vol.35,
33. pp.45-70
34. Ippolito, R., 1992. “Consumer reaction to measures of poor quality: Evidence from the mutual fund industry,” Journal of Law and Economics, Vol.35, pp.45-70
35. <https://www.icicidirect.com>
36. <https://www.kotaksecurities.com>



Exact Study of Transient Thermoelastic Deformation of a Thick Circular Plate

GAIKWAD PRIYANKA B.

Dept. Of Mathematics, Phulsing Naik Mahavidyalaya, Pusad, District-Yavatmal, State-Maharashtra(India).

Corresponding Author- GAIKWAD PRIYANKA B.

Email:- priyankagkwd4@gmail.com

DOI-10.5281/zenodo.7295824.

Abstract

The aim of this work is to determine the unknown temperature, displacement and thermal stresses on the upper surface of a circular plate subjected to an interior heat flux is known under unsteady-state field. The lower surface is kept at zero temperature and the fixed circular edge is thermally insulated. The governing heat conduction equation has been solved by using the Hankel and Laplace transform technique. The results are obtained in series form in terms of Bessel's functions and results have been computed numerically and illustrated graphically.

1. Introduction

As known, thermal behaviors of structures must be considered in many situations. Study of thermal effect on deformations and stresses of a plate, especially a circular plate is increasingly important. Firstly, the problems of circular plates are more complicated and thus more attractive to many scientists. Secondly, there are practical requirements for thick plates in various modern projects, such as high building, raceway, high-way, container wharf, and so on.

Ashida et al. [1] discussed the inverse transient thermoelastic problem for a composite circular plate. Tikhe et al. [2] solved an inverse heat conduction problem in a thin circular plate and its thermal deflection. Deshmukh et al. [3] are also discussed on an inverse transient problem of quasi-static thermal deflection of a thin clamped circular plate. Grysa et al [4] studied the one dimensional problem of temperature and the heat flux at the surface of a thermo elastic slab. Kulkarni et al. [5] studied an inverse transient problem of quasi-static thermal stresses in a thick circular plate. Also Roy Choudhary [7]

Key words and phrases: Thermoelastic Problem, Hankel transform, Laplace Transform, Circular Plate.

studied a rate of quasi-static stress in a thin circular plate due to transient temperature applied along the circumference of a circle over the upper face.

Here an attempt is made to solve an inverse unsteady-state thermoelastic problem in a circular plate to determine the unknown temperature, displacement and stress components on the upper surface (z = h) of a circular plate subjected to an interior flux f(r, t) is known under unsteady-state field. The lower surface (z = -h) is kept at zero temperature and the fixed circular edge (r = a) is thermally insulated. The governing heat conduction equation has been solved by using the Hankel and Laplace transform technique. The results are obtained in series form in terms of Bessel's functions and results have been computed numerically and illustrated graphically.

This paper contains new and novel contribution of stresses in circular plate under steady state. The results presented here will be more useful in engineering problem particularly in the determination of the state of strain in circular plate constituting foundations of containers for hot

*2000 Mathematics Subject classifications: Primary 35A25, Secondary 74M99, 74K20.

gases or liquids, in the foundations for furnaces etc.

2. Statement of the problem

Consider a circular plate of radius a and thickness $2h$ occupying space $D : 0 \leq r \leq a, 0 \leq z \leq h$. Initially the plate is at zero temperature. Let the plate be subjected to an interior heat flux $f(r, t)$ is known within region $-h \leq z \leq h$. The lower surface

($z = -h$) is kept at zero temperature and the fixed circular edge ($r = a$) is thermally insulated. Assume that the boundary of the circular plate is free from traction. Under these more realistic prescribed conditions, the unknown temperature $g(r, t)$ which is at the upper surface of the plate and the thermal stresses due to unknown temperature $g(r, t)$ need to be determined.

The differential equation governing the displacement potential function is given in [6] as,

$$\frac{\partial^2 \phi}{\partial r^2} + \frac{1}{r} \frac{\partial \phi}{\partial r} + \frac{\partial^2 \phi}{\partial z^2} = K \tau \tag{1}$$

where K is the restrain coefficient and the temperature change is given by $\tau = T - T_i$ where T_i is the initial temperature. The displacement function ϕ is known as Goodier's thermoelastic potential.

The unsteady state temperature of the plate at time t satisfies the heat condition equation is,

$$\frac{\partial^2 T}{\partial r^2} + \frac{1}{r} \frac{\partial T}{\partial r} + \frac{\partial^2 T}{\partial z^2} = \frac{1}{k} \frac{\partial T}{\partial t} \tag{2}$$

where k is the thermal diffusivity of the material of the plate.

The initial and boundary conditions are

$$T(r, z, t) = 0 \text{ at } t = 0, \tag{3}$$

The boundary condition

$$\frac{\partial T}{\partial z} = f(r, t) \text{ (known) at } z = \xi, 0 \leq r \leq a \tag{4}$$

$$\frac{\partial T}{\partial r} = 0 \text{ at } z = -h, 0 \leq r \leq a \tag{5}$$

$$\frac{\partial T}{\partial r} = 0 \text{ at } r = a, -h \leq z \leq h \tag{6}$$

$$\frac{\partial T}{\partial z} = g(r, t) \text{ (unknown) at } z = h, 0 \leq r \leq a \tag{7}$$

The stress functions σ_{rr} and $\sigma_{\theta\theta}$ are given by,

$$\sigma_{rr} = -2\mu \frac{1}{r} \frac{\partial U}{\partial r} \tag{8}$$

$$\sigma_{\theta\theta} = -2\mu \frac{\partial^2 U}{\partial r^2} \tag{9}$$

where μ is the Lamé's constant, while each of the stress functions σ_{rz}, σ_{zz} and

$\sigma_{\theta z}$ are zero within the plate in the plane state of stress. The equations (1) to (9) constitute the mathematical formulation of the problem under consideration.

3. Solution of the Problem

GAIKWAD PRIYANKA B.

Applying finite Hankel transform defined in [8] to the Eq. (2) to Eq. (7), one obtain

$$\frac{d^2 \bar{T}}{dz^2} - \lambda_n^2 \bar{T} = \frac{1}{k} \frac{d\bar{T}}{dt} \tag{10}$$

with boundary conditions

$$\frac{\partial \bar{T}}{\partial z} = \bar{f}(\lambda_n, t) \quad \text{at } z = \xi, 0 \leq r \leq a \tag{11}$$

$$\frac{\partial \bar{T}}{\partial r} = 0 \quad \text{at } z = -h, 0 \leq r \leq a \tag{12}$$

$$\frac{\partial \bar{T}}{\partial r} = 0 \quad \text{at } r = a, -h \leq r \leq h \tag{13}$$

$$\frac{\partial \bar{T}}{\partial z} = \bar{g}(\lambda_n, t) \quad \text{at } z = h, 0 \leq r \leq a \tag{14}$$

where \bar{T} denotes the Hankel transform of T and λ_n is the Hankel transform parameter. Again applying Laplace transform defined in [8] to the Eq. (10) to Eq. (14) .we get,

$$\frac{d^2 \bar{T}^*}{dz^2} - q^2 \bar{T}^* = 0 \tag{15}$$

where

$$q^2 = \left(\lambda_n^2 + \frac{s}{k} \right) \quad \frac{d\bar{T}^*}{dz}(\lambda_n, \xi, s) = \bar{f}^*(\lambda_n, s) \tag{16}$$

at $z = \xi, 0 \leq r \leq a$

$$\frac{d\bar{T}^*}{dz}(\lambda_n, h, s) = \bar{g}^*(\lambda_n, s) \quad \text{at } z = h, 0 \leq r \leq a \tag{17}$$

where \bar{T}^* denotes the Laplace transform of \bar{T} and s is the Laplace transform parameter. The Eq. (15) is a second order differential equation, whose solution is given by,

$$\bar{T}^*(\lambda_n, z, s) = A e^{qz} + B e^{-qz} \tag{18}$$

where A and B are constants.

Using Eq.(16) and Eq.(17) in Eq.(18) we obtain the values of A and B. Substituting these values in Eq.(18) and then inversion of finite Laplace and finite Hankel integral transform leads to,

$$T(r, z, t) = \frac{2k\pi}{h^2} \sum_{n=1}^{\infty} \frac{J_0(r\lambda_n)}{\lambda_n [J_0(a\lambda_n)]^2} \sum_{m=1}^{\infty} (-1)^{(m+1)} m \cos\left(\frac{m\pi(z-h)}{(\xi-h)}\right) \int_0^t \frac{\bar{f}(\lambda_n, t')}{\lambda_n} e^{-k\left[\lambda_n^2 + \frac{m^2\pi^2}{h^2}\right](t-t')} dt' - \frac{2k\pi}{h^2} \sum_{n=1}^{\infty} \frac{J_0(r\lambda_n)}{\lambda_n [J_0(a\lambda_n)]^2} \sum_{m=1}^{\infty} (-1)^{(m+1)} m \cos\left(\frac{m\pi(z-\xi)}{(\xi-h)}\right)$$

$$\int_0^t \frac{\bar{g}(\lambda_n, t')}{\lambda_n} e^{-k \left[\lambda_n^2 + \frac{m^2 \pi^2}{h^2} \right] (t-t')} dt' \tag{19}$$

since $T_i = 0$, the temperature change is $\tau = T - T_i = T$.

3. Determination of Thermoelastic Displacement

On putting the values of temperature $T(r, z, t)$ from Eq. (19) in Eq. (1), one obtain the theromoelastic displacement function $\phi(r, z, t)$ as,

$$\begin{aligned} \phi(r, z, t) = & K \frac{k\pi}{2h^2} \sum_{n=1}^{\infty} \frac{r^2 J_0(r\lambda_n)}{\lambda_n [J_0(a\lambda_n)]^2} \sum_{m=1}^{\infty} (-1)^{(m+1)} m \cos\left(\frac{m\pi(z-h)}{(\xi-h)}\right) \\ & \times \int_0^t \frac{\bar{f}(\lambda_n, t')}{\lambda_n} e^{-k \left[\lambda_n^2 + \frac{m^2 \pi^2}{h^2} \right] (t-t')} dt' \\ & - K \frac{k\pi}{2h^2} \sum_{n=1}^{\infty} \frac{r^2 J_0(r\lambda_n)}{\lambda_n [J_0(a\lambda_n)]^2} \sum_{m=1}^{\infty} (-1)^{(m+1)} m \cos\left(\frac{m\pi(z-\xi)}{(\xi-h)}\right) \\ & \times \int_0^t \frac{\bar{g}(\lambda_n, t')}{\lambda_n} e^{-k \left[\lambda_n^2 + \frac{m^2 \pi^2}{h^2} \right] (t-t')} dt' \end{aligned} \tag{20}$$

The radial displacement U as,

$$\begin{aligned} U(r, z, t) = & K \frac{k\pi}{2h^2} \sum_{n=1}^{\infty} \frac{[2rJ_0(r\lambda_n) - r^2 J_1(r\lambda_n)]}{\lambda_n [J_0(a\lambda_n)]^2} \sum_{m=1}^{\infty} (-1)^{(m+1)} m \cos\left(\frac{m\pi(z-h)}{(\xi-h)}\right) \\ & \times \int_0^t \frac{\bar{f}(\lambda_n, t')}{\lambda_n} e^{-k \left[\lambda_n^2 + \frac{m^2 \pi^2}{h^2} \right] (t-t')} dt' \\ & - K \frac{k\pi}{2h^2} \sum_{n=1}^{\infty} \frac{[2rJ_0(r\lambda_n) - r^2 J_1(r\lambda_n)]}{\lambda_n [J_0(a\lambda_n)]^2} \sum_{m=1}^{\infty} (-1)^{(m+1)} m \cos\left(\frac{m\pi(z-\xi)}{(\xi-h)}\right) \\ & \times \int_0^t \frac{\bar{g}(\lambda_n, t')}{\lambda_n} e^{-k \left[\lambda_n^2 + \frac{m^2 \pi^2}{h^2} \right] (t-t')} dt' \end{aligned} \tag{21}$$

4. Determination of Stress functions

Using Eq. (21) in Eq. (8) and Eq. (9), the stress functions are obtained as,

$$\begin{aligned} \sigma_{rr} = & 2K \frac{\mu k \pi}{h^2} \sum_{n=1}^{\infty} \left[\frac{J_1(r\lambda_n) - \frac{J_0(r\lambda_n)}{r} + rJ_1'(r\lambda_n) + J_1(r\lambda_n)}{\lambda_n [J_0(a\lambda_n)]^2} \right] \\ & \times \sum_{m=1}^{\infty} (-1)^{(m+1)} m \cos\left(\frac{m\pi(z-h)}{(\xi-h)}\right) \int_0^t \frac{\bar{f}(\lambda_n, t')}{\lambda_n} e^{-k\left[\lambda_n^2 + \frac{m^2\pi^2}{h^2}\right](t-t')} dt' \\ & - 2K \frac{\mu k \pi}{h^2} \sum_{n=1}^{\infty} \left[\frac{J_1(r\lambda_n) - \frac{J_0(r\lambda_n)}{r} + rJ_1'(r\lambda_n) + J_1(r\lambda_n)}{\lambda_n [J_0(a\lambda_n)]^2} \right] \\ & \times \sum_{m=1}^{\infty} (-1)^{(m+1)} m \cos\left(\frac{m\pi(z-\xi)}{(\xi-h)}\right) \int_0^t \frac{\bar{f}(\lambda_n, t')}{\lambda_n} e^{-k\left[\lambda_n^2 + \frac{m^2\pi^2}{h^2}\right](t-t')} dt' \end{aligned} \tag{22}$$

$$\begin{aligned} \sigma_{\theta\theta} = & 2K \frac{\mu k \pi}{h^2} \sum_{n=1}^{\infty} \left[\frac{4rJ_1'(r\lambda_n) + r^2J_1''(r\lambda_n) + 3J_1(r\lambda_n)}{\lambda_n [J_0(a\lambda_n)]^2} \right] \\ & \times \sum_{m=1}^{\infty} (-1)^{(m+1)} m \cos\left(\frac{m\pi(z-h)}{(\xi-h)}\right) \int_0^t \frac{\bar{f}(\lambda_n, t')}{\lambda_n} e^{-k\left[\lambda_n^2 + \frac{m^2\pi^2}{h^2}\right](t-t')} dt' \\ & - 2K \frac{\mu k \pi}{h^2} \sum_{n=1}^{\infty} \left[\frac{4rJ_1'(r\lambda_n) + r^2J_1''(r\lambda_n) + 3J_1(r\lambda_n)}{\lambda_n [J_0(a\lambda_n)]^2} \right] \\ & \times \sum_{m=1}^{\infty} (-1)^{(m+1)} m \cos\left(\frac{m\pi(z-\xi)}{(\xi-h)}\right) \int_0^t \frac{\bar{g}(\lambda_n, t')}{\lambda_n} e^{-k\left[\lambda_n^2 + \frac{m^2\pi^2}{h^2}\right](t-t')} dt' \end{aligned} \tag{23}$$

5.

Numerical Calculation

Numerical calculations have been carried out for a steel (5N 50C) plate with parameters chosen $a = 1m$, $h = 1m$, $\xi = \frac{h}{2}$, $t = 10sec$.

The thermal diffusivity is given by $k = 15.9 \times 10^6 (m^2 s^{-1})$. The Poisson ratio by $\nu = 0.281$ and $\lambda = 59.0 Wm^{-1} K^{-1}$.

The transcendental roots of $J_1(\lambda_n a)$ as in [9] are $J_1 = 3.8317$, $J_2 = 7.0156$, $J_3 = 10.1735$, $J_4 = 13.3237$, $J_5 = 16.470$, $J_6 = 19.6159$.

For convenience, we get

$$A_n = \frac{2k\pi}{\lambda_n [J_0(a\lambda_n)]^2 h^2}$$

GAIKWAD PRIYANKA B.

$$B_n = K \frac{k\pi}{2\lambda_n [J_0(a\lambda_n)]^2 h^2} \text{ and } C_n = 4\mu K B_n$$

These values are used to evaluate the temperature, displacement, stress components and thermal stresses given by Eqs.21-25 these have been computed numerically and illustrated graphically with help of a computer programme.

6. Concluding Remarks

In this article, we study an inverse unsteady-state thermal stresses in a circular plate. We develop the analysis for the temperature field by introducing the methods of the Hankel

transforms and Laplace transforms and determine the unknown temperature, displacement, stress components on the upper surface.

From fig.1 and fig.2, we observe that temperature decreases from lower surface to outer circular surface in radial direction. Also it decreases from upper surface to lower surface in radial direction. From fig.3 & fig.4 thermoelastic displacement decreases from inner circular surface to outer circular surface in axial direction. Also it increases from lower surface to upper surface.

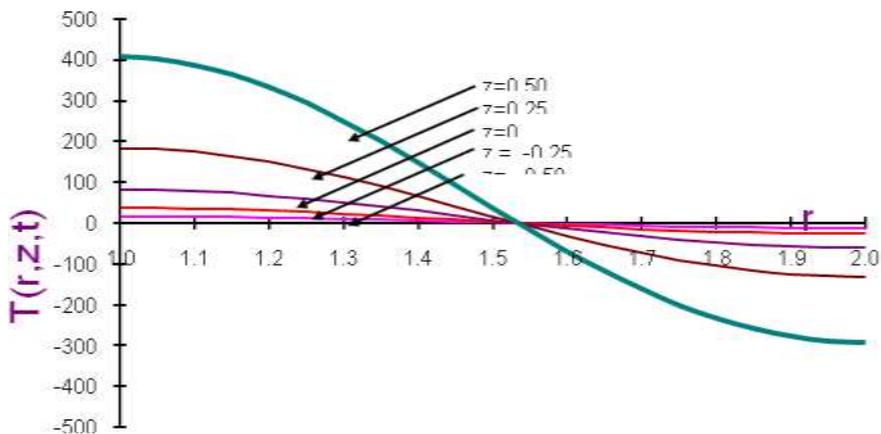


Fig.1 The temperature distribution $T(r,z,t)$ In radial direction

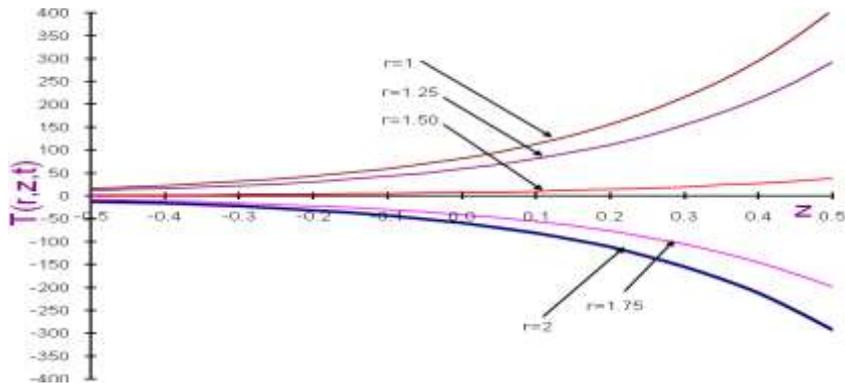


Fig.2 The temperature distribution $T(r,z,t)$ in axial direction

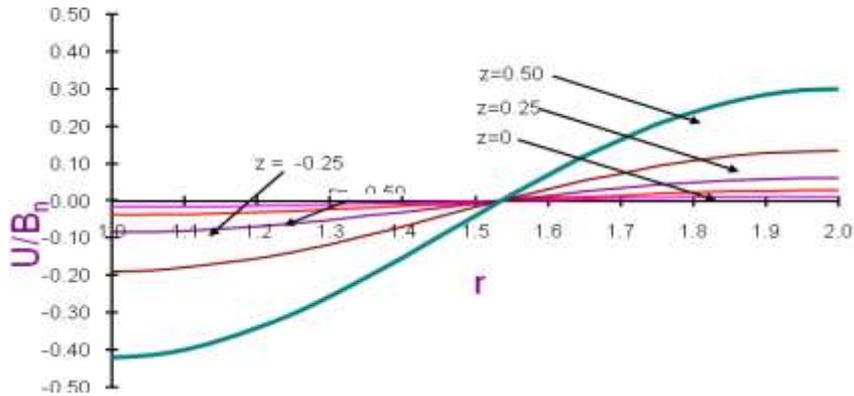


Fig.3 The displacement function $U(r,z,t)$ in radial direction

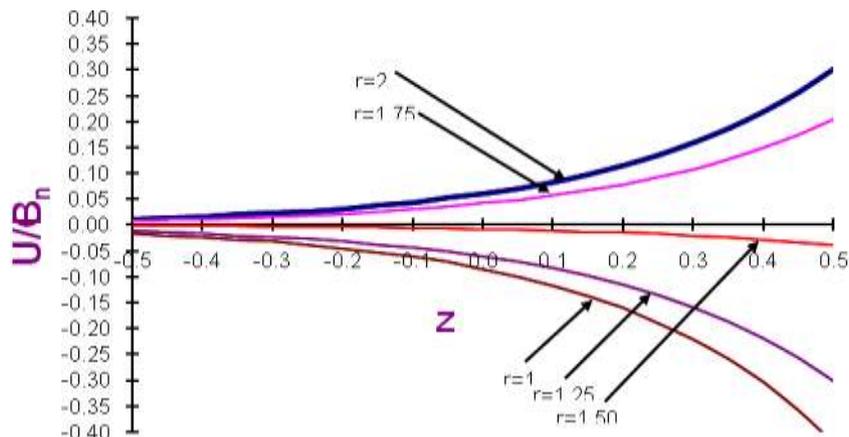


Fig.4 The displacement function $U(r,z,t)$ in axial direction

Reference:

1. Ashida F. and Sakata S., Tauchert T.R. and Yamashita Y., 2002, "Inverse transient thermoelastic problem for a composite circular disc" *Journal of thermal stresses*, Vol.25(431-435).
2. Tikhe, A. K., Deshmukh, K.C., *Inverse heat conduction problem in a thin circular plate and its thermal deflection*, *Applied Mathematics Modelling*, ScienceDirect, 30(6)(2006)554-560.
3. Deshmukh, K.C. and Wankhede P.C. (1998). *An Inverse transient problem of quasi-static thermal deflection of a thin clamped circular plate*, *Bulletin of pure and Applied Sciences*, Vol.17 E.
4. Grysa and Kozłowski (1982). *One-dimensional problem of temperature and heat flux determination at the surface of a thermo elastic slab part -I*, *The Analytical Solutions*, NUCL. Engrg. 74; p. 1-14.
5. Kulkarni, V.S., and Deshmukh, K. C., 2007, *Quasi-static thermal stresses in a thick circular plate*, *Science Direct, applied Mathematics Modeling*. Vol.31, pp.1479-1488.
6. Noda, N., 1989, *An inverse problem of coupled thermal stress fields in a circular cylinder*, *JSME, International Journal, Ser.A.32*, pp.791-797
7. Roy Chaudhari, S. K. (1982). *A rate of quasi-static stress in a thin circular plate due to transient temperature applied along the circumference of a circle over the upper face*, *Indian Journal of Pure and Applied Mathematics*, Vol.13, pp.1273-1277.
8. Sneddon I. N., *The Use of Integral Transform* McGraw Hill, New York 1972, pp.235-238.
9. Ozisik, N. M. (1968): *Boundary value problem of heat conduction tables for the roots of transcendental equation*; p. 481-492.

GAIKWAD PRIYANKA B.



Climatic Change and its Impact on Environment

R. R. Attarde

Professor, Principal, HOD, Department of Physics, Pankaj Arts and Science College,
Chopda, Dist. Jalgaon

Corresponding Author- R. R. Attarde

Email:- nandiniwagh2012@gmail.com

DOI- 10.5281/zenodo.7295832

Abstract:-

Climatic change refers to any change in climate over time. Weather due to natural variability or as result of human activity. Global warming is defined as an increase in the average temperature of the Earth's atmosphere, especially a sustained increase great enough to causes changes in global climate'. The term global warming is synonymous with Enhanced greenhouse effect, implying an increase in the amount of greenhouse gases in the earth's atmosphere, leading to entrapment of more and more radiations, and thus increasing the overall temperature of the earth. Global warming is burning subject today the whole world now focuses on the problem Let's understands that Global warming is the gradual increase in the overall temperature of the Earth's atmosphere due to increased level of carbon dioxide and other pollutants. It has a number of negative effects on natural systems and creatures. At the Global level, all sorts of initiatives have been taken and stress is on how to decrease its increasing effect the world over. Climatic change may after the distribution and quality of Indian natural resource and effect the livelihood of its people. With an economic closely tried to it natural resource base and climatic sensitive sector such as agriculture, water and forestry, Indian may face major threate because of the projected changes in climate. As for a Global warming is concerned it appears to be quote Richwood Huntington & Gorge wood well the world is warming climate zone are shifting glacier and melting .Sea level is rising. Although multiple facilities have been giving to mankind by the Science and technology but in the sometime number of environmental issue are emerged global warming is one of the outcome of human activity that are enhancing the greenhouse effect.

Keyword:- Global warming, climatic change, environment health threats.

Objective:-

- Explain the global warming effect and how it is changing our climate
- To discuss the control greenhouse gases in atmosphere.
- What are the main source and effects of global warming.

Introduction:-

Global warming is the increase of earths average surface temperature due to effect of greenhouse gases such as carbon dioxide emissions from burning fossils fuels on from deforestation which trap heat that would otherwise escape from earth recent observation of global warming have solidified the they that it is indeed on enhance greenhouse effect that is causing of the world to warm the planet has experience the

largest increase in surface temperature over the last century. Between 1906 and 2006 the earths average service temperature rose between 0.6 to 0.9 degree Celsius the last 50 years sew the temperature increase rate almost doubling sea levels have shown a rise of about 0.17 meter during the 20th century the extend of Arctic sea ice has steadily scruple by 2.7% per decided since 1978 just as worlds glaciers steadily receded. Global warming beginning when sunlight reaches Earth cloud atmospheric particles reflective ground surface and ocean surface the reflected about 30% of it back into space while the remaining is absorbed by Oceans land and air this turn heats the planet's surface and atmosphere making life possible.

Impact of global warming on the environment Recent sea level rise the rise in sea level is due to expansion of ocean water as it warms and to the addition of water from melting glaciers and ice sheets both of which are consequences of global warming sea level rise is one of the most certain impacts of global warming. Water expands when heated the sea levels are expected to rise due to climate change rising sea levels will also result as the polar caps to melt. Rising sea level is already affecting many small islands. The world watch Institute reports that Earth's ice cover is melting in more place and higher rates that at any time since record keeping began rising sea level will impact many coastlines and large mass of humanity lives near the coasts by major river.

Green House Effect:- The main gases that causes the greenhouse effect are.

- Water Vapor
- Carbon dioxide or CO₂
- Methane
- Nitrous oxide

Physics earth absorbs incoming solar radiation and then tends to cool by emitting long length infrared radiation this radiation is absorbed by greenhouse and hands can't effect should be two increase mean annual temperature most of the increase is due to human activities like.

1. Burning gasoline to drive car and trucks.

2. Burning oil, coal or wood to produce electricity.

3. For heating, cooling and other purposes burning forests to clear land.

All their activities and many others release greenhouse gases into the atmosphere. With greater or amounts of greenhouse gases in the air more heat will be trapped and the earth will get warmer.

Deforestation:-

Most people assume that global warming is caused by burning oil and gas. But in fact between 25 and 30% of the greenhouse gases released into the atmosphere each year 1.6 billion acres are caused by deforestation. Deforestation is a major contributor to global warming. Deforestation has many negative effects on the environment the most dramatic impact is a loss of habitat for millions of species. 70% of the earth land animals and plants live in forest and many

cannot survive how deforestation that destroys their homes deforestation drives climate changes.

Spread of Infections Diseases:-

Climatic change is already threatening the planet with a spread of infectious diseases, which will move farther northward and to higher elevations. The World Health Organisation project sense of millions more causes of malaria and other infectious diseases. The spread of infectious diseases will be the most important public health problem related to climatic change. Climate change is affecting the seasons and we're seeing early arrival of asthma and allergy season. The another issue which, is ozone, ugly ozone, the ground level photochemical smog and that's reaction between tailpipe emissions that sped up with warming so we're seeing warming counteract some of the attempts to reduce ozone. In Canada, ecologists have found that present day mosquitoes wait nine days more than their ancestors 30 years ago before they begin their winter dormancy, with warmer autumns being the most likely cause. A warmer climate can expand the geographical range of tropical mosquito born diseases such as malaria, dengue fever, and yellow fever, high latitudes and latitudes. Climate changes is affecting the seasons, and we're seeing early arrival of asthma and allergy season, then there's another issue, which is ozone, ugly ozone, ground level.

Conclusion:-

An increasing body of observations gives a collective picture of a warming world and other change in the climate system. The global average surface temperature has increased over the 20th century by about 0.6°C degree temperature have risen during the past four decades in lowest 8k.m. of the atmosphere snow cover and ice extent have decreased. Emission of greenhouse gases and aerosols due to human activities continue to affect the atmosphere in ways that are expected to affect the climate, there is new and strange evidence that most of the warming observed over the last 50 years is attributable to human activities, human influences will continue to change atmosphere composition throughout the 21st century.

Reference:-

1. Environmental problem solution:- S. Chand.
2. Environmental Geography:- Dr Saxena.

3. Greenhouse effect and Indian sub continents :-T.M. Das.
4. Environmental Geography:- Dr Phule.



Study of snakes and view of community towards snakes

Sunil N. Khade¹ Priyanka B. Gaikwad²

¹Department of Zoology

²Department of Mathematics

Phulsing Naik Mahavidyalaya, Pusad district Yavatmal, Maharashtra, India

Corresponding Author- Sunil N. Khade

Email:- skhade680@gmail.com

DOI- 10.5281/zenodo.7295846

Abstract-

The present paper is based on identification of snake species and how to increase the rate of killing by common people by giving knowledge to people about snakes from study period during July 2018 to August 2019. The present study is important for the survival, awareness and conservation of snake from Yavatmal District of Maharashtra state, India

Keywords: Snakes, diversity.

Introduction:

per year, approximately 5.4 million snakebites occur in the world. Due to this scenario cause up to 2.7 million envenomings, almost 138,000 deaths, as well as 400,000 cases of disability or sequelae different [1,2] per year, in the Asia about two snakebites found, the record says above 46,000 people die due to snakebite in Indian country [1,3]. Various types of snake species found in the world by different habitat. Nearby 3000 snakes are terrestrial across the world also recorded that in the warm climates and moisture region from the tropics. Approximately 278 snakes recorded on the Indian region across that fifty eight snakes found venomous [1]. Three thousand snakes are existing across the world. Five hundred poisonous found in subcontinent [2]. Bite of snakes is a very serious live threatening duration decreasing clinically emergency an occupational hazard often handled by farmers and common people. This scenario is endemic towards tropical nations like India. According to analytical data Indian country 2.5 lakhs snake bites across the 35,000 to 50,000 die every year due to snake poisoning. Nearby 216 snakes done nomenclature and study in Indian country as fifty two are poisonous. Majority of snake species families venomous snakes in Indian country are Elapidae include common cobra (*Naja naja*), King cobra, common krait (*Bungarus caeruleus*), viperidae also *Russell's*

viper echiscarinatus (saw scaled or carpet viper) and pit viper and hydrophidae (Sea snakes) [4]. People should get appropriate knowledge of snake behavior and their coloration then the rate of death of people will be decreased and also snakes will not be killed by people [13], current study of snake is important in the point of view of snake species conservation and also getting awareness in the people of India

Materials And Methods

The study initially requires well-trained snake rescuers for the observation, it needs courage, self-daring, confidence, and very essential experience and most important is the study of behavior and nature of the snake to be caught. Snake rescue records of survey was made from July 2016 to August 2017, sampling was done as per the need, request of the local people or stress calls made by residents, for twenty four hrs. Individual species of snakes were located and try to catch by hand, sticks and through pitfall traps in association with drift fences. After catching the snakes, their characteristics, predominant features were observed then noted for taxonomical study, take the photographs and identified up to species level using keys and other publications as per [5], [6], [7], [8]. After the study the captured snakes species were released in the forest/safely area as per the guidelines of wildlife and forest department rescued and

released into the proper habitat without harm them.

Results and Discussion:

In this research paper 16 species from 16 genera belongs to the 05 families amongst them ten species were non venomous, four were Poisonous and two were semi poisonous, in the point of view of common people they are just snake and they just can't differentiate which is poisonous and non venomous because of this reason that all snakes used to kill by them, if they would have been able to identify poisonous and non venomous so many snakes species can save.



A



B

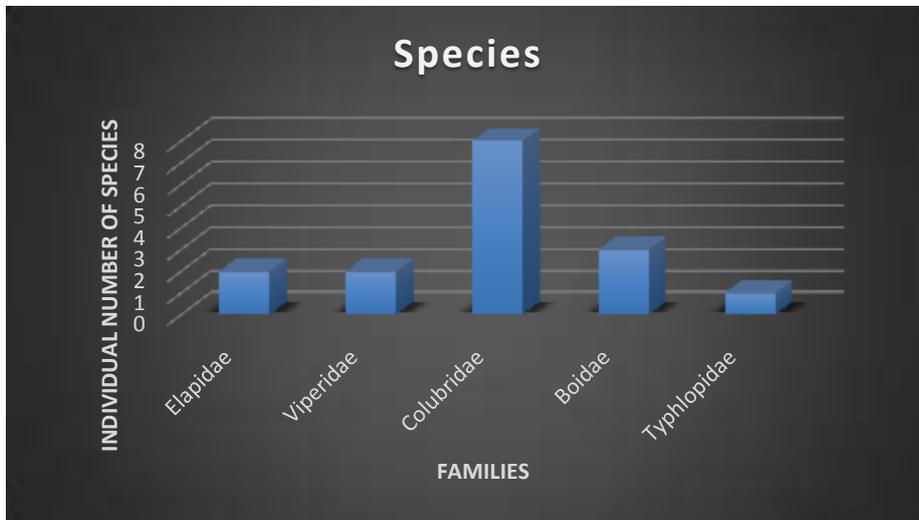
- A. After rescuing Cobras from residential area safely releasing in the natural habitat forest, after observation. B. *Naja naja*

Sr. No	Family	Genus	Species	Common name	Local Name	Nature	Status
1	Elapidae	<i>Naja</i>	<i>naja</i>	Spectacled cobra	Naag	***	C
		<i>Bungarus</i>	<i>caeruleus</i>	Common krait		***	C
2	Viperidae	<i>Daboia</i>	<i>russelii</i>	Russell's viper	Ghonus	***	C
		<i>Echis</i>	<i>carinatus</i>	Indian saw-scaled viper	Furase	***	C
3	Colubridae	<i>Boiga</i>	<i>trigonata</i>	Common cat snake	Manjarya	**	C
		<i>Ahaetulla</i>	<i>nasuta</i>	Common vine snake	Harantol	**	C
		<i>Ptyas</i>	<i>mucosa</i>	Indian rat snake	Dhaman	*	C
		<i>Coelognathus</i>	<i>helena</i>	Common trinket snake	Taskar	*	C
		<i>Macropisthodon</i>	<i>plumbicolor</i>	Grass snake	-	*	U
		<i>Amphiesma</i>	<i>stolatum</i>	Striped keelback	Iral/Pandhivad	*	R
		<i>Lycodon</i>	<i>aulicus</i>	Common wolf snake	Kawadya	*	C
4	Boidae	<i>Xenochrophis</i>	<i>piscator</i>	Checkered keelback water snake		*	C
		<i>Eryx</i>	<i>johnii</i>	Earth boa/Red sand boa	Mandul	*	C
		<i>Gongylophis</i>	<i>conicus</i>	Common Sand boa		*	C
5	Typhlopidae	<i>Python</i>	<i>morulus</i>	Indian rock python	Ajgar	*	R
		<i>Ramphotyphlops</i>	<i>braminus</i>	Brahminy worm snake		*	U

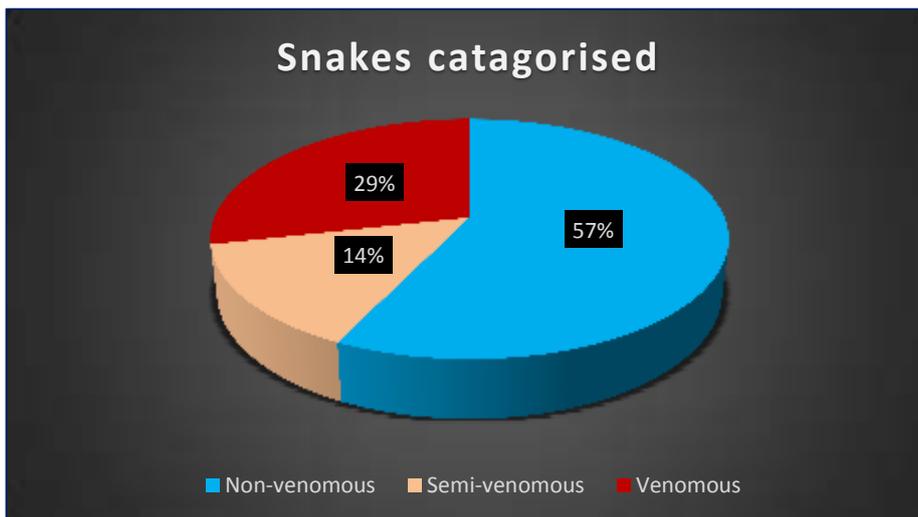
Table No.I: Diversity of Snakes (Note 1: C- common, U-uncommon, R-rare.) (Note 2: Non-venomous=*, Semi-venomous=,Venomous=***)**

Families	Species
Elapidae	2
Viperidae	2
Colubridae	8
Boidae	3
Typhlopidae	1

Table No.2: Species recorded according to families



Graph No. I: Showing number of individuals according to families



Graph No. II: Showing in percentage venomous, non-venomous & semi-venomous snakes

Among the all snakes the non-venomous snakes the rare species reported here as Indian rock python, *Python morulus* and Striped keel back, *Amphiesma stolatum* belongs from Boidae and Colubridae family respectively. Todays lifestyle of humans changing tremendously and its affecting on

global warming and on habitat of animals too [9].

Conclusion:

According to the present paper the rate of unnecessary killing snake should have decrease for that appropriate knowledge have

Sunil N. Khade, Priyanka B. Gaikwad

to reach to the people then and then only it will be possible.

References

1. WHO Snakebite Envenoming, Key Facts 2019. Available online: <https://www.who.int/news-room/factsheets/detail/snakebite-envenoming> (accessed on 22 April 2020).
2. Bolon, I.; Durso, A.M.; Mesa, S.B.; Ray, N.; Alcoba, G.; Chappuis, F.; de Castañeda, R.R. Identifying the snake: First scoping review on practices of communities and healthcare providers confronted with snakebite across the world. *PLoS ONE* 2020, 15, e0229989. [CrossRef] [PubMed].
3. Mohapatra, B.; Warrell, D.A.; Suraweera, W.; Bhatia, P.; Dhingra, N.; Jotkar, R.M.; Rodriguez, P.S.; Mishra, K.; Whitaker, R.; Jha, P.; et al. Snakebite mortality in India: A nationally representative mortality survey. *PLoS Negl. Trop. Dis.* 2011, 5, e1018. [CrossRef] [PubMed].
4. Sonali R. Raut¹, Shantaj M. Deshbhratar¹, Jyotsna A. Mahaley², Vijay K. Hile³, Ankita J. Thakur PS and NE Warghat, 2014. Documentation of Road Killed and Rescued Harpatofauna in and Around Amravati City, Maharashtra, *Advances in Applied Science Research*, 5(2):373-381.
5. Punde DP, 2008. Meet the Expert: Management of Snake Bite 9Report APICON, Kochi), Medicine update Volume 18, 2008
6. Deoras PJ, 1965.Snakes of India, National Book Trust (NBT), New Delhi.
7. Government of India dat: pp 107-108 of <http://cbhidghs.nic.in/writereaddata/main%20Status%20Indicators.pdf>. 2017
8. Khaire N, 2010. Snakes, Indian Herpetological Society, Pune
9. Daniels JC, 2002. The book of Indian Reptiles and Amphibians, Bombay Natural History Society and Oxford University Press. Mumbai.
10. Whitaker, R. and A. Captain, 2008. Snakes of India. The Field Guide. Draco Books.Chengalpattu, Tamil Nadu, xiv+479.
11. Aengals, R, VM Sathish Kumar and MJ Palot, 2012. Updated Checklist of Indian Reptiles.
12. Lingayat AM and PR Wankhade, 2015. Study of clinical profile complications and outcome in patients of snake bite in pediatric age group, *Healthcare and Biomedical Research*, 03 (03): 203-208
13. Mukesh Kumar Chaudhary, 2020, Review on snake bites and its management, Vol no 3, 319-326.



Marine gastropods distribution, taxonomy and statistical analysis, along west coast of India

Sunil N. Khade¹ Priyanka B. Gaikwad²

¹Department of Zoology

²Department of Mathematics

^{1,2} Phulsing Naik Mahavidyalaya, Pusad, District Yavatmal.

Corresponding Author- Sunil N. Khade

Email:- skhade680@gmail.com

DOI-10.5281/zenodo.7295865

Abstract

The marine biodiversity of the west coast of India is rich and much of the world's wealth of biodiversity is found in highly diverse coastal habitats. A present study was carried out on marine gastropod accessibility among Raigad district coastline to collection, taxonomical identification and diversity according to Shannon Wiener Diversity Index. A collection made by rocky platform, boulder field, some sheltered areas sandy beaches, and muddy habitat during October 2018 to September 2019. SCUBA diving used during the study for collection, The molluscan fauna is rich in prevalence of various habitats, so there is urgent need to taxonomical study of gastropods molluscs as well as sustainable utilization in the point of view of biodiversity conservation.

Keywords: Gastropods, taxonomy, statistical analysis, Raigad, west coast of India.

1. Introduction:

India is mega Biodiversity County, in India the marine molluscs are recorded from the diverse habitats. They occur in different habitats such as mangroves, coral reef, rocky coasts, sandy beaches, sea grass beds and also at greater depth in the sea, they are more diverse and abundant in the rocky intertidal zone along the coast. Sandy stones, inter tidal flats, mangrove areas [1]. Mangroves are one of the biologically diverse ecosystems in the world, rich in organic matter and nutrients and support very large biomass of flora and fauna [2]. The gastropods are collected extensively for local consumption. Mangrove roots & lower parts of trunks provide substrate for oysters and mussels. Because these animals are filter feeders, they are confined to microhabitats below mean high water and are usually only abundant in areas adjacent to open water [3]. An oysters, mussels and clams serve the nutritional needs of the coastal population they are good source of minerals, protein, and glycogen and easily digestible compared to other animal food [4]. In India, till today, 5,070 species of molluscs have been recorded of which, 3,370 are from marine habitats [5]. The gastropods such as sacred chank,

Trochus, *Turbo* are exploited from the Indian marine region [6]. The present papers investigate the diversity of gastropod molluscs of mangrove, rocky coasts, and sandy beach from selected study stations of open coast of Raigad district.

2. Materials and Methods:

In the present study were collected from five stations namely Awaas (Lat. 18°46.068"North and Long. 072°51.817"East), Sasvane (Lat. 18°47.159" North Long. 072°51.760"East), Kolgaon (Lat. 18°48.197" North Long. 072°52.660" East), Mandva (Lat. 18°48.324" North and Long. 072°52.967" East), Kopropli (Lat. North 18°47.669"and Long. 072°54.305"East) coastline of Raigad district west coast of India, The sampling was done randomly from intertidal region at five stations also from sea with the help of SCUBA diving collection done as per need. The five quadrates of nylon rope each 1-m² was used, data were collected twice in each season post-monsoon, winter and summer October 2018 to September 2019. Soon after collection of live animals, they were brought to the laboratory and the shells were brushed to clean the fouling biomass and mud. They were then stocked in filtered seawater pumped in the laboratory

from the localities for observation then animal preserved in 70% alcohol for taxonomical identification of morphological characters of typical animal, especially, lunal, umbo, and operculum. Internal parts teeth. The shells were identified from Zoological Survey of India, Kolkata, also using the reference [19], special guidance taken for identification by Dr.Sherly Slack, Australia for identification.

3. Results: In the present study were documented 18 species of gastropods

belonging to 18 genera out of 11 families from the coast line of Raigad district, west coast of India. A study five stations respectively Awas station: 8 species belonging 8 genera out of 6 families, Saswane station: 6 species belonging 6 genera out of 4 families, Kolgaon station: 6 species belonging 6 genera out of 4 families, Mandva station: 5 species belonging 5 genera out of 3 families, and Koproli 9 species belonging 9 genera out of 5 families, documented.

3.1: According to Shannon Wiener Diversity Index

No. of sample	pi=sample/sum	ln (pi)	pi*ln (pi)
08	0.235	-1.448	-0.340
06	0.176	-1.737	-0.305
06	0.176	-2.737	-0.305
05	0.147	-1.917	-0.281
09	0.264	-1.331	-0.351
sum=34			Sum = -1.582

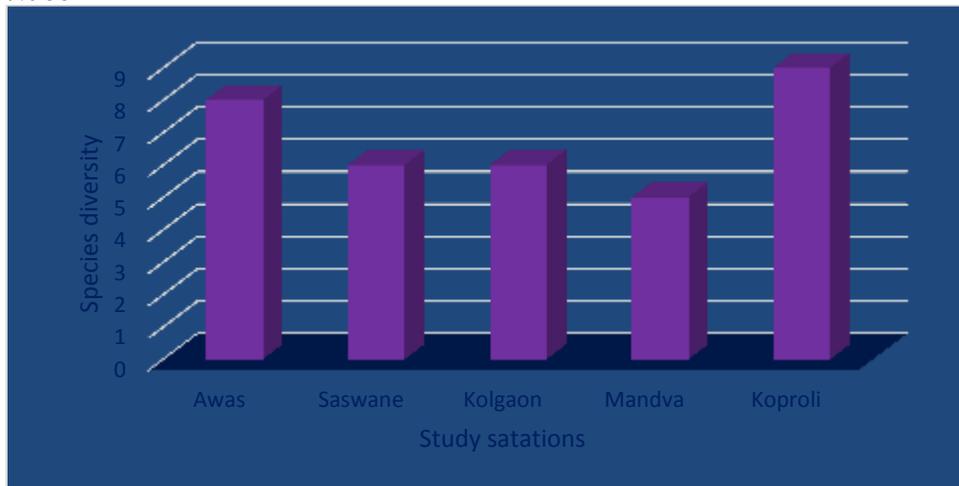
H= 1.582

$H_{max} = \ln(N) = \ln(5) = 1.609$

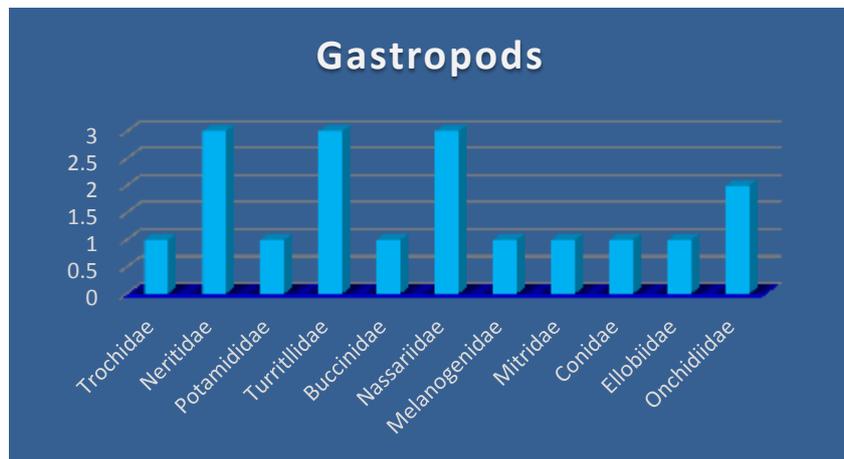
Evenness = $H/H_{max} = 1.582/1.609 = 0.983$

Result: Shannon diversity index (H) = 1.582

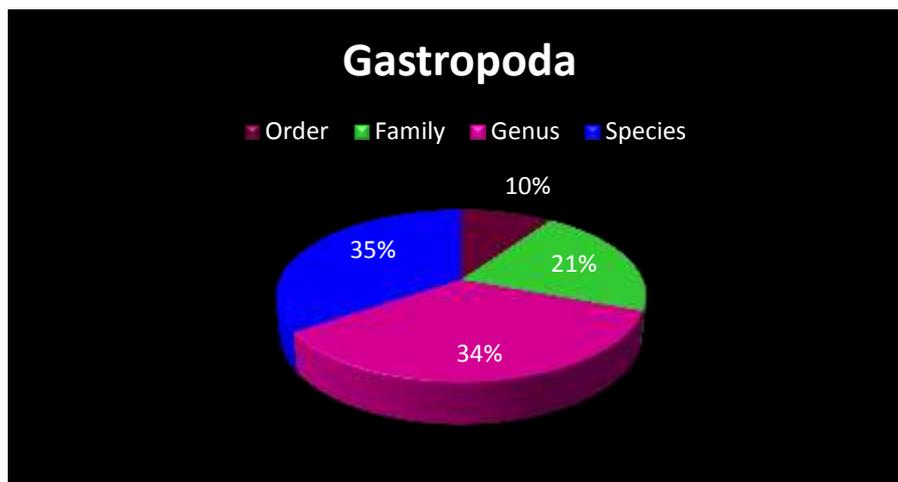
Evenness = 0.983



GRAPH NO.I. Study stations & gastropods on coastline along west coast of India.



GRAPH NO.II. Families & gastropods on coastline along west coast of India.



GRAPH NO.III.

Total account of gastropods on coastline along west coast of India.

According to "graph 1" The station Koproli documented maximum diversity, According to "graph no 2" family Neritidae, Nassariidae and Turritellidae documented rich diversity. According Shannon diversity index (H) = 1.582 while Evenness is the 0.983.4. **Discussion: 4.1:** The diversity of gastropods molluscs at five stations of Raigad district coast varies significantly. The pulmonate snail *Cassidula nucleus* has been studied from Pichavaram mangroves [8]. The *Nerita (Dostia) crepidularia* in vellar estuary mangroves, its having a variety of habitats mangroves plant on the stems, intertidal mudflat during the high tide time animals moving to plant stem after that during low tide time animals moving to mud flats [9]. The lowest density was in the month of July because of monsoon season. In monsoon, due to self-dilution of the body fluid, the sensitive

Sunil N. Khade, Priyanka B. Gaikwad

molluscs were unable to adjust the fluctuating osmotic balance quickly hence their mortality was high. After the month July because of adjustment, the mortality rate of molluscs decreased gradually. As a result, density of molluscs increased. It also understood that in the month of July, the salinity and temperature dropped down which made the condition adverse for the molluscs [10]. The population density was at its peak in the month of November during post monsoon period. It is clearly noticed by many research workers that the post monsoon period is the most favorable time for the new inflow of molluscan species. The mangroves support high density of every type of molluscan species especially, *Telescopium*, *Potamides*, *Natica*, *Nerita*, and *Littorina* and oysters. The *Littorina sp.* was densely found on the trunks, pneumatophores as well as on stilt roots of mangrove plants. It is good harvesting place for variety of molluscan

species [7]. **4.2:** The gastropods are generally benthos organism and they are regularly used as bio-indicators of aquatic healthy. These species can produce a billion of larvae in the form of planktons that sustains the biotic population & they have an essential role in food chain, & energy flow. The observation of these species populations in mangrove ecosystem is important to evaluate their condition [11]. In the region of *Nerita (Dostia) crepidularia*, *Littorina sp*, *Cerithidea sp*, were observed to the mud banks, mudflats, mangrove forest, sandy muddy area swamps, prop-roots and pneumatophores. *Telescopium telescopium* were found in the mud flats of mangroves plants. **4.3:** Molluscs can reach high biomass in mangroves ecosystem because of high primary production within the food web, as predators, herbivores, detritivores & filter feeders. The numerical abundance & biomass of molluscs can be equally impressive. The numerous investigation of mangroves associated molluscs in the world wide, 39 species recorded of gastropods in as Australian mangroves, [12]. 23 molluscs species from the mangrove forest in Hong Kong [13]. 44 sp., of Sematan mangrove forest of Malaysia recorded [14]. A total account of Sundarban 56 species of molluscs 31 gastropods & 25 bivalves [15]. 12 bivalve & 13 gastropods mangrove associated molluscs at Ratnagiri recorded [16] 39 gastropods belongs 15 families from Raigad district coast recorded [17]. The calcium concentration is varied in different gastropods shells, these shells can be used for preparation of calcium for the medicinal purpose [18]. Gastropods are typically one of the dominant and most conspicuous macrofauna in mangrove systems, and occupy wide range of ecological niches.

Conclusion:

The present study recorded from study stations Koproli, Awas, Saswane, Kolgaon and Mandva coast line of Raigad, west coast of India has greater diversity of gastropods and their commercial as well as it has a significant ecological role to play in the mangrove ecosystems, also rocky habitats is suitable especially for gastropods. it is necessary to document the diversity of the group of threatened ecosystems. There is an urgent need conservation & sustainable utilization of gastropod molluscan species.

Sunil N. Khade, Priyanka B. Gaikwad

References

1. Ramakrishna and A. Dey. Annotated checklist of Indian Marine Molluscs (Cephalopoda, Bivalve and Scaphopoda) Part-1. *Rec.Zool.Surv.India*, Occ. Paper no., 320:1-357. (Published by the Director, *Zool.Surv.India*, Kolkata).
2. Pawar R. Prabhakar, Molluscan Diversity in Mangrove Ecosystem of Uran (Raigad), Navi Mumbai, Maharashtra, West coast of India. *Bull. Environ. Pharmacol. Life Sci.* Vol. 1(6) May 2012: 55-59.
3. Macintosh, D.J. and E. C. Ashton. A review of mangrove biodiversity conservation and management. Final Report 10/06/2002. 2002. *Centre for Tropical Ecosystems Research, University of Aarhus, Denmark.*
4. G. D. Suryavanshi, A.M.Shaikh and U.H.Mane: Impact of Zink on protein content of oyster *Crassostrea cattuckensis* from Ratnagiri coast, Department of zoology, Yogeshwari Mahavidyalaya, Ambajogai, Dist. Beed-431517. *J. Ecotoxicol. Environ. Monit.* 22. (4), 323-328, (2012). Palani Paramount Publications- Printed in India.
5. Subba Rao, N. V., *Mollusca in Animal Resources of India* (Zoological Survey of India, Calcutta): 1991, 125-147.
6. Venkataraman, K. and M. Wafar, Coastal and marine biodiversity of India. *Ind.J.Mar.Sci.*, 2005, 34 (1) : 57-75.
7. Thakur S., Yeragi S.G. and Yeragi S.S. Population Density and Biomass of Organisms in the Mangrove Region of Akshi Creek, Alibag Taluka, Raigad District Maharashtra. International Day for Marine Biological Diversity, Marine Biodiversity 2012.
8. Dious, S.R.J. and R.Kasinathan. *Environmental Ecology*, 1994. 12(4):845849.
9. Palpandi, C. *Journal of Biodiversity Conservation*. 2011. 3(4): 121-130.
10. Patole, V.M. Ecology and biodiversity Mangroves in Mochamad Estuary of Vengurla, South Konkan, Maharashtra. Ph.D. Thesis, (2010). University of Mumbai.
11. Dewiyanti Irma, Karina Sofuatuddin. Diversity of Gastropods and Bivalves in mangrove ecosystem rehabilitation areas in Aceh Besar and Banda Aceh districts, Indonesia. 2012. Aquaculture, Aquarium,

Conservation & Legislation *International Journal of the Bioflux Society*.

12. Camilleri, J.C. *Mar. Bio*, 1992, 114 (1): 139-145.
13. Wells F.E. Distribution of marine invertebrates in a Hong Kong mangrove, with emphasis on molluscs. 1990. In: Morton, B.S. (Ed.), *Proceedings of the Second International Marine Biological Workshop: The marine Flora and Fauna of Hong Kong and Southern China*, 1986, Hong Kong University Press, Hong Kong, 783-793.
14. Elizabeth C., Ashton, Donald J. Macintosh, J. Peter and Hogarth. *J. Trop. Eco.*, 2003, 19: 127-142.
15. Anirudha Dey, *Handbook on Mangrove Associate Molluscs of Sundarbans*: 2006, 1-96. (Zool. Surv. India, Kolkata).
16. Khade S.N. and Mane U.H. Diversity of edible Bivalve and Gastropod Molluscs from Ratnagiri, Maharashtra. *IJSPEAR*, Vol. (8), July 2012. (1-4).
17. Khade S.N. and Mane U.H. Diversity of Bivalve and Gastropod Molluscs from selected localities of Raigad district, Maharashtra, West coast of India. *World Journal of Science and Technology* 2012, 2 (6):35-41.
- Koteswara Rao and Kiran Kumar J.S. Determination of calcium content in shells of gastropod snails of Ramayanpatnam beach of Andhra Pradesh. *Journal of Chemical and Pharmaceutical Research*, 2016, 8(8):577-580. no.320, ZSI-2010.



WOMEN LEADERSHIP IN INDIA: THE CHANGING LANDSCAPE

Ms. Shweta Audichya¹ Dr Deepti Bhargava²

¹(Research Scholar, Department of Business Administration, Mohan Lal Sukhadia University, Udaipur (Rajasthan))

²(Principal, Shrinathji Institute Of Biotechnology and Management, Nathdwara, Udaipur)

Corresponding Author- Ms. Shweta Audichya

Email:- Shweta.audichya91@gmail.com

DOI- 10.5281/zenodo.7304474

Abstract

This study examined how Indian male and female managers perceived and used leadership styles and civility techniques in professional settings. The employment of politeness strategies and male and female leadership styles have been heavily researched in the Western context, but this research is lacking in the dynamically changing Indian setting, where society has historically been hierarchical and very paternalistic. The number of Indian women holding executive roles in the workforce has steadily increased, creating new linguistic settings. The purpose of this study is to increase public understanding of both the potential and difficulties that women managers encounter in patriarchal societies. This study shows that gender stereotypes still exist in the workplace in India because it is thought that female leadership goes against patriarchal culture and traditional religious beliefs. Gender stereotypes, patriarchy, and religious beliefs continue to devalue, degrade, and limit women. On the other hand, female managers excelled at presiding over meetings. Despite the dual roles that Indian women were required to play as mothers, wives, and professionals, they outperformed male managers. This shows that gender roles are evolving and that the paternalistic society of Indonesia is being influenced by global factors.

Keywords: Indian women, Stereotypes, Barriers, Leadership.

Introduction:

This study, which examined how men and women behave in the contemporary workplace and the attitudes of managers and subordinates regarding their leaders, who may be either male or female, is significant given the shifting roles of men and women in Indian culture. It is intended that the study's findings would not only shed light on the leadership practices of Indian male and female leaders, but will also lay the groundwork for management education that will benefit both sexes in positions of authority. Greater gender diversity has been promoted as an organisational strategy, functioning as a key corporate performance driver for achieving the competitive advantage, in response to the changing social and cultural trends of the society. Men are also seen as being more focused and career-oriented in Indian organisations, which has greatly influenced organisational culture.

Women are becoming more active in a variety of fields, including social science, medicine, engineering, academia, law, and entrepreneurship. Indian women are coping poorly with a variety of oppressive and rigid patriarchal family structures, relationships to men through their families of origin, matrimony, and procreation, as well as patriarchal traits. The viewpoint that typically prevails is based on the assumption that women are unable to manage the ideal balance between their personal and professional fronts. After giving birth, they lose their career momentum. The culture of the Indian people is characterised by the crowning of women as "rulers" at home. While carrying out their multiple jobs, it is believed that they prioritise their family above all else, which has a detrimental effect on their performance gaps in terms of their career growth ladder. The majority of company founders frequently encounter the

conflicting notion that there aren't enough effective women leaders in today's multinational firms, while women leaders hold the opposite view and think that these organisations don't use open performance evaluation standards.

According to a Harvard Business Review study from 2019, men and women are seen as equally effective in leadership roles. Social perceptions that women shouldn't hold senior leadership positions have a negative impact on their career. Organizations must therefore change their hiring and promotion practises to guarantee that qualified women are given meaningful consideration. By establishing a system that supports career growth, diversity, and work-life balance to assist organisations achieve their goals, women can rise into leadership roles by learning about the global leadership competencies. As MNCs use the distinctive skill set and experience of women in the workforce, these developmental programmes help female leaders improve the knowledge, proficiencies, and abilities needed to run organisations in a global setting, resulting in better growth and higher aggregated revenues.

Women's Leadership In India:

Despite a deeply ingrained patriarchal culture, it is quite paradoxical that India has produced countless women leaders over the years, including Indira Gandhi, the country's first female prime minister, Pratibha Patil, its first female president, Kiran Bedi, the country's first female inspector general of police, Indira Nooyi, the country's first woman and person of Indian descent to lead Pepsi Co., and Chitra Ramak. Since they reached the pinnacle of their professions and made their mark on the younger generation of women leaders, these women leaders continue to serve as inspirations for all young Indian women who desire to leadership positions. Compared to their counterparts in other regions of the world, more Indian women employees hold senior leadership positions.

Barriers to Women Leadership in Indian Context:

Organizational culture: The cultural norms that support gender-insensitive hiring, promotion, and retention procedures, among other things, considerably contribute to the lack of women working in the office corner. Additionally, men predominate in the social

milieu of an organisation. In order to succeed in the traditionally male-dominated workplace, women executives tend to adopt behaviours and/or quirks comparable to those of their male colleagues.

Workplace Relationships: The main issue is the association of female executives with their mentors, managers, and other coworkers. Due to their restricted access to knowledgeable mentors, women are hindered in the workplace. Due to their propensity to comprehend the difficulties most frequently encountered, many people choose to have mentors who are also their own gender. Men, on the other hand, do not experience these obstacles, but they also do not want to mentor a woman because they perceive her to be more emotional, less capable of addressing problems, and more likely to experience workplace sexual harassment.

Globalization: Due to their increased responsibilities and expectations, women in middle and senior level management face numerous additional challenges as a result of globalisation. Top executives must relocate to new towns, cities, and countries due to business relocations. For many women who have families and a spouse or significant other who works, this poses a substantial hurdle. In a similar vein, women may run into opposition to female leadership in various cultures.

Intrinsic Motivation: Due to several barriers to career advancement, many women lose their will to excel. These challenges include prejudice, discrimination, stereotypes, familial obligations, and a lack of chances.

Lifestyle Conflicts: Women managers frequently have conflicts related to their multiple roles. Many women may be forced to choose between family and profession due to changing workplace requirements and promotions. Due to the impact it would have on their careers, very few female CEOs and executives chose to have children. In contrast, a lot of women have deliberately quit their occupations because of family considerations. On the other hand, the proportion of women quitting their employment after having children has sharply decreased. Additionally, after a woman has children, she is less hesitant to travel and work long hours due to their

domestic obligations, which reduces her chances of promotion.

Stereotyping and Leadership Styles:

Many organisations associate success and achievement with masculine traits like assertiveness, aggression, etc. Women, meanwhile, are thought of as being modest, quiet, and selfless. As a result, these moderate traits might be viewed as unsuitable for managerial positions. Organizations want a leader who will carry out his duties, handle criticism well, and perform to the best of his abilities.

Marital Status Bias: In addition, employers may have negative impressions about married and single women's employability, which could have an impact on critical choices like promotions and layoffs. Additionally, it is thought that single, unmarried women have fewer social responsibilities and are required to work longer hours than married, working women; in contrast, employers assume that married males are more employable than single men. It is thought that as their financial responsibilities grow after marriage, men show more steadiness, determination, and commitment to their careers. Thus, it is significant that one of the main issues that Indian women still face is bias based on marital status.

Importance Of Women In Leadership Roles:

There are many reasons why women's leadership is essential, not least the bottom line. According to Baroness Berridge (Minister for Women in the UK), companies in the top 25% for gender diversity on their executive teams are 25% more likely to have above-average profitability.

A more diverse workforce, including more women in leadership roles, is linked to more innovation and financial performance. Studies show that having women in leadership roles can help organisations forge a deeper connection with their customers, inspire other women employees, and boost employee engagement. Increasing diversity is also a significant benefit during skills shortages as organisations have access to a broader talent pool.

1. Women leaders will paint the future

It can be daunting for women who have not yet been in a position of leadership to take on such a high-profile role due to the stigmas

attached to it. This could push away the younger generation from striving to break down barriers.

In 2019, the proportion of women in senior management roles globally grew to 29%. This remained constant in 2020 and grew to 31% in 2021, the highest number ever recorded. While this can be considered positive news, women just entering the workforce will need to be inspired by other women who are currently smashing their roles as a leader in the workplace. Once achieved, it can carve a direction for all young aspiring women leaders to increase the global percentage and break new records.

2. Unique transformational ideas will be brought to the front

A meta-analysis comparing male and female leaders identified female leaders were more transformational. They demonstrated more contingent reward behaviour than the two-dimensional actions (active and passive management) presented by male leadership. This transformational leadership style has been shown to build social and personal identification amongst members and also build the mission and goals set out by leadership and organisations. This demonstrates a clear positive influence on the success of an organisation and its employees.

3. The enhancement of teamwork

Women are able to make bold and wise decisions as leaders; this helps make the team environment less authoritative and more cooperative, bringing a family-like feel to the team. This boosts teamwork across the organisation and helps implement a new culture within the business.

4. Women demonstrate superior leadership values

A national survey by the Pew Research Center Social and Demographic Trends survey ranked 2,250 adult women better than or equal to men in seven of the eight primary leadership traits assessed throughout the survey.

The key statistics from this survey outline that half of the respondents ranked women as more honest than men, with 20% saying that men are more honest than women. In terms of intelligence, 38% said they viewed women as smarter, with only 14% indicating men are smarter. For the other cases, women

were ranked as being more compassionate, outgoing and creative.

5. Business-wide communication can be enhanced

Communication is said and known to be among a woman's strongest skills. Female leaders will utilize this power to enhance meaningful conversations with employers, co-workers and partners, thus creating an open communication stream that creates a sense of clarity.

6. Achieve a better financial outcome

It's possible that more original ideas will be put forth in a workplace with a greater diversity. This promotes development and increases organizational sustainability. Diversity in the workplace should not only focus on women but also include a fluid mix of both sexes across the board.

Gender diversity at work fosters innovation, promotes performance and employee satisfaction, and, as has been proven, fosters greater teamwork across the organisation. According to a workplace survey, organisations with gender-diverse workforces are 21% more likely to have above-average profitability.

7. Fresh new outlooks and perspectives

Women leaders will bring skills, different perspectives, and innovative ideas to the table, but these three combined will help create innovative perspectives that lead to better decision-making as a whole for the business.

8. Women leaders can provide better mentorship

The importance of role models, particularly for the younger generation, cannot be understated. Everyone needs someone to mentor them so they can advance in their careers, regardless of gender. Women can employ their skills in this area since, specifically, female leaders are better mentors than male leaders when it comes to developing and guiding new talent.

A study found that 29% of women think that being a woman will prevent them from advancing. Women in leadership positions can seize this chance to start empowering the talented young minds of the following generation in order to go past this challenge.

9. The ability to wear many hats

Women frequently perform multiple roles within one another in daily life. Along with many other situations, you can frequently

find them juggling families, occupations, and parental supervision. These aid female leaders in making quick adjustments to novel circumstances and concentrating on finding answers to practical workplace problems.

10. Women in leadership roles can close the gender pay gap

The fact that the gender pay gap can become a gender opportunity gap is something that is frequently neglected. When men and women begin their careers from scratch, it has been observed that men are typically given more opportunities that lead to higher-paying employment.

Conclusion:

Women in leadership: Be impactful.

Research has found that the global share of women in senior management roles is increasing incrementally, with 90% of global companies having at least one woman in a senior management role in 2021. However, it will still be 170 years until women achieve economic parity on a global scale, according to the World Economic Forum's Global Gender Gap Report.

According to a survey of approximately 8,500 companies across 61 countries in 2021, conducted by S&P Global and researchers from the University of Paris, female CEOs demonstrated better empathy, adaptability, and diversity more frequently than their male peers. In the past, words like empathy, intuition, compromise, and compassion may have been seen as soft, but today they are seen as words that are becoming more and more important in the workplace—possibly even a strategic imperative. An further recent study, this one from Catalyst, demonstrates that compassionate leaders have more creative and effective teams and are more likely to keep talent. Data indicates that:

Empathy is a force for productivity, life-work integration, and positive work experiences.

Empathy boosts productivity.

Employees with empathic managers and leaders are more innovative and engaged in their work than are employees with less empathic managers and leaders. Women of color experience less burnout when they have more empathic senior leaders. Senior leader empathy is linked to reduced intent to leave. Women leaders tend to use an empathetic style to influence others and to build trust, which produces productive and

effective teams. In fact, a 2019 S&P Global Markets Intelligence Study found that firms with female CEOs and CFOs produced superior stock price performance. The study highlighted positive stock price, profitability, board diversity, and results by organizations run by female C-level leaders. One CEO who I've worked with says that she aims to balance empathy with hard data and results. This push to prove that results do go hand-in-hand with a well-balanced organization is something many female leaders have in common. They want to change the culture of their organizations and provide inspiration for other aspiring female leaders while ensuring that results and long-term thinking do not suffer; in fact, they should increase. But it's important to note that evolution is not exclusive to women. More of the male CEOs I work with understand that empathy and rigor can be impactful as a leader.

References

1. Anitha, N. "Work Life Balance of Women in BPO's." NHRD Newsletter, 23, (5), 2007, 16-18
2. Ely, Robin J. "The Power in Demography.: Women's Social Constructions of Gender Identity at Work." Academy of Management Journal, 38 (3), 1995, 589-634.
3. Fels, A. "Do Women Lack Ambition?" Harvard Business Review, 82, (4), 2004, 50-93.
4. Hamsaveni, V. 'Women as Managers', NHRD Newsletter, 24, (3), 2008, 26.
5. Rosener, J.B. "Ways Women Lead." Harvard Business Review, 68 (6), 1990, 119-25..
6. Ruderman, Marian N. Ohiott, Patricia J, Panzer, Kate and King, Sara N. (2002). *Benefits of multiple roles for managerial women*. Academy of Management Journal, p. 369-386, Vol. 45(2).
7. Shanti Nachiappan and Santhi N. (2004). *Too Few Women Managers*. HRD Newsletter, 20(6), 20-21.
8. Shrank, N. and Kanter, R.M. Reach for the Top: Women and the Changing Facts of Work Life. Boston, MA: Harvard Business School Press, 1994.
9. Srivastava, Sushma. *Women and Development*. Common Wealth Publishers, New Delhi.
10. V. Hamsaveni (2008). *Women as Managers*. HRD Newsletter, 24(3), 25-26.
11. Van Der Boon, M. (2003). *Women in International Management*. Women in Management Review, 18(3): 132-146.
12. Zaccaro J. Stephen, Gilbert A. Janelle, Thor K. Kirk and Mumford D. Michael. *Leadership and Social Intelligence: Linking Social Perspectiveness and Behavioural Flexibility to Leader Effectiveness*. Leadership Quarterly, 2(4), 317-342.

Chief Editor

P. R. Talekar

Secretary,
Young Researcher Association, Kolhapur(M.S), India

Executive Editor

Dr. M. S. Shinde,

I/C Principal,
IQAC Coordinator and HOD,
Department of Physics
Mahant Jamanadas Maharaj
Art's, Commerce and Science College Karanjali

Editor

Dr. P.T. Wankhedkar

Department of Zoology
Mahant Jamanadas Maharaj
Art's, Commerce and Science College Karanjali

Dr. N. R. Giri

HOD, Department of Zoology
Mahant Jamanadas Maharaj
Art's, Commerce and Science College Karanjali

Editorial & Advisory Board

Dr. S. D. Shinde

Dr. M. B. Potdar

Dr. P. K. Pandey

Dr. L. R. Rathod

Mr. V. P. Dhulap

Dr. A. G. Koppad

Dr. S. B. Abhang

Dr. S. P. Mali

Dr. G. B. Kalyanshetti

Dr. M. H. Lohgaonkar

Dr. R. D. Bodare

Dr. D. T. Bornare
