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TRANSFORMATION IN SPATIAL AND TEMPORAL DISTRIBUTION OF PRIMARY HEALTH CENTRES IN RURAL AREA JALGAON DISTRICT (MS)

Arvind A. Badgujar
Associate Professor in Geography, Y. C. S. P. Mandal's Dadasaheb Digambar Shankar Patil Arts, Commerce & Science College, Erandol, Dist. Jalgaon
***Corresponding Author*- Arvind A. Badgujar**
Email : aabddsp@gmail.com
DOI- 10.5281/zenodo.7056985

Abstract :
A Primary Health Centre is the basic unit for measuring the availability of healthcare facilities in a region. An endeavor is made in the present research paper to find the transformation in spatial and temporal distribution of Primary Health Centres in rural area of Jalgaon district of Maharashtra. The work is based on secondary data which are obtained from the District Census Handbooks and Health Care departments for the years 1991 and 2011. The spatio-temporal changes are based on relative percentage changes incurred during the last two decades of 1991 and 2011. The results suggest that the spatio-temporal changes are positive in all the tehsils but these changes are very high in Raver and Erandol tehsils. Badvad and Yawal tehsil have recorded low increase in the proportion of villages having Primary Health Centres..

Key words : *Transformation, Rural Service Centres, Jalgaon district*

Introduction

The medical facilities include primary health centre, health center, family planning centre, maternity and child welfare center, dispensary and registered private practitioners. Although the government health organization is engaged sincerely in providing medical facilities to the general public but the provision of sanitary facilities, made so far is negligible and confined to the urban areas only. Human community has been suffering from various diseases since long time due to non-availability of adequate health care facilities. The conditions have become more severe in the region where lack of transport facilities restricts the movement of people to approach the nearest health care centers. Therefore, the need for providing medical relief, preventive and primitive health care to a large section of the population living in the rural areas is as great as that of the population living in the city.

Health hazards are many in rural areas, so need of health facilities is most important. On an annual basis, 1.5 million deaths and loss of 73 million workdays are attributed to waterborne diseases (Park, 2000), (Patil, Somasundaram, & Goyal, 2002). More than 85% of rural children are undernourished (150 000 die every year). (Mukhopadhyay, Srinivasan & Bose, 2001) There are many reasons contributing towards this. Important among them are lake of hygienic environments, under nutrition and malnutrition, lack of health consciousness and poor housing. Good health is a state of physical and mental well being necessary to live a meaningful, pleasant and productive life. Good health is not just indicator of quality of life but key of economic growth and sustainable development. Availability of health care facilities is very crucial issue in this regard. The medical facilities must increase according to increase in population. This paper make an effort to find out the growth in Primary Health Centres according to increase in population during the last two decades.

The Study Region :

The district under study is flanked by the Satpura ranges to the north and Ajanta hills to the south and the central part of the district is covered by well-known Tapi river basin which flows towards the west. The region experiences slightly different climate than by rest of the state of Maharashtra, since it is located away from the coast but at much lower altitude that the rest of the plateau of Maharashtra. Low altitude has resulted in abnormally high maximum summer temperature which is normally above 40^0 C. The location away from the coast has resulted in high range of mean daily temperature which is slightly than 15^0C.

The district is bounded by the state of Madhya Pradesh to the north. The rivers Anner and Panjhara form a boundary in the west between the region and the Dhule district. In the east, the district under study is bordered by Buldhana district. To the south, Satmala, Ajantha and Chandor hills form a natural boundary between the study region and the districts of Nasik and Aurangabad. The Jalgaon district which is one of the 35 districts of Maharashtra lies between 20^0 N and 21^0 N latitudes and 74^0 55 E and 76^0 28' E longitudes. The total area of the district is 11765.0 sq. Km. According to 2011 Census, the total population of the region was 42, 29, 917.

Objective :

The objective of the present paper is to explain the transformation incurred in the spatial and temporal distribution of healthcare facilities to the rural population in the form of Primary Health Centres in Jalgaon district of Maharashtra

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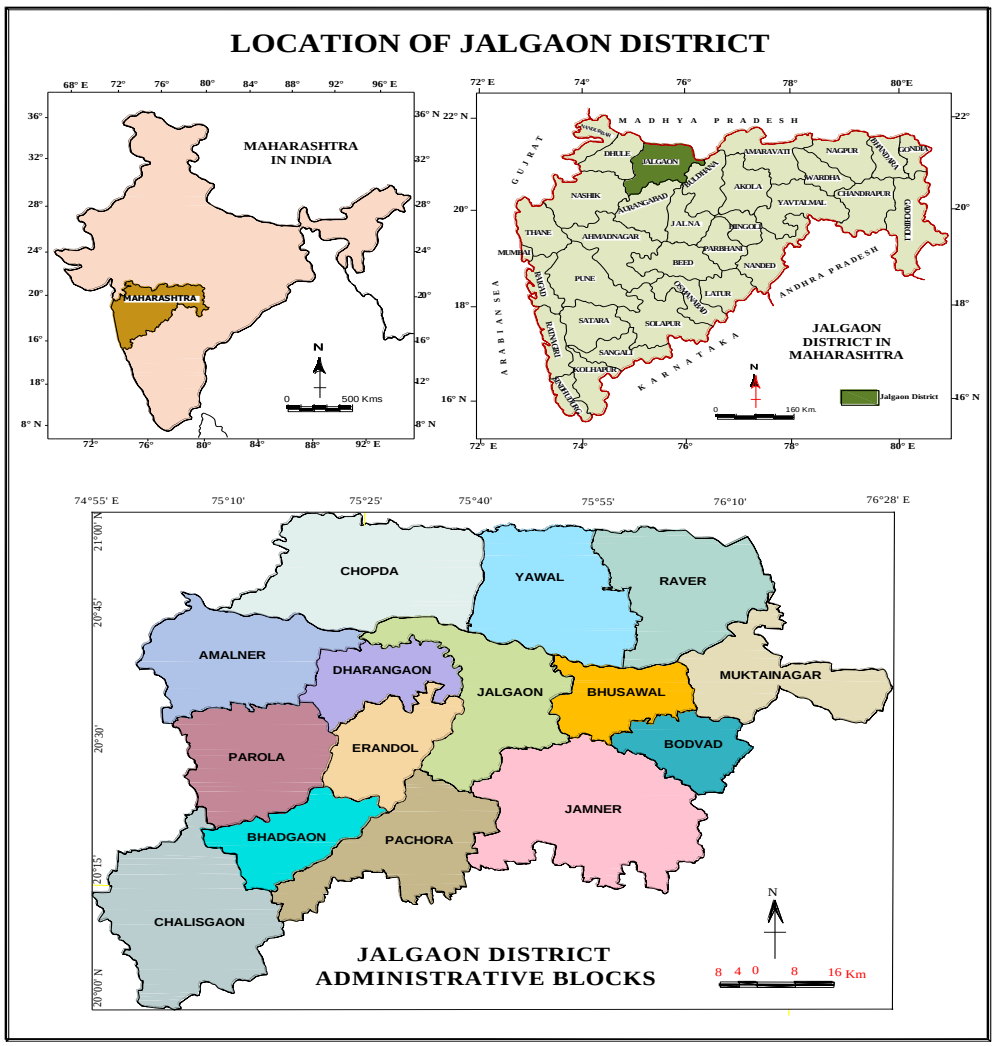

Fig. No. 01

Methodology :

The data for the present study are of secondary type, which are collected from the District Census Handbooks of 1991 and 2011 for Jalgaon district. The distribution of Primary Health Centres is based on data available in District Census Handbooks of Jalgaon district and Socio-economic Abstract of Jalgaon district. The transformation in spatial and temporal distribution is calculated in the form of spatio-temporal changes are based on relative percentage changes incurred during the decade of 1991 and 2011. While calculating spatio-temporal changes, the data of 1991 are considered as base, and then relative changes are calculated accordingly for each tehsil of Jalgaon district. The results, thus obtained are elaborated thoroughly with the help of table and maps.

Results And Discussion :

Primary Health Centre :

Rural India is suffering from a long-standing health care problem. Most of the health problems through which people suffer in the rural community are preventable and easily treatable. In view of the above issues, the National Rural Health Mission (NRHM) was launched by the Government of India in April 2005. In rural area primary health centre a basic part of the health care system. The medical officer appointed to run the primary health centre must be MBBS degree holder. In addition to the provision of diagnostic and curative services, the Medical Officer acts as the primary administrator for the primary health centre.

Primary health center is the contact point from village community and the Medical Officer. The primary health centers were envisaged to provide an integrated curative and preventive health care to the rural population with emphasis on preventive and primitive aspects of health care. The primary health centers are established and maintained by the State Governments under the Minimum Needs Programme. Primary Health Centre is the cornerstone of rural health services- a first port of call to a qualified doctor of the public sector in rural areas for the sick and those who directly report or referred from Sub-Centres for curative, preventive and promotive health care. (IPHS, 2012)

A typical Primary Health Centre covers a population of 20,000 in hilly, tribal, or difficult areas and 30,000 populations in plain areas with 6 indoor/observation beds. It acts as a referral unit for 6 Sub-Centres and refer out cases to CHC (30 bedded hospital) and higher order public hospitals located at sub-district and district level. However, as the population density in the country is not uniform, the number of PHCs would depend upon the case load. PHCs should become a 24 hour facility with nursing facilities. Select PHCs, especially in large blocks where the CHC/FRU is over one hour of journey time away, may be upgraded to provide 24 hour emergency hospital care for a number of conditions by increasing number of Medical Officers, preferably such PHCs should have the same IPHS norms as for a CHC. (IPHS, 2012)

In rural area of Jalgaon district, primary health centers were available in only 4 percent villages in the year of 1991. Yawal tehsil ranked first with 5.62 percent villages having Primary health center facilities among all the tehsils in the district.

In Chopda, Bodvad, Bhusawal and Bhadgaon tehsils, the proportions of villages having primary health centers were 4.5 percent to 5.5 percent while in Raver, Muktainagar, Jalgaon, Chalisgaon and Jamner tehsils ranged from 3.5 percent to 4.5 percent. The lower proportion was in Erandol, Dharangaon, Amalner, Parola and Pachora tehsils, i.e. below 3.50 percent. This clearly show that some villages for this facilities depend on nearest city and nearby large villages.

Table No 01. Jalgaon District: Transformation in the Proportion of Primary Health Centers to Total Villages, (1991-2011)

Sr. No.	Tehsils	Proportion of Primary Health Center		Spatio-temporal changes
		1991	2011	
1	Chopda	4.50	6.31	40.00
2	Yawal	5.62	6.74	20.00
3	Raver	3.51	6.14	75.00
4	Muktainagar	3.66	4.88	33.33
5	Bodvad	4.95	5.88	18.84
6	Bhusawal	4.95	7.84	58.45
7	Jalgaon	4.65	5.81	25.00
8	Erandol	3.31	4.69	41.62
9	Dharangaon	3.31	4.49	35.78
10	Amalner	2.61	3.27	25.00
11	Parola	2.63	3.51	33.33
12	Bhadgaon	5.08	6.78	33.33
13	Chalisgaon	4.23	5.63	33.33
14	Pachora	3.15	3.94	25.00
15	Jamner	3.82	4.46	16.67
Jalgaon District		**4.00**	**5.36**	**34.31**

Source: *District Census Handbook of Jalgaon District, 1991 & 2011*

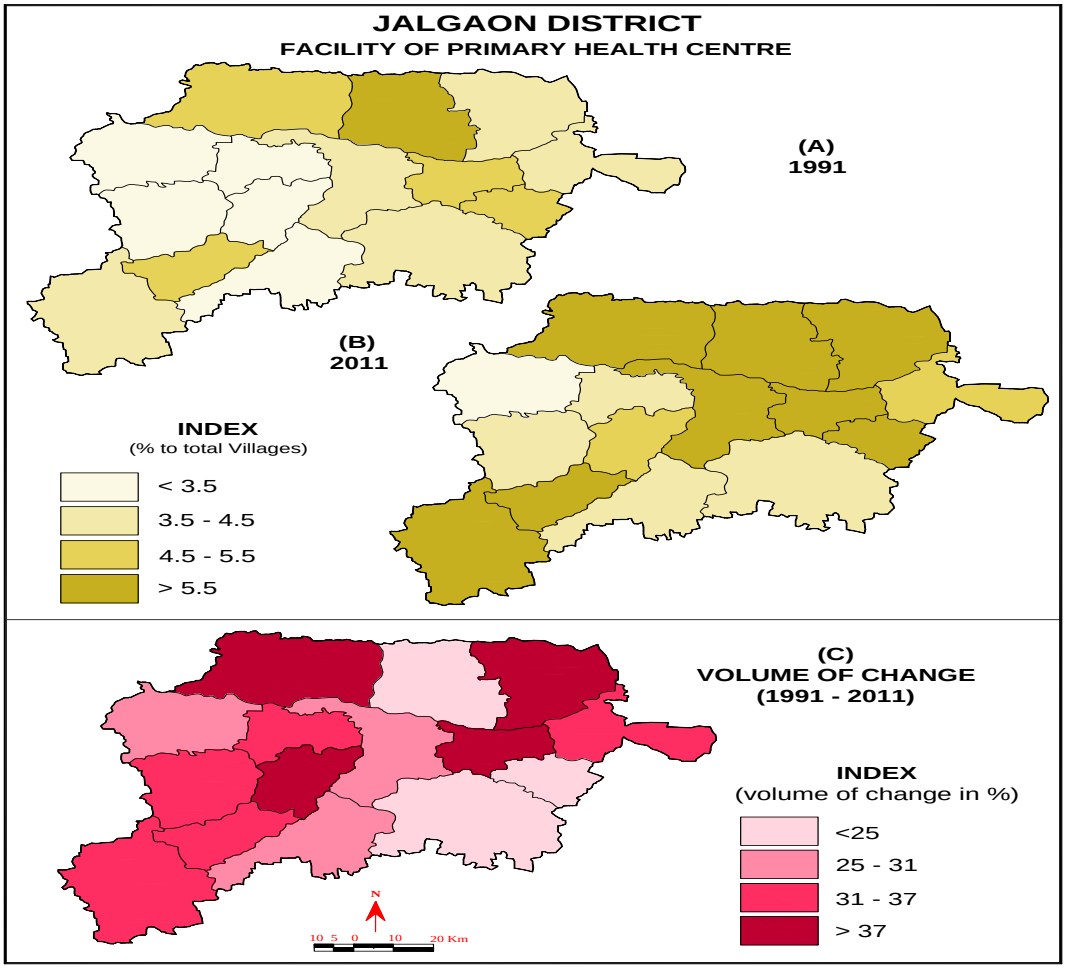

Fig. No. 02

According to Census of 2011, the proportion of villages having Primary Health Centres is about 5.36 percent. In the district, almost every twenty villages have primary health center. Chopda, Yawal, Raver, Bodvad, Bhusawal, Jalgaon, Bhadgaon and Chalisgaon tehsils have higher proportion (more than 5.5 percent) of villages having primary health centers. The proportions of Muktainagar and Erandol tehsils are 4.9 percent and 4.7 percent respectively. In Dharangaon, Parola, Pachora and Jamner tehsils this proportion is ranging from 3.5 percent to 4.5 percent, while the proportion of primary health centers in Amalner tehsil is very poor (i.e. 3.3 percent). The maximum villages do not have primary health centers. These villages depend upon the nearest urban centre and big villages situated at a distance of hardly 5 to 10 km.

There has been a slow growth in the primary health centers during the study period. The proportion of primary health centers has risen from 4.00 percent in 1991 to 5.36 percent in 2011 gaining a net increase of 34.3 percent in the period of two decades. The study region shows uneven changes in primary health centers. The maximum changes in the proportion of villages having primary health centers have been noticed in the tehsils like Chopda, Raver, Bhusawal and Erandol more than 37 percent. The second highest change is found for Muktainagar, Dharangaon, Parola, Bhadgaon and Chalisgaon tehsils ranging from 31 percent to 37 percent. Jalgaon, Amalner and Pachora tehsils have reported 25 percent increase of primary health centers. Yawal, Bodvad and Jamner tehsils show very slow improvement below 25 percent than other tehsils, because the villages lying in this tehsils get the primary health center facilities from nearby urban center and big villages.

Conclusion :

The transformation incurred in the spatial and temporal distribution of PHCs is uneven throughout the district. The northern tehsils Chopda and Raver, as well as Erandol and Bhusaval have reported high increase during the study period. On the other hand, Yawal, Bodvad and Jamner tehsils have shown very slow improvement than other tehsils, because the villages lying in this tehsils get the primary health center facilities from nearby urban center and big villages. The healthcare facilities available at urban centres are utilized by these villages. The availability of qualified doctors, assisting staff as well as equipment and medicine mainly affect on quality of healthcare facility.

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PUBLIC POLICY MAKING IN INDIA

Mukesh
Research scholar, Maharshi Dayanand University, Rohtak, Net/Jrf Qualified
***Corresponding Author*- Mukesh**
Email- mukeshkundu1998@gmail.com
DOI- 10.5281/zenodo.7056989

Abstract
Public policy is a purpose of course of action, system of laws or regulatory measures taken by the government entity or its representative in dealing with matters of concern . Do public policies are meant for addressing the needs of people? These policies focus on the public and related problems; the context of public policy is intended to achieve maximum social gains.

Types of public policies

1.Distributive policies:

Policies concerned with the distribution of new resources are distributed policies, these include grants and subsidies that give a protection to a certain interest against competition for example, adult education program ,flood relief ,social insurance scholarships to students belonging to weaker sections of the society.

2.Redistributive policies:

These are concerned with changing the distribution of existing resources and with the rearrangement of policies which are related to bringing about social and economic changes in the economy and society for example, actions that affect credit and supply of money, taxes, social security, etc.

3.Regulatory policies:

These are concerned with the regulation and control of activities. These seek to alter individual behavior directly by impulsing standards on regulated industries and are much more likely to invite controversial issues for example organizations like UGC see AICTE city CBSE perform both promotional and regulatory activities in the field of education.

The medical council of India at, the bar council of India, the pharmacy council of India and nursing council of India are examples of regulatory agencies intended to protect standards of respective professions.

Public policies serve important purposes in a democratic society in improving the economic social system and democratic or political capacities of people. Any policy which is meant for the betterment of the public undergoes several stages in its process cycle these stages are:

1. Policy formulation
2. Implementation
3. Evaluation

In this paper we are going to study these various stages and also look at the roles of different organs of government as well as non-government organizations in the world in the policy process.

Let us now say what is done when public policies are formulated which are the important organs of policy making .

Policy making involves deciding on a program structure, the aims and the means of a plan or program and the issues related to the administration including the plan of implementation of policies.

Important organs of policy making : Policy making is a collective effort in which many institutions participate. Important organs in the world in policy making constitutional framework for policymaking legislature ,judiciary and executive.

Let us discuss these four organs in brief ; we will start with the constitutional framework for policy making in India that is best on the foundation of its constitution. The Constitution specifies rules for the

recruitment of authorities and their role in making policies.

There are four pillars of constitutional framework for policy making:

First pillar is democratic and sovereign republic.

The preamble of the Indian constitution declared India to be sovereign, democratic, republic. Enduring its citizens equality and liberty in all aspects. **Sovereignty** of public ensures that final authority for determining the policies for country rests with people and democracy government should satisfy to important features that is it should be representative and responsive.

Second pillar is the parliamentary system in India; The government purports to be a parliamentary type of executive both at center and state. In this system the real executive power of government is to be exercised by council of ministers comprising of leaders of political party or parties holding majority in legislature and collectively responsible for it in its working. This provides competent leadership to the legislature in all matters legislation, finance, policy enunciation, etc.

Third pillar is federalism. The country is divided into States and union territories. It is a combination of unitary form of government with a dominant central government with a large area of governmental autonomy and a reasonable independence to states. But deliberate effort is made to demarcate and differentiate the areas of policy formation between central and state government by listing subjects in the central list, the state list and the concurrent list, any disputes between the Central and State government are to be decided by the supreme court.

Fourth pillar is social economic philosophy; The directive principles of the state policy describe India to be the welfare state whose objective is to secure social and economic welfare for its people. The basic principles of economic policy are rational distribution of ownership and control of material resources and avoidance of concentration of wealth and means of production.

Second organ of policy making is powered in legislature;

The parliament in India makes laws, policies and legitimizes the decisions of the government. Its primary role is that of vetoing regulations and influence. It helps in determining the final form of some of the policies. Examples of parliamentary control over policies are law making, president address, general discussions on budget and adjournment motions but the legislators control over the policy making has some limitations for example if we public policy may not require legislative enactment.

Third organ of policy making is powered in the judiciary ;

The Indian constitution entitled the supreme court and high courts at state levels to exercise judicial review. Judicial review is the power of judicial course to determine the constitutionality of actions of legislature and executive and declare them null and void if such actions do not conform to constitutional provisions. The courts generally do not interfere with the policy matters of the legislator and executive unless the policy is against the constitution or statute or is actuated by malafides. Courts in policy matters decide on specific issues and do not take the initiative, a person seeking to invoke the power of courts must show the direct legal injury and must have exhausted all the administrative remedies before a judge entertains his case.

The judge takes into account particular set of facts and makes a decision that will resolve the problem at hand, if the decision is accepted by other judges it means the judge has made a policy for all jurisdictions in which that view persists for example, the right of female employees not to be sexually harassed at workplace as in case of vishaka vs state of Rajasthan 1997 became established as a court made policy. The Supreme Court here meant for the decision to have general application in all public and private organizations the role of judiciary in the formation of social and economic policies is significant.

judges pronounced Judgments on matters like equal protection by law, property ownership and employer employationship which letter may have policy implications.

Fourth organ of policymaking is power of executive;

The main body's engaged in policy formulation at cabinet, the prime minister and his office, the central security at the cabinet's secretary at established institutions.

Now let us start with the implementation process with its objectives firstly realization of policy decision secondly utilization of Scott's resources and mainly generation of output. In implementation an important aspect to be considered is whether an organization is able to carry out and achieve its stated objectives within time and with minimum costs implementation of public policy aims at realizing the aim state of the policy this policy implementation is actually putting policy into an action.

Let us understand elements in policy implementation ,

As we have already seen, implementation is the process of moving an idea from concept to reality.

To implement policy effectively one needs to know first what needs to be done, the availability of required resources and the ability to assemble and control these resources. Communication of expectations to implement controlling their performance is of equal significance. Other factors which complement policy implementation are availability of administrative capability to achieve desired policy output, political support and support from all organs of government such as executive, administrative and judicial. After understanding the elements now let us discuss different approaches of policy implementation

first is top ground rational system approach ;

This involves carrying out of a policy decision by statute executive order or court decision, here authoritative decisions are implemented to produce desired effects *characteristic features* of top-down approaches are clear and consistent goals, articulated and the top of the hierarchical environment knowledge of persistent cause and effect and clear hierarchy of authority establishment of rules at the top and alignment of policy with the rules and resources or capacity to carry out commands from the top **Second is bottom up Rational Approach** ,

This school of thought believes that the target groups are actual implementers of policy. According to this few local bureaucrats, implementers are allowed discretion in implementation process with respect to local conditions for the success of policing. Discretion may be very good thing especially when it uses expertise of people impacted by the policy to increase the likelihood of success and excellence.

Third is interorganizational interaction approach; Behavior of people with each other in an organization is an important consideration for this aspect.

According to this view implementation is the process which involves interactions within various organizations Two approaches under this category are 1. ***power dependency approach*** in which interaction of organizations is the product of powerful relationships within two organizations such organizational relations are based on dominance and dependence and ***2.*** **Organizational exchange** approach in which organizations work with one another for mutual benefit.

Fourth is policy action relationship model;

An interactive and bargaining process takes place over the time between those who are responsible for enacting the policy and those who have control over resources.

Now let us see who actually implements the policy;

Administrative agencies Public administrators have a dual role to play in policy management as those who give expert advice in policy issues and tools who implement policies. Basic functions of public administrators are : Administrators must clearly understand the nature and significance of policies, they must assist policymakers to avoid ambiguities, they must be able to translate general policies

and their objectives into operational targets.

voluntary sector and pressure groups;

The role of voluntary seeking to work for the betterment of poor and needy has been well recognized. Voluntary organizations like NGOs have been very active in implementation of public policies for example forest policy, population policy, health policy. Group action is always more effective than individual action for implementation of public policies. NGOs have prove to be effective communicators with public officials on the implementation of public policies they are vital links between individual citizens.

Third is community as an alternative;

The development of community as a policy implementer is supported by laws enacted by state governments in 1950 and by constitutional status given to panchayats and municipalities.

For formulation and implementation of policies and programs, for economic development and social services, for local community by the constitution.

Three main techniques for approaches for rational evaluation analysis are

1. **Cost benefit analysis**
2. **Performance measure techniques**
3. **Experimental technique**

As we have seen earlier policy evaluation comprises not only of evaluation of policies but also of people who are implementing the policies evaluation of people can be done on the basis of tasks to be performed by them assessment of reasons or input of eleven efforts or behavior or amount of reward remuneration or reinforcement to be given to improve maintain or advance the current level of performance does this type of analysis can be considered as a tool for human resource management the aim of this human resource management evaluation is to change people so as to become more committed competent and cost effective let's look at agencies involved in evaluation evaluation is carried out in variety of ways using a variety of evaluators sometimes it is very systematic and formal and at other times it can be casual or quite informal it may be carried out by indoors who are delivering the program that is concerned government department or ministry or by private agencies outside the government other contributors to evaluation of a policy are communication media researchers in private and public institutions organized groups commissions and public interest organizations policy evaluation can be classified into three broad categories administering evaluation it is undertaken by government agencies financial and administrative exports attached to different governments journey evaluation under this course examine constitutionality of policy being implemented and whether the implementation of policy violates the rights of person challenging the validity of policing and political evaluation this evaluation can be done by political parties pressure groups media and non-governmental agencies now we will talk about problems and evaluation there are many difficulties in the evaluation of policy programs first one is unclear policy goals if the policy goes are unclear or not specified any measurable form determining the extend to which this goals have been achieved becomes very difficult next problem is of measurement sometimes although the goals are expressed in a concrete manner it is difficult to measure the exchange to which this goals have been achieved absence of ready means to measure the performance may cause a problem in judging the performance for example in assessing the impact of education program the short term goal of improving reading right in and learning and long term goal of improving the quality of life of recipients may cause a question in measurement sometimes concurrent implementation of policies may pose a problem in correct evaluation of the effectiveness of a particular policy for example isolation of evaluation of health program in improving the health of poorer sections as difficult as the paddle effect of education program and nutrition program cannot be overlooked next difficulty is identification of inappropriate indicators in the absence of appropriate indicators it may be difficult for the evaluators to judge the exact

outcome of a program another problem is that of targets non availability and non-satability of the data are some of the difficulties in policy evaluation it is very important to differentiate people receiving benefits of a policy and the actual target population if the demarcation is improper it will give misleading results other major problems in evaluation of policy are selection of the wrong methodology lack of specialized knowledge and technical skills we have discussed in detail how public policy is formed implemented for achievement of goals and evaluated for consequences of public policy.

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A STUDY ON THE RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT AWARENESS AND DECISION MAKING AMONG HIGHER SECONDARY SCHOOL STUDENTS IN THIRUVANANTHAPURAM DISTRICT

Malini G[1] Dr. Bindu.B[2]
[1]Research Scholar in Education, Mar Theophilus Training College, Nalanchira Thiruvananthapuram
[2]Associate Professor, Mar Theophilus Training College, Nalanchira Thiruvananthapuram
***Corresponding Author*- Malini G**
Mail id: malinig22@gmail.com
DOI- 10.5281/zenodo.7056993

Abstract
The present study explores the relationship between sustainable development awareness and decision making among higher secondary school students. Normative survey method was used for the study. 200 higher secondary school students were selected through stratified random sampling technique. Education for sustainable development involves teaching and learning the main issues related to sustainable development such as climate change, biological diversity, poverty reduction and sustainable consumption. Sustainable development awareness through education would seek to develop decision making ability that allow to the students helps to take justified decision in social, economic and environmental problems. This study found that the relationship between sustainable development awareness and decision making among higher secondary school students is positive relationship and significant. The study showed that there is significant difference between boys and girls for the variables sustainable development awareness and decision making.

Keywords: *Sustainable Development Awareness, Decision Making, Higher Secondary School Students*

Introduction

education that "empowers learners to take informed decisions and responsible actions for environmental integ- rity, economic viability and a just society, for present and future generations, while respecting cultural diversity. education that "empowers learners to take informed decisions and responsible actions for environmental integ- rity, economic viability and a just society, for present and future generations, while respecting cultural diversity."

Globalization and digitalization connect the world. As a result, cultures mix, economies grow and communication speeds up. The world becomes increasingly complex and uncertain. Humanity is altering the planet's climate, animals and landscapes in unprecedented ways, and threatening all life on earth. The students need new perspectives to be able to understand the rapidly changing world they live in. In addition, they need to participate in this world. Many of them also want to help reduce poverty, protect the environment and create inclusive societies. Sustainability education provides this alternative approach, aiming to educate students as global citizens for sustainable development. *Education for Sustainable Development provides an exciting vision of an interdisciplinary and learner-centered way to empower students to advance a pro-social and environmental agenda in their organizations, communities and personal lives.*

Sustainable development would meet the needs of the present without compromising the ability of future

generations to meet their own needs. Education for sustainable development that empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a society, for present and future generations, while respecting cultural diversity. Decision making is the individual's ability to apply higher-order thinking skills such as analysis, synthesis, problem recognition and problem solving, inference and evaluation. Sustainable development awareness is helps to the students to develop their decision-making for current and future generations and the practice of engaging in analytical dialogue and problem-solving mechanisms, through active mental and emotional inquiry, for the transformation of individuals, communities and institutions.

Critical thinking is the individual's ability to apply higher-order, rational thinking skills such as analysis, synthesis, problem recognition and problem-solving, inference, and evaluation

Education for sustainable development allows each student to acquire the knowledge and skills and to form the attitudes and values necessary to build a sustainable future. Education for sustainable development involves teaching and learning the main issues related to sustainable development such as climate change, biological diversity, poverty reduction and sustainable consumption. It also implies the use of methods based on participation, motivating students and allowing them to adapt and become active participants of sustainable development. So it leads to the students to attain appropriate judgment and decisions in their life. In this regard, education within sustainable development would seek to develop decision making ability that allows graduates to predict certain crucial events in the future and take correct decisions.

Need and Significance of the Study

Sustainable development involves the three areas of environment, economy and society, with a focus on the relationships between environmental protection and human development. Education for sustainable development takes a holistic view on the environmental, economic and social dimensions of sustainable development and aims to empower students to engage in the democratic development of society in a more sustainable direction. The sustainable development helps to develop to the students to make active sustainability citizen, it will motivate and empower learners to think critically and participate in shaping the future of this world. The education provided sustainable development goals and guide to the students for preparing good sustainability citizen and protecting our resources in the global society.

Sustainability challenges, including climate change, loss of biodiversity, poverty, epidemics, and violent conflict, manifest at a certain location, yet the underlying causes are linked to other nations, locations, and even the global society. Hence options for migration, adaptation, and solution to these interconnected environmental, social, economic and political challenges call for education to enable the young generation to act and engage responsibility and innovatively with this world. The sustainable development awareness is to enable individuals to reflect on their own actions, taking into account their current and future social, cultural, economic and environmental impacts, from a local and global perspective. Sustainable development awareness helps to improving the capacity of students to address environment and development issues. So this study helps to recognize the influence of sustainable development on decision making and find out its relationship.

Objectives of the Study

1. To find out the relationship between sustainable development awareness and decision making among higher secondary school students
2. To compare the sustainable development awareness of male and female higher secondary school students

3. To compare the decision making of male and female higher secondary school students

Hypotheses Of The Study

1. There is significant relationship between sustainable development awareness and decision making among higher secondary school students
2. There is significant difference between male and female higher secondary school students in their sustainable development awareness
3. There is significant difference between male and female higher secondary school students in their decision making

Methodology In Brief

Method adopted

The selection of a method and the specific design within that method is appropriate in investigating a research problem which will depend upon the nature of the problem. The investigator adopted normative survey method for the study.

Sample selected for the study

The sample of the study consisted of 200 male and female higher secondary school students in Thiruvananthapuram District. The sampling techniques used for the study was stratified random sampling.

Variables of the study

The variables involved in the study are

1. Sustainable development awareness
2. Decision making

Tools used for the study

Sustainable development awareness scale

It developed by the investigator was used for collect the data for the present study. It validated questionnaire contains 20 items and a self reported scale used to measure student's awareness toward sustainable development. The set of statements which are rated using 5 point Likert scale , namely strongly agree, agree, uncertain, disagree and strongly disagree for the study to form a total sample of 200.

Decision making scale

It developed by the investigator was used for collect the data for the present study. It validated questionnaire contains 24 items and a self reported scale used to measure student's ability toward decision making. The set of statements which are rated using 5 point Likert scale , namely always, frequently, sometimes, rarely, and never for the study to form a total sample of 200.

Statistical techniques used for the study

1. Mean
2. Standard Deviation
3. t-test
4. Karl Pearson's coefficient of correlation

Analysis And Interpretation Of The Data

Table 1. Result of the significant relationship between sustainable development awareness and decision making among higher secondary school students

Variable correlated	N	Degrees of freedom	'r' value	Result
Su Stainable Development and Decision Making	**200**	**198**	**0.785**	**Significant**

Note: For 198 degrees of freedom at the 0.01 level of significance, the table value of 'r' is 0.181

It is inferred from the Table 1 that the calculated 'r' value of the relationship between sustainable development awareness and decision making of higher secondary school students 0.785 is greater than that of the table value 0.181 at the 0.01 level of significance. Hence the hypothesis that there is significant relationship between sustainable development awareness and decision making of higher secondary school students is accepted at the 0.01 level of

significance. Hence the alternate hypothesis that there is significant relationship between sustainable development awareness and decision making of higher secondary school students is accepted.

Table 2. Result of significance difference between sustainable development awareness of male and female higher secondary school students

	Gender	N	Mean	S.D	Degrees of freedom	t-value	Result
Sustainable Development	Boys	95	63.57	17.65	198	3.22	Significant
	Girls	105	71.24	15.83			

Note: At 0.01 level of significance, the table value of 't' is 2.60

It is inferred from the Table 2 that the calculated 't' value for the sustainable development awareness 3.22 is more than the table value 2.60 at 0.01 level of significance. Hence the hypothesis that there is significant difference between the sustainable development awareness scores of male and female higher secondary school students is accepted at the 0.01 level of significance

Graph showing the mean scores of sustainable development awareness of male and female higher secondary school students

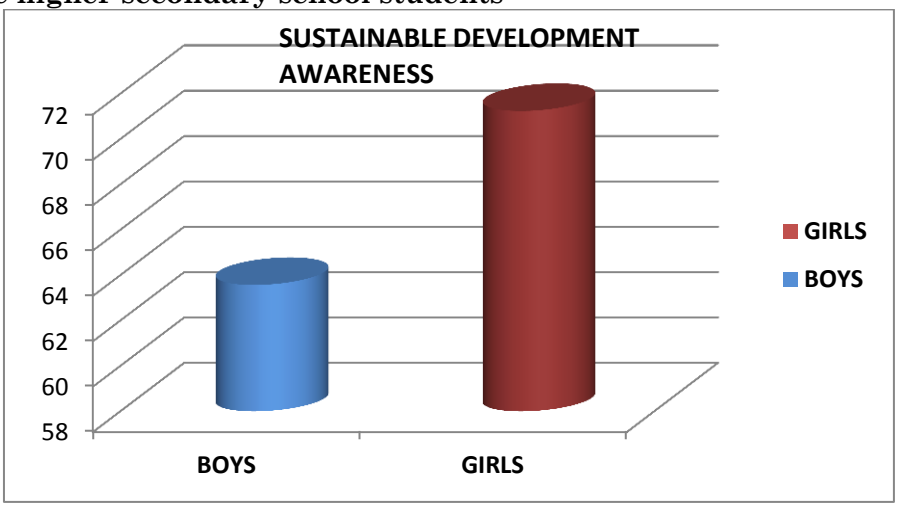


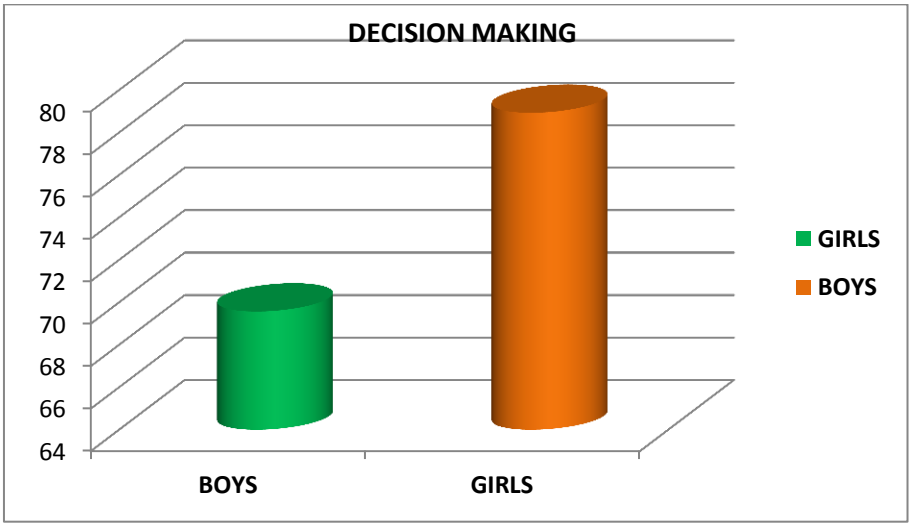
Table 3. Result of significance difference of decision making of male and female higher secondary school students

	Gender	N	Mean	S.D	Degrees of Freedom	t-value	Results
Decision Making	Boys	95	69.57	17.29	198	3.56	Significant
	Girls	105	78.93	19.85			

Note: At 0.01 level of significance, the table value of 't' is 2.60

It is inferred from the Table 3 that the calculated the 't' value for the decision making 3.56 is more than the table value 2.60 at 0.01 level of significance. Hence the hypothesis that there is significant difference between the decision making scores of male and female students is accepted at the 0.01 level of significance.

Graph showing the mean scores of decision making of male and female higher secondary school students



Major Findings of The study

1. There is significant difference between sustainable development awareness and decision making among higher secondary school students. The obtained correlation coefficient is significant at 0.01 level (r = 0.785) for the total sample.
2. There is significant difference between male and female higher secondary school students in their sustainable development awareness. Here the t-value is 3.22 which is the significant at 0.01 level.
3. There is significant difference between the of male and female higher secondary school students in their decision making. Here the t-value is 3.56 which is the significant at 0.01 level.

Conclution

It found from the study that the relationship between sustainable development awareness and decision making among higher secondary school students is positive relationship and significant. This means that higher sustainable development awareness leads to the higher level of decision making to the students. So that decision making is the key competencies in sustainable development. It helps to the students to take major decisions and judgment in social, economic and environmental problem solving. Sustainable development awareness to the students helps to learn how the environments will be impacted when current consumption trends continue. The sustainable development awareness helps to improving the capacity of students to address environment and development issues and develop to the students to make active sustainability citizen.

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HUMAN RESOURCES MANAGEMENT IN PUBLIC SECTOR BANKS

Dr. Prakash Ratanlal Rodiya[1] Mr. Someshwar R. Panchakshari[2]
[1]Asst. Prof. Faculty of Commerce, Rajarshi Shahu Mahavidyalaya, (Autonomous), Latur
[2]Asst. Prof. Faculty of Commerce, Mahatma Basweshwar Mahavidyalaya, Latur
***Corresponding Author*- Dr. Prakash Ratanlal Rodiya**
Email- prakashrodiya123@gmail.com
DOI- 10.5281/zenodo.7057003

Abstract:

Any organization is nothing without human resources. Different Organizations that provide services or goods are all involved in operating them. Human compared to natural resources are more valuable, the quality of each organization's human resources. Human resources Contribute significantly to its future development. Human resource management being related to human activities they are considered the heritage of any organization. Human beings perform various tasks adjust and build the future of the organization. Acts as an operator and controller, with the help of which finances in the country the business is run and the entire credit system operates. Today, the entire development is the result of human resource. The human resource of any business is based only on the strong shoulders of It is a major helper in construction, operation and target achievement. Presently banking is an emerging service sector. Bank's production is only there is a service prepared by man for man. In the era of developing economy, bank officers and employees and the complexity of the work has increased. Therefore, they are appointed on the basis of special criteria. This is done through their training and development. So in the banking area human resource management and development is essential. The present study is the attempt to study the human resource management in public sector banks.

Key Words: *Public Sector Banks, Human Resources, Management, Performance.*

Introduction:

The rising significance of individuals to the exceptionally victory of the trade is causing businesses to respect particular human asset (HR) concerns as people related trade issues. It appears improbable that organizations will survive in a progressively competitive environment on the off chance that they disregard individuals related business concerns. Dynamic organizations around the world have treated their individuals as their most vital resource and likely have therefore gotten to be what they are nowadays. Since individuals are getting to be such a basic calculate, within the future, the winning organizations will be those that are able to manage their human assets successfully. Numerous analysts have pointed out that Human Asset Administration Hones effect on the results such as worker fulfillment, employee commitment, worker maintenance, representative nearness, social climate between specialists and administration, representative association, worker believe, employee loyalty, organizational decency and Story. A few of the creators demonstrate that these outcomes and HRM Hones can lead

to a firms execution such as benefits, showcase esteem of the company, advertise share, increment in deals, efficiency, item service quality, client fulfillment, advancement of products/services and future ventures. Over the long time, organizations the world over have ended up mindful of the significance of Human Assets. Numerous nations are getting to be progressively mindful of ought to include individuals through support, strengthening, way better get to and opportunity. The genuine life encounters substantiate the presumption that no matter how modern and modern the commerce actuates of the organization may ended up, it'll discover it greatly troublesome to maintain its development and effectiveness unless human assets are complimentary to its operations.

History of Banking in India:

Present day banks in India begun within the final decades of the 18th century. To begin with bank to be built up was Bank of Hindustan, set up in 1770 and sold in 1829-32; and following was Common Bank of India built up in 1786 but fizzled in 1791. Directly, the most seasoned bank in India is State Bank of India. It has started from three administration banks named Bank of Calcutta set up on2nd of June 1806 which was overhauled as Bank of Bengal in 1809. Bank of Bombay established in 1840 and Bank of Madras in the year 1843. Since these three banks were arranged in administration town they were called Administration Banks.

Objectives of the study:

1. To discover out the impact of HRM on work fulfillment in Indian Public sector banks.
2. To think about the impact of HRM on organizational commitment in Indian Public sector banks.
3. To survey the impact of work fulfillment on organizational commitment in Indian Public sector banks.

Research Methodology:

Three Public sector banks in India were chosen to think about the employee's recognitions of HRM and its result. The test of the show study consists of 100 respondents. The respondents were chosen by a multi-stage examining strategy. They are working in numerous offices of the Branches and Territorial workplaces of the Banks. The information were collected by the utilize of organized survey containing twenty- six questions. It was planned to empower us to test employees' perceptions about HRM (Staffing, Preparing, Emolument, Execution examination and Worker relations), Work fulfillment (Inherent remunerate fulfillment, Extrinsic reward fulfillment and Social compensate fulfillment) and organizational commitment (Emotional commitment, Continuation commitment and Normative commitment). The taking after rebellious were utilized in a study to degree the factors within the Study.

Literature Review:

Human Asset is the foremost critical resources within the service organization than fabricating organization and enhancement has got to be connected more unequivocally to the individual's issues (Boselie, 2002). In administration terms human assets alludes to the traits people bring to the workplace-intelligence, aptitudes, commitment, implied information and abilities, and the capacity to memorize. But the commitment of this human asset to the organization is regularly variable and unpredictable. This indeterminacy of an asset the "most vexatious of resources to manage" (Fitzenz, 2000). Human asset varies from other assets, partly because people are blessed with different levels of capacity (counting aptitudes, abilities and information), with contrasts in identity characteristics, sexual orientation, role perception and encounter, and incompletely as a result of contrasts in inspiration and commitment (Braton, 2003). Visitor (2001) considered four zones of HRM practice – great and secure working conditions, preparing and advancement, rise to work openings, and enlistment and determination. These ranges of HRM were chosen since they have already been distinguished as those likely to have the most prominent effect on demonstrative behavior and outlooks.

In the investigate by Edgar and Geare (2005) factually critical comes about were gotten between HRM hone and worker demeanors. HRM hone (for the areas of great and secure working conditions, preparing and advancement, and enrollment and determination) and three worker demeanors.

Data Analysis :

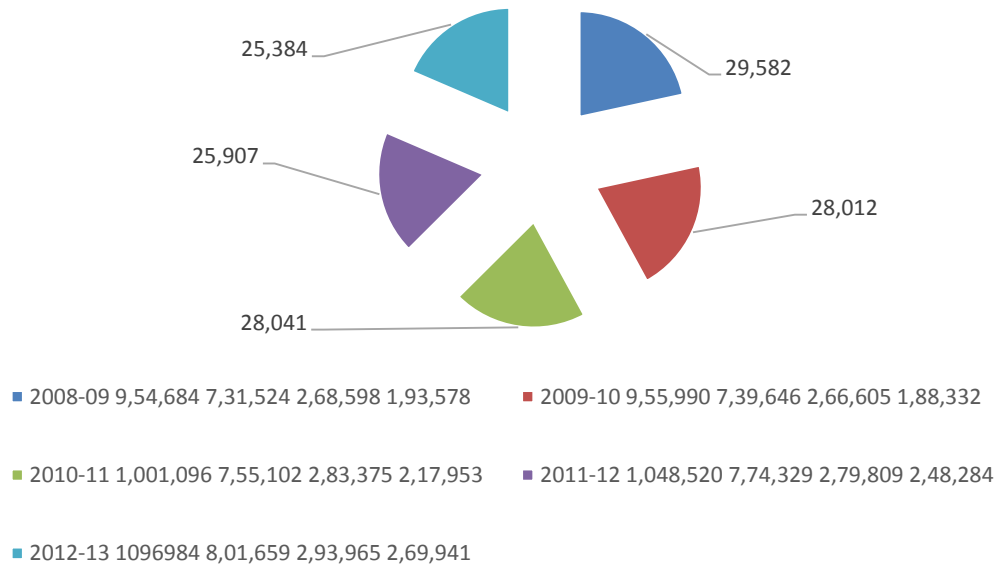
Table 1. Employee data in Indian banks

Banks	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013
Commercial	9,54,684	9,55,990	10,01096	10,48520	1096984
Public Sector	7,31,524	7,39,646	7,55,102	7,74,329	8,01,659
SBI	2,68,598	2,66,605	2,83,375	2,79,809	2,93,965
Private	1,93,578	1,88,332	2,17,953	2,48,284	2,69,941
Foreign	29,582	28,012	28,041	25,907	25,384

(Source: Economic Survey of India, 2014)

The over specified consider relates to the expanding number of workers enlisted each year by the banks in India. The most noteworthy number of workers is within the category of Commercial Banks. Public sector banks come another in category. SBI stands following in category. The private banks and outside banks are set following. This states that banks in India are still developing and are in require of youthful era workforce to run them.

Chart 1. Employee data in Indian banks



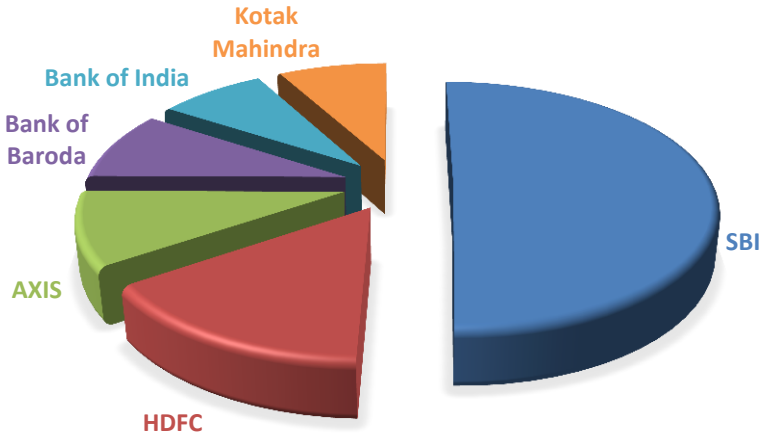
(Source: Economic Survey of India, 2014)

Table 2. Employee strength in Indian Banking

Bank	Category	Rank	No. of Employee
SBI	PSB	01	293469
HDFC	Private	02	87555
AXIS	Private	05	56084
Bank of Baroda	PSB	07	52420
Bank of India	PSB	10	45619
Kotak Mahindra	Private	11	46500

(Source : Economic Survey of India, 2016)

Chart 2. Employee strength in Indian Banking



(**Source** : Economic Survey of India, 2016)

Managing Banking Industry in India (2010 – 2017) :

All Relate banks of SBI and Bharatiya Mahila Bank have been blended with SBI as on 01.04.17. Two private segment bank viz. Bandhan bank and IDFC Bank have been consolidated from 23.08.15. With a point to redo the working of PSBs, conclave called "Indradhanush" was propelled at Pune vide commerce standard dated 14.08.15. This gathering was gone to by CEOs of all public segment banks, Prime Minister.

Table No. 3. Demographic detail of respondents

Particulars	Frequency	%
Gender		
Male	62	73%
Female	38	27%
Position		
Assistant	74	34%
Manager	26	66%
Salary		
0-25000	29	47%
25-50000	55	47%
50-1 lakh	26	6%
Age		
20-30	06	44%
30-40	26	15%
40-50	32	19%
50-60	46	21%

(**Source**: Primary Data Collection, 2022)

The number of males in public sector bank are 62 and the numbers of females are 38. This implies the presence of more number of males with compare to females in public sector banks. This is may be because of the presence of more number of public sector bank branches in remote areas.

Conclusion:

This study was conducted in three PSBs in India endeavors including a test of 100 members to whom organized survey was managed. Results reveal that HRM hones lead to work fulfillment. It implies that viable HRM hones contribute to work fulfillment. Be that as it may, for PSB in India three HRM measurements decide the employee satisfaction. Encourage Representative Fulfillment will offer assistance to decrease the steady loss and fulfill client. This study found that HRM too lead to organizational commitment.

This result tends bolster to the taking after past discoveries. This means that successful HRM tend to form representatives express commitment to their organization.

Two HRM measurements decide the organizational commitment of Indian PSBs. Advance HRM make workers feel comfortable with their affiliation with the organization they work conjointly derive benefits whereas including within the organizational undertakings. Auxiliary condition show built by relapsing HRM, worker fulfillment and organizational commitment contains a solid fit with the information.

The result of the study uncovers that HRM leads to a better level of representative fulfillment and higher level of organization commitment. This think about distinguishes HRM affect altogether on representative satisfaction and organizational commitment. Encourage recognizes that Work fulfillment lead to organizational commitment and there's relationship among HRM practices, representative fulfillment and organizational commitment in Open Division Banks. Suggestions are given for bank directors to assess the part of HRM hones and its results; how HRM can influence them; and how HRM can provide viable comes about for the managing an account industry. Assist investigate can be conducted on these factors between two nations and other South East Asian countries and an endeavor may be made to compare private segment banks as fine.

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PERFORMANCE EVALUATION OF KOTAK MAHINDRA BANK IN THE PRESENCE OF NPA- NON-PERFORMING ASSETS

Mrs. Yasmin. A. Barodawala
Assistant Professor, Dr. Thakorbhai Patel Girl's Commerce College, Vadodara.
***Corresponding Author*- Mrs. Yasmin. A. Barodawala**
Email:yasminbarodawala@gamil.com
***DOI*-** 10.5281/zenodo.7071299

Abstract
The bank having the highest CASA ratio, Kotak Mahindra, is analyzed in this paper to determine whether it has stood to its rank performing efficiently or not. This has been done through evaluating the bank specific ratios in the presence of bank's massively affecting section- the NPA. The Statistical tool of correlation is employed over 8 years, from 2014-15 to 2021-22 to assess the relationship of NPA with the ratios like CAR, ROA, ROE, NIM, NPM and CASA. The conclusion derived from the analysis affirms that all the ratios have a remarkable association with the selected bank's NPA as expected.

Keywords: *NPA, CAR, ROA, ROE, NIM, NPM, CASA ratio.*

Introduction

The performance evaluation of bank is done selecting parameters of Capital size and Profitability. But in today's times, the rising levels of bad loans also have to be considered while framing condition of a bank. Therefore, even one of the factor of bad loans is included to verify its relation with the existing bank's performance indicators. Net NPA is taken into the study as it is a superior scale than Gross NPA about the financial status of the bank. Banks expect to have a lower ratio of NNPA. When the defaulting loans rise this ratio goes up.

Review of Literature

(Meenatkshi & Kritikaa, 2022) the financial health of Kotak Mahindra Bank has been assessed with SWOT analysis for 2017-2021. Kotak Mahindra Bank's performance remained outstanding during the study period as the deposits and giving of Loans showed upward trend. (Prasanth, Nivetha, Ramapriya, & Sudhamathi, 2020) Stresses that out of the many variables that are significant with the NPA, CAR, ROE and ratio of loan to deposit showed a strong association with NPL for the banks under study. Whereas, cost effectiveness, bank size and loan growth displayed an insignificant effect on NPA. (Chaibi, 2016) The handling of loan portfolio by Tunisian Banks and the quality of loans is assessed taking into consideration the bank specific indicators. The overall conclusion drawn is that cost efficiency and profitability are common for credit risk and bank size and capitalization influences the loan deterioration in banks. (Arora, Rohatg, & Sharma, 2015) The Non-Performing Assets of Kotak Mahindra Bank and Axis bank is analyzed to observe its growth and direction. The relation of NPA with profit as well as with loan disbursed is taken up for study. The conclusions drawn affirms that both these ratios are high in Kotak Mahindra bank as compared to Axis bank.

Objective:

To find out the relationship between NPA with CAR, ROA, ROE, NIM, NPM, CASA ratio.

Hypotheses:

H1= There is a significant association of NPA with CAR, ROA, ROE, NIM, NPM, CASA ratio.

Research Methodology:

For the purpose of analysis Pearson's Coefficient correlation test is applied.

The implications of each ratios and the expected outcome of testing the hypothesis of finding the relationship of NPA with all other selected performance related ratio is discussed as follows:

Summary of variables and expected relationship with dependent variable (DV) -Net NPA.

DV	Independent variables	Notation	Details/Meaning	Expected Effect
NNPA	Capital Adequacy Ratio	CAR	It reflects the bank's ability to meet its obligations. However, the rising NPAs creates a need to flush in more capital to absorb the amount locked in the non-performing assets. Usually CAR goes up with the rising levels of NPA.	Positive
	Return on Assets	ROA	It displays the bank's efficiency in generating revenue. The negative impact of rising NPA lowers the profitability of the banks which is reflected in lower ROA ratio.	Negative
	Return on Equity	ROE	This ratio suggests the ability of the management to generate income from the sources like equity. The funds so raised through equity is used to extend loans but when these loans do not turn up, the Return on Equity falls. Hence lower ROE signifies high levels of NPA.	Negative
	Net Interest Margin	NIM	The bank gives interest on deposits and earns interest on loans given. NIM is the gap between these two interest source. Usually high ratio of NPA gives rise to low NIM.	Negative
	Net Profit Margin	NPM	The existence of NPA directly affects the profits as it increases the operating cost and provisions are made from profits	Negative
	Current Account Saving Account ratio	CASA	It shows how much of the money with bank comes from current and savings account. A	Positive

			higher CASA ratio is measurement of the financial health of the bank. It is observed that when NPA rises the need for more inflow is fund arises, as the banks have to keep their credit activity going. Hence this ratio tends to go up with the rising quantum of bad loans.	

Data Collection and Period of Study:

Secondary data is collected from annual report of Kotak Mahindra Bank. Money control and RBI website. Period of study is 8 years (2014-15 to 2021-22).

Sample selection:

The bank having the highest CASA ratio as on 31st July 2022 amongst all the banks in the banking industry is selected for the study which Kotak Mahindra Bank.

Analysis of Data:

Table no1: Ratios of Kotak Mahindra Bank for 2014-15 to 2021-22

YEARS	NNPA	CAR	ROA	ROE	NIM	NPM	CASA
2014-15	0.64	17.00	1.76	13.19	3.98	19.19	36.35
2015-16	1.21	16.00	1.08	8.72	3.58	12.75	38.06
2016-17	0.71	17.00	1.58	12.35	3.78	19.27	43.99
2017-18	0.75	18.00	1.54	10.89	3.59	20.68	50.75
2018-19	0.98	17.00	1.55	11.47	3.60	20.32	52.49
2019-20	1.26	18.00	1.65	12.25	3.74	22.08	56.16
2020-21	1.06	22.26	1.81	11.01	4.00	25.94	60.44
2021-22	0.92	22.69	1.99	11.9	3.91	31.7	60.68
Pearson Correlation ('r')	1	0.89	-0.329	-0.538	-0.262	-0.060	0.212
Sig.(2-tailed)		0.835	0.427	0.169	0.530	0.888	0.614

Source: Annual Report of Kotak Mahindra Bank and Author's Computation

Findings:

1. Association of NNPA with CAR: it is found that, there is strong positive correlation between the bank's Net NPA and Capital Adequacy Ratio, r=.89, n=8 however the relationship was not significant (p=.835)
2. Association of NNPA with ROA: there is a weak negative correlation between ROA and NNPA, r=-.329, n=8, however the relationship was not significant (p=0.427)
3. Association of NNPA with ROE: there is a moderate negative correlation between ROE and NNPA, r=-.538, n=8, however the relationship was not significant (p=0.169)
4. Association of NNPA with NIM: there is a weak negative or no correlation between ROA and NIM, r=-.262, n=8, however the relationship was not significant (p= 0.530)
5. Association of NNPA with NPM: there is a weak negative correlation between NNPA and NPM, r= -.060, n=8, however the relationship was not significant (p=0.888)
6. Association of NNPA with CASA: there is a weak positive correlation between NNPA and NPM, r= .341, n=8, however the relationship was not significant (p=0.408)

Conclusion:

When comparing six different ratios with the Net NPA ratio of Kotak Mahindra Bank during the period 2014-15 to 2021-22, it is concluded that only CAR and CASA has shown positive relationship with the NNPA but ROE, ROE, NIM and NPM all show negative correlation with the bank's Net NPA Ratio. Summation of the study is an indication towards the increasing effects of NPA on all the working of the bank. If these bad loans are not put under control they would become the cause of bank's unhealthy state.

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SUSTAINABLE DEVELOPMENT AND INSURANCE COMPANIES: LITERATURE REVIEW

Mohammed A. Alshadadi[1], Mohammed A. Alfakih,[2] P. V. Deshmukh[3]
[1,2,3] Dept. of Economics, Dr. Babasaheb Ambedekar Marathwada University, Aurangabad, India.
***Corresponding Author*- Mohammed A. Alshadadi**
E-mail: alshadadi588@gmail.com
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Abstract
The objective of this paper is to review the literature on the relationship between insurance companies and sustainable development, according to the ESG approach discussed in developed and developing countries. Insurance companies face many opportunities and threats related to the concept of sustainability, such as climate change and environmental pollution, which is the problem most affecting the insurance industry, especially the life insurance sector. The paper concluded the readiness of insurance companies to provide sustainable insurance products in the future through their commitment to environmental and social standards, while there are some difficulties with respect to adhering to the principles of governance because the majority of insurance companies are small and medium-sized. Previous studies have also emphasized the close relationship between the insurance industry and sustainability factors, as they are affected by each other in an integrative relationship that requires integrating ESG factors into insurance companies' business strategies.

Keywords: *Sustainability, Insurance Companies, Environmental, Social, Governance.*

Introduction

ESG stands for Environmental, Social, and Governance Practices, which are now of importance to investors, scholars, and businesspeople. A set of standards for evaluating the sustainability and moral impact of investments are included in this idea. ESG stands for sustainability considerations that investors and stakeholders must make when deciding which investments to make (Manninena & Huiskonen, 2022). The idea of responsible investment, also known as green investment, socially responsible investment, or values-based investment, and the three ESG criteria are closely related. In order to achieve sustainable development, many financial institutions, including insurance companies, mutual funds, and pension funds, establish a long-term investment strategy that is appropriate for the nature of their long-term due responsibilities. Therefore, in order to attain sustainability and foster new growth opportunities, many businesses are eager to include ESG principles into their strategy (Li et.al. 2022). It is difficult to classify ESG standards accurately, so the Institute of Chartered Financial Analysts (CFA) has identified them in three groups, first: environmental factors, including climate change, hazardous waste, nuclear energy, carbon emissions, air and water pollution, biodiversity, deforestation, water scarcity, and animal welfare. Second: social concerns, including diversity, human rights such as child labor, consumer protection, data protection and privacy, notorious stocks (alcohol, tobacco, gambling, weapons). Third: Governance expresses the rights and responsibilities of the board of directors and stakeholders, and includes management structure, employee relations, executive compensation, corruption and bribe, political contributions, and the structure of the audit committee (Al-Kubaisi & Nobanee, 2022). In this report, we review

some literature that discusses the extent to which the insurance sector understands ESG concepts within its operations and to identify the trends of insurance companies towards providing sustainable insurance products in accordance with the principles of ESG. As the insurance sector is one of the financial sectors that are carefully regulated and have long-term resources commensurate with long-term profitable investments.

Literature Review

Al-Kubaisi & Nobanee (2022).

The concept of sustainability presents a variety of opportunities and risks for the insurance industry. The purpose of this study is to examine how sustainability affects insurance company performance. As investors, especially in the life insurance industry, we strive to take on long-term risks that are proportionate to our long-term resources. ESG policies can help insurance firms attain stability, minimise ESG risks, and increase their long-term profitability. The findings indicated that while governance has no bearing on the performance of insurance companies, there is a favourable association between insurance risks and sustainability practises because of the environmental and social aspects. In order to ensure chances to generate more sustainable investment returns, the study advises expanding environmental knowledge among insurance businesses and incorporating environmental and social aspects into customer service.

Abdulwahab et al., (2022).

The study examined the factors that affect business sustainability in the insurance sector using a questionnaire that included 116 individuals working in the Malaysian insurance sector. The results concluded that process and product innovation have a significant impact on business sustainability. Strategic orientation also helps improve the relationship between business sustainability and product innovations.

Surminski et al., (2022).

Using a survey of 70 experts, the study aimed to know the role of sustainable insurance in managing climate risks in Africa. The study confirmed that there is a dynamic interaction between insurance companies and governments. The role of insurance companies in motivating governments towards proactive management of climate risks is highlighted by providing information on climate risks associated with insurance.

Pfeifer & Langen (2021).

Insurance premiums must be invested in secure locations due to how crucial insurance is in protecting people and businesses from significant losses. Many new, rising hazards, such as climate change, which has a substantial impact on the life insurance industry, are being faced by small and medium-sized insurance companies. In particular, it highlights how these strategies are supported by strong legal orientations in Europe. This study discusses appropriate strategies to deal with emerging risks related to sustainability other than climate change, such as poverty, repression, migration, and the sustainable development goals set by the United Nations, which must be attained by European insurance companies. Through the direct sponsorship of environmentally and climatically friendly projects, insurance companies can concentrate on secure investments (green assets).

These initiatives provide cutting-edge solutions known as "green insurance," which helps to safeguard the environment and achieve sustainability. These tactics include substituting worn-out home appliances with energy-saving models, limiting the use of chemical fertilisers in agriculture, using car liability insurance products with premiums based on individual driving habits, investing in alternative energy sources, and encouraging employees to participate in healthy sports activities. The survey found that small and medium-sized businesses are eager to adhere to all ESG legal requirements and help promote ESG principles, despite the legislation requiring insurance companies with more than 500 employees to comply with and report ESG principles. As a result, future small and medium-sized insurance companies will be able to achieve the UN's sustainable development goals.

Mittal et al., (2021).

The study sought to understand the effects of ESG factors and climate risks in particular on the insurance industry as well as how insurance companies handle climatic changes. The world's most complicated problem is climate change, thus insurance companies work to provide environment-friendly services by offering green products, encouraging socially conscious investing, and incorporating ESG priorities into their daily operations. Managing climate change risks has become one of the most crucial projects for insurance businesses because they reflect long-term effects that affect both sides of the assets and liabilities in the balance sheet of insurance firms. By securing the effects of weather accidents on life and decreasing the impact of climate change by using data analysis and technology to analyse conditions, insurance firms have helped to achieve climate resilience and mitigate its risks. In 2018, 83% of insurance businesses assessed ESG in their operations, up from 32% in 2017, according to the report.

The analysis demonstrated that the COVID-19 issue has had a major impact on mortality trends, health insurance claims, and property damage claims resulting from floods, fires, and pollution. Without considering the other ESG factors, the study found that climate risks have a significant impact on the insurance business, but that doing so can eventually cost money. The report makes recommendations, including the necessity of increasing public knowledge of ESG risks and the necessity of having insurance firms prioritise the effects of natural catastrophes.

Khovrak, (2020).

Using a comparative examination of data from 156 insurance businesses in 26 countries between 2019 and 2020, the study sought to determine the ability of insurance companies to achieve sustainable development and comply with ESG risks. The study also attempted to assess 16 insurance companies' performance using the ESG methodology. The findings demonstrated a significant correlation between insurance company performance and the risks of sustainable development related to ESG. In light of this, insurance businesses were split into three risk categories. 24 firms have low ESG risk, 111 companies have medium risk, and 21 companies have high risk. The study also identified three components of the right ESG approach to business management for insurance businesses.

The environment component entails encouraging clients to adopt business models and switch to low-carbon operations, effectively communicating with investors about implementing climate strategies, investing in renewable energy sources and energy efficiency, following the guidelines of green building, and properly disposing of waste. The social component includes funding for research and innovation that raises public awareness of social risks, charitable endeavours that align with community priorities, the establishment of volunteer programmes, education, the maintenance of employee health and safety, and the encouragement of diversity and cooperation. The governance component includes implementing the approach in the company's strategy, providing data to classifiers and global databases, establishing committees on sustainable development, supporting research on identifying risks, complying with international standards for sustainable development and social responsibility, complying with internal standards, supporting a company culture that depends on the ESG approach**.**

Maftuchah et.al (2020).

Due to its role in fostering a more stable environment for businesses and industries, ESG practises have grown in importance in both developed and developing nations. Using information from 44 Indonesian insurance businesses, this study aimed to assess how well insurance companies used the ESG strategy to foster a stable environment that aids in achieving sustainability. According to the study's findings, an insurance company's performance and willingness to offer sustainable insurance

products in the future are positively impacted by its knowledge of ESG principles, the degree to which insurance products are currently developed, and its understanding of sustainable financing principles. According to the report, the majority of Indonesian insurance firms are prepared to adopt sustainable insurance through the development of their organisational structures, the identification of suitable working practises, and staff capacity building initiatives. According to the survey, insurance against harm brought on by emissions compounds and insurance against environmentally friendly damages are the most ecologically friendly insurance products that insurance firms try to offer.

Pagano et al., (2018).

The study aimed to review the literature that dealt with the methods provided by insurance companies in order to develop acceptable forecast models for managing climate risks and natural disasters. The paper concluded that there is a significant link between insurance companies and the necessary response to natural hazards. This is done through the development of a set of tools in the field of insurance and reinsurance to manage environmental risks.

Kalkavan, (2015).

The study sought to identify sustainable leadership practices in the Turkish insurance sector using a questionnaire that includes 70 managers in the insurance sector. The study showed that sustainable leadership skills among managers in the Turkish insurance sector are below average, and need to be improved.

Discussion

The previous articles describe the integrative relationship between the insurance sector and sustainable development according to the ESG approach, showing their mutual influence. Due to the specific considerations received by the insurance sector as one of the highly regulated financial sectors, the previous articles converge at the point where they emphasise the importance of the insurance sector's positive contribution in reaching ESG sustainability aspects. Looking at insurance businesses as a sector capable of absorbing business risks and their capacity to absorb long-term investments that are commensurate with the nature of their financial resources are two of these concerns. The insurance industry, on the other hand, is significantly impacted by ESG sustainability issues because of its connection to novel and developing risks like climate change, environmental degradation, and expanding societal concerns. Because ignoring them could result in significant long-term losses for insurance firms, it is important to combat and restrict these risks. Some key ideas from the earlier literature are reiterated here, including how insurance businesses can use ESG variables to boost long-term profitability and improve performance. Also, the majority of current insurance companies have a good level of understanding of ESG factors and are ready to offer sustainable insurance in the future**.** One of the effective ways to achieve green agricultural development is to implement the sustainable development strategy and to improve the productivity of green agricultural factors (Fang et.al. 2021)

Conclusion

In accordance with the ESG approach that is most frequently discussed in both developed and developing nations, the report analysed a summary of numerous studies on the relationship between insurance businesses and sustainable development. The ability to accomplish sustainable development and make socially conscious investments in the global business environment is tied to the idea of ESG. The idea of sustainability presents insurance firms with both opportunities and risks, including climate change and environmental degradation, which is the issue that the insurance industry, particularly the life insurance sector, is most affected by. Therefore, the interest of insurance companies in achieving sustainability increased by increasing their level of understanding of ESG principles and their contribution to

spreading awareness of the importance of ESG risks.

The mission to implement and disseminate ESG principles has become one of the current insurance companies' initiatives to provide sustainable insurance products. Studies show that insurance companies are prepared to offer sustainable insurance products in the future due to their adherence to social and environmental standards, but there are some challenges with respect to upholding the principles of governance because the majority of insurance companies are small and medium-sized businesses and their organisational structures do not permit the incorporation of governance principles into their work strategy. Finally, as one of them is impacted by the other in an integrative way that necessitates integrating ESG issues into the insurance companies' business strategy, this paper highlighted the close relationship between the insurance industry and sustainability factors.

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HYDROGEN AS AN ALTERNATIVE RENEWABLE ENERGY PERSPECTIVE: A CONCISE REVIEW

Lokesh Baloat[1], Sumitra Meena[2]
[1]Assistant Professor, Department of Chemistry, University of Rajasthan, Jaipur-302004, Rajasthan, India
[2]Assistant professor, Department of English, Government College, Bassi, Jaipur-303301, Rajasthan
***Corresponding Author*- Lokesh Baloat**
E-mail: lokeshbaloat@gmail.com
DOI- 10.5281/zenodo.7057031

Abstract
Our fossil fuel-dependent economy can transition to a hydrogen economy using hydrogen as an energy carrier, which might then supply an emissions-free source of transportation fuel. The two primary research approaches were independent research and literature reviews. Due to the distinctive low density of hydrogen, storage and transportation of hydrogen are topics of significant investigation. The issue of anthropogenically induced climate change and its unbreakable connection to the current and future energy requirements of our global society are possibly the greatest threat to our planet. With its ability to help with issues of environmental emissions, sustainability, and energy security, hydrogen is now widely recognised as one important component of a potential energy solution for the twenty-first century. With minimal to no negative environmental effects both locally and internationally, hydrogen has the potential to be used as a source of energy for transportation, distributed heat and power generation, and energy storage systems.

Keywords: *Hydrogen, Energy, Production, Storage, Resources.*

Introduction

Hydrogen is a diatomic gas with the chemical formula H_2 that is harmless, non-metallic, tasteless, colourless, and highly flammable at standard temperature and pressure. An appealing alternative fuel is hydrogen. However, hydrogen is not a primary energy source like coal, gas, or oil. As a secondary "energy carrier," it is more like electricity in that it must first be created using energy from another source before being delivered to a location where its latent chemical energy can be fully realised. Diverse resources, both renewable (hydro, wind, wave, sun, biomass, and geothermal), can be used to produce hydrogen (coal, natural gas and nuclear). The only by product at the time of use is water, and it can be stored as a fuel and used in distributed heat and power generation systems, fuel cells, internal combustion engines, and turbines [Crabtree at el. 2017].

Due to the quick development of fuel cell technology over the past ten years, the significance of hydrogen as a possible energy carrier has substantially increased. Fuel cells that run on hydrogen or fuels rich in hydrogen have the potential to play a significant role in accelerating the transition to a sustainable energy system with low carbon dioxide emissions in the future. The eventual establishment of a hydrogen-based economy has the potential to bring about significant economic and environmental gains as well as increased energy supply security. The potential to significantly lower carbon emissions globally is perhaps the strongest argument in favour of a sustainable hydrogen economy [Dorian at el. 2012; Ewan 2005]. However, there are considerable scientific, technological, and

socioeconomic challenges to the adoption of hydrogen as the clean energy in the transition from a carbon-based (fossil fuel) energy system to a hydrogen-based economy. But any switch from a carbon-based (fossil fuel) to a hydrogen-based economy is fraught with formidable scientific, technological, and social obstacles. This succinct paper seeks to explain the reasons behind the rising demand for hydrogen energy around the world and looks at some of the key concerns affecting how hydrogen will evolve as an energy source in the future.

Hydrogen production and distribution

The third most common chemical element in the crust of the Earth is hydrogen, but it is almost always found in chemical combinations with other elements. It must consequently be created using energy, like as heat or electricity, from other sources that include hydrogen.

At present, hydrogen is produced in large quantities from fossil fuels by Steam Reforming of natural gas and partial oxidation of coal or heavy hydrocarbons. These processes are now the least expensive and most well-established for the large-scale production of hydrogen and can benefit from economies of scale. There are two steps to the entire process. The hydrocarbon raw material is combined with steam and supplied into a tubular catalytic reactor in the first stage. With less CO_2 present, syngas (a combination of H_2 and CO gas) is created during this process. When a portion of the raw material (heated gas) inside the reactor is burned, oxygen or air is added to raise the reaction temperature as needed. The second stage involves feeding the CO catalytic converter with the cooled product gas, where carbon monoxide is largely transformed by steam into carbon dioxide and hydrogen. (As shown in Figure 1)

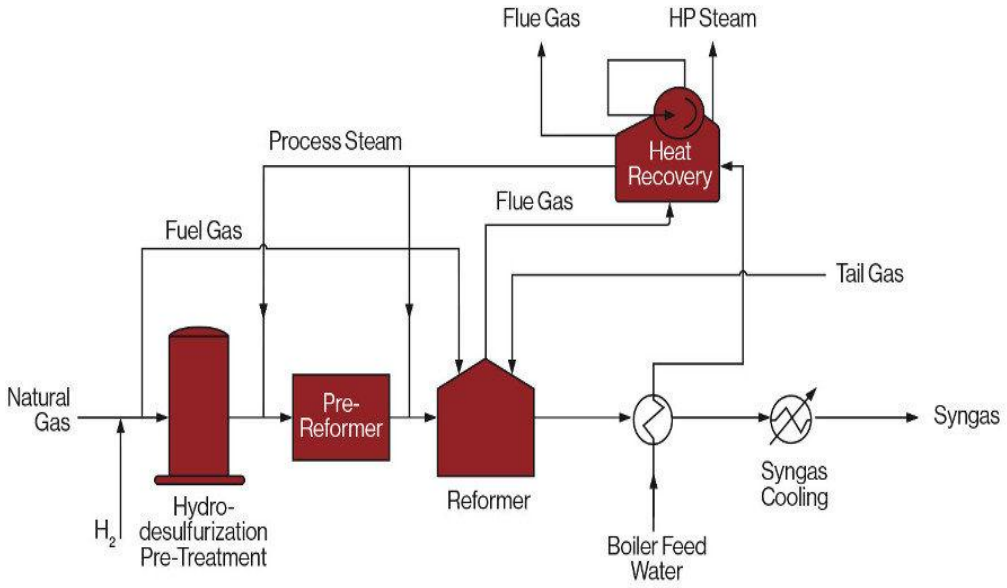

Figure.1. Schematic diagram of steam reforming process

However, it is evident that we must transition to a situation where hydrogen is produced from non-fossil resources, chief among them being water, in order to reap the benefits of a truly sustainable hydrogen energy system [Sherif et al. 2005; Penner 2018]. Water can be divided into hydrogen and oxygen through a number of methods, including photo-electrolysis, high-temperature decomposition, electrolysis, and photo-biological water splitting. Although the commercial electrolysis of water produces hydrogen with a 75% efficiency, the price of hydrogen is now far greater than that of hydrogen derived from fossil fuels [Dutton 2002; Ewan & Allen 2005; International Energy Agency 2006].

If one could actually show that such a technique could be employed to produce the necessary enormous volumes of hydrogen, the biological reformation of biomass utilising microorganisms and fermentation is plainly appealing. This process emits carbon dioxide, but additional biomass can grow to recycle it. The photocatalytic technique, which uses solar energy to split water straight into its component parts, hydrogen and oxygen, without the usage of power, will be the holy grail of hydrogen production. In order to divide water from our seas, this optimal manufacturing route therefore harnesses "solar hydrogen," the power of the Sun. According to a recent US Department of Energy (DoE) research, solar photodecomposition of water is most likely the only significant, long-term solution to a CO_2-free route for the mass generation of the enormous volumes of H2 required for the development of the hydrogen economy [US Department of Energy, Office of Science 2003]. The development of novel materials, emerging physical phenomena, and unique methods are required for low-cost and effective solar energy production of hydrogen.

Hydrogen storage

Many people believe that one of the most important and technically difficult obstacles to the widespread use of hydrogen as a reliable energy carrier is the availability of viable hydrogen storage (Crabtree et al. 2017; Harris et al. 2004). In terms of energy per unit of weight, hydrogen is the most energetic substance. Unfortunately, it also has a very low energy density per unit volume because it is the periodic table's lightest chemical element. Two different kinds of hydrogen storage systems—one for stationary uses and the other for transportation—will be necessary for the hydrogen economy. Both have unique demands and limitations. In the coming hydrogen economy, the transportation industry is anticipated to be the first large-scale user of hydrogen. In comparison to stationary uses, hydrogen storage requirements for transportation applications are much stricter.

Currently, the two main types of hydrogen storage are cryogenically chilled (liquefied) fluid hydrogen and high-pressure gas containers. Traditional steel cylinders have a gravimetric density of about 1 wt% and can store hydrogen at 200 bar. With a gravimetric hydrogen density of up to 10%, recently created ultra-high density composite cylinders composed of high-grade carbon fibre can store hydrogen at pressures in the range of 700–1000 bar.

The family of ionic-covalent hydrides generated by light elements including lithium, boron, sodium, magnesium, and aluminium are the most promising hydrogen storage materials. With the exception of $NaAlH_4$, which can act as a reversible store with the right catalysts, high-temperature solid-phase transitions are often involved in the hydrogen absorption or desorption in these materials. Recently, fresh, promising hydrogen storage materials have been ffound [Chater et al. 2006], and new chemical pathways have been devised for triggering hydrogen uptake/release under benign conditions [Johnson 2005]. To satisfy the needs for hydrogen storage, however, much more fundamental study is needed to comprehend the physical and chemical processes driving hydrogen storage and release as well as to enhance the features of hydrogen absorption and desorption in this class of materials.

Hydrogen utilization

One of the most alluring paths to a sustainable energy future is the synergistic complementarity of hydrogen and electricity, and fuel cells offer, arguably, the most effective means of turning hydrogen and other hydrogen-bearing fuels into power. Similar to a battery that is constantly being recharged, a fuel cell produces electricity through the electrochemical reaction of hydrogen and oxygen from the air.

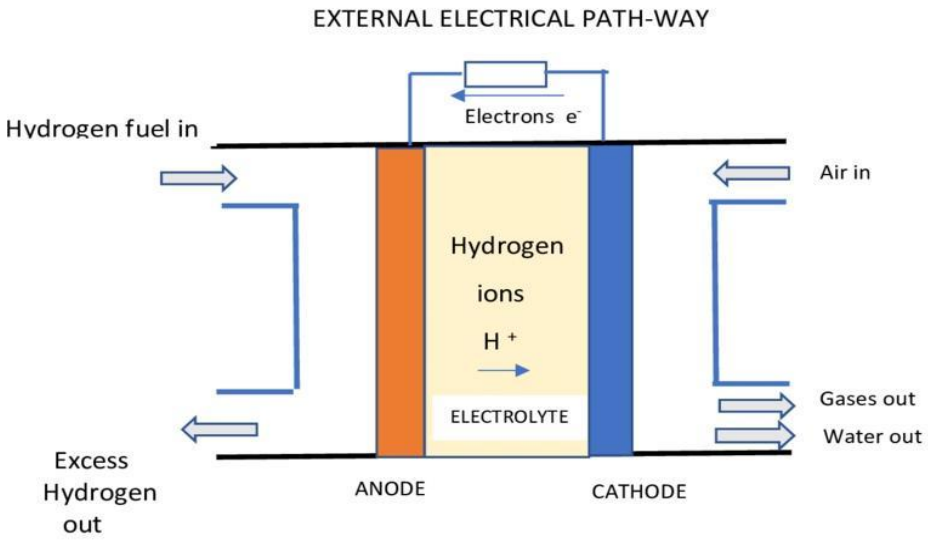

Figure.2. Schematic diagram of hydrogen fuel cell

In the future, fuel cells could replace more harmful internal combustion engines in stationary and mobile distributed energy applications. Because hydrogen fuel cells operate in the 60 to 120°C temperature range, which is significantly lower than the typical operating temperature of internal combustion engines, they generate just water and almost no other pollutants, including nitrogen oxides [Winter & Brodd 2004]. If hydrogen fuel could be obtained from renewable sources, hydrogen-powered fuel cell vehicles might theoretically provide a path to actual (i.e., whole life cycle) zero emissions.

There is a very real possibility that much of the existing energy systems will be replaced by fuel cells. They provide a very alluring technological development path that will result in large efficiency improvements over the commercially accessible hydrocarbon fuels of today and high efficiency when hydrogen is used as an alternative energy source in the future. However, a number of significant technological obstacles still need to be cleared before fuel cells can successfully compete with traditional energy conversion technologies. Cost reduction and better component and material durability are the main scientific and technical problems facing fuel cells.

Conclusions

Hydrogen has a remarkable potential to play a significant role in accelerating the shift from our current carbon-based global energy economy to one that is clean, renewable, and sustainable. In order to address growing concerns about carbon emissions and climate change, as well as the future availability and security of energy supply, the development of hydrogen generation, storage, and usage technologies is expected to play a key role. In many nations, hydrogen and fuel cells are regarded as significant alternative energy sources and essential technologies for upcoming sustainable energy systems in the stationary power, transportation, industrial, and residential sectors. The problems of developing a new energy economy, one that is not dependent on carbon fuels, are tremendous, however, and call for significant technology advancements, as well as scientific breakthroughs.

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GEOGRAPHICAL STUDY OF ORANGE CULTIVATION IN VIDARBHA -2021

Dr. Vijay Purushottam Gorde
Assistant Professor, Dept. of Geography, Mahatma Gandhi Arts, Science & Late N.P. Commerce College, Armori Dist. Gadchiroli
***Corresponding Author*- Dr. Vijay Purushottam Gorde**
Email- vijaygorde11@gmail.com
DOI- 10.5281/zenodo.7057037

Abstract: -

Vidarbha is the north-eastern region of the state of Maharashtra. Situated in the central part of India. The Vidarbha region is known for its growing major crop of oranges and cotton. Mandarin orange (Citrus reticulata) is most common among citrus fruits grown in India, as well as Vidarbha. It occupies nearly 40% of the total area under citrus cultivation in India. Nagpur mandarin is one of the best mandarins in the world, as well as Vidarbha. Production of this orange crop in the central and western parts of India is increasing per year. Amravati and Nagpur are the major orange cultivators in Vidarbha. But Changing weather conditions in Vidarbha affected orange cultivation in this region.

Keywords: - *Orange Cultivation, Vidarbha*

Introduction: -

Among the various regions of Maharashtra, the Vidarbha region is located in the eastern part of the state of Maharashtra. Vidarbha includes a total of 11 districts of Maharashtra. Vidarbha is divided into two administrative divisions namely East Vidarbha and West Vidarbha. East Vidarbha has a total of six districts including Nagpur, Wardha, Bhandara, Gondia, Chandrapur, Gadchiroli, etc.

West Vidarbha consists of five districts namely Amravati, Yavatmal, Akola, Washim and Buldhana, etc. Various crops are grown in different districts of Vidarbha where black cotton-rich soil is found in West Vidarbha while rice cultivation is important in East Vidarbha.

Important crops grown in Vidarbha are cotton, tur, soybean, rice, sorghum, wheat, and orange. Nagpur in East Vidarbha and Amravati District in West Vidarbha are the main orange-producing districts in Vidarbha. Orange from Vidarbha is popularly known as 'Nagpuri Orange'. The Orange region of Vidarbha is mainly found in the lower region of Satpura foothills. Nagpuri orange from Vidarbha is known as mandarin. Which is famous for its attractive sweet and sour taste. Orange is a cash crop and horticultural crop in Vidarbha and farmers get maximum financial benefit from it. Oranges from Vidarbha are famous not only in India but also in the world.

Which 30 inches to 40 inches of rainfall along with 15 degrees to 38-degree centigrade temperature can grow oranges. Since orange is a horticultural crop, it requires a large amount of irrigation. The orange crop is harvested twice a year which is known as Ambia blooming (Bahar) and Mrig blooming (Bahar).

Objectives of the Study: -

1. To make a comparative study of the area under orange crop in Vidarbha.
2. To identify the main orange-producing districts of East Vidarbha and West Vidarbha.
3. To study the effect of irrigation and groundwater status on orange cultivation.
4. To discuss the status of the industry on orange crops considering the economic importance of orange farming.

Area of study: -

Vidarbha region is located in the center of India and on the East side of

Maharashtra. Vidarbha is situated between 19⁰ 05' to 21' 47' North latitude and 75⁰ 59' to 79⁰ 11' East latitude. The area covered by Vidarbha is 97321 square kilometers and it covers 31.6 % of percentage area of Maharashtra. Vidarbha region shares its boundary with the state of Chhattisgarh towards the east, Madhya Pradesh in the north, Telangana in the south, and Aurangabad and Nashik administrative division of Maharashtra state in the west. Vidarbha has been divided into Amravati and Nagpur administrative divisions of Maharashtra.

Amravati administrative division in the west side of Vidarbha region with five districts Buldhana, Akola, Washim, Yavatmal besides Amravati district. Nagpur administrative division is on the East side of Vidarbha with 6 districts Wardha, Bhandara, Gondia, Chandrapur, and Gadchiroli besides Nagpur district, Vidarbha represents 11 districts.

Study Methodology: -

In the present research article, the research data related to the subject while studying the geography of orange farming in Vidarbha is based on the secondary data source and it is taken from District Socio and Economic Survey - Districts in Vidarbha (2021). The bar graph is drawn based on the data from Vidarbha.

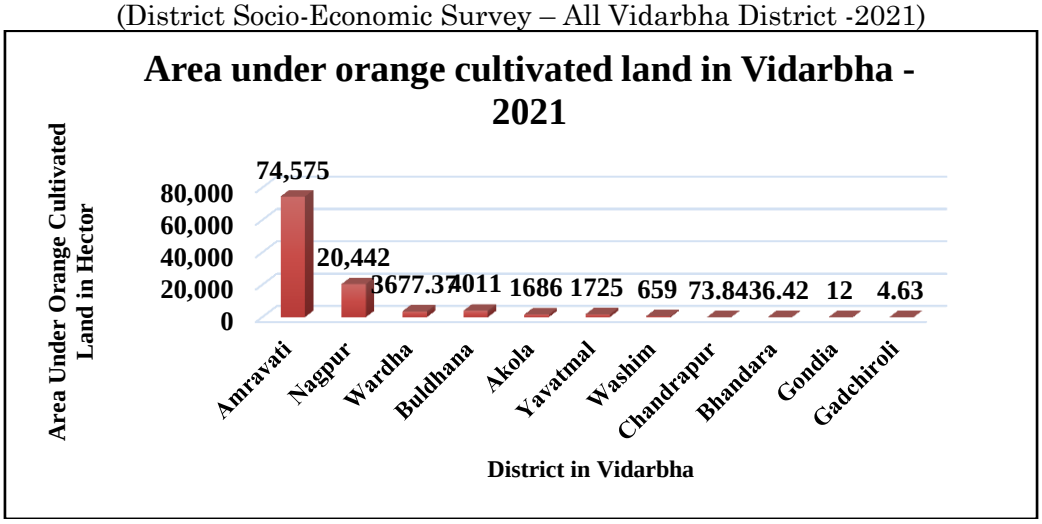
Status of Orange crop in Vidarbha: -

A study of total net cultivated area and area under orange crop in Vidarbha reveals that two orange growing districts are prominent in Vidarbha, namely Nagpur in East Vidarbha and Amravati in West Vidarbha. In the entire Vidarbha district, Amravati seems to have the largest area under orange cultivation followed by Nagpur, Wardha, Buldhana, Yavatmal, and Akola respectively.

Orange cultivation- 2021

Sr. No.	District	Total cultivated land (in Hector)	Orange cultivated land (in Hector)	Orange cultivated Land (%)	Irrigated land under Orange crop (Hector)
1.	Amravati	7,61,513	74,575	69.75 %	74,575
2.	Nagpur	5,40,107	20,442	19.12 %	20,316
3.	Wardha	389772.4	3677.37	3.42 %	3338.39
4.	Buldhana	750457	4011	3.75 %	4011
5.	Yavatmal	863707	1725	1.61 %	1725
6.	Akola	4,20,037	1686	1.57 %	1535
7.	Washim	407056	659	0.61 %	659
8.	Chandrapur	470834.21	73.84	0.06 %	58.63
9.	Bhandara	182249.17	36.42	0.03 %	31.90
10.	Gondia	167267	12	0.01 %	01
11.	Gadchiroli	205892.30	4.63	0.004 %	0.00
Total District		5158892.08	106,906.26	100 %	106250.92

(District Socio-Economic Survey – All Vidarbha District -2021)



According to the 2021 data, 20,442 hectares of farmland is under orange crop in Nagpur district while 74,575 hectares of farmland are under orange crop in Amravati district. Amravati district in Vidarbha has the highest total area of 69.75% covered by orange crops. And Amravati district is the first largest producer of oranges in Vidarbha. After that, Nagpur district occupies second place with 19.12% area. Warud taluka of Amravati district alone has more area (22492 Hector) than Nagpur district (20442 Hector) which is the second largest producer of oranges in Vidarbha.

Although oranges in Vidarbha are known as Nagpuri oranges, the area of Amaravati district is three times that of Nagpur district. Warud, Morshi, Chandurbazar, and Achalpur are important orange-producing talukas in the Amravati district while Katol, Narkhed, Kalmeshwar, and Savner are the main orange-producing talukas in the Nagpur district.

Orange being a horticultural crop requires irrigation. Due to the impact of irrigation, the groundwater level in Warud, Morshi, Achalpur, and Chandur Bazar of Amravati district and Narkhed, Katol, Kalmeshwar, and Savner talukas of Nagpur district is seen to have decreased to a large extent.

Conclusion: -

1. Amravati district appears to be the main orange-producing district in the whole of Vidarbha.
2. Warud taluka of Amravati district in the entire Vidarbha has the maximum area under net cultivation of the orange crop.
3. As the orange crop requires a large amount of irrigation, it is seen that the farmers have pumped the water from the ground by bore wells on a large scale. The effect of which is that the administration has banned borewells in the Amravati district.
4. The increasing heat is affecting the orange groves and the orange area seems to be shrinking.
5. Due to the day-by-day decreasing groundwater level in the orange growing areas, lack of irrigation, and lack of processing industries based on the orange crop, orange farmers in Vidarbha are seen committing suicide on a large scale.
6. The project started by the Amravati Food Grower Industrial Co-operative Society in 1958 closed in 1962 and NOGA was established in 1972 after which the orange juice processing industry started in the Amravati district and it also closed down.
7. It is necessary to set up an orange processing industry in the main orange-producing talukas of Amravati or Nagpur district to get the right price for the orange farmers.
8. In the orange-growing district of Vidarbha, there is a need to build large dams, and canals and provide large-scale subsidies for drip irrigation in various irrigation facilities. Along with this, it is also necessary to provide loans at low-interest rates to orange farmers.

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LASER TECHNOLOGY AND SUSTAINABLE DEVELOPMENT

Ms. Geetha Nair
Smt. C. H. M. College, Ulhasnagar, Thane Dist., Maharashtra
***Corresponding Author*- Ms. Geetha Nair**
Email id : ngeet@rediffmail.com
DOI- 10.5281/zenodo.7057047

Abstract
A century has passed after Einstein introduced us to the stimulating theory of radiation called LASER. The amazing properties of lasers make them unusual compared to the ordinary light. The properties of laser are so unique and hence have led to many exciting applications. Lasers have touched all the facets of our life through laser printers, textiles, storage devices, bar code scanners, laser surgery, LIDAR, etc. This paper is a detailed study of the laser technology and how lasers can help in sustainable development in many fields such as manufacturing, medical, space sciences, textiles etc.

Keywords: *Laser, stimulated emission, LIDAR, Additive Manufacturing*

Introduction

The acronym **LASER** stands for **L**ight **A**mplification by **S**timulated **E**mission of **R**adiation. The theory of stimulated emission given by Einstein has completed more than 50 years. Lasers has revolutionized half a century through the well known laser printers, laser surgery, compact disc players, bar code scanners etc., to name a few. The list of laser applications is endless.

History of Lasers

A laser is a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation. As the working of laser involves electromagnetic radiation, its origin dates back to the law of radiation given by Max Planck without which the idea of laser would not have been conceived. Einstein gave the mechanism of stimulated emission of electromagnetic radiation where an excited atom when stimulated by an incident photon will emit another photon having same wavelength and energy as that of the incident photon. This forms the basis for this incredible phenomenon of lasers.

What makes lasers different from ordinary light -Laser Properties

The amazing properties of lasers make them unusual compared to the ordinary light that are produced by the sun, lamp, light bulb, tube light etc. The properties of laser are so unique and hence have led to many exciting applications. They are

Monochromatic : If we observe the light emitted from a tube light, the white light consists of many frequencies corresponding to various colours. Laser light consists of only one colour i.e. single frequency. Hence the light produced is monochromatic.

Collimated : Ordinary light spreads out in different directions. Laser light travels almost along a straight line. Hence it produces an extremely focused light. It can be focused down to less than 0.001 inch in diameter.

Coherent : Ordinary light consists of light waves travelling with different frequencies and hence with different wavelengths. The laser consists of light waves of similar wavelengths travelling parallel to each other, hence they travel in phase, for reinforcement producing a strong beam.

So how do lasers produce this kind of unusual light – The Physics of Lasers

According to quantum theory, any atom in the ground state by ***absorption*** of a photon can go into the excited state. As this is an unstable state, this atom may spontaneously decay to the ground state by emitting a photon. This process is

called as ***spontaneous emission*** producing fluorescent light. Note that the energy of the absorbed photon should be equal to the difference in energy of the two states. The spontaneously emitted light will go in different direction, is out of phase and hence it will not be coherent in nature. Also for each photon that is absorbed, another photon is emitted. Hence this process of absorption and spontaneous emission of a photon cannot lead to amplification of light.

So how does amplification of light occur so as to produce lasers?

Stimulated emission [1] is essential to the operation of lasers. An incident photon can stimulate the excited atom to emit a photon and lower down to the ground state. The emitted photon will have same frequency, wavelength and energy as that of the incident photon. Note that the energy of the emitted photon will be equal to the difference in energy of the two states. Hence the basic principle of laser is that if an excited atom emits a photon then this photon will stimulate the other atoms to emit photons. These emitted photons in turn will stimulate more atoms to emit photons. This will produce a powerful radiation of photons which is monochromatic and coherent.

Also an atom need not necessarily de-excite to the ground state. It can lower down to an intermediate state called as metastable state (Figure 1). Under equilibrium conditions, the population of excited / metastable states is less than that of the lower energy states. However, the atoms in the metastable states can stay for a longer time. Hence it is possible to have large number of atoms in the metastable states compared to the lower energy states. This is called as *population inversion* which is a pre-requisite for amplification of light in lasers. The population inversion is achieving more number of atoms in the metastable / excited state compared to the number of atoms in the ground state.

Now an incident photon can stimulate the atom in the metastable state to de-excite to the lower energy state or the ground state by emitting a photon. Hence for one incident photon, two photons are emitted and hence results in the optical amplification. Thus there is a cascading effect of stimulated emission.

What is Laser made of - Components of a Laser

The essential components for designing a laser are (Figure 2):

Gain medium : The gain medium is which emits light when supplied with energy. The lasing medium can be a solid, a liquid or a gas.

Pumping or excitation mechanism : For amplification of light, the atoms will require energy which will be acquired by the pumping mechanism. This energy is supplied by passing electric current or by light incident of different wavelength. This creates population inversion.

Optical Resonator : The medium and the pumping mechanism are confined to a cavity called an optical resonator. The cavity has mirrors at both ends facing each other. The mirrors are provided so that light is reflected back into the medium itself.

How does Laser work

The medium inside the optical resonator, when excited by an energy source will emit photons. Initially most of the atoms of the medium are in the ground state. By absorption of the energy, the atoms are excited into the higher energy states. Since the atoms are unstable in the higher energy states, they will drop down to the ground state quickly. Hence the medium is chosen such that a metastable state is possible, so that the excited atoms remain there for more time before they decay to the ground state. Energy is supplied by the pumping system to produce population inversion. The pumping process helps in achieving more electrons in the metastable state compared to the ground state.

After achieving population inversion, some atoms will decay to ground state by spontaneously emitting photons. Further, these photons will stimulate the other atoms in the metastable state to return to the ground state. Thus they also emit photons which are of the same wavelength, phase and

direction as that of the stimulating photons.

The mirrors fixed at the two ends of the optical cavity will reflect the photons back and forth helping the cascading effect to continue i.e. the reflected photons stimulating more atoms to emit photons. This increases the strength of the light and leads to amplification of light. Hence the optical resonator maintains the gain output through optical feedback. The feedback mechanism helps in overcoming any losses. The light will be transmitted from the cavity which is the laser output.

Types of lasers

Depending upon the lasing medium that is used, the lasers can be classified as follows.

Solid state state lasers

They use solids as the lasing medium. The materials used are glass or crystals. The first solid state laser developed was the Ruby laser. Nd: YAG laser is another example which produces laser light commonly in the near-infrared region of the spectrum at 1064 nanometers (nm). The medium is optically pumped. Laser diodes are also used to pump the medium.

Liquid lasers

They use liquids as the medium. Light energy is used as the pumping source. A dye laser is an example of liquid laser. It produces laser light in the near ultraviolet (UV) to the near infrared (IR) region of the spectrum. The unique property of liquid dye lasers is that the output wavelength is tunable.

Gas lasers

The lasing medium is in the gaseous state. The medium is electrically pumped. Helium- Neon laser, CO_2 lasers are examples of gas lasers.

Helium-neon laser emits laser light in the visible portion of the spectrum. CO2 lasers emit energy in the far-infrared. The main advantage of gas lasers over solid state lasers is that they are less prone to damage by overheating so they can be run continuously.

Semiconductor lasers / Diode lasers

Semiconductor diode is used as the medium. Electrical energy is used as the pumping source. When a p-n junction is forward biased, electrons from n-side and holes from p-side will cross the junction and recombine. This recombination leads to release of a photon from the semiconductor such as Ga-As. This emitted photon will stimulate the other electrons and holes to recombine and emit photons. By choosing proper materials, desired wavelengths can be obtained. These lasers typically emit a red beam of light that has a wavelength between 630 nm and 680 nm.

Applications of Lasers

Lasers for Measurements

The property of high intensity and directionality of laser is used to measure the distance from an object. The laser beam is directed on a target, the light is reflected back from the target and detected by a laser system (Figure 3). The time required for the laser to travel one side i.e. between the target and the laser system, is multiplied by the velocity of light to determine the distance of the target. The *laser rangefinder* is based on this principle. These are light weight, handy and highly accurate compared to the conventional rangefinders. Nd:YAG laser or Carbondioxide lasers are mostly used.

Defence

Laser rangefinders are used in defence applications for detecting enemy army tanks etc. These are highly reliable and can be used under any weather conditions. Military rangefinders use powerful laser beams compared to the commercial rangefinders.

Landscaping and construction

Long range measurements are required in commercial landscaping such as garden landscaping, setting up of a parking lot etc. Laser rangefinders help in making quick and easy distance, height and clearance measurements. They help in finding distance between remote objects or the height or clearance of any obstruction. We can use them to accurately map locations. They are very useful when it comes to difficult terrains which are not accessible physically.

Gauging obstructions in the path

Airfield runways need to be checked regularly for them to be obstacle

free for easy air traffic flow. Using laser rangefinders long range measurements are easier and these inspections need not be done from the runways but anywhere far away from these runways. Hence these inspections have become easy and safe compared to the earlier methods.

Storage devices

A Compact Disc (CD) / Digital Versatile Disc (DVD) stores data in the form of binary numbers. An area on the disc is burned by a laser beam to produce a pit which represents the binary digit' 0'. If the surface is flat i.e. if it is not burnt, that represents a binary digit '1'. When the CD / DVD rotate, a laser beam from a diode laser will read the pits and the flat areas. The flat areas will reflect the laser beam and the pits will scatter it. This way, the laser reads the data as'0' and '1'. The reflected light from the flat areas is converted into electric current. When no light is reflected, in the case of a pit, no current will flow. A decoder will decode these binary data into a changing pattern of electric currents.

A Blu ray disc (BD) (Figure 4) works on the same principle as that of the DVD. Both are of the same size but BD stores more data than DVD. The data density is increased because BD uses blue laser light of shorter wavelength of 405nm compared to the red laser used by DVD having wavelength of 650nm. Shorter the wavelength, the beam can be focused to a smaller diameter compared to that of a DVD. Hence the pits on the BD, at which the laser is focused to read the data, is half the size that of a pit on a DVD. As the area of pits decrease, more space is available to store data on the BD. DVD can store 4.7 GB and BD can store about 25 GB.

Laser Cutting

Laser beams can be concentrated at a spot on the material to produce heat energy. This, in turn, will vaporize the material and cuts it. As lasers are highly focused, a very small part of the material is heated and melted (Figure 5). Laser cutting machines use Carbon dioxide or Nd: YAG lasers. [5] Lasers can be used to cut any material such as cloth, wood, metal, leather etc (Figure 6). Laser cutting is non-contactless and better and faster than manual cutting which involves changing of cutting tools like blades. It gives better cutting quality because of high degree of precision. It minimizes distortion and damage of the material.

Lasers for atmospheric study

Understanding the earth's atmosphere helps us in solving growing issues of the environment such as greenhouse effect, ozone depletion, melting of glaciers etc. **LI**ght **D**etection and **R**anging (LIDAR) make high resolution measurements using lasers to understand the earth's atmosphere. The basic principle of LIDAR is that it emits laser light into the earth's atmosphere which is reflected back to the LIDAR by the particles in the atmosphere. Some of the light is lost while it is scattered back. The backscattered light detected is used to study the distribution of atmospheric constituents such as aerosols, water vapour, gases, the vertical structure of the clouds etc. A laser can measure objects of same size or larger than its wavelength. A LIDAR system can be ground based or airborne. [7]

Differential Absorption Lidar (DIAL) uses laser light of two wavelengths. The shorter wavelength of the two, can measure size of smaller particles compared to the longer wavelength. Hence both wavelengths will measure different properties of the atmosphere. Nd: YAG lasers or semiconductor lasers are used in DIAL. It detects particular atmospheric components such as water vapor by measuring the wavelength-shifted return from selected molecules. Space borne LIDAR was launched by NASA to study earth's atmosphere from the space.

Laser technology for sustainable development

Laser 3D printing

3-D printing, as also called as **Additive Manufacturing (AM)** involves successively adding layers of a material using computers to form a 3-D object. First a 3-D model is created using software, sliced into thousands of layers and then fed to 3-D printer to be printed. Then the object is printed layer by layer.

Selective Laser Sintering (SLS)

uses the method of melting or softening the material to produce layers. SLS uses high power lasers to selectively fuse the powdered form of materials such as plastic, metal, ceramic etc. The laser traces pattern of a 3-D model on a bed of powder. After one layer is formed, the bed is lowered and another layer is built on it. The bed is lowered until all layers are formed (Figure 7).

Manufacturing

Traditional manufacturing which is slow and expensive is likely to be replaced by AM. 3-D printing involves manufacturing a single piece or materials of less volume at an affordable cost. Materials of any shape and size can be printed very quickly. The designs are stored and can be reproduced later at any time even if the original product is unavailable.

Medical applications

With more and more sophisticated laser technology, operator training will be less required and it will lower training costs. This will lead to the medical institutions to adopt these technologies with both hands. As transplant surgeries are very costly and conducting such surgeries is very difficult, research is being carried out to make 3D printed human organs and tissues, the technique called as bioprinting.

Lasers for space science

Radio waves have been used for space communications, but they will run out of bandwidth consequently. As data rate requirements are increasing, the shorter wavelength of lasers can be put to good use to increase the bandwidth compared to current bandwidth offered by current RF radios. The increased bandwidth will help to receive and transmit high resolution data between earth and space.

The Laser Communications Relay Demonstration(LCRD) is a mission to be launched by NASA using lasers to encode and transmit data at rates 10 to 100 times faster than today's fastest RF radios, delivering more accurate navigation capabilities with reduced size, weight and power requirements. High resolution data send from space to earth, will help the scientists to explore the deeper space with detailed understanding.

Textile applications

Traditional textile procedures involve waste generation as it is a wet process. Compared to conventional textile processes, laser technology offers sustainable solutions. Gas lasers provides flexibility in design and operation without leading to pollution or waste material, as it is a dry and clean process.

Fibre lasers

A fibre laser involves the gain medium to be confined within a fibre. The laser beam is generated within the fibre and need not be aligned as in the case of conventional laser systems. The laser beam generated by fibre lasers are of high beam quality, power and efficiency. Diode lasers are used to pump the fibre lasers.

Cutting

Carbon dioxide lasers are normally used in cutting. But with fibre lasers, about three times faster speeds can be achieved when cutting thin materials. Since there are no moving parts or mirrors, this reduces maintenance and operating costs. The disadvantages of fiber compared with CO_2 mainly relate to the cutting speed when processing thicker materials, typically above 5 mm. Research is being carried out to generate fibre lasers that will enable cutting materials of greater thickness.

Medical applications

The ability of lasers to operate at specific wavelength is used in dermatology, ophthalmology, cosmetic surgery and to destroy cancer cells. The compactness, low maintenance and high efficiency of fibre lasers make them suitable candidates for surgical applications. Earlier the laser systems and equipments used in the hospitals were large and complicated. With the advent of fibre lasers, the size and cost of these equipments are decreasing.

A century has passed after Einstein's stimulating theory of radiation gave us the useful LASER. Lasers have touched our lives. Undoubtedly, they have become a part of our life, be it in our homes, offices, be it in any of the fields such as manufacturing, medicine,

information technology, space science, atmospheric science etc. Laser development still remains an active field of research, aiming towards the development of more robust, high power systems that in turn promote scientific research, further commercialization and more importantly sustainable solutions. With the invention of lasers and applying it in our life, the quest for more powerful and efficient lasers to further improve our lives, continues.

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Figures

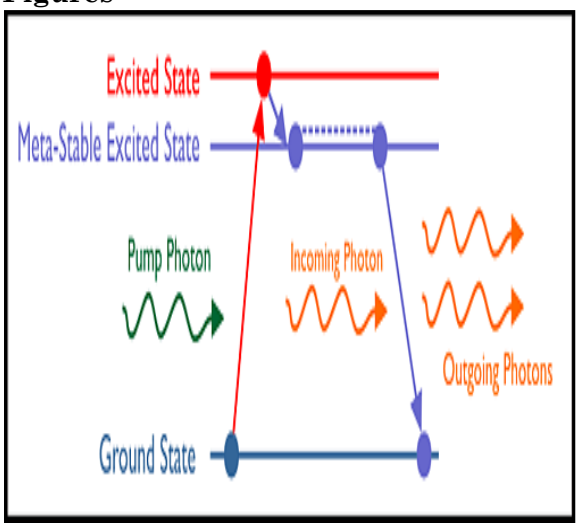

Figure 1

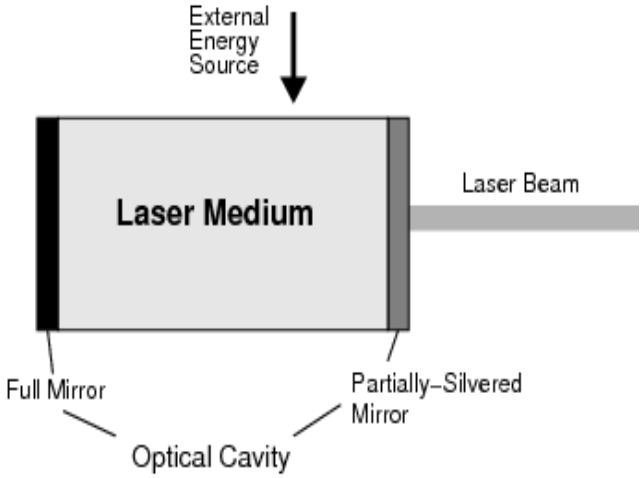

Figure [2]

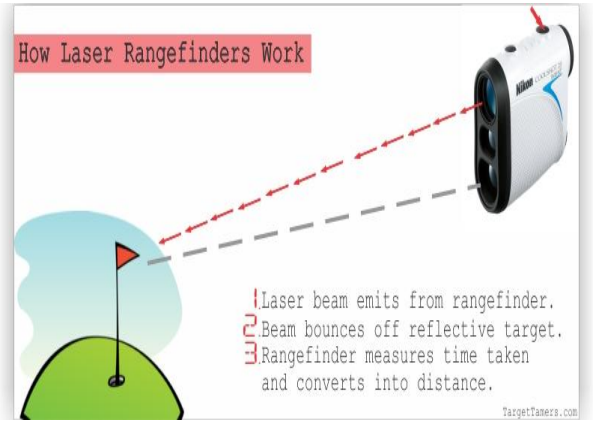

Figure 3

Figure4

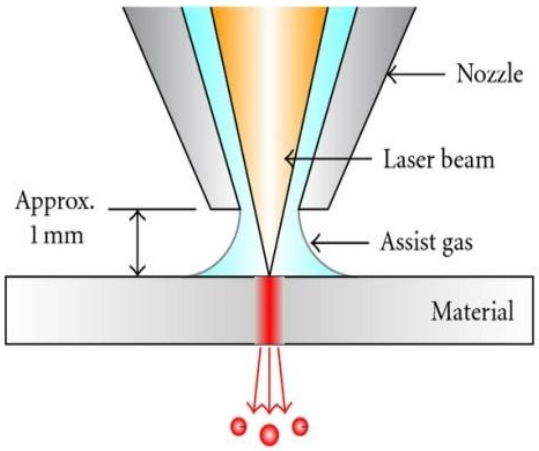

Figure 5 [6]

Figure 6

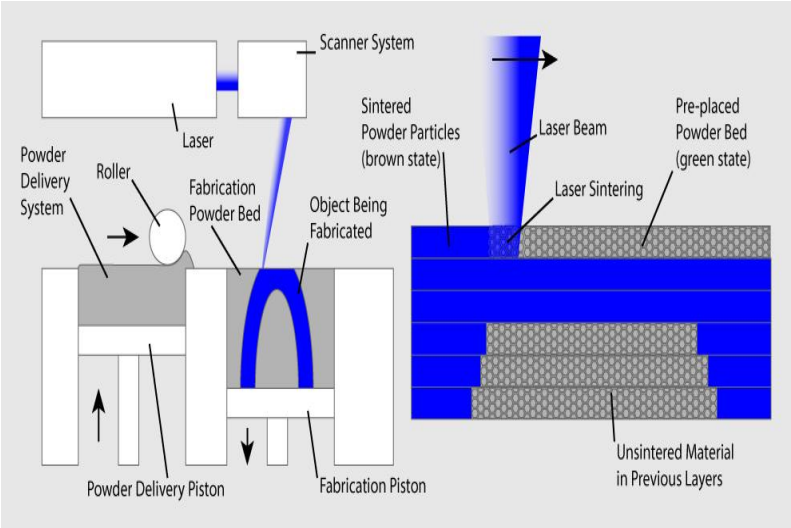

Figure 7

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DIFFUSION OF DIFFERENT KINDS OF FARM EQUIPMENT'S SUBSIDIES IN SELECTED DISTRICTS OF BIHAR

(A COMPARATIVE STUDY OF TWO DISTRICT OF THE DIFFERENT AGRO-CLIMATE ZONE OF BIHAR)

Santosh Kumar[1] **Dr. Md. Alamgir**[2]
[1]Research Scholar, Department of Applied Economics and Commerce, Patna University, Patna
[2]**Associate Professor, Department of Applied Economics and Commerce Patna University, Patna**
***Corresponding Author*- Santosh Kumar**
Email – mohhamadalamgir654@gmail.com
DOI- 10.5281/zenodo.7057054

Abstract
Sustainable agricultural mechanization can also increase land abundance by facilitating timeliness and quality of cultivation, relieving the burden of labor shortages, reducing poverty, and achieving food abundance while improving people's sustenance. Mechanization is a means of development, not an end in itself thereupon The Government of Bihar executed an incentives plan for encouraging acquire and use of farm equipment during 2014- 2021. This study is based on both primary and secondary data. Secondary data was collected from the Official website ***farmech.bih.nic.in*** *of Bihar government and other published sources like Statistical Handbook, and Economic Survey government reports. This study looked into the Distribution and Composition of Farm Equipment Subsidies in the Begusarai and Khagaaria districts of Bihar. By personal consultation using a structured questionnaire, the present study also assessed the perception of the 250 beneficiaries selected from 25 blocks of Begusarai and khagaria district of Bihar state, about the effectiveness of farm equipment's, which is purchased under farm equipment's subsidy program, the difficulty faced in availing Farm equipment's subsidies by beneficiary respondents and supply of electricity for irrigation of subsidies rate in agriculture. This research found that 98% of respondent farmers were not satisfied with the contribution of government in total cost. Overall 56% of the recipients expressed contentment with the quality of farm equipment bought under the subsidy scheme. 80 % percent of respondents reported not facing difficulties in availing the subsidy and not paying extra amount. The findings of the study will be helpful for policymakers to evaluate the scheme and make augmentations based on perception and feedback look into the study.*

Keywords: *Farm mechanization, irrigation, subsidy, food security, productivity and sustainability, Wages rate,*

Introduction

Agriculture is the single largest private-sector occupation in Bihar and may be considered the riskiest business. Bihar is considered the most suitable area for the second green revolution and it has a strong chance of becoming India's "Granary." It can also serve as major fruit, vegetable, and fisheries hub for both domestic and worldwide markets. Agriculture dynamics drive the entire economic prosperity process in Bihar. The Indian agriculture sector not only ensures food security but also, directly and indirectly, employs a large portion of the population. In light of its commitment to transforming the agriculture sector, the government has introduced several schemes and policies (Agriculture Road Map) to support the greater mechanization of agriculture. Sustainable agricultural mechanization can also increase land productivity by facilitating timeliness and quality of cultivation and relieving the burden of labor shortages and reducing poverty, and achieving food

security while improving people's livelihoods. Mechanization is the process of changing from working largely or exclusively by hand or with animals to doing that work with machinery. Mechanization is not an end in itself, but a means of development. It is an important element of the modernization of agriculture and allied activities. As an agrarian State Bihar with high agricultural production potential characterized by good soil, adequate rainfall, favorable hydrological profile & water resources, and a congenial temperature regime. Due to these features, Bihar'ss agricultural policies prioritize agricultural subsidies to boost agricultural production, and rural incomes, improve food security, and reduce income poverty, especially among the landless rural populace to improve their livelihoods. However, the effectiveness and efficiency of such policy interventions remain unknown. The percentage of the population employed in the agricultural production system in Bihar is estimated to be approx. 80%, which is much higher than the national average (43%). Nearly 42 percent of the GDP of the state (2019-20) has been from the agriculture sector (including forestry and fishing). Farm mechanization one of the important sub-sectors of agriculture forms an integral component of agricultural development strategies. Government subsidies are granted as a tool in agriculture development and transfer of technology particularly for the remote areas of the country. (Verma & Tripathi, 2015) The technological development in England had a significant impact on India's early agricultural mechanization. Farm mechanization aids in the efficient use of inputs, resulting in higher labor and land productivity. Furthermore, it aids in the reduction of farm labor drudgery. The fragmentation of landholdings the large presence of small and marginal farmers, the unaffordability of farm technology, and the practice of subsistence agriculture are all factors that limit the growth of the farm mechanization sector in Bihar. (SINGH, PAUL, & BURMAN, 2020) Said that India's agricultural production faces enormous challenges due to dwindling farm labor availability and growing disinterest among rural youth in traditional farming. The Government of India launched the farm mechanization scheme in 2007 and was replaced by the Sub Mission on Agricultural Mechanization, recognizing the importance of fully utilizing farm mechanization. (NAMDEO, VICTOR, & DHRUWE, 2018) When technology is used in any field, it automatically increases productivity. The availability of farm power, as well as the efficient use of farm implements, are both positively correlated with farm productivity. By implementing new environmentally friendly technologies, farmers can produce crops more efficiently while using less energy. The primary objective of the study is (i) To study the types of farm equipment used in farming in the district of Begusarai and Khagaria and (ii) To study the amount disbursed towards farm equipment subsidies in the district of Begusarai and Khagaria during the year 2016-17 to 2020-21 and (iii) To find out the difficulty faced in availing subsidies by beneficiary respondents in the district of Begusarai and Khagaria. When technology is used in any field, the rate of production and quality increase automatically. Farm productivity is positively correlated with the availability of farm power, as well as the efficient use of farm implements. Subsidy programs aim to improve farmers' incomes and national food security by increasing food production, according to many developing country governments. Farmers can produce crops more efficiently while using less energy by implementing new environmentally friendly technologies.

Need Of Study

As the mechanization of farming is an important element of the modernization of agriculture so the government of Bihar provides a financial incentive to farmers to adopt farm mechanization in the agriculture sector. This study is based on the diffusion level of farm equipment subsidy in agriculture mechanization in selected districts of

Bihar. The Purpose of the study is to bring out insights into the level of use and adoption of farm equipment with the help of governments incentive and self co-payments by the farmers of the Begusarai and Khagaria districts of where most of the landholdings (approx. 80 percent) are small and marginal. The emphasis of the farm subsidy policy in the state has been on making the benefits of the government programs reach every needy farmer in the state. Compared to other states of India, the adoption of farm mechanization is lagging in Bihar.

The study attempted to dig deep into the farmers' perception regarding their experience with various farm equipment and including its accessibility and use. This study will help farmers to take decisions at the time of buying agricultural equipment through the farm equipment subsidy program. Begusarai and Khagaria district has first and second rank inter of production area for maize respectively, and a major contribution in total agro-output of the state. Besides that Begusarai districts has the highest per capita income in the state. Begusarai, famous as the 'Industrial Capital of Bihar' lies on the northern bank of the river Ganges.

Review of Literature

(kumar & Joshi, 2014) It has been perceived that input subsidies and equipment are two important variables for the sustainable growth of agriculture in India. (Khalequzzaman & Karim, 2007) Found that the fertility of the soil was increased (80%) by agricultural mechanization in a village of Bangladesh during 2006. They also emphasize that agricultural machinery has both positive and negative effects on the rural environment. In India (Mehta, Chandel, & Senthilkumar, 2014)) An attempt to determine the status of farm mechanization in India by using trend analysis in the growth of mechanically powered farm equipment over traditional human and animal power operated farm equipment. As a result, India pursues a policy of selective mechanization under a variety of conditions, making agricultural mechanization a difficult task. During the last six decades, there has been a direct correlation between farm power availability and agriculture outputs.(Gulati & Ashok, 2007) Also, reviewed the trends in Government agriculture subsidies and expenditure in the agriculture sector of India. Similarly, (Dhiman & Dhiman, 2015) evaluate the progress and impact of farm mechanization technology in the agriculture and allied sector. They found that there is a positive relationship exists between farm power availability and agricultural outcomes. (Wang, Manjur, Kim, & Lee, 2019) Based on structured interviews with household heads and expert consultation, the study found that approximately 90% of respondents received at least one type of subsidy, except farm equipment subsidies, and that the large-cap farmers have greater access to subsidies than the poor or small group of farmers. (Yun, Zhutian, & Huang, 2020) Using Q-type Hierarchical Cluster Analysis, the subsidy for buying farm equipment was classified, and the entire 31 territories were categorized into four types of province based on qualitative accommodation. Authors proposed that China allocate subsidy resources fairly, and it was proposed to improve the subsidy policy for buying equipment by studying zonal classification. In the next (Soren, Kumar, Sahu, Kumar, & MD Danish, 2020). Was collected information about the status and tractor utilization pattern, implement by implement, at the farmer level? According to the study's findings, MRF owned the most tractors (26.82 percent), followed by 14.63 percent of Small Farmers. In the next (Tadesse, Goundan, & Sarr, 2019) Authors also evaluate that the impact of the subsidy on farm equipment used was insignificant as it doesn't provide support to those farmers who primarily depend on rental services. On the other side, the authors also observed that there is a less remarkable difference between market and subsidized value of machinery.

On the other hand, (SINGH, PAUL, & BURMAN, 2020) attempted to assess the beneficiaries' perception of the

status of scheme implementation through this study, with a focus on power tiller accessibility and use. The study was carried out in 23 randomly selected districts across 5 purposefully selected Indian states, with a total of 746 farmers benefiting. This survey found the variation among the states based on cost and subsidy received to buy the power tillers equipment. In the next study (Singh, 2014) the author highlights the scope and constraints in mechanization. According to the authors, the use of farm mechanization expands employment opportunities both on farms and in non-farm activities by increasing the area under the plow, multiple cropping, and the development of agro-industries and related services. He also explain the number of arguments against farm mechanization like, size of farming, poor farmers who are not able to fulfill co-payments. (Zhong, Chen, & Xiao, 2013) The policy of agricultural subsidies for farmers and the behavior of farmers are examined in this article. Although farm subsidies have expanded the well-being of farmers, the effect is not significant on the increase in output.

Research gaps

From the above existing review, none of the studies highlighted the distribution of farm equipment subsidies in the state of Bihar, apart from that not even a comparative study has been made between the districts of Bihar. So this paper is going to highlight the status of farm equipment subsidy and also make a fair comparison between two selected districts (Begusarai and Khagaria) of Bihar, which comes under the different agro-climatic zone. Research based on the comparison of agriculture variables between different agro-climatic zones of the state of Bihar is a new dimension of the study. This study contributes to future research.

Objective of the Study

1. To study the types of farm equipment used in farming in the district of Begusarai and Khagaria
2. To study the amount disbursed towards farm equipment subsidies in the district of Begusarai and Khagaria during the year 2016-17 to 2020-21
3. To find out the difficulties of farm mechanization in the district of Begusarai and Khagaria.

Research Methodology

Although the Farm Equipment's subsidy program spanned across all the District of Bihar. This study was conducted in two districts of different agro climate zone of Bihar. Studies were conducted in the eighteen blocks of Begusarai district and seven blocks of Khagaria district to assess the Distribution and Composition level of Farm Equipment Subsidies and its's utilization in agriculture and allied activities from 2016 to 2021. By personal interview using a structured questionnaire 250 respondents were selected from the 25 blocks, 10 farmers from each block of the selected district. The main surveyed items are the effectiveness of farm equipment, which is purchased under farm equipment's subsidy program, the difficulty faced in availing of Farm equipment's subsidies by beneficiary respondents, and the supply of electricity for irrigation of subsidies rate in agriculture and allied sector. For finding the composition level of farm equipment or agriculture machinery purchased by the farmer, a list of beneficiaries and types of farm equipment and the total amount of incentive with the full cost of agricultural machinery is collected from the government website i.e. farmech.bih.nic.in , Statistical Handbook of Agriculture, and Bihar Economic Survey. Data are analyzed by preparing tables and charts from collected secondary data. For testing the mean rank of equipment Kendall's W-test has been used to compare the distribution of farm equipment's subsidy in Begusarai and Khagaria district of Bihar. To prepare tables, charts, and hypothesis testing SPSS-25 and Excel has been used.

Analysis and Results

Begusarai is called the industrial capital of Bihar, beyond that, about 93 % population lives in the rural area. Whereas About 99% of the population in the Khagaria district has lived in rural areas. Agriculture and allied sector is the main source of income & occupation of the people in both the districts (**Table 1**)

Table 1. Demographic profile of Begusarai and Khagaria District of Bihar

District	Block	Population 2011	Population 2020	Total Cultivators	Cultivators Male	Cultivators Female	Agricultural labor,	Rural area	literacy rate
Begusarai	18	2970541	3352525	114,779	102,813	11,966	225,638	0.92596	63.87
Khagaria	7	1,666,886	1881232	75365	66,889	8476	145787	0.99192	60.87

Source: https://www.indiastatdistricts.com & Census 2011

Types of farm equipment used in farming in the district of Begusarai and Khagaria.

Due to the subsidy given by the government to the farmers on the purchase of machinery, the farmers continued to use more and more machinery in agriculture. There has been a tendency to increase the use of machinery in agriculture, especially by small and medium farmers. It is a different matter that still the big farmers are taking the benefit of most of the subsidy because they have the co-payment amount to take advantage of the subsidy. In another hand, small and medium farmers are not able to take much advantage of farm equipment through subsidy farm mechanization programs by the government

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Table 2 Procurement of Farm Equipment under Different Subsidy Schemes in Khagaria and Begusarai District

	Begusarai						Khagaria					
Name of farm equipment's purchase through subsidy program	2016-17	2017-18	2018-19	2019-20	2020-21	Grand Total	2016-17	2017-18	2018-19	2019-20	2020-21	Grand Total
Animal Deterrent Bio-Acoustic Equipment	0	0	5	2	0	7	0	0	0	25	0	25
Brush Cutter	0	3	15	4	2	24	0	0	2	0	0	2
Chaff Cutter(Electric motor operated)	0	0	0	243	0	243	0	0	0	22	0	22
Chaff Cutter(Manual) Shuking	202	38	23	2	0	265	685	328	1	104	0	1118
Chaff Cutter(Manual) Non-Shuking	0	250	155	73	0	478	0	0	199	0	0	199
Chaff Cutter-Stationary	17	372	523	26		938	0	4	33	3	0	40
Chaff Cutter-Tractor PTO	0	21	11	5	0	37	0	73	75	13	0	161

Operated												
Combine Harvester	3	2	2	1	0	8	2	1	0	2	0	5
Cultivator	0	51	50	17	6	124	0	12	14	13	4	43
Disc Harrow	0	212	166	91	0	469	0	93	106	53	0	252
HDPE Tube	252	399	339	112	53	1155	0	16	31	6	1	54
HDPE Tarpaulin Sheet	0	186	126	12	17	341	0	33	23	1	0	57
Laser Land Leveler	0	1	0	1	0	2	0	0	4	1	0	5
Manual Rocker Sprayer(Gator)	21	18	9	9	0	57	2	1	10	2	0	15
Mini Rubber Rice Mill Tractor operated	4	3	1	0	0	8	0	0	0	0	0	0
Multi Crop Thresher	0	0	59	48	10	117	0	1	41	22	6	70
Potato Planter	7	9	7	7	0	30	0	0	0	0	0	0
Power Sprayer	0	1217	1461	545	168	3391	2	10	110	69	37	228
Power Knapsack Sprayer	0	103	0	0	0	103	0	19	0	21	0	40
Power Maize Sheller	22	28	18	2	0	70	1	0	4	0	0	5
Power Operated Equip(Cultivator)	133	0	0	0	0	133	95	28	0	0	0	123
Power Operated Wheat Thresher	15	82	1	0	0	98	39	70	0	0	0	109
Power Tiller	0	1	0	1	0	2	0	0	0	0	0	0
Pump Set(Diesel)	0	167	140	0	0	307	211	151	77	0	0	439
Pump Set(Electric)	181	147	420	524	284	1556	0	3	28	137	137	305
Reaper cum Binder	30	56	67	39	42	234	39	58	75	36	31	239
Rotavator	113	261	211	61	0	646	18	43	55	39	0	155
Sprayers Duster	464	20	0	0	0	484	23	0	0	0	0	23
Straw Reaper	13	20	0	17	2	52	26	0	1	6	0	33
Thresher	0	0	114	91	0	205	0	0	25	44	0	69
Zero Tillage	6	15	8	15	0	44	1	0	0	0	7	8
Grand total	1483	3682	3931	1948	584	11628	1144	944	914	619	223	3844

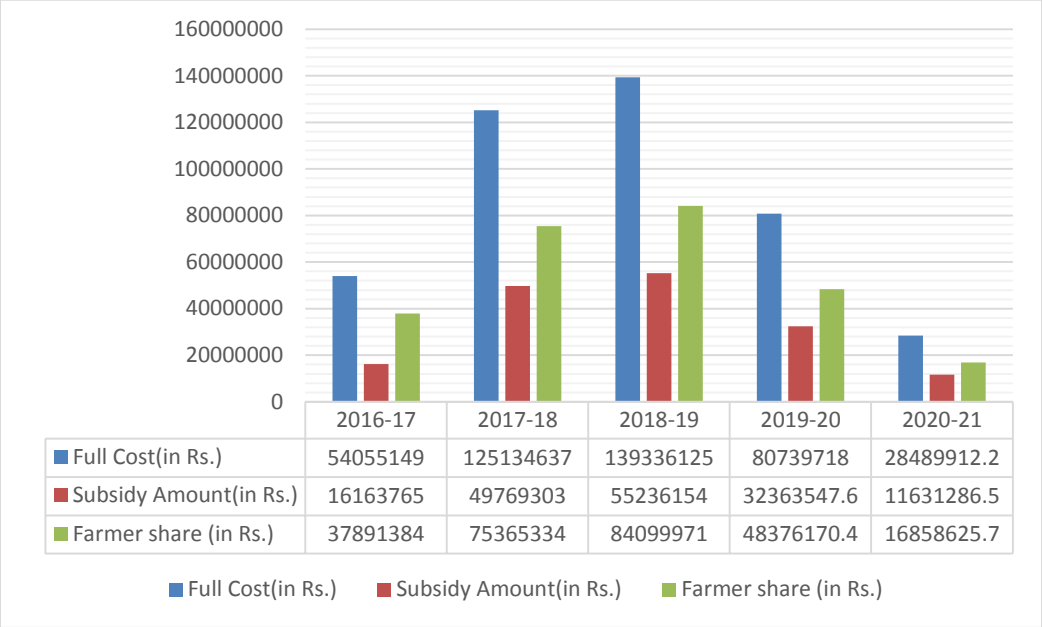
Source - farmech.bih.nic.in/

In the Begusarai district highest 3931 number of farm equipment are purchased in the year 2018-19 followed by 3631 in the year 2017-18. In the year 2020-2021, the lowest amount of equipment is purchased. Whereas in the Khagaria district highest 3931 farm equipment are purchased in the year 2016-17 followed by 944 in the year 2017-18. In the year 2020-2021, the lowest amount of equipment is purchased. In Begusarai total of 11628 number of equipment is purchased by the farmers in five accounting years in which the highest amount of power spare followed by a pump set and chaff cutter are purchased. Whereas in the Khagaria district a total of 3844 number of equipment are purchased by the farmers among five accounting years in which the highest amount of chaff cutter followed by pump set is purchased.

The amount disbursed towards farm equipment subsidies in the district of Begusarai and Khagaria during the year 2016-17 to 2020-21

In Begusarai district approx. Rs.1.6 crores in the year 2016-17, R.s 5 crores in the year 2017-18, R.s.5.5 crores in the year 2018-19, Rs.3.2 crores in the year 2019-20 and Rs.1.1 crores amount disburse in a different group of a farmer in 18 districts of Begusarai district as an incentive for buying farm equipment subsidy (Figure 1)whereas in Khagaria district approx. Rs.1.4 crores in the year 2016-17, R.s 2.3 crores in the year 2017-18, R.s.2.7 crores in the year 2018-19, Rs.1.7 crores in the year 2019-20, and Rs.0.67 crores amount disburse in a different group of farmers in 18 districts of Begusarai district as an incentive for buying farm equipment subsidy (Figure 2)

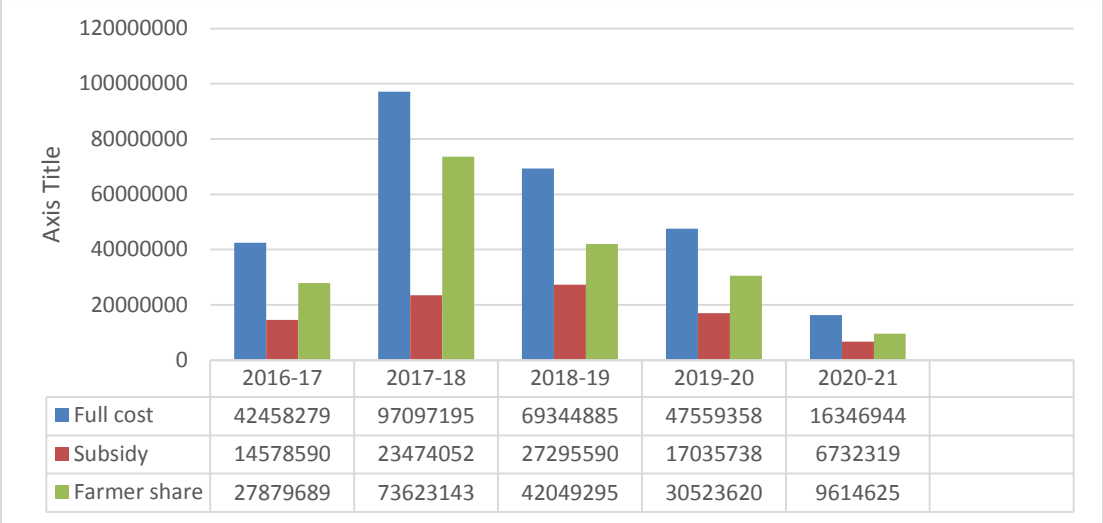
Figure 1:- Multiple Bar Diagram Showing Amount of Subsidy and Farmers' Contribution for Buying Farm Equipment In Begusarai District During 2016 To 2021



Source:- Authors' computation

Figure 2:-

Multiple Bar Diagram Showing Amount of Subsidy and Farmers Contribution for Buying Farm Equipment's In Khagaria District During 2016 To2022



Source:- Authors own computation

To find the mean rank of equipment covering subsidy Kendall's W Test has been applied, the results of which are mentioned below

Descriptive Statistics						
	N	Mean	Std. Deviation	Minimum	Maximum	Kendall's W Test
						Mean rank
Animal Deterrent Bio-Acaustic Equipment	90	3277.78	24759.08	0	225000	10.64
Brush Cutter	90	2567.78	6746.698	0	40000	12.18
Chaff Cutter(Electric motor operated)	90	48573.33	141436.9	0	968440	14.04
Chaff Cutter(Manual) Shucking Type	90	10481.78	19818.2	0	130500	15.59
Chaff Cutter(Manual)-2Non-Shuking Type	90	16546.22	26070.57	0	142444	16.93
Chaff Cutter-Stationary Engine Operated	90	192186.4	319824.5	0	1453213	20.43
Chaff Cutter-Tractor PTO Operated	90	20677.78	45056.73	0	250000	14.21
Combine Harvester	90	35555.56	129225.1	0	800000	11.81
Cultivator	90	13765	25077.14	0	144000	16.29
Disc Harrow	90	79866.67	97641.42	0	410000	20.48
HDPE Laminated Woven Lay flat Tube	90	21092.78	20763.31	0	82950	21.78
HDPE Tarpaulin Sheet	90	4728.33	7424.015	0	35750	15.69
Laser Land Levelers	90	3333.33	22234.7	0	150000	10.63
Manual Rocker Sprayer(Gator)	90	1478.89	2686.357	0	12000	13.3
Mini Rubber Rice Mill Tractor operated	90	4666.67	15191.66	0	60000	11.58
Multi Crop Thresher(Driven by Tractor)	90	67520	126815	0	650000	18.09
Potato Planter	90	11528.33	27005.38	0	100000	12.95

Power Sprayer	90	6952.78	16665.55	0	90000	13.82
Power Knapsack Sprayer	90	3666.67	9295.402	0	50000	12.34
Power Maize Sheller	90	3355.56	10637.34	0	60000	11.91
Power Operated Equip(Cultivator)	90	50988.89	97449.9	0	520000	17.02
Power Operated Wheat Thresher	90	84805.78	112794.1	0	445601	23.27
Power Tiller	90	1333.33	8893.881	0	60000	10.55
Pump Set(Diesel)	90	34570	68417.73	0	305000	16.11
Pump Set(Electric)	90	134741.6	133533.4	0	707471.2	26.81
Reaper cum Binder	90	458277.8	534156.4	0	2625000	23.77
Rotavator	90	299200.1	432135.3	0	1962900	24.12
Sprayers Duster	90	10513.78	27746.13	0	172100	13.93
Straw Reaper	90	73038.89	223399.3	0	1620000	14.17
Thresher	90	120077.8	212606.3	0	748000	17.58
Zero Tillage	90	15874.44	36835.39	0	198000	13.96

Test Statistics	
N	90
Kendall's W[a]	.337
Chi-Square	908.804
Df	30
Asymp. Sig.	.000
a. Kendall's Coefficient of Concordance	

Source: - Authors' computation

Based on the above analysis (**Table 5**) based on mean rank, it can be concluded that the highest mean rank is for pump set (26.81) followed by rotavator (24.12) and reappear cum binder (23.77). The above analysis shows that the maximum amount has been spent on pump sets followed by rotavators and reappear cum binder through the subsidy program within five accounting years (2016-2021)

To discern the difficulties of farm mechanization in the district of Begusarai and Khagaria.

Farmers were asked about their insights about the volume of subsidized price, Subsidy Amount Received, Difficulty faced in availing subsidies, Co-payment, quantity, and quality of farm machinery supplied through an incentive program and the mode of disposal. The result highlight that all groups of farmers gates partial amount of subsidy on farm equipment in both districts. In Begusarai, farmers get 40% of the total cost of machinery as a subsidy (except in 2016 it was 30%) while they have to pay 60% of the amount themselves in terms of co-payments. On the other hand, farm equipment purchased by farmers in the Khagaria district got an average of 34% as a subsidy, while farmers themselves had to pay an average of 66%. (Table 6).

Table 6.

The amount of subsidy and farmers contribution for buying farm equipment's subsidy in Begusarai district during 5 accounting years (2016-2021)

	Begusarai			**Khagaria**		
Year	**The full cost of various equipment**	**% of farmer contributions**	**% of subsidy amount**	**The full cost of various equipment**	**% of farmer contributions**	**% of subsidy amount**
2016-17	54055149	0.70	0.30	42458279	0.66	0.34
2017-18	125134637	0.60	0.40	97097195	0.76	0.24

2018-19	139336125	0.60	0.40	69344885	0.61	0.39
2019-20	80739718	0.60	0.40	47559358	0.64	0.36
2020-21	28489912.2	0.59	0.41	16346944	0.59	0.41

Source – Authors own computations

Opinion of farmers related to qualitative and quantitative satisfaction:-

In Bihar approx. 85% of the farmers belong to small and medium groups. Most of the respondent farmers also belong to small and medium groups so 98% of the farmers are not satisfied with the amount of subsidy received by the government as co-payments. The survey results also showed that 52% of the farmer's observed breakdown/defect during the use of machinery in the field whereas 56% of farmers are satisfied with the quality of farm equipment. On other hand, regarding the supply of electricity available for agriculture, the farmers' answer is satisfactory. Farmers said that they are getting proper power supply for agriculture and irrigation at low rates (rupees 1 per unit

Table: 7 Opinion of Farmers on Satisfaction level related to Farm Equipment and Subsidy

Variables	Responses	%
cost cover by subsidy amount	Full	0.00
	Partial	1.00
Satisfaction regarding the amount of co-payments	yes	0.02
	No	0.98
Break Down or Defect during the Usage	Always	0.03
	Most of the Time	0.12
	Never	0.12
	Rarely	0.21
	Sometimes	0.52
Level of Satisfaction on Quality of Farm Equipment's	Dissatisfied	0.13
	Satisfied	0.56
	Fully Dissatisfied	0.07
	Fully Satisfied	0.11
	Neither Satisfied Nor Dissatisfied	0.14
Paid some extra amount for getting subsidy	Do not want to disclose	0.15
	No	0.80
	Yes	0.05
Supply of electricity for farming	Proper	0.79
	Improper	0.21

Conclusions and recommendations

In the Begusarai district, 11% of the total cultivator and Khagaria district only about 1% of the total cultivator benefited from the subsidy given by the government on the farm equipment. More than 85% of the farmers in the district are small and marginal, who have only 2 hectares of land. Fragmentation of land holdings followed by the unaffordability of farm technology is the main hurdle in the adoption. Purchasing farm equipment for a small or marginal farmer is financially unviable, and without it, the farmer will never be able to sustain positive returns from the agricultural output. Small and medium farmers have to depend on others for the use of high-priced farm equipment because reach farmers use agriculture machines as a 'Farming as a Service'

model, Therefore, the government should give more subsidies on farm equipment so that more and more farm equipment can be used by farmers in agriculture and irrigation. If the government should provide an adequate quota of incentives on time to farmers, it benefited reduce their cost of production and gain a sufficient sum of surplus. Apart from that, there is a need for a transpicuous strategy on agricultural mechanization with welfare co-payments amounts. On other hand, the government should ensure loans at a cheaper rate to small and marginal farmers and manufacturers also. Government should be made expenditure on research for alighting and Identification of suitable and advanced machinery for development in co-occurrence with farmers for better productivity and cost minimization. Advance farm policy and expenditure on research and development provide a bright future for Bihari farmers. Bihar can undoubtedly emerge as India's 'Granary' if the proper emphasis is placed on Sustainable mechanization. The study can help policymakers and development agencies evaluate the scheme, develop effective strategies, and design appropriate training and extension interventions in the future to improve farm machinery adoption at the grassroots level.

Limitations and scope for future study

This study is cramped to only two districts of two different agro-climatic zone of Bihar. A complete analysis of the diffusion of farm equipment subsidy as a whole in the different agro-climatic zone of Bihar could not be performed. On other hand, Primary data is collected from farmers regarding difficulties and perceptions of farmers toward farm equipment and farm equipment subsidy only. First, two objectives of the study are based on secondary data amassed from Online Farm Mechanization Application Software (OFMAS) or farmech.bih.nic.in. Therefore, the quality of the outcomes of the study depends on the perfection, and quality of the secondary data. In the future, a large number of districts from the different agro-climatic zone of Bihar can be considered and the study can be made more in line with primary data, based on the socio-economic impact of farm equipment's subsidy on different types of farmers in Bihar state.

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"A STUDY OF EFFECTIVENESS OF THE ART OF LIVING ON TRIBAL STUDENTS EDUCATION PROCESS IN SOLAPUR UNIVERSITY"

Adv. Rajendra Appasaheb Koli[1] Dr. Vishnu p.Shikhare[2]
1 LL.B,M.S.W.,M.A- M.Ed. , D.ed.
[2]Guide, College Of Education Barshi,dist solapur
***Corresponding Author*- Adv. Rajendra Appasaheb Koli**
Email- rajendra.koli44@gmail.com
DOI- 10.5281/zenodo.7057060

Abstract:-
When student learn at classroom and understanding teachers explanation but if teacher can't prove his blood with physically & mentally balanced till his teaching will not be impressive & effective. If you want to give any example, any concept by enthusiastically you should available there bodily & mentally. Otherwise not that time most number teacher meet me & explain their complaint about body & mind fitness as well as concentration. Researcher think on that teachers problems frequently & researcher has chosen the subject for the research. Yoga, Pranayam & Meditation is a subject which plays a vital roale in the development of healthy & education a career of every student. If aided by Descriptive method during school curriculum will certainly bring astonishing results.

key words:- *Effectiveness,yoga ,pranayam,meditaion,tribal students education process*

Introduction :-

Academic achievement is an attained ability or degree of competence in school task, usually measured by standardized tests and expressed in grades or units based on norms derived from a vide sampling of pupils' performance. Studies reveal that even low or moderate levels of stress can interfere with task performance. Cognitive reactions of stress result in the inability to concentrate. Yoga, which is a way of life, is characterized by balance, health, harmony, and bliss. Meditation, being part of yoga, which is the seventh limb of Ashtanga Yoga state of alert rest as stated by Maharishi Mahesh Yogi, who founded a new technique of meditation, popularly known as **transcendental meditation**. By practicing yoga, a person is supposed to reach a state of mental equanimity, where responses to favorable or unfavorable external events are well under the individual's control, and responses are moderate in intensity.The science of yoga is a powerful stream of knowledge, which enables the practitioners to achieve radiant physical health, serene mind, continues spiritual uplift, and creates the ability for harmonious social living.

Test Anxiety:-

An early study indicated that after 18 weeks of meditation there were significant improvements in test anxiety (Linden,1973). A recent pilot study found that meditation was a feasible and acceptable intervention for anxious children (Semple, Reid, & Miller, 2005).

Increasing Attention

Peck and colleagues studied the effects of yoga on attention. After 3 weeks, students' time on task increased to an average of more than 80% (Peck, Kehle, Bray, & Theodore, 2005). Meditation and relaxation were found to reduce the nonattending behaviors of behaviorally disturbed children relative to control children who practiced relaxation only during a 5-day intervention (Redfering & Bowman, 1981).

Cognitive Performance

Several studies have found improved cognitive performance in schools that include regular meditation as part of

the school day, as compared to schools that do not (Warner, 2005).

Body Satisfaction Meditation has also been shown to improve body satisfaction in children with low body satisfaction and poor physical coordination (Clance, Mitchell, & Engelman, 1980).

Physiological Indicators of Stress

After 6 months, girls in a yoga group showed a decrease in breath rate and a more regular breathing pattern relative to controls (Telles, Narendran, Raghuraj, Nagarathna, & Nagendra, 1997). Research has shown that teaching yoga and meditation is good for teachers, too! Meditation has been shown to reduce teacher stress and burnout (Anderson, Levinson, Barker, & Kiewra, 1999; Winzelberg & Luskin, 1999).

Conceptional And Operational Definition Of The Terms

1.Effectiveness:-

The term effectiveness defines as, "The measure to which something is successfull in obtaining a desired output ,success."

The proposed paper aims to take effectiveness means total score scord by sample students from 1 st year ,2 nd year and 3 rd year of various senior colleges in solapur university for experimental purpose after experiment.

yoga.

Yoga has different traditional definitions. Some o the n (process)" or "Yoga is balance (equanimity)." Yoga means "union" between one's individual consciousness and the Universal consciousness, in contrast to the common understanding of union between body and mind, or body, mind and spirit. .

Pranayama:

Pranayama is an exact science. It is the fourth Anga or limb of Ashtanga Yoga. *"Tasmin Sati Svasa prasvasayorgativicchedah Pranayamah"*— Regulation of breath or the control of Prana is the stoppage of inhalation and exhalation, which follows after securing that steadiness of posture or seat, Asana.

Medition :

Meditation means keep mind kalm n quiet. When meditaion done by students they are became focused and concentrated.

Tribal students education process

Those students who taking education in various colleges under solapur university.

Also they belong to schedule tribe and who victim of addiction,uniterested in education.

Objective Of The Research :

1. To study of positive effectiveness of yoga,Pranayama and meditation on teaching process.
2. To create positive approach between teacher & student .

Research Methodology:

The core intension of the present study was to observe effectivenessof yoga, pranayam,meditation for senior college students and see its effectiveness on the performance of the students. Today's era is competitive era, so that the quality of that student is as good as possible. The quality become good when the students clear understanding takes place. So,the following information show the effectiveness of yoga,pranayam,meditation and knowledge points on education process of present research. Today's era is competitive era, so that the quality of that student is as good as possible. The quality become good when the students clear understanding takes place.

1. The researcher planned goals and objectives of yoga,pranayam,meditation and knowledge points on education processof tribal students in various colleges in solapur university.
2. The internal evaluation of a yoga,pranayam,meditation done
3. Within the subject experts.
4. The researcher analyzed and interpreted the data obtained in evaluation.
5. This research is concerned 30 students of senior colleges.
6. A pretest of 30 marks implemented on the sample.The answer scripts were assessed the score were collected analyzed and interpreted .
7. The experimental group instructed by using yoga,pranayam,

and meditation on education process, while control group was instructed by using conventional process of education.

A posttest of 30 marks administered on the sample. The response of the students were gathered in types of scores.The data was analyzed and interpreted.

One Hour Package

In this research researchers design one hour package of yoga, pranayam and Meditation. First of all here understanding about designing of package. Then the main process of yoga, pranayam & meditation as following-

Warming Up (body rotation) top to Bottom.

Yoga – Different type of Yoga

Pranayam – Some types of Pranayam

Meditation – Importance Process

At this process researcher gave the time weightage for each process.

1) Warming up - 10% (10 minutes)
2) Yoga - 10% (10 minutes)
3) Pranayam - 20 % (15 minutes)

Meditation - 60 % (25 Minutes)

yoga pranayam & mediation in this process researcher presented the details of yoga pranayam & meditation with action, that's why this stage is very important for understanding this research.

Warming Up.(Concentrate On Breath Within Whole Process)

In this process researchers demonstrated the step and procedure of warming up of body.

Head rotation. (clockwise & anticlockwise)

Shoulder rotation (Back to front & front to back)

Waist rotation –(ramming right to left & left do right)

Bend & touch the ground & toes (15 time)

Site sit up-(one leg to other-right to left)

jumping on the & pot- (100 jumps)

This all warming proceeds should be complete with in 5 to 10 minutes.

yoga

Researcher state here some importance types of yoga which is more effective for this process.

Pashcchimottanasan :-,Sarwangasan-Halasan –,Chakrasan - ,Naukasan – Dhanurasan –,Bhujangasan-

Now from here chronologically explained all types of yoga

Pranayam -

After completion of yoga stage researcher explained here some type of pranayama. Which will most useful for effectiveness of this process.

Nadishodhan / Anulom vilom., Kapalbhati, Bhasstrika, Bhramari

Meditation: -

sited all students silently for 10 to 20 minuts 'Is the art of living knowledge – yoga,pranayam,meditaion and knowledge points used in experimental group of students proved helpful to the students from the group?'was question to be answered.

A comparative analysis and interpretation of the gains in achievement was done to answer the question.

Conclusion were drawn about the effectiveness of the art of living – (yoga,pranayam,meditation and knowledge points) on tribal students education process and suggestions were Stated.

5. Analysis & Interpretation of Data:-

Table : t-values of different test of scores scored by students

test	**Control group Mean**	**Exp.group Mean**	**T- value**	**df**
pretest	4.5	4.8	0.35 (NS)	
posttest	12.7	17.8	5.42 (S)	
Pre over posttest	Pre 4.5 Post -12.7	---	8.7 (S)	38
Pre over posttest	----	Pre- 4.8 Post -17.8	14.05 (S)	
Gains	8.5	13.0	5.41(S)	

NS:non significant **S:** significant

The data was analyzed with the help of statistical and non-statistical measures.The technique of t test was used. The researcher tabulated the collected data and calculated the t values to compare the achievement of students from control and experimental groups

Conclusion:-

The practice of Yoga enables any human being to realize one's own multi-dimensional nature, integrating physical, psychological, intellectual and spiritual levels of existence. All realized yogis and shastras declare that yoga is indispensable for all those who want to attain the universal consciousness (Paramaatman) in life. Yoga has become a popular subject as a curative and preventive measure for all physical and/or psychological issues.

In yoga, body, mind and soul are not seen in isolation. Maharshi Patanjali with his yogic method helps us to eradicate the root-cause of disease, by bringing *Sharirashuddhi* (purification of body), *Manahshuddhi* (purification of mind), *Karmashuddhi* (purification of action), *Chitttashuddhi* (purification of mind) together to result in *Atmashuddhi* (purification of soul). Practicing Yoga-Asanas in one's daily life will not only develop a flexible body but also maintain balance between mind and body. Ideally, this puts the spiritual development of an individual on the track towards realization of the ultimate goal of human life: achieving Universal Consciousness.

Discussion Of Results :-

In order to evaluate the impact of implement the art of living knowledge-yoga,pranayam,meditation on tribal students education process cannot be denied.

Teacher should take benefit of the art of living knowledge not only to focus on education process but also to creat environment of happiness and interesting education. The research done by Mind/Body Institute, Harvard Medical School, and Bruce D' Hara and his team at the University of Kentucky in Lexington, U.S., revealed a positive influence of meditation on brain functioning and performance. Educators and researchers have recommended incorporating yoga and meditation into school curricula for the last

40 years. Since then, numerous research studies have documented the usefulness of yoga and meditation as part of the school experience. Almost all of these studies examined "stand alone" yoga and meditation programs, because very few schools integrate these practices into the curriculum. Childhood and adolescence are times of great stress and transition, but yoga and meditation practice can help students through these exciting periods of development.

Test Anxiety An early study indicated that after 18 weeks of meditation there were significant improvements in test anxiety (Linden,1973). A recent pilot study found that meditation was a feasible and acceptable intervention for anxious children (Semple, Reid, & Miller, 2005).

Increasing Attention

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and meditation is good for teachers, too! Meditation has been shown to reduce teacher stress and burnout (Anderson, Levinson, Barker, & Kiewra, 1999; Winzelberg & Luskin, 1999).

Recommendations –

1. To do this process as early as possible in morning for best effect. Don't do any process against your capacity (Body)
2. Don't do any paranayam with fast speed of breath. Each & every process of pranayam must do in slowest speed of breath.
3. Don't think about any subject while you do pranayam .Your attention should be on breath only in hole process.
4. Meditation is thinkless process so you should must seat blank minded for meditation.

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According to this book we select below points.

a) Knowledge Yoga and Pranayam (Page. 140, 142)

2.Rishimukh Magazine (Art of Living)– "Yoga
"Sabija Samadhi"
According to this book we select below points.

a) Yoga wisdom (page No. 8)
b) Living Tips – Stress Buster (Page No.21)
c) Yogasan (Page No. 22)

Vivekvani – "Swami Vivekanand" Dhyandharna (Meditation) Unit 4
Ashtavakra Geeta – "Slok"
According to this book we select Tipes for meditation.
Patangali Yog Sutra Yoga and pranayam CD's
Shri Shri Ravi Shankaraji –"Narad Bhakti Sutra" (1997)
Art of Living Foundation (Page No. 21)

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FLOOD DISASTER MANAGEMENT USING ENVIRONMENTAL AND ECOLOGY MOVEMENT AND CONSERVATION TECHNIQUES

Madhuchhanda Dhole
R.K.D.F. University, Ranchi
***Corresponding Author*- Madhuchhanda Dhole**
E-mail id: madhuchhandadhole@gmail.com
DOI- 10.5281/zenodo.7057064

Abstract:
A flood is an overflow of water caused by a large water mass that engulfs land. Although flooding is a natural hazard, it can occasionally turn into a disaster due to the devastation it causes. Floods can be caused by increases in river or reservoir capacity that cause them to overflow or breach their levees along the coast. Flooding may not always occur when water levels in rivers, lakes, or other bodies of water rise due to seasonal changes or glacial melting. Flooding is described as an overflow of water that covers human habitats on land. Flooding along rivers and coasts is a common natural disaster that occurs more frequently than any other natural disaster. Another reason for a catastrophic flood is a burst dam. Floods are very likely to occur in low-lying areas, coastal regions, riverine regions, and dam regions. Another reason for flooding in urban areas is a malfunctioning drainage system, which prevents even light rain from adequately draining away and causes settlement downstream of roads. Another reason for this issue is the disappearance of wetlands due to urbanisation. West Bengal has 111 blocks within its 37660 sq. km of flood-prone land. According to statistical analysis, West Bengal experienced the average devastated area over 2000–10,000 square kilometres on ten different occasions throughout the course of the previous 41 years (1960–2000) (The Financial Express, 2017).

Keyword: *Disaster as a flood, Flood and its types, Discussion and results, Mitigations, Movement for environment and Ecology.*

Introduction:

An environmental catastrophe affecting the environment as a result of human activity is known as an environmental disaster or ecological disaster. Because of this, it differs from the idea of a natural disaster. Floods are a significant natural disaster and danger, yet they may also be caused by people. So, it is possible to claim that it is a natural-like phenomenon. For those who live in low basin areas and coastal areas—areas that are more likely to flood—it is an atmospheric calamity. India is a place where diverse areas flood every year, causing millions of people to lose everything. The primary contributors to it are all drainage system disruptions from the locality to the river.

Study Area:

It is located in the eastern section of India at latitudes 21^{0}31'N-27^{0}13'14"N and 85^{0}45'20"E-89^{0}53'E, respectively. The research area is the entirety of West Bengal, which is approximately 89 square kilometres, with a catchment area of 180628, of which almost 38 square kilometres are at risk of flooding and 35380 square kilometres are already protected (data according to irrigation & waterways directorate). This area experiences flooding every year due to its location alongside a coastal region, beneath hills, between a plateau in the west and a delta in the east. The gradual slope is generated toward this state since it is located on the east side of the lower Ganga plain. Different rivers are, therefore, running on it. Even a moderate rain produces a flood in a river valley or basin that is lower plain and flat. The principal rivers in this region are the Teesta, Damodar, Ganga, Bhagavati, and Hooghly. The embankment is nearly 10,400 kilometres long.

Objectives:

The Objectives are-

1. To find out the causes of flood and its consequences in West Bengal.
2. To find out the mitigations process from the effect of this disaster.

Methodology:

i) The author gathered information for this study from N.B.S.S.I., the West Bengal Relief Department, the Central Hydrology Department, and other sources.

ii) The author has studied the data, created some figures, and created a table to show the issues and effects of flooding on individuals.

iii) The author attempted to illustrate the main flood-prone region in West Bengal.

iv) All of the meteorological information was gathered from two important sources, namely www.imd.org and www.indiawaterportal.org. The data accessible on the IMD website was in the daily format, with a clear distinction between daily rainfall and seasonal rainfall. All the data provided on the other websites was in the form of annual and monthly statistics. The information for the literature section was obtained from the West Bengal Irrigation & Waterways Department's periodicals from 2016 and 2017.

v) The author used the MS Office programme to create several cartographic diagrams to analyse the flood scenario.

Disaster as a flood:

The word "disaster" originates from the French word "desastre," which translates as "Bad Astre." A disaster is an unexpected challenge that severely damages both plants and animals. When a risk exceeds the limits of its ability to destroy, it becomes a disaster (Modak, 2018).

There are three forms of disaster: natural, quasi-natural, and man-made. One sort of natural calamity is a flood. The impact of a flood may be small-scale or widespread. A district, or a sizable region made up of several districts or states, may be affected. It causes harm in a variety of ways, including to the environment, society, or millions of dollars' worth of property. Shelters are damaged by the water, and household animals disappear after going adrift.

Flood and its types:

Flooding is the temporary dilution of a large or small area caused by a river or reservoir overflowing its banks. As a result of torrential rain, cyclones, tides, tsunamis, snowmelt brought on by global warming, and tank or dam bursts, water flooded the surrounding areas or the catchment of the water bodies. According to the Indian Meteorological Department, if it rains more than 125% more than usual, a flood has been declared. There are several varieties.

Flash flood-

A flash flood is defined as a flood that happens within six hours of the start of rain and is accompanied by thunder and lightning storms. It primarily occurs because of an extremely high cumulonimbus cloud in the area. A flash flood occurs when a significant amount of rain falls quickly and over a limited area. Due to the abrupt nature of flash floods, notifying the surrounding population may not always be possible. Because of this, this flood has a greater impact on individuals than past floods. Despite being a short-term steady hazard, it has a very high destruction margin.

River flood-

Long-term precipitation over huge river catchment areas is what causes river floods. During the rainy season, these floods typically develop gradually and may remain constant for a few days or weeks (Agnihotri & Patel, 2011).

Coastal flood-

Some floods, mainly in tropical regional coastal areas, like tropical cyclones, are connected to cyclones with thunder storm activity.

Flood in India –

Floods are acknowledged as disasters and hazards. Every year during the monsoon season, it regularly affects different parts of India, primarily the area around the Ganga and Brahmaputra river basins. Floods and tsunamis are caused by the location's geography and climate (IPCC, 2007b).

The Rivers are India's maternal country. Numerous rivers of various sorts have

grown throughout India. Every year, flooding in 20 flood-prone areas along over 60 major rivers occur as a result of heavy rains during the south-west monsoon season throughout India (Bengal flood:India: Monsoon-2017). Nearly 80% of India's annual precipitation falls during the monsoon, and as a result, river dam releases cause flooding in the river basin's lower reaches. In some Indian states, including Assam, Bihar, Uttar Pradesh, and West Bengal, maximum damage is allowed. Crops, domestic animals, and riverine residents were all severely impacted. Crops are the main source of revenue in these nations due to the fertile nature of the soil. However, every year floods destroy millions of dollars' worth of crops, causing farmers to suffer a tremendous loss and driving up the cost of food items. Table 4 displays a summary of losses and damage for all of India. According to this table, June through July 2016 is covered. Assam was the state with the largest amount of damage; 21 districts were under water, more than 1 lakh people were impacted, numerous lives were lost, and more than 12 thousand hectors of crops were destroyed. This year's events also had an impact on the states of Andhra Pradesh, West Bengal, Maharashtra, and others. Figure.6 depicts a flood-prone location. Table.4 also lists the population, flood occurrence, and fatality rate per state in India.

Rainfall distribution and Flood in West Bengal-

West Bengal receives a lot of rain each year due to its location in the monsoon path, in the foothills of a mountain range, and close to the seashore. In this state, the average annual precipitation is 1750 mm, with the monsoon season seeing the highest totals. The average rainfall for the foothills and hills is 2500–4000mm and 1125–1875mm, respectively. During Bengal's south-west monsoon season, the hilly area and the Gangetic plain receive 75% and 78% of their annual rainfall, respectively. West Bengal was divided in two by the Ganga river. The southern portion, known as the Gangetic Plains, receives rain on a considerably less frequent basis than the northern portion, known as Sub-Himalayan West Bengal, which receives the most rain overall. According to the Indian Meteorological Department, the monsoon's actual and typical rainfall amounts in north Bengal are 11163mm and 11633.5mm, respectively, and in south Bengal, they are 14849.5mm and 14986.9mm. Although it has been demonstrated that South Bengal receives more rainfall than North Bengal, if catchment areas and river counts are compared, it may be said that North Bengal receives more rainfall on a relative basis than South Bengal (Information from Article and data, West Bengal Disaster Management & Civil Defence Department). The West Bengal rainfall distribution is shown in table.7 and figure.3.

The Himalayan and Gangetic plain rainfall patterns are considerably different when taking into account the rainfall pattern in West Bengal. The highest annual rainfall is in Jalpaiguri, where it is 5323 mm, while the lowest is in Bankura, where it is 1119 mm. Typically, the monsoon season lasts from June through September. Due to monsoon rains, 95% of the total rainfall falls during this time. Each year, numerous locations are impacted by severe flooding, which results in a significant loss of life and property. tables 1, 6, 7, and 8 list some of the years with frequent flooding.

Discussion and result-

Every risk and catastrophe have some underlying causes and outcomes. Like that flood, it too has causes and effects as a tragedy. They are covered under a few topics-

Causes of flood:

The intensity and high amount of rainfall in West Bengal are accordingly quite high and are some of the causes of floods there. Landslides in mountainous terrain. Regular river bank and embankment failure. The normal flow of rivers is hampered by the excessive deposit of boulders and silt from land erosion. Mountainous soil erosion. Regular changes in the rivers' courses. A large amount of rainfall occurs in a short period as a result of cloud bursts, continuous rain

from tropical cyclones, stagnant low pressure, and other factors (Kedarnath temple in Uttarakhand survives glacier, floods).

As a result, the high amount of rain could not pass through properly and the local area was flooded by stagnant water, which caused a flood to occur suddenly. As a result of global warming melting the ice and raising sea levels, sea water seeps onto landmass, inundating low-lying islands (The State of African Cities 2008: A framework for addressing urban challenges in Africa. UN-HABITAT). When permafrost in the upper latitudinal zone began to melt in the spring, a large volume of water flowed into the nearby river in a short period of time, causing a flood that resembled a calamity. Tsunamis, high spring tides, and flooding. Due to soil erosion, the deposition of silt reduces the navigability of rivers, and flat landforms in low plain regions cause the capacity of river water to decline (The OFDA/CRED International Disaster Database). Because of this, rain that ranges from moderate to heavy causes disastrous floods. In table. 2, further causes are displayed.

Drainage system of West Bengal:

The lower Ganga plain and the Ganga delta are largely comprised of West Bengal. About 42% of Bengal's total land is subject to flooding. Due to the Gnaga-Padma river system's extensive use of clay, sand, and silt in the development of its structural framework, the navigability of the river system has been negatively impacted. The impacted area was approximately 30607 sq. km. in 1978 and 23971 sq. km. in 2000, according to the 2017 annual flood report. The geomorphological structure of Bengal's drainage system is mostly dendritic in pattern, rectilinear in South Bengal and Trillies, parallel in North Bengal, and interstate or international in nature.

Due to this, several forms of flood problems have emerged in various state regions.

The rivers Teesta, Torsa, Jaldhaka, Raidak, Sankosh, and Mahananda in North Bengal were formed from a variety of sources in West Bengal and India's neighbouring states. as they emanate from a hilly area beneath the Himalayan drainage system. In the rainy season, they receive water from monsoon rainfall, and in the spring, they receive water from melting snow. Therefore, the water level in these rivers is always high. Because North Bengal is located at the foot of the Great Himalaya, it receives more rain during the monsoon season. Additionally, those rivers' tributaries are discharging a massive volume of water over a broad area. A disastrous flood occurs as a result of a large volume of water flowing down a wide but shallow river channel combined with the release of dam water in a short amount of time. As a result, the majority of the districts of Alipurduar, Jalpiguri, Kooch Bihar, Malda, Dinajpur, and Darjeeling in North Bengal typically experience disastrous floods every year. Every year, a red alert is issued for the four months of June, July, August, September, and October during the monsoon rainy season because of water flow that is over the danger limit.

The plateau region, flat plain, and delta are located in the state's east and southern regions of South Bengal. The flooding in this location is primarily caused by the terrain. The flood becomes particularly large in this location due to the shape of the catchment area as well. Mayurakshi, Ajay, Damodar, Hooghly, Bhagirathi, Bramhani, Shilai, Kanshi, Rupnarayan, Haldi, Subarnarekha, etc. are some of the major rivers in South Bengal. Water does not always exist because it comes from the Chotonagpur plateau, where it also flows. Only a few rivers carry a small quantity annually. However, due to the steepness of the plateau, a significant amount of rainwater and dam water flows by these rivers in a very rapid manner during the rainy season. However, due to the steepness of the plateau, a significant amount of rainwater and dam water flows by these rivers in a very rapid manner during the rainy season. However, the east side of the state's flat topography and flat river basin are not able to transport so much water, which causes severe flooding in many areas. West Bengal's Murshidabad,

Barddhaman, Hooghly, Midnapur, and some portions of the other districts are among those that are affected.

The monthly rainfall in some Bengal rivers during the monsoon season is shown in table. 7 and Figure. 3. It demonstrates that North Bengal receives substantially more rainfall and water flow than South Bengal.

While all rivers in North Bengal contain more than 800 mm of water in June, more than 2000 mm in August, and more than 900 mm in September, Hooghly and Ganga only have a 200 mm water flow despite having a large channel. But due to their plateau location and significant catchment area, the Kangsabati and Damodar rivers have more than 1000 mm of rainwater in them. In July, the situation is the opposite of other months, with the greatest rain gauge readings in Bengal at the Damodar and Kangasabati rivers, at 4012mm and 4124mm, respectively. Therefore, the monsoon season is quite bad for the local population.

Climate change and global warming and increasing rate of flood frequencies:

Global warming is today's major atmospheric challenge. There are sufficient root causes and effects for that. The primary causes of global warming are the massive use of fossil fuels and the decline of vegetation. The global climate is slowly changing due to a variety of human activities, as well as a rise in destructive work. based on tables 10 and 11 and figures. 1 and 2 The author has attempted to demonstrate how the average temperature has changed over the past 100 years and how, as a result, rainfall has increased in West Bengal. As the amount of rainfall has increased and the navigability of the river has decreased due to siltation deposits, the river's capacity to hold water has been exceeded, resulting in river flooding and flash flooding. The global temperature is rising. Raising the sea level will flood coastal communities. Additionally, as temperatures rise, tropical regions experience more cyclones. The coastal coastline was destroyed by the unexpected and frequent attacks of cyclones, storms, and waves, which also caused the water to overflow into rivers or the sea and enter landmasses (Ahmed & Kranthi, 2018). The average temperature and rainfall in West Bengal are shown to be steadily changing in tables 10, 11 and figures 1, 2, which also show an increase in the frequency of flooding.

Impact of flood: Floods affect people's lives in a variety of ways, including-

Deaths:

Humans, animals, plants, and microbes perish in flood waters. Many peoples and cattle were lost or killed when they were moved downstream. Crop damage: Due to West Bengal's excellent soil, numerous varieties of paddy, wheat, jute, oil seeds, and different sorts of vegetables are produced. However, floods wipe off all the crops. Since agriculture is the primary source of revenue for the community, a flood completely impoverishes them. Many of them are completely ruined. Due to that, agro-based industries will suffer severe losses. West Bengal's economy is heavily dependent on agriculture compared to other sectors, and this tragedy has an impact on the local market across the entire state and country (West Bengal Disaster Management & Civil Defence Department & The Times of India, 2017).

Disease mishaps: People and children are frequently attacked by a variety of water-related diseases during and after floods.

Ecosystem vulnerability –

as a result of flooding, plants and animals perish, which leaves herbivores without food and leads to animal deaths. Following a flood, the soil and water have become contaminated, making the surrounding environment susceptible. The dimensions of the damage for West Bengal and India in various years are displayed in tables.3 4, and 5.

Flood prone areas-

In the monsoon season, the district is almost entirely devastated by flooding. However, specific areas are comparatively hard to find. In West Bengal, Bankura, Purulia, West Midnapur, Murshidabad, the Damodar valley watershed, Darjeeling, Kooch Bihar, Jalpaiguri, Alipurduar, and other areas are

particularly vulnerable to flooding. West Bengal ranks top in India among disasters due to flooding. 29.8 lakh hectares of the 37.6 lakh hectare area listed as flood-prone by the irrigation department is protected land. River basin wise the amount rainfall is affected the flood area that have been shown in tables.9.1 and 9.2 according to the location of West Bengal. Also, the rainy month wise (June-Sept.) rainfall distribution has been drawn in figure.6 based on table.8 for comparing the amount of rainfall in different river basins and the probable vulnerability of devastated flood in that zone. The flood-prone regions of India and West Bengal are depicted in figures. 3 and 5 of table 2.

Mitigation of flood:

Flood mitigation refers to the management of flooding's impacts rather than its prevention. It involves a collaborative effort from the government or certain disaster management NGOs. Although man cannot prevent disasters because of the many unexpected natural forces that cause them, he can attempt to lessen their effects by using certain strategies or procedures. The mitigation steps have been shown in figure.4. First, scientists can create a map of the flood-prone zones and forecast floods based on historical trends in temperature, rainfall, river channel shift, and other factors, and then the government can inform the public through the media. Before a crisis, it's also possible to move individuals from the affected area to a safe area (Extent of flood prone areas from DoIW-GoWB, 2014; Actually flooded areas from DFO, 2014; Drought-prone areas from WBPCB, 2009; Slope map derived from Shuttle Radar Topography Mission data of 2000).

Before flood-

Storage of food, water, plastic, rope, candles, primary essential medicines, money, and necessary paperwork should all be done in order to prepare for a flood disaster. Avoid building in flood-prone areas.

At the time of flood-

Disconnect any electronic devices' electrical and gas connections. Pay attention to announcements in the news. Don't freak out. As soon as possible, move to a safe location with your valuables and necessities. Avoid using well water.

After flood-

Exercise caution when consuming food and fluids. Drink from a cup of boiling water. Keep an eye out for any road holes with standing water. Returning home after a safety warning.

Movement for Environment and Ecology:

An environmental movement is a campaign for environmental preservation with the goal of enhancing the environment in a state or, more broadly, the entire world. The term "green movement" is another name for the environmental movement (Implementation guidelines for Canadian Environmental Protection Act, 1999). The protection of the environment through changes in public policy is frequently emphasised by the movements. There are numerous environmental and ecological movements. There are several different environmental movements, ranging from local to virtually global. Below are some examples of environmental movements that were held to protect the environment and save the planet. They are—

Bishnoi Movement-

Amrita Devi led the villagers of Khejarli, Marwar region, Rajasthan state during this movement to ban the destruction of sacred trees and animals by the king's army. Bishnoi and the surrounding villages also participated.

Chipko Movement –

Under the direction of Sundarlal Bahuguna and others, Chamoli residents in Uttarakhand's Tehri-Garhwal district fought another movement in 1973 to defend the Himalayan slopes' trees from the axes of forest contractors (Kedarnath temple in Uttarakhand survives glacier, floods). Save the Silent Valley Movement: In 1978, an evergreen tropical forest called Silent Valley was discovered in Kerala, India's Palakkad district. The poet-activist Sughathakumari and the NGO Kerala Sastra Sahitya Parishad (KSSP) were instrumental in preventing the hydroelectric project from destroying the lush, ever-green Silent Valley.

Appiko Movement-

In the Karnataka districts of Uttara Kannada and Shimoga, opposition to the commercialization of natural forests and destruction of traditional livelihoods is strong. The main advantages of Appiko as a state leader are that it is neither formal, institutionalized, nor motivated by a specific personality. In 1983, he assisted in organising the movement. The locals wrapped the trees that the forest department's contractors would be cutting down. The Appiko movement used a variety of tactics to educate the populace, including street dramas, slide exhibitions, folk dances, and foot marches into the forest. The development of afforestation on fallow lands was the movement's second focus. Later, the movement concentrated on the sensible use of the environment by employing alternate energy sources to lessen the strain on the forest(Appiko & NBA).

Conclusion:

This study provides a brief explanation of flood disasters and typical flooding. The majority of floods are caused by nature, but human activity increases their severity. There are many different types of floods on Earth, but some of them are disastrous. West Bengal and India deal with flooding every year. Assets were worth a million dollars and lives were lost due to flooding. Bengal's terrain, its location in the foothills of the Himalayas, high rain, and more importantly, a lack of infrastructure, such as a sewage-drainage system, are the sources of the problem. People need to be aware of this in order to minimise future gore. Local administrators need training in a variety of management-related areas (Environmental Management Systems & Disaster Reduction and Sustainable Development).

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Tables- Table 1.: Year wise Record of flood in West Bengal

Flood affected Area (in Sq. Km)	Years of incidence of Flood	Total No. of Years
< 500	1985,89,92,94,97,2001,2005, 2006, 2013, 2014 & 2016	11
500 – 2000	1962,63,64,65,66,72,75,96,2003,2004,2007,2009, 2011 & 2015	12
2000 – 5000	1960, 61, 67, 69, 70, 74, 76, 80, 81 & 82	10
5000 10000	1973,77,93,95,98 & 2008	6
10000-15000	1968, 79, 83, 90 & 99	5
15000 – 20000	1971, 86, 87 & 88	4
> 20000	1978, 84, 91 & 2000	4
Source: West Bengal Disaster Management & Civil Defence Department.		

Table-2 Major controlling factors leading to flood in Indian and their consequences			
Controlling factors	**Causes**	**Consequences**	**Precautions**
Heavy rain and thunder storm	Global climate variability and changes.	Inundation of low-lying areas and economic resource destruction, human being is suffered.	Remove valuable things and people in safe place
Over & rapid Urbanization, industrialization	Immigration and increase of population growth rate, industrialization	Cover up the land of wetlands and water bodies, less groundwater percolation and fall of ground water level create isostatic disbalance, as a result earth quake, create urban heat islands	To maintain all environmental balances urban plan must be design with consideration.
Gradient of Slope	Anthropogenic impact makes gradient of terrain in reverse direction.	Obstruction of surface and sub - surface run-off	It should not disturb the natural gradient as much as possible.
Poor and non-sufficient drainage system	Rapidly increase of Urbanization & slums, siltation in drainage system, lack of communication among both govt. and public.	Contamination of fresh ground water, intensity of seasonal floods.	Clean the drainage system over all city regularly.
Through all garbage in water bodies and drain from house hole and factory.	Non-awareness rather than casual attitude of citizen about the consequences of flood and waste management system.	Enclosure of river, canal and drainage channels reduction in the water holding capacity, as a result flood submerge the local area.	All drainage system must be clear and should making developing work excluding the space of drainage system.
Rivers	Shifting of river Channel	River shifting is a natural process, but human activities disturb this process in various way.	People should avoid the riverine area for making residence.

Source: Compiled by author

Table-3. Blue Areas depict Flood Affected Area		
Flood	North Bengal	South Bengal
Districts Affected by Flood	Cooch Behar, Jalpaiguri, Uttar Dinajpur, Dakshin Dinajpur, Malda;	Nadia, Howrah, Murshidabad, North 24Parganas, South 24 Parganas, Hooghly, Paschim Medinipur, Purba Medinipur
Relatively scare Districts affected by Flood	Darjeeling	Purulia & Bankura
Source: West Bengal Disaster Management & Civil Defence Department		

Table 4. Total and Percentage of flood events and fatalities in West Bengal								
Decadal/State	1978-'87		1988-'97		1998-2006		Total (1978-2006)	
	Flood Event	Fatalities	Flood Event	Fatalities	Flood Event	Fatalities	Flood Event	Fatalities
West Bengal	28(4.6)	820(5.6)	112(11.7)	882(5.9)	67(7.7)	2213(14.3)	207(8.5)	3915(8.7)
Source: National Disaster Management Authority								

Table 5. Population, Flood event and fatalities rate of states of India.					
States	Population (Millions)	Flood events rate		Fatalities rate	
		Rate	Rank	Rate	Rank
Andhra Pradesh	76.2	0.03	20	1.18	17
Arunachal Pradesh	1.1	1.6	1	6.12	4
Assam	26.7	0.22	10	2.65	7
Bihar	109.9	0.03	20	1.32	13
Gujrat	50.7	0.05	18	2.8	6
Haryana	21.1	0.09	15	0.61	22
Himachal Pradesh	6.1	0.83	4	8.36	2
Jammu & Kashmir	10.1	0.25	9	4.64	5
Karnataka	52.9	0.13	13	0.93	20
Kerala	31.8	0.21	11	1.26	14
Madhya Pradesh	81.2	0.05	17	0.51	23
Maharashtra	96.9	0.1	14	2.01	10
Orissa	36.8	0.07	16	2.07	9
Punjab	24.3	0.1	14	1.08	18
Rajasthan	56.5	0.06	17	1.2	16
Tamil Nadu	62.4	0.04	19	0.97	19
Tripura	3.2	0.34	7	2.8	8
Uttar Pradesh	174.6	0.03	20	1.47	12
West Bengal	80.17	0.09	15	1.68	11
Chandigarh	0.9	0.9	3	0.9	21
Goa	1.3	0.35	6	0.33	24
Manipur	2.1	0.19	12	0.33	24
Meghalaya	2.3	0.32	8	1.21	15
Mizoram	0.9	0.65	5	6.75	3
Nagaland	1.9	0.1	14	0.01	27
Sikkim	0.5	1.2	2	20.08	1
Delhi	13.9	0.07	16	0.22	25
Pondicherry	0.9	0.07	16	0.11	26
Total	1028.6	0.08		1.5	
Source: National Disaster Management Authority					

Table 6. Number of lives lost and other damages in various states in India due to floods this season June 1 to July 16:						
	Districts affected	Lives lost	Injured	Houses damaged (partial + full)	Animals affected	Crop area affected (ha)
States of India						
Assam	21	34	-	5023	1,30,203	12,884

Kerala	14	81	27	8069	5469	8,177
Maharashtra	-	123	98	-	65	-
Gujarat	8	27	4	310	110	-
Karnataka	10	128	-	8481	706	3,522
West Bengal	19	72	5	6910	12	47,679
Bihar	-	-	-	-	-	-
Jammu and Kashmir	-	6	6	17	38	3
Manipur	11	9	-	17,846	400	4709
Tripura	8	21	36	7593	5	4173
Mizoram	-	10	-	-	-	-
Rajasthan	-	-	-	-	-	-
Total	91	511	176	54,249	1,37,008	81,147
Source: National Disaster Management Authority						

Table 7. Followings are the records of large flood in West Bengal	
Year	Flood Characteristics
1978	Major Flood.
1986	Flooding due to heavy rains in some areas of Kolkata, Hooghly, Howrah, Parganas and Midnapore.
1988	Monsoonal rains caused flooding in areas of Balurghat and Dinajpur lying under the purview of the Ganges and Churani rivers.
1991	Flash floods caused damage 35,000 houses.
1995	Flooding triggered by heavy rains caused erosion, severe agricultural damage and outbreak of diseases.
1998	Monsoon rains caused flooding of the Ganges River.
1999	Tropical cyclones caused destruction of an estimated number of 1500 village. Floods due to brief torrential rains affected areas of Kolkata, Burdwan and Birbhum.
2000	Besides flash floods triggered by incessant torrential rains, disaster is also accredited to the opening of sluice gates of dams. The fatalities counted to the tune of 1262, besides affecting millions of people.
2002	Flooding in Jalpaiguri, Cooch Behar and Jalpaiguri in north Bengal due to monsoonal rains. Flash-floods swamped ten villages, causing four deaths and 11,000 displacements.
2003	Monsoonal rains caused floods affecting the regions of Darjeeling, Jalpaiguri, Malda and Murshidabad.
2004	Heavy monsoonal rains affected several districts.
2005	Heavy rains caused floods in many areas. About 3000 coastal villages were inundated and 60,000 huts and many roads washed away. Heavy monsoon rains triggered flash floods and landslides.
2006	The regions of Birbhum, Burdwan and Murshidabad were affected mainly from continuous monsoonal downpour Monsoonal rains and tropical cyclone-driven storms injured and 30,000 mud houses destroyed. Heavy rains left large parts of Kolkata city under water; subsequently 2000 people were evacuated from the city.
2007	Heavy rain from tropical depression in the Bay of Bengal caused flooding leading to 51 deaths, and affecting 3.2 million people.
2013	Heavy rainfall & water release from various dams by DVC led to widespread flooding in the districts of Paschim & Purba Medinipur, Howrah, Hooghly, Bardhaman and Bankura Causing 17 deaths, 8790 villages affected, an affecting 2.1 miillion people.

Source: West Bengal Disaster Management & Civil Defence Department wbdmd.gov.in/Pages/Flood2.aspx 9/

Table 8 Monthly Rainfall statistics of Rain Gauge(mm) Stations during Monsoon 2017				
River Basin	June	July	Aug.	Sept.
Teesta	1951.66	2155.4	2620.5	1707.2
Jaldhaka	1710.2	1196.1	2025.4	914.7
Mahananda	860.8	1550.9	2386.8	1232.5
Torsa	2776.8	2388.9	5286.5	2737.4
Damodar	1208	4012.47	1577.5	1141.43
Hooghly	243.7	621.5	372.7	94.1
Ganga & Bhagirathi	284.47	848.89	469.31	406.59
Kangsabati	1819.95	4124.54	2439.4	2211.1
Source: Irrigation and waterways directorate,2017				

Table 9.1. Flood period in different river in West Bengal (1971-'80)							
	Flood in river of North Bengal	Station	months				
Year			June	July	Aug	Sept	Oct.
1971	Teesta	Domohani	17	12	5		5
1974			9				
1975			7	10	4		
1976			10	8	6		
1971	Teesta	Coronation	1	5			
1972			1	7	1	6	
1974			5	21	8	4	
1976			1	2	6		
1977			1	4	12		
1978			5	3	1	1	
1979				11		2	
1980			8	3	1	1	
1971	Torsa	Ghugumari		1			
1972			1				1
1973			1				1
1974			1				1
1975				1			
1980				2			
1973	Jaldahaka	Road Bridge	2				
1976			10	3	4		
1977					3	2	1
1978			8	20	10	7	1
1979				16	9	9	
1980			1	9	2	4	
1971	Mohandndra	Fulbari		1			
1972				1	2		
1973				1	2		
1974				1			
1975				1			
1976			1				

1977				1			
1979				1		1	
1980				1			
1972	Mahananda	Englishbazar			26	26	
1974					6		
Source: Annual report of flood.							

Table 9.2. Flood period in different river in West Bengal (1971-'80)

	Flood in river of South Bengal	Station	months			
Year			July	Aug	Sept	Oct.
1971			9	31	23	
1974			2	21		
1975				31	6	
1976	Ganga	Manikchak ghat		16	14	
1977				13	16	
1978				21	6	
1979				31	26	
1980				2		
1974			2	21		
1975				31	6	
1976				16	14	
1977	Ganga	Nurpur		13	16	
1978				21	6	
1979				31	26	
1980				2		
1971	Bhagirathi	Berhampore		31	21	
1979			5	7	1	
1971	Bhagirathi	Katwa	9	30	14	
1978				2	11	
1971	Chdmt	Hanskhal		23	30	6
1978					13	26
1980				5	30	4
1971	Ajoy	Katwa	12	18	11	
1978			1	2		12
1971			2	31	27	
1972					7	2
1973					7	2
1977	Jalangl	Swarupganj	10	23		
1978				22	30	22
1980				5	26	
Source: Annual report of flood.						

Table.10 Mean Decadal Trend of Temperature (Degree c) of West Bengal	
Year	Temperature (^{0} C)
1901-1910	25.34
1911-1920	25.15
1921-1930	25.36
1931-1940	25.46
1941-1950	25.58

1951-1960	25.87
1961-1970	25.66
1971-1980	25.39
1981-1990	25.63
1991-2002	25.86
Source: https://www.indiawaterportal.org/met_data/	

Table.11 Decadal Trend of Precipitation in m.m. of West Bengal (1901-2002)

Year	Rainfall (mm)
1901-1910	27601.774
1911-1920	29707.101
1921-1930	28489.479
1931-1940	28920.735
1941-1950	29885.493
1951-1960	27672.75
1961-1970	26358.112
1971-1980	30027.069
1981-1990	29923.985
1991-2002	28253.061
Source: https://www.indiawaterportal.org/met_data/	

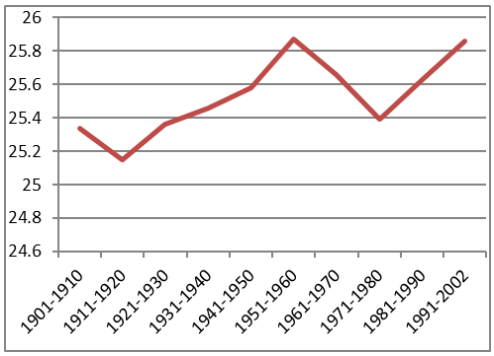

Figure. 1 Mean Decadal Trend of Temperature (Degree c) of West Bengal

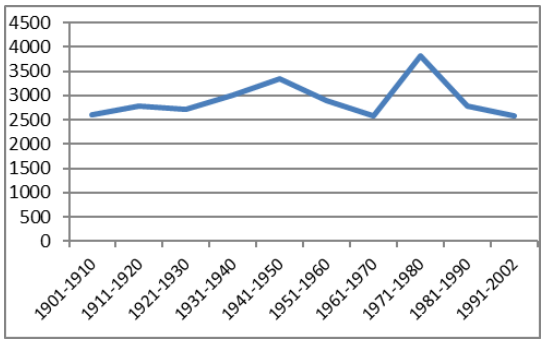

Figure. 2 Decadal Trend of Precipitation in m.m of West Bengal (1901-2001).

Fig. 3. (Occurrence of Flood in West Bengal)
Source: http://wbdmd.gov.in/Pages/Flood2.aspx

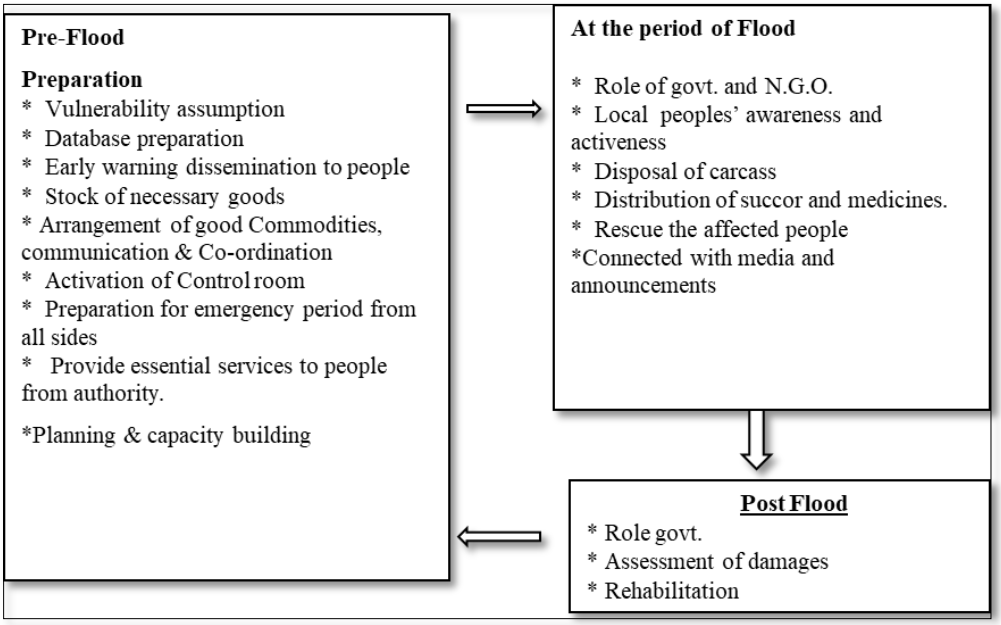

Fig.4. Steps of Disaster mitigation. Compiled by the author.

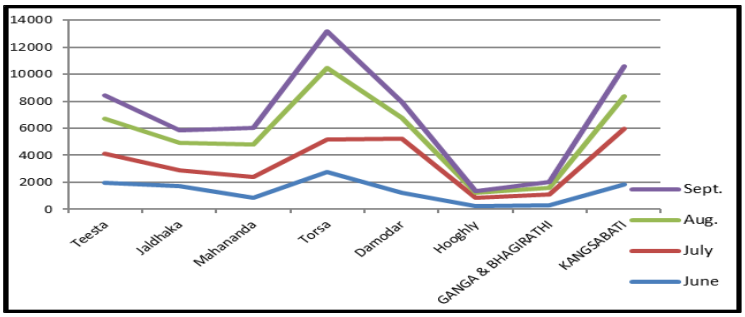

Figure. 5. (Flood prone area of India), Source: Irrigation and waterways

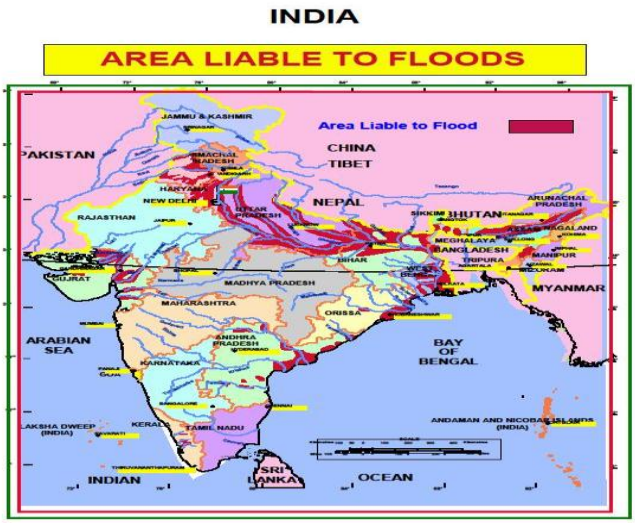

Figure. 6 Monthly Rainfall Statistics of Rain Gauge
Source- https://ndma.gov.in/en/zone-maps.html
(mm) Stations during Monsoon, 2017 Or, National Disaster Management Authority. directorate,2017

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CULTIVATION OF PLEUROTUS MUSHROOM AND PREPRED THEIR TWO NUTRITIONAL FOOD PRODUCT-PAKODA AND PICKLE

Miss.Pallavi Vinayak Tamboli[1] Miss.Arti Dattatray Sutar[2]
[1]Popatrao Kisanrao Thorat college Khutbav,Tal –Daund ,Dist-Pune
[2]Popatrao Kisanrao Thorat college Khutbav,Tal –Daund ,Dist –Pune
***Corresponding Author*- Miss.Pallavi Vinayak Tamboli**
Email- pallavitamboli123@gmail.com
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Abstract:
Mushrooms provide important nutrients, including selenium, potassium, riboflavin, niacin, vitamin D, proteins, and fiber. All together with a long history as food source, mushrooms are important for their healing capacities and properties in traditional medicine.Mushrooms contain antioxidants as well as compounds that have anti-inflammatory properties. Topical use of these natural compounds promotes healing and fights inflammation. Mushroom extracts are often used in skin products for treating skin conditions like eczema, rosacea, and acne. Pleurotus is a genus of gilled mushrooms which includes one of the most widely eaten mushrooms, P. ostreatus. Species of Pleurotus may be called oyster, abalone, or tree mushrooms, and are some of the most commonly cultivated edible mushrooms in the world.

Scientific name: Pleurotus
Phylum: Basidiomycota
Higher classification: Pleurotaceae
Order: Gilled mushrooms
Genus: Pleurotus

Introduction :

Mashroom are acknowledged food source and widely consumed through the worled .the mashroom cultivation is estimated .the present study aimed at the formulation of mashroom pickle and pakoda product and influence by its nutritional value ,quality and physiochemical properties.mashroom provided important nutrients for human body.Pleurotus is a edieble mashroom is having high percentage of nutrients and proteins.mashrooms are used into food industries.

This study consisting cultivation of mashroom in various steps like Soak Straw, Drain and Bag, Pasteurise, Prepare Growing Room,Inoculate bag,Incorages colonisation,Monitor bags etc.After harvesting cultivated mashroom and then formation of their products-Pakoda and pickle.also get aware peoples about use of Mashroom by servaey.

Materials And Methods:

1)Cultivation Of Mushroom:

1.Straw (the medium for growing the m in mshrooms)
2.Containers (for soaking straw)
3.Plastic bags (or reusable containers for holding straw)
4.Elastic bands or string (to constrict bag opening)
5.Cotton wool (to filter out contaminants)
6.Barrel or drum (for pasteurising the straw)
7.Material liner (for holding bags within barrel)
8.Gas burner (for heating barrel)
9.Bleach spray (to clean growing room)
10.Spoon, gloves, clean clothes, face mask (to look the part when inoculating straw)

11.A growing area that can retain moisture in the air, shaded with some light
12.Possibly plastic sheeting (to help retain humidity & to reduce other unwanted moulds)
13.Mushroom spawn (see How to Grow Mushroom Spawn)
14.A water or weed sprayer (to increase humidity within growing room)
15.A thermometer and hygrometer (to keep an eye on temperature and relative humidity)

Step 2: Soak Straw, Drain and Bag

The mushrooms require a medium to grow in, in this case we will be using straw. The straw length should be approximately 5-10 cm (2-4 inches). Placing the straw in water tight containers, submerge the straw in water for 24 hours. Wash, rinse and drain thoroughly, then bag in 5 litre plastic bags ready for pasteurising.

Step 3: Pasteurise

Position your drum onto the heat source (we used a gas burner), pouring around 40 litres of water into the drum. Place a suitable platform at the bottom of the drum, one that will keep the bags above the water yet allow steam to rise. Insert a material bin liner and fill with the prepared bags of straw. Close off the bags with the liner and cover the drum with a lid. Heat the drum, steaming the bags for approximately 60 minutes. It should take around 30 minutes for the steam to make its way to the top bags (the temperature should near 95°C ~200°F). Leave to cool, removing the bags and transferring them to the growing area.

Step 4: Prepare Growing Room

The growing room should be clean and dimly lit (shaded with indirect sunlight), able to retain moisture in the air yet also provide an airflow when ventilation is needed. Plastic sheeting can be used to seal off an area to help retain humidity and to reduce other unwanted moulds and insects.

To prepare the room for the inoculations, spray a 1:20 (5%) solution of bleach along walls and corners (any area where mould might like to grow). Temperatures of 10°C to 24°C (50°F to 75°F) for pleurotus ostreatus (winter) and 10°C to 30°C (50°F to 85°F) for pleurotus pulmonarius (summer) should be available depending on stage of growth (initial spawn run, colonisation, pinning and fruiting).

Step 5: Inoculate Bags

Before inoculating the bags of straw, make sure you have showered and are wearing clean clothes. Clean your hands with antibacterial soap or wear sterile gloves. A face mask and hair cap will also help reduce contamination (we are very dirty creatures). Open the bags of straw and the mushroom spawn. Taking a sterile spoon, place a few spoonfuls into the straw, breaking it up and mixing lightly. As a general rule, the more spawn you add, the faster the substrate will be colonised (with 1 litre of spawn, we inoculated about 10 bags - you could inoculate more). Restrict the opening of the bag by placing a rubber band (or cord) around the bag's neck. Taking a small piece of cotton wool, plug the bag's opening to reduce the chances of contamination and insect infestation. Leave to incubate.

Step 6: Encourage Colonisation

Once inoculated, the bags should be left to incubate. During this time the spawn "runs" (mycelium spreads) throughout the straw. The spawn run will be complete when the mycelium has spread entirely throughout the bag (the straw is then fully colonised).

Depending on the mushroom variety, humidity and temperature, this process should take between 1 to 3 weeks.

Pleurotus ostreatus (winter), 24°C (75°F) 2 to 3 weeks

Pleurotus pulmonarius (summer), 24°C to 30°C (75 to 85°F) 1 to 2 weeks

During incubation, light is not required, however, make sure the bags have plenty of fresh air.

Step 7: Monitor Bags

It is important to monitor the bags for any sign of unwanted moulds and pests. While the straw is still in the bags, you shouldn't have a problem with insects or mice. However, the best policy for fighting both contamination and

infestation, is prevention. You may want to spray some surfaces to deter flies and other insects from setting up home, mesh any windows and keep doors closed. Regularly check bags for any mould contamination and remove any infected bags from the growing area. Black mould found within the straw may indicate ineffective sterilisation. You may also notice sprouting straw and the appearance of unwanted mushrooms such as the ink cap (see pictures). Green moulds are common and can be caused by contaminated spawn (ineffective grain sterilisation), high moisture / low spawn levels and ineffective straw sterilisation. At this early stage, it is better to simply remove infected bags, as you want to prevent its spread. Up to a 10% loss due to contamination is generally regarded as acceptable. Finally, as the bags become fully colonised, the initial stages of fruiting (or pinning) may beseen.

Step 8: Encourage Pinning

Once pinning has started, it is time to remove the substrate from the bags. Pinning naturally occurs as humidity increases, low levels of light appear and temperature levels fall. Increase the growing room humidity by regularly spraying with a water sprayer (avoid spraying directly on the mushrooms). You can also wet the floor and leave open containers of water in the room (95-100% humidity is recommended). As our climate is very dry, we only managed 60% at best, dropping down to 40%, by spraying 5 litres of water 2 - 3 times a day (even at these humidity levels a good result can be achieved). To prevent excessive CO2 levels, allow the growing area to flush with clean air before spraying. If you can, regulate the temperature accordingly.

Pleurotus ostreatus (winter), 10-15°C (50-60°F)

Pleurotus pulmonarius (summer), 10-24°C to 30°C (50-75°F)

You may notice an initial drying out of early stage pinning, as you remove the plastic. As you maintain the humidity levels this will regenerate. Keep a close eye on flies and spray when needed. If any mould is found, either remove the infected straw or the entire mound from the growing area.

Step 9: Harvesting

As the mushrooms begin fruiting, it is important to keep the humidity high (85-90% is recommended). As before, allow air to flush through the growing area prior to spraying (oyster mushrooms require a consistent source of fresh air). Temperatures can now be higher than for the initial pinning stage.

Pleurotus ostreatus (winter), 10°C to 20°C (~50°F to 70°F)

Pleurotus pulmonarius (summer), 16°C to 28°C (~60°F to 80°F)

Remember to constantly monitor for pests, such as flies and mice, as they can quickly ruin a crop. You should expect three or more crops, each taking arounda

week or so to mature. You may harvest the mushrooms at any size, however, once a mushroom has reached its full size, you will notice it will begin to dry, turning a yellowish colour (they taste great, even dry). When harvesting, remove the mushroom completely, by twisting firmly at its base. After harvesting a few crops, we found it helpful to stack the mounds of straw, which seemed to help increase the yield. If you find your mushrooms with long stalks and small caps, they may not be getting enough light, also high CO2 levels can also lead to small deformities (allow for more fresh air). After the straw ceases to produce mushrooms, it can be fed to livestock or composted.Now, finally take your harvested mushrooms

Preparation Of Mushroom Pakoda:

Ingredients

1 cup besan / gram flour
¼ cup rice flour
½ tsp kashmiri red chilli powder / lal mirch powder
pinch of baking soda
½ tsp chaat masala
¼ tsp ajwain / caraway
pinch of hing / asafoetida
½ tsp ginger garlic pastesalt to taste
½ cup water

Recipe:

firstly, in a large mixing bowl take 1 cup besan and ¼ cup rice flour.
also add ½ tsp chilli powder, ½ tsp chaat masala, ¼ tsp ajwain, ½ tsp ginger garlic paste, pinch of hing and ½ tsp salt.
add in ½ cup water and whisk smooth.
make a smooth batter without forming any lumps.
also add a pinch of baking soda and mix gently. do not over mix as baking soda will loose its property.
make sure the batter is flowing consistency.
dip the small mushroom into prepared besan batter and coat it completely.
furthermore, deep fry in hot oil.
also stir occasionally and fry on both sides.
further, fry the mushroom till they turn golden brown.
finally, mushroom pakoda recipe is ready to serve.

Preparation Of Pickle:

Ingredients:

Mushrooms - number.
→ Oil - 1/2 cup.
→ Turmeric powder - 1/4 tea spoon.
→ Sesame seeds powder - 1 tea spoon.
→ Mustard seeds powder - 1 tea spoon.
→ Red chilly powder - 1 tablespoon.
→ Salt - to taste.
→ Lime juice - 2 tablespoons.

Racipe:

Cut mushrooms into 2 pieces and keep aside.
Heat oil in a pan and add mushrooms and remove from flame and keep aside.
When mushroom colour change add turmeric powder, sesame seeds powder, mustard seeds powder, red chilly powder, salt, lime juice and mix nicely.
Transfer into a container and stored in refrigerator or outside for 1 week or 10 days.
Now Mushroom Pickle is ready to serve.

Below are the survey of Mushroom Awareness of 100 people's of all age group.

Questionnaire:

Here are some question related to the Mushroom Awareness for common day to day routing.

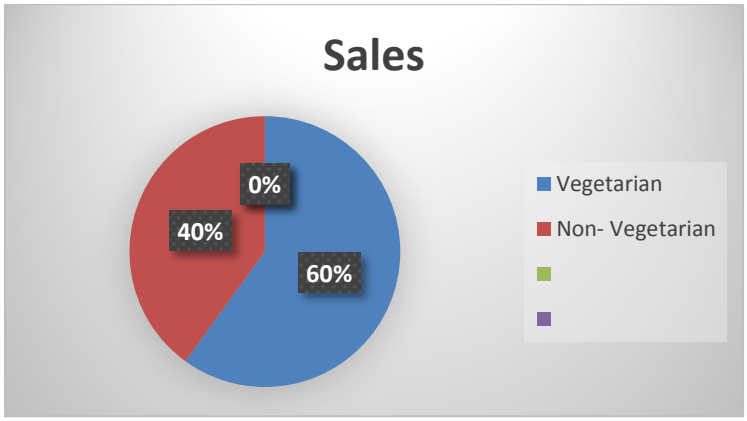
1. Name:
2. Age:
3. Sex:
4. Educational Qualification:
5. Diet style:Vegetarian/Non Vegetarian
6. Family Orientation: Cultural/ Modern/Cosmopolitan
7. Family Type: Common/Nuclear/separated due to both are working
8. Family background: Civilian/ Army/Mixed
9. Diet style of the family: Vegetarian/ Non vegetarian/ Eggetarian.
10. Do you wish to know about different king of foods? Yes/No
11. Do you like to cook or eat different kings of food items? Yes/No
12. Have you heard about mushroom?

13. Have consumed it
14. If no, Say something why don't like mushroom?
15. Any other information you wish to tell?

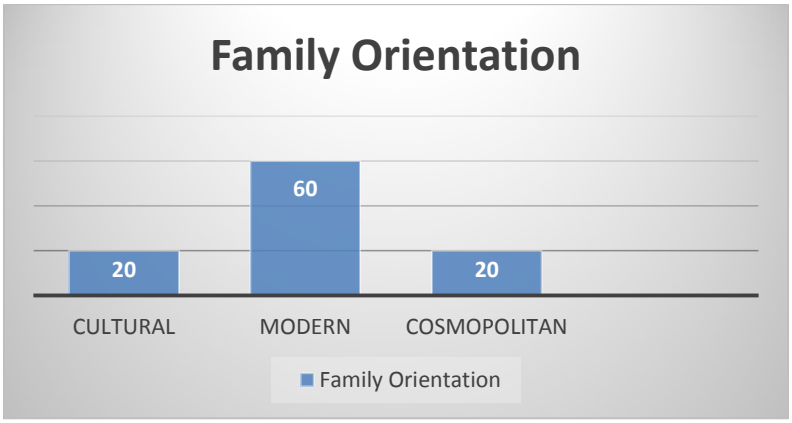
Result:-

Some are the analysis of the Mushroom used in daily lifestyle. And the observation shared below are the analysis report about the Mushroom Awareness Questionnaire.

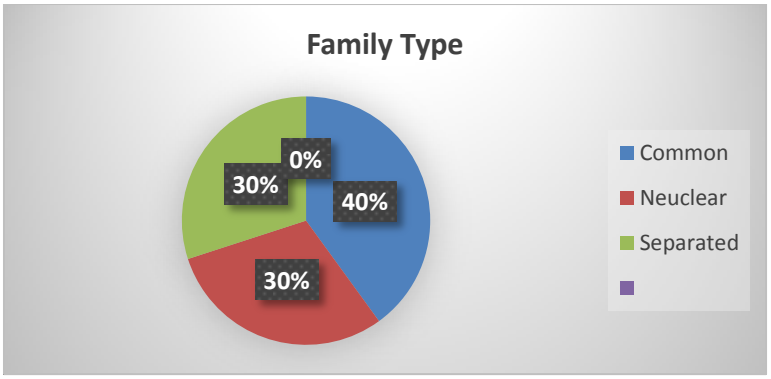
- Q.1. Diet Style: Vegetarian/ Non-Vegetarian.



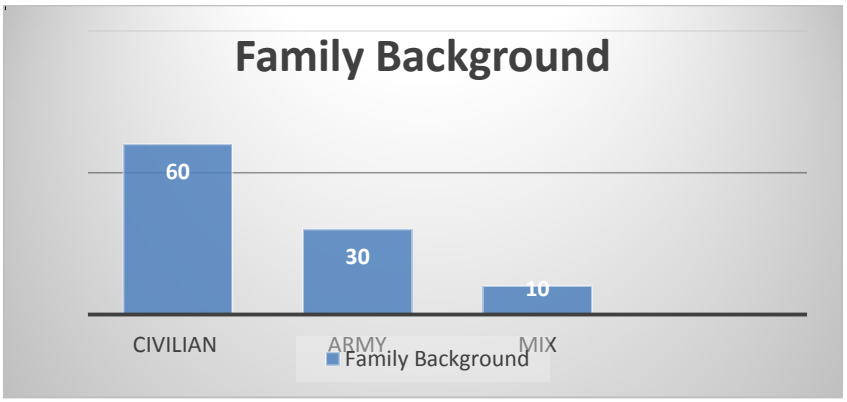
- Q.2. Family Orientation: Cultural/ Modern/ Cosmopolitan.



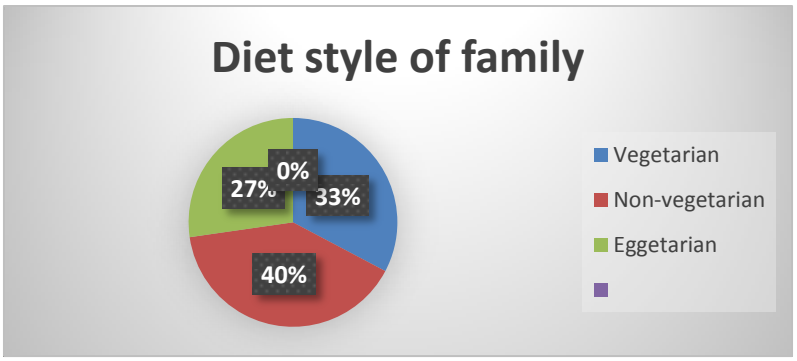
- Q.3. Family type: Common/ Nuclear/ Separated.



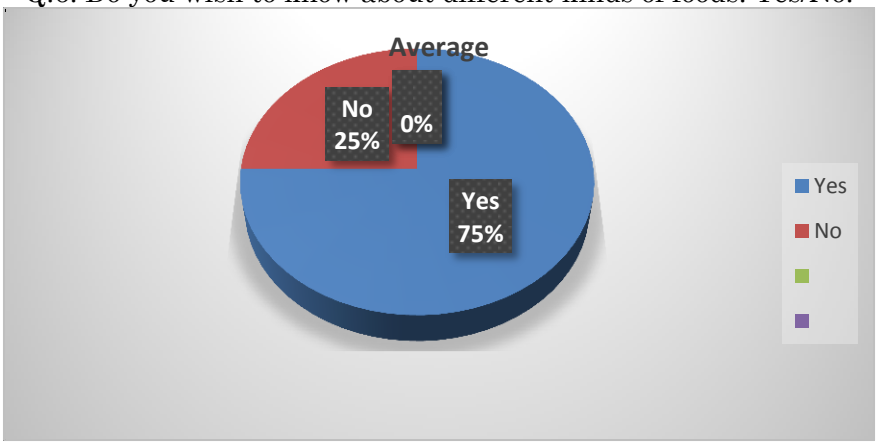
- Q.4. Family background: Civilian/Army/Mixed.



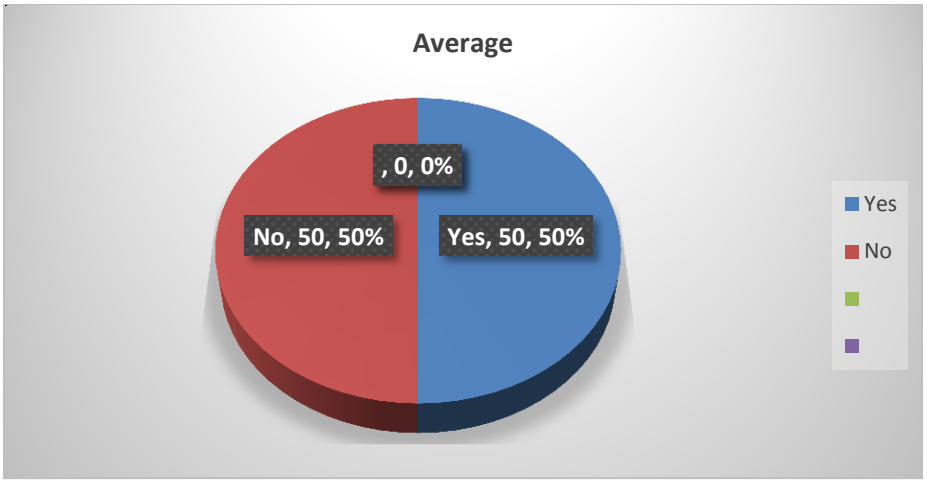
- Q.5. Diet style of family: Vegetarian/ Non-Vegetarian/ Eggetarian.



- Q.6. Do you wish to know about different kinds of foods: Yes/No.



- Q.7. Do you like to cook or eat different kinds of food items: Yes/No.



Conclusion:

About is the detail analysis and uses of Mushroom. Pleurotus Mushroom is a health food used in regular meal and it provides protein in body. Pakoda and Pickle are delicious in taste and its colours are also bright. The new try of Pleurotus Mushroom was nice to work and had good taste.

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AN ANALYSIS ON SUSTAINABLE DEVELOPMENT

A. Sarlin Venotha[1] Dr.S. Mariadoss[2]
[1]Assistant Professor, Department of Commerce, St. Joseph's College (Autonomous), Trichy-2. Affiliated to Bharathidasan University, Trichy.
[2]Assistant Professor, Department of Commerce, St. Xavier's College (Autonomous), Tirunelveli.
Affiliated to Manonmaniam Sundaranar University, Tirunelveli.
***Corresponding Author*- A. Sarlin Venotha**
Email- sarlinvenotha@gmail.com
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Abstract
The first mention of sustainable development was made at the 1992 Rio de Janeiro United Nations Conference on Environment and Development. As long as humans exist, action must be sustainable. We are all aware of the scarcity of resources on Earth. We will finally run out of these resources if we keep utilising them all. Many resources are nearing their end of life. Business Standard (2015) reported that if we keep using resources at the same pace, we will run out of natural gas in 54 years, oil in 53 years, and coal in 110 years. We need to consider what we should do next. To achieve it, all nations must cooperate. For us to attain Sustainable Development, digitalization is also crucial. Because resources are limited, we must use them intelligently, which is where digitization comes in. In this essay, we will briefly outline the primary obstacles we must overcome and what results in we can expect if we are successful. Economically speaking, losing all those resources mostly hurts developing nations like India. How does sustainable development advance our development? We strive for a new form of energy and something else that will produce numerous new items that will stimulate the economy. When innovation occurs, the Schumpeter innovation model also holds. This study investigates all potential strategies for sustainable development.

Key Word: *Inclusive Development, Environmental Degradation, Globalization, Intellectual Property Rights.*

Introduction

At the United Nations Conference on Environment in Stockholm (1972), Indian Prime Minister Mrs Indira Gandhi emphasised the importance of eradicating poverty as part of a global environmental strategy. It is impossible to confine the ideas of interconnectedness, a shared planet, global citizenship, and spaceship earth to just ecological concerns. They apply equally to the joint and connected duties of promoting human growth and environmental protection. (History has produced enormous inequities that have resulted in one-fifth of the world's population living below the poverty line and nearly three-fourths of the people living in less developed and developing nations. It is impossible to wish away the long-term effects of previous industrialization, exploitation, and environmental harm. It is only fitting that progress in this new century is more aware of its long-term consequences, taking a page from the history of the post-industrial revolution. The choices are challenging, and the challenges are complex. Our shared future can only be realised with a deeper comprehension of our shared issues and obligations. It is primarily from the developing and least developed countries that we speak about human development and eradicating poverty from the planet. Only China and India contain more than fifty percent of the poor. So, despite having an

international component, ending poverty is a national issue.

The primary causes of the water crisis include rising demand, unequal distribution across zones, a lack of moral guidelines for use, limited knowledge and resources, significant land use changes, a steady reduction in water levels, and an rise in salinity and pollution. India's land used for agriculture is subject to a wide range of climate and meteorological conditions. Approximately 228 MHA of land, or nearly 69 percent of the country's total area, is dry and rain-fed. It falls within 142 MHA (68 percent of the cultivated area).

History of sustainable development

However, the history of the idea of sustainability is far older. Aristotle referred to a Greek statement in his discussion of household economics as early as 400 BCE. Greek households were different from modern ones in that they had to be, at least in part, self-sufficient and could not only be consumer-oriented. The idea of continuation and potential growth comes first and is connected with being used for by still a lot of wind. As regards terminology, use the phrase "old forestry you acquire from harvesting which is supported" rather than a translation of the German word "nachhaltiger Ertrag" from 1713 that goes back one after the other. However, by a different source, forestry was already enhanced between the 12th and 16th centuries with the addition of a persistent concept and playback of a sense of equilibrium while consuming the resource. The American government began its history with the concept of continuous evolution from the citizen's behaviour (N.E.P.A.) of environmental policy in 1969. Santa Babaraoiru's influence and his pouring of the wild living things caused this behaviour, which is out of character for the area that serves as his natural habitat. However, it was also the result of increased cultural awareness of the effects of industrial pollution, which was fostered by Rachael Carson's 1962 book Silent Spring. The National Wilderness Preservation System was established at about the same time as the Clean Water Act and the Water Quality Act, which were all products of the same movement for increased environmental awareness. The Environmental Protection Agency (E.P.A.) was established in 1970, shortly after N.E.P.A. was passed, and it promotes environmental protection through research, standard-setting, and monitoring. The E.P.A.'s objectives included safeguarding both natural resources and human health.

The 1972 United Nations Conference on the Human Environment held in Stockholm, Sweden, was the next milestone in the spread of sustainable development as a mainstream idea and practice. At this meeting, a developing nation with industrialization and the slogan "being healthy, together you shape the contour of the right of the human family to produce environment" was present. For instance, a similar assembly kept happening after it. When the character that led to the compilation of the complete facility inside the United Nations system has been attached is recognised, the bond between humanity is made to reanimate. (Here, as for us, it can transfer to international from the citizen's focuses.) This culminated in the release of "Our Common Future" by the Bruntland Report in 1987, which defined a suggested course for sustainable development worldwide and worked to elevate the idea of sustainability on a global scale.

When the first United Nations Conference on Environment and Development was held in Rio de Janeiro in 1992, it represented a revolutionary milestone. Agenda 21, which "recognised each nation's right to seek social and economic growth and entrusted to States the responsibility of adopting a classical of sustainable development," was approved during this meeting. Agenda 21 is a "programme of action for a livable future for the human family and an initial step toward ensuring that the world will change into a more just, secure, and prosperous habitat for all humanity," according to the Secretary General of the U.N.C.E.D. The focus was broader than it

had been when the E.P.A. originally started. Working toward a world where all people have access to the natural resources necessary to survive was much more strongly emphasised.

The Kyoto Climate Agreement, signed in 1997, is another significant international agreement intended to direct the global community toward sustainable development, particularly environmental development. Its objective was to reduce emissions from signatories, with a focus on industrialised nations that are primarily accountable for air pollution and the effects that result from it. It should be emphasised that the United States is the only developed nation and one of just two overall that has not ratified this agreement (the other being South Sudan).

Objectives of the study

The critical goals of the current investigation are listed below.

1. To research sustainable development as a concept.
2. Investigate the environmental economics perspective and the economic aspect of sustainable development in general.
3. To review the sustainable development indicators.

Concept of sustainable development in Economic Perspective

A more contemporary development theory is the idea of sustainable development. This development theory was advanced in the 20th century. It is an interdisciplinary, multi-dimensional, and multi-perspective notion. According to Van Den Bergh (1996)1, the notional perspectives on sustainability include Neo-classical economic equilibrium, Evolutionary, economic, socio-cultural, and human ecology. Similarly, sustainable development is an interdisciplinary term involving natural and social disciplines, including geography, economics, botany, zoology, engineering, and sociology. Thus, the greenhouse effect, climate change, ozone depletion, and atmospheric acidification are the only signs of unsustainability. Toxic pollution, deforestation, biological species extinction, land degradation, desertification, urban air pollution, and solid waste are all examples of environmental problems.

From an economic standpoint, the idea of sustainable development examines the economic or environmental element. It is essential to think about the definition of this term solely from the perspective of the financial aspect of sustainable development because that is the subject of the current article. The following vital definitions of sustainable development will help you better understand what it means from an economic standpoint. "Our standard definition of Sustainable development will be non-declining per capita utility – because of its evident appeal as a criterion for inter-governmental equity."- JohnPezzey "Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concepts of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given, and the idea of limitations imposed by the state of technology and social organization on the environments ability to meet present and future needs."- The Brundtland Report "Sustainable development-development that is likely to achieve lasting satisfaction of human needs and improvement of the quality of human life."- Robert Allen (How to save the world) "We summarize the necessary conditions for sustainable development as the constancy of the natural capital stock. More strictly the requirements for non–negative change in the stock of natural resources such as soil and soil quality, ground surface waters and their quality, land biomass and the waste assimilations capacity of receiving environment."- David Pearce, Edward Bar bier, Anil Markandya.

There are three essential components of sustainable development: economic, social and environmental. The financial element of sustainability requires that societies pursue growth paths that generate an

optional flow of income while maintaining their stock of artificial, human, and natural capital. It also requires internalizing all costs, including the environmental costs associated with production and consumption. These primary goals of an economic system comprise increasing the production of goods and services, satisfying basic needs or reducing poverty, and improving equity. The social length of sustainable development is built on the identical principles of justice and equity. Wealth, resources, and the opportunity should be equitably shared for a development path to be sustainable over a long period. All citizens should have access to minimum security standards, human rights and social benefits such as food, health, education, shelter and opportunities for self-development. Social fairness implies equal opportunities to all for education and for making productive contributions effectual sink function, to resource use, and maintenance of stock natural capital.

Indicators of Sustainable Development

Sustainable development is a modern broader, and more vital concept of development. Hence its measurement is so much crucial for practical applicability and significance. Therefore, indicators of sustainable development have been developed at individual levels.

The United Nations Department for Policy coordination and sustainable development (U.N.D.P.C.S.D.) provided a list of indicators for economic aspects of sustainable development in 1997. It consists of

1. G.D.P. per capita
2. Net Investment Share in G.D.P.
3. Sum of exports and imports as a percentage of G.D.P.
4. Environmentally adjusted net domestic product (EDP)
5. Share of manufactured goods in total merchandise exports
6. Annual energy consumption
7. Share of natural resource-intensive industries in manufacturing value added
8. Proven mineral reserves
9. Prove fossil fuel energy reserves
10. A lifetime of proven energy reserves
11. The intensity of material use
12. Share of manufacturing value added in G.D.P.
13. Share of consumption of renewable energy resources
14. Net resource transfer/G.N.P.
15. Total ODA was given or received as a percentage of G.N.P. dept service /export xvii) Environmental protection expenditure as a percentage of G.D.P.
16. Amount of new or additional funding for S.D.
17. Capital goods imports

In addition to these, Prof. Barthwal of I.I.T., Kanpur, has proposed additional critical sustainability indicators, including the GDP growth rate, population stability, Human Resource Development Index, Clean Air Index, Energy Intensity, Renewable Energy Proportion, Material Intensity, Water Use, Soil Degradation, Forest Cover, Recycling Proportions, Transport Intensity Proportion of Urban Population, Access to Sewage and Water Facilities, Government Allocation for Environment Herman Daly has outlined a few sustainable development tenets. The human population should be kept to a level that does not exceed the environment's carrying capacity. Technology should be developed to increase efficiency rather than output. The rate at which renewable resources are harvested and replenished should not exceed that at which nonrenewable resources are used up. The same goes for Ralph Rookwood, who outlined ten broad "Rules of Conduct for Sustainable Growth." Any strategy for development must prioritise the growth and use of human resources as well as the overall betterment of peoples' lives.

The genuine difficulties with sustainable development

Despite numerous obstacles, the United Nations deliberations in New York on the post-2015 development agenda nearly resulted in a political declaration. All of these will be adopted at the U.N. Summit on September 25–27, 2015, titled "Delivering on and implementing a

Transformative Post–2015 Development Agenda," which will also feature a broader framework based on the agenda. The primary global obstacles to sustainable development are unemployment, poverty and exclusion, climate change, war and humanitarian assistance, creating inclusive and peaceful societies, fortifying institutions of governance, and promoting the rule of law. While accepting the United Nations Framework Convention on Climate Change, the Open Working Group of the United Nations has recommended the following objectives for its Sustainable Development Goals (SDGs), some of which include explicit deadlines: Abolishing extreme poverty for all people worldwide by 2030 is currently defined as people making less than $1.25 per day, ending all forms of poverty worldwide. By 2030, we want to eradicate hunger, achieve food security, increase nutrition, and advance sustainable agriculture.E nsuring accessible and equitable high-quality education and fostering possibilities for lifelong learning for everyone by 2030. By 2030, all people will have access to and benefit from sustainable water and sanitation management By 2030, reduce global and intra-country inequality Making inclusive, secure, robust, and sustainable cities and human settlements by 2030 ensuring sustainable patterns of production and consumption taking swift action to halt and mitigate climate change and its effects through increased resilience and capacity for natural disasters and hazards related to climate change in all nationsOcean, sea, and marine resource conservation and sustainable use for sustainable development by 2025 By 2020, we want to protect, restore, and promote the sustainable use of terrestrial ecosystems, manage forests sustainably, stop desertification, and stop and reverse land degradation and biodiversity loss. Ensuring that everyone has access to justice and encouraging inclusive, effective institutions at all levels

The aforementioned has given rise to several different arguments. Charles Gore, a member of the U.N. Experts Group for the U.N. Millennium Project, has observed that the conversion of the Millennium Development Goals (M.D.G.s) to Sustainable Development Goals (S.D.G.s) has resulted in the narrowing of these more expansive goals into national objectives, which could harm the accomplishment of the S.D.G.s that involve policy debates, universality issues, the benefits of a partnership approach, the principle of joint and Reducing inequality should be acknowledged as a guiding concept for the post-2015 agenda around which the SDGs may be incorporated, according to the Secretary-report General on managing the transition from the MDGs to SDGs.

Several developed nations have questioned the validity of the concepts of universality but with differentiation (UBWD) and common but differentiated responsibility (CBDR). Most civil society organisations have consistently questioned the private sector's crucial role, and this point of dispute persists. One concerned country is Brazil, which claims that "an excessive emphasis on partnerships undermines the primary duty of States while overplaying the role of the private sector." Brazil also encourages sustainable management of natural resource bases and wants the industrialised world to lead in sustainable consumption and production practices. It seems that when making domestic plans for their countries, the industrialised nations must consider the universal nature of goals. Brazil also contends that the political declaration calls for leaders to reaffirm their support for institutions of global governance that are more legitimate and representative and are better equipped to deal with the escalating complexity of the modern world. The Group of 77 and China, as well as the Least Developed Countries (LDCs), Small Island Developing States (SIDS), and the African Group, on the other hand, vehemently oppose the SDG document's acceptance along with the political declaration's goals and objectives. The G-77 wants a proclamation that "promotes capacities and conditions for growth among countries, guided by the Rio

principles of Common but Differentiated Responsibility. The group feels that to achieve global sustainable development; the declaration must underline the necessity of fundamental changes in how societies produce and consume.

India's place

India aspires to uphold the recently embraced ideals and ideologies of member states. The nation does not want to revise the Rio+20 consensus since it is crucial that the notion of "shared but differentiated responsibility" be fully acknowledged. Regardless of ideological support, it is not comforting to see how much of India's natural resource wealth is being used compared to what it has. Even as India struggles to cope with the global financial crisis, the Global Footprint Network remarked on this widening natural capital imbalance.

Only China and the United States currently consume more bio-capacity than the nation. According to Jamshyd N Godrej, the former chairman of the CII Sohrabji Godrej Green Business Centre, "India is squandering its natural assets in support of its current economic boom and the development of its population." This implies that business and government intervention is required to halt this dangerous trend and guarantee a sustainable future in which India will maintain its economic competitiveness and its citizens will be able to lead fulfilling lives.

India consumes a large portion of the world's bio-capacity, yet its per-capita ecological footprint, at 0.8 global hectares, is far smaller than the worldwide average of 2.2 global hectares and much lower than that of many other nations. Many Indians' ecological footprints may need to expand to provide enough food, shelter, electricity, sanitization, healthcare, and material things. By 2050, India's population is anticipated to grow to 1.7 billion, according to the United Nations. In such circumstances, even if the nation's existing per-capita levels of resource consumption remain the same, it is likely to confront a growing ecological deficit. Therefore, corporate and government leaders must seek to conserve the natural capital on which India's economy and all human existence depend for Indian society to continue developing in an increasingly resource-constrained global environment. The interests and way of life of the poor and tribal people, who rely heavily on access to shared resources like forests, water bodies, and grazing grounds, are shamefully disregarded in national and international SDG debates. We must allow pollution and the pursuit of unrestrained private profit to threaten the commons, which these sections frequently rely on for survival. Before India can confidently lead the developing world and the BRIC bloc in SDG discussions and other negotiations, it must first take care of its own house.

It's vital to remember that Foreign Service officers typically represent our nation in negotiations and have a limited understanding of intricate ecological and environmental issues. They are frequently transferred before understanding the problems at hand. Experts and environmentalists who are more knowledgeable about the subject and skilled negotiators than civil service employees might be a better choice. Brazil has demonstrated superior foresight and comprehension of the S.D.G.-related difficulties compared to India and has offered some wise recommendations. As a result, Brazil has achieved a level of leadership that India ought to have matched. India might have made the case that human growth and sustainability don't have to be mutually exclusive but may work in harmony. For instance, in the Human Development Index 2011, a common evaluation framework was created by combining development indices such as those for education, health, gender justice, and economic standards of living with the ecological footprint calculation. India may lead by incorporating this framework into its plans and programmes because it has the potential to assist as a model for other countries to adopt. The argument that it is difficult to assess and correlate sustainability and human growth or that they are basically

incompatible with one another is no longer valid. Because it has been able to combine these indices, Costa Rica, a small nation in Latin America, boasts some of the happiest and healthiest citizens in the world. According to numerous studies and reports—the most current being the UN's Global Happiness Report—it has thus produced a flourishing, joyful, and fulfilled community.

Sustainability and digitalization

Taking into account the development of new digital technologies, we can see that they have the potential to alter every area of sustainability fundamentally.

Environment

The advent of the Internet of Everything (connected people and objects) will produce enormous volumes of data that, when analysed and visualised, will help us better understand how we interact with one another, businesses, and our surroundings. By unlocking these insights, we can find patterns for more sustainable behaviour, such as:

Improving natural disaster or event predictions

Optimizing global agricultural production and food supply; predicting traffic jams and managing low-emission zones; capping energy production at the precise needs of consumers; identifying defects in, or impending failure of, particular product components; and enabling preventative maintenance that prevents loss and more expensive repair/replacement.

The delivery of such a linked world and the generated data management will strain the environment, but the careful implementation of so-called "Green)T" solutions like virtualization, effective hardware, free air-cooled data centres, etc., will help ensure minimal damage.

Economic

Most of the time, adopting sustainable business practices will result in decreased waste, reduced energy use, and time savings. Additional impacts for large organisations actively participating include: Customers who are driven by environmental concerns are drawn to them. They reduce the adverse effects on the "bottom line" of environmental taxes and the rising cost of energy. With solutions typically becoming commodities thanks to commercial approaches driven by consumer mentalities of availability anywhere, anytime, and "only pay for what you use," investing in new technologies and sustainable business processes does not have to be prohibitively expensive. This is because of the "Cloud" approach to)T service provision.

Social

This is the area where the digital revolution will alter the rules of the game, opening the door to a new social structure built on sharing, a fundamental tenet of sustainable thought. With the help of new economic models, we can give you access to free or freemium services, which are very helpful for developing new forms of collaboration. Ad hoc social networks will help the sharing economy flourish, fueling the expansion of the already existing car sharing and apartment renting markets. It's interesting to see how Blablacar, the industry leader in car sharing, emphasises the advantages of its services for the environment while simultaneously positioning them as a "new strategy for travelling together." Crowdfunding will help ethical projects because there is typically little money available for up-front investments; while trust is required, sustainability is usually a world of faith. Mobility can increase accessibility and connectivity, but it also offers many more long-term advantages by supplying contextual information that enables the best choice at the right time. Users can benefit from intelligent service delivery at the proper place and time and schedule optimization. Smart Cities are a practical approach to managing a city and reducing its environmental impact. They are strengthened by mobility, social networks, and connected items. Additionally, it ushers in a new era of civic engagement.

As work becomes more collaborative, adaptable, and agile, Industry 4.0 will undoubtedly be a breakthrough in bringing environmental advantages to the industry and its supply chain. It will also be a significant step towards the "reinvention of work. With

work increasingly becoming a thing we do rather than a location we attend, the workplace will adapt to unique and changing demands. Finally, the digital revolution offers developing nations a chance to advance over the limitations typical in the "legacy burdened" old world. But there is a more profound concern: "How can we ensure they don't repeat the same mistakes the leading nations did during the first industrial revolution?"

Suggestions

The advice below will help achieve India's objective of sustainable development.

1.Economic strategies, especially the 12th Five Year Plan, should prioritise sustainable development.

2.India's economic policy should place a high premium on sustainable development.

3.India should implement a plan to establish, maintain, and promote sustainable economic growth.

4.The manufacturing sector, which is underutilized and unreliable and requires proper attention, as well as the secondary sector in general, should be given the attention they need to achieve sustainable development.

5.To support the development of the present and future generations, it is vital to establish an appropriate investment plan that will give actual investment rather than financial investment in the economy.

6.Additionally, this will lessen our reliance on importing capital goods from outside. India has the chance to take advantage of and use international commerce as a tool for economic expansion.

7.To achieve the goal of sustainable development, budgets at all levels of government must give environmental protection the attention it deserves.

8.Through legislative actions, it is critical to restrain urbanization and population expansion at the macro level.

9.Address the issue of poverty, which is a significant barrier to attaining sustainable development, requires due diligence and honesty.

10.Giving underprivileged strata of women and children access to education, health and medical care, and a nutritious diet should be a priority.

11.A road map for India's sustainable development can be found in the above direction.

Conclusion

There have been issues with sustainability for more than ten years. The economic crisis won't end tomorrow, and as we go into a period of slower growth, financing investments in sustainability will become more challenging than ever. The necessity of these expenditures is now evident in light of the numerous global ecological catastrophes. This is why we proposed two years ago to intimately couple Sustainability and Economy when promoting Economic Sustainability, which has become affordable thanks to the third digital revolution as a by-product of the digitalization of Society and Business. This was in addition to the actions derived from our Corporate Sustainability Program. Both digitalization and sustainability are crucial for the future of humanity. Sustainable development is made possible through digitization.

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GIS-BASED SUITABILITY ANALYSIS FOR SITING SOLAR POWER PLANTS IN SALEM DISTRICT, TAMIL NADU, INDIA

Abirami M[1], Latha S[2], Jeevananthan R[3]
[1,2,3]Department of Geography, Bharathidasan University, Tiruchirappalli.
Corresponding Authors: **Abirami M**
Email- abiramimohan30@gmail.com
DOI- 10.5281/zenodo.7057099

Abstract

Solar energy is one of the sustainable and cleanest ways to produce power, and humans can harness it to generate power for day-to-day activities without producing harmful pollutants. Green electricity can become the cheapest form of energy by 2050, and in the long-term supply up to three-quarters of all demand. The installation of a solar power plant will help to satisfy the power demands of the consumers at a cheaper cost. Hence, this study will evidently show the precise location to gather the utmost solar radiation in Salem district, Tamil Nadu. The methodology involves the usage of OSM (Open Series Map) SOI (Survey of India) toposheets to create buffer analysis from roads and streams; Landsat 8 satellite data was used to create a land use/land cover map of the study area. Solar radiation and NDVI maps were created using MODIS data and the Global horizontal irradiance data were obtained from Global Solar Atlas. The final Site Suitability map was made by organizing all the criteria based on the AHP (Analytic Hierarchy Process) of the MCDM (Multi-Criteria Decision-Making) method. The GIS and statistical techniques aid in finding the ideal suitable site for installing a solar power plant in the study area.

Keyword:- *Solar Radiation, Sustainable, Site Suitability, Solar Power Plants, GIS.*

Introduction

Renewable energy sources represent a viable alternative to meet the increasing demand for energy in the future (Colak, Ebru, Memisoglu, Tugba, Gercek, Yasin. 2020). Renewable energy accounted for 26.2% of global electricity generation in 2018, which is expected to grow to 45% by 2040, making renewable energy the fastest-growing source of electricity (Global Energy Institute 2021). When compared to other sources, solar energy is among the most inexpensive, reliable, and available energies (Ahmet Koc, Seda Turk, Gokhan Şahin, 2019). Green electricity can become the cheapest form of energy by 2050, and in the long-term supply up to three-quarters of all demand (Economic Times 2022).

The GIS has great potential in planning and implementing solar PV systems, due to its capabilities in terms of capturing, handling, modeling, analyzing, and visualizing spatial data (Resch., Bernd., Sagl., Günther., Törnros., Tobias., Bachmaier., Andreas., Eggers., JanBleicke., Herkel., Sebastian., Narmsara., Sattaya., Gündra., Hartmut. 2014). Integration of GIS and MCDA is best suited for solving complex site selection problems and the combination of these two tools provides a more reliable decision for the most suitable site selection (Al Garni, H.Z., Awasthi, A. 2018). A study on Solar Energy Potential for Bumthang valley in central Bhutan has used geographic information systems (GIS) and Analytic Hierarchy Process

(AHP) (Tempa, U., Jai Govind Singh, Change, C., Thani,P. 2020). To manage multi-layered geographic data, regulate benchmark weight, and present the resulting product in an appropriate format, the combined use of GIS and MCDM techniques has provided significant benefits. (Marina. Giamalaki & Theocharis Tsoutsos 2019). Another study presents a GIS-based method for locating suitable sites for utility-scale wind and solar farms in Thailand's Songkhla Province (Shahid. Ali., Juntakean Taweekun., Kuaanan Techato., Waewsak, J., Gyawali, S. 2019). To determine the best suitable areas for solar power plants, AHP combined with a GIS tool is applied in the Ayranci region in Karaman, Turkey (Uyan, M. 2017).

The multi-criteria weight methodology has been used to rank land suitability evaluation for crop production in Morocco (Ennaji, W., Barakat, A., Baghdadi, M. 2018). A combination of GIS and the AHP has been used to identify the most suitable sites for PV system installations in southern England (Watson, Joss J.W., Hudson, Malcolm D., 2015), Tanzania (Aly, A., Jensen, S.S., Pedersen, A.B. 2017), Turkey (Tercan, E., Eymen, A., Urfalı, T., Saracoglu, B.O. 2021), West Africa (Yushchenko, A., de Bono, A., Chatenoux, B., Patel, M.K., Ray, N. 2018), and Morocco (Merrouni, A.A., Elalaoui, F.E., Mezrhab, A., Mezrhab, A., Ghennioui, A. 2018). A case study was performed for the Desert of Chihuahua, Mexico, a region with the potential to provide a significant portion of the country's energy demand, using the AHP method (Prieto-Amparán, J. A., Pinedo-Alvarez, A., Morales-Nieto, C. R., Valles-Aragón, M. C., Álvarez-Holguín, A., Villarreal-Guerrero, F. 2021). A study on the most suitable areas for solar-wind energy with case studies in four counties of Igdir: Tuzluca, Igdir Central, Karakoyunlu, and Aralik included the analysis of both qualitative and quantitative factors and the problems were solved by using a mapping technique and AHP method (Ahmet Koc, Seda Turk, Gokhan Şahin, 2019). Ruiz et al. (2020) applied reliable site-suitability assessment tools for solar power plants to account for protecting cultural, natural, and ecological conservation areas (Ruiz, H.S., Sunarso, A., Ibrahim-Bathis, K., Murti, S.A., Budiarto,I. 2020). Hence, in the present study, an attempt is made to analyze the suitable sites for the installation of solar power plants using GIS technologies, to acquire most of the solar energy to satisfy the electricity need to the maximum extent, in the Mayiladuthurai District.

Objectives

The aim of the study is to identify a suitable site for installing a solar power plant using GIS techniques in Salem, Tamil Nadu.

Study Area

Salem District is situated between 11 14' and 12 53' in North Latitude between 77 44' and 78 50' in East longitude and bounded on North by Dharmapuri District, South by Trichy and Namakkal District, East by Villupuram and Perambalur Districts and West by Erode District and Karnataka State. Salem district is divided into 4 Revenue Divisions (Attur, Mettur, Salem and Sankari) and 9 Taluks. The district comprises of one Municipal Corporation, 4 Municipalities, 33 Town Panchayats, and 30 Census towns. There are 585 Revenue Villages in the Salem district. The total area of Salem Districts is 5217.74 Sq.km. The estimated population of the study area was 34, 82 lakhs people as per the 2011 census. Salem district forms part of the upland plateau region of Tamil Nadu

with many hill ranges, hillocks and undulating terrain with a gentle slope towards east. Salem district has an average elevation of 278 m (912 ft). The climate of the Salem District is generally warm. The hottest period of the year is generally from the months of March to May. The highest temperature goes up to 39.8 C in the month of May (Salem District profile, 2018). The climate becomes cool from December to February when it touches a minimum of 16.7 C in the month of December. On average, the District receives an annual rainfall of 979.9 mm. The district is a part of Cauvery and Ponnaiar river basins and Sarabanga, Tirumanimuttar, Vasista and Suveda are the important watersheds/sub basins.

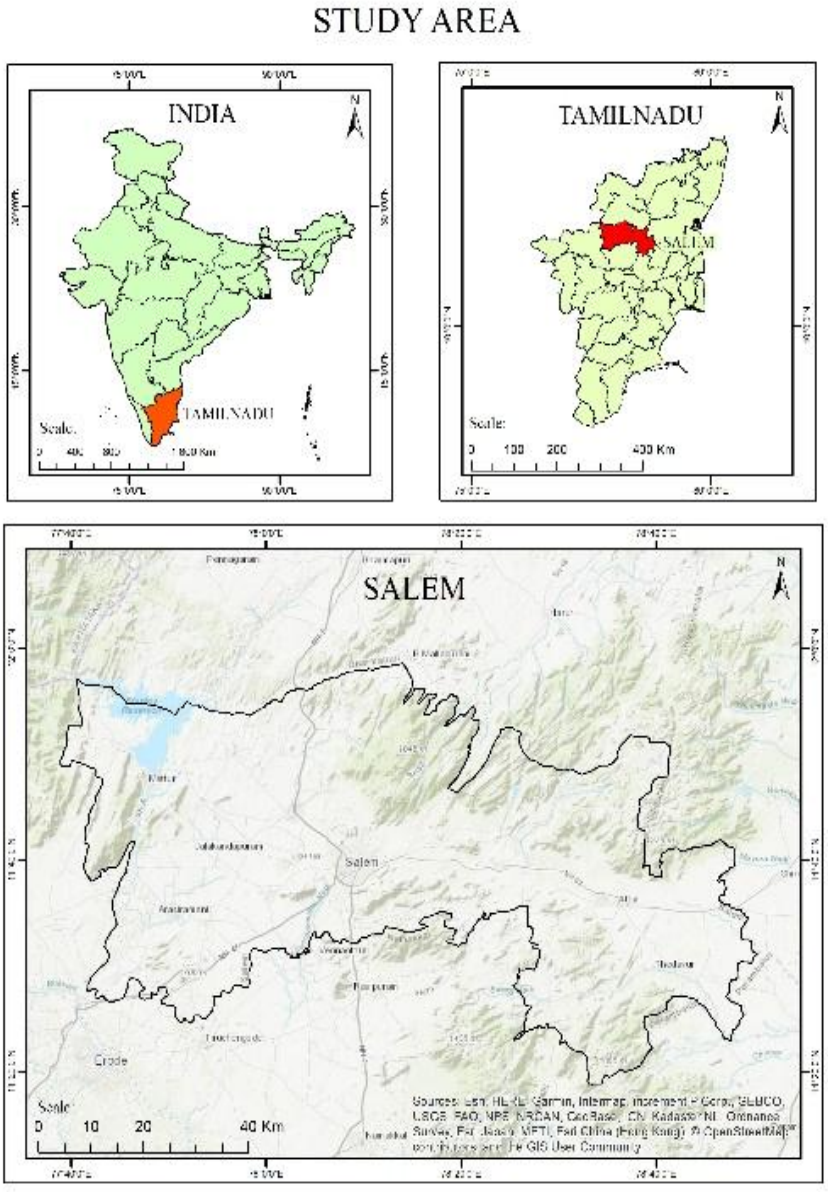

Fig. 1: Study Area

Data, Methodology, and Criteria

The secondary data sources used in this research work are- Landsat 8 satellite imagery, SRTM DEM data, WorldClim temperature data, MODIS data, Solargis GHI data, and GIS vector data in shape files, which include Proximity to roads, Proximity to settlements, Proximity to power transmission lines and Proximity to streams. The methodology is shown in Fig 2.

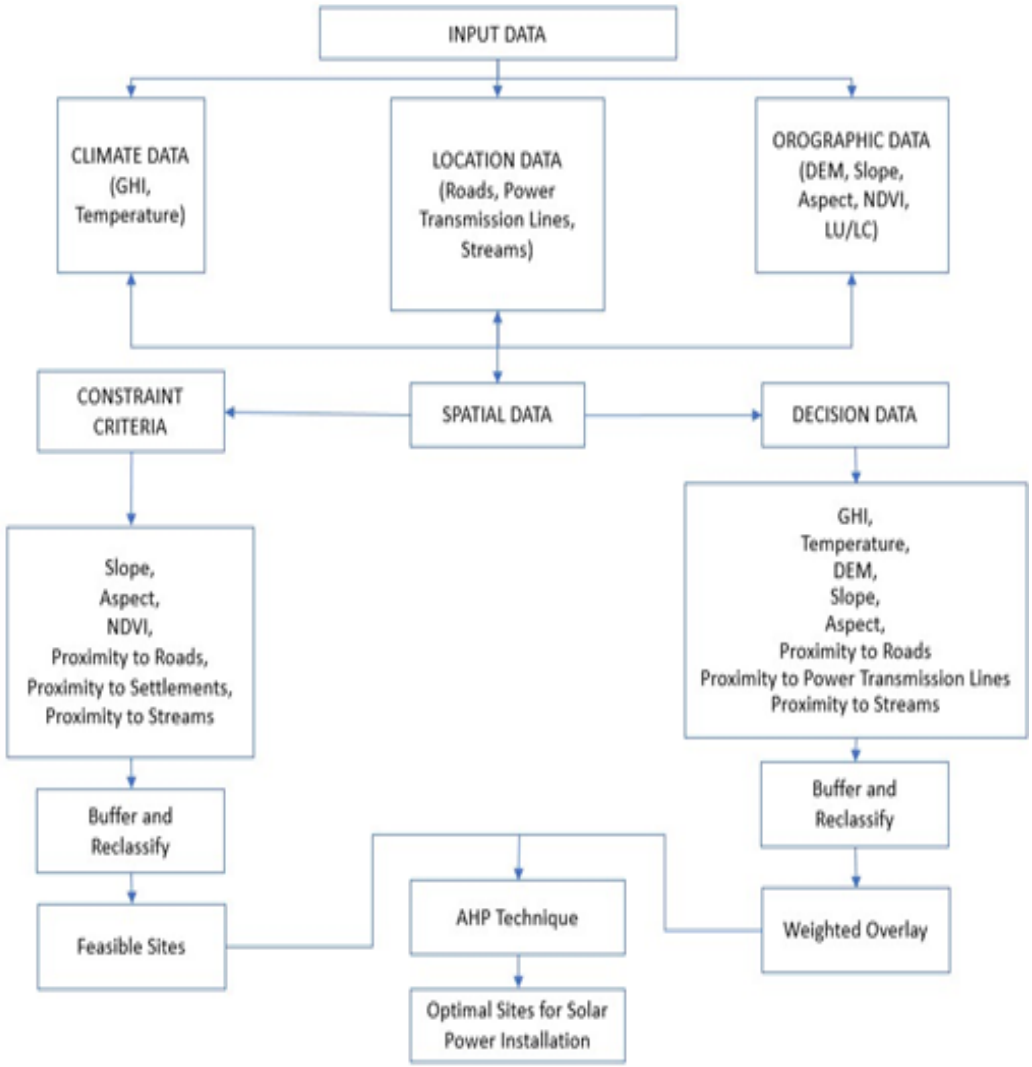

Fig. 2: Methodology

Parameters:

Digital Elevation Model (DEM)

Doljak and Stanojevic (Doljak, D., & Stanojevic, G. 2017) interpolated data about the annual average duration of sunshine, relative humidity, and air temperature data collected from 56 stations in Serbia for the period 1961-2010 by using Regression Kriging in SAGA GIS software with EU-DEM, geographic latitude, and longitude as predictors. For the present, SRTM DEM data was used to create the slope and aspect maps and is shown in Fig.3a. The average elevation of the study area is 278 m and the DEM classes (in m) identified are >1500, 1000 - 1500, 500 - 1000, 100 – 500 and <100.

Slope

The slope influences the solar radiation distribution on Earth's surface

and determines the potential for electric energy production (Cioban, Alina, Criveanu, Horia, Matei, Florica, Pop, Ioana, Rotaru, Ancuta, 2013). The local shadowing effects of the terrain due to land slope play a crucial role in modifying the distribution of solar irradiation (Pietras-Szewczyk, Małgorzata, 2017). Slope was a highly important factor, as some rows of panels situated on higher slopes would block or shadow others at lower elevations, thereby affecting system efficiency (Sánchez-Lozano, J.M., Teruel-Solano, J., Soto-Elvira, P.L., García-Cascales, M.S. 2013; McKinney, M. 2014; Guo, M., Zang, H., Gao, S., Chen, T., Xiao, J., Cheng, L., Sun, G. 2017). Only slopes under 5% were considered inclusive, whereas some studies did not exclude areas of steep slopes, only categorizing them (Sheikh, N., & Kocaoglu, D. 2011; Carrion, J., Estrella, A., Dols, F., Toro, M., Rodrıguez, M., & Ridao, A. 2008). South-facing slopes are considered the best for siting solar panels, as sun rays are better captured at this orientation, with minimal shading or shadowing (Miller, A., & Lumby, B. 2012).

In the present study, the slope classes (in%) identified are <5, 5 - 10, 10 - 20, 20 - 30, and >30 and as shown in (Fig.3b). As the lower slope angle helps in maximum harvest of the solar power plant, the area that falls under the slope of less than 5%, is highly suitable for the installation of solar panels in the study area

Aspect:

Aspect made up an important criterion as it determines the amount of solar energy received by the solar panels (Hassaan, M. A., Hassan, A., Al-Dashti, H. 2020). The aspect orientations facing South, Southwest, and Southeast are considered best for solar panels to be situated anywhere in the northern hemisphere (Hassaan, M. A., Hassan, A., Al-Dashti, H. 2020). In the present study, the aspect data that is derived from the DEM data is shown in Fig.3c. From the map, it could be observed that a suitable aspect orientation, required to capture a higher amount of solar radiation, is noticed.

Temperature

The available site is assessed using a unique and cohesive approach, including temperature as a parameter, to select the most appropriate locations for solar farm development in the Valencian Community, a Spanish region in the east of Spain (Inmaculada Guaita-Pradas., Inmaculada Marques-Perez., Aurea Gallego., Baldomero Segura 2019). The average temperature of the study area ranges from 26˚C to 30˚C and the month with the most sunshine is May (Average sunshine: 11.5h). The month with the least sunshine is November (Average sunshine: 5.7h). Approximately 1469.58 hours of sunshine are recorded in the study area throughout the year, on an average of 122.46 hours per month (en.climate-data.org, 2020). The distribution of temperature in the study area is shown in Fig.3d.

Global Horizontal Irradiance (GHI)

Solar energy is usually expressed in Global Horizontal Irradiance (GHI) referring to the total amount of shortwave radiation received from above by a surface horizontal to the ground (Vaisala, 2020). GHI includes both Direct Normal Irradiance (DNI) and Diffuse Horizontal Irradiance (DHF) (Vaisala, 2020).

The study area has an average solar irradiance of 5.58 kWh/m^2 (Vaisala, 2020). The GHI map (Fig.3e) shows the areas receiving solar irradiance, under the classes- Very low, low, moderate, high, and very high, in the study area.

Normalized Difference Vegetation Index (NDVI): The site suitability analysis for the identification of potential sites for solar power plants is calculated using NDVI (Jesal Zala. 2021). The NDVI of the study area is derived with classes- Very high, high, moderate, low and very low- shown in the Fig.3f. NDVI will help delineate the regions with high vegetation as constraints to the situation of solar power plant in the study area.

Landuse: The site suitability analysis for identification of potential sites for solar power plants in Gujarat is calculated using landuse (Jesal Zala. 2021). The landuse map of the study area is used to demarcate the built-up area, that are used as a constraint criteria in locating the suitable sites for the installation of solar power plant. The landuse classes- Builtup, waterbodies, Fallow land and Vegetation are shown in Fig.3g.

Proximity to Roads:

The locational site of the solar plant should not be installed in the proximity of roads within <50 m (Al Garni, H.Z. & Awasthi, A. 2017; Uyan, M. 2013; Georgiou, A., & Skarlatos, D. 2016). But the sites had to be close enough to roads in order to adhere to economic realities involved in implementing large-scale projects (Tisza, K. 2014). Though roads are one of the standard restriction factors (Table1), accessibility of the sites is also equally important. The road map (Fig.3h) shows that the study area possess good road connectivity throughout the district.

Proximity to Settlements :

The locational site of the solar plant should not be installed in the proximity of settlements within <500 m (Al Garni, H.Z. & Awasthi, A. 2017; Uyan, M. 2013; Georgiou, A., & Skarlatos, D. 2016). But the sites had to be close enough to human settlements, in order to adhere to economic realities involved in implementing large-scale projects (Tisza, K. 2014). The distribution of settlements are extracted from the landuse map, of the study area.

Proximity to Power Transmission Lines

The power grids and power transmission lines play a major role in installing solar power plants. The solar power park has to be connected to a high voltage power grid (Gerbo, Abayneh., Suryabhagavan, Karuturi Venkata., Kumar Raghuvanshi, Tarun. 2020; Brewer, J., Ames, D. P., Solan, D., Lee, R., Carlisle, J. 2015; Yousefi, Hossein., Hafeznia, Hamed., Yousefi-Sahzabi, Amin. 2018). The proximity to power transmission lines are shown in fig.3i. From the figure, it could be observed that the study area has two major power transmission lines with <=150 kv, >200 and <= 400 kv, and >700 kv capacity.

Proximity to Streams:

The solar power plant locations were affected by streams and water bodies (Abraham Hizkiel Nebey., Biniyam Zemene Taye., Tewodros Gera Workineh. 2020). As per the standard restriction factors (Table1) water body is a parameter that has least mportance while choosing a site for solar power plant. But, considering the need of a cooling system, water bodies are necessary for proper functioning of a solar power plant. The study area is drained by streams of Cauvery, Ponnaiar, Sarabanga, Tirumanimuttar, Vasista and Suveda. The proximity to streams are analysed for the study area and the same is shown in Fig.3j.

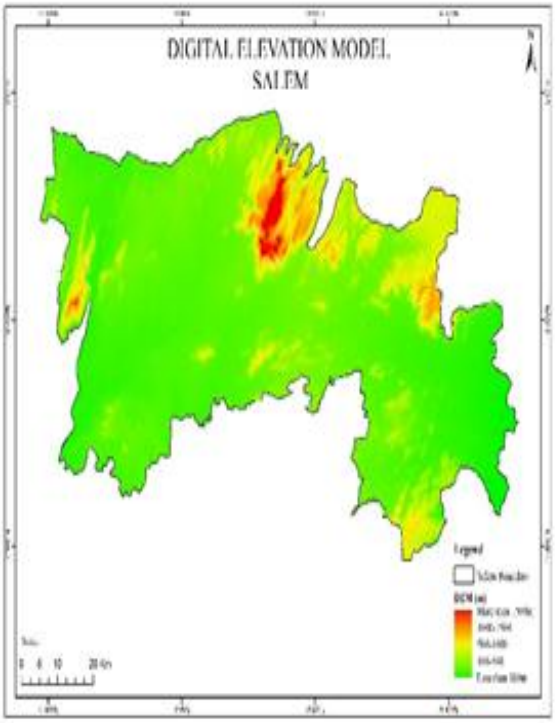

Fig. 3a: DEM

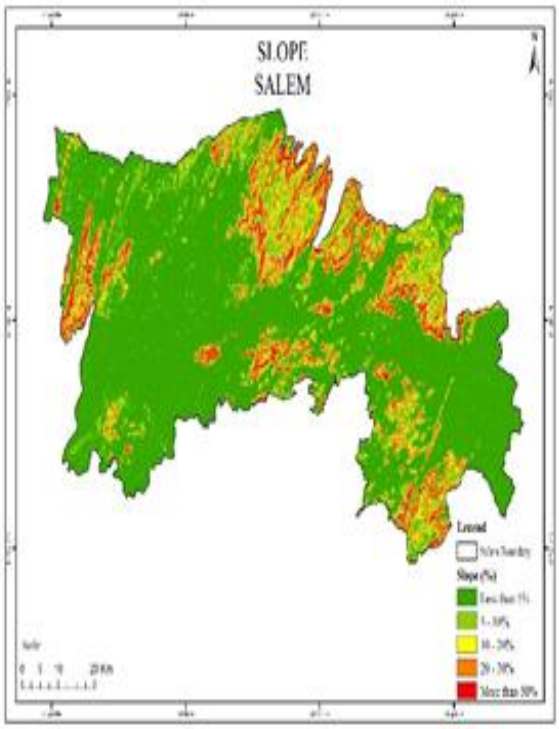

Fig. 3b: Slope

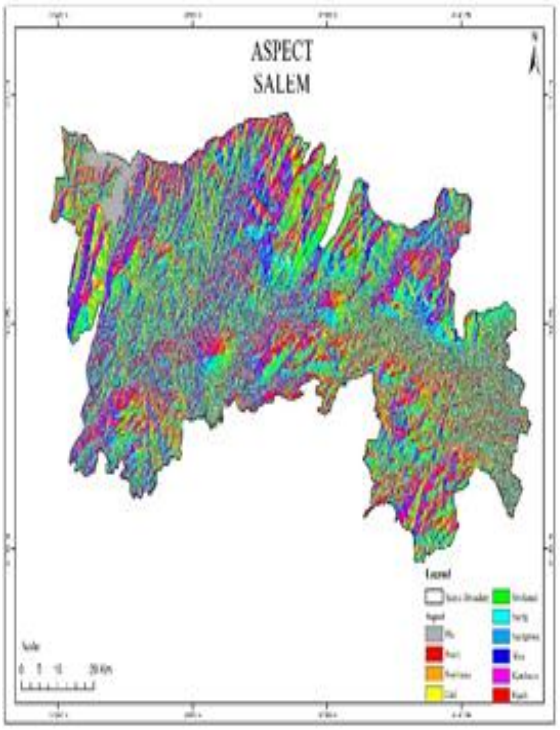

Fig. 3c: Aspect

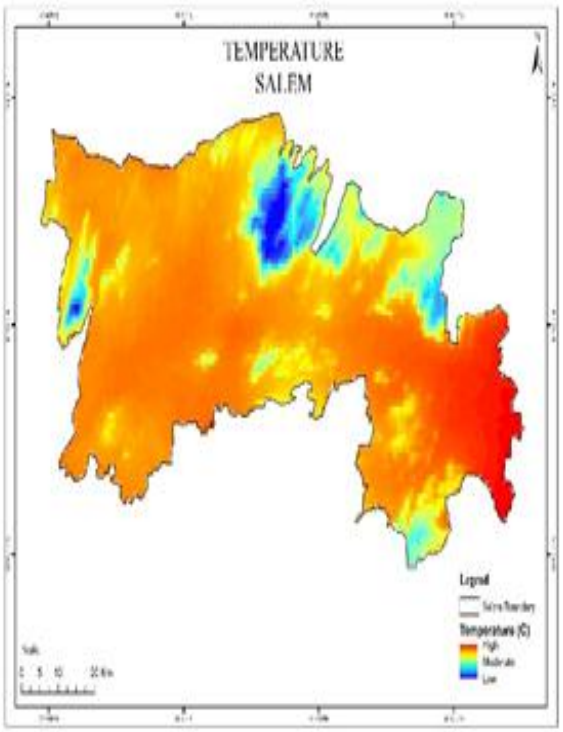

Fig. 3d: Temperature

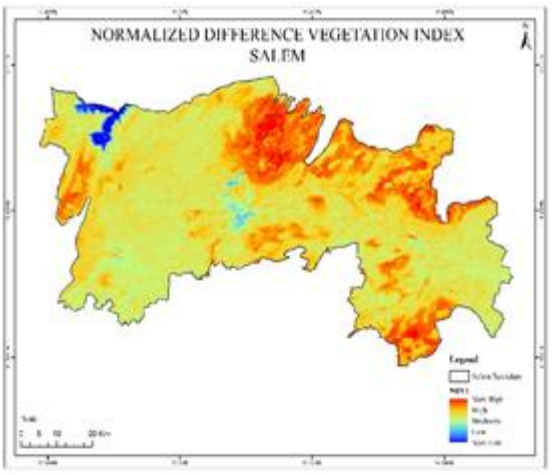

Fig. 3f: NDVI

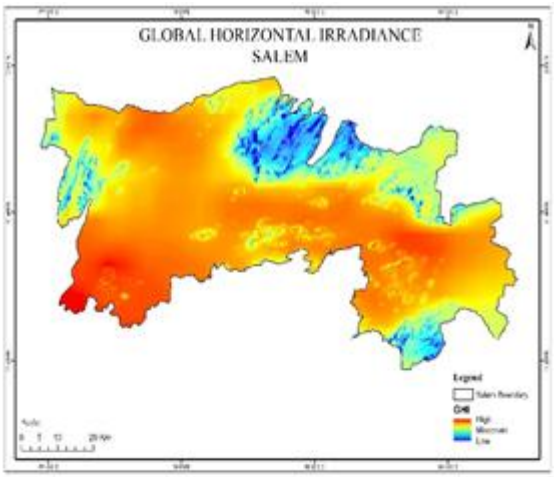

Fig. 3e: GHI

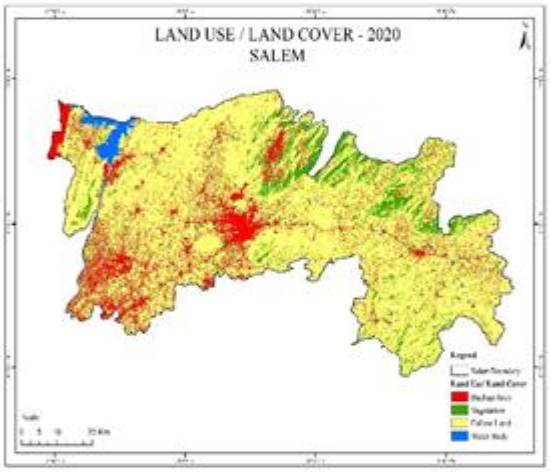

Fig. 3g: LU/LC

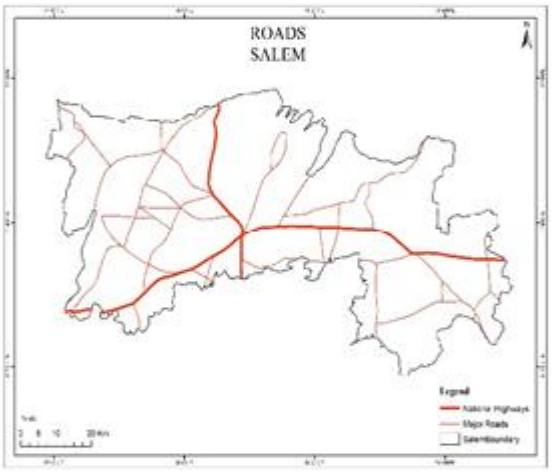

Fig. 3h: Roads

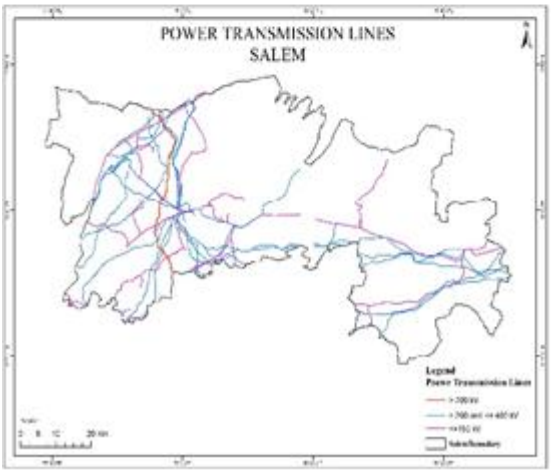

Fig. 3i: Power Transmission Lines

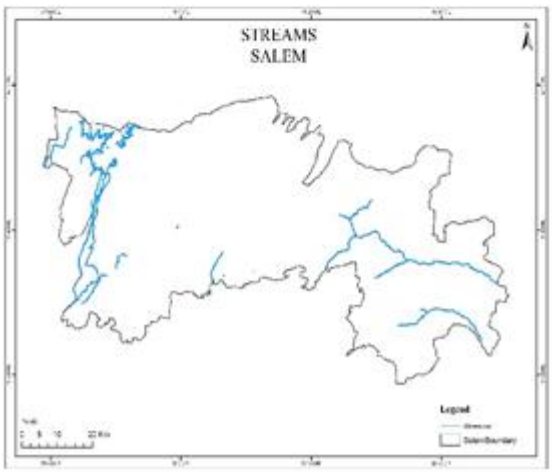

Fig. 3j: Streams

(a).Constraint Criteria

This process helps to delineate the restricted or constraint factors that would aid in visualizing unsuitable areas from optimal areas. The parameters that are used to separate the constraint area are- slope, aspect, NDVI, roads, settlements and streams. The slope and aspect maps created from the DEM data. And the proximity to roads, streams, power transmission lines, vegetation cover, and settlement was also analyzed using MODIS and Landsat data. The reclassified constraint criteria are analysed using raster calculator tool in ArcGIS toolbox, where 0 refers to unsuitable areas and 1 refers to the suitable areas for installing the solar power plants (Olubunmi O. Omoloso., Deborah Alaigba., Olatunji Aboyeji., Ifeoluwa Balogun., Samuel Akande. 2020). Table 1 shows the standard restriction factors to be considered while locating the suitable sites for solar power plants (Georgiou, A., & Skarlatos, D. 2016).

Table 1: **Standard Restriction Factors**

Restriction	**Buffer**	**Impact Type**
Roads	< 50m	Social
Aspect	South, South-east, South-west, East, West	Technical
Human Settlements	<500m	Social
Slope	>5˚	Technical
Land Cover	High Vegetation, Build-up areas, Water bodies	Environmental

a)Decision Criteria

The decision criteria are the factors that are favorable for the installation and efficient functioning of the solar power panels. The parameters considered for decision criteria are; Global Horizontal Irradiance (GHI), temperature, DEM, slope, aspect, roads, power transmission lines and streams. The solar panel efficiently works depending on the surface temperature. The surface temperature the study area is relatively uniform, so the 30 years average temperature of the study area was used as one of the decision criteria in this study. The solar panels have to be placed at a right distance from the roads, power transmission lines and settlements for easy connection and usage of the power source. The lower slope of the study area is a positive factor for installation of the solar panels. The slope directions of south, south west and south east are considered as the best orientations for receiving more energy from the sun (Olubunmi O. Omoloso., Deborah Alaigba., Olatunji Aboyeji., Ifeoluwa Balogun., Samuel Akande. 2020). **Table 2** shows the importance of the scale values assigned for each criterion of the decision criteria map.

Table 2: **Ratio Scale Importance**

Importance	**Scale Values**
Minimum Importance	1
Moderate Importance	2
Strong Importance	3
Very Strong Importance	4
Extreme Importance	5

In the present study, weightage was given to the parameters based on its importance in determining the efficiency in receiving more amount of solar energy. The weighted decision criteria is divided into sub-criteria and are given scale values from high to low. **Table 3** (Noorollahi, E., Fadai, D., Shirazi, M.A., Ghodsipour, S.H. 2016) shows the weightage of each parameter, sub-criteria for each parameter and their respective scale values from 1 (Minimum importance) to 5 (Extreme importance) as shown in **Table 2**.

Table 3: Decision Criteria Considered for Site Suitability

Decision criteria	Weight	Sub-criteria	Scale value
Slope (%)	0.106	Less than 5%	5
		5 – 10 %	4
		10 – 20 %	3
		20 – 30 %	2
		More than 30 %	1
Aspect	0.062	South	5
		Southwest & Southeast	4
		East & West	3
		Flat	2
		others	1
Proximity to streams (m)	0.102	50 m	5
		100 m	4
		500 m	3
		1000 m	2
		1500 m	1
Proximity to roads (m)	0.254	50 m	5
		100 m	4
		500 m	3
		1000 m	2
		1500 m	1
Proximity to power lines (m)	0.324	50 m	5
		100 m	4
		500 m	3
		1000 m	2
		1500 m	1
Elevation (m)	0.060	More than 20 m	5
		10 – 15 m	4
		5 – 10 m	3
		1 – 5 m	2
		Less than 1 m	1
Temperature (℃)	0.066	Less than 22℃	5
		22℃ - 24℃	4
		24℃ - 28℃	3
		28℃ - 30℃	2
		More than 30℃	1
Global Horizontal Irradiance (GHI)	0.086	1,696.220947 - 1,871.456353	5
		1,871.456354 - 1,912.387251	4
		1,912.387252 - 1,950.759967	3
		1,950.759968 - 1,978.899959	2
		1,978.89996 - 2,022.389038	1

Land Suitability Map for Potential Sites

The land suitability map was created using the Analytical Hierarchical Process (AHP) method. Land suitability refers to the degree to which the suitable and unsuitable areas can be differentiated. The decision criteria made using weighted overlay and the constraint criteria map made using raster calculator are used as inputs for AHP technique which shows the optimal and less suitable areas for the installation of the PV plants.

Results And Discussion:-

Constraint Criteria

The constraint criteria maps that were made according to the standard restriction factors (Table 1) are shown below in figures 4a, 4b, 4c, 4d, 4e and 4f. These reclassified constraint criteria maps were joined together using the raster calculator tool the in Arc GIS toolbox to obtain the overall constraint map layer shown in Fig. 4g. About 22.01% of the study area is found to be suitable for the installation of solar panels.

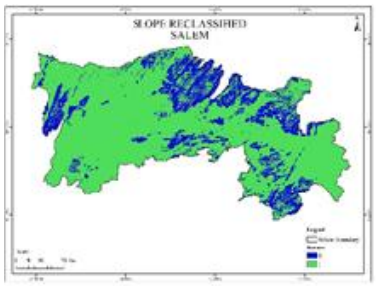

Fig. 4a: Reclassified Slope

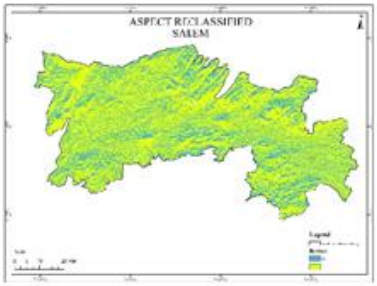

Fig. 4b: Reclassfied Aspect

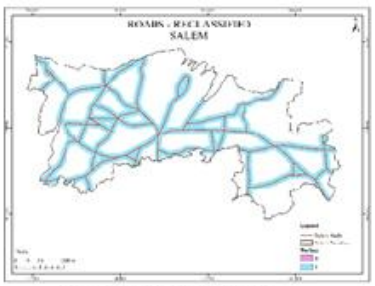

Fig.4d: Reclassified Roads

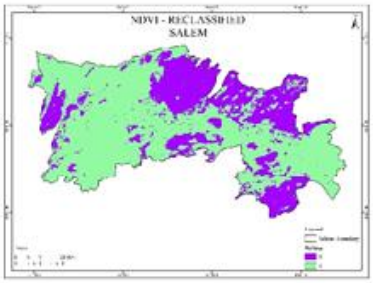

Fig. 4c: Reclassified NDVI

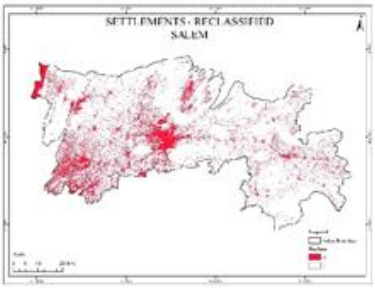

Fig. 4e: Reclassified Settlements

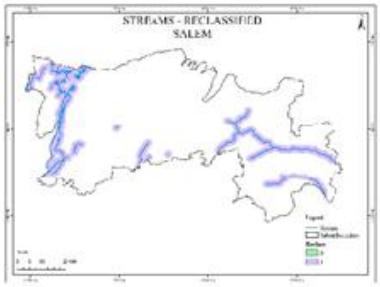

Fig. 4f: Reclassified Streams

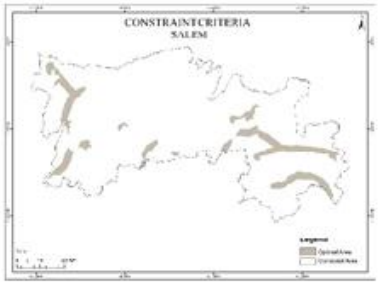

Fig. 4g. Constraint Map

Decision Criteria

The images from 5a, 5b, 5c, 5d, 5e, 5f, 5g and 5h shows the reclassified inputs for the decision criteria shown in Fig.5i, created using Weightage overlay analysis. The weightage for each parameter is shown in **Table 3**.

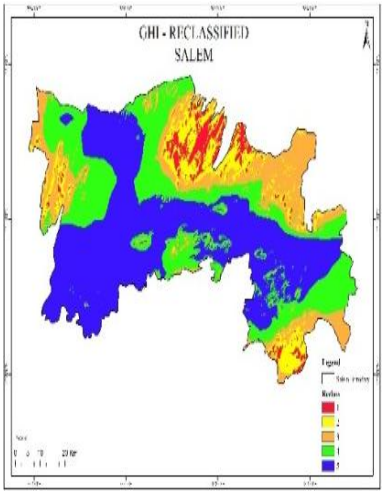

Fig. 5a: Reclassified GHI

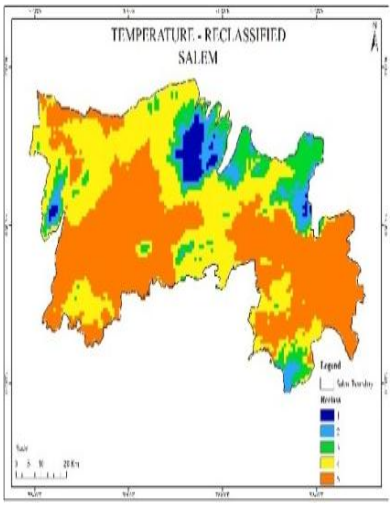

Fig. 5b: Reclassified Temperature

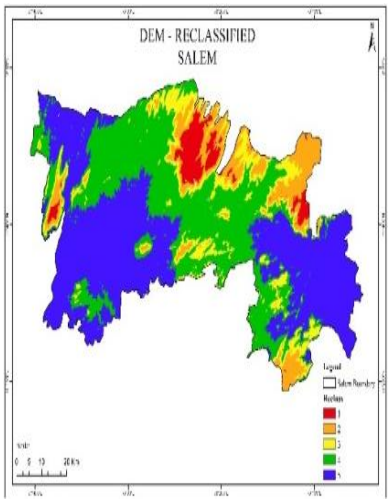

Fig. 5c: Reclassified DEM

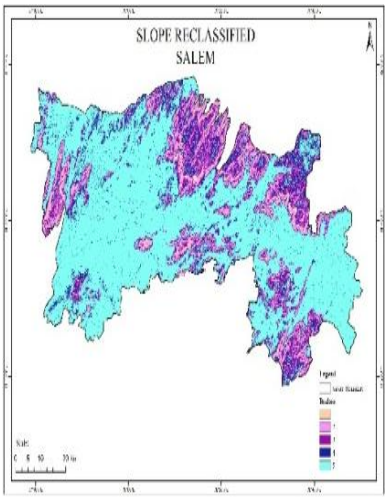

Fig. 5d: Reclassified Slope

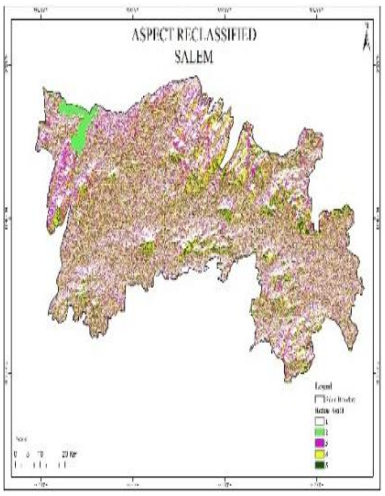

Fig. 5e: Reclassified Aspect

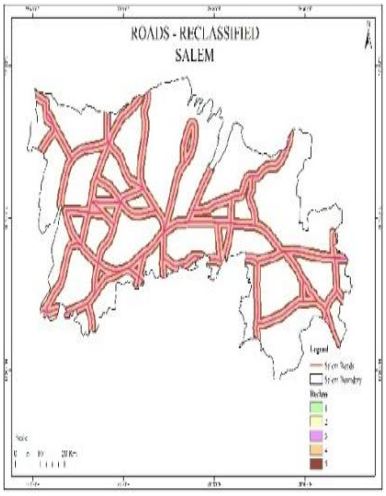

Fig.5f: Reclassified Distance from Roads

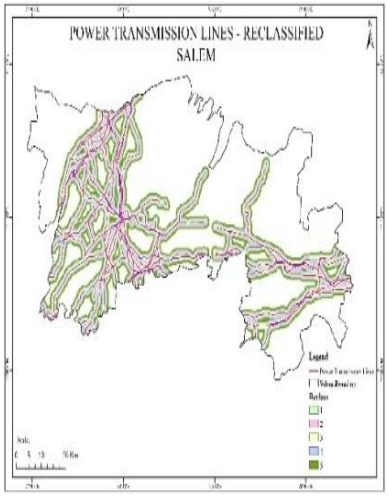

Fig. 5g: Reclassified Distance from Power Transmission Lines

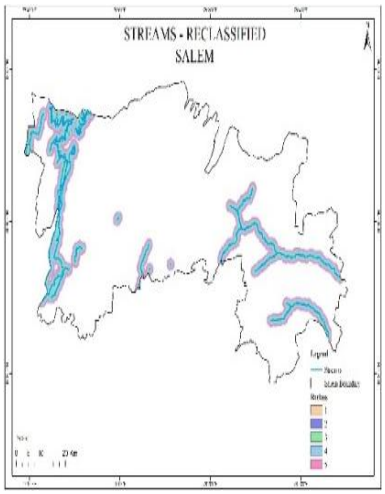

Fig. 5h: Reclassified Distance from Streams

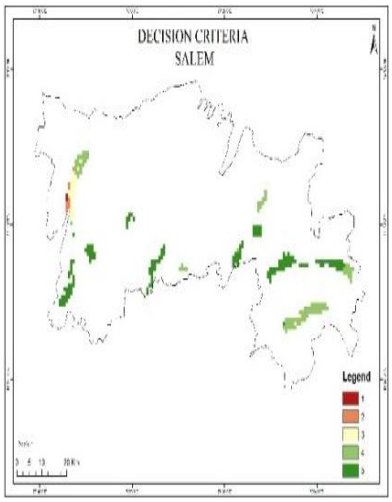

Fig. 5i: Decision Criteria Map

Potential Energy Generation of the Study Area

As per the ratio scale importance **Table 2**, the suitable areas are classified under five classes- Excellent, Good, Fair, Poor and Very Poor, and is shown in **Table 4**.

Table 4: Solar power produced in the graded area

Suitability	Area (sq. km)	Power Produced (MW)/Year
Excellent	617.9334	1257.6881
Good	383.7764	781.6373
Fair	112.1554	228.4269
Poor	27.3224	55.6475
Very Poor	7.2324	14.7302
Total	**1148.42**	**2338.13**

The average solar irradiance of the study area is 5.58 kWh/m^2. The suitable area for solar panel installation in the study area is 1148.42 sq. km which is capable of producing 2338.13 MW of electricity if completely used. The Excellent suitability area will yield up to 1257.6881 MW, Good, Fair, Poor and Very Poorly suitable areas could contribute 781.6373 MW, 228.4269 MW, 55.6475 MW and 14.7302 MW respectively.

Site Suitability for solar power plants

The final site suitability map for solar power parks was created using the AHP analysis with the decision criteria map (Fig.5i) and constraint map (Fig.4g.), as inputs, and the same is shown in Fig.6

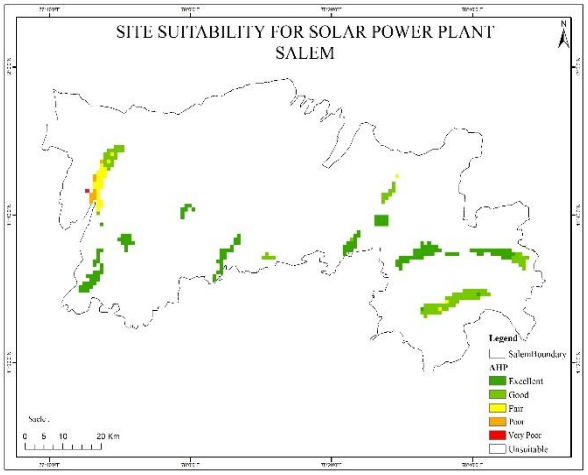

Fig.6: Site Suitability for Solar Power

From the figure, it could be observed that the suitable areas are classified as excellent, good, fair and poor as per the ratio scale importance **Table 2**.

The site suitability for the solar power plants in Salem district is 22% (1148.42 sq.km) and 78% (4069.32 sq.km) are found unsuitable. Out of the 22% , nearly 53.34% (617.9334 sq. km) is categorized as 'Excellent', 33.43% fall under 'Good' (338.7746 sq. km), followed by 'Fairly suitable' for 9.77% (112.1554 sq.km) and 2.83% (27.3224 sq. km) is 'Poorly Suitable'. Only 0.63% (7.2324 sq. km) of the area is 'Very Poorly suitable' for the site suitability of solar power plants in the study area. The final site suitability map shows that the excellently suitable areas are confined to southern region of the study area noted with lower slope and

vegetation, higher temperature and GHI that would promote the installation of the solar power panels. The areas with good suitability are seen in the central and eastern part of the district. The fairly suitable and poorly suitable areas are noticed in the western part of the district. The northern part of the study area are found unsuitable for the installation of solar panels due to the presence of hills and water bodies.

Conclusions:-

The findings showed that the southwestern sections of the district, which make up roughly 22% of the research area, are the best places to build solar power facilities. This study makes a valuable methodological contribution to the research community. In the future, societal aspects like population and energy usage can be incorporated for a thorough analysis. As a result, this study helps to sustainably close the energy gap in the study area between supply and demand.

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AN ANALYSIS OF THE JURISPRUDENCE OF FUNDAMENTAL RIGHTS OF COMPANIES

Faiz Ayat Ansari[1] Nafees Ansari[2]
[1]Assistant Professor, Parul Institute of Law, Faculty of Law, Parul University, Vadodara
[2]B.A. , Avadh University, Faizabad
***Corresponding Author*- Faiz Ayat Ansari**
Email- faizkkr@yahoo.com
DOI- 10.5281/zenodo.7057110

Zindagi ajeeb balaa hai, iski kayi surat hoti hai

Har pehlu ko nibhaane mein kuch kirdaar ki zarurat hoti hai

Kuch jaandar hamari tarbiyat ka hissa hote hain

To kuch bejaan bhi hamari zarurat mein shamil hote hain

Bejaan cheezein bhi hoti hain hamari zindagi ki shaan

Ghair maamuli na samajhna katai inko meri jaan

Hain to bejaan par inki badaulat chalti hain saanse hamari

Zindagi ka khaas hissa hote hain office, dukaan aur makaan

Chal phir nahi sakte to kya, inke bhi huqooq hote hain janaab,

Inki safaai, marammat, dekhbhal nahi kiya to khaakh badhenge aap

Waqt waqt par inke saath bhi zimmedari hai nibhaate rehna,

Hamare baad hamari naslon ko hai inka istemaal karna.

Introduction

It is an established fact from various statutory provisions provided in the Companies Act, 2013 that all corporate bodies are separate legal persons. They are capable of owning properties, they can enter into contracts and they can sue or be sued.[1] However, all the corporate bodies including companies are inherently artificial entities and not natural persons. This fact often leads to frequent questions as to whether the corporations are actually entitled to the same fundamental rights guaranteed to natural citizens/persons by the Indian Constitution or whether there are certain restrictions. Let us address this issue in this research article.

[1] A.K. Majumdar and Dr. G.K. Kapoor, Taxmann's Company Law and Practice, 12th Edition.

Jurisprudencial Background With Respect To The Fundamental Rights Of Companies

With the sky rocketing growth of the professional, competitive and corporate form of businesses in the latter half of the nineteenth century and early part of twentieth century that legal scholars actually rethought the corporate theory in sense of the extent to which the state could exercise authority over these corporate bodies.

Popular theories like the *grant theory* suggest that a company is in fact an artificial entity essentially incorporated under a charter. This asserts that the power of a company is limited to the charter of its incorporation. However, during the middle of the nineteenth century, the state started granting charters to several companies. This started diluting the privilege status of the companies. This phenomenon led to a substantial loss of significance of the grant theory. Gradually, the notion of companies being a real entity started gaining popularity. Lets consider the same from the constitutional point of view.

Status Of Companies As Entities From Constitutional Point Of View

As we all know, Part III of the Indian Constitution deals with the fundamental rights. There is a fine line of distinction between the fundamental rights provided in Part III. This distinction has its source from the inherently different treatment meted out to persons generally or exclusively for citizens. If we see, some of the fundamental rights are available only to citizens whereas others are available to persons in general. The constitution envisages Equality before law(Article 14), Protection in respect of conviction of offences(Article 20), etc as the rights available to persons in general. On a contrary basis, the other articles like Prohibition of discrimination on grounds of religion, race, caste, sex or place of birth (Article 15), Equality of opportunity in matters of public employment (Article 16) etc are exclusively for the citizens. Thus, it is in this background that the different sets of rights for citizens and persons become important to determine which fundamental rights guaranteed by the constitution are available to companies in India.

From Article 5, it is well established that Companies per se are not citizens in India. At the same time, the question regarding whether company may still not be entitled to the fundamental rights which are available to the citizens of India who may be the shareholders of such companies is a question which can only be determined through the judgments of the apex court taken in India.

Important Judicial Pronouncements Related To Fundamental Rights Of Company In India

The dilemma whether companies have fundamental rights is as old as independence in India. In *Sholapur Spinning and Weaving Company case*[2], a shareholder of the Sholapur Spinning and Weaving Company decided to challenge the Sholapur Spinning and Weaving Company (Emergency Provisions) Act, 1950 on the constitutional ground that the Act was not within the competence of the legislature and also infringed his fundamental rights which were guaranteed by Articles 19(1)(f), 31 and 14 of the Indian Constitution. The court laid down the principle of separate legal entity and pronounced that individual shareholders and company are separate legal entities. Thus, a shareholder could not claim infringement of his fundamental rights on behalf of the company itself unless it violates his own rights simultaneously.

The Court confirmed the same line of thinking that only certain sets of fundamental rights are available to companies in yet another judgment of the *Jupiter General Insurance Company v. Rajagopalan and Anothers*.[3] On the contrary, the Bombay High court indulged in a different stand allowed the petition of violation of fundamental rights under Article 19(1)(g) of the constitution by a company. This judgment of the Bombay High Court was a clear contrast from the

[2] Chitranjit Lal Chowduri v. The Union Of India And Others 1951 AIR 41

[3] AIR 1952 P H 9

earlier stand taken by various Indian Courts where a company was held only to be a person in general and was thus entitled only to such fundamental rights as available to persons in general. In the popular case of *Reserve Bank of India v. Palai Central Bank Limited*[4], very versatile contentions emerged where the Kerala High Court interpreted that the intention of the framers of the Indian constitution was not at all to exclude corporate bodies from enjoying all the fundamental rights.

The issue was again put up for discussion before the Supreme Court of India in the *State Trading Corporation of India Ltd & others v. The Commercial Tax Officer, Visakhapatnam and others*.[5] In this case, the court was put in a dilemma and had to judge a company is a citizen within the meaning of Article 19 of the Indian constitution and whether it can seek remedy for the enforcement of fundamental rights granted to the citizens under the aforesaid article. The Supreme Court adjudged unambiguously that all corporate bodies are indeed juristic persons and that is the reason that they cannot be classified as citizens despite the fact that they may be of Indian nationality due to being incorporated in India. Therefore, it was decided that a company is not entitled to any particular right available only for citizens under the Indian constitution.

The Supreme Court held in *Bennett Coleman and Company* case[6] that the inherent fundamental rights exercised by shareholders as citizens are not lost in any manner when they actually associate to form a company of sorts. Other significant recent cases like *Star India Private Ltd. v. The Telecom Regulatory Authority of India*[7] also confirmed a similar rationale adopted by various courts that companies are not citizens and therefore they cannot claim any fundamental rights that are specifically provided for citizens only. So, the same is the present condition that a company cannot claim citizenship from the state and cannot as a consequence claim any subsequent rights under various Articles of the constitution which are specifically dealing with citizens only. At the same time, the shareholders of a company are free to challenge the constitutional validity of any law on the ground of violation of any articles of the constitution in case their own rights are violated. If such a situation arises, then the fact that a company's right is also violated will not act as a deterrent or hindrance or reason for dismissal of such a petition by the shareholder.

Conclusion

It is an established fact that all corporate bodies, whether company or not, are important for the development of a nation's economy. They do not only serve the industrial development purpose but are also significant from the employment point of view. A significant part of a common man's life is related to some or the other corporate activity. This leads us to a logical point of view that one must realize the fact that if a company when it is at fault for not performing its duties can possibly be held guilty and punished under various laws like in Indian Penal Code, torts, the Companies Act, etc then at the same time it is also equally crucial that such companies have certain sets of fundamental rights important for its own proper functioning. Even the 101st Report of the Law Commission of India noted this fact that it is important to give the right of freedom of speech and expression to a newspaper company. If the companies of the 21st century are expected to perform their duties to the fullest according to the law for the interest of others as well as the nation, then simultaneously their interest and rights should also be protected justifiably.

Another interesting fact is that the fundamental rights of the corporate bodies are indeed protected in other nations like the United States of America as well as countries in Europe. So there is no good reason why the same should not be followed in India too. An honest

[4] AIR 1961 Ker 268
[5] 1963 AIR 1811
[6] Bennett Coleman & Company & Others v. Union Of India and Others 1973 AIR 106
[7] 146 (2008) DLT 455

preservation of Fundamental rights of corporate entities including companies is extremely important for the overall growth of the society at large. Hence, such artificial persons should therefore be treated no less than a citizen so that they can avail certain basic rights. It is true to some extent that the distinction between artificial and natural person cannot be removed completely all of a sudden, but at least such certain basic rights which are extremely important for the progress as well as development of these corporate bodies should be granted to them without any second thoughts. The companies do need to enjoy these rights so that there is no discouragement for the companies in this sense. One should not forget the fact that a large volume of the employment comes from the companies and they should be incentive in this manner too.

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EFFECT OF THEREBAND TRAINING AND CIRCUIT TRAINING ON SELECTED FITNESS VARIABLE AMONG COLLEGE LEVEL ATHLETES

Pasam Mohan[1] Dr. George Abraham[2]
[1]Ph. D. Research Scholar, Tamil Nadu Physical Education and Sports University, Chennai-127, Tamil Nadu, India.
[2] Research Supervisor and Principal, YMCA College of Physical Education, Chennai35,Tamil Nadu, India.
***Corresponding Author*- Pasam Mohan**
Email- mohanpasam97@gmail.com
DOI- 10.5281/zenodo.7057123

Introduction

Training is an educational process. It aims at improving the sports performance as well as education of the sportsman. High sports performance through training can be achieved by a scientific and systematic use of training means. Training means are various physical exercises and other objects, methods and procedures which are used for the improvement, maintenance and recovery of performance capacity and performance readiness.Physical Fitness is the capacity to carry out responsible vigorous physical activity and includes qualities in pertain to the individual health and well being. Sports' training largely depends on Physical Fitness. Physical Fitness improves the general fitness, health, organic functioning capacity, strength, stability of muscular and skeleton system etc. Importances of Physical Fitness or motor abilities are the main criteria in sports training. As per Sebastian Coe - says that, the basis for overall physical fitness is achieved by improving your respiration and your circulation, and to the end the most effective activity is running. The longer you keep running and exercise well the longer you will stay well.

Muscles are made up of a combination of fast twitch and slow twitch fibers. Fast twitch fibers contract rapidly and slow twitch fibers contract more slowly and with lower level of force. Speed is an ability to execute motor action under given condition in maximum possible time (Clarke, 1987). If all other things are equal, athletes with longest muscle fibers and greater percentage of fast twitch fiber should have the ability to run faster than an athlete with shorter slow twitch fibers. Eicher (1975) pointed out that speed is the product of two factors, stride length and stride frequency. Increasing either factor automatically increases a runners sprinting speed. Stride frequency is an inborn quality; it might be possible to improve it slightly through training (Astrand & Rodahe, 1970).

But the stride length can be increased by increasing the leg strength and power. In this study fifty meters sprint has been taken as a test for measuring the speed of the subjects.Fitness in the human body what fine tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us for better look, pleasant feel and do our best. More specifically, it is "the ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure time activities and meeting emergency demands. It is the ability to endure, to bear up, to withstand stress, to carry on in circumstances where an unfit person could not continue, and is a major basis for good health and well being" (Singh, 1991).

Materials and Methods

The perpose of the study were to find out the effects of Theraband training and Circuit training on flexibility among college level male Athletes the

researcher randomly selected 60 male athletes (n= 60), who competed at inter collegiate level sports meets representing different colleges in Tirupati chittoor District Andhra Pradesh.The selection of subjects age range from 17 and 21 years. The selected subjects were randomly divided into three equal groups of thirty subjects each (n = 20). Experimental group I was assigned as Theraband training (TTG) and Experimental group II was assigned as circuit training Exercises (CTG) and control group. During the training period, the experimental groups underwent their respective training programme for eight weeks 3 days per week. Control group (CG), who did not participate in any specific training. Muscular Strength was selected as dependent variable for this study. It was measured by Push ups . These are the exercises used as a Tharaband training 1. Shoulder Flexion 2.Lateral Raise 3. Reverse Flies 4. Chest presses 5. Chest Flies, 6. Side Bend 7. Quick Kicks 8. Lunges. For Circuit training; 1. Jumping jacks, 2. Burpees, 3. Crunches 4. High knee, 5. Half squat, 6. Triceps dips, 7. Butt kicks, 8. Push-ups. The collected data were statistically examined by analysis of covariance (ANCOVA). The confidence level was fixed at 0.05 levels, which is appropriate to the present study. Whenever the F ratio is found be significant, Sheffee's test was applied as post hoc test to find out the paired mean difference.

Results and Discussions

The muscular strength was measured through push ups. The results on the effect of twelve weeks Theraband training and Circuit training are showed in Table I.

Computation Of Analysis Of Covariance On Muscular Strength

	TTG	CG	CG	SOV	SOS	df	MS	F-value
Pre-test mean	18.65	18.80	19.70	B	12.9	2	6.45	2.97
				W	123.75	57	2.17	
Post-test mean	20.45	20.55	19.95	B	4.13	2	2.07	0.86*
				W	136.88	57	2.40	
Adjusted posttest mean	20.72	20.72	19.51	B	17.52	2	8.76	6.04*
				W	81.20	56	1.45	
Mean difference	1.80	1.75	0.25					

*Significant 0.05

In this investigation the pretest values of training group I, training group II and control group on muscular strength were 18.65, 18.80 and 19.70 respectively. The post test scores of both training groups and control group were 20.45, 20.55 and 19.95 respectively. The adjusted mean values of both training groups and control group on muscular strength were 20.72, 20.72 and 19.51 respectively.

The obtained F value on pretest value 2.97 was lower than the required table of 3.16 to be significant at 0.05 level. This result proved that there was an insignificant difference between the two experimental and control groups The post test scores also proved that there was a significant improvement between the two experimental groups and control group, the obtained F value 0.86* and 6.04*, was greater than the required F value of 3.16.this clearly proved that there was a significant difference in posttest and adjusted posttestare showed in Table II.

Scheffe's Confidence Interval Test Scores On Muscular Strength

Means			MD	CI
TTG	CTG	CG		
20.72	220.72		0.00	0.95
20.72		19.51	1.20*	
	20.72	19.51	1.20*	

* Significant 0.05

The needed confidence interval for the post hoc analysis of ordered adjusted means was 0.95 Pair wise mean comparisons over the required confidence interval were significant at 0.05 levels. The Mean Difference (MD) between Theraband training group and Circuit Training group was 0.00 and between the theraband training group and Control Group 1.20*and the Circuit Training group and Control Group was 1.20*. The final study findings of Vikicetal,(2007) who analyzed the impact of special programmed physical education including dance, aerobics and rhythmic gymnastics on the development of motor and functional abilities and found significant development of coordination/agility and specific rhythm coordination, functional aerobic ability, repetitive and explosive strength and flexibility, along with significant reduction of overweight and adipose tissue. The research findings of Lewis (2005 who observed improvements in sub maximal heart and respiration rates, aerobic performance, muscle strength and endurance, gross motor skills due to aerobic exercises.

Conclusions

The result of this investigation is clearly indicating that the circuit training was better than the Theraband training in terms of improving the muscle strength of college level male Athletes Comparing between the treatment groups, it was found that Theraband Training was better than Circuit training group.

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EVALUATING IMPACTS OF WATERSHED DEVELOPMENT ON LIVELIHOOD AND SOCIO-ECONOMIC DEVELOPMENT OF TRIBALS IN AKOLE TAHSIL OF AHMEDNAGAR DISTRICT

Mr. Wayal Navnath Laxman[1] Dr. Sachin Ranu Govardhane[2]
[1]Assistant Professor, Department of Geography, D.B.F.Dayanand College of Arts and Science College Solapur
[2]Associate Professor, Department of Geography, V.V. Ms S. G. Patil Arts Science & Commerce College Sakri Tal- Sakri (Dhule)
***Corresponding Author*- Mr. Wayal Navnath Laxman**
Email Id- sachingovardhane@gmail.com
DOI- 10.5281/zenodo.7057127

Abstract:
Livelihood and socio-economic development are the most important indices of development of tribal agrarian communities particularly those in rainfed areas. Even in the 21st century, the livelihood of the tribal people seems to be traditional and still there is no change in recent years. The income of various tribal groups in India is mainly generated from the land, livestock, cottage industries, forest collection, etc., which depend heavily on inputs like water, fodder, fibre, fuel-wood and forest products. The gradual soil erosion and sinking of these natural resources are one of the basic reasons behind the higher incidence of poverty among the tribal people. To mitigate the hardships and improve the standard of living of the tribal people of the country, the Indian government is vigorously implementing various schemes for rural and tribal development. Watershed Development Programme is one of the strategic programmes, from which efforts are made to minimize the soil erosion, conserve available water, avoid gully formation and thereby improve the soil fertility by which the farmers can gain a good level of income. Through this programme, the beneficiary farmers are guided to use the improved technologies of agriculture by which the farmers can derive better crop yields, obtain sustained returns on their investments and elevate their living standards. This paper presents the impact of the watershed project on the livelihoods of the beneficiaries in terms of change in agricultural production and productivity, change in cropping intensity and cropping pattern, change in employment, and overall change in socio-economic status and agricultural development of tribal people of selected villages from Akole tahsil of Ahmednagar district of Maharashtra state. The assessment and impact of the watershed project on the livelihoods of the beneficiaries showed that there was a marked increase in agricultural production and productivity in the study area compared to the base year. Similarly, the beneficiaries have diversified their agriculture, the mainstay of their livelihood, and are producing more oilseeds, pulses and vegetables rather than traditional cereal crops like Paddy, Nachani, Wari etc. Further, the study also demonstrates that there is a remarkable improvement in the income and socio-economic status of the beneficiary farmers compared to that of non-beneficiary farmers of the study area.

Keywords: *Livelihood, Tribal Area, Cropping Pattern, Cropping Intensity.*

Introduction:

As most of the world's indigenous people live in remote, mountainous and forest areas, they face food insecurity, income poverty and socio-economic backwardness. These regions have also faced the challenge of resource degradation and low agricultural productivity. The means livelihoods of many tribal groups seem to be traditional and their main sources of income are agriculture, animal husbandry and forestry. However, this rain-fed agricultural system suffers from various problems. High variability in the amount of rainfall received in short intensive

spells separated by long dry periods during the monsoons exposes the standing crops to the risks of both water stress and floods, resulting in low yields if not outright crop failures (Rockstrom et al., 2010). Watershed management has been seen as a solution to confront such problems (Wani *et al.*, 2009). Watershed management is an 'Area development' strategy in many developing countries, including India. In India, watershed management is considered the main vehicle of rural development (Turton, 2000). Capturing the rainfall in the wet season and increasing the availability of water during dry periods is the principal element of watershed management. This offers several potential benefits including increasing soil moisture for rain-fed agriculture, augmenting groundwater recharge for dry season irrigation or drinking water purposes, and arresting run-off into storage structures (eg. tanks, reservoirs, etc.) for various consumptive and productive usages. Benefits from the adoption of the watershed management approach are reported from many arid and semi-arid tropic regions, where it has helped enhance the agricultural productivity, improve livelihoods of the watershed community and alleviate poverty (Hope, 2007). It also helps in the appropriateness of the method employed in carrying out the project activities and to estimate the medium and long-term social and economic benefits of the activities, efficiencies and impact of the project in the context of its stated objectives (Gupta et al. 2000). Now, poverty alleviation and improving living standards by enhancing sustainable livelihood opportunities for the watershed community is the focal point of most of the Watershed Management Programme (WMP).

Very less information is available on the success of WMP in terms of improvement of livelihoods and socio-economic development of the watershed community and poverty alleviation, even though it uses a huge budget (Hope, 2007). Government bodies mostly evaluate a project's success in terms of physical and financial achievements. Other studies confines to qualitatively evaluated or quantitatively analysed, heavily supervised projects, with no information about long-term impacts (Kerr, 2002). Evaluative methodology that could measure the changing livelihood profiles of the watershed community quantitatively is needed as it would help determine how far the project has been successful in achieving the basic objective of WMP, i.e. livelihood improvement and poverty alleviation of the watershed community. To accomplish this, a livelihood assessment framework for timely monitoring and evaluation is required that could aid in continual improvements in WMP based on the feedback mechanism. To know the overall effect of soil and water conservation measures adopted in a particular watershed area, it is necessary to evaluate the impact on the livelihood and socio-economic life of the people in that area. Keeping in the view importance of post-project evaluation, a study was undertaken to evaluate the impact of watershed activities on the livelihood and socio-economic development of tribals in Akole tahsil of Ahmednagar District.

Study area:

Akole tahsil is one of the 14 tahsils in Ahmednagar district which is located in the western part of the district. The tahsil comprises 191 villages. It is lies between 19° 15'N to 19° 45'N latitude and 73° 36'E to 74° 06'E longitude. The tahsil is surrounded by the mountain ranges of Sahyadri. Three important rivers originate in the Sahyadri ranges of Akole tahsil namely Mula, Pravara and Adhula which are parts of the upper Godavari watershed. The tahsil has about 98712 hectares of total cultivable land out of about 150989.37 hectares of total geographical area. The net sown area (NSA) is 62198.36 hectares and only 14 percent of NSA is under irrigation. The climate of the tahsil is characterized by hot summer and general dryness except during the southwest monsoon season. The average rainfall in the Akole tahsil is about 900mm and its distribution both spatial and temporal is not uniform. The total population of Akole tahsil is 291950 of which 147880 male and 144170 female

population. The tahsil has a 47.87 percent tribal population.

Objectives:

The main objective is,

1) To evaluate the impacts of watershed implementation on certain key indicators of livelihoods of tribal communities.

Research Methodology:

For the present analysis, the impact of the watershed development programme on the livelihood of the beneficiaries was assessed in terms of changes in cropping pattern, changes in cropping intensity, changes in employment, and overall changes in socio-economic status etc. The impacts were assessed at the household level. The impact of WSD was captured with the help of frequency distribution of farmers reporting different levels of impact. For this purpose, five beneficiaries' villages and five non-beneficiaries villages from the Akole tahsil of Ahmednagar district was selected for the study.

A case study includes qualitative as well as quantitative techniques. The five beneficiary villages where Watershed development Programme (WDP) has implemented and five non- beneficiary villages where WDP has not implemented selected for the present study. From each of the beneficiary and non-beneficiary villages 25 respondents were selected i.e. 125 beneficiaries' respondents and 125 non-beneficiaries' respondents were selected purposively for the study purpose, overall ten villages and 250 respondents were covered under the present study.

Results and Discussion:

Change in cropping pattern

A cropping pattern means the proportion of area under different crops at a point as it changes over space and time. Cropping pattern was considered as hectares covered under various crops as compared to base year i.e. 1995. It has been observed that there is a difference in types of crops and seasonal area of kharif, rabi and summer crops grown by the respondent before and after participation in the watershed project. The changes in the cropping pattern of farmers in selected beneficiary and non-beneficiary villages have been collected and analysed. This was compared with the base year i.e. 1995 versus the sample year 2021.

Significant changes have been observed in the cropping pattern in the beneficiary villages. It is revealed from Table No.1 that, a majority of the beneficiaries (54.40 percent) reported 101 to 150 percent changes in their cropping pattern, followed by 25.60 percent of the beneficiaries found to be in 51 to 100 percent a change in their cropping pattern. About 14.40 percent of the beneficiaries exhibited change in their cropping pattern in the category up to 50 percent. As watershed development has created certainty of water for irrigation, many farmers have started cultivating oilseeds and vegetables along with traditional crops, which has changed the cropping pattern in the beneficiary villages. As well as 4.00 percent of the beneficiaries indicated no significant change in their cropping pattern. The average cropping pattern of the beneficiaries during this period was found 93.60 percent.

However, a slight change has been reported in the cropping pattern of non-beneficiary villages. It is also observed that the majority of the non-beneficiaries (49.60 percent) exhibited 51 to 100 percent changes in their cropping pattern. About 19.20 % of the non-beneficiaries reported changes in the category up to 50 percent and 8.00 percent indicate a change in category 101 to 150 percent. The 22.40 percent of the non-beneficiaries exhibit no significant change in their cropping pattern. The average cropping pattern during this period in the case of the non-beneficiaries was found 53.40. Since the farmers in the non-beneficiary villages were not willing to change their rainfed cropping pattern so there was not significant change in cropping pattern in such group of farmers.

Table-1: Distribution of the respondents according to their change in cropping pattern

Sr. No.	Per cent change in cropping pattern	Number of Beneficiaries (N=125)		Number of Non-Beneficiaries (N=125)		Overall (N=250)	
		No.	Percent	No.	Percent	No.	Percent
1.	No significant change	5	4.00	28	22.40	33	13.20
2.	Up to 50	18	14.40	24	19.20	42	16.80
3.	51 to 100	32	25.60	62	49.60	94	37.60
4.	101 to 150	68	54.40	10	8.00	78	31.20
5.	Above 151	2	1.60	1	0.80	3	1.20
		125	100.00	125	100.00	250	100.00

Source: Primary Survey data year 2021

Overall 37.60 percent, 31.20 percent and 16.80 percent change was observed in the cropping pattern of the respondents ranging from 51 to 100, 101 to 150 and up to 50 respectively. About 13.20 percent of the respondents exhibit no significant change in their cropping pattern. The overall average change in cropping pattern during this period of the respondents was found 73.5 percent. Due to various measures of soil and water conservation, farmers in the beneficiary villages are more inclined to cultivate high-yielding varieties of crops along with traditional crops, oilseeds and vegetables instead of cereals.

A. Change in cropping intensity.

For the purpose of investigation, cropping intensity was considered as the proportion of the area under different crops including double cropping to the net cultivated area. Cropping intensity was measured in terms of percentages by calculating the total cropped area divided by the net sown area. The information on a change in the cropping intensity of the beneficiaries and non-beneficiaries was collected and analysed. This was compared with the base year i.e. 1995 versus the sample year 2021. The results are presented in Table No. 2.

Table-2: Distribution of the respondents according to their change in cropping intensity

Sr. No.	Per cent change in cropping intensity	Number of Beneficiaries (N=125)		Number of Non-Beneficiaries (N=125)		Overall (N=250)	
		No.	Percent	No.	Percent	No.	Percent
1.	No significant change	2	1.60	22	17.60	24	9.60
2.	Up to 30	16	12.80	54	43.20	64	25.60
3.	31 to 60	58	46.40	26	20.80	42	16.80
4.	61 to 90	39	31.20	18	14.40	76	30.40
5.	Above 91	10	8.00	5	4.00	44	17.60
		125	100.00	125	100.00	250	100.00

Source: Primary Survey data year 2021

Major changes have been observed in the cropping intensity in the beneficiary villages. It is revealed from Table No. 2 that, during the year 2021, 46.40 percent of the beneficiaries exhibited a change in cropping intensity in the category of 31 to 60 percent, followed by 31.20 percent of beneficiaries who reported a change in cropping intensity in category 61 to 90 and 8.00 percent reported in category 91 and above. About 12.80 percent of the beneficiaries reported a change in cropping intensity up to 30 percent. No significant change in cropping intensity was reported by 1.60 percent. The mean cropping intensity of the beneficiaries was found to be increased by 54.6 percent over the base year.

It is also observed from Table No. 2, that there was a slight change has been observed in the cropping intensity of non-beneficiary villages. It is revealed that

maximum i.e. 43.20 percent of the non-beneficiaries exhibited change in cropping intensity in the category of up to 30 percent, followed by 20.80 percent of the non-beneficiaries who reported no change in cropping intensity in the category of 31 to 60 percent. About 14.40 percent of the non-beneficiaries reported change in cropping intensity in the category of 61 to 90 percent and 4.00 percent was reported in 91 percent and above category. About 17.60 percent of the non-beneficiaries reported no change in cropping intensity. Mean cropping intensity in the case of non-beneficiaries was found to be increased by 30.84 percent over the base year.

Overall 30.40 percent, 16.80 percent and 25.60 percent change was observed in the cropping pattern of the respondents ranging from 61 to 90, 30 to 60 and up to 30 respectively. About 9.16 percent of the respondents exhibit no significant change in their cropping pattern. The overall average change in cropping pattern during this period of the respondents was found 52.68.

In the agricultural context cropping intensity above 91 percent is considered a healthy sign for assured crop incomes for farmers. The above results were indicative of the fact that in villages where watershed development has taken place, various measures taken for soil and water conservation measures have a better chance of providing protective irrigation to the crop and reaping another crop throughout the year. In addition, due to the availability of water in some beneficiary villages, groundnut, tomato and other seasonal vegetables are being cultivated even in summer.

Change in employment.

Change in employment for the respondent was considered as additional employment in the number of days generated as a result of benefits from the watershed project. The distribution of the respondents according to their percent change in employment was studied, for this purpose year 1995 was considered as the base year and change in the employment was studied during 2021 and presented in Table No.3.

Table-3: Distribution of the respondents according to their change in employment.

Sr. No.	Per cent change in employment	Number of Beneficiaries (N=125)		Number of Non-Beneficiaries (N=125)		Overall (N=250)	
		No.	Percent	No.	Percent	No.	Percent
1.	No significant change	0	0.00	2	1.60	2	0.80
2.	Up to 40	14	11.20	38	30.40	52	20.80
3.	41 to 80	32	25.60	44	35.20	76	30.40
4.	81 to 120	61	48.80	28	22.40	89	35.60
5.	Above 121	18	14.40	13	10.40	31	12.40
		125	100.00	125	100.00	250	100.00

Source: Primary Survey data year 2021

It is revealed from Table No. 3 that, during 1995-2021, nearly half of the beneficiaries (48.80 percent) exhibited a category of 81 to 120 percent increase in their employment in terms of man-days per year, followed by 25.60 percent of the beneficiaries found to be in 41 to 80 percent increase in their employment. About 14.40 percent of the beneficiaries reported a change in their employment in the category of above 121 percent and 11.20 percent increase in the category of up to 40 percent. The average employment generated during this period of the beneficiaries was found to be 86.56 (man-days per year).

It is also observed that 35.20 percent of the non-beneficiaries exhibited an increase in their employment in terms of man-days per year in the category 41 to 80 percents, followed by 30.40 percent of the non-beneficiaries who reported up to 40 percent increase in their employment. About 22.40 percent of the non-beneficiaries have reported an increase in their employment in the category of 81 to 120 percent and 10.40 percent reported a change in employment in the category above 121 percent and above. Only 1.60

percent of the non-beneficiaries indicate no significant change in employment. The average employment generated during this period for the non-beneficiaries was found to be 64.16 (man-days per year).

Thus, it can be concluded that the majority of respondents i.e. 35.60 percent reported an increase in the employment category of 81 to 120 percent, followed by 30.40 percent found to be in 41 to 80 percent increase in their employment.

Employment availability during the implementation phase of the watershed program increased employment due to an increase in the irrigated area during the Rabi season and increased employment due to the development of the double-crop area are taken into consideration. On probing the employment phenomenon more deeply it was noticed that the agriculture sector was contributing to 35 to 40 days of employment per hector during kharif season and almost no employment in Rabi before the implementation of the watershed programme. However, significant changes were noticed in terms of availability of employment days in kharif and Rabi season to the extent of 90 to 110 days per hector in a year after implementation of watershed activities.

Change in socio-economic status.

Change in socio-economic status for the investigation was considered as the change in the position of respondent occupied concerning prevailing average standards of cultural position, effective income, material possession and participation in the group activity of the community. The distribution of the respondents according to per cent change in socio-economic status has been presented in Table No. 4.

Table-4: Distribution of the respondents according to their change in socio-economic status.

Sr. No.	Per cent change in socio-economic status	Number of Beneficiaries (N=125)		Number of Non-Beneficiaries (N=125)		Overall (N=250)	
		No.	Percent	No.	Percent	No.	Percent
1.	Low (Up to 30)	34	27.20	62	49.60	96	38.40
2.	Medium (30 to 60)	75	60.00	52	41.60	127	50.80
3.	High (60 and above)	16	12.80	11	8.80	27	10.80
		125	100.00	125	100.00	250	100.00

Source: Primary Survey data year 2021

It is revealed from Table No. 4 that, a majority of the beneficiaries (60.00 percent) exhibited medium i.e. 30 to 60 percent change in their socio-economic status, followed by 12.80 percent of the beneficiaries found to be in the high category i.e. 60 per cent and above a change in their socio-economic status. About 27.20 percent of the beneficiaries reported change in their socio-economic status in the low category i.e. up to 30 percent. The average socio-economic status of the beneficiaries during this period was found 40.68.

It is also observed that half of the non-beneficiaries (49.60 percent) exhibited a change in their socio-economic status in the low category i.e. up to 30 percent, followed by 41.60 percent of the non-beneficiaries exhibiting a change in their socio-economic status in the medium category i.e. 30 to 60 percent. Only 8.80 percent of the non-beneficiaries reported change in their socio-economic status in the high category i.e. 60 and above percent. The average socio-economic status of the non-beneficiaries during this period was found 32.76.

The 50.80 percent change in the socio-economic status of the respondents was ranging from 30 to 60 percent i.e. medium, followed by 38.40 percent of the respondents indicating percent change in their socio-economic status in low category i.e. up to 30 percent. Only 10.80 percent of the respondents exhibited high i.e. 60 and above percent change in their socio-economic status. The overall average percent change in the socio-economic status of the respondents during this period was found 36.72. The above results show that watershed development has

increased the income of the people in the beneficiary villages which has helped in improving their social life as well as their material possessions.

Conclusion:

Watershed development in the study area encouraged farmers to change their cropping pattern and crop intensity due to the availability of water for agricultural irrigation along with soil and water conservation. The present investigation revealed that there was a considerable change in the cropping pattern and cropping intensity in the beneficiary villages compared to that of non-beneficiary villages of the watershed development programme. Further, the WSD programme has also provided various avenues of employment, in the form of catchment area development and land development activities, to the members of the beneficiary families. Secondly, the intensification in crop and livestock production resulting from an increase in irrigation was also responsible for employment availability to more family members of the beneficiaries. The availability of employment has helped in increasing the economic income of the beneficiary villagers and raising their physical wealth, health, education and social life. Thus, the WDP, along with other government schemes for tribal development, has made significant contributions to the overall improvement of the resource-poor tribal communities in the field of study.

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भारतीय विदेश नीति के जनक : जवाहर लाल नेहरू

चन्द्रशेखर उसरेठे
सहायक प्राध्यापक, (राजनीति विज्ञान), शासकीय महाविद्यालय चौरई,
Email- chandrashekharusrethe@gmail.com
Corresponding Author- **चन्द्रशेखर उसरेठे**
DOI- 10.5281/zenodo.7057134

जिला छिन्दवाड़ापारिभाषिक शब्दावली— पंचशील, गुटनिरपेक्षता, राष्ट्रमण्डल, उपनिवेशवाद, साम्राज्यवाद

किसी भी देश की विदेश नीति एक महत्वपूर्ण दस्तावेज होता है जो एक संप्रभु राष्ट्र से दूसरे संप्रभु राष्ट्र के सम्बंधों के बारे में राष्ट्र की नीति को रेखांकित करता है। जिस प्रकर व्यक्ति के व्यक्ति के साथ, पड़ोसी के पड़ोसी के साथ संबंध होते हैं, उसी प्रकार दो देशों के बीच आपसी संबंध उनके आपसी रिश्ते और उन रिश्तों को अल्पकालीन और दीर्घकालीन उद्देश्यों को पूरा करने के लिए संपादित किये जाते हैं। किसी भी देश की विदेश नीति का उद्देश्य उस देश की संप्रभुता की रक्षा और राष्ट्रहितों की पूर्ति करना होता है। विदेश नीति स्थायी नहीं होती है यह समय और परिस्थिति के साथ बदलते रहती है। भारत की विदेश नीति के संबध में पंडित जवाहर लाल नेहरू ने सितम्बर १९४६ मं कहा था कि भारत विदेश संबंधों के क्षेत्र में एक स्वतंत्र नीति का अनुसरण करेगा और गुटों से दूर रहते हुए विश्व के सभी पराधीन देशों के लिए आत्म निर्णय का अधिकार प्रदान करने तथा जातीय भेदभाव की नीतियों का दृढ़ता पूर्वक उन्मूलन करने का प्रयास करेगा, साथ ही वह विश्व के अन्य स्वतंत्रता प्रेमी और शांतिप्रिय राष्ट्रों के साथ मिलकर अंतर्राष्ट्रीय सहयोग और सद्भावनाओं के लिए निरंतर प्रयासरत रहेगा। स्वतंत्र भारत के प्रथम प्रधानमंत्री बनने के बाद नेहरू ने पंचवर्षीय योजनाओं के माध्यम से देश का सामाजिक व आर्थिक विकास किया। साथ ही उनकी सोच ने विदेश नीति को भी व्यापक रूप से प्रभावित किया। उन्होने घरेलू परिस्थितयों व आवश्यकताओं तथा अंतर्राष्ट्रीय परिस्थितियों के अनुरूप विदेश नीति को आकार देने का प्रयास किया। नेहरू ने अपनी विदेश नीति को निम्नलिखित सिद्धांतो पर आधारित कियज्ञं

भारत और राष्ट्रमण्डल—

नेहरू यह जानते थे कि आर्थिक दृष्टि से भारत का अधिकांश व्यापार ब्रिटेन और राष्ट्रमण्डल के देशों पर निर्भर है। इस हालत में एकाएक राष्ट्रमण्डल से सम्बन्ध—विच्छेद कर लेने में कठिनाई थी। सैनिक दृष्टि से भी भारत ब्रिटेन पर निर्भर था। अपनी विस्तृत समुद्रतटीय सीमा की रक्षा के लिए भारत ब्रिटेन की नौ—सेना पर आश्रित था। इन परिस्थितयों में नेहरू ने विदेश नीति के क्षेत्र में निर्णय लिया कि भारत राष्ट्रमण्डल का सदस्य बना रहेगा। राष्ट्रमण्डल इस समय एक मंच के रूप में खड़ा है जहां भारत अफ्रीका, एशिया, यूरोप प्रंशांत और कैरिबयन समूह के अन्य राज्यों के साथ संबंधों का निर्माण, नवीनीकरण और पुनर्परिभाषित कर सकता है। अपनी औपनिवेशिक जड़ों के बावजूद, यह सबसे पुरानी संस्था है जिसने भारत को स्वतंत्रता प्राप्त करने से दशकों पहले दुनिया का एक दृष्टिकोण प्रदान किया। स्वतंत्रता के बाद, राष्ट्रमण्डल ने विभिन्न तरीकों से भारत के हितों की सेवा की है। पश्चिमी देशों से मधुर संबंध बनाये रखना, व्यापार संबंधों और आर्थिक सहायता का विस्तार करके नए शामिल हुये अफ्रीकी देशों एवं अन्य छोटे देशों के साथ एकजुटता दिखाना, राष्ट्रमण्डल शिखर सम्मेलन एवं राष्ट्रमण्डल खेलों की मेजबानी करके अपनी कूटनीतिक और संगठनात्मक क्षमताओं का प्रदर्शन करना।

गुट निरपेक्षता—

गुटनिरपेक्ष आंदोलन को १९६१ में भारत की पहल पर शुरू किया गया और औपचारिक रूप से गुटनिरपेक्ष आंदोलन का शुभारंभ भारत के प्रधानमंत्री जवाहरलाल नेहरू, यूगोस्लाविया के राष्ट्रपति मार्शल टीटी और मिश्र के राष्ट्रपति कर्नल नासिर ने किया।जैसा कि नाम से ही स्पष्ट है, गुटनिरपेक्षता की नीति का उद्देश्य गुटों की राजनीति से दूर रहना, किसी के साथ भी सैनिक संधियां न करना और दोनों गुटों से दूर रहते हुये एक स्वतंत्र विदेश नीति का विकास करना है। नेहरू ने कहा था कि भारत किसी भी गुट में

शामिल नहीं है। भारत की गुटनिरपेक्षता की नीति को एक सकारात्मक तटस्थता कहा जा सकता है। इस व्यवस्था के अंतर्गत देश स्वतंत्र रूप से कार्य कर करता है और प्रत्येक प्रश्न पर गुण–दोष के आधार पर ही किसी नतीजे पर पहुंचता है। १९६० के बाद गुटनिरपेक्षता की अवधारणा इतनी मूल्यावान हो गई की जो भी देश इस काल में स्वतंत्र हुए उन्होंने अपनी राजनीतिक स्वतंत्रता की रक्षा और आर्थिक विकास के लिए गुटनिरपेक्षता का मार्ग ही चुना।

पंचशील के सिद्धांत–

पंडित जवाहर लाल नेहरू ने भारत की विदेश नीति को ऐसे अवसर के रूप में देखा जिसमें वे अंतर्राष्ट्रीय मंच पर भारत को एक सशक्त राष्ट्र के रूप में स्थापित कर सकें। उनकी विदेश नीति का महत्वपूर्ण हिस्सा था उनका पंचशील का सिद्धांत जिसमें राष्ट्रीय संप्रभुता बनाये रखना और दूसरे राष्ट्र के मामलों में हस्तक्षेप न करने जैसे पॉच महत्तवपूर्ण शांति सिद्धांत शामिल थे। इस सिद्धांत पर भारत और चीन ने २९ अप्रैल १९५४ को हस्ताक्षर किए। ये पांच सिद्धांत निम्नलिखित हैं–

१.एक दूसरे की भौगोलिक अखण्डता व प्रभुसत्ता का सम्मान करना।

२.अनाक्रमण की नीति अपनाना।

३.एक–दूसरे के आंतरिक मामलों में हस्तक्षेप न करना।

४.परस्पर समानता के व्यवहार का पालन करना।

५.शांतिपूर्ण सह–अस्तित्व की नीति का पालन करना।

सन् १९६२ में भारत पर आक्रमण करके चीन ने इन सिद्धांतों का हनन किया। इस युद्ध में नेहरू की पराजय हुई तथा नेहरू की विदेश नीति को गहरा आघात पहुँचा।

विश्व शांति का समर्थन एवं संयुक्त राष्ट्र संघ में आस्था–

पंडित नेहरू ने सदैव विश्व शांति की नीति का समर्थन किया तथा संयुक्त राष्ट्र संघ के क्रियाकलापों में अपना सहयोग दिया। संयुक्त राष्ट्र के विभिन्न आयोगों व संस्थाओं में भारत की सहभागिता रही। जून १९४५ को संयुक्त राष्ट्र संघ के चार्टर पर हस्ताक्षर करने वाले प्रारंभिक सदस्यों में भारत भी था। दूसरे विश्व युद्ध के बाद सभी राष्ट्र एकजुट हुए और आने वाली पीढ़ियों को युद्ध की विभीषिका से बचाने, मानवाधिकारों और पुरूषों व महिलाओं के समान अधिकारों के प्रति दोबारा विश्वास कायम करने व बड़े और छोटे राष्ट्रों के लिए समान रूप से न्यायसंगत शर्तें स्थापित कर स्वतंत्र रूप से सामाजिक प्रगति को बढ़ावा देने के लिए प्रतिबद्ध थे। ऐतिहासिक सैन फ्रांसिस्को सम्मेलन में भारतीय प्रतिनिधिमंडल का नेतृत्व रामास्वामी मुदालियर ने किया, जिन्होने चार्टर पर हस्ताक्षर भी किए। १५ अगस्त १९४७ को संयुक्त राष्ट्र मुख्यालय में आजाद भारत का झंडा फहराया गया और ५४ देशों के बीच भारत ने अपना यथोचित स्थान हासिल किया। भारत ने कोरिया, कम्बोडिया, सोमालिया तथा विश्व के अन्य स्थानों में शांति सेनाएँ भेजने में पूर्ण सक्रियता दिखाई। हिन्द महासागर को शांति क्षेत्र बनाने में भारत ने सदैव ही प्रयास किया है।

रंगभेद की नीति का विरोध–

पंडित नेहरू ने रंगभेद की नीति का घोर विरोध किया। भारत ने स्वतंत्रता प्राप्ति के पूर्व भी दक्षिण अफ्रीका की रंगभेद की नीति की आलोचना की तथा बाद में भी इस नीति का विरोध किया। भारत के निरंतर प्रयासों के कारण सुरक्षा परिषद ने दक्षिण अफ्रीका की सरकार के विरूद्ध अनेक प्रतिबंधों की घोषणा की तथा भारत ने दक्षिण अफ्रीका से १९५४ में अपने कूटनीतिक सम्बन्ध तोड़ लिए।

अफ्रो–एशियाई एकता पर बल–

पंडित जवाहर लाल नेहरू ने प्रारंभ से ही एशिया और अफ्रीका के नव स्वतंत्र राष्ट्रों की एकता के समर्थक थे। जनवरी १९४९ में दिल्ली में आयोजित किए गये एक सम्मेलन में उन्होने सुझाव दिया था कि अफ्रीका और एशिया के इन देशों के बीच सहयोग और मित्रता की भावना को मजबूत किया जाना चाहिए।

निशस्त्रीकरण का समर्थन–

भारत ने हमेशा नि:शस्त्रीकरण का समर्थन किया है। इस संदर्भ में संयुक्त राष्ट्र संघ और उसके बाहर भी सभी मंचों पर भारत ने दृढ़ता से अपनी आवाज बुलंद की है। नेहरू ने सर्वप्रथम २ अप्रैल १९५४ को संयुक्त राष्ट्र संघ में परमाणु शस्त्रों से मुक्त विश्व बनाने के लिए स्टैंडस्टील रिजोल्यूशन प्रस्तुत किया था। परंतु जब १९५९ तक भारत के बार–बार दोहराने पर भी कोई कार्यवाही नहीं हुई तब भारत की पहल पर १९६१ में महासभा ने नि:शस्त्रीकरण समिति के रूप में एक स्थायी समिति की स्थापना पर सहमति व्यक्ति की। इन प्रयासों के फलस्वरूप १९६३ में संयुक्त राष्ट्र संघ द्वारा आंशिक परमाणु प्रतिबंध संधि पर सहमति हुई।

साम्राज्यवाद और उपनिवेशवाद का विरोध–

भारत ने साम्राज्यवाद और उपनिवेशवाद का हर मंचो पर विरोध किया है। इस संदर्भ में भारत ने इंडोनेशिया की स्वतंत्रता के लिये संयुक्त राष्ट्र

संघ में आवाज उठाई। नई दिल्ली में १९४९ में एशियाई देशों का सम्मेलन बुलाकर इंडोनेशिया की स्वतंत्रता का समर्थन किया।

साधनों की पवित्रता की नीति—

भारत की विदेश नीति महात्मा गांधी के इस मत से बहुत प्रभावित है कि न केवल उद्देश्य बल्कि उसकी प्राप्ति के साधन भी पवित्र होने चाहिए। भारत हमेशा प्रयास करता है कि अंतर्राष्ट्रीय विवादों का समाधान शांतिपूर्ण तरीकों से होना चाहिए।

निष्कर्ष—

नेहरू की विदेश नीति का मुख्य उद्देश्य विश्वशांति और अंतर्राष्ट्रीय विवादों का शांतिपूर्ण समाधान करना था। वे पड़ोसी देशों से भी मित्रतापूर्ण सम्बन्ध बनाये रखना चाहते थे और महाशक्तियों से भी। गुट निरपेक्षता की नीति को नेहरू के बाद भी भारत के सभी प्रधानमंत्रियों ने अपनाया। सोवियत संघ के विघटन के बाद भी आज अमेरिका और रूस के बीच अनेक मुद्दों पर विवाद बना हुआ है इसलिये आज भी गुटनिरपेक्षता की प्रासंगिता बनी हुई है।

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माहिती व तंत्रज्ञान

प्रा. सुरेखा जो. रेडेकर
समीर गांधी कला महाविद्यालय, माळशिरस
Corresponding Author- **प्रा. सुरेखा जो. रेडेकर**
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प्रस्तावना:-

माहिती प्रक्षेपित करण्यासाठी, साठविण्यासाठी, तयार करण्यासाठी, प्रदर्शित करण्यासाठी किंवा तिची देवाणघेवाण करण्यासाठी वापरली जाणारी विद्युत उपकरणे म्हणजे माहिती व संप्रेषण तंत्रज्ञान. यामध्ये रेडियो, दूरदर्शन, व्हिडियो, डिव्हिडी, दूरध्वनी, मोबाईल फोन, उपग्रहावर आधारीत सेवा व सुविधा, संगणक व त्या संबंधित हार्डवेअर आणि सॉफ्टवेअर अशा गोष्टींचा समावेश होतो. ह्या व्यतिरिक्त, व्हिडियो कॉन्फरन्सिंग, ईमेल, ब्लॉग अशा तंत्रांचा ही यात समावेश होतो.

उद्देश:-

सध्याच्या 'माहिती युगात' शैक्षणिक ध्येये समजून घेण्यासाठी माहिती व संप्रेषण तंत्रज्ञानाच्या (ICT) नवनवीन स्वरूपांचा शिक्षणात अंतर्भाव करणे गरजेचे आहे. हे सर्व प्रभावीरीत्या करण्यासाठी शैक्षणिक नियोजनकार, मुख्याध्यापक, शिक्षक व तंत्रज्ञांना प्रशिक्षण, तंत्रज्ञान, वित्त, शिक्षण, संप्रेषण अशा विविध क्षेत्रात अनेक निर्णय, ते ही योग्य रीत्या घेता आले पाहिजेत. अनेकांसाठी हे काम म्हणजे एखादी नवी भाषा शिकणे व ती शिकविण्यास शिकणे इतके कठीण काम वाटते. शिक्षणतज्ञ, नीतीशास्त्रज्ञ, नियोजनकार, अभ्यासक्रम तयार करणारे तज्ञ तसेच इतरांना माहिती व संप्रेषण तंत्रज्ञानाची (ICT) गुंतागुंतीची उपकरणे, त्या संबंधित संज्ञा आदींतून मार्ग काढत योग्य निर्णय घेणे सोपे जावे हा यामागील उद्देश आहे.

माहिती व संप्रेषण तंत्रज्ञानाचा (ICT) वापर करून शिक्षणाच्या दर्जात उल्लेखनीय आणि सकारात्मक सुधारणा करता येईल असे साधारणतः सर्वच शिक्षणतज्ञांचे व संशोधकांचे म्हणणे आहे. मात्र शिक्षणपद्धतीमध्ये माहिती व संप्रेषण तंत्रज्ञानाचे स्थान नेमके काय असावे व त्याच्या उपयुक्ततेचा जास्तीत जास्त फायदा कसा करून घेता येऊ शकतो हा अजून ही चर्चिला जाणारा मुद्दा आहे.

कार्यक्षेत्रात तंत्रज्ञान साऱ्या जगातून मिळविलेल्या, तंत्रज्ञानाचा वापर करताना वापरल्या जाणाऱ्या पद्धती, उपाय, धोरणे, त्यांचे यश अपयश यांच्या कथा, यात खालील मुद्यांचा समावेश आहे:

मल्टीचॅनेल लर्निंग (बहु-वाहिनी शिक्षण)
शैक्षणिक दूरदर्शन, शैक्षणिक रेडियो, वेब-आधारीत सूचना, शोधासाठी ग्रंथालये, विज्ञान व तंत्रज्ञान यांची प्रात्यक्षिके, माध्यमांचा (मीडिया) वापर, विविध क्षेत्रातील तंत्रज्ञानाचा वापर: लहान मुलांचा विकास, कमी घनता असणारी लोकसंख्या, प्रौढ शिक्षण, स्त्री शिक्षण, मनुष्यबळ विकास, शिक्षकांच्या तयारीसाठी व प्रशिक्षणासाठी तंत्रज्ञानाचा वापर, धोरणे आखण्यासाठी, माहिती व्यवस्थापन (डेटा प्रबंधन) करण्यासाठी तंत्रज्ञानाचा वापर, शाळा व्यवस्थापनासाठी तंत्रज्ञानाचा वापर

सद्यकाळातील तंत्रे:

तंत्रज्ञान क्षेत्रातील कोणकोणत्या गोष्टींचा वापर शिक्षणपद्धतीत करता येऊ शकतो याचा आढावा:

सूचनात्मक साधने

1. ऑडियो, व्हिडियो व डिजिटल उपकरणे (श्रव्य, दृश्य व डिजिटल उत्पाद)
2. सॉफ्टवेअर व कन्टेन्टवेअर
3. संपर्काची साधने
4. माध्यम (मीडिया)
5. शैक्षिणक वेबसाईटस्

भविष्यातील तंत्रज्ञान:

सध्या अस्तित्वात असलेले तंत्रज्ञान व भविष्यात येऊ घातलेले तंत्रज्ञान यावर एक नजर. वापर करणाऱ्या आणि निर्णय घेणाऱ्यांच्या कल्पनेला प्रोत्साहन देण्यासाठी आणि काय उपलब्ध आहे ह्या वरच आधारित

नव्हे तर काय येत आहे, ह्यावर भविष्यातील तंत्रज्ञानावर एक दृष्टि

रेडियो व दूरदर्शन

1. 20व्या शतकाच्या सुरूवातीपासून रेडियो व दूरदर्शन यांचा वापर शिक्षणासाठी केला जात आहे.

2. रेडियो व दूरदर्शनचा वापर मुख्यत्वे खालील प्रकारे केला जातो: ICT च्या ह्या स्वरूपांचा मुख्यत्वे तीन प्रकारे उपयोग करण्यात येतो:

3. शालेय विषयांशी संबंधित ध्वनी चित्रफिती व रेडियोवरून प्रसारित केले जाणारे कार्यक्रम यांच्या सहाय्याने वर्गांत शिकविणे.

शाळांमध्ये शिक्षणाला पूरक असे कार्यक्रम प्रक्षेपित करणे.

सामान्य ज्ञान व माहितीपर शैक्षणिक कार्यक्रम दाखविणे किंवा प्रसारित करणे.

रेडियोवरून (IRI) प्रसारित केले जाणारे कार्यक्रम दैनिक स्वरूपाचे असतात. हे रेडियो धडे, एका विशिष्ट विषयाशी संबंधित असतात व त्यांचा प्रेक्षकवर्ग लक्षात घेऊन त्यांची काठिण्यपातळी ठरविली जाते. या कार्यक्रमांमुळे शिक्षकांना तो विषय अधिक चांगल्या रीतीने शिकविण्यास मदत होते तसेच मुलांना ही तो विषय समजून घेणे सोपे जाते. या पद्धतीमुळे दुर्गम भागातील शाळेतील विद्यार्थी व ज्या ठिकाणी शिक्षकांची कमतरता आहे अशा ठिकाणच्या विद्यार्थ्यांना ही शिक्षण घेणे सोपे जाते. रेडियोवरून (IRI) प्रसारित केल्या जाणाऱ्या या कार्यक्रमामुळे औपचारिक व अनौपचारिक दोन्ही प्रकारच्या शिक्षणाचा दर्जा व त्याची व्याप्ती, दोन्ही गोष्टींवर सकारात्मक प्रभाव पडला आहे. शिवाय रेडियो कमी खर्चिक असल्यामुळे मोठ्या लोकसंख्येला शिक्षणाचा लाभ मिळू शकतो.

दूरचित्रित केलेले कार्यक्रम अभ्यासक्रमास पूरक म्हणून किंवा स्वतंत्र पाठ म्हणून ही वापरले जाऊ शकतात. अशा कार्यक्रमांत आता अनेक आमूलाग्र बदल घडून आले आहेत. पूर्वी अनेकदा अशा कार्यक्रमांत एखादा शिक्षक एखाद्या विषयावर विवेचन करताना दाखविला जाई मात्र आता त्याची जागा विद्यार्थ्यांना जवळ वाटणाऱ्या मुद्यांनी व सुसंवाद साधणाऱ्या कार्यक्रमांनी घेतली आहे त्यामुळे हे कार्यक्रम विद्यार्थ्यांना अधिकाधिक खिळवून ठेवत आहेत. विद्यार्थ्यांची ग्रहणक्षमता व सुसंवाद वाढविण्यासाठी बहुतेक अशा शैक्षणिक कार्यक्रमांसह छापील व इतर प्रकारचे साहित्यदेखील पुरविले जाते. आशिया-पॅसिफिक प्रदेशात शैक्षणिक प्रसारण मोठ्या प्रमाणात केले जाते. उदा. भारतात इंदिरा गांधी राष्ट्रीय मुक्त विद्यापीठातील अनेक अभ्यासक्रम दूरदर्शन व व्हिडियो कॉन्फरन्सिंगच्या मदतीने शिकविले जातात.

काही विशिष्ट अभ्यासक्रमांशी संबंधित कार्यक्रम प्रसारित करण्याबरोबरच सर्वसामान्य शैक्षणिक कार्यक्रम प्रसारित करण्यासाठी ही दूरदर्शन व रेडियोचा वापर केला जाऊ शकतो. वास्तविक, शैक्षणिक मूल्य असणारा व रेडियो किंवा दूरदर्शनवरून प्रसारित केला जाणारा कोणता ही कार्यक्रम 'सर्वसामान्य शैक्षणिक कार्यक्रम' म्हणून गणला जाऊ शकतो. उदा. अमेरिकेत प्रसारित केला जाणारा 'सीसेम स्ट्रीट' हा कार्यक्रम किंवा कॅनडामधील 'फार्म रेडियो फोरम' हा रेडियो चर्चा कार्यक्रम.शिक्षणामध्ये रेडियो व दूरदर्शन प्रसारणसेवेचा कसा वापर करून घेण्यात आला आहे?

रेडियो १९२० च्या दशकाच्या सुरुवातीपासून तर दूरदर्शन १९५० च्या दशकाच्या सुरुवातीपासून शैक्षणिक साधन म्हणून वापरला जात आहे. हा वापर मुख्यत्वे खालीलप्रकारे केला जात आला आहे:

थेट वर्गात शिकविण्यासाठी जेथे कार्यक्रमाचे प्रसारण शिक्षकाचा तात्पुरता पर्याय मानला जाते.

शाळांमध्ये शिक्षणाला पूरक असे कार्यक्रम प्रक्षेपित करण्यासाठी.

सामान्य ज्ञान व माहितीपर शैक्षणिक कार्यक्रम प्रसारित करण्यासाठी.

याचे सर्वात चांगले उदाहरण म्हणजे रेडियोद्वारे सुसंवाद (इंटरऍक्टिव्ह रेडियो इंस्ट्रक्शन्स) (IRI) या २० ते ३० मिनिटांच्या कार्यक्रमांत विविध स्वाध्यायांद्वारे वर्गांत शिकविले जाते. रेडियोवरून प्रसारित केले जाणारे हे धडे मुख्यतः गणित, विज्ञान, आरोग्य, अभ्यासक्रमांतील विविध भाषा यांच्याशी संबंधित असतात. या कार्यक्रमांचा मुख्य उद्देश वर्गात दिल्या जाणाऱ्या शिक्षणाचा दर्जा उंचाविणे तसेच ज्या शाळांमधील शिक्षकांना योग्य प्रशिक्षण मिळू शकलेले नाही अशा शिक्षकांना त्यांच्या विद्यार्थ्यांना शिकविण्यास मदत करणे हा आहे.

असे कार्यक्रम भारत व इतर काही दक्षिण आशियाई देशांत राबविले गेले आहेत. आशिया खंडात अशा प्रकारचा कार्यक्रम सर्वात प्रथम थायलंड या देशात १९८० साली राबविण्यात आला. १९९०च्या दशकात इंडोनेशिया, पाकिस्तान, बांगलादेश व नेपाळ या राष्ट्रांत असे कार्यक्रम सुरु करण्यात आले. या कार्यक्रमाचे मुख्य वैशिष्ट त्याच्या उद्देशात आहे. या कार्यक्रमाचा मुख्य उद्देश आहे केवळ शिक्षणाची व्याप्ती न वाढविता त्याची गुणवत्ता वाढविणे. आणि त्याच्या या उद्देशात त्याला पुष्कळसे यश ही मिळाले आहे. जगभरात केल्या गेलेल्या संशोधनाच्या आधारे हे स्पष्ट झाले आहे की या कार्यक्रमामुळे शिक्षणाच्या गुणवत्तेवर अनुकूल परिणाम झाला आहे. शिवाय रेडियो इतर साधनांच्या तुलनेत बराच स्वस्त असल्याने त्याच्या सहाय्याने प्रसार करणे ही सोपे जाते.

दूरचित्रवाणी कार्यक्रम उपग्रहांच्या मदतीने संपूर्ण देशभरात शाळांच्या वेळेत प्रसारित केले जातात. हे कार्यक्रम शाळांत शिकविल्या जाणाऱ्या अभ्यासक्रमांवर आधारित असतात. प्रत्येक तासाला वेगवेगळ्या विषयांवर आधारित कार्यक्रम प्रसारित केले जातात. शाळेत विद्यार्थ्यांबरोबर एक शिक्षक असतोच शिवाय कार्यक्रमांच्या माध्यमातून विद्यार्थ्यांना वेगवेगळ्या शिक्षकांच्या शिकविण्याची पद्धत अनुभवायला मिळते.

या कार्यक्रमांच्या स्वरूपात आता कालपरत्वे बदल घडून आलेला आहे. केवळ बोलणाऱ्या व्यक्ती (टॉकिंग हेडस्) दाखविण्यापेक्षा हे कार्यक्रम अधिक सुसंवादी करण्याकडे व त्या माध्यमातून समाजाला शिक्षणाशी जोडण्याकरीता ''लिंक्स्'' आकर्षित करण्याकडे आता भर दिला जात आहे. या कार्यक्रमांमुळे माध्यमिक शाळांतून होणारी विद्यार्थ्यांची गळती बऱ्याच प्रमाणात कमी झाली आहे. रेडियो व दूरदर्शनचा शिक्षणासाठी अधिकाधिक वापर चीनमधील ४४ रेडियो व दूरदर्शन विद्यापीठे (ज्यामध्ये चायना सेंट्रल रेडियो व दूरदर्शन विद्यापीठाचा समावेश आहे) इंडोनेशियातील टरबुका विद्यापीठ, भारतातील इंदिरा गांधी राष्ट्रीय मुक्त विद्यापीठ यांच्याद्वारे करण्यात येत आहे.

जापानच्या एअर विद्यापीठाने २००० साली १६० दूरदर्शन व १६० रेडियो अभ्यासक्रम प्रसारित केले. प्रत्येक अभ्यासक्रमामध्ये १५ ते ४५ मिनिटांची व्याख्याने आठवड्यातून एक दिवस याप्रमाणे पंधरा आठवडे संपूर्ण देशभरात प्रसारित केली जातात. ही व्याख्याने विद्यापीठाच्या आकाशवाणी केंद्रांवरुन सकाळी ६ ते दुपारी १२ वाजेपर्यंत प्रसारित करण्यात येतात. याशिवाय विद्यार्थ्यांना अभ्यासास पूरक असे छापील साहित्य, सूचना, व्यक्तिगत मार्गदर्शन व ऑनलाईन स्वाध्याय देखील पुरविले जातात.

छापील साहित्य, कॅसेटस् आणि सीडीज् यांसारख्या साधनांच्या साहाय्याने प्रसार माध्यमांद्वारे शिकविल्या जाणाऱ्या अभ्यासक्रमांमुळे विद्यार्थ्यांना अनेकविध विषयांचा अभ्यास करण्याची संधी उपलब्ध झाली आहे. मात्र शाळेत प्रसारित केले जाणारे अभ्यासविषयक कार्यक्रम शाळेतील शिक्षकांची जागा घेण्यासाठी बनविलेले नाहीत तर या कार्यक्रमांद्वारे शिक्षकांच्या शिकविण्याच्या पद्धतीत आणि विद्यार्थ्यांच्या अभ्यास करण्याच्या क्षमतेत सुधारणा व्हावी व एकूणच शाळेतील शिक्षणाचा दर्जा सुधारावा हा यामागील मुख्य हेतू आहे. रेडियोवरून (IRI) प्रसारित केल्या जाणाऱ्या कार्यक्रमांपेक्षा दूरदर्शन संचावर दाखविता येणारे कार्यक्रम अधिक सोयीस्कर असतात कारण शिक्षक आपल्या वर्गाच्या सोयीनुसार ते दाखवू शकतात व त्याला पूरक अशा साहित्याची जमवाजमव करू शकतात. इंग्लडमधील बीबीसी (ब्रिटिश ब्रॉडकास्टिंग कॉरपोरेशन एज्युकेशनल रेडियो टीव्ही) शैक्षणिक रेडियो आणि जापानमधील एन एच के (NHK) रेडियो अशा रेडियो प्रसारण क्षेत्रातील अग्रेसर कंपन्या रेडियोद्वारे शिक्षणप्रसार करतात. विकसनशील देशांमध्ये शाळांतून प्रसारित केले जाणारे कार्यक्रम मुख्यतः शिक्षण मंत्रालय व माहिती प्रसारण मंत्रालय यांच्या भागीदारीत चालविले जातात.

सर्वसामान्य शैक्षणिक कार्यक्रमांत बातम्या, माहितीपट, प्रश्नमंजुषा कार्यक्रम, शैक्षणिक कार्टून्स अशा विविध कार्यक्रमांचा समावेश होतो. म्हणजेच माहिती मूल्य असणारे रेडियो व दूरदर्शनवरील सर्वच कार्यक्रमांचा यात समावेश होतो. नॅशनल जिओग्राफिक चॅनेल, डिस्कव्हरी अशा माहितीपर वाहिन्या, अमेरिकेत प्रसारित होणारा व्हॉईस ऑफ अमेरिका, द फार्म रेडियो फोरम ज्याची सुरूवात कॅनडा येथे 1940 मध्ये झाली आणि ज्याने वैश्विक पातळीवर रेडियो चर्चेचे प्रारूप म्हणून सेवा प्रदान केल्या, अनौपचारिक शैक्षणिक कार्यक्रमांची ह्या बाबतीतील काही उदाहरणे.

1.संशोधन केल्या नंतर हे सिद्ध झाले आहे की माहिती व संप्रेषण साधने (ICTs) योग्यरीत्या वापरल्यास विद्यार्थ्यांमध्ये शिक्षणाविषयी आवड निर्माण करता येते व शिक्षणाची गुणवत्ता सुधारण्यास मदत होते.

2. माहिती व संप्रेषणांच्या (ICTs) साधनांमुळे, विशेषतः संगणक व इंटरनेटमुळे शिक्षक व विद्यार्थ्यांना ज्ञानाची नवी कवाडे उघडी झाली आहेत. संगणक व इंटरनेट वापरून शिक्षक व विद्यार्थी पुस्तकी ज्ञानाच्या पलिकडे जाऊन त्यांच्या विषयाशी तसेच इतर विषयांशी संबंधित नवनवी माहिती मिळवू शकतात व आपल्या ज्ञानात भर घालू शकतात. यामुळे आतापर्यंत शिक्षककेंद्रित असणाऱ्या शिक्षणपद्धतीत नवा बदल घडून आला आहे. आतापर्यंत शिक्षक विद्यार्थ्यांना ज्ञान देत असत मात्र आता विद्यार्थी देखील स्वतः इंटरनेट वापरून माहिती मिळवू शकतात व ती वर्गात वाटू शकतात. म्हणजेच शिक्षणपद्धती हळूहळू शिक्षार्थी केंद्रित होत चालली आहे.

सक्रिय सहभाग:

माहिती व दळणवळणाच्या साधनांमुळे परीक्षापद्धती, माहितीचे विश्लेषण करण्याच्या पद्धती यांत अनेक बदल घडून आले आहेत. त्यामुळे विद्यार्थ्यांना माहिती मिळविण्यासाठी, तिचा अभ्यास करण्यासाठी नवीन मार्ग उपलब्ध झाला आहे. आता विद्यार्थी त्यांच्या सवडीप्रमाणे माहिती मिळवू शकतात, निरनिराळ्या प्रकारे तिचा अभ्यास करू शकतात, दैनंदिन जीवनातील घटना अभ्यासू शकतात व त्यायोगे विषय अधिक सखोलरीत्या जाणून घेऊ शकतात. अशा पद्धतीने

माहिती व दळणवळणाच्या साधनांमुळे केवळ अभ्यासाची घोकंपट्टी करून गुण मिळविण्याच्या पद्धतीला प्रोत्साहन मिळण्यापेक्षा विद्यार्थ्यांचा शिक्षणातील रस वाढण्यात मदत होत आहे.

दुहेरी शिक्षण:

माहिती व दळणवळणाच्या साधनांमुळे विद्यार्थी, शिक्षक, तज्ञ यांच्यात संवाद व सहकार्याची भूमिका निर्माण होण्यास मदत होते. शिवाय या साधनांमुळे वेगवेगळ्या संस्कृतीतील व्यक्तींशी, त्यांच्या संस्कृतींशी ओळख होते व आपल्या ज्ञानाच्या कक्षा रुंदावण्यास मदत होते. या सर्वांचा आयुष्याच्या पुढील वाटचालीत नक्कीच फायदा होतो. माहिती व संप्रेषणाच्या साधनांचा शिक्षणावर कितपत आणि कसा प्रभाव पडतो हे ती साधने कशी व कशासाठी वापरली जातात यावर अवलंबून असते. या साधनांचा सर्वांनाच सारख्याच प्रमाणात फायदा होईल असे ही नाही. मात्र ही साधने योग्य पद्धतीने वापरली गेल्यास त्यांचा फायदा नक्की होतो.

दर्जा उंचाविणे

माहिती व संप्रेषणाच्या साधनांमुळे शिक्षणाच्या गुणवत्तेवर काय परिणाम होतो ह्याचा विस्तृत अभ्यास अजूनपर्यंत केला गेलेला नाही मात्र जो काही थोडाफार अभ्यास करण्यात आलेला आहे त्यावरून हे स्पष्ट झालेले आहे की माहिती व संप्रेषणाच्या साधनांमुळे शिक्षणपध्दतीवर निश्चितच चांगला परिणाम होतो. प्रसारित केल्या जाणाऱ्या अनेक शैक्षणिक कार्यक्रमांपैकी रेडिओद्वारे सुसंवाद कार्यक्रमाचा सखोल अभ्यास करण्यात आला. या कार्यक्रमामुळे शिक्षणाचा दर्जावर उत्तम परिणाम झाल्याचे दिसून आले. तसेच विद्यार्थ्यांच्या गुणांत व उपस्थितीत ही सुधारणा झाल्याचे आढळले.

मात्र संगणक, इंटरनेट यांच्या वापरामुळे शिक्षणाच्या दर्जात फारसा फरक पडल्याचे आढळून आले नाही. याविषयाव संशोधन करणाऱ्या रसेल या अभ्यासकाने 'काही उल्लेखनीय अंतर नसल्याचे' म्हटले आहे की माहिती व संप्रेषणाच्या साधनांचा वापर करणाऱ्या विद्यार्थ्यांच्या गुणवत्तेत व व्यक्तीगत मार्गदर्शन घेणाऱ्या विद्यार्थ्यांच्या गुणवत्तेत त्याला फारसा फरक आढळला नाही. माहिती व संप्रेषणाच्या साधनांद्वारे दिल्या जाणाऱ्यामुळे व्याख्यांनामुळे विद्यार्थ्यांमधील अनुपस्थितीचे प्रमाण वाढल्याचे ही मत अनेक समीक्षक व्यक्त करतात.

निष्कर्ष:-

असा निष्कर्ष काढला जातो की काही विशिष्ट परिस्थितींमध्ये, माहिती आणि संप्रेषण तंत्रज्ञान (ICTs) गरीब लोकांच्या मानवी आणि सामाजिक क्षमतांमध्ये लक्षणीय वाढ करू शकतात आणि त्यांच्या कल्याणावर सकारात्मक परिणाम करतात.

संदर्भ।

1. माहिती व तंत्रज्ञान मुक्त विद्यापीठ.

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ANALYTICAL STUDY OF THE CONVENTION ON BIOLOGICAL DIVERSITY 1992

Dr. Umesh S. Aswar
Former Judge, Assistant Professor, Government Law College, 'A' Road Churchgate Mumbai
***Corresponding Author*- Dr. Umesh S. Aswar**
Mail ID umeshaswar@gmail.com
DOI- 10.5281/zenodo.7064208

Abstract:
The scientists have evolved the term biological diversity of the environment. It lays down the significance of the wholesomeness and vitality of the environment. The third earth summit i. e. the Rio De Janeiro conference organized in 1992 worked on the importance of the biological diversity from the point of view of the protection of environment, prevention of environmental pollution and sustainable development of the human being. As a result convention on biological diversity came in to existence in 1993 at the initiation of the United Nations Organization (hereinafter to be called as UNO).

Keywords: *UNOs Rio de Janeiro earth summit 1992 – biodiversity – convention on biological diversity 1992 – significance of the convention*

Statement of Problem:
Under convention on biological diversity 1992 biological diversity means, "variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems." The natural resources which exist in the biodiversity of the environment are commercially vital. At the same time conservation of this biodiversity secures the objective of protection of environment and prevention of pollution. New branches of the science such as biotechnology, living modified organisms (LMOs) are directly associated with the biological diversity. Therefore it is necessary to analyze the provisions of the biological diversity convention 1992 to understand its significance.

IIntroduction: The Background of the Convention:
The Convention on biological diversity 1992 has been signed in the background of the third earth summit popularly known as *Rio De Janeiro* Conference organized in 1992. The members of the UNO who had participated in this earth summit continued their discussion and eventually the text of the provisions of the proposed biological diversity convention was opened in the Rio earth summit for signature on 5 June 1990. By June 1993 convention received 168 signatures and accordingly it came into force on 29 December 1993.

IIProtocols and Arrangements entered on post Biological Diversity Convention 1992: Wholesomeness is the important feature of the environment. After passing of the present convention soon the importance of living modified organisms (LMOs) which is the outcome of the biotechnology; an independent branch of the knowledge was realized. The role of all countries in the sustainable use of living modified organism as the component of the biodiversity/environment is relevant. Therefore 'the Cartagena protocol on biological diversity' as a part of biological diversity convention was adopted on 29 January 2000 in form of the supplementary agreement which came into force on 11 September 2003.

Eventually on the basis of above-mentioned lines only 'the Nagoya protocol' was entered into as the another supplementary agreement to present

convention on 29 October 2010 which came into force on 12 October 2014. Its object is to ensure access to genetic resources and sharing of the benefits arising from their utilization in the background of present convention on the basis of fairness and equality. It is a strategic plan for biodiversity adopted for the period of 2011 to 2020. It includes in itself the 'Aichi biodiversity targets' consisting of twenty objectives emphasizing on streamlining biodiversity across Government & society, eliminating pressures on biodiversity, improving status of biodiversity and its sustainable use, providing benefits of the biodiversity to all through participatory planning, knowledge management and capacity building.

The above-mentioned two additional protocols provide a kind of legal framework for the sake of implementation of the objectives of '1993 biological diversity convention.' The adoption of independent protocols and subsequent arrangements also manifests the sensitivity and liveliness of the state parties to the issue of biodiversity.

'The European Union's biodiversity strategy 2020' has raised level of knowledge and understanding about ecosystems in the Europe. This policy is concerned about the invasive alien species in the biodiversity and also strives to combat biodiversity loss at international level. It shows the positive approach adopted by regional international organizations towards protection of biological diversity. The 'post 2020 global biodiversity framework' is in the stage of evolution. Its draft was released in July 2021 and final content is in process of finalization at the instance of 'conference of the parties' (COP). It includes a proposal to designate 30% of the global land and sea as the 'protected area'. It will also be working on elimination of agricultural pollution and using digital revolution for the protection of biodiversity.

IIIObjectives of the Convention on Biodiversity 1992 and its Importance:

'The convention on biological diversity 1992' has been entered by the states at international level, hence it is multilateral treaty. Three important objectives of this convention are as follows, firstly to initiate the movement of protection and conservation of biological diversity at international level. Secondly to encourage the state parties for sustainable use of components of the biodiversity which in fact are the natural resources. Thirdly to ensure that the benefits arising from genetic resources will be shared on the basis of equality and fairness. Thus convention is vital because on one hand it strives to protect biodiversity and on other hand it promotes the concept of sustainable development and concept of sharing the benefits of the biodiversity on the basis of equality among relevant stakeholders.

IVFeatures of the Biological Diversity Convention 1993: On analysis of the provisions of the convention following features of the same are apparent.

i) Convention speaks about the conservation and sustainable use of biological diversity (as defined above).

ii) Convention contains the provisions regulating the access to genetic resources and traditional knowledge; it also includes provision of prior informed consent of the state party who is providing the resources to other parties.

iii) Convention contains the scheme of the fair equitable sharing among the state parties and local communities the results of research and development and the benefits acquired from the commercial utilization of the genetic resources.

iv) The provisions of the convention have ensured that the state parties will be able to have access and transfer of the technology regarding biodiversity including biotechnology. Similarly the local communities providing traditional knowledge and biodiversity resources will be equally having this access.

v) The convention has ensured that there will be technical, scientific corporation at international level inclusive of coordination of a global directory of taxonomic expertise.

vi) The state parties have committed that they will be strictly adhering to the environmental audit i.e. environmental

impact assessment process while planning and implementing any development adventure.

vii) State parties committed that they will be providing special attention to the education and awareness of the people at large for the protection of environment and biological diversity.

viii) State parties have also agreed for providing special financial resources for the implementation of the convention within the territories and making national reporting of the state efforts towards implementation of the provisions of conventions.

VAuthorities under the Convention:

For the sake of implementation of the provisions of the convention following authorities have been formed.

i) Under the convention governing body called as 'conference of the parties' (COP) is formed. Each state party is having a representation in it. It performs the functions such as making periodical review of the progress of the implementation of convention, readjusting the priorities under convention with passing of the time and setting up the plans of the implementation for the guidance of state parties. The 'conference of parties' could also suggest for the amendments if any required in the provisions of convention. It also forms the special subsidiary bodies if required, enters into a tie-up with other international organizations and makes review of the report filed by state parties.

ii) Convention has also made a provision of having full-time 'secretariat' based in Montréal. It is also operative under 'United Nations environmental program'. Secretariat perform the functions such as calling of the meetings of state parties, drafting the documents as decided by the parties, assisting Governments in implementation of the provisions of the convention, collecting and disseminating the required information to the stakeholders under convention and coordinating with other international organizations in the light of the provisions of convention.

iii) Under convention there is 'subsidiary body for scientific, technical and technological advice' (SBSTTA). This committee consists of the experts from the state parties belonging to different relevant fields. Its primary function is to make recommendations to the COP on scientific and technical issues. It also makes assessment of the status of biological diversity and the relevant measures undertaken by the state parties.

iv) In 2014 'conference of the parties to the biodiversity' under present Convention established one 'subsidiary body on implementation' (SBI) in order to substitute 'working group' formed on the ad hoc basis to review the implementation of the convention. Thus now it is full time permanent body. The main functions of this body are to review the progress in implementation of the convention, to form a strategy of the action plan for implementation of the provisions of convention, to strengthen the means of the implementation, and to bring in to operation the provisions of the convention and protocols.

v) In order to secure implementation of the provisions of the convention at national level following two means have been evolved.

a) National biodiversity strategies and action plans (NBSAP): It is the primary arrangement for the implementation of the convention at national level. Under convention state parties have to prepare national biological diversity strategy in such a manner so that the same will be implemented while planning for any activity in all the relevant fields of the life of said country.

b) National report system: In conformity to the Article 26 of the convention, parties do prepare national reports on the status of implementation of the convention which is the mirror document specifying the success of the implementation of the provisions of convention in said state party.

VI Conclusion:

On the basis of the above mentioned analysis following conclusions pertaining 'convention on biological diversity 1992' are drawn which will have to be tested on the touchstone of the time itself.

i) The biological diversity and its components are having ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic value. It on one hand protects & promotes natural environment, prevents environmental pollution and on other hand sustainable use of the biological diversity in form of natural resources ensures material development of the state.
ii) The biological diversity is vital for evolution and for maintaining life sustaining systems of the biosphere. The conservation of biological diversity is a common concern of humankind for its survival.
iii) Under the nation state system and in conformity to the Charter of the UNO the states are having sovereign rights over their own biological resources at the same time they are equally under obligation to conserve their biological diversity and to use their biological resources in a sustainable manner.
iv) Conservation of the biological diversity at a global level is necessary because same has been significantly reduced by certain human activities.
v) There is general lack of the information and knowledge regarding biological diversity therefore it is necessary to develop scientific technical and instrumental capabilities which could aware about the significance of biodiversity and also enable the states to plan and implement appropriate measures for its protection.
vi) It is necessary and important to anticipate, prevent and attack the causes of material reduction or loss of biological diversity at source.
vii) Where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty/technology know-how etc. should not be used as a reason for postponing measures to avoid or minimize any threat to biological diversity.
viii) Fundamental requirement for the conservation of biological diversity is conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings.
ix) At the original place it will be the country of origin (of biodiversity, ecosystem) which will have to play significant role for protection of biodiversity.
x) Many indigenous local communities are dependent on the biodiversity as their traditional lifestyle is based on the biological resources. It is necessary to share benefits with these communities in the meticulous manner on the basis of equality arising from the use of traditional knowledge, innovations and practices which are relevant to the conservation of biological diversity and the sustainable use of its components.
xi) The vital role played by the women in conservation and sustainable use of biodiversity was recognized and it is expected that women should have full participation at all the levels of policy-making and implementation for the conservation of biodiversity.
xii) Conservation of the biological diversity and its sustainable use could be materialized through regional and international cooperation among the state parties which should include access to the relevant technologies for addressing the issue of loss of biological diversity.
xiii) Undeveloped or developing countries who are state parties should be provided with additional financial resources and appropriate access to relevant technologies enabling them to contribute for the protection of biodiversity.
xiv) Under the convention it has been accepted that economic, social development and eradication of the poverty will be the priorities of the undeveloped, developing state parties and in consonance with the same they will be discharging their obligations under the convention. xv) Through conservation and sustainable use of the biological diversity only right to food, health and other needs of the growing population of mankind can be fulfilled.
xvi) The conservation and sustainable use of biological diversity will strengthen friendly relations among states at international level and will be contributing for the world peace.

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Mrs. Sayyed S. N.
Librarian Sharadchandra Mahavidyalaya, Shiradhon Tq. Kallam, Dist. Osmanabad
***Corresponding Author*- Mrs. Sayyed S. N.**
Email : sayyedsamina077@gmail.com
DOI- 10.5281/zenodo.7077500

Abstract

Knowledge is recognized as a key resource in all organizations whether it is profitable or non. Profitable organizations are beginning to realize that there is a vast and largely untapped asset diffused around in the organization is knowledge. Knowledge and management of knowledge are regarded as increasingly important features of an organizational survival. At the beginning knowledge management hyped in 1990 in business sector and then in higher education and then in the library management the need for embracing knowledge management in academic libraries is mainly due to a combined impact of library budget shortfall and higher user expectation and staff user ratio.

Key words : *knowledge management, academic libraries*

Introduction

Knowledge management plays an important role in library services. It is very useful for the library to make it's facilities effective as well as to satisfy the users. In modern era man invented the skill of making fire many initiatives to transfer information, knowledge and skills today labeled as knowledge management. However the systematic study of knowledge management in 1990. S.R. Rangamathan was the first person who advocate that a universe of a subject is synonymous to a universe of knowledge management. Knowledge means to know about something, to understand something. Knowledge management is not a technology thing or a computer thing. "If we accept the premise that knowledge management is concerned with the entire process of discovery and creation of knowledge dissemination and use of knowledge we are strongly driven to accept that knowledge management is much more than a technology thing." Knowledge has been identified as a key resource in all organizations whether profit or non-profit organizations are beginning to realize that there is a vast and largely untapped wealth diffused around in the organizations. Knowledge and management of knowledge are regarded as increasingly important features of organizations to deliver creative products and services. ICT has played a significant role in this dynamics has not only made access the globe easier, but has facilitated integration of thought process. Synergy in working methods and places, team learning and enhancing organizational transparency.

Definition of Knowledge Management

The art of creating value from an organizations intangible assets Davenport and Prusak Defined KM is concerned with the exploitation and development of the knowledge assets of an organization with a view to furthering the knowledge objective.

What is knowledge management?

Knowledge is recognized as a key resource in all organizations whether it is profitable or non. Profitable organizations are beginning to realize that there is a vast and largely untapped asset diffused around in the organization is knowledge. Knowledge and management of knowledge are regarded as increasingly important features of an organizational survival. At the beginning knowledge management hyped in 1990 in business sector and then in higher education and then in the library management the need for embracing knowledge management in academic libraries is mainly due to a combined impact of library budget shortfall and higher user expectation and staff user ratio.

Need of knowledge management in Academic libraries:-

Growth of human knowledge in different formats has led libraries to develop their resources and it access and share strategies from print to electronic and digital resources. Due to budget shortfalls in academic libraries limited technological access. Poor staffing and space, academic libraries have to carefully analyze needs of their users.

Barriers to knowledge management in Academic Libraries

Every library professional who works in academic, public of any special wants to techniques to knowledge management to achieve the organizational goal and provide better services but occurs some following barriers.

- Every library cannot participate in terms of modern technology and its management
- Lack of staff training
- Lack of sufficient budget
- Lack of tools & techniques
- Lack of communication skills

The following points are identified for the better implementation of knowledge management in Academic libraries

- To provide sufficient budget
- To provide special budget for the new technologies
- Interchange of technical staff among organization.
- To equip library with new technology with network facility
- Staff sharing to develop their professional skills.
- Organize the training programme for library staff.

Information technology and systems can provide effective support in implementing knowledge management. Librarians should train themselves and their staff to develop the appropriate knowledge management systems and use information technologies to equipped academic libraries to provide better, faster and pinpointed services to it users.

Conclusion

In this way in this article author has tried to depict the importance and need of knowledge management in academic libraries. Knowledge have always been managed at least implicitly effective. Knowledge management requires new techniques and perspectives. The knowledge management refers to effectively identify, acquire, develop, use store and share their knowledge sharing of knowledge in knowledge management system is very essential to promote the academic library facility by using KM we can provide good type of faculties to the users in short span of a time knowledge management is most important factor in academic library services to avoid the mistakes in academic libraries work. Knowledge management helps library and information professional in improving the service being rendered to their users. Information profession have to recast their roles as knowledge professionals. The librarians roles should not be limited to being the custodian of information but they have to acquire skill to keep themselves updated so as to cope intelligently and objectively with the effective and efficient knowledge management in Academic libraries.

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CO - OPERATIVE SOCIETIES AND AGRICULTURE: PROBLEMS AND PROSPECTS

Dr. M. Christopher[1] Prof. S. R. Hatti[2]
[1]Jain Deemed to be University Bangalore
[2]Faculty Dept of Commere, MGVC Arts, Commere and Science College,Muddebihal
Corresponding Author- Dr. M. Christopher
Email Id: shrishailhatti2@gmail.com
DOI- 10.5281/zenodo.7077506

Abstract:

Indian Economy is Mainly Depend on Agriculture. Agriculture is back bone of Indian Economy. But currently Agriculture is losing its importance because of Global economy from Existence of LPG. Low farm yield due to use of traditional methods of cultivation, feasibility issues with farming, Global Competition are some problems faced by the Indian agriculture. In Addition to this lease farming, entry of MNC's to farming, contract farming, etc are related lots of uncertainty and threats to small farmers in India. The Co-operatives have ready to solve the problems of poverty, food security, and employment generation. This paper discloses how the Co Operative societies are helping agriculture sector. What are problems facing by farmers in India?

Key Words: *Agriculture, Cultivation equipments, Co-operative Societies*

Introduction:

As said above agriculture is a back bone of India. Indian economy is mainly depend on agricultural produces, level of income of the farmers is very low because of no proper price for agriculture products, and sufficient water is not available because of environmental fluctuations, environmental pollution, Increase population, De forestation etc. At the same time for everything Money is measure of exchange for doing agriculture activities finance is require so that Co Operative Societies are established for providing finance to farmers and also provide modern technology for Farming activities to grow more and more. Co Operative Societies gives hands to poor, illiterate, and especially rural people for growth and development. Co Operative societies provide funds to start farming activities like, Rabbit farming, Goat Farming, poultry Farming, many more and to build a storages and warehouses, cold storages, for storing agriculture produces for future.

Advantages/Benefits of Co-operative Societies

Benefits to Farmers	Benefits to rural communities	Benefits to Consumers
Ownership and democratic control	Added Community income	Quality Products
Increased farm income	Stronger rural Communities	Varied Services
Improved service	Goods and Services to No Farmers	New products and Processes
Quality of supplies and products		Lower Production and Marketing costs
Enhanced competition		

Other Benefits:

1. It is an organization for the poor, illiterate and unskilled people.
2. It is an institution of mutual help and sharing.
3. It softens the class conflicts and reduces the social cleavages.
4. It reduces the bureaucratic evils and follies of political factions.
5. It overcomes the constraints of agricultural development.

6. It creates conducive environment for small and cottage industries.

Problems of Co- operative societies

1. Mis management and Manipulation
2. Government interference
3. Lack of awareness
4. Small size and single purpose
5. Functional weakness Lack of professionalism
6. Production Control
7. Farming Based on Labor Input
8. Price Fixing

Measures

1. Corporate governance
2. Mobilize fund
3. Export of Agriculture Produces
4. Maximum Membership

Top Agriculture co-operatives in India

01. **National Co-Operative Development Corporation (NCDC):** It was established by an Act of Parliament in 1963 as a statutory corporation under the Ministry of Agriculture. It's Functions: Planning, promoting and financing programmes for production, processing, marketing, storage, export and Import of agricultural produce: and minor forest produce through co-operatives, besides income generating stream of activities such as poultry, dairy, fishery semi-culture, handloom etc. NCDC Act has been further amended. It will now be able to finance projects in the rural industrial co-operative sectors and for certain notified services in rural areas like water conservation, Irrigation, and micro irrigation, agri-insurance, agro-credit, rural-sanitation, animal health etc. Loans and grants are advanced to State Governments for financing primary and secondary level co-operative societies and direct to the national level and other societies having objects extending beyond one state. Now, the corporation can also go in for direct funding of projects under its various schemes of assistance on fulfillment of stipulated conditions.

02. **National Agricultural Co-operative Marketing Federation of India (NAFED):** The objects of the NAFED shall be 1. To organize, promote and develop marketing processing and storage of agricultural, horticultural and forest produce. 2. to distribution of agricultural machinery, implements and other inputs, undertake inter- state, import and export trade, wholesale or retail as the case may be. 3. to act and assist for technical advice in agricultural production for the promotion and the working of its members and co-operative marketing, processing and supply societies in India.

03. **Tribal Co-Operative Marketing Development Federation of India Ltd, Objective:** 1. To secure higher earnings and generate employment opportunities for the tribal people of the country. 2. To create awareness of the interplay of market forces among tribal. 3. To provide assured markets and remunerative prices for tribal produce and also to undertake price support operations wherever required. 4. To provide marketing and financial support to state level tribal and forest. 5. To upgrade quality of tribal products with a view to maximise unit value realisation. 6. To export tribal products. 7. To provide full range of services, including organisation and collection. 8. Tribal produce, scientific exploitation of forest products, storage 9. Transportation, marketing and exports.

04. Indian Farmers Fertilisers Co-Operative Limited (IFFCO):

IFFCO's mission:

Is "to enable Indian farmers to prosper through timely supply of reliable, high quality agricultural inputs arid services in an environmentally sustainable manner and to undertake other activities to improve their welfare"

The objects of IFFCO shall be to promote the economic interest of its members by conducting in affairs in professional, democratic and autonomous manner through self help and mutual co-operation for under taking manufacture/ production/development of chemical fertilisers: bio-fertilisers, petro chemicals, refining industrial chemicals and hydro-carbon, their inputs etc.

IFFCO may undertake one or more of the following activities which are indicative but not limited to:

1. To set up plant or plants for manufacture of chemical fertilisers and allied products/bye products. 2. To undertake production, processing and manufacture of insecticides, pesticides, seeds, agricultural machinery etc. 3 To acquire, establish, construct, provide and maintain and administer factories, townships, estates, channels, water reservoirs, storage sheds and accommodation of all descriptions for facilitating the business of IFFCO. 4. To act as warehousing agency

under the warehousing Act and own and construct its own go-downs or hire go-downs for the storage of fertiliser and other goods. 5. To set up storage units for storing fertilisers. 6. To maintain transport units of its own. 7. To promote and organise other co-operative societies in the field of manufacturing. 8. To subscribe to the shares of co-operative and other institutions. 9. To take up such other activities which are incidental and conducive to the agriculture and rural development. 10. To set up agricultural farms by purchasing, acquiring and taking on lease of land from Government institution or private agency for research and development of agriculture.

05. Indian Farm Forestry Development Co-Operative (IFFDC):

It is a multi-state co-operative society promoted by IFFCO, has been implementing afforestation projects in UP, Rajasthan and Madhya Pradesh. The society has been floated under contribution agreement signed between IFFCO and India-Canada Environment Facility (ICEF) Development of Primary Farm Forestry Co-operative Societies (PFFCS) is an important activity undertaken towards afforestation of waste lands. High participation of women is an important feature of the IFFDC.

6. Co-operative Rural Development Trust (CORDET):

IFFCO promoted Co-operative Rural Development Trust (CORDET) in the year 1979 to provide education and training to farmers on various aspects of crop production, horticulture, animal husbandry, farm machinery etc.

7. Krishak Bharati Co-Operative Limited (KRIBHCO):

It is a premier co-operative society for manufacture of fertilizer, registered under Multi-state Co-operative Societies Act 1985, was promoted by (lie Government of India, IFFCO, NCDC and other agricultural I II operative societies spread all over the country. KRIBHCO has set up a fertiliser complex to manufacture Urea. Ammonia and Bio-fertilizers at Hazira in the state of Gujarat, on the bank of river Tapti, 15 kms from Surat City on Surat-Hazira stale highway.

Objectives: 1. To increase the urea installed capacity, maintaining its market share. 2. To ensure optimum utilisation of existing plant and machinery. 3. To diversify into other core sectors like power, LNG terminal/port, chemicals etc

8. National Bank for Agriculture and Rural Development (NABARD):

1. NABARD serves as an apex financing agency for the institutions providing investment and production credit for promoting the various developmental activities in rural areas. 2. Takes measures towards institution building for improving absorptive capacity of the credit delivery system including monitoring, formulation of rehabilitation schemes, restructuring of credit institutions, training of personnel etc. 3. Co-ordinates the rural financing activities of all institutions engaged in developmental work at the field level and maintains liaison with Government of India, State Governments, Reserve Bank of India (RBI) and other national level institutions concerned with policy formulation.

Conclusion:

The cooperatives have inherent advantages in tackling the problems of poverty alleviation, food security and employment generation. Cooperatives have immense potential to deliver goods and services in areas where both the state and the private sector have failed. It is worth mentioning here that any model of development which ignores India's rich endowment of human resources and rich natural resources including land and water resources is bound to fail. Any development route which bypasses the farming community of India is unlikely to be sustainable. Salvation of the developing economy as vast and diverse as India's lies only in the transformation and revitalization of its rural economy, which require people's empowerment and participation. One's sense of idealism is in direct proportion to one's distance from the real scenario. Neither private sector nor public sector shall promote social welfare. But, the cooperative sector has this potential. If this concept could be used in the form of cooperative farming, it will be a great advantage to the Indian economy. Hence, every citizen of the country should extend their support for the strengthening this sector.

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IMPACT OF FUNGAL METABOLITES ON SEED MYCOFLORA AND SEED GERMINATION OF HERBAL PLANTS OF THESPESIA POPULNEA

Harane Smita S[1] Harpale Dattatraya V[2]
[1]SPH Arts, Science and Commerce Mahila Mahavidyalaya, Nashik-423105
[2]HPT Arts & RYK Science College, Nashik- 05
***Corresponding Author*- Harane Smita S**
Email- smitaharane@gmail.com
DOI- 10.5281/zenodo.7081578

Abstract
Effects of fungal metabolites on seed mycoflora, seed germination of medicinal plants of Thespesia populnea seeds were studied. The metabolites affect the seed germination as well as the length of radicle. Production of the metabolites depends on the species, isolates or strain of the fungus, and on the ecological conditions like temperature humidity etc. and the nature of the substrate. Therefore, experiments were performed to study the effect of extracellular metabolites, produced by eight the dominant storage fungi, which are represented in the research paper. Seeds of herbal plant, like those of agricultural and horticultural crops, carry a wide variety of micro-organisms like fungi, bacteria and even some viruses. The metabolites affect the seed germination as well as the length of radicle. Production of the metabolites depends on the species, isolates or strain of the fungus, and on the ecological conditions like temperature humidity etc. and the nature of the substrate.

Keyword: *Metabolites, seed mycoflora, medicinal seeds.*

Introduction

Fungi are known to produce various extracellular metabolites; they may be enzymes, toxins, organic acids etc. All these play a role in disease development. Fungi growing on stored seeds produce highly toxic metabolites (Mycotoxins), that are poisonous, sometimes fatal to man and animals. These fungi are also known to produce cell wall degrading enzymes like pectolytic and cellulolytic enzymes.

Some of them are also known to produce the enzyme amylase which attack the starch content of the seed and deteriorate them and the enzyme lipase that attack on the lipids present in the cell walls. Seeds are used for the medicine. These seeds are found to be frequently contaminated by fungi (Roy *et al.* 1988, Mamatha *et al.*, 2009).[(1)] Chaurasia (1990) investigated that almost all medicinal seed samples were associated with a large number of fungi. Effects of fungal metabolites on seed mycoflora, seed germination of herbal plants of *Thespesia populnea* seeds were studied. [(2)]

Material and Method

The toxicity of the culture filtrates of fungi on seed germination and seedlings was assessed by the method adopted by Papdiwal and Deshpande (1978). [(3)] The toxicity was tested by using as follows: The toxic effect of culture filtrates on seed germination was studied by keeping 12 seeds on filter paper in a petridish. The filter paper was soaked in 8 ml of the above solution. Filter paper soaked in 8 ml tapwater served as control. The filter paper was kept moist by adding the cultures filtrate or water in the respective petridishes. The plates were incubated for 80 hours and percentage germination was recorded.

Observations

Seeds of herbal plant *viz. Thespesia populnea,* was surface sterilized with 0.1 % $HgCl_2$ solution for four minutes and washed repeatedly with sterile distilled water. For the study of fungal metabolites,

8 dominant fungi, occurring on the herbal seeds under investigation, was selected. They were *Penicillium corylophilum, Pythium indigoferae, Aspergillus carbonarius, A. flavus, A. niger, Cladosporium cladosporioides, Fusarium oxysporum,* and *Rhizopus oryzae.* The extracellular metabolites of these fungi were collected, as per the method described earlier.

Effect on Seed Germination

Suitable controls were maintained with sterile distilled water. The seed germination of *Thespesia populnea* herbal plant under investigation was noted, and expressed as percent germination. The length of radicle of every germinated seed was recorded, and its mean was calculated. The results were compared with control and percent inhibition of seed germination, and average radicle length were calculated. The results are presented in table 1, fig. 1 and 2. The effect of these metabolites of respective fungi on seed germination was studied as per the method described earlier (Papdiwal and Deshpande, 1978).[4]

Table 1: Effect of culture filtrates on seed germination and length of radicle of *Thespesia populnea*

SN	Metabolites from the fungus	Seed germination		Average Radicle length	
		% germination	% inhibition	Length in cm	% inhibition
1	*Aspergillus carbonarius*	50	45.45	0.6	40.00
2	*A. flavus*	40	55.56	0.4	60.00
3	*A. niger*	50	45.45	0.6	40.00
4	*Cladosporium cladosporioides*	60	33.34	0.6	40.00
5	*Fusarium oxysporum*	55	38.89	0.7	30.00
6	*Penicillium corylophilum*	40	55.56	0.4	60.00
7	*Pythium indigoferae*	65	27.78	0.7	30.00
8	*Rhizopus oryzae*	60	33.34	0.6	40.00
9	Control	90	---	1.0	--
Mean			56.67		0.62
S. D.			15.21		0.18
C. V.			26.84		28.72

Source: Fieldwork, 2022

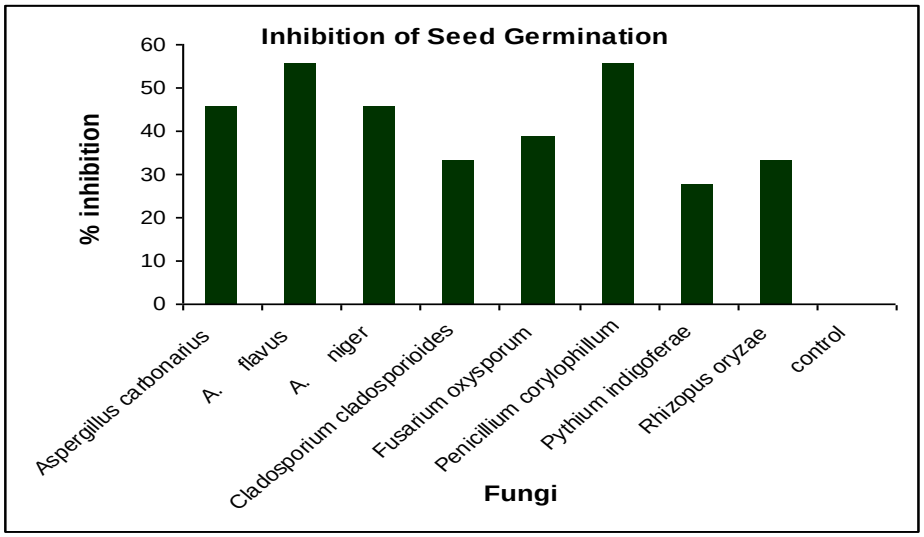

Fig. 1

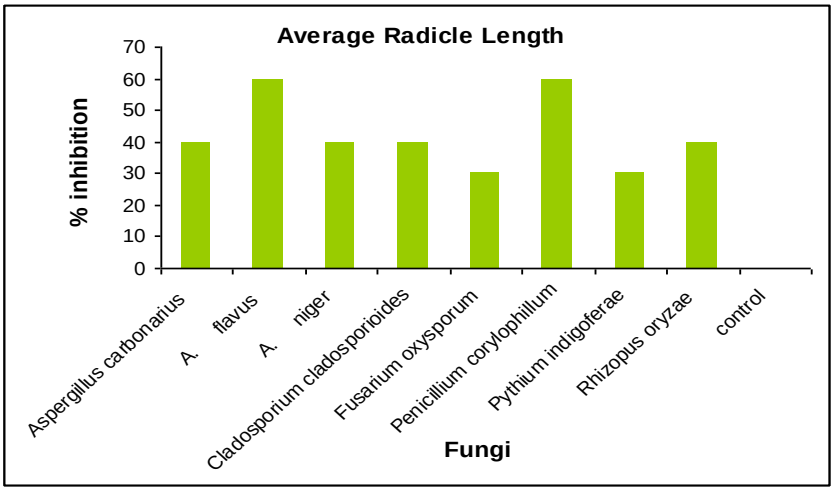

Fig. 2

The extracellular metabolites secreted by the 8 storage fungi, under investigation, were inhibitory for the seed germination and radicle length, of *Thespesia populnea* It is observed from table 1, fig. 1 and 2 that in case of *Thespesia populnea*, the highest inhibition (55.56%) of seed germination was with culture filtrates of *A. flavus* and *P. corylophilum*. The culture filtrates of *A. flavus* and *P. corylophilum* were found to cause maximum inhibition (60%) of the length of the radicle. The culture filtrate of *P. indigoferae* caused minimum inhibition of seed germination (27.78%) while the culture filtrate of *F. oxysporum* and *P. indigoferae* were minimum inhibitory for the radicle growth (30%). It is further noted that the metabolites from *P. indigoferae* were comparatively less inhibitory for seed germination and radicle length of *T. populnea;* compared to other fungi under investigation (Plate 1).

Result

The result reveals that the culture filtrate of *Aspergillus flavus* and *P. corylophilum* cause maximum inhibition, of seed germination, among the 8 storage fungi studied. The culture filtrate of the fungus was found to cause maximum inhibition of seed germination of the medicinal plants investigated. The maximum inhibition of seed germination was observed in the culture filtrates of *A. flavus and P. corylophilum (*inhibition 60%). Minimum inhibition was observed in culture filtrates of *Pythium indigoferae* (27.78%). The adverse effect of culture filtrates was also observed on radicle length.

Plate.1: *Thespesia Populnea Tree*

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FARMERS SUICIDE IN MARATHWADA A SOCIO-ECONOMICAL PHENOMENON

Dr. Manisha Rohidas Chavan
President, Shambhuraje Englsih Medium School, Kandhar.
***Corresponding Author*- Dr. Manisha Rohidas Chavan**
DOI- 10.5281/zenodo.7081584

Abstract

Agriculture is the largest economic sector and plays an important role in the overall socio- economic development of India. More than 50% of the farmers working in this sector are smallholder and smallholder farmers. They rely on loans from private lenders or from financial institutions to cultivate their land. They depend on farm income for their family expenses, childr en's education and marriage. Agriculture in India is in crisis and farmers in various parts of Marathwada in particular are suffering from indebtedness, crop failures, rising production costs, low quality of seeds, the effects of globalization, exploitation by moneylenders and entrepreneurs. Other causes are the main causes of their distress leading to suicide.

Keywords: *Agriculture , moneylenders and entrepreneurs.*

Introduction

The total geographical area of India is 329.6 million hectares, out of which net sown area is 146 million hectares 93.8 million hectares is dependent on natural rainfall and the rest is horticultural area.

This shows that dryland farming is indispensable for Indian farmers. Crops grown in dryland agriculture include sorghum, pulses, oilseeds, cotton etc. Indian farmers rely mainly on timely rainfall, 'abundance of nature'. Rainfall in India is unimaginable. Failure of rains leads to crop failure. In Telangana in Andhra Pradesh and Marathwada and Vidarbha in Maharashtra, the tendency of farmers to commit suicide has been recorded in the late 1990s. Punjab, Maharashtra, Karnataka and Andhra Pradesh have been witnessing this tragedy since 1997. After India liberalized the economy and opened up markets for foreign direct investment. Pesticides used by farmers could not control the pests due to adulteration which caused crop damage. In some areas, the peasantry was frustrated by poor quality seeds, crop losses and debt. Dissatisfied farmers committed suicide. 'Suicide' gradually spread to other states. According to the National Crime Records Bureau (NCRB 2007) report,

'Accidental Deaths and Suicides in India 2015', 52 farmers commit suicide every day in India. 'Suicide' gradually spread to other states, but it is more prevalent in Maharashtra, Karnataka, Andhra Pradesh, Madhya Pradesh and Chhattisgarh. These states account for one- third of the total population but farmers account for two-thirds of suicides. The suicides of farmers in these states are higher than those of non- farmers. Maharashtra is the state with severe agricultural crisis for many years. In the past, despite the farmers' agitation, there was no history of farmers committing suicide when crops or markets failed.

Table 1.1 Compensation Paid to Victims Family from 2010-2018

Sr.No	Marathwada Region	Total
1.	Reported Cases	1897
2.	Rejected Cases	1247
3.	Except Cases (Paid Compensation)	984
4.	Investigation Cases	46

Source: Department of Agriculture, Maharashtra

The above table describes about the compensation paid to victims family from the year 2010-2018 and it was observed that Marthwada region of Maharashtra has recorded 1897 cases of farm suicide during the year of 2010-2018, out of 1897 farm victims only 984 cases has recorded to get the compensation it means compensation is paid to only 984 victims the bases of thorough enquiry made by the committee. After due thorough enquiry the committee report compensation is paid in 984 cases, compensation has not been approved to 1247 cases, due to these victims are not fall under the guideline given for the recommendation of the committee.

Table 1.2 Type of the Family belongs to the Victim and Control Farmer

Sr.No	Family Type	ControlFarmer	SuicideFarmer
1.	Nuclear	80	90
2.	Joint	70	60
Total		**150**	**150**

Source: Study

The above table 1.2 describes about the type of family holding by the farm victims and Control farm family and it was observed that out of 150 victims 90farm victims were belonging to nuclear families as well as 80 control farmers and only 60 cases were living in the joint families and same of the 70 cases of control farmers. There is an emotional and physical security to each of the members in the joint family system. More number of farm suicides in nuclear families is an indication that the nuclear family system has failed to provide the necessary security to its members in thefight against the personal destruction. The sense of insecurity drives the farmers' to suicide.

Table 1.3 Suicide Reason Given by the Victims Family Members (Percent)

Sr. No	Reason	Control FarmerPercentSuicide Farmer	
1.	Crop Failure	25.69	27.23
2.	Debt Burden	15.48	17.64
3.	Loss in Agriculture Activities	17.25	14.87
4.	Problem of Family	9.58	11.53
5.	Crashes of prices	13.35	9.28
6.	Daughter/Son Marriage	6.78	8.82
7.	Water Availability Failure	7.67	6.31
8.	Habitual	4.20	4.32
Total		**100.0**	**100.0**

	0	**0**

Source: Study

The above table 1.3 describes about the suicide reason given by the victim family member and it was observed that, eight reasons for suicide are extensively listed. Based on the reasons listed; Victim and control family members were asked to list possible causes that led to farmer suicides. Compare the majority of cases of victims with the latter half of the control family (27.23 cent) that crop failure is the leading cause of suicide, crop failure due to drought, flood or other calamity. However, crop failure affected families did more to control the farm. It is difficult to take this observation on its face value as there were controlled farmers in the same village and area who did not report complete crop failure. It depends on the victim's history and therefore the analysis of events in the victim's life is given above the table.

Table 1.4 Details of credit arrears: Victims' and control families

Land Size	**Control farmers**		**Suicide Farmers**	
	itutional	**Non-Institutional**	**itutional**	**Non-Institutional**
<1 Acre	15327	12600	5590	13980
1 – 2 acre	21589	32170	50210	66218
2 – 4 acre	21284	28680	26850	53207
4-10 acre	32699	32540	37820	49970
> 10 acre	623800	35871	45870	135894
All	123570	31790	36475	61230

The above table 1.4 describes about the details of credit arrears: Victim's and control families and it was observed that the families of the victims have reported money taken from the victims from various credit policies. There were four major sources that are usually taken by farmers - commercial banks, co-operative banks, regional rural banks and lenders. Out of these, the most preferred source of credit is regional rural banks, followed by lenders and commercial banks. Table 1.4 shows that the affected families borrowed more from lenders than from the control group. The amount taken from the families of the victims was higher than that of the control group. It appears from the table that moneylenders (including relatives) emerged as the main creditors to the affected families. Despite the fact that lenders charge very low interest rates (3 to 4 per cent per month), it is surprising that the families of victims are more inclined to borrow from lenders and informal sources. This can be done either through formal credit unions or after their repayment process. In other words, the preference for borrowing from lenders over formal institutions clearly reflects the fact that the opportunity to go through the process is as wide as the interest rate difference between formal and informal lenders. It was noted that despite the fact that formal credit institutions have a monthly instalment, the pressure to repay arises only at the end of the financial year. Coincidentally, at that time the farmer may have spent a large portion of his earnings or with various social or family responsibilities. Wedding of son/daughter and other festivals also come at that time. This increases the tension in the family and makes it inevitable to reach out to the lender.

Conclusion:

It was found that suicide is a form of violence on the victim's life through various 'events', 'actions' and 'triggers'. Therefore, there are many reasons why a person commits suicide from a farmer. Often these factors transcend socio-economic, behavioural and personal factors. Hence the question of the socio-economic environment of the victimized and controlled families, the above synthesis brings out some important factors related to the social and economic background. The breakup of the joint family has reduced the moral and physical support they have received in

their existence. Family tensions and intolerance with the spouse are important factors for the victim's farm family, and often arise from the breakdown of the joint family. Social support and public participation always prevent such incidents due to the assurance received from the society from an individual. Similarly, a close intra-family relationship also boosts one's self-confidence and prevents a person from saying such a thing. Therefore, the socio-economic personalities of the victims and the families under their control say a lot about the conditions in which the individual lived and interacted with the society. This helps in reducing the mentality of a person about the failure of traditional institutions as well as at the time of the victim incident. A large number of victim families have noted the introverted characteristics of the victims. It also indicates that the victims themselves are suffering from problems of an economic or social nature. In the absence of these supportive organizations and individuals, the growing financial problem reduces the intense emotion that leads to the abnormal tendency to reduce the crises that occur within one.

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'OZONE DEPLETION' A VIEW!

Dr. Prakash Laxmanrao Dompale
M.Com., L.L.M., NET, Ph.D., Shri Shivaji Law College, Kandhar Tal. -Kandhar, Dist.-Nanded. ***Corresponding Author*- Dr. Prakash Laxmanrao Dompale**
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Abstract:
In the earth's atmosphere, nitrogen (78.1 percent), oxygen (20.9 percent), argon (less than 1 percent) are the main elements, along with carbon dioxide, water vapor, and ozone, there are also small amounts of radioactive elements. This mixture of gases in the earth's atmosphere is called air. The atmosphere is the mixture of many gases (air) surrounding the Earth and other planets and large satellites. Strong enough gravity keeps the atmosphere stuck to the surface of these healthy spheres. A healthy sphere revolves around itself and around other stars or planets with its mantle at various distances. Most of the planets in the solar system, except for the satellite Mercury, have more or less atmosphere around them. Even large satellites orbiting planets far from the Sun are no exception. Man cannot live without air. Air is essential for all living things. Apart from this, neon, helium, krypton, xenon, methane, hydrogen and nitric oxide (NO) gases are also present in small amounts in the earth's atmosphere. Small amounts of gases such as carbon monoxide (CO), nitrous oxide (N2O) and nitrogen dioxide (NO2) are also present. Ozone is a very important component of the atmosphere in small amounts. The ozone layer on the earth protects the earth from the harmful rays of the sun which are constantly hitting the earth. Ultraviolet rays from the sun can destroy human life. Due to this, the ozone layer at a distance of 20 to 30 km from the earth protects our earth from the ultraviolet rays coming from the sun. Ozone layer in Earth's atmosphere absorbs UV-A, B, C rays. These rays are considered very dangerous to living beings, they cause skin cancer and skin burns, but due to the ozone layer, these rays hit the earth and are reflected back to the sun. This three types of rays coming from the sun to the earth, UV-A rays pass through the ozone layer, UV-B rays are absorbed by the ozone layer to a large extent, and UV-C rays are sent back by the ozone layer as they are very dangerous to living things. Doing 'Re-Sending'. Therefore, life on earth is protected from those rays.

Keywords : *Atmosphere, Gas, Ozone layer, UV rays, Protection;*

Historical background:
In 1785, M.Van Marum was the first to notice a peculiar smell near electric machines. In 1840 C. F. Schoenbein proved that the smell was caused by a new gas and named it ozone after the Greek word Ozein meaning smell. In 1872 B. Brody proved that the ozone molecule consists of three oxygen atoms joined together. In 1913, French physicists Charles Fabry and Henri Buisson discovered the ozone layer. In 1930, physicist Sidney Chapman discovered the process of ozone layer formation. Chapman said that harmful rays from the sun are absorbed by the ozone layer and thus protect human life, and if the harmful rays from the sun entered the earth's atmosphere directly, life on earth would have been destroyed.

Introduction:
Depletion of ozone occurs as the concentration (number of molecules) decreases in the atmosphere. At the end of the 1970s, scientists became aware of the depletion of ozone in the atmosphere over the continent of Antarctica. Since 1980, the Earth's temperature has been increasing. Today, new temperature highs are being reached every year. After the industrial revolution started, coal, natural gas, mineral oil started to be used in large quantities. Paper mills, chemical industry increased. . Deforestation, wildfires,

cement production all started releasing huge amounts of carbon dioxide into the atmosphere. Before the industrial revolution, the concentration of carbon dioxide in the atmosphere was 260 ppm. It is now more than 400 ppm. The combustion of various oils has increased the amount of methane. Nitrous oxide levels increased due to the combustion of hydrocarbons. Therefore, efforts have been started globally to stop ozone depletion and protect life. Banning the production of CFCs, reducing their production or finding alternative chemicals etc. remedial measures are being taken. In 1985, British scientists pointed out that the ozone hole (an area where ozone concentrations have significantly decreased) has been increasing since the 1960s. Ozone concentrations were found to decrease by up to 50% in some places over Antarctica. It appears that the protective layer of the ozone layer has been depleted in many places. This has created a serious problem for the world. If UV-B rays reach the Earth, the entire life cycle will be destroyed.

It is necessary for humans to curb this in time. The immunity provided by nature to humans can collapse due to lack of ozone. The challenge for all is to ensure that the ozone layer does not deplete. The United Nations Environmental Protection Committee signed an international agreement in September 1987. To create awareness about this, September 16 is observed as 'International Ozone Day'. The Montreal Convention of 1987 and the London Conference of 1989 brought awareness to the seriousness of ozone depletion. As a result, the production of CFCs has been reduced by 20 percent. India is a responsible and aware nation regarding ozone problem. Realizing that ozone depletion is a global problem, India has signed the Montreal Convention in 1992. However, India's firm position is that these types of agreements should be normal and fair in the eyes of all the nations of the world.

Importance of ozone layer:

When ozone is found in our lower atmosphere (known as the troposphere), it is classified as an air pollutant that is extremely harmful to human health. We also need it in the stratosphere, because even at concentrations as low as 12 parts per million, ozone is so effective at absorbing the sun's UV rays that even small amounts are enough to protect us on Earth. UV rays are emitted by the sun and harm living organisms. Radiation is absorbed by this layer, preventing it from reaching the Earth's surface. Ozone protects the Earth from the sun's harmful ultraviolet (UV) rays. Without the ozone layer in the atmosphere, life on Earth would be extremely difficult. Plants, as well as the plankton that feed most ocean life, are unable to grow and thrive in high levels of UV radiation. Humans are more prone to skin cancer, cataracts, and weakened immune systems if ozone layer protection is weakened.

Causes of Ozone Depletion:

The causes of ozone layer depletion can be divided into two groups firstly, there are natural causes of ozone layer depletion and secondly, man-made causes.

Natural causes of ozone layer depletion

Few natural phenomena have been discovered to disrupt the ozone layer. However, it has been found that it causes only 1-2 percent depletion of the ozone layer and its effects are only temporary. Natural causes of ozone layer depletion include:

Sunspots,

The Sun's energy output varies, particularly during the 11-year sunspot cycle. As more UV reaches Earth during the active part of the 11-year sunspot cycle, more ozone is formed. This process can increase the average ozone concentration at the poles by about 4%, but when this is averaged across the globe, the global average ozone increase is only 2%.

Stratospheric winds,

Very strong winds in the stratosphere carry nitrogen gases from solar storms further into the atmosphere where they mix with and attack the ozone layer.

Volcanic eruption,

The chemical transformation of ozone-depleting chlorine into more reactive forms is aided by explosive volcanic

eruptions that release significant amounts of sulphur dioxide into the stratosphere. Major volcanic eruptions (Chi chon in 1983 and Mount Pinatubo in 1991) are also believed to contribute to ozone depletion.

Man-made causes of ozone layer depletion

There are also man-made causes of ozone layer depletion and these are the main causes of ozone layer depletion.

Use of Chlorofluorocarbons

One of the man-made causes of ozone layer depletion is the use of chlorofluorocarbons, is also a major cause of ozone layer depletion. Chlorofluorocarbons have been released into the atmosphere over the past fifty years due to the use of refrigerators, air conditioners in homes, offices, and factories. This has a huge impact on ozone. Chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and halons destroy the earth's protective ozone layer, which protects the earth from harmful ultraviolet (UV-B) rays from the sun. CFCs and HCFCs also heat the Earth's lower atmosphere, causing global climate change.

Global warming,

Global warming is one of the man-made causes of ozone layer depletion. As a result of global warming and the greenhouse effect, most of the heat is trapped in the troposphere, which is below the stratosphere. Ozone in the stratosphere prevents heat from reaching the troposphere, keeping it cooler. Because more sunlight and heat are needed to recover the ozone layer.

Uncontrolled rocket launch,

Rocket launches are also a major man-made cause of ozone depletion. According to studies, uncontrolled launch of rockets depletes the ozone layer much more than CFCs. If left unchecked, ozone layer depletion could occur significantly by 2050.

Nitrogenous compounds,

Nitrogenous compounds emitted by human activities such as NO, N2O and NO2 are believed to be one of the causes of ozone layer depletion.

Ozone Depleting Substances (ODS)

"Ozone depleting substances are chlorofluorocarbons, halons, carbon tetrachloride, hydrofluorocarbons etc. which are responsible for depletion of the ozone layer."

When strong UV radiation breaks down ODS, the resulting chemicals are chlorine and bromine. Chlorine and bromine are depleting the ozone layer at supersonic speeds. One molecule of chlorine has the power to destroy thousands of ozone molecules. Ozone depleting compounds have remained in the atmosphere for many years and will continue to do so in the future. This effectively means that many of the ozone-depleting compounds that humans have allowed to enter the atmosphere over the past 90 years are still in the atmosphere, causing ozone depletion.

The following is a list of some of the most common ozone-depleting compounds and their emission sources:

1.Chlorofluorocarbons (CFCs)
2.Hydrofluorocarbons (HCFCs)
3.Halons
4.Carbon tetrachloride
5.Methyl chloroform

Chlorofluorocarbons, (CFCs)

It is known as an ozone depleting compound because it accounts for more than 80% of total ozone depletion. Prior to 1995, it was used as a coolant in household appliances such as freezers, refrigerators, and air conditioners in both buildings and cars. Dry cleaning products, hospital disinfectants and industrial solvents all contain this chemical. It is also used in foam items such as mattresses and pillows, as well as in home insulation.

Hydrofluorocarbons, (HCFCs)

Over time, hydrofluorocarbons have replaced chlorofluorocarbons. They are not as harmful to the ozone layer as CFCs.

Halons

It is used in certain fire extinguishers in situations where water or extinguishing chemicals can damage the equipment or material.

Carbon tetrachloride

It is also found in many solvents and fire extinguishers.

Methyl chloroform

Cold cleaning, vapor reduction, chemical treatments and specific aerosols are all commonly used in industry.

International measures and agreements

In 1978, the United States, Canada and Norway banned products containing CFC gases. But European nations refused to ban products containing CFC gases. This led to a massive tunnelling of the ozone layer in the Antarctic, after
which CFCs were banned. However, many countries still use products containing CFC gases. This includes India, Pakistan, China, Japan, Afghanistan, Sri Lanka. The use of CFCs was completely closed out in 1996 due to the Montreal Agreement of 1987. 160 countries signed this agreement. Scientists say that global bans on CFCs have slowed ozone depletion to some extent. But since CFCs have a lifetime of 50 to 100 years, it is likely to take several decades to restore the ozone layer.

Solutions at household level:

1: Air conditioners should be used only when necessary.
2: Do not leave the refrigerator open for long. This will prevent CFCs from entering the air in large quantities.
3: Avoid using body sprays, instead use scented perfumes. 4: A large number of trees should be planted.
5: Avoiding the use of plastic bags and stopping the burning of plastic bags.
A number of actions have been taken globally to slow down the depletion of the ozone layer, thereby protecting the ozone layer.

Montreal Protocol

The Montreal Protocol on Ozone Depleting Compounds was developed by the international community in 1987 to address the depletion of the ozone layer. It was the first international treaty signed by all the countries of the world and is often regarded as the UN's greatest environmental success story. The Montreal Protocol aims to reduce the presence of ozone-depleting substances in the atmosphere by reducing their production and use, thereby protecting the Earth's ozone layer.

EU regulation

The EU's ozone-depleting substances are among the strictest and most advanced in the world. The EU has not only implemented the Montreal Protocol through a series of laws, but has also placed out harmful substances faster than necessary. The current EU "Ozone Regulation" includes various measures to ensure a high degree of ambition. While the Montreal Protocol regulates the production and bulk sale of these chemicals, the Ozone Regulation prohibits their use under the majority of conditions (some uses are still permitted in the EU). Furthermore, it regulates not only bulk compounds but also substances found in products and equipment. The EU Ozone Regulation further establishes licensing requirements to regulate and monitor the export and import of all ozone-depleting substances, as well as substances not covered by the Montreal Protocol (over 90 chemicals), as well as five more chemicals known as "new substances".

Actions needed globally to continue recovery of the ozone layer include:

1.Existing ozone-depleting substance limits are properly implemented and ensure worldwide ozone-depleting substance use is declining.
2.Ensure that ozone-depleting compounds (both in storage and existing equipment) are handled in an environmentally sound manner and are replaced by climate-friendly alternatives.
3.To ensure that ozone depleting chemicals are not diverted from their legitimate uses.
4.Reducing the use of ozone-depleting compounds in non-consumptive uses, as defined by the Montreal Protocol.
5.Ensure that no new chemicals or technologies emerge that threaten the ozone layer (e.g., very short-lived substances).

Actions required by individuals to protect the ozone layer.

1.Avoid breathing gases harmful to the ozone layer due to their composition or production methods. The most harmful gases are CFCs (chlorofluorocarbons), halogenated hydrocarbons, methyl bromide and nitrous oxide.

2.Reduce vehicle use. In urban areas, cycling or walking are the best modes of transport. If you must travel by automobile, try to carpool with others to reduce the number of cars on the road, reducing pollution and saving money.
3.Avoid using cleaning products that are harmful to both the environment and yourself. Many cleaning products contain solvents and caustic compounds, however, these can be replaced with non-toxic alternatives such as vinegar or bicarbonate.
4.Buy things made in your area. This way you not only get fresh things, but you also avoid eating food that has travelled long distances. Because of the medium used to transport that product, more nitrous oxide is produced as the distance travelled increases.
5.Keep air conditioners in good working order, as malfunctions release CFCs into the atmosphere.

Conclusion:

Countries around the world are working hard to restore the ozone layer. Montreal agreement was signed in 1987 for this purpose. Accordingly, the use of chlorofluorocarbon (CFC) was stopped. Hydrochlorofluorocarbons (HCFL) and hydrofluorocarbons (HFCs) were used as alternatives. Although both have a low impact on the ozone layer, the use of these new chemicals will be phased out by 2030. Because the UV rays will reduce the skin's immunity and cause skin cancer. The leaves of the plant will be smaller in size. The production of crops like maize, rice, wheat, soybeans, peas will decrease, colours of clothes, plastic furniture, pipes will be damaged. Earth's temperature will increase and cause tsunami like disasters.

The glaciers will melt and the coastal countries and cities will be submerged in water. Moreover, the fear of the destruction of the world is expressed by the expert. Therefore, although there is a global ban on the use of chlorofluorocarbons in air conditioners, refrigerators, and refrigerators, according to experts, the use of chlorofluorocarbons in some countries should be stopped 100 percent. It requires social consciousness. Mass awareness can be a solution for that. Scientists are succeeding in creating alternatives to ozone-depleting gases. It should be everyone's duty to use them strictly. Ozone friendly products are widely available in the market. Only that should be used. Scientists have often expressed the belief that the ozone layer will be restored by 2050 if the conditions laid down in the global agreement are strictly followed.

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RESEARCH – LIBRARY & INFORMATION SCIENCE

Mr. Sunil Rajeshwarrao Ambatwad
Librarian, Shri Shivaji Law College, Kandhar Dist. Nanded.
***Corresponding Author*- Mr. Sunil Rajeshwarrao Ambatwad**
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Abstract

This article indicates the research is primary purpose is to help teach the skills necessary for a librarian to conduct rigorous, basic research. Yet many of the methods, techniques, and tenets of basic research are relevant for applied research, and a person conducting applied research should benefit from a solid understanding of basic research methods. The librarian wishing to carry out a cost study, evaluate the performance of his or her library, or survey the library's users will need to be able to apply many of the principles and techniques treated in this book to his or her specific project. The more rigorous the research, the more useful its results, whether it be basic or applied in nature.

Keywords: *Research, Basic research, Library and Information Science Research*

Introduction

The increasing complexity and specialization of research has tied in with a further development—the professionalization of research. There are many ways of defining a "profession." All agree that it should form one's main paid occupation, that it involves a high level of specialist knowledge, and that it should entail maintenance of appropriate standards of competence both individually and across the professional group. General acceptance that research satisfies these requirements only came in the decades around 1800. This does not mean that recognizably professional researchers had not existed before 1800. Medicine is a typical example of a profession, and some of its practitioners were famous researchers long before that time. Similarly, surveying was a well-regarded profession in North America from the early days of European settlement, and some of its members contributed to early American research. However, in virtually all these cases, the research was regarded as ancillary to their work, rather than as an essential component of it.

Even in the academic world, though a number of professors or fellows of colleges contributed to research, the main justification for their posts was teaching. The belief that university posts should require ability in both teaching and research grew gradually throughout the nineteenth century. Again, Germany led the way. The different German states competed to obtain the most eminent staff for their universities. Such eminence was assessed most readily in terms of what they had published. Professors acquired research students to help develop their research programmes. These students needed some certificate of their research ability, and so grew up the process of awarding the Ph.D. The research reputation of German universities and the availability of doctorates attracted both German students and others from abroad (not least, from the United States and the UK). In the latter half of the nineteenth century, the possession of a German Ph.D. was a widely accepted sign of a professional researcher. Though Germany especially attracted would-be researchers in science-based fields, its importance for research training extended into other fields (theology and philosophy, for example.

Basic Research

Mouly stated that -Research is best conceived as the process of arriving at dependable solutions to problems through the planned and systematic collection, analysis, and interpretation of data.

Research also can be dichotomized as quantitative and qualitative. -Quantitative research methods involve a problem-solving approach that is highly structured in nature and that relies on the quantification of concepts, where possible, for purposes of measurement and evaluation.‖ Qualitative research methods focus on observing events from the perspective of those involved and attempt to understand why individuals behave as they do. They take a more natural approach to the resolution of research problems. Some research projects utilize both quantitative and qualitative research methods to study and report behaviors and events

Library research

According to Shera, Ralph Beals once categorized library literature into the tripartite classification of Glad Tidings, Testimony, and Research, and noted that there was little of the last. Goldhor, in his text on library research, categorized library literature with regard to research as including: one, a relatively small body of published research as defined in the narrow sense; two, a larger amount of published and unpublished services studies, or applied research; three, an even larger number of reports or descriptions of specific situations, or simply opinions; and four, original data.

Library research trends

Losee and Worley stated: -There is a tendency among information professionals to write and publish in the _How I done it good‘ genre, a genre that is very situation-specific.‖ In short, as was noted earlier, and as Busha and Harter indicated in their textbook, the preponderance of library-related research has been applied in nature. A 1984 issue of Library Trends was devoted to research in librarianship, and it reviewed research as related to the history of library and information science, economics of libraries, political science, sociology, psychology of information use, organization theory, public administration, and operations research. This work thus provided a categorization of library research in terms of both methodology and subject. In the first chapter of this issue of Library Trends, Mary Jo Lynch identified her own general categories for describing different research activities as practical research, bibliographical research, scholarly research, and scientific research. She characterized practical research as problem solving with information; bibliographical research as reordering the thoughts of others; scholarly research as systematic collecting, organizing, and analyzing of data; and scientific research as discovering new knowledge.

Mathews described research performed by the U.S. Department of Education from 1977 to 1988.18 Along with analyzing the products of the research; she also discussed recent research agenda efforts of the Department and implications for future research. McClure and Bishop provided a useful summary of reports published from 1976 to 1988 related to the status of research in librarianship. several of the reports contained analyses of the types of research methods utilized during various time periods. Powell summarized some methodological studies ranging from an analysis of dissertations dating back to 1925 to an examination of research articles published in 1984. He also characterized more recent trends including qualitative, interdisciplinary, and technology-based research. Buttlar analyzed library and information science (LIS) dissertations to identify the authors‘ gender, the nature of the most highly cited materials, the most highly cited journals, the literature cited in disciplines other than LIS, the countries of origin of publications cited, and the currency of the cited literature.21 She did not identify the type of methodologies used, but did report that the literature from the LIS field is cited about 50 percent of the time and identified education, computer science, health and medicine, psychology, communications, and business as disciplines that impact LIS research.

Growth of Basic Research of Library and Information Science

As indicated earlier, one of the major purposes of basic research is to create new knowledge. -It is the purpose

of science [scientific research] to go beyond experience and common sense, which frequently are quite limited and inadequate—and often quite incorrect, . . . for advancing knowledge, for promoting progress, and for enabling man to relate more effectively to his environment, to accomplish his purposes, and to resolve his conflicts.‖(**Mouly, p15**.)
According To Kunge indicates that ‗Learning to master theoretically and in practical application, the ground rules of research creates the best foundation for continuing growth in a profession.' But perhaps even more basic to the advancement of the profession -is the need for the field to test the various myths, assumptions, rules-of-thumb, and other conventions by whichit has operated for so long a time, to link concepts which have been proven through testing to be valid, and thereby establish theories indigenous to the field itself.‖

In addition, the profession needs to advance beyond its heavy dependence on descriptive data and establish principles and theories on which libraries and information systems and services can be based. -One of the hallmarks of a profession is the ability of its members to give advice to clientele derived from a body of generalized and systematic knowledge that comprises its theoretical core.‖ -Putting OUR Knowledge to Work: The Role of Research in Special Libraries, -defining library and information science research as not well developed, with fewer peer-reviewed journals and grant-funded research in comparison to other disciplines.54 The statement identifies ways that special librarians, researchers, and SLA can work together to contribute to the library and information profession and to build a foundation for evidence-based practice. **(Special Library Association, 2001).**

The Future of Library Research

The past weaknesses of library-related research can at least partially be explained by the fact -that research in librarianship is still relatively young. Clear conceptions of the goals, objectives, and methodologies of library science research are only now beginning to be solidly formulated.‖ (**Busha, p6.)**
It does appear clear, however, that it will become more and more -necessary to use the methodology of other disciplines—in particular, those of sociology, psychology, economics, linguistics, history—and to employ more generally applicable methodologies‖ in order to study the many problems facing librarianship today. The American Library Association, a considerable number of programs and committee meetings directly deal with research and statistics. ACRL established a Research Mentoring Program to help members with various aspects of the research process. ALA's Committee on Research and Statistics is charged with promoting research to answer questions regarding library services.

-Research Statement‖ calls for evidence-based practice, which is decision making - . . . based on the strongest evidence‖ of what will work best for the libraries' clients. With the expanding role of library and information professionals and the widespread accessibility of information, SLA advocates for the selection, acquisition, organization, and management of information resources to be based on research findings.

(Putting our Knowledge to Work," Special Libraries Association)

The vision of the society includes: -Advancing knowledge about information, its creation, properties, and use; providing analysis of ideas, practices, and technologies; valuing theory, research, applications, and service; nurturing new perspectives, interests, and ideas; and increasing public awareness of the information sciences and technologies and their benefits to society.‖

(-**Mission and Vision," ASIS&T: The Information Society for the Information Age**)

It is always difficult to predict the future, but research in LIS will probably continue to incorporate more multidisciplinary and qualitative methods. Studies addressing the impacts and use of digital resources and technology are currently represented in the literature and will likely continue to pique interest in researchers and

practitioners as the resources and technologies evolve and library users become more sophisticated in their demands for and use of these resources. Hernon and Schwartz support this assessment and add, -The problems, research designs, the tool chest of methodologies, and data analysis techniques and software are richer today than ever before.‖

Conclusion

Research is endless process, there is mounting evidence that the quality, if not the quantity, of Library and Information Science research is improving. And, hopefully, there is increasing recognition -that the results of research in a broad spectrum of effort extending well beyond librarianship will, in large measure, determine the future directions of library services and the nature of the profession itself‖ ALA a statement that still resonates after 40 years.

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RIGHT TO HEALTH CARE FOR ALL – AN ANALYSIS

Dr. Mahesh L. Dharmapurikar
Assist. Professor, Shri Shivaji Law College, Kandhar
Corresponding Author- **Dr. Mahesh L. Dharmapurikar**
Email- maheshld2012@yahoo.com
DOI- 10.5281/zenodo.7081608

Abstract:

Health denotes the condition of a person"s body or mind, it includes mental health, physical health and healthy environment for protecting the all-round health of a human being. A good health means state of being free from illness or injury. This conceptual idea reflects the general meaning of the health is that if any human being is not in good health it means he is ill, but this is not the general aspect of the health, it is confusing definition of the health. In real sense the absence of illness does not mean that ne is in good health. According to the Constitution of World Health Organization (WHO), "health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity". Health means the enjoyment of highest attainable standards of health is one of the fundamental rights of every human being without distinction of race, political belief, economic and social condition". Mental and physical health is the development of the basis of human personality. Good health is very essential for survival, long life and new product of progressive ideas; it is an emotional requirement for the development of the society, by good health individual may perform excellent activities in all the sphere of individual and collective life so that the society rises to higher levels of the endeavour and achievement. Conceptualization of right to health is the path of achieving the other basic rights which are related to economic, social, cultural, earn livelihood, build housing, take food, hygiene, proper work condition, and exercise of various freedoms such as right to happiness, right to equality, right to education, right to protection, right to practice any religion and to form right to civilized treatment in custody and in prison, right to impartial and speedy justice and protection human rights in every circumstances of the society. The health of women is itself wealth of the society, thus conceptually health includes the wealth, because by good health one may be capable, competent, and have ability, skill, power, talent and knowledge for the earning of different kinds of wealth. Health care requires to be nurtured from the childhood, care to health is a determined factor togreat extent by behaviours learned from the childhood and starting to appear throughout the world. Physical activities for the betterment and good health are also part of the conceptualization of the health. If the physical activities are decreased in the adolescence, particularly in girls, and obesity has increased it is very dangerous for the good health. It is situation not only in Asia but in the same point of time is the problem in Europe, and North America, but in China and Japan where population are traditionally slender.

Key Words:- *Care, Equality, Health, Law, Right.*

Introduction:

Health is a common theme in most cultures and civilizations. In fact, all societies have their concepts of health, as part of their culture and civilization. The oldest definition of health is the "absence of disease". In some communities, health and harmony are considered equivalent, harmony being defined as "being at peace with the self, the community, god and cosmos". The ancient Indians and Greeks shared this concept and attributed disease to disturbances in bodily equilibrium of what they called "humours".

Generally, modern medicine is criticized for its preoccupation with the study of disease, and neglect of the study of health. Consequently, our ignorance

about health continues to be profound, as for example, the determinants of health are not yet clear; the current definitions of health are elusive; and there is no single yardstick for measuring health. There is thus a wide ambit and scope for the study of "epidemiology" of health. Health continues to be a neglected entity despite lip service. At the individual level, it cannot be stated that health occupies a valuable place. It is usually subjugated to other needs defined as more important, e.g., wealth, power, prestige, knowledge, security. Internationally, health was "forgotten" when the Covenant of the League of Nations was drafted after the First World War. Health was again "forgotten" when the Charter of the United Nations was drafted the end of the Second World War. The subject of health had to be introduced *ad hoc* at the United Nations Conference at San Francisco in 1945.

However, during the past few decades, there has been a reawakening about health. Health has been recognized as a fundamental human right and a world-wide social goal. It is essential to the satisfaction of basic human needs and to an improved quality of life; and, that it is to be attained by all people. In 1977, the 30th World Health Assembly resolved that the main social target of governments and WHO in the coming decades should be "the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life" for brevity, called "Health for All". When the health was adopted as an important part of socio-economic development by the United Nations in 1979 health, while being an end in itself, has also become a major instrument of overall socio-economic development and the creation of a new social order.

Health is a basic human right and fundamental freedom. Health is a birth right. It is man's natural condition. Health is the result of living in accordance with the law of nature relating to the body, mind, and environment. Natural laws relate to fresh air, sunlight, clean water, healthy environment, sound sleeping, diet, suitable exercise, sufficient rest and relaxation, elimination, right attitudes of mind, good habits and above all life style. Health is not a static phenomenon. It fluctuates within a range varying from optimum function to various levels of dysfunction. It is multi- dimensional physical, mental and social. Each is influenced by numerous factors, medical and non- medical. To understand the importance of health is the basis of all health care. Health is not perceived the same way by all members of a community including various professional groups (e.g., biomedical scientists, social science specialists, health administrators, ecologists, etc.) giving rise to confusion about the concept of health. In the modern changing world, new concepts are emerging based on new patterns of thought. Health has developed over the centuries as a concept from an individual concern to a world-wide social goal and encompasses the whole quality of life. Commenting upon the importance of health American health scholar David J. Anspaugh states:

The quality of life that each individual ultimately is to have is determined in part by the health decisions the person makes. Our health is continually evolving and changing as a result of our behaviour and decisions. Health is not a state but process through which we seek to feel at ease with our social, emotional, and physical environment. Health has many complicated, interrelated, components that must be balanced if high-level wellness is to be achieved.

New Horizons Of Health

Health is multidimensional. The definition given by WHO covers three specific dimensions- the physical, the mental and the social, many more may be cited, viz. spiritual, emotional, vocational and political dimensions. With the expansion of knowledge, the list may be expanded. Although these dimensions function and interact with one another, each has its own ambit and scope.

The physical dimension of health is simple. The physical health means the notion of "perfect functioning" of the body.

It conceptualizes health biologically as a state in which every cell and every organ is functioning at optimum capacity and in perfect harmony with the rest of the body. Health is on one hand a highly personal responsibility and on the other hand a major public concern. It thus involves the joint efforts of the whole social fabric, viz. the individual, the society and the State to protect and promote health.

In modern times a new philosophy of health have been acquired, which may be read as follows:

1. health is a fundamental human right;
2. health is the essence of productive life, and not the result of ever increasing expenditure on medical care;
3. health is intersectoral;
4. health is an integral part of development;
5. health is central to the concept of quality of life;
6. health involves individuals, state and international responsibility,
7. health and its maintenance is a major social investment; and health is world-wide social goal.

Legal Framework For Protection Of Health Care

In India, the right to health care and protection has been recognized since early times. Independent India approached the public as the right holder and the state as the duty-bound primary provider of health for all. As our country is a founder member of United Nations, it has ratified various International Conventions promising to secure health care right of individuals in society. In this context, Art-51 of the constitution of India, which strives to provide for a welfare state with socialistic patterns of society under Article 21 of the Constitution, guarantees the right of life and personal liberty. Though it does not expressly contain the provision of right to health but it has been settled by the apex court in a good number of cases. Further, arts-38, 42, 43 and 47 of our Constitution provide for promotion and protection of health of the individual members in the society.

In addition to the International and constitutional provisions, the Parliament in India has enacted a good number of laws that protect the health interests of the people in general. These include the Indian Penal Code, 1860, the Fatal Accidents Act, 1855, the Indian Medical Degrees Act, 1916, Dangerous Drugs Act, 1930, Drugs and Cosmetics Act, 1940, the Dentists Act, 1948, Drugs (Control) Act, 1950, Pharmacy Council of India Regulations, 1952, Prevention of Food Adulteration Act, 1954, Drugs and Magic Remedies (Objectionable Advertisements) Act, 1954, the Indian Medical Council Rules, 1957, the Medical Termination of Pregnancy Act, 1975, the Dentists Code of Ethics and Regulations, 1976, the Consumer Protection Act, 1986, the Consumer Protection Rules, 1987, the Pre-
natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994, the Transplantation ofHuman Organs Act, 1994 etc.

It is pertinent to discuss here that although the Parliament has enacted the Indian Medical Council Act in 1956 and other corresponding legislations governing various branches of medicine such as the Indian System of Medicine, Dentists, Homoeopaths etc., they have only provided for the registration and regulations of the conduct of doctors, hospitals and nursing homes, and have failed to protect the interests of persons who have suffered on account of negligence or deficiency on the part of medical professionals. This field left untouched by the Medical Council Acts(s) is covered by the law of tort in general, and now by the Consumer Protection Act 1986. It is worthwhile to remember that the existence on the statute book of the Indian Medical Council Act has not stood in the way of such grievances being agitated before the ordinary civil courts, by the institution of civil suits claiming damages for negligence as against the concerned hospital or medical doctors. Prior to the enactment of the Consumer Protection Act 1986, the field of medical negligence is perhaps not possible; rather it would remain a somewhat slippery word.

Despite Constitutional and statutory provisions safeguarding the patient against medical negligence, the growing incidence of medical negligence is disturbing. Although reliable official statistics on medical negligence are not available in our country, it has been observed that many a times the victims of such negligence are not financially well off due to which they are forced to avail the medical aid from the government run hospitals/dispensaries or charitable hospitals. However, these hospitals have been kept out of the purview of the Consumer Protection Act, 1986.

Health providers in India may be broadly classified into five categories:

1. Government run hospitals and dispensaries, clinics, primary health care centres and sub- centres;
2. Private hospitals and nursing homes;
3. Charitable hospitals;
4. Hospitals run by or under the authority of or connected with medical institutes or medicalcolleges; and
5. Hospitals or dispensaries run under the miscellaneous statutes such as the Employees' State Insurance Act 1948, the Plantation Labour Act 1951, and hospitals or dispensaries run by the employer such as CGHS dispensaries, Railways hospitals and health centres; and Army, Navy or Air Force hospitals.

Apart from the above mentioned recognized categories of health providers, in our country, there are private practitioners without any formal qualifications" such as, *hakims, vaidyas, quacks, tantrik* and others who are very much popular in rural and semi-urban sectors and people who are living in those areas, fall as an easy prey.

1. Do our poor people know that they have the right to health care?
2. Do they know that they can demand a Government doctor to treat them?
3. Does the common man know that t mentally ill person cannot be illegally confinedwithout his consent?
4. Does he know that he can demand for basic facilities in a Primary Health Centre?

If the common man can answer all these questions, the poor ma n will get a better deal inhealth sector.

Right to Health – Some new dimensions

Right to health as fundamental human right has acquired a new dimension due to spread of deadly disease AIDS, across the world as well as in India. The conflict between human rights of HIV positive person and the other individual‟s vis-à-vis society is alarmingly increasing. Legislative vacuum in the area sought to be filled by judicial decisions. The Indian Supreme Court in X v hospitalZ held that a positive (HIV) person does not have the right to marry as this would result in spreading the disease. As a result of this ruling if such a person gets married even after the consent of another ne having disclosed his positive status then they will be liable to be punished under Ss. 269 and 270 of Indian Penal Code. Section 269 IPC says that a negligent act likely to spread infection of disease dangerous to life shall be punishable with imprisonment which may extent to six months, or fine or both. Section 270 says that any malignant act likely to spread infection of a disease dangerous to life shall be punished with imprisonment which may extent to two years or fine or both.

Since the matter is „replete with thorny issues of policy which defy resolution on the basis of legal principles alone‟, we refrain to analyse herein which needs independent in-depth investigation and detailed enquiry to offer a proper solution, possibly and broadly viable one. While doing this, wide repercussions ought to be taken into account and interest of positive person, partner, future generations and society to be weighed properly.

Another equally alarming area is dumping of bio-medical waste, its use after recycling it and subsequent health hazards. The Indian Supreme Court had passed the order in 1995 and made it compulsory for all private hospital with more than 50 beds to install incinerators and autoclaves to destroy medical waste. However, response to this is very lethargic which shows a total apathy towards the issue. In New Delhi recently there was

seizure of a truckload of used syringes and other hospital material. The Biomedical Waste (Management and Handling) Rules 1998 prescribes a number of provisions to eliminate the threat to human health from such waste, nursing homes. Until recently people vested their hopes in the judiciary to set right a system gone wrong. And the judiciary has never failed to step in to protect the human rights of the people. Yet, today we find that even the judiciary‟s directives are being observed more in the beach in matters of vital concern to the public. In the long run nobody profits from such dangerous practices. It will ultimately undermine the greater public good and this affects us all.

Conclusion

Even after more than seven decades of independence no effective steps have been taken to implement the constitutional obligation upon the state to secure the health and strength of people: It has rightly been said that nutrition, health and education are the three inputs accepted as significant for the development of human resources. But these sectors get adequate attention only when community becomes affluent to meet the heavy expenditure involved in each.

The focus on improvement in health continues to employ perspectives of curative medicine rather than concentrate on public health approaches, clean water, sanitation, nutrition, housing education, employment and social determinants seem to receive a lower priority structures continue to oppress people. Patriarchal society places much burden on girls and women, especially in rural India. Without changes in social structures, improvements in health and economic status will remain a distant dream for the many millions who live in the margins of a resurgent India.

For achieving the Constitutional obligations and also objective of "Health Care for All" there is a need on the part of the Government to mobilize non-governmental organizations (NGOs) and the general public towards their participation for monitoring and implementation of health care facilities. To this end the Government should formulate legislations and health policies facilitating the participation of the public in health care.

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STUDY IN DIGITAL LIBRARIES WITH PHYSICAL EDUCATION

Dr. Purushottam K. Dhondge
Department of Physical Education, Shri Shivaji Law College Kandhar
Corresponding Author- **Dr. Purushottam K. Dhondge**
DOI- 10.5281/zenodo.7081618

Abstract:

Technology plays an important role in various forms of communication in the classroom today; Changing the way of communication that directly affects learning. A different breed of technology harnessing the power of simple digital libraries has finallyproven to have a direct impact on researchers and physical education professionals. Technologies like digital libraries prove to provide a more dynamic learning experience, which has direct benefits. Researchers and sports professionals. It's a refreshing change for educators struggling with the complexity, cost, and practicality of the last generation of technology tools.

Introduction:

The Internet has grown rapidly in recent years, and the implications of this growth for physical education and sports science research are enormous. This study will show the potential uses and threats of digital libraries as a research resource. The world wide web has a lot of information, some useful, most relevant. A researcher can waste a lot of time hidden and difficult to find. A researcher can waste a lot of time trying to find relevant sites, with no guarantee of success. Secondly, the accessibility of the Internet means that anyone with the right technical skills and equipment can publish on it, and so there is no guarantee of quality.

Internet:

Although it is not necessary for you to have detailed technical knowledge of the Internet, it is useful to have an understanding of what exactly the Internet is. Simply put, the Internet is a network of computer networks. Each network provides informationthat can then be accessed by other networks. Thus, the Internet itself does not contain information. Rather, it is a tool that allows the exchange of information held on a computer. Everything available on the Internet has its own Uniform Resource Locator(URL). When you type a URL or click a link to a URL, you send a request to retrieve that document or web page from its source.

Digital Library:

A digital library, also called an online library, Internet library, digital repository, or digital collection, is an online database of digital objects that may include text, stillimages, audio, video, digital documents, or other digital media formats. Libraries accessible through the Internet. Objects can include prints or photographs, as well as originally created digital content such as word processor files or social media posts. Inaddition to storing materials, digital libraries provide a means of organizing, searching,and retrieving the materials contained in the collection. Digital libraries can vary greatly in size and scope and can be maintained by individuals or organizations. Digital content can be stored locally or accessed remotely through a computer network. These information retrieval systems are able to exchange information with each other through interoperability and durability.

Types of Digital Library:

Institutional Repositors:

Many academic libraries are actively involved in building a repository of institution's books, papers, theses and other works that can be digitized or are 'born digital'. Many of these repositories are made available to the general public with few restrictions, in keeping with open access goals, in contrast to the publication

of research in professional journals, where publishers often limit access rights. Institutional, truly free, and corporate repositories are sometimes referred to as digital libraries. Institutional repository software is designed to store, manage, and search library content. Popular open-source solutions include DSpace, GSDL(Greenstone Digital Library), EPrints, Digital Commons, and the Fedora Commons-based systems Islandora and Samvera.

National Library Collection:

Legal deposit is usually covered by copyright law and sometimes by laws relating to legal deposit, and all published material in a country must submit one or more copies for preservation to an institution, typically a national library. Since the advent of electronic documents, legislation in Australia has had to be amended to accommodate new formats, such as the 2016 amendments to the Copyright Act 1968. Since then, various types of electronic depositories have been built. The British Library's publisher submission portal and the German model at the Deutsche Nationalbibliothek have a deposit point for a network of libraries, but public access is only available in reading rooms within the libraries. The Australian National Depository System has similar features, but also allows remote access by the general public for most materials.

Features of Digital Library:

The benefits of digital libraries as a means of easily and quickly accessing books, archives and a wide variety of images are now widely recognized by commercial interests and public institutions. Traditional libraries are limited by storage space; Digital libraries have the potential to store more information, simply because digital information requires much less physical space to store it. Because of this, the cost of maintaining a digital library can be much lower than that of a traditional library.A physical library has to spend a lot of money on staff, maintenance of books, rent and additional books. Digital libraries can reduce or, in some cases, eliminate these fees. Both types of libraries require catalog input to allow users to search and retrieve materials. Digital libraries may be more willing to adopt technological innovations by providing users with improvements in electronic and audio book technology as well as introducing new forms of communication such as wikis and blogs; Traditional libraries may think that providing online access to their OP AC catalog is sufficient. One of the key benefits of digital conversion is increased accessibility for users. They also increase accessibility to individuals who may not be traditional patrons of libraries due to geographic location or institutional affiliation.

No physical boundary: A user of a digital library does not need to physically visit the library; People all over the world can access the same information as long as they have an internet connection.

Round the clock availability:

One of the major advantages of digital libraries is that people can access information 24/7.

Multiple Access:

The same resources can be used simultaneously by multiple organizations and patrons. This may not be the case for copyrighted material: a library may be licensed to "lend" only one copy at a time; This is achieved through a system of digital rights management where a resource can become inaccessible after the loan expires or the lender makes it inaccessible (equivalent to returning the resource).

Information Retrieval:

The user is able to use any search term (word, phrase, title, name, subject) to search the entire collection. Digital libraries can provide a very user-friendly interface, providing click-enabled access to their resources.

Preservation and Conservation:

Digitization is not a long-term preservation solution for physical collections, but it is successful in providing access copies for materials that may deteriorate through repeated use. Digitized collections and born-digital objects pose many preservation and conservation issues that analog materials do not. Please see the

"Problems" section below on this page for examples.

Space:

While traditional libraries are limited by storage space, digital libraries have the ability to store more information, simply because digital information requires much less physical space to contain them and media storage technology is more affordable than ever before.

Added value:

Certain characteristics of objects, mainly the quality of images, can be improved. Digitization can increase legibility and remove visible defects such as stains and discoloration.

Importance of Digital Library in Physical Education:

The decline in visits to traditional libraries indicates that patrons these days want to access information and read materials without visiting a library in person. Many large libraries and universities have already started the digitization process to make materials available to members and the general public. Also, Google has launched the Library Project with the aim of helping universities and libraries digitize millions of books. Corporates of various sizes have also started analyzing the benefits of digital libraries and adopting digital libraries for their employees.

Wide variety of content access:

Traditional libraries lack the flexibility to include a wide variety of materials due to limitations related to physical space. But digital libraries store a wide range of content—ebooks, magazines, articles, blogs, papers, videos, podcasts, and audiobooks—in a virtual environment. Sophisticated digital libraries these days store resources in the cloud to make content available to their users anytime and anywhere.

Latest and updated Unlike large universities and libraries, small libraries do not have sufficient resources to purchase new books, magazines and other content resources. But your organization can update the digital library regularly. Nowadays, many publishers offer digital libraries for readers to access the latest editions and magazines based on a pay-as-you-read model. Hence, yourdigital library will engage readers by providing access to the latest publications.

Allow readers to access content on demand:

Physical books are still more popular than eBooks. But the number of people reading books in digital format
is steadily increasing. Young readers opt for digital versions of books to read content anytime and anywhere. Also, they can access ebooks anytime and anywhere using their mobile devices. Unlike traditional libraries, digital libraries enable readers to access digital resources on the Internet using any device such as a computer, mobile device or tablet.

Make readers find resources quickly:

When visiting a traditional library, readers have to spend both time and effort to find the right book. Also, getting relevant information from physical books takes time. But digital libraries are designed with built-in search options. Many digital libraries leverage popular search engines such as Google, Bing, and Yahoo to speed up content discovery. Therefore; Readers can quickly find the information they need. Also, they can use the search option to find and sort digital resources by simply entering relevant words and phrases.

No opening or closing hours:

To visit a traditional library, readers have to check the opening and closing times and then plan accordingly. They do not have the option to access library resources at their convenience. But digital libraries enable readers to read e-books, listen to audiobooks and watch videos 24 hours a day. Readers can access and read library materials in digital form anytime and anywhere using their preferred devices. Many readers these days prefer digital libraries over traditional libraries to access content at their own pace and convenience.

Multiple and simultaneous access:

When visiting a traditional library, many readers cannot read the same book at the same time. One has to wait for other readers to return that book. But multiple readers can access the same books, videos, and audiobooks simultaneously in a

digital environment. Many institutions these days set up digital libraries so that a large number of students can access the same book from different locations at the same time.

Library Management Automation:

Digital libraries have transformed librarians into cyberlibrarians through the automation of routine library services – indexing, issuing, tracking and preservation. Librarians are no longer required to organize and manage library resources logically and organizationally. Library management software comes with built-in features to automate end-to-end library management. Automation encourages many organizations and enterprises to easily establish digital libraries.

Real-time interaction:

New-age library management software these days comes with features to facilitate interaction between readers and administrators. Also, many software solutions facilitate reader interaction by setting up online communities. These real-time interaction options help readers gather additional or specific information about a book or article within seconds. Many readers switch from traditional libraries to digital libraries due to dynamic and real-time interaction.

Eliminate resource depletion:

Traditional libraries have to invest in preservation and conservation of library resources. As physical library resources are accessed and reused by patrons, librarians find it difficult to prevent deterioration of books, vinyl records, cassette tapes, and other resources. Many institutions digitize their libraries to make digital resources accessible to a larger number of readers on a regular basis rather than focusingon the preservation of physical materials.

Conclusion:

No organization can remain relevant in the knowledge economy without facilitating digital library access. A new generation of learning management systems (LMS) makes it easy for businesses and educational institutions to access large digital resources on demand. Your organization can easily investin the right LMS system to take advantage of these digital library benefits.

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STUDY OF STARTUPS AND THEIR CONTRIBUTION TOWARDS THE GROWTH OF THE INDIAN ECONOMY

Dr. Archana Aher
Asst. Professor, MIT Arts, Commerce & Science College, Pune
***Corresponding Author*- Dr. Archana Aher**
Mail ID – dr.aherarchana@gmail.com
DOI- 10.5281/zenodo.7103177

Abstract:
India needs more than a 100 million jobs a year and the jobs which are generated are mostly from startups and not big enterprises. Startup entrepreneurship is crucial because it also brings new innovations, new jobs and competitive dynamics into the business environment and enterprises. The role of startups in economic prosperity is enhancing in today's world. One of the main advantages of startups is that it creates new jobs. Global data shows that startups are creating more jobs in our nation than the large companies or enterprises. As of now, many of the startups have introduced latest technology Artificial Intelligence, and Robotics etc. Most of the technology giant companies outsource their tasks to startups now days. It will also help to increase the cash flow of startups. Bearing in mind the significance of responsibility that the Indian startups are allocated to play in the enlargement of Indian economy. The turnover achieved through the startups and the vast numbers of jobs that can be created by facilitate startups, even the market controller Securities and Exchange Board of India (SEBI), the ease of use of startup regulation led to facilitate the flow of funds from the market to startups. This research paper will make analysis of impact of startup's, growth of startup, analysis of ecosystem of startups and its impact on Indian economy and growth of economy. Objective of present study is to determine the effects of startups of recent time in India. The ultimate goal is how can the increase in new rising unicorns of business world can have an influence on Indian economy and most importantly how it helps in eliminating the joblessness in India.

Keywords*: Startups, economic growth, GDP, economy etc.*

Introduction:
The start-up ecosystem is often described as young, innovative, aspirant and futuristic. India, home to a new breed of young start-ups, has evolved to become the fourth largest base of technology start-ups in the world. India's startup economy has been booming, the last decade has seen significant activity on multiple fronts including the founding of new startups, amount of funding and number of investment rounds, influx of global investors and startups, development of regulatory infrastructure, global mergers and acquisitions, and internationalization. At last count, India had 26 unicorns.

Some of the key factors that show the positive impact of the Startup industry on the Indian Economy are:

1. Growth drivers like access to capital/mentors, whitespace opportunities and increased M&A activity are accelerating the start-ups growth which in turn helps the economy to safeguard against economic downturns. Indian start-ups, with their unique solutions, are witnessing increased traction in global whitespace opportunities such as internet of things, augmented reality, smart hardware, big data & analytics, cloud computing, etc.
2. Domain solutions emerging – Ad-Tech, Edu- Tech and Health-Tech and other niche solutions emerging for healthcare, agriculture, etc.
3. Young entrepreneurs dominate the start-up landscape with over 73 per cent of founders in the age bracket of

less than 36 years. Most of these founders with a strong consumer-centric approach, have come up with some of the best-in- class B2C start-ups. Women entrepreneurs have also started to leverage the innovation economy.

Start-up is an open door for a business person to teach and rouse others while some are considering how to do and what to do. If the growth continues at the same pace then it is expected that Indian start-ups will generate almost 2.5 lakh jobs in the next five years.

Objectives:

1. To study the impact of startups on various variables of Indian economy, to analyze the impact of startups on GDP, GNI, balance of payment, import, export, foreign reserve, to analyze the startups initiative.
2. To understand significance of startups in Indian economy.
3. To study about the government initiatives taken by the government to boost the startups.

Significance:

1. India needs more than a 100 million jobs a year and the jobs which are generated are mostly from startups and not big enterprises. Startup entrepreneurship is crucial because it also brings new innovations, new jobs and competitive dynamics into the business environment and enterprises.
2. According to global data, instead of large enterprises, it is the startups that create new jobs in any country. Startups are full of the latest innovations and are an awesome way to intensify the employment creation in the Indian economy. Nonetheless, a more impactful aspect is the technological advancements startups bring to the country. Startups involve dealing with new technology and make the world aware of it and its applications. With the increase in the number of startups, India has the potential to be a global leader in skilled work and not just a hiring destination for cheap IT services.
3. Startups are the most effectual economic bodies on the market, as they provide additional effects and intense competitiveness to any economic system. This implies that the economy stays healthy, indispensable and industrious, while individual companies find it harder to fall asleep on their honor. A startup is important as it brings the latest and new innovations, new employments and competitive effectiveness into the business environment.
4. Startups are not just another new business but they bring added value to society. It solves the problems that never addressed before. It creates jobs, demand, and run the economic cycle. Startup companies are the most dynamic economic organizations as they bring more competitiveness and vigilance on the table.
5. There is no doubt that startups and innovations are the drivers of India's growth story. It gives us a chance to shed our independence on imports. They not only contribute to India's GDP but also benefit society at large.

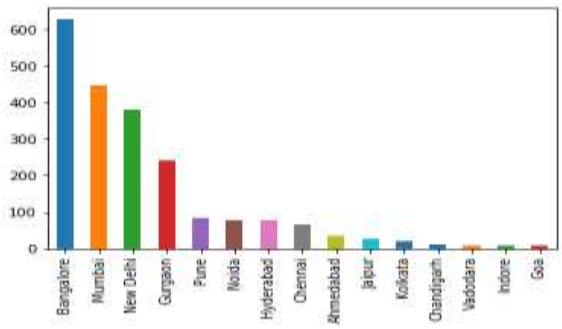

FIG 1.1: Number of startup's in India in recent years in respect to

Research methodology:

Problem statement:

The problem statement is "what is the impact of startups on Indian economy"

Dependent and independent variables

1. Independent variable: startups
2. Dependent variables: GDP, GNI, import, export, balance of payment, foreign reserve, per capita GDP.

Sources of data collection:

Secondary Data –

Secondary data is collected from RBI Reports, books, e-journals, magazines, articles, survey reports, published literature etc.

Definition of startups:

A startup venture could be defined as a new business that is in the initial stages of operation, beginning to grow and is typically financed by an individual or small group of individuals. It is a young entrepreneurial, scalable business model built on technology and innovation wherein the founders develop a product or service for which they foresee demand through disruption of existing or by creating entirely new markets. Startups are nothing but an idea that manifests into a commercial undertaking.

Grant Thornton (2016) define startup business as an organization which is

Incorporated for three years or less

1. At a funding stage of Series B or less(B Series means second round of funding)
2. An entrepreneurial venture/a partnership or a temporary business organization
3. Engages in development, production or distribution of new products/services or processes
4. Revenue of up to INR 25 cr.
5. Not formed through splitting or restructuring

The startup scenario in India:

It is to be noted that every year more than 800 technology startups are being set up in India. By 2020, it is estimated that around 11,500 tech-startups are going to be established with employment potential of around 250,000 technical people (NASSCOM, 2015). It is admirable to note that India is amongst the top five countries in the world in terms of startups with 10,000+ led by US with 83,000+ comprising 43% tech-based firms with 9% managed by women entrepreneurs. The number of incubators also has crossed 100 in 2014-15 to give boost to the startup saga (Grant Thornton, 2015).Sector wise, the distribution of Indian businesses is:

Table: 1 Break-up of Indian Startup Businesses

Technology Based	Non-Technology Based
E-Commerce - 33%	Engineering- 17%
B2B - 24%	Construction-13%
Internet - 12%	Agri- products- 11%
Mobile apps - 10%	Textile - 8%
SaaS - 8%	Printing & packaging – 8%
Other – 13%	Transport & logistics- 6%
	Outsourcing & support -5%
	Others-32%

Source: Startups India- An Overview, Grant Thornton, 2015

Achievement of Startups India Initiative:

1. Shri Narendra Modi, launched the Startup India initiative on January 16, 2016. An Action Plan with 19 action points, focusing on simplification and hand-holding, funding support and industry academia partnership and incubation was outlined.
2. The Department of Industrial Policy and Promotion has been actively taking requisite measures to encourage entrepreneurship and promote innovation. There are over 14,600 Startups recognized under Startup India that are spread across 479 districts, covering all 29 States and 6 UTs. In order to provide growth stage funding to Startups, a Fund of Funds (FFS) of INR 10,000 Crore has been setup. This is supporting innovators and risk takers in their

path towards the creation of a New India.

3. The Government has already committed INR 1,611.7 Crore to 32 Venture Capital Funds through FFS. The funds contributed by Government have enabled VC funds to raise a corpus of over INR 7,000 Crore which is available for Startups. When these committed funds complete their fund-raising process, then a total of INR 13,888 Crore will be available to be used by Startups. Thus, Government contribution has catalyzed 8X funding for Startups.

Issues and challenges of startups:

A successful start-up cannot start a business just with passion and an idea. A high level of leadership skills with clear understanding of market, excellent communication skills, maturity to see things in right perspective along with the ability to take calculated risks are required on the part of the entrepreneur. Lack of awareness, multiple clearances, unorganized market, poor infrastructure in Tier 2 /3 cities, lack of mentoring , stringent exit policies, corruption/red tape, technological risk, regulatory obstacles and lack of reforms keeping pace with the fast evolving market changes are some of the challenges

Some of the major issues and challenges are discussed below:

1. Financial Resources
2. Revenue Generation
3. Team Members
4. Supporting Infrastructure
5. Creating Awareness in Markets
6. Exceed Customer Expectations
7. Tenacity of Founders
8. Regulations
9. Growth Decelerators
10. Lack of Mentorship

Direct Impact of startups in the Indian economy

More job vacancies

The serious problem that India is facing is unemployment.jobs which are generated are mostly from startups and not big enterprises. Since the startups are free from economic downturns and free from encumbrance they can manage more staffs

Creative ideas create more works

A start-up that creates a solution easily will have more demand so every startup will try to be creative and with Everyone thinks differently so that the solutions found out by different startups for the same problem are also different and the smartest and creative ways are encouraged more and create more outsourcing to India

Talent explosion of professionals and entrepreneurs for better ROI

India is filled with talented professionals but they don't have the option to expose it. Startups are in search of talented professionals which give them a platform to showcase their talent and they are always encouraged by multinational companies which make them spend more money in India

The new technology that cut off production cost

Technological advances will significantly improve operations and lower the cost of doing business. Startups will search for new technology or create new technology in India which simplifies the workload. When new technologies are accepted and demand increases then many multinational companies will show interest in investment in India

Not only that, many Advancements in the computer industry, coupled with advancements in telecommunications, have increased job opportunities and strengthen economic growth in recent years.

More competition which gives more confidence for work

Good healthy competition is always required for the improvement of the quality and updating of a product or service. When competition increases the companies studies the behavior of customers and launch new products which the users demand which increases the demand for the product and increases the sales which directly benefits the Indian economy

More outsourcing of service

Many multinational companies are now outsourcing their work to small companies because they can concentrate on their core work. When these start-up companies

prove their talents, then many other companies also show interest in our country to outsource their work so that India will become specialized in that field.
For example, India is now becoming a VFX hub to the world. Many big companies are outsourcing their works to India which deeply impact the Indian economy

More flow of foreign money

When more outsourcing comes to India more foreign money is circulated and distributed in India which is good for the growth of the Indian economy

More demand in the market

When you prove the quality and value for money of your product or service then the demand increases which increases the revenue of startups which positively reflect the Indian economy

Can decrease importing

When our startups can handle the need for a product or service then we can decrease the importing of that product/service which decreases the flow of money to another country and that money flows inside the Indian market which is good for the Indian economy

Can increase exporting

When we have more startups then we can produce more products then we can start to export to another country which increases the flow of foreign money to Indian markets

New investments

Many multinational companies are closely watching the progress of Indian start us and they are ready to invest money that creates wealth for a start-up which helps to increase production which is good for the Indian economy
Not only that if many startups support their businesses they always prefer to start their company in India which increases job opportunity also.

Indirect Impact of startups in the Indian economy:

More flow of money into the Indian market

When start-up gives a job to people, they start to purchase products and service which increase the flow of money and revenue of the government which boosts up the Indian economy

Changes in the face of the town or city

When many startups are in a particular location the demand for that location increases because many people are trying to stay there to work and the infrastructure of that city changes a lot

More indirect jobs are very important and an Impact of startups in the Indian economy

When infrastructure change many hotels, homestays, restaurants, bus operators will starts which indirectly creates many job opportunities which increase the revenue of the people of that city

Increase of demand for related service

Many supporting services for star-ups starts such as Registration Company, marketing company, human resource company. Which also create jobs which are good for our economy

Increase in GDP

When income increase the people start to spend more money in the market which directly influences the economy of a country

Improves standard of living

When people have money they will start to buy quality products to improve the quality of life so the demand for good quality products increases which is good or our economy

Good progress in education

People always like to give a good education for their children. When they get a good income which they will demand a good educational institution and much foreign institute show interest in India which creates more job as well as the flow of money which gives progress in the society.

Progress in the health segment

People like to get good treatment but they are much expensive but when people have the income to spend then they demand good treatments which help the hospital management to import all modern equipment that makes India self-sustainable for every treatment

Progress in the transport segment

The need for transport increases as a city progresses which also gives job and more facility in the transport segment

startup India is a program that is aimed to support start-ups to promote the talents of every entrepreneur .The support that the government gives to the startups shows the importance and Impact of startups in the Indian economy.

Government initiatives:

Indian government is serious in promoting entrepreneurship at the startup level and has taken a number of initiatives to ensure appropriate support. In this aspect it is relevant to mention **'Make in India'** campaign introduced in September'14 to attract foreign investments and encourage domestic companies to participate in the manufacturing sector. The government increased the foreign direct investment (FDI) limits for most of the sectors and strengthened intellectual property rights (IPRs) protection to instill confidence in the startups. In order to make the country as number one destination for startups, Government of India (GoI) has introduced a new campaign called '**Startup India'** in 2015 aimed at promoting entrepreneurship among women and to help startups with bank funding. Another commendable and far reaching initiative is '**Digital India'** introduced in 2015 to ensure government services are made available to every citizen through online platform that aims to connect rural areas by developing their digital infrastructure which translates into a huge business opportunity for startups.

In August 2015, the Hon'ble Prime Minister, Shri Narendra Modi, announced the launch of the national flagship initiative – Startup India, with a mandate to promote and encourage young entrepreneurs of our country. He envisioned the aim of the initiative to transform India into a Startup nation, "a country of job creators instead of job seekers".

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SUSTAINABLE DEVELOPMENT AND EDUCATION

Dr .Prakash Ashok Jagtap
TCE ,Pune
***Corresponding Author*- Dr .Prakash Ashok Jagtap**
DOI- 10.5281/zenodo.7103185

Abstract-
present paper discussed about what is education for sustainable development,role of education in sustainable, components of education for sustainable education . Contribution of Sustainable Development to Education. Sustainability adds purpose to education. Sustainability gives relevance to the curriculum.

Introduction-
Education is seen as a big force; a force that not only contributes to national development, but also sustainable development. It is a key to development, be it social, economic, political or environmental. Education promotes development of knowledge and skills required to achieve sustainable development (SD). It encourages promotion of economic well-being, social equity, democratic values and much more. Education for Sustainable Development (ESD) enables people and citizens to learn as to how to preserve earth resources which are limited in availability. The ESD has the objective of empowering present and future generations to meet their needs using a balanced and integrated approach to the economic, social and environmental dimensions of SD.

Education for Sustainable Development -

Education for Sustainable Development means including key sustainable development issues into teaching and learning; for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption.

Education for Sustainable Development (ESD) is simultaneously a sub-field of education and a conceptual tool to aid policy makers in authoring educational policies that take into account the present environmental, societal and economic challenges. According to the UNESCO, it is based on all levels and types of learning - learning to know, learning to be, learning to live together, learning to do and learning to transform oneself and society." It further says that, "Perhaps ESD can be seen as the total sum of diverse ways to arrive at a 'learning society' in which people learn from and with one another and collectively become more capable of withstanding setbacks and dealing with sustainability-induced insecurity, complexity and risks. From this vantage point, ESD is about- through education and learning- engaging people in sustainable development issues, developing their capacities to give meaning to SD and to contribute to its development and utilizing the diversity represented by all people- including those who have been or feel marginalized- in generating innovative solutions challenges"

Role of Education in sustainable Education-
Education for sustainable development (ESD) promotes the development of the knowledge, skills, understanding, values and actions required to create a sustainable world, which ensures environmental protection and conservation, promotes social equity and encourages economic sustainability.

Components of education for sustainable development-
To reorient a curriculum to address sustainability, educational communities need to identify the knowledge, issues, perspectives, skills, and values central to

sustainable development in each of the three components of sustainability – environment, society, and economy – and integrate them into the curriculum.

Contribution of Sustainable Development to Education

Not only does education contribute to sustainable development and the transformation of society; the reverse is also true. Sustainability improves education and has the potential to transform education. As countries and communities struggle to cope with contemporary challenges accompanied by major life-changing events (e.g. climate change-induced drought or the rise in sea level), the purpose and relevance of education itself have been questioned.

Sustainability adds purpose to education.

Perceptions of the purpose of education vary according to the role and perspective of the person responding to the question. Teachers often say that the purpose is to help children develop their full potential. However, the reality of a teacher's job is that s/he must also prepare students to pass end-of-the-year exams for promotion to the next year of schooling. Parents often hope that school will prepare children for jobs that will provide economic security for their families. Some politicians claim that the purpose of education is to ensure national economic competitiveness. Others say that global stability is the goal of education.

For years, many countries have used education as one of several investments to increase economic growth. Unfortunately, such economic growth has brought with it unprecedented environmental challenges as well as large gaps - both economic and societal – between the "haves" and the "have-nots." It is evident that economic growth as the purpose of education no longer serves the planet well. From the perspective of sustainable development, it is time to rethink, reorient and restate the purpose of education. Education that promotes sustainability, global stability and resilient societies could help create a more sustainable future for the planet.

Sustainability gives a common vision.

Many children and adults know that something is not right in their community and in the wider world. They see environmental deterioration, social injustice, and economic inequity around them and learn about it in the media. Children and adults can easily identify what is unsustainable in the world around them. They also want a better world and some can even envision that world. Sustainability also positions education to make a concrete contribution to a better world.

Sustainability gives relevance to the curriculum.

The relevance of many primary and secondary curricula has also been called into question. The disconnection between the curriculum and life in the community is a factor in children and adolescents dropping out of school. Unfortunately, retention in school is a problem for countries around the world. One of the causes of dropout is that pupils or their parents do not perceive education as being relevant to the lives they lead or would like to lead. Making the curriculum more directly related to the lives of children and adolescents is important to retention. Education that is reoriented to address sustainability examines real-life problems in the community and explores solutions, thereby adding relevance to the curriculum by connecting it to learners' felt needs.

Conclusion-

education for sustainable development promotes research and provides information needed to solve sustainable developmental problems arising out of human-made decisions. Education as an investment in human resources plays an important role among the factors, which contribute to sustainable development.

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INFLUENCE OF COMPETITION INTENSITY ON GREEN PROCESS INNOVATIONS AND GREEN PRODUCT INNOVATIONS AND ITS IMPACT ON ENVIRONMENTAL PERFORMANCE

Dr. Soumya Varghese
Assistant Professor, St. Joseph's Business School, St. Joseph's College of Engineering and Technology, Kottayam-Kerala
***Corresponding Author*- Dr. Soumya Varghese**
Email id: soumya@sjcetpalai.ac.in
DOI- 10.5281/zenodo.7103197

Abstarct
Organizations adopting green practices can position themselves distinctively in the competitive marketplace and get the potential competitive advantage over competitors. If a market has characterised by intense competition, customers have many alternative options to satisfy their needs and can easily switch to other suppliers. Implementing continuous process and product innovation in terms of material efficiency, productivity and waste management etc. is crucial in the present scenario. Environmental performance(EP) is growing in significance for corporations as well as nations (Mehta and Chugan 2015). Based on the strategy-actions-performance paradigm the implementation of environmental management practices might work as an essential mediator through which proactive environmental strategy impacts EP. To minimise the negative impact on the environment and enhance sustainable development, firms increasingly recognise the importance of Green innovation (GI) in dealing with external environmental pressures (Huang and Li, 2017).A wide set of research studies described that GI makes product development and production processes less detrimental to the natural environment. The green product manufactured through the innovative green process with reduced consumption of water, and electricity, better waste management, and reduced emissions enables the organisation to be better competitive. The detailed review of research papers revealed that major competitor' strategies and activities is critically important for firms in the context of GI. Hence the present conceptual paper focused on examining whether competitive intensity has an influence on green process innovations and green product innovations (GRPSI and GRPDI) and the impact of these innovations on EP.

Keywords: *Competition Intensity, Green Innovations, Green Process Innovations, Green Product Innovations and Environmental Performance*

1. Introduction

When competition intensifies, managers have to engage in risk-taking and proactive activities that require both bold learning and exploration to break out of price or promotion wars. The cost-leadership strategy enhances competitive advantages through GRPSI since it enables firms to offer products in more efficient ways with distinctive manufacturing patterns that isolate them from imitation by rivals (Desyllas et al., 2018). According to (Porter, 1980), management must pay more considerable attention to costs in the competitively intense market, partly because of the higher pressure on prices. To obtain a cost-leader position, firms should make more effort to upgrade the manufacturing process and with better products for the benefit of all the stakeholders. Ghisetti, Marzucchi and Montresor (2015) state that GI is substantially different from standard technological and non-technological innovations. On the other hand, GI helps firms to satisfy the requirement of environmental protection and avoid protests or punishment from government regulators (Chang, 2011).

In the words of (Carrion- Flores and Innes, 2010), the qualitative and quantitative impacts of GI provide more potential benefits of green performance. Huang and Lic (2017) explained that GI could improve performance, whereas research also shows that green practices and innovations improve EP (Lirn, Lin and Shang, 2014; Yang, 2018). GI has understood as an innovation that generates environmental performance or reduces environmental damage. Companies enhance their competitive positions through GI, and must check their EP because GRPSI and GRPDI are positively associated with EP (Dong, Wang, Jin, Qiao and Shi, 2014). According to (Eiadat et al., 2008), green innovation strategy and the company's positive green performance are positively linked and should consequently continue to win-win solutions for environmental problems. In short GRPSI and GRPDI are crucial environmental strategies that may bring substantial benefits to organisational EP.

2. Literature review

2.1 Competitive Intensity

A firm's behaviour is heavily influenced by the actions and contingencies undertaken by the competitor. Organisations usually react and respond to the activities based on their competitors. Generally, after observing the competitors' successes, a firm may adopt the same practices imitating the successful firms (Liu, Ke, Wei, GU and Chen, 2010).Yalabik and Fairchild (2011) explained that many organisations are subjected to constant pressure from their competitors and have been forced to incorporate design for the environmental requirements in their role as supply chain partners. However, the success of such a design requires cross-functional cooperation within the firm, teams across different functional units and collaboration with external partners (Zhu, Sarkis and Geng, 2005). Henriques and Sadorsky (1999) remarked competitors as potential environmental leaders to set industry norms and legal mandates possess the ability to drive environmental innovation. While (Inkpen and Pien, 2006) described that firms collaborating with rivals are more likely to perform and better in innovation than they would otherwise.

In a highly competitive market, firms need a stronger competitor orientation to identify the competitors' strengths and weaknesses, develop competitive advantages, and anticipate competitors' reactions. Large and successful firms in an industry usually face intense scrutiny from competitors and external environmental activists (Zhu and Sarkis, 2007). Based on the above-stated studies, the present paper also considers competition intensity as one of the drivers of green innovation.

2.2 Green Process Innovations

Studies (Conding, Habidin, Zubir, Hashim and Jaya, 2012; Santamaría, Nieto and Miles,2012) indicate that GRPSI involves process-related to energy-saving, prevention of pollution, low energy consumption, recycling, reuse, and remanufacturing material. Moreover,the use of cleaner technology to make savings and prevent pollution. Companies aim to reduce environmental effects with the development of current production facilities or add some new processes through green process innovation activities (Chen, Chang and Lin, 2014). Hence, (Wong, 2012) indicated that GRPSI is the application of innovative initiatives to design and manufacture new products that significantly reduce the negative impact on the environment and promote sustainability.

2.3 Green Product Innovations

GRPDI is a cost-effective means for both consumers and producers to meet environmental and business objectives (Pujari, 2006). According to (OECD, 2005) GRPDI is a product innovation where there is an introduction of a good or service. It may be a new or significantly improved concerning characteristics or intended uses in terms of the improvements in technical specifications, components and materials, incorporated software, user-friendliness or other functional features. Firms developing innovative green products can sustain in the market by optimising various benefits directly and indirectly. Activities such as

decrease of toxic components within products, emissions and energy consumption during product usage, and increasing the useful life of products, including recycling, are a differentiation tool for marketing activities (Dangelico and Pujari, 2010).

Studies by (Dangelico,2016; Yu, Ramanathan and Nath,2017) contend that developing green products can help to improve a firm's performance through product differentiation, new market entry, cost-saving, etc.GRPDI allows firms to respond to the environmental needs of the market and the government to improve the resource effectiveness necessary to achieve the optimal environmental benefits in a PLC (Dong et al., 2014).

2.4 Firm Environmental Performance

In the business community, there has been an increasing need to apply the proactive approach of environmental management by balancing environmental, economic, and social performance as a part of the responsibility to society (O'Donohue and Torugsa 2016; Guerci, Longoni and Luzzini, 2016). In the words of ISO14031 environmental performance is a measure of the organisation's success in managing the relationships between its activities, products, or services and the natural environment.

2.5 Influence of Competitive Intensity on Green Process Innovations and Green Product Innovations

The increased global competition pressure is forcing organisations to continually develop and strengthen their core competencies measured by the process and product improvement as well as GI (Smith, Collins and Clark, 2005; Sanna - Randaccio and Veugelers, 2007). The following section shows a detailed review of the influence of competitive intensity on GRPSI and GRPDI.

2.5.1 Influence of Green Process Innovations on Firm Environmental Performance

According to (Guoyou, Saixing, Chiming, Haitao and Hailiang, 2013), three crucial elements are involved in GRPSI such as the reduction in the emission of hazardous substances or waste, the consumption of water, electricity, coal, and oil, and the use of raw materials. Hence, green operational management can provide a solid foundation for externally oriented green practice implementation (Green, Zelbst, Meacham and Bhadauria, 2012), with great potential for performance improvement (Jabbour, de Sousa Jabbour, Govindan, De Freitas, Soubihia, Kannan and Latan, 2016). The activities of GRPSI emphasize on waste reduction, reuse, recycling, increase in production efficiency with less input, higher quality, smooth flow of information and materials, etc. (Tseng et al., 2013).

In the line of (Li et al., 2016) GRPSI made 'the modifications made in manufacturing processes and systems to ensure energy savings, pollution prevention, and waste recycling. It includes all innovations that have a beneficial effect on the environment. GRPSI is more to new methods that can contribute to environmental protection by minimising production waste, enhancing resource efficiency (Chang, 2011); uses input with high efficiency, the least environmental effects (Amemba, Nyaboke, Osoro and Mburu, 2013). As no cost advantage has been gained if a firm adopts any other known best practices (Liu et al., 2018),

the GRPSI is likely to lead a "win-win" situation in terms of business performance and social perception (Zailani et al., 2015). The adoption of GRPSI helps firms enhance their EP and reap the benefits of sustainability and profitability (Hojnik and Ruzzier, 2016; Huang and Li, 2017).In short, GRPSI is the application of innovative ideas leading to the adoption of production processes or management practices that create less or no adverse ecological, human health, social, cultural and economic impacts.

2.5.2 Influence of Green Product Innovations on Environmental Performance

A product is considered as a competing product in "greenness" if it creates less burden on the environment in terms of energy, raw materials requirements, air

emissions, waterborne effluents, solid waste, and other environmental releases incurred throughout the PLC (Greenpeace International, 2011). Products using less energy, resources and materials in the development and design phase were seen as more favourable (Chen, 2008).GRPDI encourages efficient use of raw materials, resulting in lower costs for raw materials and may lead firms to find new ways of converting waste into saleable products that provide additional revenues (Porter and Van Der Linde, 1995; Christmann, 2000).Pemayun and Suprapti (2016) point out that GRPDI involves the creation of new products by considering environmental aspects into the entire life cycle - starting from raw materials, production processes, transportation, and use of products so that they have minimal impact on the environment.

The development of green products will result in better environmental performance, social well-being, and an increase in economic performance (Sarooghi, Libaers and Burkemper, 2015).GRPDI promote production differentiation and thereby gain market share (Siegel, 2009). As (Zailani, Jeyaraman, Vengadasan and Premkumar, 2012) stated GRPDI paves the way for sustainable green packaging thereby organisations reduce costs and fulfil external societal drivers such as customer, public and non-government. The corporate environmental commitment, environmental benchmarking, R and D strength, and cross-functional integration has contributed to GRPDI, which in turn creates a positive influence on green performance (Huang and Wu, 2010).

2.6 Green Process Innovations and Green Product Innovations Mediate the Relationship between Competitive intensity and Firm Environmental Performance

When competitive forces become intense or the competition base changes, firms change their strategies and operations to comply with the new environment to stay competitive. Firms are required to develop products and services that are environmentally sustainable and are produced by eco-friendly processes. To better respond to market and customer demands, firms must incorporate environmental issues into their competitive strategy. According to (Canning and Hanmer-Lloyd, 2001) many organisations work in an environment which includes pressures from their competitors and induces organisations to adopt green initiatives to combat competition and gain competitive advantages. Because when a market becomes highly competitive, it will make it increasingly difficult for firms to differentiate themselves from their competitors (Gatignon and Xuereb, 1997). Myers and Omer, 2012 explained how the competitive environment affects a firm's strategic environmental activities and found that competitive pressure has a large impact on firms' operations.

Imitative pressure originates from rival firms based on their development of new materials, technology, equipment, etc. and spurs firms to improve their innovation abilities. Firms are more likely to be "greener" in competitive markets by adopting innovative green products or green processes, which may give them a competitive advantage in the future. External competitive pressure engenders improved product, process quality and EP, which plays a critical role in the growing demand for eco-innovation abilities.

3. Conceptual Framework of the Study

Based on the extant literature the study developed a conceptual framework. The following section gives a detailed outline of the independent variable mediating variables and the dependent variable, which constitute the theoretical framework for the study.

Independent Variable: Drivers of environmental behaviour come from constituents inside and outside the firm and exert pressure on the reduction of negative externalities (Aravind and Christmann, 2011). Hence, the study identified competition intensity as one of the major external drivers which force firms to adopt environmental strategies such as environment-friendly processes to deliver environmentally friendly products.

Mediating Variables: The majority of prior research concerning innovativeness has been conducted in different forms with a focus on products and processes. The resource-dependence dynamics result in stakeholders having different levels of influence on the corporate green innovation decision (Kassinis and Vafeas, 2006). Hence, the conceptual study considers only core GRPSI and GRPDI as the mediating variables.

Dependent Variable: Firms are investing a lot of effort toward GI to minimise production waste, and increase productivity to make up for environmental costs (Chiou et al., 2011). GI differentiate itself from competitors to gain sustainable development through improved EP (Lin et al., 2013). EP has been considered as the dependent variable of the study. Fig 1. shows the conceptual model linking independent, mediating and dependent variable.

Fig 1: Conceptual Framework

Fig 1 shows the conceptual framework developed for the study to clarify the inconclusive assertions on the relationship between the antecedent, mediating variables and outcome. The external driver identified competitive intensity is considered as one of the most important driver of GRPSI and GRPDI as they are those that have frequently used in various studies. The comprehensive framework integrates the external driver, GI, especially in terms of the GRPSI and GRPDI as the mediating variables, EP (dependent variable). The study also focuses on whether the GRPSI and GRPDI influence the relationship between the key external driver with EP.

4. Implications of the Study

Based on the detailed review the author would like to emphasise the managerial implication of competition intensity on GRPSI and GRPDI. As (Porter, 1985) and (Li and Li, 2008) describe, managers can adopt two basic types of competitive strategies such as differentiation and cost-leadership strategies to survive during intense competition. When facing fierce competition, market differentiators can focus on integrating environmentalism into product innovation. Hence, managers can target new and un-served market segments with innovative green products that are impressive, eye-catching with less polluting materials, improved design, eco-friendly packed and eco-labelled to seize opportunities in emerging markets. The use of a differentiation strategy through GRPDI and GRPSI is an efficient means to avail profit in a situation of fierce competition.

As (Zailani, Govindan, Iranmanesh, Shaharudin and Chong, 2015; Shu, Zhou, Xiao and Gao, 2016) argued that due to the increasingly prominent environmental problems and excessive consumption of resources firms should implement green production to reduce environmental risks effectively and their negative consequences in the whole production process. Firms use improved EP to lower their costs by reducing waste in their production processes

(Shrivastava,1996). The study stresses the view of (Tseng, Divinagracia and Divinagracia, 2009) that low energy consumption, such as water, electricity, gas and petrol during production/ use/disposal and the use of cleaner technology make savings and prevent pollution. In short, the conceptual findings of the study highlights the view of (Chiou et al., 2011) that when focusing on GRPSI companies or manufacturers can save cost, increase efficiency, productivity and better product quality leading to improved green performance.

Cheng and Shiu (2012) state that eco-product implementation brings environmental improvements in existing eco-products or the development of new eco-products.Better understanding and insights in the areas of product design, product recovery, and product packaging for developing environmentally-friendly products through the procurement and usage of less or non-polluting/toxic materials help the managers to have better waste management, pollution control, and resources consumption thereby improve organisation's environmental situation. So the managers can target new and unserved segments to introduce GRPDI that seize opportunities in emerging markets through a better learning process and investment.

EP plays a critical role in the sustainability of firms (Claver, Lopez, Molina and Tari, 2007). Hence the managers can consider the GRPSI and GRPDI to showcase the ecological advantages for better FP. The observations of the review are consistent with the findings of (Chen et al., 2006) that companies could innovatively embody the green concept in their products and processes to differentiate their products from competitors. Hence, the study emphasizes that the competition intensity influences the organisations to move towards more value-added GRPSI and GRPDI rather than being stuck with the traditional business models.

5. Conclusion

According to (Chen and Wen,2006), the competitive strategy could either enable firms to derive profit from GRPSI and GRPDI or hinder them in doing so. To face competitive intensity and to maximise environmental performance, firms may need to align green innovation activities to its process and products. With the increasing market competition, green practices have been a principal differentiation tool to enhance efficiency, green reputation and product quality to gain a more competitive advantage (Hwang and Min, 2015).In a highly competitive market, the green concept in the products and processes can create differentiation from its competitors, especially through pricing and promotional strategies. Organisations should be better equipped through promotional wars, pricing strategies and communicate the firm's efforts through eco-labelling and eco-packed products to create a better market position. Based on the detailed review of literature the present paper also emphasises that competition intensity influences GRPSI and GRPDI and also has a positive impact on EP. So the firms need to identify the competitors' strengths and weaknesses and anticipate competitors' reactions in the context of GI practices. The study also confirms that firms with green process and product innovation strategies help to face the competition with better EP.

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STUDY OF CUSTOMER BUYING BEHAVIOUR IN TERMS OF PERCEPTION AND EXPECTATIONS FOR REAL ESTATE IN PCMC AREA

Dr. Sharad Kadam
Asst. Professor, MIT Arts, Commerce & Science College, Pune.)
***Corresponding Author*- Dr. Sharad Kadam**
DOI- 10.5281/zenodo.7103218

Abstract:
The paper presents an analytical study of consumer buying behaviour in terms of perception and expectations for real estate in PCMC area. Almost 80 % of real estate developed in India, is residential space and the rest comprise office, shopping malls, hotels and hospitals. Real estate companies would also do well to maximize their own performance and operational efficiency. This Sector is already overburdened with taxes; any further imposition of taxes in any form would adversely affect the growth of this sector of the economy. The importance of the Real Estate sector, as an engine of the nation's growth, can be gauged from the fact that it is the second largest employer next only to agriculture and its size is close to US $ 12 billion and grows at about 30% per annum. Five per cent of the country's GDP is contributed by the housing sector. This paper focus on the customer behaviour while purchasing the property.

Key words: *Consumer, behaviour, perception, real estate etc.*

Introduction:-

The size of the real estate industry in India is estimated by FICCI, to be around US$ 12 billion. This figure is growing at a pace of 30% for the last few years. Almost 80 % of real estate developed in India, is residential space and the rest comprise office, shopping malls, hotels and hospitals. This double-digit growth is mainly attributed to the off shoring business, including high-end technology consulting, call centres and software programming houses which in 2003-04, is estimated to have accounted for more than 10 million square feet of real estate development. This is the ideal time to invest in the country as policy makers have begun to emphasize on developing adequate infrastructure for the country. Real estate companies would also do well to maximize their own performance and operational efficiency.

The future of the real estate sector in India is going to be guided by two important factors, namely suitable amendments in the Foreign Direct Investment (FDI) guidelines in townships, housing, built-up infrastructure and construction – development projects as well as abolition of Service Tax on the construction industry especially the housing sector. Conversely, if the abolition per se is not possible then drastic modifications in the existing Service Tax norms is the need of the hour. This Sector is already overburdened with taxes; any further imposition of taxes in any form would adversely affect the growth of this sector of the economy. The importance of the Real Estate sector, as an engine of the nation's growth, can be gauged from the fact that it is the second largest employer next only to agriculture and its size is close to US $ 12 billion and grows at about 30% per annum. Five per cent of the country's GDP is contributed by the housing sector. The Real Estate Industry has significant linkages with several other sectors of the economy and over 250 associated industries. A unit increase in expenditure in this sector has a multiplier effect and the capacity to generate income as high as five times. If the economy grows at the rate of 10% the housing sector has the capacity to grow at 14% and generate 3.2 million new jobs over decade. Furthermore, this sector has witnessed a spurt in demand not just in residential

property but also in commercial property. A fast growing area is the I.T. and I.T. - enabled services along with the BPO boom.

Objectives of the study:-

1. To study of consumer buying behaviour in terms of perception and expectations for real estate
2. To determine the customer's perception.
3. To determine the customer's expectations.
4. To determine the problems faced by the customers while buying a house

Research methodology:-

Survey method isused for conducting the present research study.

Scope :-

This study will help to create awareness to consumers regarding property documents and in promotion of their services.

In order to accomplish the objectives of the study a survey has been conducted amongst customers of the real estate market. The survey is based on questionnaire filling method and limited to Pimpri Chinchwad from Pune district. The survey is restricted to the information needed to show legal, technical and financial transparency between project developer and customer.

Primary Data –

Primary datais collected by Self prepared Questionnaire from 100 customers of real estate marketin PCMC area.

Total population of PCMC area is divided into four directions. Then 25 customers are selected randomly from each sub-area.Stratified & random sampling method is used for sampling to collect Primary data.

Sampling

Sr.No.	Direction	Name of Sub-Area	Sample selected
1	East	Ajmera, Nehrunagar, Morwadi, MIDC, Gawali matha, Landewadi.	25
2	West	Chinchwadgaon, Akurdi Railway station, Rawet, Pradhikaran, Akurdigaon.	25
3	North	Chikhali, Talwade, Moshi, Charholi, Nighoje, Dehu.	25
4	South	Pimprigaon, Kalewadi, Navi sangvi, Rahatni, Thergaon, Wakad.	25

Secondary Data – This is collected from libraries through magazines, articles, published literature and Research centers and internet.

Primary data is collected by Self prepared Questionnaire from 100 customers of real estate market in PCMC area. It is analysed and interpreted as below:

Data Analysis and Interpretation

Table No. 1 - Classification of consumers' occupation

Sr.No.	**Particulars**	**Respondents**	**Percentage**
1	Service	64	64.00%
2	Business	28	24.00%
3	other	8	8.00%
	Total	**100**	**100.00%**

Source – Primary Survey

Primary data is collected from 100 respondents out of which 64.00% respondents are doing service, 28.00% respondents are in business and 8.00% respondents are not doing service or business. Researcher met service class people because they are educated and they are having capability of buying house or any experience of buying house or any property.

Table No. 2 - Satisfaction with the provided knowledge about real estate

Sr.No.	Particulars	Respondents	Percentage
1	Highly satisfied	1	1.00%
2	Satisfied	31	31.00%
3	Neutral	25	25.00%
4	Dis-Satisfied	42	42.00%
5	Highly dis-satisfied	1	1.00%
	Total	**100**	**100.00%**

Source – Primary Survey

With the help of above table, it is clear that majority i.e. 42.00% of respondents are dis-satisfied whereas very less proportion i.e. 1.00%respondents are highly-satisfied with the marketing information provided by the real estate companies. Many people who are satisfied with the marketing information provided by developer,they said that Real estate companies do not want to share each marketing detail but also some real estate companies do not want to hide any marketing details if customers ask them. 25.00% respondents are neutral, 31.00% respondents are satisfied and 1.00% respondents are strongly dissatisfied from the marketing details provided by the real estate companies. The reason of this strange result in simple languages is as follows-

1. Builders do not give complete marketing information in their broacher.
2. Marketing information provided by real estate developers is condition based.
3. In the marketing information broacher, developers do not share the negative side of project.
4. The paper work is a bit different from that of the actual work.

Table No. 3 - Preference given for the source of information

Sr.No.	Particulars	Respondents	Percentage
1	Print media	11	11.00%
2	TV/ Radio	31	31.00%
3.	Internet	39	39.00%
4	Personal reference	9	9.00%
5.	Broker	7	7.00%
6.	Friends & relatives	2	2.00%
7	Other	1	1.00%
	Total	**100**	**100.00%**

Source – Primary Survey

The above Table and chart shows that maximum respondents said that search of property through internet is very comfortable. Because in a single click they can reach to a number of builders and their projects. They said that mostly internet property web portal shows only marketing detail of projects but if they will show legal and technical document of project so searching property through internet become more beneficial. Some people say that print media is better way of searching property because it is easily available at everywhere any time and also gives information about current status of project with marketing details.

Table No. 4 - Reliability of builder checked through

Sr.No.	Particulars	Respondents	Percentage
1	Property documents	91	91.00%
2	Past records	1	1.00%
3	Market details	8	8.00%
	Total	**100**	**100.00%**

Source – Primary Survey

The above table reflects that before going to buy a house people generally look for the property documents which comes up to 91.00% of the total responses, then

the marketing details and the past records come.

Table No. 5 - Satisfaction with timely possession

Sr.No.	Particulars	Respondents	Percentage
1	Yes	24	24.00%
2	No	73	73.00%
3	Can't say	3	3.00%
	Total	**100**	**100.00%**

Source – Primary Survey

The answer of majority was not in favour. Out of 100, 73 respondents said 'No' to this comprising of 73.00% of the whole population. Whereas 24 respondents said 'Yes' and Rest were in two minds.

Table No. 6 - Satisfaction towards the Government initiative for low budget homes

Sr.No.	Particulars	Respondents	Percentage
1	Yes	34	34.00%
2	No	57	57.00%
3	Can't say	9	9.00%
	Total	**100**	**100.00%**

Source – Primary Survey

Majority said 'No' when asked this question and comprised of 57.00% of the total answers, 34.00% said yes and 9.00% didn't knew where to go.

Findings:-

The primary data is collected from 100 customers of real estate market of PCMC area gives findings as below:-

1. Most of the people are dissatisfied from the real estate marketing information provided by the real estate companies, but very few people are strongly satisfied.
2. Some of the people check delayed delivery penalty clause while buying a property.
3. 91% people want to check details of booking before buying or searching house.
4. Most of the people have chosen Internet & Broker as a source of information while buying or searching for a property.
5. People who have chosen internet, print media, brokers, and personal reference as a source of information for searching house or property are more satisfied compare to the other sources of information.
6. There is great demand of 2, 3 BHK house in near future in Pune and KP side, bander, katraj region.
7. Maximum respondents choose information related to the property documents as their first preference compared to the marketing details of the project, past record of builder and new policies of govt. related to real estate sector.
8. Most of the respondents want that the government should make policies in terms of legal, technical and financial aspects which could create transparency in real estate sector.
9. Most of the respondents know only the names of few property documents and they check only these documents while searching a property.

Conclusion:-

Now a day's people who go for buying a house have become more aware about what they should look for and the information they should seek, and are more concerned about the selection of the right type of house for them. But majority of the people are still unaware of the documents which they should look for before going to buying a house. Here researcher has collected the perception and analysed the expectations of the general public as a whole. The conclusion thus is that people need to be more aware of all the documents, the total legalities, and collect as much as information from the builders, and then only they can do their investment with a free mind. Thus because of the above reasons there is a need to create awareness among the customers as well as project developers to give the customers the complete

information and the role of 'TRUSTED PROPERTY' to educate people is appreciated in this regard.

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पर्यावारण प्रदूषण मानव जीवन के लिए अभिशाप

संजय कलमे[१] डॉ एस.एन. शर्मा[२]
[१]विषय लॉ, विक्रम विश्वविद्यालय उज्जैन (म.प्र)
[२]पूर्व प्राचार्य, विद्यि महाविद्यालय उज्जैन (म.प्र)
***Corresponding Author-* संजय कलमे**
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सारांश –
विभिन्न प्रकार के प्रदूषणो की चर्चा करते हुए यह सोचते भी भय होने लगा है कि अखिर प्राणी उस पृथ्वी पर जीवित कैसे है ? उसे खाने-पीने सोने, सांस लेने अथवा कोई भी कार्य करने में निष्पदता की तो बात ही नहीं आती । एक अनजान भय, अनचाही आशंका और कभी भी अप्रिय घटना की सम्भावना ने मनुष्य का जीवन दूभर कर दिया है । इसका अधिक दोष बढ़ती आबादी है जिसने अधिक आद्योगिक प्रगति को बढ़ावा दिया है और जिससे अधिक प्रदूषण फैला है । दूसरा दोष देश की अर्थिक व्यवस्था को दिया जा सकता है क्योंकि भूतपूर्व प्रधान मंत्री स्वर्गीय श्रीमतीत इन्दिरा गाँधी के शब्दों में "आबादी से गरीबी आती है और प्रदूषण गरीबी का आवश्यक प्ररिणाम है ।" इसी कारण आर्थिक विपन्नता वाले देशों में प्रदूषण की समस्या अधिक है । इससे भी अधिक उत्तरदायी हमारे देश की सामाजिक तथा नागरिक उत्तरदायित्व न वहन करने की आदत है । न तो वर्तमान पीढ़ी इस और स्वयं ध्यान देती है और न ही भावी पीढ़ी को सिखाने का प्रयास करती है वस्तुओं का ठीक से उपयोग न करने जीवन की शैली को अव्यस्थित रूप से ही चलाये जाने तथा अपने स्वार्थ और सुविधा के लिए दूसरों की परेशानियो की और ध्यान न देने से ही कई समस्याओं ने जन्म लिया है जिससे प्रदूषण भी एक है व मुख्य है । शासन व प्रशासन चाहे जितनी योजनाये बनावे कितनी ही व्यवस्थाये करे, प्रदूषक को रोका नहीं जा सकता । इसको नियंत्रित अथवा कम अवश्य किया जा सकता है, पर उसमें निःसन्देह आम आदमी को प्रभावी भूमिका निभानी होगी ।

जब कोई वस्तु किसी अन्य अनचाहे पदार्थो से मिलकर अपने भौतिक रासायनिक तथा जैविक गुणों में परिवर्तन ले आती हैं और वह या तो उपयोग के काम की नहीं रहती अथवा स्वास्थ को हानि पहुँचाती हैं, तो वह प्रक्रिया और परिणाम दोनों ही प्रदूषण कहलाते हैं।
प्रदूषक अनचाही वस्तुओं के मिलने से होता हैं जिससे प्राकृतिक अथवा मानवकृत पर्यावरण पर विपरित प्रभाव पड़ता हैं।

वायु, जल और भूमि में किसी भौतिक, रासायनिक अथवा जैविक अनचीते परिवर्तन से जिससे प्राणीमात्र के स्वास्थ्य, सुरक्षा और कल्याण को प्रभावी तौर से हानि पहुचाती हो प्रदूषण कहलाता हैं।मनुष्य की जीवन प्राथमिकताओं में वायु, जल, भूमि की भी यदि निरापदता नहीं हैं तो एक अच्छे जीवन की कल्पना भी कैसे की जा सकती हैं निःसन्देह पर्यावरण के प्रदूषण ने मानव जीवन को संकट में भी डाल दिया हैं और भयग्रस्त भी बना दिया हैं।

पर्यावरणीय प्रदूषण

पर्यावरणीय प्रदूषण एक ऐसा शब्द हैं जिसका आशय मुख्यतः लोगो के आस-पास के क्षेत्र को प्रदूषित करना हैं। यह कार्य मुख्यतः लोगो द्वारा ही उनके गलत कार्यो से होता हैं। धुऐ और विभिन्न गैसों से वायु खराब होती हैं, जिससे सांस लेना भी कठिन हो जाता हैं, पानी में उनके रासायनों तथा आपत्तिजनक स्त्रावों से वह दूषित हो जाता हैं जो पीने के पानी की कठिनाई के साथ ही समुद्री जीवों के जीवन को भी नष्ट करता हैं।

तथा अधिक रासायनिक खाद और कीटाणुनाशक दवाईयों से मिट्टी की उर्वरकता को हानि पहुचाती हैं जिससे अन्न उत्पादन में कमि आशंका भी बनी रहती हैं। यह तीन प्रकार के प्रदूषक (१)वायु प्रदूषक (२)जल प्रदूषक (३)भूमि प्रदूषक मनुष्य तथा अन्य जीवधारियों के लिए अत्यन्त हानिप्रद हैं। उनके अतिरिक्त भी कई प्रकार के प्रदूषक हैं, जिनका प्राणीजीवन पर बहुत प्रभाव पड़ता हैं।

प्रदूषण के प्रकार–

मुख्यतः निम्न प्रकार के प्रदूषणों को पर्यावरण के क्षेत्र में सम्मिलित किया जाता हैं:

1- वायु प्रदूषण
2- जल प्रदूषण
3- भूमि प्रदूषण
4- ध्वनि प्रदूषण
5- वाहन प्रदूषण
6- तापीय प्रदूषण
7- विकिरणीय प्रदूषण
8- समुद्रीय प्रदूषण
9- आद्यौगिक प्रदूषण
10- कूड़े–कचरे से प्रदूषण
11- घर तथा उद्योगों से निकलने वाले जलस्त्राव से प्रदूषण
12- अन्य प्रकार से प्रदूषण

पर्यावरणीय अध्ययन के कारण–

पर्यावरणीय अध्ययन निम्नलिखित कारणों से महत्वपूर्ण हैं–

पर्यावरण में जीवन के प्रत्येक स्वरुप की अपनी महत्वपूर्ण भूमिका हैं चाहे वह छोटा हो या बड़ा। अतः पृथ्वी पर मानवजीवन के अस्तित्व को बनाये रखने के लिए यह आवश्यक हैं कि जैव–विविधता को संरक्षित किया जाए। इसके लिए पर्यावरण का अध्ययन आवश्यक हैं।

प्रकृति की संरचना विशिष्ट हैं तथा इसकी प्रत्येक क्रिया और कार्य का एक निश्चित उदेश्य होता हैं । यह कभी प्रत्यक्ष तो कभी अप्रत्यक्ष रुप से मानवीय जीवन को प्रभावित करती हैं और इससे थोड़ा सा परिवर्तन मानव जीवन पर बड़ा संकट पैदा कर सकता है। ऐसे में पर्यावरणीय संरचना का ज्ञान आवश्यक है । पर्यावरण का अध्ययन जनसंख्या एवं संसाधनों के मध्य अनुकूलतम सम्बन्धों की स्थापना हेतु आवश्यक है । पर्यावरण के अध्ययन द्वारा पर्यावणीय जागरूकता का प्रसार कर सतत् विकास एवं अर्थिक उन्नति को बढ़या जा सकता है

पर्यावणीय अध्ययन के विषय क्षेत्र

वर्तमान समय मे पर्यावरण के सम्बन्ध में निम्नलिखित विषयों का विशेष रूप से अध्ययन किया जा रहा है मानव द्वारा पर्यावरण में हो रही तापमान वृद्धि तथा वायुमंण्डल में तापमान वृद्धि तथा जलवायु परिवर्तन । ओजोन परत का हास तथा महानगरों तथा अन्य स्थानों पर वायु प्रदूषण । प्राकृतिक आपदाओं का अध्ययन तथा मानव द्वारा जंगलों का विनाश । जैविक विविधता का हास ।

संसाधनों का सदुपयोग तथा उनका संरक्षक प्राकृति संसाधनों का लेख–जोखा तैयार करना तथा जैविक विविधता का लाभ समाज के सभी वर्गों तक पहुँचाना ।

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