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Resource Management and Agricultural Development

Chief Editor
Dr. R. V. Bhole
'Ravichandram' Survey No-101/1, Plot No-23, Mundada Nagar, Jalgaon

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CONTENTS

A Geographical Analysis of Talukawise Landuse Pattern in Osmanabad District

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Introduction

Land use Pattern is a function of four variables i.e. land, water, air and Man.Each has its own role to compose its life history. Land use in an area is a cumulative outcome of the interaction of soil structure and texture, rainfall, relief and socio-economic factor of the area. Pattern of land utilization differs with the differences in the above said factor.A Land use study is essential to avoid the misuse and for the optimum use of every piece of land without disturbing the ecological balance of the area.The census of India has classified the land into nine categories to represent the land use. In the present study land use in grouped in to five categories.

Abstract

The existing pattern of land use has resulted from a process of land utilization within the framework of physical and Socio-Economic setting of the area and modified by the expansion of irrigation growth of population and modern technology.The general land use pattern and shows the Talukawise land use pattern of the study area. The detailed analysis of the land use categories is given During the Study Period of 2000-2001.

Objective:

1) The main objective of the study is to Table and map analysis of Talukawise Landuse Patternin Osmanabad District.

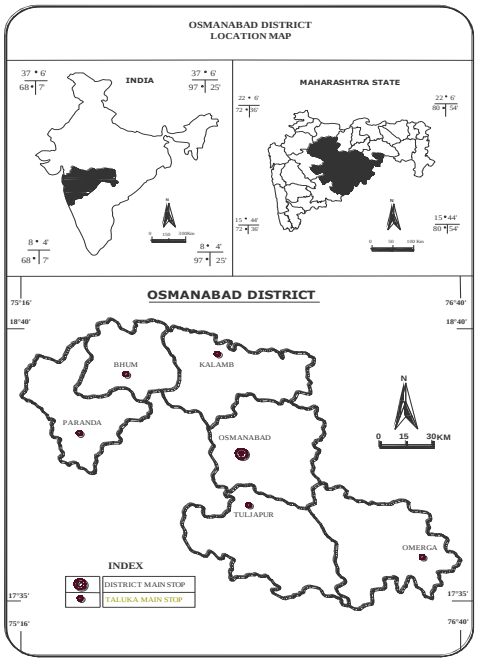
2) Find out the characteristics of TalukawiseLand use Patternin Osmanabad District

Methodology:

1. Data will be collected primary and secondary sources like personal interview.
2. Use the Socio-Economic Abstract & District census handbook of Osmanabad district.
3. Chose the random sample of six Taluka level places.
4. Find out the Spatial characteristic of Talukawise Landuse Patternon the basic of data available.

Study Area:

The district of Osmanabad southern most districts in Aurangabad division of Maharashtra State situated between **17^0 37|** to **18^0 42|** North Latitudes and **75^0 17| to 76^0 47|** East Longitudes. The district has an area of **7484** Sq KM. About **7271** Sq KM. area **(96.79%)** is known as rural area where as only **241.4** Sq KM **(3.21%)** area comes under urban categories. As for as area is concerned the district ranks **24^{th}** in the state of Maharashtra. East-West extent is **280KM**and South-North extents only **240KM.** It is bounded on the Southwest by Solapur district, on the North-West Ahmednagar district and South by Bidar and Gulbarga district Karnataka State.

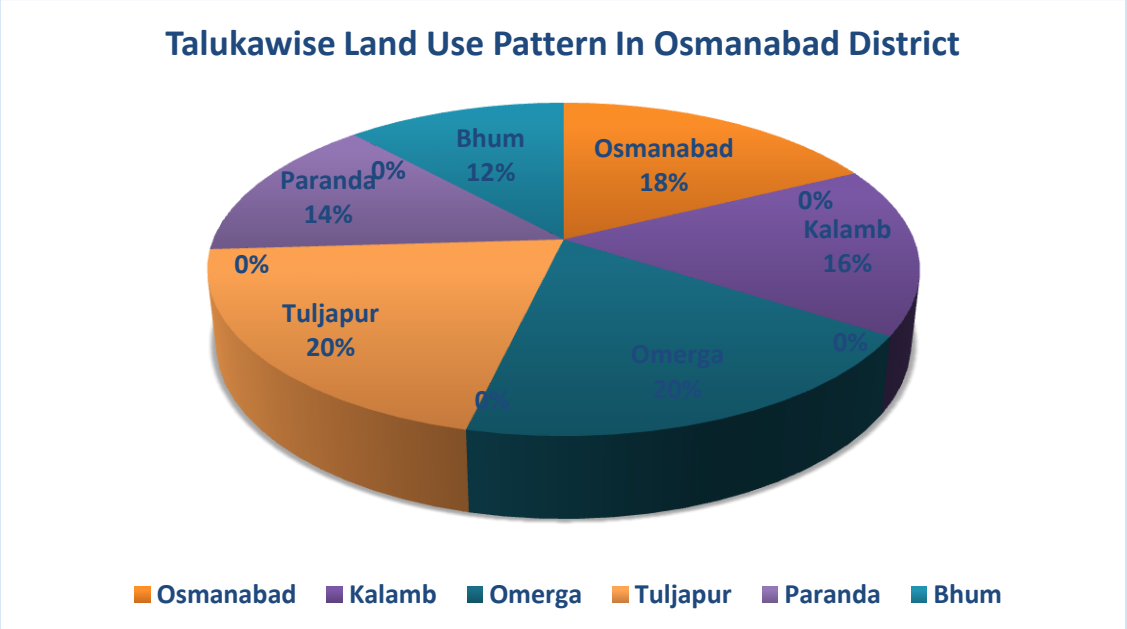


Osmanabad District-Talukawise Landuse Pattern(2000-2001)							
Sr. No.	**Taluka**	**Geographical area in '00' hect.**	**Land under forest '00' hect.**	**Land not available for cultivation '00' hect.**	**Cultivable waste land '00' hect.**	**Fallow land '00' hect.**	**Net sown area '00' hect.**
1	Osmanabad	1326	2	29	38	98	1159
	% to total	17.71	0.15	2.19	2.87	7.39	87.4
2	Kalamb	1227	20	20	167	223	813
	% to total	16.39	0.2	1.63	13.61	18.17	66.26
3	Omerga	1465	28	28	44	83	1299
	% to total	19.57	0.75	1.91	3	5.67	88.67
4	Tuljapur	1524	35	35	236	152	1084
	% to total	20.36	1.12	2.3	15.49	9.97	71.13
5	Paranda	1055	39	39	18	48	942
	% to total	14.09	0.76	3.7	1.71	4.55	89.29
6	Bhum	887	61	61	89	113	616
	% to total	11.85	0.9	6.88	10.03	12.74	69.45
	Region	7484	185	212	592	717	5913
	% to total	100	100	100	100	100	100

Source: Compiled by the Author.

Area under forest:

From the ecological an environmental point of view a forest cover plays an important role but



the region under study falls under the rainshadow area, cause to less forest cover. Out of the total geographical area, forest occupies 2.47 percent area which is too less than the state average and required proportion for ecological balance. (33.00%) comparatively more forest area is observed in Tuljapur, Paranda Bhum and Omerga and limited land is in Kalamb and very limited area is Kalamb Taluka the forest area.

Land-not available for cultivation:

This category consists of land put to nonagricultural uses barren and uncultivable waste. Of the total Geographical land, this category covers 2.12 hundred of land, which comes to (92.83%) percent of the total Geographical area. Proportion of such land to Geographical area is high in Tuljapur, Paranda, and Bhum and Low in Osmanabad, Kalamb and Omerga Taluka.

Fallow land:

The fallow land includes current fallow and other fallow land which is largely found due to inadequate water supply, Excess evaporation, large land holding, poor nature of soil and for preserving fertility to maintain crop yield. Out of the total Geographical area, area under this category is (9.59%)

percent. It is ranging between (18.17%) percent to 4.55 percent in the study area. It is highest in Kalamb Taluka and lowest in Paranda Taluka. This variation is due to scarcity of water, rainfall and Poor soil. Which compelled farmers to have the agriculturally land as fallows.

Net sown area:

One of the most significant features of the landuse in the study region is that the larger proportion of area is suitable for agriculture and it has already been brought under cultivation. Out of the total Geographical area 79.00 percent area is under this category, Relief, natural drainage pattern, soil structure and texture, climate, irrigation facilities, technological innovations and socio-economic condition of the people are the important factors which are responsible for higher cultivable land in the study area. Total Geographical area of the region shows that area under this category is the highest in Omerga Taluka and the lowest in Bhum Taluka.

Conclusion

Osmanabad District-Talukawise Landuse patternhas resulted from a process of land utilization within the framework of physical and Socio-Economic setting, Relief, natural drainage pattern, soil structure and texture, climate, irrigation facilities, technological innovations and socio-economic condition of the people are the important factors which are responsible for higher cultivable land in the study area. Total Geographical area of the region shows that area under this category is the highest in Omerga Taluka and the lowest in Bhum Talukaof the area and modified by the expansion of irrigation growth of population and modern technology.

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Agricultural Marketing

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Abstract:

India is known as an agricultural country. A major part of Indian population resides in rural areas or villages and its size is more than 833.33 million. Due to its large size, rural market has high potential. Main occupation of rural people is agriculture. Even the non-agriculture sector of India predominantly depends on agricultural sectors for its development. Agricultural marketing includes all the activities and processes through which agricultural products are provided from the cultivated farm to the final consumers. The aim of this paper is to highlight the past and present scenario of agricultural marketing prevailing in India and also the significance of agricultural marketing for the development of Indian economy. The paper also discusses the various problems faced by the farmers in the marketing of agricultural products as well as initiatives taken by the Indian Government to beat the problems faced by the rural farmers.

Keywords*: Agro products, Marketing, Intermediaries, Farmers, Rural India, Villages.*

Introduction:

Marketing of Agriculture produce is also known as agriculture marketing. It covers the services involved in moving an agricultural product from the farm to the consumers. In short, Agriculture marketing can be defined as the commercial function involved in transferring agricultural products consists of farm, horticultural and other allied products from producer to consumer. It continues to be the mainstay of life for majority of Indian population. It contributes around 25% of the GDP and employ 65% of the workforce in the country.

Definitions Of Agricultural Marketing

According to Thomsen – The study of agricultural marketing comprises all the operations, and the agencies conducting them, involved in the movement of farm produced foods, raw materials and their derivatives, such as textiles, from the farms to the final consumers, and the effects of such operations on farmers, middlemen and consumers.

According to the National Commission on Agriculture – Agricultural Marketing is a process which starts with a decision to produce a saleable farm commodity, and it involves all the aspects of market structure or system, both functional and institutional, based on technical and economic considerations, and include pre- and post-harvest operations viz., assembling, grading, storage, transportation and distribution.

Objectives Of Study:

i. To study about the meaning and concept of agricultural marketing.
ii. To analyse the problems which are faced by agriculture marketing in India.
iii. To find out the recent trends of agricultural marketing.
iv. To examine the initiatives taken by government to support agricultural marketing.

Role Of Agriculture Marketing In Economic Development In India:

i. Increase in farmer income
ii. Basic Source of Food Supply
iii. Release of surplus manpower
iv. Improving Rural Welfare
x. Raw Material for the agro-based industries

Problems In Agricultural Marketing:

Agriculture sector plays very important role in the development of any country. In spite of being most important sector it has to face lots of the problems. Some of the problems in agricultural marketing system are discussed here:

i. Too many middlemen
ii. Lack of Financial support
iii. Defective Weights and Scales
iv. Illiteracy
v. Lack of Awareness of the Market
vi. Lack of Organised Marketing System

STEPS Taken By Government For The Improvement Of Agricultural Marketing System:

Improving the marketing system of agricultural products would help the farmers to better their economy. Higher growth of the domestic economy to a great extent depends upon the robust performance of the

agriculture in rural sector. The government of India has also taken various steps in order to boost the agricultural marketing system. These steps and suggestions are described below:

i. Establishment of regulated markets

A regulated market is one, which aims at the elimination of the unhealthy and unscrupulous practices, reducing marketing charges and provide facilities to producers. The regulated markets however has the following benefits:

- Farmers are encouraged to bring their produce to the markets.
- Farmers are protected from the exploitation of market functionaries.
- Farmers have access to up to date market information.
- The marketable surplus of the farmers will be increased.

ii. Establishment of cooperative marketing societies or cooperative marketing

Cooperative marketing is the organized sale of farm products on a non-profit basis in the interest of the individual producer. Cooperative marketing are organized by farmers themselves and the profits are distributed among the farmers members based on the quantity of the produces marketed by them. The benefits of cooperative marketing or cooperative societies include:

- Make arrangement for sale of produce to the members.
- Provide credit facilities to the members on the security of agriculture produce.
- Arrange the supply of inputs required by the farmers.
- Provide grading facilities, which would result in better price

iii. Provision of Agricultural marketing training to farmers

Provision of training of utmost importance in view of the malpractices resorted to by various market functionaries. The farmers need to be trained in product planning i.e. crops and varieties to be grown, preparation of produce marketing malpractices and rules and regulations, market information, promotion of group marketing etc.

iv. Introductory of food security system

In a bid to provide food grains and other essential goods to consumers at cheap and subsidized rates, the Government of India has built up an elaborate food security system in the form of Public Distribution System (PDS) during the planning period. It operates as a safety rate by maintaining large stocks of food grains in order to meet any shortage and shortfalls that might occur in some years and for in certain areas of the country.

Conclusion :

Agriculture is the backbone of every nation contributing more income to rural areas and Indian Economy. This sector accomplishes the basic needs of nation required for survival and aids in stability, sustainability and strengthens the economy. In order to raise the agricultural production as well as productivity, it is necessary to move the agricultural produce from the farmers‟ field to the consumers‟ room at a reasonable price and provide fair remuneration to the producers. The agricultural marketing plays an important role in distribution of agriculture products to the customers. To develop agricultural marketing, there is a need to expand services like strengthening of marketing infrastructure, warehousing and transportation, investment requirements, ample sources of funds (including private sector), improvement in marketing information system, human resource development in agricultural marketing, and actions needed for promotion of exports etc. As most of the rural people in India are engaged in agriculture and its allied activities, more and more provisions must be made available to integrate the agriculture marketing systems.

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Problems and Prospects of Horticulture: A Case Study of Osmanabad District of Maharashtra (India)

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Abstract:-

In the Modern Era agriculture consists of horticulture, fish farming, pig farming and poultry. Horticulture is one of the most important type of agriculture. It is as an expensive art or science of cultivating fruits, vegetables, flowers, or ornamental plants. Over the years, horticulture has emerged as one of the potential agricultural enterprise in accelerating the growth of economy. Its role in the country's nutritional security, poverty alleviation and employment generation programs is becoming increasingly important. It generates both rural and urban employment. Therefore attempt is made here to assess the problems and prospects of horticulture in Osmanabad district. The present study is entirely based on primary data source. Twenty four sample villages of study region are selected for field survey. To examine the problems of horticulture stratified random sampling technique has been utilized.A questionnaire (schedule) is prepared for farmers to get the information regarding their problems in horticulture field. The study reveals that farmers of the region is facing the Problem of Draught, Soil erosion, Lower Mechanization, Labour Problem, Lack of Irrigation facilities, Problem of Indebtedness of farmers, Increasing Prices of Chemical Fertilizer, Soil Erosion, Poor Economic Condition of Farmer, Problem of Load Shedding, Ignorance about Soil And Water Testing, Low And Uncertain Prices of horticultural Commodity, Problem of Capital and decline of water table.

Keywords:*Horticulture, Problems and Prospects*

Introduction:

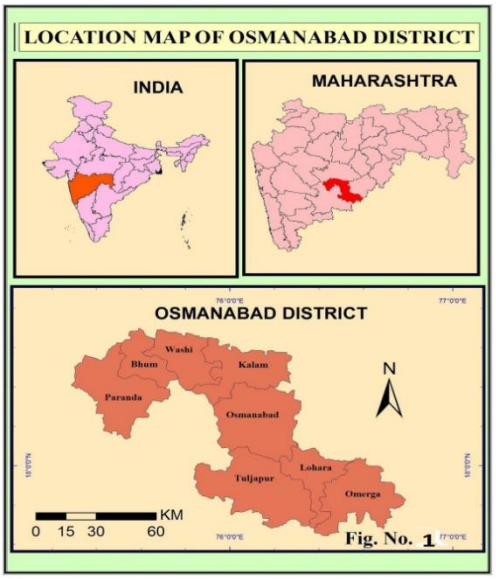
Agriculture is the backbone of the Indian economy and horticulture is one of the most important part of agriculture. In the last several decades, the geography of horticulture has emerged, creating its own niche as a sub-discipline within agricultural geography. Horticulture is the applied science. The term 'Horticulture' is probably of recent origin and it first appeared in writings of 17th Century (Kumar N., 1986). The word Horticulture comes from Latin 'Hortus' means Garden and 'Cultura' means Cultivation, which means garden cultivation (George A., 2002). Horticulture is the branch of agriculture dealing with garden crops, generally fruits, vegetables and ornamental plants.Over the years, horticulture has emerged as one of the potential agricultural enterprise in accelerating the growth of economy. Its role in the country's nutritional security, poverty alleviation and employment generation programs is becoming increasingly important. It offers not only a wide range of options to the farmers for crop diversification, but also provides ample scope for sustaining large number of agro industries which generate huge employment opportunities. It generates both rural and urban employment; it contributes to some extent to achieve balance of payment at national level. Horticulture can also provide large year-round employment as compared to various other traditional crops. It also offers potentials for small value-adding activities that could help in generating income for rural areas and create job opportunities (Ayman F, 2006).At present, the horticulture has become a key drivers for economic development in many of the states of India and it contributes 30.4 per cent to GDP of agriculture (ICAR, 2021). India is the second largest producer of fruits and vegetables in the world after China.Maharashtra is one of leading producer of horticultural crops in India. Due to the variation in soil and agro-climatic conditions in Maharashtra, variety of horticultural crops can be grown. In this context, the Osmanabad District of Maharashtra is analyzed to establish its suitability for horticulture. Though the horticultural crops occupy insignificant land (2.74%) of the gross cropped area, it has influenced the regional economy to a considerable extent due to high per hectare monetary returns. Thus it has become advantage to the farmers of study region as horticulture can thrive and sustain in drought conditions. There is a lot of scope to change per hectare earnings of farmers through horticulture farming. Considering the above situation,attempt is made here to analyze the problems and prospects of horticulture inOsmanabad District.

Study Region:

The Osmanabad district is situated in Marathwada region of Maharashtra state. The absolute location of district is in between 17°39'45" and 18°42'30" North latitudes and 75°18'30"and 76°46'15 East longitude. It is bounded to the South-West by Solapur district, to the North-West Ahmednagar and Beed districts, to the East by Latur district and to the South by Bidar and Gulbarga district of Karnataka State. The total geographical area of district is 7512.40 Square kilometers. As for as area is concerned the district ranks 24th in the state of Maharashtra out of which 248 sq km is urban area (3.21 % of total area) and 7321 sq km is rural area (96.79 % of total area). It is extended with 280 kms from East to West and

240 kms from North to South. It lies on the Deccan plateau at an average height of 600 meter above mean sea level. Large area of the district is covered by Balaghat Ranges and uneven with patches of low level plain (District Gazetteer of Osmanabad, 1972).

For the administrative purpose the district is divided into 8 tehsils i.e., Paranda, Bhum, Washi, Kalam, Osmanabad, Tuljapur, Lohara, and Omerga and having 729 villages. (Fig no.1)



Objective of the Study:

The main objective of present study is to analyze the problems and prospects of horticulture in Osmanabad district of Maharashtra.

Materials and Methodology:-

The present study is mostly based on primary data as well as on secondary data. To fulfill the objective of the study, primary data regarding horticulture farming is collected through field survey during the year 2015-16.Twenty four villages were selected from eight tehsils of Osmanabad district by Stratified Random Sampling Technique. The strata's are made on the basis of physiography. From each village 10 farmers with horticultural practices are selected and assessed.For primary data, a questionnaire (schedule) is prepared for farmers to get the information regarding non-physical determinants such as irrigation, use of fertilizers, pesticides, agricultural implements, high yielding variety, livestock, general land use, agricultural land use, horticultural cropping pattern, horticultural productivity, production cost and returns of different horticultural crops; and related agricultural problems. The farmers are interviewed for the same. During the field survey, exhaustive field notes also prepared, which have been used for the subsequent micro-level analysis. In order to access the main objective i.e. problems and prospects of horticulture farming, a brief account of the horticultural structure of the respondents are presented here. Secondary data is also used for the purpose of study. The data regarding physiography and socio-economic determinants is collected from district census handbook, district gazetteers and statistical abstract.

Observation and Findings:-

During field survey farmers of the selected 24 villages in the study region told different problems to the researcher at the time of their interview. Selected villages of the Osmanabad district is facing the following problems regarding horticulture.

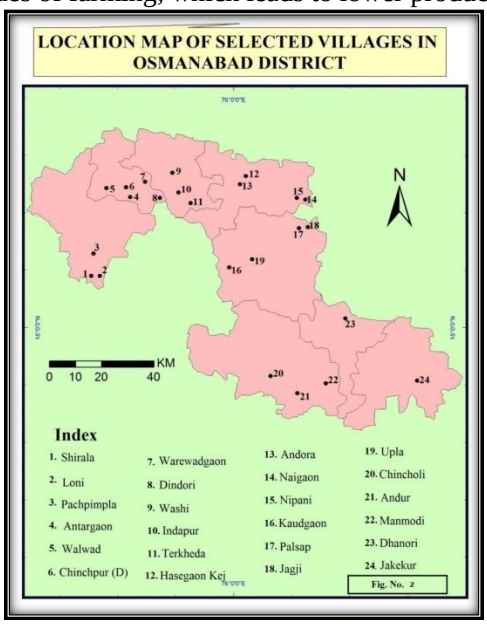
Problem of Drought or Extreme Rainfall

The region is not getting an assured rainfall in most of the villages, hence there is problem of water supply in these villages during summer season. There is no guarantee of monsoon rainfall in all villages. Erratic nature of monsoon rainfall effects on the cropping pattern and horticultural productivity was found. Major part of the district is identified as drought prone area. Sometime study region also faces the problem of heavy rainfall during November to January which adverselyaffects the flowering of plants. In such a humid condition, it leads to increase in several types of insects, pests and diseases which resulted into failure of the crop production.

Problem Regarding Mechanization/ Equipment

Most of the farmers of selected villages have been using old and inefficient methods and techniques of production. The village of Pachpimpla, Nipani, Washi, Terkheda, Naigaon, Walwad,

Dhanori, Dindori, Indapur, Antargaon, Loni, Andora, Warewadgaon, HasegaonKej, Jakekur, Andur and Chincholi have low number of tractor. The facts indicate that due to poorness the farmers of such villages are unable to use of modern techniques of farming, which leads to lower productivity.



Labour Problem

Horticulture farming is largely labour intensive activity. The availability of labour is the backbone of agricultural growth. Most of the farmers told that out migration of people from rural area creates labour problem in the study area. It is observed that there is no availability of laboures in time when performing different operations in the field. The wedges are also higher and less efficient one. Out of total sample farmers 88 percent have expressed the problem of no availability of laborers.

Lack of Surface Irrigation

Case study reveals that 62.5 per cent villages have less than 5 per cent surface irrigated area and 8.33 per cent villages are deprived from surface irrigation. These villages are totally depend on well irrigation and water table of well depend on erratic monsoon rainfall due to this there is no assure perennial irrigation, which very adversely affects on horticultural productivity. The total source-wise irrigated area of the study region is 24.51 per cent to net sown area. More than 67 per cent of farmers are facing the problems of shortage of water in summer season.

Poor Economic Condition of Farmer and Problem of Indebtedness

About 68 per cent farmers having poor economic status, they are unable to purchase and use modern equipment and High Yielding Variety, which adversely affects on horticultural productivity. The farmers of the selected villages borrow loan year after year but they are not in a position to clear off the loans, either because the loans are larger or their agricultural output is not large enough to pay off their debt. Therefore, the debt of the farmer goes on increasing this is known as rural indebtedness. Out of total farmers 30 per cent farmers told that they are taking loans from the private moneylenders because banks demand much more documents. The rate of private moneylender is about 5 to 10 per cent per month, hence, the poor farmer is born in debt, lives in debt and dies in debt. Sometimes small farmers mortgage their land property to the moneylenders and ultimately lose it latter on and they became landless labors.

Increasing Prices of Chemical Fertilizer and Pesticides

The farmers of the selected villages told that the prices of chemical fertilizer and pesticides are very high and they are increasing day by day. The quality of materials is not also satisfactorily. Over 66 per cent horticultural growers faced the difficulties of non-availability of finance for purchase of material in time. It is also observed that about 77 percent farmers are unknown about exact technical knowledge of fertilizing the crops and plant protection operations. Most of the farmers said that the horticultural crops suffer from air born bacteria and diseases by several ways.

Such mismanagement of horticultural yard has created many problems in this practice. Any mistakes in this regard lead to adverse effect on plant growth, yield and quality of produce.

Problem of Load Shedding

Irregular electricity supply is another serious problem in the study region. Almost all interviewed farmers of the selected villages raised this problem. The farmers told that load shedding is up to 18 hours

per day. During the rabbi and summer season there is irregular supply of electricity in the selected villages therefore, electric motors do not run properly to fetch water for agriculture, which resulted into low agricultural productivity. Irregular supply of it makes difficult to spray at requisite time, which affects again the yield and quality of fruits.

Ignorance about Soil and Water Testing

During field survey, 95 per cent farmers told negative answer about soil and water testing. It means that they are cultivating their crops blindly as well as using chemical fertilizer blindly, which result into low productivity.

Low and Uncertain Prices of Horticultural Commodities and high charges of Middle man and Traders Most of the farmers of the selected villages told that they are getting very low prices of horticultural production and the prices of horticultural production decreased during harvesting season and they are uncertain, which resulted into poor economic condition of farmers. Favorable weather conditions bring abundant production and when it is marketed, it causes sudden fall in market rates. Almost all farmers have expressed the problem of high charges of middle man and traders.

10) Problem of Capital

During field survey, most of the farmers told that they are unable to use innovate techniques due to lack of capital they said that loan is not easily sanctioned. Banks are neutral to advance the loan to farmer. Regarding the production cost of horticultural crops is very high and farmers faced the difficulties of non-availability of finance for purchase of material in time. Such fact adversely affects on horticultural productivity.

11) Decline of the Water Table

During the field survey, farmers mentioned that declining water table is a major problem in the study area. Majority of the villages are depended on the well and bore well irrigation system. So the ground water bail out through wells and bore wells at faster rate than ground water recharge which result into decline of water table. About 83 percent of the farmers told that the increasing demand of water to agriculture and scarcity of rainfall in the past five years causes declining water which affect on low horticultural productivity. Most of the farmers in the study area cut their orchards due to the insufficient groundwater availability.

Prospects of Horticulture in Osmanabad district:-

The Osmanabad district has hot and dry climate, which is favorable for fruit farming. The physiography and soils of 85 per cent of the selected villages are favorable for horticulture. In general, all physical factors are favorable for horticultural farming except rainfall. The district has high proportion of shallow soils and medium deep soil collectively. These soils offer good prospect for fruit farming, if perennial water supply is available. The deep to very deep soils have moisture retaining capacity which is favorable for horticultural crops such as Banana, floriculture, vegetables and spices. The potash content is high in each tahsil of Osmanabad district which states that the soil of the district offers good future for horticultural farming.The high balance of ground water in Washi, Kalam and Loharatahsils indicates that there is high scope for digging wells for better horticultural production. Surface irrigation and well irrigation play important role in the Horticulture farming. Study region benefited by two major irrigation projects i.e. the Manjara and Lower Terna which play a very important role in the development of horticulture. The high irrigation potential of Manjara Dam and Lower Terna dam indicates there is scope to increase horticultural productivity of Kalam, Lohara and OmergaTahsils.An awareness should be made among the farmers about use of micro irrigation such as drip, zirpi or sprinklers and mulching. The knowledge about drought resistance horticultural seeds and plants should be given to the farmers and promote them to use it in the study area. Lack of surface irrigation is main barrier in the horticultural development, so government should be taken an action toincreasetheminor irrigation projects, Kolhapur Types Wears as far as possible and to complete uncompleted irrigation projects. Furthermore awareness should me made among the farmers regarding use of drip irrigation which is helpful to save water and to increase in irrigated area. Awareness among the farmers to do allied activities like dairy, poultry and goat raring furthermore and for that to organize workshop for farmers to produce quality production which have export potential. Government should promote horticulture based industry such as Vinery, Juice and Jam. For indebtedness of farmers, government should restrict the rate of interest of private money lender and compel banks to sanction loans to the farmers. The poor economic status of farmers is main reason for less mechanization. The farmers should purchase mechanical equipment on the co-operative basis at Grampanchayat level For labour problem in the study area it is suggested that farmers should be shifted towards farm mechanization.To overcome the problem of load shedding, it is suggested that government should provide electric pumps to the farmers those run on solar and wind energy and sanction subsidy to

the farmers to purchase them.Most of the farmers ignore soil and water testing in their farm. Therefore it is suggested to make awareness among the farmers about soil and water testing. The government scheme like Soil Health Card (SHC) should be implemented properly. The agricultural clinic and labs should be established in rural areas.To overcome the problem of increasing prices of chemical fertilizers and pesticides, it is suggested that government should restrict prices and make awareness about organic farming. Organic farming reduces the unnecessary usage of chemical fertilizers and pesticides. It helps to retain fertility of land for a long time and reduces costs in the long run.Almost all farmers told the problem of decrease of prices of agricultural commodities during harvesting season. Therefore, it is suggested that government should declare minimum fixed prices of horticultural commodity.Problem of soil erosion is found all over the study region which restricts horticultural productivity. For this it is suggested that the 'JalyuktShivarAbhiyan' should be implemented strictly and make afforestation which is helpful for better productivity.Research efforts should be continued for the production of cost with higher yield potential and better resistance to pest. Technological advancement in horticulture should be passed down to the smaller farmers.

Conclusion:-

Forgoing analysis reveals that the study region is facing the Problem of Draught, Soil erosion, Lower Mechanization, Labour Problem, Lack of Irrigation facilities, Problem of Indebtedness of farmers, Increasing Prices of Chemical Fertilizer, Soil Erosion, Poor Economic Condition of Farmer, Problem of Load Shedding, Ignorance about Soil And Water Testing, Low And Uncertain Prices of horticultural Commodity, Problem of Capitaland decline of water table.The case study reveals that the physiography and soils offer good prospectus for agriculture development in the selected villages of Osmanabad district. But uncertain and erratic nature of rainfall is the main constraint in horticultural produce of selected villages in the study region especially in villages' lies in western and northern part of the study region.

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Classification of Agro Service Centers in Osmanabad District: A Geographical Study

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Abstract:

In Indian economy agriculture occupies strategic position. It is main source of livelihood for 70 percent Indian population. The prosperity of the India is largely depends on agriculture and development of agricultural depending on the growth and development of Agro ServiceCenters. As per government decision 500 Agro Service Centers established in the economy of the country and this was right stop for the progress. The scheme indented to provide employment in the rural area as well as to accelerate the process of modernization in the villages. It is particularly aimed at providing help to the small farmers and the relatively backward areas. AgroService Centers playing very significant role in India has providing all the required facilities to the farmers. Within a short span Agro Service Centers become an important infrastructureintheprocessofdevelopmentofagricultureandruralwelfare.

Agro Service Centers are an innovative idea and interesting experiment which holds the great promises to increase agricultural production through more use of fertilizer and wise use of other agriculturalinputs.

Key Words: *Agro Service Center, Classification, Seeds, Banks, Market places etc.*

Introduction:

For understanding the classification of agro service center, it is necessary to study the spatial analysis of Agro Service Centers. The objective of the present attempt is to work out an exclusive classification of agro service centers of the study area. It is based on functions and services. Agro Service Centers can be classified by the various central functions andservices.Agro service center are classified on the basis of their central functions which are associated with different agricultural activities in the study region.In the study area Osmanabad and Omergataluka are play a vital role. This region is under the influence of Terna and Benithora river basin. Agricultural land used for the crops like Wheat, Rice, Sugarcane and other crops. Within the 2 to 4 sq.km area minimum one Agro Service Center. Total numbers of Agro Service Centers in Osmanabadtaluka are 562 as per 2011record.In the north-western part of Osmanabad district means in the Kalamb, Washi, Bhum and Parandatalukas784AgroServiceCentersi.e. 309, 82, 284 and 109 respectively.In the south part, Tuljapur is leading taluka i.e. (218) Agro Service Centers. The more concentration of Agro Service Center was found in south-eastern part of the study area i.e. Omerga (487) and Lohara (158) Agro Service Centers. Total 2209 Agro Service Centers providing facilities to the farmers of district farmers are getting satisfied by purchasing all necessary inputs like fertilizer, weedicides, fungicides and insecticides along with guidance and consultancy service through agro care Centers.

Study Area:

The district of Osmanabad southern most districts in Aurangabad division of Maharashtra State situated between $17^0\,37'$ to $18^0\,42'$ North Latitudes and $75^0\,17'$ to $76^0\,47'$ East Longitudes. The district has an area of 7484 Sq KM. About 7271 Sq KM. area (96.79%) is known as rural area where as only 241.4 Sq KM (3.21%) area comes under urban categories. As for as area is concerned the district ranks 24^{th} in the state of Maharashtra. East-West extent is 280KM.and South-North extents only 240KM. It is bounded on the South West by Solapur district, on the North-West Ahmednagar district and South by Bidar and Gulbarga district Karnataka State.

Objectives:

The objective of the present attempt is to work out an exclusive classification of agro service centers of the study area.

To classification on the basis of their functions.

Methodology:

Data are collected primary and secondary sources.

Use the Socio-Economic Abstract & District census handbook of Osmanabad district1961-2011.

Classification of Agro Service Centers on the basis of Their Functions:

Fertilizers, seeds and insecticidesfacilities

Bankfacilities

Marketfacilities

Classification of Agro Service Centers based on fertilizers, seeds and insecticides distributionfacilities:

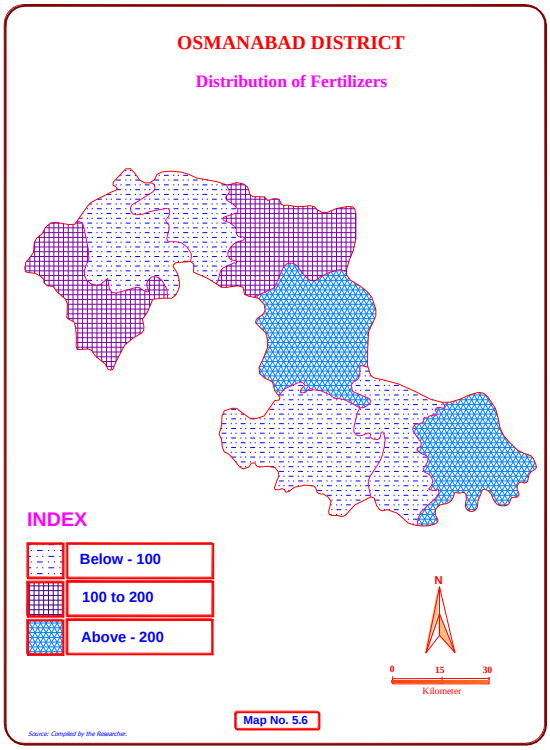
Fertilizers, seeds and insecticides distribution services important function of any agro service center in the study region .The distribution of Agro Service Centersin the study region has been shown in table and Map.Out of 2209 Agro Service Centers 917 fertilizer distribution centers are there in the study area. High concentration is in the (above 200) Osmanabad (230) and Omerga (204). Medium concentration of fertilizer distribution are there in Kalmab (124) and Bhum (120) and lower concentration is there in Tuljapur (84), Lohara (77), Paranda (50) and Washi (28) in the study area due to in accessible undulating surface, dry cultivations and poor status of thefarmers.

Table No.1.1:Osmanabad District Classification Based on Fertilizer, Seedsand Insecticides Distribution Facilities

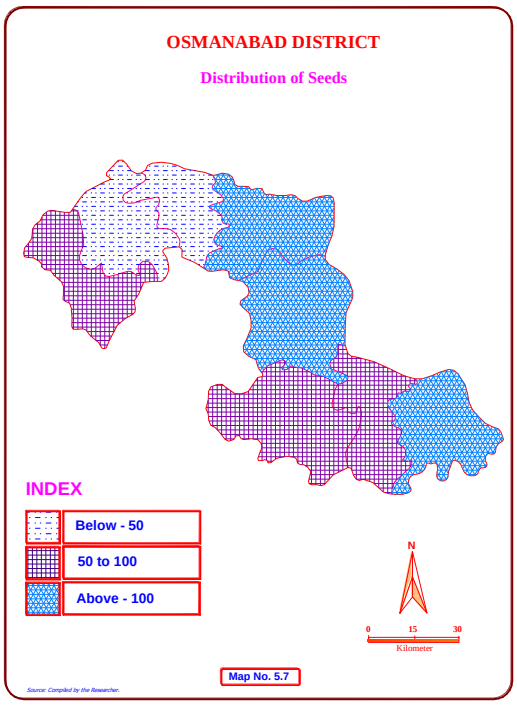
Sr. No.	Name of the Taluka	No.of ASC'S	Distribution Facilities of		
			Fertilizers	Seeds	Insecticides
1	Osmanabad	562	230	185	147
2	Kalamb	309	124	109	76
3	Omerga	487	204	163	120
4	Tuljapur	218	84	69	65
5	Paranda	109	50	29	30
6	Bhum	284	120	96	68
7	Washi	82	28	31	23
8	Lohara	158	77	54	27
Total		2209	917	736	556

Source: *Agriculture Dept. Osmanabad, Z.P.2015.*

736 Agro service center have seeds distribution facilities all over the district (above 100) high concentration of seeds distribution centers in Osmanabad (185), Omerga (163) and Kalmab (109). Medium concentration is in Bhum (96), Tuljapur (69) and Lohara (54) whereas low concentration is observed in Washi (31) and Paranda (29).

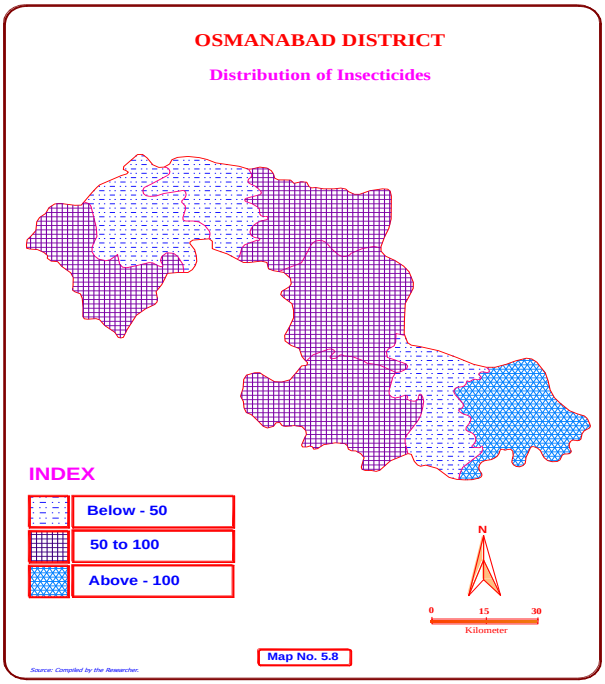


Out of 3086 agro service center 556 Agro Service Centers have facilities of insecticide distributions centers. High concentration (above 100) is in Osmanabad (147) and Omerga (120). Medium concentration of insecticide distribution facilities was noticed in Kalmab (76), Bhum (68) and Tuljapur (65), whereas low concentration of insecticides distribution was observed in remaining talukas of the district. (Map No.5.6, 5.7 &5.8)



Classification based on Primary Agricultural credit societies, Osmanabad district central co-operative bank and urban bank facilities:

There are three very important economic determinant



and life blood for Agro Service Centers.In Osmanabad district total 2209 Agro Service Centers. With only a urban banks, 469 ODCC Bank and 950 PAC,s. High concentration Primary agriculture credit society in (above 70) Osmanabad (89), Kalamb (71) and Tuljapur (70). Medium concentration (50 to 70) is in Omerga (61), Paranda (56) and Bhum (52) and low concentration of PAC;s in (below 50) in Lohara (40) and Washi (30). ASC,s with Urban bank 2 branches high concentration of URB is in (above 2) Osmanabad, Omerga and Tuljapurtaluka whereas low concentration is in Kalamb, Paranda, Bhum, Washi and Lohara for each talukas 1 URB. ASC,s with Osmanabad District Central Co-Operative Bank.Highconcentration (Above 20) is in Osmanabad (24) and Omerga (21). Medium concentration (10 to 20) of ODCCB was found in Tuljapur (16) and Kalmab (15) and low concentration of ODCCB (below 10) are found in remaining talukas.

Table No.1.2: Osmanabad District Classification Based on Distribution of PACs, ODCCBs, URBs

Sr. No.	Name of the Taluka	No.of ASC'S	PAC'S	ODCC Bank's With extension	UR Banks With Extension
1	Osmanabad	562	89	24	02
2	Kalamb	309	71	15	01
3	Omerga	487	61	21	02
4	Tuljapur	218	70	16	02
5	Paranda	109	56	08	01
6	Bhum	284	52	07	01
7	Washi	82	30	05	01
8	Lohara	158	40	06	01
Total		2209	950	469	102

***Sources**: i) Annul Report of ODCC Bank, Osmanabad (2015-16).*
ii) Annul Report of UR Bank, Osmanabad (2015-16).

1. **Classification Based on MarketFacilities**:

The classification of Agro Service Centers can be done on the basis of availability of market facilities. It has been illustrated with the help of table and Map. 2209 Agro Service Centers are with 37 weekly markets, zero submarket yard facilities and 08 marketyards.

Table No.1.3:Osmanabad District Classification Based onDistribution of Market Places

Sr. No.	Name of the Taluka	No. of ASC'S	Weekly Markets	Sub Market yard	Market yard
1	Osmanabad	562	06	00	01
2	Kalamb	309	05	00	01
3	Omerga	487	08	00	01
4	Tuljapur	218	08	00	01
5	Paranda	109	03	00	01
6	Bhum	284	04	00	01
7	Washi	82	01	00	01
8	Lohara	158	02	00	01
Total		2209	37	00	08

***Source**: District Dy. Registrar office, Osmanabad.*

For 2209 Agro Service Centers 37 weekly markets. High concentration ofweeklymarkets(above 5)areinOmerga(08),Tuljapur(08),Osmanabad(06) and Kalmab (05) and low concentration of weekly markets are in Bhum (04), Paranda (03), Lohara (02) and Washi (01)respectively.

Conclusions:

Very less number of Agro Service Centers was in Washitaluka being its location in Balaghat mountain range, due to rigid and rugged topography with dense forest. And very little land is available for cultivation so (below 100) i.e. 82 agro service centers are there in Washitaluka. Now a day irrigation facilities are increased in the district that why number of Agro Service Centers increased to provide all required material for agricultural development.Classification of Agro Service Centers, Agro Service Centers can be classified in to five service groups according to their functions in the study region. Generally there are PACs in every village of the district. In the district 469 primary agricultural credit societies are there. Distributions of PACs uneven in the district. More PAC's are there in Osmanabadtaluka i.e. 89.PAC's are concentrationPAC'sinLohara(40) and Washi (30)talukarespectivelySo many branches from all over district closed down or merged in nearby branches. But in last few decades the bank did lot for the farmers. Schemes like loans for pipelines tube well and lift irrigation. It also provides loans for improvement in Horticulture,dairydevelopment, The Osmanabad and Omerga branches provide all the service to the farmers. Along with this some Nationalized Commercial, Scheduled Banks helping to the farmers like, HDFC, ICCI, Canara, Baroda, Axis, Syndicate, State Bank, Bank of India, Maharashtra Banks There are no sub market yards for 2209 Agro Service Centers in the studyareas.At every taluka place one market yard i.e. Osmanabad, Kalmab, Omerga, Tuljapur, Paranda, Bhum, Washi and Lohara even though it has 45 Agro Service Centers. Means is in Osmanabad district 45 Agro Service Centerswithweeklymarketandmarketyardfacilities.

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Geographical Study of Fruit Farming in Karmala Tahsil of Solapur District

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Abstract

Fruits and vegetables contain a variety of nutrients including vitamins, minerals and antioxidants. Fruits are rich in fiber which is very essential for the smooth movement of the **digestive system.** There are some fruits that give body energy as they contain carbohydrates which are the main source of energy. **Carbohydrates** in fruits are mainly sugar which actually breaks down easily and make a quick source of energy. They also contain **minerals**, **vitamins** and **nutrients** that are useful for a healthy life. They are easy to cook and digest easily. Some of the popular and healthy fruits that can be consumed in daily everyday meal are **apples**, banana, grapefruit, mango, orange, strawberry, guava, papaya, watermelon, muskmelon, sweet lime etc. Karmala tahsil is a drought prone region in which the proportion of fruits cultivation area was about 0.16% in 1995-96 and about 1.38% in 2015-16 to the total cropped area. This tahsil ranks last position in fruits cultivation district in 1995-96 & 6th position in 205-16. Karmala tahsil is in Bhima basin where temperature ranges between 12˚C in winter season & 40˚C in summer season and the annual rainfall is less than 538 mm. Due to availability good soil condition, there is a greater scope for fruits cultivation by using modern technique. In this paper, an attempt is focused on changing the pattern of fruits cultivation in tahsil with comparison to Solapur district.

Keywords: Landuse, Change of volume cropping pattern crop, Total fruits cultivation area (TFCA)

Introduction

Fruits and vegetables contain a variety of nutrients including vitamins, minerals and antioxidants. Fruits are rich in fiber which is very essential for the smooth movement of the **digestive system.** There are some fruits that give body energy as they contain carbohydrates which are the main source of energy. **Carbohydrates** in fruits are mainly sugar which actually breaks down easily and make a quick source of energy. They also contain **minerals**, **vitamins** and **nutrients** that are useful for a healthy life.

They are easy to cook and digest easily. Some of the popular and healthy fruits that can be consumed in daily everyday meal are **apples**, banana, grapefruit, mango, orange, strawberry, guava, papaya, watermelon, muskmelon, sweet lime etc. Karmala tahsil is a drought prone region in which the proportion of fruits cultivation area was about 0.16% in 1995-96 and about 1.38% in 2015-16 to the total cropped area. Karmala tahsil is in Bhima basin where temperature ranges between 12˚C in winter season & 40˚C in summer season and the annual rainfall is less than 538 mm. Due to availability good soil condition, there is a greater scope for fruits cultivation by using dry farming technique. In this paper, an attempt is focused on changing the pattern of fruits cultivation in tahsil with comparison to Solapur district. There is medium type irrigation project found in tahsil which may helpful for increasing fruits and vegetable cultivation , if possible. Some fruits like Banana, Grapes, Lemon & Lime Acids are found in tahsil.

Objectives:

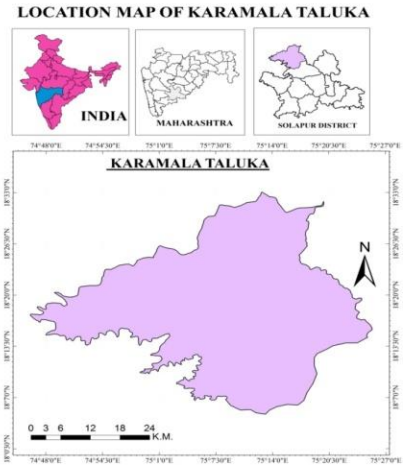
By keeping, the perspective agricultural development view in mind, the paper investigates the following objects as

To study the fruit farming pattern in Karmala tahsil of Solapur district.

To study the changing fruit farming pattern in Karmala tahsil of Solapur district.

Study Area

Karmala tahsil is located in the north-western part of Solapur district. The tahsil situated in Bhima and Sina river basin. It is surrounded by Karjat & Jamkhed tahsil of Ahmadnagar district to the northern part, Daund tahsil of Pune district to the NW part, Osmanabad district to the east, Madha tahsil to the south part and Indapur tahsil of Pune district to the west & SW part and Parenda tahsil to the east part. It's an area of 1616.10 Km² and holds the 2nd rank in areal extension within this district.



This tahsil has situated on the upper part of Ujjani dam in Solapur District . The latitudinal extent is **18˚5 '25**" N to **18˚33'14** " North and longitudinal extent is **74˚48'1**" E to **75˚24'35**" East. This Karmala tahsil is mainly rural in character and has 123 villages according to 2011 census. The total population of tahsil was 254489 person and holds 10th rank in district & literacy rate was 75.5 % and holds 7th rank in Solapur district as per 2011 census.

Results and Discussion :-

Out of total fruits cultivation of Solapur district, about 1.12 % area is found under fruits cultivation in Malshiras tahsil in 1995-96 and it changes 2.59 % in 2010-11.

Area under Fruit Cultivation in Karmala tahsil							
Fruits	**1995-96**		**Changes in 1995-96 to 2015-16**		**2015-16**		**Fruits**
	HA	% to TFCA	Hectares	% to TFCA	HA	% to TFCA	
Mangoes	28	18.18	07	-16.54	35	1.64	Mangoes
Banana	05	3.54	532	21.60	537	25.14	Banana
Grapes	10	6.49	85	-2.05	95	4.44	Table Grapes
					0	0	White Grapes
Papaya	0	0	0	0	0	0	Papaya
Guava	7	4.54	15	-3.52	22	1.02	Guava
Chikku	19	12.33	-14	-12.10	5	0.23	Chikku
Citrus Fruit	28	18.18	1229	40.65	0	0	Orange & Kinu
					0	0	Mosambi
					60	2.80	Lemon & Acid Lime
					1197	56.03	Other Citrus fruit
Other Pome Fruits	31	20.12	-3	-18.81	0	0	Watermelon
					28	1.31	Muskmelon
Other Fruits	26	16.88	136	-9.31	10	0.46	Ber
					118	5.52	Pomegranate
					34	1.59	Other fruits
Total Fruits	**154**		**1982**		**2136**		**Total Fruits**
Proportion of All Fruits to TCA	**93612 0.16**		**1.22**		**154342 1.38**		**Proportion of All Fruits to TCA**

In 1995-96, total fruits cultivation area was about 154 Ha which accounts about 0.16 % cropped area to the total cropped area. It seems that, out of total fruits cultivation area (TFCA), other pome fruits accounts about 20.12% share; other fruits constitutes 16.88% area ; grapes constitute about 6.49 % area; citrus fruits constitutes about 18.18 %; mangoes constitutes about 18.18 %; banana constitutes 3.54 %; chikku constitutes about 12.33% ; guava constitutes about 4.54% in the district. In 2015-16, total fruits cultivation area was about 2136 Ha which accounts about 1.38 % cropped area to the total cropped area. It seems that, out of total fruits cultivation area (TFCA), pomegranate accounts about 5.2% area; table

grapes constitutes 4.44 % area ; banana constitute about 25.14 % area ; ber constitute about 0.46% area; lemon & acid lime constitutes about 2.80%; mangoes constitutes about 1.64%; other citrus fruit constitute about 56.03%; pomegranate constitutes 5.52 %; guava constitutes about 1.02% area in the district

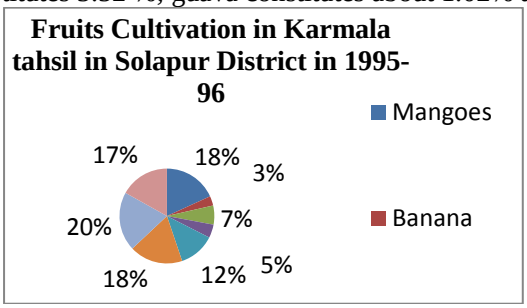


Diagram : Fruits cultivation in Karmala tahsil of Solapur district in 1995-96.

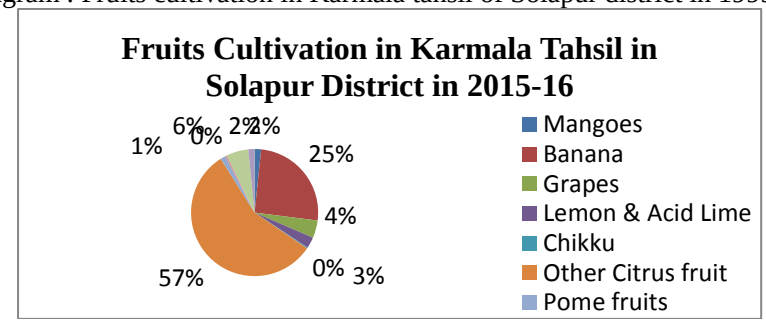


Diagram : Fruits cultivation in Karmala tahsil of Solapur district in 2010-11.

In the investigation period of study, it seems that the fruit cultivated area has been increased by 1982 Ha in the district and accounts about 1.22 % area to gross cropped area in 2015-16. There is a positive and negative changes takes place in fruits cultivated area in the district. There is a positive changes takes place by about 21.60 % under *banana*; about 40.65% under *citrus* fruits in tahsil. There is a negative changes takes place by about 16.54 % under *mangoes fruits*; about 18.81% under *other pome fruits*; about 2.05 % under *grapes* and about 3.52% under *Gauva* ; about 12.10% under *chikku* fruits; about 9.31% under other fruits in tahsil.

Conclusion :

1. There has been increased about 1982 Ha under fruits cultivation in Karmala tahsil.
2. There is about 21.60% positive changes takes place under banana cultivation in Karmala tahsil. It seems that there is a big demand of banana from surrounding market.
3. There is a found about 5.52% cultivation under Pomegranate, about 2.80% under Lemon and Acid lime ; about 56.03 under other citrus fruits due to the market demand. It helps to boost the farmers.
4. There is a negative changes found under grapes, mangoes, pome fruits , guava, chikku fruits in Karmala tahsil.
5. Karmala tahsil is leading in other citrus fruits, Banana and Pomegranate cultivation due to irrigation development.

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Consequences of Climate Change: A Geographical Study

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Abstract:

*For millions of years on earth, the atmosphere, the climate, and the nature of the environment have been in perfect balance. All living things evolved in the same environment. But due to human scientific and mechanical progress, we started deforestation. The industrial revolution brought about human development, but on the other hand, toxic gases began to build up in the atmosphere. Methane, carbon dioxide, phosphates and nitrates are the major contributors to greenhouse gases. Greenhouse gases efficiently absorb the heat from the sun on the earth, this heat is carried everywhere by the vapors in the atmosphere and helps to increase the average temperature of the earth. The sun's deadly ultraviolet rays are entering our earth's greenhouse and destroying the controlled conditions here. As a result, after **1986**, the Earth's temperature began to rise slowly, and since **2001**, extreme temperatures have been accelerating. **2018**has been the hottest year in the last **150**years. Since **2010**the world's polar ice caps have risen, sea levels have risen, cold-heat storms, hurricanes, cloudbursts, floods, earthquakes and volcanic eruptions, massive sea waves and human and bird fluctuations. Problems such as urbanization, industrialization, population and pollution are being experienced due to growth and its effects are also being felt. Not only is that, but the question of life and death of living beings facing the world due to the terrible ordeal of disasters. Of course, environmental protection is not just a matter of discussion, it is necessary to take urgent steps to prevent pollution. A study report recently found that thirteen villages in four countries in the Hindu Kush Himalayan region are facing increasing water insecurity. The report covers five villages in India: Mussoorie, Devprayag, Kalimpong, Darjeeling and Singtam. Experiencing water scarcity in villages in the Himalayan region, where huge amounts of water is available, is considered to be the worst cause of drought in the Himalayan urban areas. A report titled 'Mapping Challenges for Adaptive Water Management in Himalayan Towns' was published in the journal 'Water'. According to him, the same criteria applies to all the villages in the Himalayas and other hilly areas, including Simla.*

Key words :*Climate change, Greenhouse gases and Temperature rise, Soil, Agriculture, Water resources, Food security, Impact etc*

Objectives:

.1What is climate change?

.2To discuss greenhouse gas and temperature rise.

.3Reasons for studying the effects of climate change on soil, agriculture, water resources and food security

Research Methodology:

The secondary source for the presented research article has been relied upon. Various governmental and non-governmental reference books, books, periodicals, statistical reports, national and local current affairs papers, various websites on the Internet have been used for information.

Introduction:

Global climate change is an environmental problem. The effects of climate change can be seen in many different ways. Agricultural productivity declines, infrastructure is strained, and public health deteriorates. This increases the risk of disease and affects overall productivity. The economic consequences of climate change are many. Poverty increases, investment slows down and affects overall economic growth and productivity. That is why steps need to be taken in the next few decades in the context of climate change. The issue of climate change has become a global concern for all countries. Looking at the temperature history of the last 100 years, we know when the temperature rise started.According to NASA and the Indian Meteorological Department, global temperatures began to rise after .1986Extreme temperatures began to rise in .2001This is the ninth record increase in temperature every year since .2010The last year, 2018, has been the hottest year in the last 150years. Since 2010, the world has seen an increase in various natural disasters such as polar ice, melting glaciers, rising sea levels, cold-heat storms, hurricanes, and cloudbursts. For millions of years on earth, the atmosphere, the climate, and the nature of the environment have been in perfect balance. All living things evolved in the same environment. Forests had the ability to absorb all natural greenhouse gases, pollutants and carbon dioxide (CO(2, the ability to nourish humans and living things was in the forest, and the environment had the power to protect humans and living things. But due to human scientific and mechanical progress we started deforestation which was the basis of life, pollution increased in the name of industrial revolution, urbanization took place, population started increasing and we started to gradually remove the basis on

which creation was made. Now we are seeing and experiencing the same effects in the form of temperature rise, climate change and natural disasters. (Prof. Suresh Chopne, Maharashtra Times, 14Oct. (2018

Discussion of the Study:

What is Climate Change?

Due to the scientific and mechanical progress of human beings, we started deforestation which is the basis of life. The Industrial Revolution caused a huge increase in pollution from thermal power stations, cement industry, paper industry and various factories, which led to human development but on the other hand, toxic gases began to rise in the atmosphere. Greenhouse gases are mainly methane, carbon dioxide, phosphates and nitrates. These gases increase the temperature of the atmosphere through greenhouses, climate change and endanger the ozone layer, so the melting of polar ice, rising sea levels, as well as the heat from the sun on the earth efficiently absorbs greenhouse gases and vapors. Happens and the action of climate change begins. According to previous statistics from the IPCC's United Nations Environment Program and the Goddard Institute of Space Studies, the average global temperature has been rising since the 1950's, rising by 0.05 degrees Celsius per decade. By 2013, the temperature had risen by 1 degree. For the first time in the last 100 years, 2000, 2005, 2010, 2013 were the hottest years. Rising temperatures not only caused temperatures to rise, but also 2010 to 2013 were the coldest and most blizzard years. This is a precursor to temperature rise and climate change.

Greenhouse gas and temperature rise:

The average temperature rise of the earth is mainly Co2, methane, nitrous oxide; chloro-fluoro-carbon, ozone and water vapor are all called greenhouse gases. These gases retain heat and as their levels increase they inevitably cause the temperature of the atmosphere to rise.

Table no. 1.1 World Co2 Emitting Countries

Sr. no.	Countries	Percentage of Co2 emissions
1	China	20.7
2	America	15.5
3	European Union	11.8
4	India	5.0
5	Jpan	3.3
6	Africa Union	8.1
7	Gulf Contris	2.3
8	Small Islands	0.6

Show above table no. 1.1 China currently accounts for 20.7percent of the world's carbon emissions, compared to the United States' 15.7percent, as shown in Table 1.2by the World Bank, but the United States is one of the world's leading countries in terms of carbon emissions per capita.

Climate change and soil:

Climate plays a major role in soil formation. That is why there are diverse lands in different climatic zones. Rainfall, wind, sunlight, temperature and humidity are the factors that constantly affect the soil. So the fertility of the soil varies from region to region. Sudden changes in climate also affect soil properties. The fertility of the soil depends on its surface covering. Soil fertility depends on the right amount of organic matter, essential nutrients, bacteria, available moisture and proper moisture. Both high and low rainfall has different effects on soil fertility. Low rainfall and precipitation lead to decomposition of organic carbon and its depletion. In case of heavy rainfall, this organic curb sticks to the soil particles and carries them away with the water. Loss of soil carbon causes major loss of fertility. Due to continuous drought, the surface area is increasing. As a result, the availability of nutrients decreases. Due to high temperature and increasing precipitation, limestone nodules in the soil grow in the form of solid rocks. A more serious effect of precipitation and temperature is on the salinity of the soil. In such cases, the salinity increases and the soil become saline. The fertility of this land is further degraded.Preventive measures are more important to maintain soil fertility. Crop and cropping practices, horizontal sowing of slopes, measures taken to drain excess water, dams of fields, use of mulch, cover crops i.e. land cover crops, sun protection crops etc. benefit from such natural disasters. The damage will be reduced. Measures need to be taken to conserve and replenish the nutrients in the soil as a whole. Disaster management should be done according to local conditions in each area to ensure that fertility is not compromised in the event of a catastrophe. Need to use.

Climate change and agriculture:

Agriculture brought stability to human nomadic life and basic necessities like food, clothing, and shelter began to be met through agriculture. Then agriculture became of paramount importance in the basic

human occupation. Increasing human intervention in the natural environment in relation to agricultural development has created an ecological imbalance. Consequences: Climate change as mentioned above. Climate is one of the most important factors affecting agriculture. Rainfall, wind, sunlight, temperature and humidity are the factors that constantly affect the soil. So the fertility of the soil varies from region to region. Sudden changes in climate also affect soil properties. Emergencies of recent climate change are causing damage to crops and crops. There is a minimum and maximum temperature limit for the growth of each crop grown in agriculture. For example, in hot and humid climates, rice is grown and produced in large quantities, while in cold and dry climates, wheat is more productive. However, due to changing climate, the incidence of crop diseases and pests is increasing and crop production is being restricted. The result is food shortages, droughts, problems.

Climate change and water resources:

All people in the world need to have access to clean, pure and healthy water. Today, 1 billion 200 million people in the world are facing water scarcity. By 2025, that number will be 1 billion 80 crores. India currently has a population of 131 crore. It ranks 108th in the world in terms of per capita availability of drinking water. Freshwater is needed for the development of every sector of the economy today. Water is needed for the development of domestic, agricultural, industrial, energy and other sectors. In India, 42 per cent of the total cultivable area is under oligopoly, while in Maharashtra it is 17.90 per cent. The area under oligopoly needs to be significantly increased to provide food security to the growing population. Climate change will cause 75 to 250 million people to face severe water scarcity by 2020. The issue of food security will become more serious as the water level decreases. There will be conflict for water in different countries and in different states and districts. About 40-45 per cent of the people in India live in the Ganga, Yamuna river basin and their livelihood depends on its water. The reduction in the amount of ice in the Himalayas will greatly reduce the flow of water and in the future the water problem will become serious and will hit the agricultural sector hard. The destruction of arable land will lead to a sharp decline in rice production, endangering the livelihoods of coastal cities like Mumbai, Chennai, Kolkata, Konark, and Visakhapatnam etc. So it is necessary to think in that context.

Food Security and Climate Change:

Food security is directly and indirectly related to climate and climate, soil and topography play a major role in the natural or natural factors affecting agriculture. The weather is the most influential factor in all of this. Also, temperature and rainfall affect the type of agriculture and cropping pattern. Temperature is required from sowing to harvest. Climate change has more impact on the agricultural sector. According to the 2011 census, India's population has grown from 121 crore to 131 crore today. India needs more than 50 per cent growth in food grain production by 2025. The report of the IPCC Council predicts that by 2050, crop production in South Asia, including India, will decline by more than 30 per cent, leading to food shortages. Therefore, in view of the growing population and the growing need for food, there is a need to think in terms of food security. Considering the changing situation, it is necessary to continue the process of developing new varieties of crops by conducting new research to find varieties that are more tolerant in low rainfall regions and high yielding varieties in flood prone areas. Only then can food security be overcome.

Remedy plan:

The forest, which is the foundation of life, is very important. Forests are the only source of life-giving oxygen and food, and the control of temperature-increasing curb gases. But we need to break it and stop it with an ax to our feet. Now is the time to pay immediate attention to environmental conservation, this is the need of the hour! The best and biggest solution to reduce global warming is to cultivate trees at war level. Carb gas (CO (2helps in raising the temperature. To reduce its emissions completely, it is necessary to increase the use of unconventional energy such as solar, wind, hydro and bio energy. It is also important for the future to sustain sustainable development based on forests, trees, agriculture and nature. In addition, we need to change our lifestyle and adopt a lifestyle that complements nature. Exactly how we contribute to the control of climate change, individually, collectively, administratively and at the governmental level, will help us get out of this crisis - the alternative. To maintain soil fertility, cyclic cropping practices, horizontal sowing of slopes, construction of fields for drainage of excess water, use of mulch, cover crops, etc. So such management is necessary.

Conclusion:

Climate change is a global problem nowadays. This must be faced by the whole world together. According to the 5th Assessment Report of the Inter-Government Panel on Climate Change (IPCC-2007), the first impact of climate change will be on the agricultural sector and food production. This is because climate-based agriculture is at risk due to climate change. Leading the G20 summit, Japan called for more

research on climate change. Inspired by this, India is one of the few countries in the G20 to achieve its 2030 targets, according to a 2019 report in The Brown to Green, Climate Transparency. In addition, India is at the forefront of countries (including Germany, China, Mexico and South Africa) taking the most action to tackle the climate change crisis. Similarly, if other countries come forward and take action, there is no doubt that they will be able to control the problem to some extent.

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Study on Rain Water Harvesting From Rooftop

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Abstract:

Earth, Water, Fire, Air and sky these are five elements of universe, every element is important. Water is one of the most important elements; all living things depend on the water, water is life, without water we can't survive. Rain water is one of the sources for all living things. Rain are the main source of water if rain water is harvested the scarcity of water can be eliminated altogether, rain water is bacteriological pure and free from organic matter and soft in nature.[1] Water harvesting is collection and preservation of rainwater up to a maximum possible extent in the area of watershed where surface-subsurface water is scare. Water Harvesting may be done directly from rainwater or from run off produced from rainfall.[2]Rain water collect from the surface and collect into dams and another is rain water collect from roof top of houses. It involves collection of rain water falling on the roof or into the ground without passing through the stage of surface runoff on the land. Rain water harvesting directly from the roof, the gutter efficiently collects the rain water and discharges it to the collecting tank below. Harvested rain water used for potable uses include drinking, bathing, cooking and dish wash, before use this water it should be treated. Stored rain water uses for Non potable like flushing toilet, watering garden and washing floor and treatment of rain water is not required for this purpose. Harvested rain water from roofs can be uses for ground water recharge and helps to maintain the ground water level. Nashik cityannually received 600- 700 mm rainfall. Researcher's house is situated in the eastern part of Nashik city;its terrace size is 45 sq. meter. Researcher has installed small rainwater harvesting system at house. If the system harvested the rainwater through 700mm rainfall it can be stored around 31.5 cubic meter water in the storage tank. This stored water can be used for various non-potable uses like flushing toilet, watering garden, washing floor. That stored rain water can be used almost for 75 days of a small member family.

Keywords*: Rooftopharvesting, Non-potable use, Catchment.*

Introduction:

Water harvesting is collection and preservation of rainwater up to a maximum possible extent in the area of watershed where surface- subsurface water is scare. Water Harvesting may be done directly from rainwater or from run off produced due torainfall. Harvested water is stored and recycled for stabilization of agricultural productions and for many other purposes of the community. Without water security, no cropland can be developed for alleviation of rural poverty. Besides, water needs to be harvested for other purposes such as irrigation, domestic uses, industry, power plants, navigation, wildlife, recreation and fishery. Usually, the two ways of water harvesting is used, The first way is Rain water goes from the surface area in to the river and afterward it collects in to dams and the second way is rain water collects from roof top of houses in to the water storage tank. It involves collection of rain water falling on the roof or on the ground without passing through the stage of surface runoff on the land. Rain water harvesting directly from the roof, the gutter efficiently collects the rain water and discharges it to the collecting tank below. Harvested rain water is treated and then use for various potable uses such as drinking, bathing, cooking and dish wash, untreated harvested water is uses for non-potable purposes such as flushing toilet, watering garden and washing floor.. Based on the size of catchment rain water harvesting system can be divided to medium to small. The medium size systemcollects rain water from catchment areas, such kind of system can be used in educational institute, airport, army camps etc.. The small system collects rain water from houses. Harvested rain water from roofs can be uses for ground water recharge and maintained the ground water table. Nashik cityannually received 600- 700 mm rainfall. Researcher's house terrace size is 45 sq. meter. He installed small size water harvesting system.**Nashik city:**The present research work is focused on roof top rainwater harvesting in the Nashik city. It is located between 19° 59' 50.83" North latitude and between 73° 47' 23.29" East longitudes at Northwest part of the Maharashtra state. The climate of the Nashik city is characterised by dryness except in the south west monsoon season. Nashik city has average annual maximum temperature 31.8° C and average minimum temperature 17. 3°C, Nashik city received 600- 700 mm average annual rainfall from the south west monsoon season in June to September, average annual rainy day are 42.[4]A house is located between 20°04'46" north latitude and 73° 48'59" east longitudein east part of the Nashik city. House terrae size is 45 sq. meter and average annual rainfall received 600 -700 mm. if this roof rain water stored in storage tank it will more than 31.5 cubic meter that rain water used for no potable uses like flushing toilet, watering garden, washing floor etc.

Objective:

1. To analyses the need of water management
2. To examine the small roof top rain water harvesting system and it uses.

Research Methodology: The present study is based on the primary and secondary data. Primary data is collected through survey methods, this study is based on roof top rain water harvesting hence measure the roof of house and the storage tank by the measuring tape, calculate the volume of water using formula V=L_W_D, where L stands for length, W is the width and D represents depth. Volume of water can be calculated with help of the below table.

Area	Rainfall	Volume of water
1 Sq. meter	1 mm	1 Liter

Secondary data has been collected from the various sources such as Gazetteer of Nashik district, census of 2011, research Paper and IMD department.

Rainwater harvesting system:

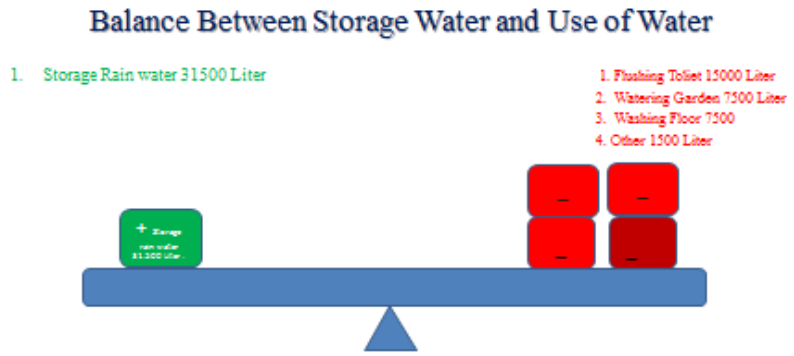
A rain water harvesting system was installed at researcher's home. This rain water system made up of four components; these are roof (catchment), gutter, down pipe and underground storage tank. The catchment area of is a 45 sq. meter, Nashik city has received 600-700 mm annually rainfall, this rain water harvested and stored in storage tank estimated 31.5 cubic meter water will stored in storage tank, that rainwater used for non-potable uses like a bathing flushing toilet, watering garden, washing floor etc.According to P.D. Sabale,"rain water is relatively spotless and absolutely free well spring of water, it enhanced for landscape plants gardens it is not chlorinated".[5] The studies carried out by the Thammer A Mohammed on potential uses of rainwater harvesting in the urban areas. The study presents that"rain water can be used for potable uses include drinking, bathing and cooking and washing usually the rain water used for this purpose must be treated to remove the contaminants. Non- potable uses include flushing toilet, watering garden and washing floor and treatment of rainwater is not required for these purposes".[3]According to the Victor F. Medina,"rain water harvesting components are rooftop collection systems metal roof are ideal for rainwater collection, conveyance systems via gutter channel and pipe, storage systems either on surface below ground and distribution of water required pumps, pipe and controls systems".[6]

Result and Analysis:

Ideal domestic rain water harvesting system generally composed of six components and these components are Roof (catchment), Gutter, down pipes, Primary screening, first flushes diverter and Storage tank etc. Most of the rain water harvesting system composes of roof (catchment), gutter, down pipe, and collecting tank. Researcher's rain water harvesting system is composed of four components which aforesaid mentioned. House terrace size is 45 sq. Meter. West part of Nashik city received 800-1000 mm annually rainfall and east part of Nashik city received 600-700 mm rainfall.[7]if this rainwater harvested and storage of water will be 31.5 cubic meters (31500 Liter) will be stored in the storage tank, that storage water will be used for non-potable uses, total storage of water is 31.5 cubic meter (31500 Liter) below table shows use of water for various purposes.

Storage of Water is 31500 Liter and it uses Water for Various Purposes

Sr. No	**Non- potable uses Item**	**Use of water Per day (Liter)**	**Number of person**	**Use of Volume of water (Liter)**	**Number of day**	**Use of water (Liter)**
1	Flushing Toilet	40	05	200 litter	75	15,000
2	Watering Garden	100	00	100	75	7,500
3	Washing Floor	100	00	100	75	7,500
4	Other					1500
	Total					**31500**



Above graph shows the storage of water is 31500 Liter and it uses for various purposes such as flushing toilet 15000 lit, watering garden 7500 lit. Washing floor 7500 lit and other 1500 lit. That storage water will be sufficient for 75 days for a small family. Researcher's storage tank has 3200 Liter it is very small tank so can't the 31500 Liter water in that tank. It is observed that the rainfall is not regular in monsoon season. It is erratic and uneven distribution of rainfall sowhen the rainfall occurred on the surface it can be stored in the storage tank and can be used in absent days of rainfall. Our storage tank is underground so pumping is required for the use of water if the storage tank is construct on the terrace use of water will be more convenient and pumping is not required.

Conclusion:

The researcher has installed and used the small size water harvesting system successfully from last two years. Based on his own experience Researchers can conclude the Paper with the help of following findings.The Nashik city received 600-700 mm annual rainfall. The 700 mm rainfall harvested in the tankand it can be stored around 31.5 cubic meter water. Stored water can be used for various non-potable uses like flushing toilet, watering garden, washing floor. That stored rain water can be used almost for 75 days of a small member family. The rate of infiltration is more due to concrete in the urban area, Storm rain water will be reduced due to the harvesting systems much of the water will be stored in tank.

The above findings shows that if most of us will follow the same water harvesting system then it will stored rain water and it will be an great opportunity to save water and save the environment.

Recommendations:

If the storage tank construct on the terrace there is no need of pumping and water can be used more conveniently.

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Changes In Land Use And Cropping Pattern Of Bhokardan Tahsil: A Geographical Analysis

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Abstract:

Land use is the surface utilization of all developed and vacant lands on a specific point at a given time and space. The land use pattern is different from region to region and place to place. Cropping Pattern is a dynamic concept as it changes over space and time. Therefore, in this paper attempt is made to analyze the existing general land use patterns and cropping pattern in Bhokardan tahsil of Jalna district and changes therein, which is very much useful for further land use planning. The period selected for the present study is from 2001 to 2011. Present investigation shows that there is 0.66 percent decrease in forested area, while 5.90 percent increase in cultivation area in the tahsil during the study period. Area of cereals and pulses has decreased while the area under cash crops and oil seeds has increased in this period. Nowadays cotton and soya bean are main crops in the cropping pattern of tahsil.

Key Words: *Agriculture, Land use, Cropping Pattern.*

Introduction:

Land is the main natural factor of production. Land use pattern is important for the development of national economy due to its alternative uses. Land use is the surface utilization of all developed and vacant lands on a specific point at a given time and space (Foreman, 1968). It is one of the most important resources for human being therefore it is necessary to put land for right use according to its capability and type. Land use study is much useful for land use planning because increasing population increases the demand on land for non-agricultural purposes may be met without reduction in farm land. The analysis of general land use pattern is very much useful for further investigation of socio-economic reality in the study area. The climate and physiographical condition are quite suitable for cultivation of different crops. In the Bhokardan tahsil cultivated crops can be classified into different categories like cereals, pulses oilseeds, cash crops and Fruits & vegetables etc. An attempt has been made to investigate the area and the production of major crops in the study area. In the recent years more than 90 percent area under various crops including fallow land .It indicates there is more scope for cultivation.

Objectives:

To analyses the existing general land use pattern and cropping pattern in Bhokardan tahsil of Jalna District and changes there in from 2001 to 2011.

Study Area:

The Bhokardan tahsil of Jalna District has been selected for the present research work. Geographically the study area is located on Deccan plateau characterized by basalt rock. The Bhokardan tahsil lies between $20^0$16' to $20^0$27' North latitudes and $75^0$46' to $75^0$77'East longitudes. The Bhokardan tahsil is surrounded on the north by jalgaon district, on the south by Badnapur tahsil, on the east Parbhani distric and Jafrabad tahsil, and on the west by Aurangabad district. It has an area of 1307.22 Sq.km, which is 17 percent of the total area of Jalna district. As per the census 2011, the population of tahsil is 311303.

Database And Methodology:

In the present study tahsil has taken as a basic unit of investigation. The present study is entirely based on secondary data which is mainly collected form Socio–Economic Review and District Statistical Abstract of Jalna, 2001 and 2011 and also information have been collected from various published and unpublished thesis, articles and books etc.

General Land Use Pattern:

Table No. 1: Land Use Pattern in Bhokardan Tahsil (2001- 2011).

Sr. no.	Land categories	2000-01 (Area in %)	2010-11 (Area in %)	Changes in %
1	Forest	1.19	0.53	- 0.66
2	Land Not Available for Cultivation	8.10	5.15	- 2.95
3	Uncultivable Land Excluding Follow land	0.78	2.47	+ 1.69
4	Follow Land	5.34	1.36	- 3.98
5	Cultivable Land	84.59	90.49	+ 5.90
6	**Total Area**	**100**	**100**	

Source: Socio-Economic Review of Jalna District, 2001- 2011.

1. Area under Forest:

The area under forest occupies about 0.53 percent of the total geographical area of the district during 2010-11. It clearly indicates that the proportion of area under forest is very much lower in the tahsil. The area under forest covers 1.19 percent of the total geographical area during 2000-01, while 0.53 percent during 2010-11. It indicates that the area under forest in the tahsil has decreased by 0.66 percent during the period 2001 to 2011.

2. Uncultivated land:

Uncultivated land and cultivable waste excluding fallow included in this land use category. The land not available for cultivation includes land under non-agricultural uses, barren and uncultivable waste. About 7.62 percent area belongs to this category, which is much lower as compared to the state average (10.34 per cent) during the period of 2010-11. In 2000-01 area under this category was 8.88 percent. During the 2000-01 to 2010-11, the area under this category has decreased about 1.26 percent. The development of infrastructural facilities like construction of road networks, canals, reservoirs, urbanization and expansion of settlements, development of industries etc, leads to high proportion of land not available for cultivation in the study area.

3. Fallow Land:

Fallow land is the land not used for cropping at the time of reporting. Fallow land further can be used for the cultivation. The fallow land occupies 1.36 percent of the total geographical area which is very lower than the state average of 8.27 per cent during 2011. The tahsil has identified with 3.98 percent decrease in fallow area from 2001 to 2011. It is because of the tahsil mostly developed irrigation facilities, agricultural practices and industries etc. are responsible for decrease in fallow land.

4. Net Sown Area:

Net sown area means, the total area sown with crops and orchards may be sown more than once in the same year but counted only once (Agricultural Census, 2011). The net sown area occupies about 90.49 percent of the total geographical area of the tahsil which is considerably larger than the other land uses during 2011. The thasil has identified with 5.90 percent increase in net sown area, while the district identified with 3.94 percent increase from 2001 to 2011. The increase in the net sown area corresponds to the decrease in forest, uncultivated land and fallow lands in the study area.

Cropping Pattern:

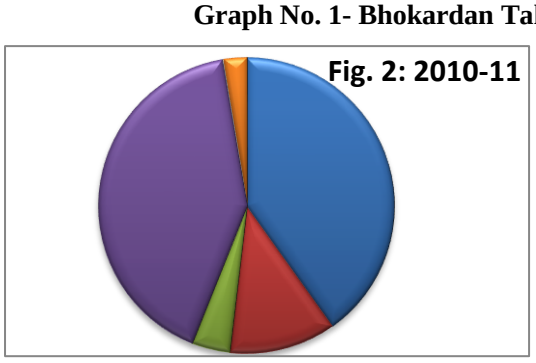
Cropping Pattern is a dynamic concept as it changes over space and time. Cropping Pattern means the proportional of area under various crops at a point of time or yearly sequence and spatial arrangement of crops and fallow on a given area. The cropping pattern of a study area is closely influenced by the geographical factors. The agriculture in the study area is intensive farming.

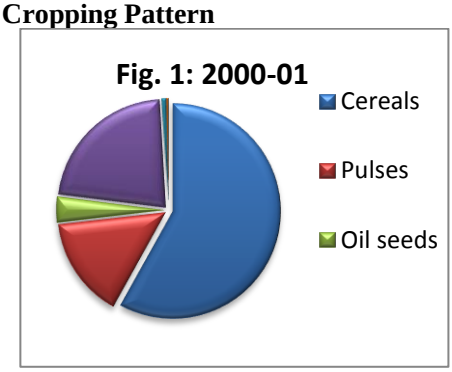
Table No 2: Bhokardan Tahsil: Cropping Pattern (2001-2011)

Sr. No.	Crops	2000-01 (Area in %)	2010-11 (Area in %)	Vol. of Change in %
1	Cereals	58.06	40.14	- 17.92
2	Pulses	15.15	11.67	- 3.48
3	Oil seeds	3.75	4.20	+ 0.45
4	Cash Crops	22.12	41.30	+ 19.18
5	Fruits & vegetables	0.64	0.22	- 0.42
6	Other crops	0.28	2.47	+ 2.19

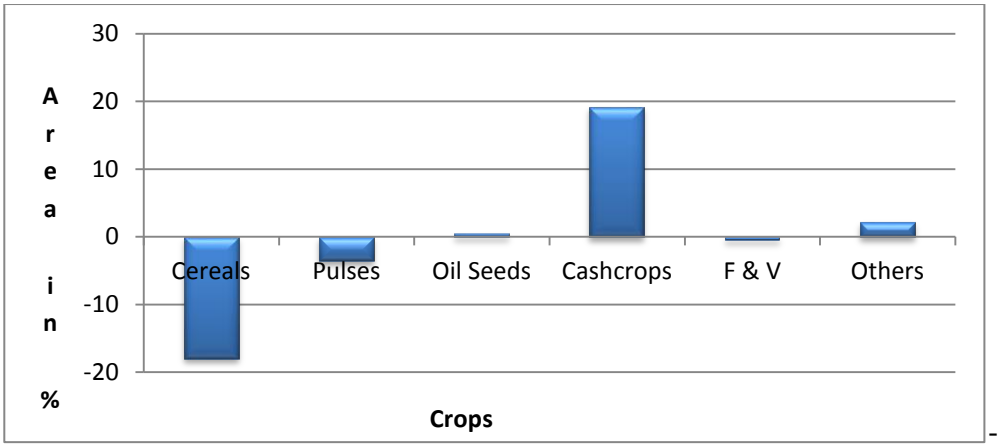
Source: Socio-Economic Review and statistical abstract of Jalna District, 2001- 2011.

Graph No. 1- Bhokardan Tahsil: Cropping Pattern





Bhokardan Tahsil: Changing Cropping Patter



Above table and figures shows that the area under crops, in the Bhokardan tahsil. The total gross cropped area in the district was 119087 hectors in 2010-11. The region is known as a food grains oriented region and they have occupied about 51.81 percent area of the total gross cropped area during 2010-11. Substantial changes have occurred in the cropping pattern of the region during the period under study. In the study region Jowar, Wheat, Bajra and Maize are the important cereal crops. In 2000-01, area under cereal crops was 58.06%, which decreased to 40.14% in 2010-11. Out of the total gross cropped area 15.15 percent area under pulses in 2000-01, this was decreased to 11.67 percent in 2010-11. Erratic nature of monsoon rainfall is responsible for the negative changes of food grain crops. In case of oilseed, area under these crops has increased from 3.75 percent in 2000-01 to 4.20 percent in 2010-11. Nowadays in oilseed crops soya bean is the main crop in the district. More productively varieties and year by year increasing market value of soya bean crop is reason of this positive change. In case of cash crops, area under cash crops has increased from 22.12 percent in 2000-01 to 41.30 percent in 2010-11. Sugar cane and cotton are cash crops in the district. Cotton is the main cash crop and ranking first in the cropping pattern of Bhokardan tahsil. Use of high yielding varieties of cotton, use of chemical fertilizers, pesticides and availability of irrigation facilities are responsible for the increasing of cotton area. It means, availability of irrigation facilities and good market price the cultivators has changed their attitude and they have turned towards the cultivation of cash crops.

Conclusion:

Present investigation shows that there is 0.66 percent decrease in forest area, 5.90 percent increase in cultivable area land and most importantly 3.98 percent decrease in fallow land. Spatial variations in the cropping pattern are depending upon the physical, socio-economic and technological environment. Area of cereals and pulses has decreased while the area under cash crops has increased in this period. After the year 2001, increased use of soya bean as edible oil, the increases in oil mills and the good price for the production, lead to a huge increase in soya bean cultivation. Year to year fluctuation of rainfall is also responsible for the changes in area and under various crops.

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A Geographical Analysis Of Utilization Of Improved Seeeds In Osmanabad District

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Abstract :

Agriculture is an ancient, basic and primary economic activity of human being. It plays a very important role in the economic development of any region, particularly a country like India. It large section of population. There is hardly any sector of economic development in India, which is not affected by changes in agricultural development. After independence the policy holders of economic development realized the importance of agriculture development. Therefore after independence Govt. If India accepted the concept of planed economy and prime importance has been given to agriculture sector to increase the productivity and employment. For that purpose different strategies adopted, one of them was to use the improved seeds and to start the (HYVP) high yielding varietiesprogrammes.

Keywords :*Improved Seeds, Economic Development.*

Introduction :

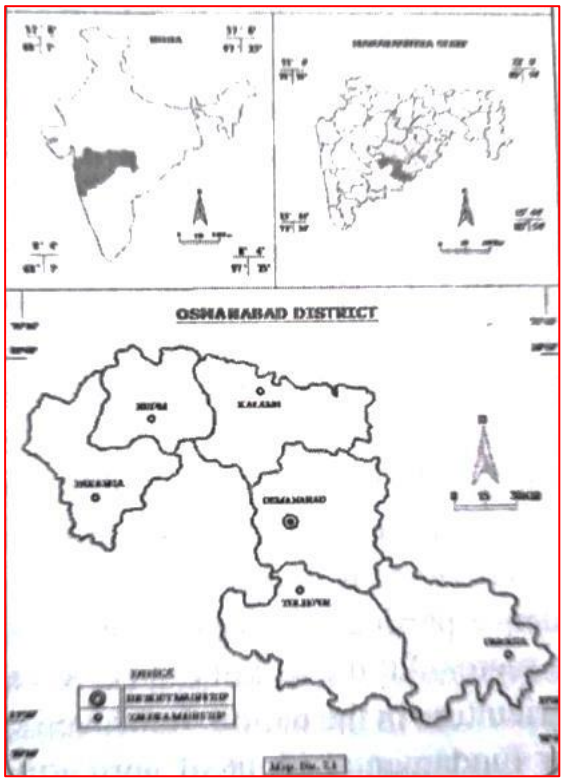
The changing role of agriculture in the economic development of the country, agriculture in India could be identified in three distinct phases since independence-

1. Phase-I (from 1951 to 1966) : in phase first agriculture became a subsistence farming and a way of life but not an enterprise.
2. Phase-II (from 1966 to 1980) : phase second known as new agricultural technology phase. High yielding varieties introduced in this second phase, due to which agriculture in India showed a dramatic change from subsistence to commercial cultivation.
3. Phase-III (from 1980) : This phase agriculture began to be diversified through allied activities like animal husbandry, forestry, horticulture, fisheries etc. Agriculture considered as an essential element in the overall rural development.

After independence particularly from 1966 new technological advancements adopted in agriculture sector. All technological advancements are basic inputs for the development of agriculture in the nation. Improved seeds or high yielding varieties is one of the a basic or fundamental input of agriculture, due to which agricultural in Osmanabad district improved seeds were using on large scale. The quantity of improved seeds increased from 1995-96 to 2005-06.

Study Area

For the present research paper Osmanabad district of Maharashtra state is selected. It is situated between $17^{o}35'$ north to $18^{o}40'$ north latitudes and $75^{o}16'$ east to $76^{o}40'$ east longitudes. It has on area of 7512.4 sq. kms. In respect of area Osmanabad ranks 24^{th} in Maharashtra state. According to 2011 census 1660311 with the density of population 219 persons per sq.km.for the administrative purpose the district is divided into 08 tahsils viz. Osmanabad, Bhoom, Paranda, Kallam, Tuljapur, Omerga, Lohara and Washi. Due to the unavailability of data newly created tehsils i.e. Lohara and Washi could not considered for the present research paper. Physiographically the district is divided into three part i.e. i) Western low land region and ii) South eastern low land region. iii) Balaghat plateau region. Manjara, Terna, Bori, Benithora, Banganga, Sina are the major rivers which drains the study area. Climate of the Osmanabad district is hot and dry except rainy season. May is the hottest month and December is the coldest month. Average annual rainfall is 716 mm. Deep black soils found in the river basins whereas medium black and shallow soils found on the Balleghatplateau region. Dry deciduous forests found all over the district. All these physical factors affected on the agricultural development in the study region.



Osmanabad District Location Map

Data Base And Methodology

For the present research paper secondary data used. Secondary data collected form district socio-economic abstract of Osmanabad district. The collected for 10 year i.e. from 1996-97 to 2005-06. The data thus collected from secondary sources tabulated and presented in a table format. Statistical techniques used for the calculation of percentages and groupings. It is represented by cartographic map for analysis.

Aims And Objectives

Following are the main aims and objectives of the present research paper-

1. To study the role of physical factors in the development of agriculture in the study region.
2. To analyses the use of improved seeds and its impact on the agriculture in Osmanabad district.
3. To find out the results and conclusions.

Discussion

In the phase-II (from 1966 to 1980) HYV seeds introduced due to which agriculture in India showed dramatic change from subsistence to commercial cultivation. Farmers aware about the HYV seeds and high productivity. They turned towards the cash crop cultivation to get higher income on a remarkable quantity HYV seeds purchased by used by the farmers of the study region. In 1996-97 use of HYV seeds was 6645 quintals and in 10 years, means 8250 quintals of HYV seeds used in 2005-2006. It shows a positive change towards the development of agriculture in Osmanabad district.

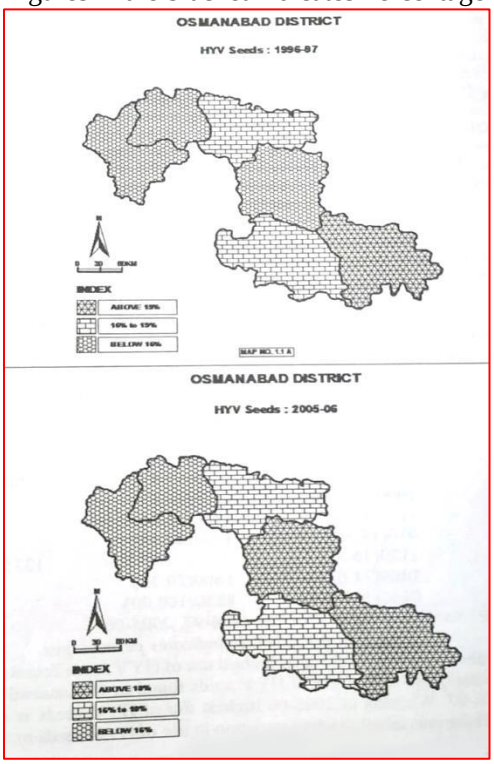
Table No. 01

Use of Improved Seeds in Osmanabad District 1996-97 and 2005-06

Sr. No.	Tehsils	Use of Improved Seeds in Quintals	
		1996-97	2005-06
01	Paranda	1025 (15.42)	1150 (13.94)
02	Bhoom	1000 (15.05)	1225 (14.85)
03	Kallam	1150 (17.31)	1450 (17.56)
04	Osmanabad	950 (14.30)	1500 (18.18)
05	Tuljapur	1120 (16.85)	1325 (16.06)
06	Omerga	1400 (21.07)	1600 (19.39)
	Total	**6645 (100)**	**8250 (100)**

Source : District Socio-Economic Abstract 1996-97, 2005-06.

Figures in the bracket indicates Percentage



From he above table it reveals that highest use of HYV seeds found on OmergaTehsil (1400 quintals) and lowest use of HYV seeds found in Osmanabad tehsil (950 quintals) in 1996-97. Whereas in 2005-06 highest use HYV seeds in observed is paranda tehsil. There was tehsil to tehsil variation in use of HYV seeds in Osmanabad district.

Out of the total district use of HYV seeds above 19 percent use of HYV seeds noticed in Omerga tehsil, about 16 percent to 19 percent use was found in Kallam and Tuljapur tehsil, whereas below 16 percent use of HYV seeds found in Paranda, Bhoom and Osmanabad tehsil in 1996-97. In the year 2005-06 the use of HYV seeds was 8250 quintals in the study region. Above 18 percent use of HYV seeds noticed in Osmanabad and Omerga tehsil. About 16 percent to 18 percent use HYV seeds noticed in Osmanabad and Omerga Tehsil. About 16 percent to 18 percentage use was found in Kallam and Tuljapurtehsils. Whereas below 16 percent use of HYV seeds noticed in Paranda and Bhoom tehsils.There was high use of HYV seeds found in Omerga tehsil in both the years. Due to the fertile soils in the river basins. Irrigation facilities and good climatic conditions high use of HYV seed found river basin area the use of HYV seeds in less than 16 percent. Bhoom tehsil lies on Balaghat plateau. Therefore Paranda and Bhoom tehsils have less use of HYV seeds in 1996-97 and 2005-06. Major part of the both tehsils lies in drought prone area. Banganga and sina river flows through Paranda tehsil but these rivers are seasonal rivers due to the Irrigation facilities from Manjara Major Irrigation Project Kallam and Tuljapur had shown medium use of HYV seeds in the study region.

Conclusions

1. Impact of physical determinants like physiography, climate, drainage, soils etc. found in the use of HYV seeds in the study region.
2. Tehsils like Paranda and Bhoom showed less use of HYV seeds.
3. These is scope to increase HYV seeds in Omerga and Osmanabad tehsils.

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Trade Area of Market Centersin YavatmalDistrict: A Geographical Study

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Abstract:

Marketing geography describes the various facts of retailing as aspect of geography which is concerned with territory economic activities and especially the distributive trades. The trade area is a phenomenon which is abstract, complex and combined result of the size of market itself. The functional attraction of the market is based on the range of goods and services, the attitudes of customers, the development of transportation network and the unexpected population behaviors. These boundaries of trade areas are simply generalized and determined one. The attempt is made here to analyze trade area of market centers in Yavatmal district. The paper is based on primary data to analyze trade area of market centers statistical techniques i.e. mean and standard deviationhas been utilized.

Key Words: Trade area of Market centers.

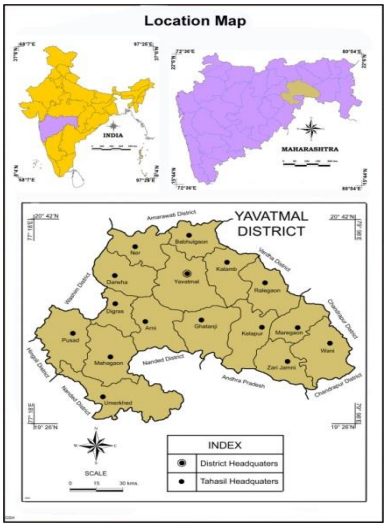
Introduction:

"Marketing Geography describes the various facts of retailing as aspect of Geography which is concerned with territory economic activities and especially the distributive trades" (Davies, 1976).

The trade area is concerned with distance between the markets, their functions, and size. These factors have relative importance of their own. There is a study of sphere of influence areas whether they are well served or poorly served with the help of the measurement of service area which is also important to comprehend marketing data; performance of market centers, the settlement and development of the shops as well as the traders and customers. This study proves importance of the planning of various methods to delimit trade area of market centers that have been employed by many Geographers and scientists.The methods as theoretical and empirical have been employed to determine trade areas of market centers. The linkage of market centers to other places outside the market centers' limit is determined in the location size and space point of view. Every market center has its own area bounded and determined by economic and social bonds. The above various factors play an important role in determining the size of trade area. The demarcations, identification and analysis of the trade areas of market centers are concerned. The studies are necessary to understand the spatial organization of land and it is epicenter of geography. To delimit the trade area is a difficult and complex exercise.In India Geographers and scholars are Ghosal (1972) made a general study of service area. Shirvastava and Gupta (1977) considered a study of the trader area of the periodic market of Kanpur. Saxena (1975) made a study of a more generalized theoretical trade area by drawing population circles in his studies on Rajasthan. The study of service area of lower Ganga-Ghagara Doab has been done by Rama and Srivastava. The method "Breaking Point Equation" has been used by Dixit (1988) to delimit the service area for higher order markets. He demarcates the trade area boundaries of the market centers of Hamirpur district of Uttar Pradesh by both empirical and theoretical methods.

Objectives:

The mainobjective of the present study isto calculate the Trade Area of Market centers in Yavatmal district.



Data Base and Methodology:

The present research paper to empirical data regarding market centers have been collected through intensive field work which is supplemented by the secondary data abstracted from socio-economic review and district statistical abstracts and district census hand book. The trade area of market centers has been collected by Jackson's method

Theoretical Method of Trade area by Jackson's Method

To analyze the trade Area Jackson's method is used Its formula is given below:

$$Trade\ Area = \frac{Total\ Area}{Number\ of\ Market Centres}$$

i) Area Context

As the Areal context considered, the total area of each tahsil was divided by the total number of market centers in the same area as follows.

$$i) Trade\ Area km^2 = \frac{Area\ in\ km^2}{Number of\ Market Centres}$$

Study Area:

The Yavatmal district is located South-western part of Vidharbha and South-eastern part of Maharashtra state. The absolute location of district is $19^0$26' to $20^0$42' north latitude and $77^0$18' to $79^0$28' east longitudes. The total geographical area of district is 13584sq.km, which constitutes 4.50 percent of the total area of the Maharashtra state. The district has hot and dry climate with average annual rainfall is 970mm, as per 2011 Census, Yavatmal district has 24, 58,272 population for administrative purpose the district is divided into 16 tahsils.

Table – 1. Theoretical Trade Area of Market Centers

Name of the Tahsil	Number of Market Centers	Area per Market Centre in km^2		No. of Inhabited Villages per Market center		Population per Market Centre	
Ner	20	33.50	XV	4.70	16	5538.10	15
Babulgaon	17	33.29	XVI	6.24	15	5244.29	16
Kalamb	16	44.50	XIV	7.87	13	5989.37	14
Yavatmal	14	80.78	IX	9.07	10	23997.64	6
Darwha	18	49.06	XII	7.28	14	9637.77	12
Digras	05	118.80	VI	15.40	7	26985.60	4
Pusad	11	109.96	VII	16.09	5	25950.72	5
Umarkhed	08	154.22	IV	15.63	6	27852.25	3
Mahagaon	13	67.92	XI	8.54	11	12171.53	10
Arni	05	168.80	III	21.00	4	27972.20	2
Ghatanji	11	92.17	VIII	9.55	9	11383.09	11
Kelapur	10	80.20	X	12.40	8	14090.70	9
Ralegaon	13	46.92	XIII	8.46	12	8064.00	13
Maregaon	04	152.50	V	23.75	3	18719.75	7
Zari-Jamani	04	178.25	II	26.00	2	18059.75	8
Wani	04	220.40	I	34.75	1	48428.25	1
Region	**173**	**101.95**		**14.17**		**18130.31**	

Source: - *Compiled by Researcher.*

Discussion

The number of market centers not gives clear idea to analyze therefore attempt is made here to present area per market centers on the basis of mean and standard Deviation. The tahsils of Yavatmal districts are divided into four categories i.e. Tahsil of lowest, low, high, &highest area per market centers km^2

Tahsil of Lowest Area per Km^2

The tahsils having Area per market centers km^2above mean plus 2 standard deviation are included in this category The table indicates that there are tahsils in Yavatmal district which having lowest areas per km^2 they areKalamb, Babulgaon, &Nertahsils

Tahsil of Low Area per Km^2

The tahsils having Area per market centers km^2above mean to mean plus 1 standard deviation are included in this category The table indicates that there are tahsils in Yavatmal district which having low areas per km^2 they are Maregaon, Digras, Pusad&Umerkhedtahsils

Tahsil of high Area per Km^2

The tahsils having Area per market centers km^2above mean minus 1 standard deviation are included in this category The table indicates that there are tahsils in Yavatmal district which having high areas per km^2 they are Ralegaon, Kelapur, Ghatanji, Yavatmal, Dharwha&Mahagaontahsils

Tahsil of highest Area per Km^2

The tahsils having Area per market centers km^2below mean minus 2 standard deviation are included in this category.The table indicates that there are tahsils in Yavatmal district which having highest areas per km^2 they are Wani, ZariJamni, &Arnitahsils

Conclusion:

The highest number of market centers are twenty in Nertahsil, whereas the lowest number of market centers are only four in Maregoan, Zari-Jamni and Wanitahsil. Lowest areas per km^2 they are Kalamb, Babulgaon, &Nertahsilsmainly due to their location in Painganga basin leads to high agricultural productivity, development of transportation.Highest areas per km^2 they are Wani, ZariJamni, &Arniis a result of rugged topography and forested area.

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Tahsilwise Percentage of Area under Irrigation to Gross Cropped Area in Yeotmal District

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Abstract

The region is monotonously underlain by Deccan Trap basaltic lava flows and on account of weathering gave rise to undulating topography. Most of the part is occupied by plateau and drained by Vardha River with its right and left bank tributaries. As the region comes under rain shadow area, rainfall throughout the year is scanty and distribution both spatial and temporal is not uniform. In order to face this problem and to solve the problem of irrigation to some extent minor and medium irrigation projects have to be undertaken constructed

Key Words:-Rainfall ,Weather ,Minor and Medium irrigation projects.

Introduction

Man is most active element in the process of agricultural development, particularly in technological field i.e. irrigation, HYV seed etc. Natural resources like soil, water etc. cannot develop by themselves. Natural resources get modified based on the need of the population. Population growth and literacy are responsible for bringing changes in agriculture. This exists best in each other company. Hunger make men willing to work and new ideas give them incentive for action. The physical attributes of an area become resources, only when its people are able to use them. Whether to accept and apply irrigation methods to develop agriculture is decision making factor of the man, who practices agriculture. There is close relationship between population and landuse. The huge concentration of population in rural area in India, confirms deep rooted relationship between people and natural resources. Overall, irrigation development depend both physical and demographic factors of the region. Because agriculture is affected by climate but ultimately it is the outcome of human effects; though man's role in irrigation has great importance.

Objective:

1) The main objective of the study is to Table and Figure analysis of Area under Irrigation.
2) Find out characteristics of Irrigation..

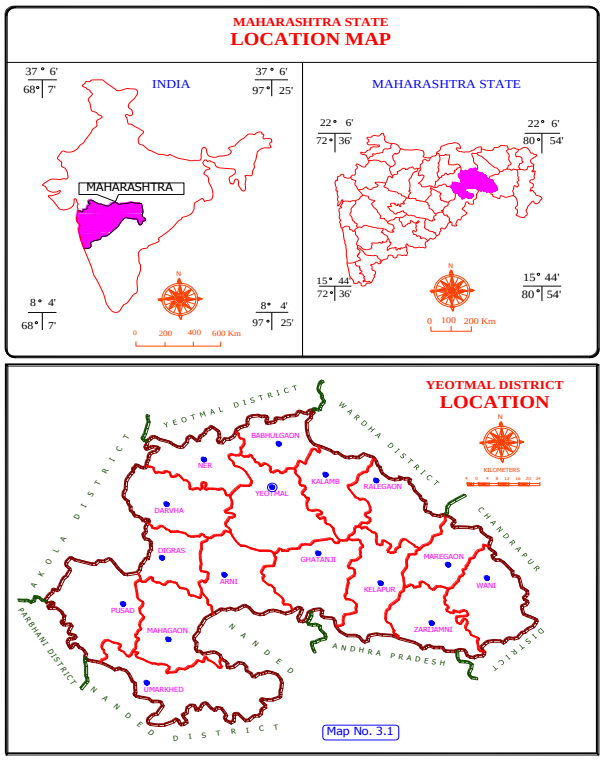
Methodology:

1) Firstly data will be collected from primary and secondary sources like special questionnaires and personal interview in 2010.
2) Use of annual socio-Economic review and District census handbook ofYeotmal District.
3) Collect the related information to from the district IrrigationDeptYeotmal.
4) AllTalukaplaces from each block have been chosen the random sample.

Study Area:

Yeotmal district is situated in the south east part of Maharashtra State; geographically it lies between $19^0 26'$ to $20^0 42'$ north latitudes and $77^0 18'$ to $79^0 28'$ east longitudes. Yeotmal is one of the districts of Amravati administrative division.East- west length of the district is 192 km and north- South width is 160 km. Yeotmal District has an area of 13584 sq. km. It is 4.5% of the total area of Maharashtra State. This district is 18th in Maharashtra in respect of area. The population is 24,58,272 as per 2001 census.

For the administrative purpose the district is divided into 16 tahsils. They are Darwha, Pusad, Wani, Yeotmal, Kelapur were Digras, Ner, Babhulgaon, Mahagaon, Umarkhed, Ralegaon, Ghatanji, Maregaon andkalamb, ZariJamni and Arni.Yeotmal district is bounded on the north by Amravati and Wardha districts, on the east and south east by Chandrapur district, on the south by Andhra Pradesh state and Nanded district, on the South – West by Nanded and Higoli district and on the west

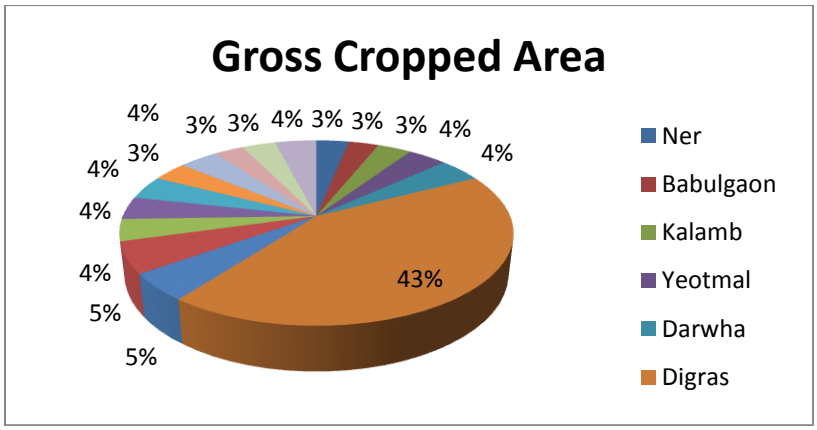


and North-West by Washim districts.

Tahsilwise Percentage of Area under Irrigation to Gross Cropped Area in Yeotmal District 2009-10

Sr. No.	Tahsil	Gross Cropped Area	Per. of Area Under Irrigation To Gross Cropped Area
1	Ner	47731	5.22
2	Babulgaon	43599	2.04
3	Kalamb	49389	4.00
4	Yeotmal	56578	6.00
5	Darwha	62297	4.32
6	Digras	637927	6.40
7	Pusad	71660	8.00
8	Umarkhed	81367	11.00
9	Mahagaon	56717	4.03
10	Arni	58479	5.00
11	Ghatanji	61033	3.00
12	Kelapur	50409	3.00
13	Ralegaon	57113	4.00
14	Maregaon	43328	2.42
15	Zari-Jamani	49026	3.14
16	Wani	60106	3.00
District Total		886819	5.00

Source: *Socio-economic Abstract Yeotmal District*



The table and Graph shows that, out of total land under irrigation, 5.25 percent land is under canal irrigation, 50.15 percent land is under well irrigation and 44.60 percent land is under other sources of irrigation. Dominance of canal irrigation is found in Mahagaon, Arni, Kelapur, and Pusadtahsils. More area under well irrigation is observed in Darwha, Pusad, and Yeotmaltahsils. shows the tahsilwise percentage of land-under irrigation to gross cropped area. reveals that out of total gross cropped area 5.00 percent land is under irrigation. Lowest area (02.04%) under irrigation is found in Babulgaontahsilwhere as highest area (11.00%) under irrigation found in Umarkhedtahsil. Relatively high percentage of land under

irrigation is noticed in Pusad, Digras, Yeotmal and Umarkhedtahsils.Land under irrigation between 4 to 6 percent is found in Ner, Kalamb, Darwash, Mahagaon, Arni and Ralegaontahsils. Land under irrigation below 4

Conclusion:

Land under irrigation between 4 to 6 percent is found in Ner, Kalamb, Darwash, Mahagaon, Arni and Ralegaontahsils. Land under irrigation below 4 percent is found in all the remaining tahsils of study region.

Reference:

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Natural Resources Management and Conservation

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Abstract

The term "resource" means anything that we use from our environment to achieve our objective. Nature provides us the basic needs like food, shelter, clothes, etc. for our survival.We use air, water, soil, minerals, coal, petroleum, animals, plants etc. in our daily life. But how long these precious materials of the nature will be available for our use. The growing population, rapid industrialization and urbanization have created heavy demand on all these materials. It is feared that unless proper steps are taken to conserve them in time, we will face tremendous hardship in future. Keyword- resource, environment, industrialization, urbanization, renewable. Introduction- The earth has plenty of resources that people can use to meet their needs. The earth is a great place where both living and nonliving things can be found. People use both living and nonliving things on Earth to satisfy their needs. The materials on earth that people use are called natural resources.Natural resources are materials and components that can be found within the environment. Every man-made product is composed of natural resources. A natural resource may exist as a separate entity such as fresh water, and air, as well as a living organism such as a fish, or it may exist in an alternate form which must be processed to obtain the resource such as metal ores, oil, and most forms of energy.

Keywords:-Research, Non-Renewable, Renewable, Water and Energy.

Introduction:-

Regarding the types of resource, according to our point of view there are two types of resource. First resource is natural and second is manmade resources. Our subject matter is to deal with natural resource, it is one of the important geographical issues today. Since the last 200 years, the man has been using natural resource constantly for his day to day use and development. In the 19^{th} century, a great development in industry took place, since natural resources have been used vastly. The world population is being increased since last ten decades and it is now reached to 6 billion in number. This great population create pressure on natural resources. So it creates an adverse effect on natural resources. So that in the near future, nature resources can be limited for us. The vast use cf natural resources affects on environment, due to that, the global warming takes place. Hence it is very necessary to make conservation and management of natural resources for keeping our environment stable and shape. There are two types of natural resources:-

Non- Renewable Resources

Renewable Resources.

There are some following sub-types of natural resources such as :-

a) Food resource, b) Forest Resource, c) Water Resource, d) Mineral Resource,
e) Energy Resource.

Out of above all sub-types, we are going to study only about water resource and energy resource.

Objective:-

To study the natural Resources.

To find out methods of natural Resource Management.

Research Methodology: -

The secondary source has been used for data collection in this regard to this subject. **Conservation Of Natural Resources**

WATER:- Water is one of the life giving important part of natural resource in environment. We get the water from Hydrological cycle (water cycle). The earth is divided in to two parts mainly water (71%) and land (29%). Out of the quantity of water(71%), 3% of water is fresh and usable. Again out of 3%, 2% water is under the ice in Himalaya and 1% is in rivers, dams and under the earth.

If we study the total quantity of fresh water in the world, 70% of water is used for agriculture need, additional 25% is for industrial use and remaining only 5% fresh water is used for domestic use.This ratio, regarding the study of India, 90% of water is used for agriculture, 7% for industry and 3% for domestic use. Each person in India, use 40 litter in average. Hence it is necessary to make water conservation. For this, very important thing is that we have to stop forest cutting and it is necessary to plant more and more trees.

Energy:

Energy recharges industries and workers. It is defined by a physicist as 'the capacity to do work'. Energy is required to develop ourselves. The sun is the largest planet in solar system which provide maximum energy to the universe. However 2 billion people making constant demand for energy but we can't provide that much sufficient energy to them. Each country in the world demands energy for making development in economy, agriculture, industrial IT and house sector. From this situation, we come to the conclusion that in future until 2020, 40% of energy will be required in India. Regarding the study of 'World Resource Institute' that the average American use 24 times the energy used by an Indian.

Types Of Energy'resources:-

1. Non-Renewable Resources
2. Renewable Resources
3. Nuclear Energy Resources

1) Non-Renewable Energy:-

Fuel, Coal, Oil and Natural Gas are included in this type. The sector are used in maximum quantity in all over the world till today, and this every sector is responsible for global warming. Since last 2 decades Coal has played an important role in the development of industry But from 21st century', other resources of energy come in to light regarding industrial development. In the industry, 39% oil, 29% coal, 24% natural gas, 7% nuclear power and 7% hydropower are used.

2) Renewable Energy :-

Hydropower, Wind, Solar, Geothermal and other factors are included in it. Renewable Resource is better option to non-renewable resource. The research for renewable resource took place in 18th century by Tata Energy Company in Western Side of India (Western Ghat). There are other research companies participated in the research too and they try to produce renewable resources like Hydropower, Wind, Solar and Geothermal. The main obstacle before these research companies is a lack of economical investment.

3) Nuclear Energy :-

In 1938, German Scientist Otto and Fritz Starssman started the research on Nuclear Energy. The largest nuclear power station is in Pennsylvania, USA made in 1956. It is the largest nuclear station in the world. Dr. Homibhabha is the Father of Nuclear power development in India. India has five nuclear power stations and all of those create only 2% of total energy. These stations are established in the places like Tarapur (MH), Gujrat, Rajasthan, Tamilnadu and Uttar-Pradesh, etc. The bonds are made between India and America regarding nuclear energy. But local population of India oppose to establish new nuclear energy station, e.g. Jaitapur nuclear power station in Ratnagiri (MH).

Management Of Natural Resources :-

Water:-

A number of measures need to be taken for the better management of the world's water resource. We can provide following efforts in order to make water resource management.

1. Build some small reservoirs.
2. Small catchment dams project development.
3. Municipal waste water use for agriculture.
4. Using Drip irrigation system in agriculture.
5. Minimize the use of fertilizers, pesticides, insecticides, etc. in agriculture.
6. Minimize water pollution.
7. Not to mix polluted water into fresh water.
8. Treatment of industrial waste water before discharge.
9. Increasing ground water level.
10. Flood Management.

Energy :-

Energy management is a term which has a number of meanings but we are mainly concerned **with** the one that relates to save energy in sectors like business, domestic, industry, etc. Energy Management is important because it is the key to saving energy in our organization. It is an universal need today. We use some part of energy and the maximum part is lost. India demands too much energy in various types of industrial sectors. As in India, one tonne of Steel prediction consumes about 9.5 million Kcal energy. While it takes about 4.3 million Kcal in Italy and 4.1 million Kcal in Japan. We can provide following efforts in order to make energy management.

1. Turn off fans and bulbs when you leave the room.
2. Use of bulb and tubes prepared on lowest Watt.
3. Keep the bulb and tubes clean so that will provide proper light.

4. Switch off Television and Radio when you sleep.
5. Use of Solar systems for domestic need of Electricity.
6. Using minimum energy in industry and IT sectors.
7. Providing maximum electricity from renewable resources, h) Minimize the use of coal, oil, natural gas, etc.
8. Each industry should start co-generation project.
9. Proper use of Energy Resources.

Conclusion:-

Resources are important part of development of the country. Non-renewable resources are available in lower quantity, though these resources are used in maximum amount. If we preserve natural resources by the various efforts made by the man, the ecosystem on earth can sustain for a longer time. Hence we are required to spread the problem of natural resources in all over India and the World. So that each person will think individually about this big natural problem and bring forth proper solution.

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Case Study of Irrigation and economic Development: Shrigonda Tahsil (Ms)

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Abstract:

Shrigonda is one of the tahsils in Ahmednagar district known for its peculiar agro-climatic condition favors the economic development. According to 2011 census handbook the Shrigondatahsil supports 2, 35,706 population in 114 villages. In comparison with 2001 census net population is more than 55,000. This shows that the decadal population growth rate of the tahsil is more than 29.22%. This certainly has created tremendous pressure on land and resources in this area. The standard of living and income level of the farmers are not so sound. The young population seems mostly un-employment. On the other hand, very large proportion of wasteland (21.64%) of the total geographical area. As per 2001 census, the Shrigondatahsil total geographical area is of 1,519.80 Sq. km, percentage of cultivable area to total area is 71.36, and irrigated area to total cultivable area is 27.72, Shrigondatahsil irrigated area is 30,064.95 hectares (Govt. canals-13,785.97 hectares, Wells-16,100.67 hectares, Other-178.31 hectares), and total un-irrigated area is of 78,389.66 hectares. In this context the socio-economic development process are important and vital areas where irrigation can be instrumental in uplifting the standard of living, economic status and human dignity in rural poor. Hence, the starting point for economic development would be no other than agriculture itself.

Hypotheses:

1. Impact of irrigation on rural development due to the agricultural development.
2. Due to irrigation, changes occur in crop pattern, productivity and per capita income.
3. Due to irrigation development Visapur Dam-1927, Ghod Dam-1966, and Kukadi Left Bank Canal- 1981 area under irrigation is increase therefore socio-economic changes took place in the study area.

Study Area:

ShrigondaTahsil forms to the southern part of Ahmednagar District (18^0 27´ N to 18^0 51´ North latitudes and 74^0 23´ E to 74^0 52´ East longitudes). Total geographical area of the Tahsil is 1519.89 Sq. Km. and stand fourth largest Tahsil in Ahmednagar district. ShrigondaTahsil is situated between Pune District to the southwest and Beed District to the northeast. Parner and Nagar Tahsil to north and Karjat to southeast. Agro climatologically, ShrigondaTahsil is affected by drought prone area, average annual rainfall is 200 to 450 mm. and the rainfall is 77% in June to September, which is reflected on cropping pattern of the Tahsil. The average maximum temperature is 38.9^{0C}.

Objectives of the study:

1. To study the impact of irrigation on economic development.
2. To examine impact of irrigation on land utilization and cropping pattern.
3. To assess the socio-cultural changes in study area.
4. To study the changes in irrigation types and irrigation systems.

Methodology:

Statistical tool play important role in present research. For data analysis average, percentage, standard deviation, measures of central tendency, etc; have been used for tabulation and presentation of data. The following methods are used for study purpose.

1. Weaver's method (1954) of crop combination been used for calculating of crop combination in study area. Following formula is used for this

$$\partial = \frac{\sqrt{\sum d^2}}{n}$$

∂ = Value of crop combination, d = the difference between the actual crop percentage in a given unit and appropriate percentage in the theoretical curve, n = Number of crops in a given combination.

As Weaver's point out, the relative, not absolute value being significant, square roots not extracted so, the actual formula used as follows:

$$d = \frac{d^2}{n}$$

2. The patterns of crop diversifications in study area are calculated by Bhatia's method (1965). The modified formula used for this.

$$\text{Index of Crop Diversification} = \frac{\text{Percentage of Net Sown Area}}{\text{Number of 'n' Crops}}$$

3. The Kendall's ranking co-efficient method is used for identification and delineation of agricultural efficiency in twenty two sample villages. The agricultural efficiency calculated for the years 1990-91 and 2010-11, by formula as:

$$X = \frac{\sum R}{N}$$

Here, X = Agricultural Efficiency, ΣR = Total ranks of the region and N = No. of crops.

Data Sources:

Primary data source: The Primary data was collected by using the questionnaire and face to face interview with village people, and field survey.

Secondary data source: For this study researcher have available a variety of secondary information sources to collecting data on canal irrigation, agricultural practices, cropping pattern and many other. The researcher has made use of secondary sources such as statistical records, district socio-economic survey reports, books published on irrigation and agriculture, the records of Kukadi Canal Project, village revenue office (Talathi), Ahmednagar district census handbook, Ground water survey department, journals, internet, news papers etc.

Random Sampling Method

Thus the Khata book record has been regrouped into four lands holding size to capture the conditions of farmers, belonging to various levels (small, medium, marginal, big, etc.)

Farmer categories:

1. < 1.5 hectares – Small farmers
2. 1.6 to 3 hectares – Medium farmers
3. 3.1 to 7 hectares – Marginal farmers
4. > 7 hectares – Big farmers.

Weaver's method (1954) of crop combination:

Where'd' is the difference between the actual crop percentages in a given area unit and the appropriate percentage in the theoretical curve and 'n' is the number of crops in a given combination. So, the actual formula used as follows:

$$d = \frac{d^2}{n}$$

The theoretical curve for the standard measurement was employed as follows:

Monoculture	:	100% of the total harvested crop land in one crop.	Five crop combination	:	20% in each of two crops.
Two crop combination	:	50% in each of two crops.	Six crop combination	:	16.66% in each of two crops.
Three crop combination	:	33.33% in each of two crops.	Seven crop combination	:	14.28% in each of two crops.
Four crop combination	:	25% in each of two crops.	Eight crop combination	:	12.5% in each of two crops.

To illustrate the technique of Weaver for the delineation of crop combination an illustration can be given. From study area in which the percentage share of different crops in the gross cropped area in the year 1990-91 and in the year 2010-11. The deviation of the actual percentages from the theoretical curve is seen to be the lowest that is the combination.

Crop Combination Application and Results:

The deviation of the actual percentages from the theoretical curve seen to be the lowest for a eight crop combination in 1990-91 i.e. 362.22 and five crop combination in 2010-11 that is 50.77, This result established the identity and the number of crops in the basic combination for the tahsil as:

1990-91(Jr+Bj+Wh+Gn+Su+FV+Fd+Pl)

2010-11 (Su+Wh+Jr+Bj+Gn)

Crop Diversification

Crop combination method is applied to compute crop diversification pattern of the region and its meaning is to raise verity of crops on arable land. It shows the contemporary competition among crops for an area, scope for rotation, the effect on double cropping, and the greater numbers of crops lead to greater competition. The higher is the magnitude of diversification.

In order to identify spatial pattern of crop diversification in present study, Bhatia's method has adopted in modified formula. The crops having less than five percentages have been excluded from computation. This modified formula expresses as:

$$\text{Index of Crop Diversification} = \frac{\text{Percentage of Net Sown Area}}{\text{Number of 'n' Crops}}$$

Where 'n' crops are those which are individually occupy five or more than five percent of crop to Net Sown Area in the study area.

Table-3 shows that four crop diversification regions have been identified as:

1. Area of high crop diversification
2. Area of moderate crop diversification
3. Area of low crop diversification
4. Area of very low crop diversification

The four groups of crop diversification and, its class, magnitude, divisions and area shows in the next tale.

Agricultural Efficiency:

Agricultural efficiency is closely related to the per hectare yields, whereas the agricultural efficiency is much more than agricultural productivity and conveys a more comprehensive meaning. Agricultural productivity is the actual performance of the land in terms of per hectare yield, whereas agricultural efficiency is a ratio between the achievement in terms of agricultural production and the actual potential of the land productivity is a physical rather than a value concept and describes the changing relation between output and one of the major inputs like land, labor and capital.The measurements of production and inputs required for the production of that output is known as agricultural efficiency. In other words, it is an input output ratio. The crops have ranked in order to their yield per unit area. Then the arithmetic mean of these ranks is obtained which Kendall's called as ranking co-efficient.

$$X = \frac{\sum R}{N}$$

Here, X= Agricultural efficiency, $\sum R$ = Total ranks of the region and N= no. of crops.

The agricultural efficiency areas have been identified as:

Areas of very high efficiency: less than 5.00
Areas of high efficiency: 5.00 to 6.00
Areas of moderate efficiency: 6.00 to 7.00
Areas of low efficiency: 7.00 to 8.00
Areas of very low efficiency: more than 8.00

Impact of Irrigation on Economic Changes

The indicators of agricultural development in Shrigondatahsil are given in the table No-8. There is found changes occurred in agricultural indicators in 2010-11 in compared with 1990-91. Irrigated area, crop intensity, ratio of cash crops, livestock density, area net sown, irrigable pumps and number of labours these seven elements are used to indicate changes in agricultural development in study area. Taking above mentioned seven elements in account of 1990-91 and 2010-11, the consequently put forward ranking co-efficient. The lowest value indicates highest agricultural development and highest value indicate lowest agricultural development.To show the changes in agricultural development in study area, Kendall's (1968) ranking co-efficient method has been used. For applying this method: seven major agricultural indicators are considered. The agricultural indicators have ranked in order to percentage. Then the arithmetic mean of these ranks is obtained which Kendall's called as ranking co-efficient.

Formula is $X = \frac{\sum R}{N}$

Here, X = Agricultural development co-efficient, $\sum R$ = Total ranks of the region and N = No. of indicators.

The indicators of agricultural development:

1. Irrigated area: Percentage of net sown area to gross irrigated area.

2. Crop intensity:

$$CI = \frac{\text{Area under Double crop}}{\text{Area net sown}} X\ 100$$

3. Ratio of cash crops: percentage of cash crops to gross cropped area.

4. Livestock density: proportion of animals per thousand hectares.
5. Area net sown: percentage of net cropped area to total geographical area.
6. Irrigable pumps: percentage of total agricultural pumps to irrigable pumps.
7. Number of labours: percentage of labours to total population
The agricultural development has been identified as:
Areas of high development- less than 2.50
Areas of moderate development- 2.50 to 3.00
Areas of low development- more than 3.00

In 1990-91 Shrigondatahsil leads in moderate agricultural development. Next decked Shrigondatahsil leads in high agricultural development, because co-efficient value is less than 2.50 in 2010-11. The farmers use high yield verity seeds, modern techniques adopted so the cropping intensity is higher than other areas of district, Therefore Shrigondatahsil shows high agricultural development after irrigation. The impact of canal irrigation on economic changes in Shrigondatahsil, shows through the following indicators. Here, ten major economic indicators have used to show the changes in economic development of study area. For this, Kendall's ranking co-efficient method has been used.

The ten indicators of economic development as follows:
Number of Banks: Percentage of banks per thousand populations.
Credit co-operative societies: Percentage of credit co-operative society's per thousandpopulations.
Transport facilities: Percentage of length of roads per thousand populations.
Health facilities: Percentage of health centers per thousand populations.
Educational facilities: Percentage of schools per thousand populations.
Per capita income: Ratio of total income of area and total population of area.
Proportion in service sectors: Percentage of engaged peoples in service sectors of literate peoples to total population.
Literacy ratio: Percentage of literate peoples to total population.
Industrial ratio: Percentage of peoples engaged in industrial sector to totalpopulation.
Agricultural ratio: Percentage of peoples engaged in agricultural sector to total population.
The above ten indicators are presented information of economic development in the year 1990-91 and 2010-11 of study area in next table No-8.According to farmers opinion in Shrigondatahsil about 56.01% farmers are use capital for agricultural development from their agricultural income. Some of these use capital from other sources such as 33.59% from Bank loan and 7.10% from other sources, for agricultural growth. The figures show that 79.21% farmers send their agricultural goods at local and district level markets. Only 2.10% farmers are sending their agricultural goods at national or international markets. The farmers of Pargaon in study area send their some agricultural goods such as Grapes, Pomegranate and Lemon at abroad.

Conclusion:

The present study reveals that the positive changes occur in agricultural practices in study area. The study region has varied topography, soil and climate. Land in river valleys is fertile which resulted to cultivate Sugarcane, Fruits, Vegetables and Fodder crops beside Jowar and Bajra crop. There is also scope to separately study on Sugarcane farming, Sugar Factories, Lemon processing industries, Dairy farming, Co-operative water use societies, etc. After the overall study of the area the following conclusive points are significantly seen in the study area.

1. Due to increase in the irrigation facilities more area come under irrigation.
2. Area under cash crop is increased mainly sugarcane. Due to increase in sugarcane the three new sugarcane factories started in the study area. Due to this outgoing migration is become less.
3. After irrigation standard of living is increased.
4. Increases in number of labors and their charges. Increased in educational facilities and literacy rate.
5. Increase in expenditure on non-food items that is clothing, medicine, education, fuel, entertainment, travel, fertilizer, electricity etc.
6. Changes in house types, changes in household facilities and amenities.
7. Increased in registered motor vehicle and road length.
8. Increased in livestock and poultry
9. Increasing in attendance of the school going children. (Under the age of 4-15)
10. After irrigation the migrated population come back to his native places, and started the farming activity therefore the increase in population seen in study area.
11. Increase in number of co-operative societies, patsanthas, co-operative banks, and nationalize banks with this, number of loan holders are also increased and recovery of loans are also increased.

12. Trade and transport facilities are also increased in study area. In brief the socio-economic development took place in study area.

Suggestions:

1. As the northern part of the study area is lacking in the irrigational facilities there is wide scope to develop a co-operative lift irrigation facilities in this area. Along with the enhancement of agricultural facilities it will reduce the outgoing migration.
2. The sugar industry located in the study area is one of the major sources of employment generation. However as this industry provide seasonal employment. An attempt should be made in direction of strengthening other sources of employment.
3. Dairy industry is one of the emerging economic activities in the study area. This industry has great potential to stabilize to economic condition of the farmers. Thus the dairy industry should be strengthening.
4. As the production of the lemon is high in the study area, a food processing industry based on lemon should be established. This will provide the job opportunities and also will give more returns to the farmers.
5. During the period of rotation a considerable amount of water drains in to the Hanga River. If small check dams are constructed on the river such water can be utilized for agricultural purpose.
6. There are needs to be introduced new planning strategies to enhance the knowledge of farmers for increased crop production.

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Shivkalin Water Management

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Introduction:-

Traditionally, it has been learnt in history as the rise and fall of the dynasties after dynasties of which glories were confined to the wars and victories. Except such incidents from the history one can learn to lead the present towards the future. It is stated that history as nothing but it is a future torch In case of Chh. Shivaji Maharaj it has been learnt his valority and shrewdness in defeating and outlandishing his enemies. But most of the historians were having the same lenses of describing historical incidents like the incidents from the epics. The administration of the king does not mean to manage the enemies but to convenient his/her kingdom in all respects. Chh. Shivaji Maharaj did his best in terms of the water management which is the need of the time. It is a moderate attempt to cast a light upon his water manageme We have a great legacy of water management for example the traces of water management had been seen in the ancient India(Indus Civilization),Medieval India (Malikambar, Badshah Akbar etc.) and the bridge of water management legacy can be witnessed in the Shivkal. Shivkal consists of the era of Chh. Shivaji Maharaj, Chh.Sambhaji Maharaj, Chh. Rajaram Maharaj and Maharani Tarabai. All Shivkalin kings and Queens tried their best to manage the water but in the said paper the water management of Chh. Shivaji Maharaj is highlighted majorly. It is quoted that water is life. Unless there is water no one survives. It is the only one who can judge the importance of water who is having a farsight. Really Chh. Shivaji Maharaj was a farsighted king in history. Therefore it is necessary to bring forth the contribution of him in the water management. Shivkalin water management can be classified into two major phases particularly water management of Chh. Shivaji Maharaj as water management as a part of security and welfare of the farmers. So first of all it is imperative to take an account of the water management and security. Dr. Morwanchikar Ramchandra Srinivas, a well known historian who notified the contribution of Chh. Shivaji Maharaj's water management in his one of voluminous book. According to him it is universally acknowledged that Chh. Shivaji Maharaj as the king of masses who took the care of his subjects during the adverse state of his reign ship. On the contrary during the sorry state of the state he went on implementing the welfare policies such as where he went on seeking to build the village dams, wells, built up wells in order to preserve the water. In order to enrich the water resoirs and preserve them he went on building the water irrigations at large. Accordingly farmers should priortize the waterfed land as to preserve the water canals.Ramchandrapant's Epistolary describes the policy of water management of Chh. Shivaji Maharaj in the following extract.

To build the fort where water abundant as
to preserve the fort based water,
unless the traces of water found to break the rock into water that lasted for a long resoirs
and then to build the fort [1]

So such policy was maintained by Chh. Shivaji Maharaj in terms of managing the water.

At the outset Chh. Shivaji Maharaj took an inspiration from his Mother Jijau built up a dam near Pune. By the passage of time it a had been disappeared unfortunately. On the same ground he built up such dams in Khed and Shivapur Chh. Shivaji Maharaj had built up eight dams on the Raigad Fort where the water resoir were abundant. For example Gangasagar, Kolim, Kushavart, Elephanta, Kala,etc dams of which few were dysfunctional. Gangasagar was one of the major resoirs of the Raigad fort which was built of mine stones before the fort. At the time of Chh. Shivaj Maharaj's coronation about lacks of attendees were attending the ceremony according to the British and Portugal sources that the resoirs convenient the masses. He was a quite visionary ruler regarding the water management where as he built up the raining gauge system by the Kushavart Dam as availed before the two thousand and four hundred years by Kautilya to convenient the farming and dam building. According to his water management one can realize the modernized policies of him with which he realized the total rainfall of the year in surplus amount or deficit. Accordingly he went on building the dams within the water resoirs dimensions. According to him if there is an abundancy of rainfall causing an abundancy of crops causing to increase the income the framings causing the abundancy of the kingdoms exchequer. Therefore he wanted to empower the agro based economy. Even today the foreign and domestic tourist would visit the Raigad [2].

Water Irrigation:-

It was the heart of Chh. Shivaji Maharaj water policy. Accordingly Chh. Shivaji Maharaj developed his policy of water irrigation as he built up a scores of dams of which water had been canalized in order to supply to farming. According to him the water fed crops such as Shugarcane,Ginger,Turmuric

and vegetables should be retained of which results would be seen in the farmers income of which revenue would be collected by the state so that he went on supplying the canalized water. Those who were taking initiatives in case of building resoirs, were encouraged by giving titles and awards. On 15 February 1650 it was ordered that the custody of the water would be of the king. So that the water supplied from the dams of the Wai province directed by the king. Accordingly the water for farming purpose would be released once withen a week. According to the water release proportion, tax would be imposed for example the Banana farming should pay as per the area was concerned.[3] In fact Chh. Shivaji maharaj did a lot to a uplift the masses from the lower income to upward by enacting the various types of the welfare policies of which example is of farming development. According to the policy it was stated that those landing were not tilled where such land holders were encouraged and promoted to till the land in order to till the land the kingdom was ready to pay the compensation of which return would be taken away intact within the stipulated period. In this way he developed the farming. While imposing the tax on farming Chh. Shivaji maharaj had classified the irrigation system were 2.5 Hone(Unit)would be applied to those farming which were irrigated through the canalized water and 2.0 Hone(Unit) would be applied to those farming which were irrigated through the well lifted water.[4]

Conclusion:-

Today the whole world is thirsty and struggling to survive through the National and international agencies with which the world was trying to convince the whole world the preciousness of the water in spite of the industrial development and scientific advancement the world is not quenching the world's thirst. It is a great legacy of water preservation we people fail to introspect means leaf through the well known policies of water management found in history for example Indus valley civilization, Medieval period and post medieval period especially of Chh. Shavaji Maharaj or Shivkal Water Management.

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Covid-19 Impact on Indian Agriculture

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Introduction

The novel Coronavirus (COVID-19) pandemic has rapidly spread across the world, adversely affecting the lives and livelihoods of millions across the globe. India reported its first infection on 30 January 2020, prompting the authorities to soon initiate various measures to contain the spread of the epidemic. Given that the disease is highly contagious, the much-needed nation-wide lockdown was enforced starting 25 March 2020 in order to contain the spread of COVID-19 pandemic. During the initial few weeks, the restrictions were strict and all non-essential activities and businesses, including retail establishments, educational institutions, places of religious worship, across the country were prohibited from operating. Subsequently, these restrictions are being gradually eased in a phased manner in most parts of the country. As the restrictions imposed due to the lockdown are being lifted, it is an opportune moment to analyse the impact of COVID-19 on different sectors of the economy. A number of reports have pointed towards the possibility of contraction of Indian GDP in 2020-21. This is a worrisome indication, since a higher GDP contributes immensely towards achieving better living standards, reduced poverty as well as improvement in other socio-economic indicators. While other sectors are reported to be under significant stress, it is important to analyse the impact on agricultural and allied sectors which provide likelihood to majority of the population in India. COVID-19 pandemic has disrupted the Indian agricultural system extensively. Nevertheless, the recent quarterly GDP estimates post-COVID scenario showcase robustness and resilience in Indian agriculture, the only sector to register a positive growth of 3.4% during the financial year (FY here after) 2020–21 (Quarter 1: April 2020 to June 2020). At the same time, the immediate past quarter growth was estimated at 5.9% witnessing a decline by 2.5% point. In this context, we aim to synthesize the early evidence of the COVID-19 impact on the Indian agricultural system viz., production, marketing and consumption followed by a set of potential strategies to recover and prosper post-pandemic. Survey findings indicate that the pandemic has affected production and marketing through labour and logistical constraints, while the negative income shock restricted access to markets and increased prices of food commodities affecting the consumption pattern. The pandemic wreaked a substantial physical, social, economic and emotional havoc on all the stakeholders of Indian agricultural system. Seizing the crisis as an opportunity, the state announced a raft of measures and long-pending reforms. We propose a 10-point strategy ranging from socialsafety nets, family farming, monetizing buffer stock, staggered procurement to secondary agriculture to revive and prosper post-pandemic.

Methodology

questionnaire (enclosed in Annexure) for obtaining feedback from DDMs was designed and test checked internally. In view of restricted mobility of people owing to complete lockdown with effect from 25 March 2020 announced by Govt. of India, online survey was the only option available to solicit responses from the field. Accordingly, the online link was shared with the DDMs seeking their responses through a structured questionnaire. The questionnaire was designed in such a manner so as to assess whether the lockdown imposed due to COVID-19 pandemic had impacted the various activities in the agriculture and rural sector adversely, favourably or had no impact. Based on the responses received, a further probe was attempted to quantify the magnitude of impact on various activities in this sector, wherever possible.

Objectives

1)Agriculture and allied sector production, agriculture labour and wage rates.
2)Impact on Agriculture Production
3)Banking activities in terms of access to credit, recovery and digital transactions

Impact on Agriculture Production

The impact of lockdown imposed in the entire country owing to COVID-19 on the overall production levels in the agricultural and allied sector has been significant with overall production levels in the agriculture and allied sector declining in 47% of the sample districts. However, 19% of the districts have also reported an increase in the overall level of production in the sector and 34% of the districts have shown no change in the levels of production in the agriculture and the allied sector. Some of the reasons for decline in agricultural activities include lack of availability of labour and machines, need for social distancing, and restrictions on free movement of men and machineries.

Agriculture:

In the agriculture sub sector, most of the states have witnessed a decline in production. States like Chhattisgarh (13%) and Himachal Pradesh (15%) have witnessed a sharp decline in agriculture production.

However, some large agricultural states like Telangana (23 % increase), Punjab (5%), Rajasthan (4.4%) and Gujarat (6.7%) have actually shown an increase in agricultural production which may be attributed to the fact**re:**that rabi season had witnessed a bumper crop production and harvesting of the crops had been completed in many of the states before the onset of the pandemic and the lockdown. The pandemic and the subsequent lockdown imposed to curb its spread had a significant impact on the supply, demand and wages of Agri-labour at all-India level (Fig. 3.9). The country has also witnessed large number of migrant labourers attempting to return back to their native places. This had significantly impacted the supply of labour in some of the states. Agricultural labour supply had shown a decline in 70% of the districts covered in the survey. The labour supply had remained the same only in 17% of the districts. Labour supply had also seen an increase in 13% of the districts which may be attributed to return of migrant labour to their native places. As regards the demand for labour, at all India level, the demand for labour had increased in 43% of the districts whereas it had declined in 25% of the districts. In 32% of the districts, the demand for labour had remained the same. As far as wages were concerned, it was reported during the survey that wage rate had increased in 41% of the districts, decreased in 13% of the districts and remained the same in 46% of the districts. The dynamics of supply and demand in rural areas showed a mixed trend due to outflux of labourers from agriculturally advanced states to influx of labour in relatively backwards states. The aggregate magnitude of decline in labour supply was estimated to be about 20% percent at the all-India level whereas aggregate magnitude in increase in demand for labour was estimated to be about 6%. At all-India level, the wage rate was estimated to increase by 8.36%. This slight increase in wage rate could be attributed to the decline in supply of labour due to restricted mobility and increase in demand of labour at all India level.

Impact on Banking Activities

Banking sector carries immense importance for the livelihoods of the rural population through the provision of basic banking services such as deposits, withdrawals, credit, etc. For example, timely availability of credit through Kisan Credit Cards (KCC) to farmers in the form of working capital is a major factor determining the production of agricultural sector. Therefore, the survey attempted to capture the impact of COVID-19 and resultant lockdown on various banking services viz. KCC, term lending to agriculture sector, basic banking services, recovery and digital banking in sample districts at all India level Farmers' Access to Credit through KCC: At all-India level nearly 59% of the districts reported an adverse impact on the farmers' access to credit through KCC. Although provision of banking facilities was exempted from the restrictions imposed in the lockdown yet the adverse impact on KCC disbursement may be due to restrictions imposed on the movement of people, and fear of contracting corona virus through human contact and gathering. Several north-eastern states including Manipur, Mizoram and Sikkim had reported adverse impact in all of their sample districts. Other major states reporting higher proportion of districts affected adversely include Kerala (100%), Assam (75%), West Bengal (76%), Uttar Pradesh (75%), Bihar (73%) and Maharashtra (71%).

Access to Basic Banking Services: The access to basic banking services such as deposits, withdrawal, etc. was reported to be adversely impacted in nearly 50% of sample districts in India. One possible reason for the adverse impact on basic banking services was need for social distancing and the restrictions imposed on movement of people, thereby restricting their ability to reach banks. Some of the major states reporting higher proportion of districts being impacted adversely include Chhattisgarh (78%), Jharkhand (75%) and Maharashtra (68%).

Term Lending by Banks: The term lending by banking institutions was reported to be most adversely impacted across the different Indian states. At all-India level, nearly 89% of the sampledistricts reported adverse impact on term lending by banks. Some of the possible reasons were the restrictions imposed on movement of people during lockdown period, difficulty in undertaking field visits by bank officials for appraisal of the project, reduced repayment capabilities of households due to present challenges and postponement of new investments/projects due to prevailing economic and health uncertainties. Many smaller states/UTs, including A&N Islands, Arunachal Pradesh, Manipur, Puducherry, reported an adverse impact in all of their sample districts. The major Indian states reporting higher proportion of districts with adverse impact include Haryana (100%), Himachal Pradesh (100%), Bihar (95%), Punjab (95%), Rajasthan (95%), Maharashtra (94%) and Madhya Pradesh (91%).

Digital Banking/Digital Financial Transaction:Among various banking aspects, digital financial transaction was the only aspect reported to have been impacted favourably in nearly 63% of the sample districts. This was indicative of the fact that even people who otherwise don't prefer digital financial transactions may have transacted digitally due to restrictions imposed during the lockdown, possibly by

taking assistance from others. The major states reporting high proportion of districts with favourable impact include Kerala (92%), Punjab (91%), Rajasthan (90%), Haryana (87%) and Bihar (81%).

Conclusions

The pandemic led crisis has wreaked havoc on both the Indian and global agricultural system. A global food security crisis is in potentially looming that cannot be countered without understanding the impacts of COVID-19 on the agricultural system, especially of the developing countries. A host of food exporting nations viz., Kazakhstan, Myanmar, Russia and Vietnam have imposed cereal trade restrictions like bans, quotas and licensing (GTA, 2020) which are distorting the global food supply. Disruptions in supply and/or value chains leads to food wastage unleashing volatility in prices and having implications to food and nutritional security. For instance, Bangladesh witnessed a significant level of food wastage in perishables like milk and vegetables, and reduced consumption of nonvegetarian items like poultry products and fish – a major source of protein – owing to misinformation concerning the spread of COVID-19 (Termeer et al., 2020a). India too has witnessed a steep reduction in consumption of poultry meat for some time due to the same reason causing enormous income loss to poultry farmers. The poverty rate has increased by 9% during the lockdown period in Ethiopia, and a survey of 3107 households revealed income loss for 38% of casual labourers while 90% reported food affordability as a major concern (de Roo and de Boef, 2020). Kenya witnessed around 15% fall in crop productivity owing to disruption in extension services and increased demand for vegetables and staples due to stockpiling. The poverty rate in Kenya is likely to rise by 13% point with an estimated 3 to 3.5 million slipping from food security in the near future (Termeer et al., 2020b). Impacts of COVID-19 in Mali are abysmal. Around 70% of the households surveyed (n ¼ 1766) reported hunger with 25 to 28% not able to buy the basic food items despite the average consumer prices remaining relatively stable

On the whole, at the national level the impact of COVID-19 and the resultant lockdown had been quite harsh on agriculture and allied sector in majority of districts. Among various subsectors, rabi crops were least affected as its harvesting was on the verge of completion but allied sectors such as poultry, fisheries and pig/goat/sheep sector witnessed a drastic fall in demand due to misplaced rumours leading to declining production as well as declining farm gate prices. However, prices of agriculture inputs were estimated to be rising mainly due to disruption in supply chain and closure of shops and markets. Although banking activities were exempted from lockdown, yet basic banking services viz, loans, deposit and recovery were severely hampered in majority of the sample districts in the country. However, the silver lining was the increase in digital banking transactions in majority of the sample districts. The microfinance sector and MSME sector were the biggest casualty with disruption in more than four-fifths of the sample districts thereby seriously hampering the livelihood in the unorganised sector which provides maximum employment in the rural areas. The activities of FPOs and FCs also came to complete halt. However, these rural institutions including SHGs grabbed the opportunities provided by the situation of stitching face masks, PPEs and preparation of sanitizers thereby helping the society as also earning some income for their members. Further, FPOs in close coordination with local administration in some of the districts were quite instrumental in door to door delivery of fruits, vegetable and dry rations to the needy there by extending a helping hand to the society. These rural institutions like SHGs and FCs were also active in creation of awareness in rural areas about COVID 19 and its preventive measures.

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Microbial Importance in Agriculture: A Review

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Abstract

Agricultural microbiology is a branch of microbiology that deals with study of plant-associated microbes and plant and animal diseases. Current agricultural practices depend heavily on chemical inputs (such as fertilizers, pesticides, herbicides, etc.) which, all things being equal cause a deleterious effect on the nutritional value of farm product and health of farm workers and consumers. Excessive and indiscriminate use of those chemicals has resulted in food contamination, weed and disease resistance and negative environmental outcomes which together have a big impact on human health. So there is need to study of microbiology of soil fertility, such as microbial degradation of organic matter and soil nutrient transformations. Biofertilizers, biopesticides, bioherbicides, bioinsecticides, and lots of the opposite fungal based and viral based insecticides, obtained using microorganisms, are a number of the outcomes of Microbiology playing a key role in sustainable agriculture. This review features a wide overview of microbes mainly utilized in agriculture. Hence, the role of microorganisms in agriculture is indispensable.

Keywords: Microbiology, Sustainable agriculture, Biofertilizers, Biopesticides, Bioinsecticides.

Introduction

Microbes can make nutrients and minerals in the soil available to plants, produce hormones that spur growth, stimulate the plant immune system and trigger or dampen stress responses. In general a more diverse soil microbiome leads to fewer plant diseases and better yield. Farming can destroy soil's rhiziobiome (microbial ecosystem) by using soil amendments like fertilizer and pesticide without compensating for his or her effects. By contrast, healthy soil can increase fertility in multiple ways, including supplying nutrients like nitrogen and protecting against pests and disease, while reducing the necessity for water and other inputs. Some approaches may even allow agriculture in soils that were never considered viable. [1]The group of bacteria called rhizobia live inside the roots of legumes and fix nitrogen from the air into a biologically useful form.[1]Mycorrhizae or root fungi form a dense network of thin filaments that reach far into the soil, acting as extensions of the plant roots they live on or in. These fungi facilitate the uptake of water and a wide range of nutrients.[1]Up to 30% of the carbon fixed by plants is excreted from the roots as so-called exudates—including sugars, amino acids, flavonoids, aliphatic acids, and fatty acids—that attract and feed beneficial microbial species while repelling and killing harmful ones. By making the use of microorganisms in large quantity, numbers of biological preparations have been prepared that have the great importance in field of agriculture [2].

Roles of Microorganisms in Agriculture In modern agriculture, along with the use of hybrid seeds, high yielding varieties, chemical fertilizers, and frequent irrigations, the utilization of microbes as natural fertilizer is becoming the most trending field in era of today. [2]The unhealthy impacts and high cost of chemical fertilizers are making them unaffordable to use in agriculture. It is estimated that by The Economic Survey of India 2020-21 report stated that in FY20, the entire grain production within the country was recorded at 296.65 million tonnes—up by 11.44 million tonnes compared with 285.21 million tonnes in FY19. The government has set a target to shop for 42.74 million tonnes from the central pool in FY21; this is often 10% quite the number purchased in FY20. For FY22, the govt has set a record target for farmers to boost grain production by 2% with 307.31 million tonnes of food grains. In FY21, production was recorded at 303.34 million tonnes against a target of 301 million tonnes.[3].The agricultural productivity of soil also can be improved by microbes found within the soil.

Biofertilizers The natural fertilizers of which the most constituents live microbial inoculants including algae, fungi, bacteria alone, or together and have ability to reinforce the supply of nutrients in soil for plants [4]. They have a capability to convert the nutritionally important component present within the soil from unusable form to the usable form by their microbial activities including phosphate solubilization, nitrogen fixation, excretion of plant growth hormones, and biodegradation within the soil. The use of biofertilizers is eco-friendly, productive, easily accessible to marginal farmers, and more efficient [5]. A lot of studies have been made to exploit the use of microorganisms and their associations for the production of biofertilizers. They can be grouped as following on the idea of their function and nature.

Rhizobium The supply of N by symbiotic N2 fixation via legume-rhizobium symbiosis is that the foremost vital source of N in agro-ecosystems. This renewable and environmentally sustainable N source also ensures soil restorative agents for maintaining soil fertility and sustainable crop production. [6].

Arbuscular mycorrhizal fungi AMF, being natural root symbionts, provide essential plant inorganic nutrients to host plants, thereby improving growth and yield under unstressed and stressed regimes. The role of AMF as a bio-fertilizer can potentially strengthen plants' adaptability to changing environment. [7].

Azotobacter Azotobacter improves seed germination and has beneficiary response on Crop Growth Rate (CGR). It helps to extend nutrient availability and to revive soil fertility for better crop response. It is an important component of integrated nutrient management system due to its significant role in soil sustainability. [8].

Cyanobacteria The cyanobacteria are bestowed with ability to fix atmospheric N2, decompose the organic wastes and residues, detoxify heavy metals, pesticides, and other xenobiotic, catalyze the nutrient cycling, suppress growth of pathogenic microorganisms in soil and water, and also produce some bioactive compounds [9].

Plant growth promoting rhizobacteria Plant growth promoting rhizobacteria (PGPR) shows a crucial role within the sustainable agriculture industry. … The mechanisms of PGPR include regulating hormonal and nutritional balance, inducing resistance against plant pathogens, and solubilizing nutrients for straightforward uptake by plants. [10].

Biopesticides Biopesticides are naturally occurring compounds or agents that are obtained from animals, plants, and microorganisms such as bacteria, cyanobacteria, and microalgae and are used to control agricultural pests and pathogens. [11].

Bioinsecticides Bioinsecticides has been developed to minimize the use of synthetic insecticides by making the use of microorganisms. Because of shortest shelf life, they do not persist in environment and are also eco-friendly. For example, 200 diseases are caused by fungi in insects that can control their population [12].

Conclusion

An ideal agriculture system maintains and improved soil health; In addition, produce enough food to feed world population and food security. Sustainable agriculture approach may fulfill these aspirations of farmers at low cost. Due to high cost of chemical fertilizers and pesticides, farmers are severely affected and compel to leave these practices. Application of biological approach decreases dependency on pest and fertilizers. This method is sustainable, cost-effective, and increase crop yield.The application of microbial consortium reduced depletion of soil organic material and environment pollution. So plant growth promoting rhizobacteria offers an environmentally sustainable and cost-effective technology for increasing crop production. A number of studies have reported the effectiveness of use of microbes in agriculture such properties enable them to be applying as a potential alternative to traditional agriculture practices.

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Assessment of Soil Erosion in Warasgaon Lake Catchment Pune Maharashtra Using, Usle, GIS and Remote Sensing

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Abstract

Modelling and mapping soils for their physical and chemical properties typically involves extensive field work and laboratory analysis, which are expensive and time consuming. Digital soil mapping (DSM) relies on field work, laboratory analysis and remote sensing data, integrated with quantitative methods to map spatial patterns of soil properties at different spatial and temporal scales ,to provide up-to-date soil information .As soil salinity, texture and organic matter (OM) all play an effective and vital role in assessing topsoil characteristics and soil quality ,remote sensing can be explored as an effective method for studying these soil properties .As a consequence, it would be an advantage to be able to map soil properties from one or more datasets of satellite imagery. Based on the soil loss model, the study area was classified into five erosion classes ranging from 2 to more than 299 kg/m 2 /yr. However, these above Soil loss classes termed as erosion classes, as Very Low, Low, Medium, High and Very High.Average annual soil loss was calculated by multiplying five factors: R; the erosivity factor, K; the soil erodibility factor; LS, the topographic factor; C, cover and management factor and Support practice factor. The average soil loss predictions range between 2- 299 kg/m 2 /yr. Sub-basin wise soil loss was calculated and the study area was categorized into 7 sub-basins (Sakhari, Warasgaon,Dhamanovhal, Dhadwali, Tev,Palase and Dasave) and it was revealed that highest soil loss was observed in the sub-basins TevDhadwali and Palase respectively.

Keywords: Watershed, Mapping GIS, Remote Sensing, USLE, Soil Loss.

Introduction

Assessing the soil erosion rate is essential for the development of adequate erosion prevention measures for sustainable management of land and water resources. Geographic Information System (GIS) technologies are valuable tools in developing environmental models through their advance features of data storage, management, analysis, and display. The Remote Sensing (RS) technology has been used to provide the land use/cover information by using 3 digital image processing techniques.

RS and GIS integrated techniques do not only estimate soil loss but also provide the spatial distributions of the erosion. Especially, generating accurate erosion risk maps in GIS environment is very important to locate the areas with high erosion risks and to develop adequate erosion prevention techniques. Conducted a study where RS and GIS technologies were successfully used for land degradation and erosion mapping

General description of study area:

The area of the proposed study is the Warasgaon Lake Catchment located in the Western flanks of Sahyadri in Pune district of Maharashrta State of the western Ghat and occupies its position in upper Bhima Basin. The study area comprises medium size watershed namely Warasgaon also known as Veer BajeePasalkar Reservoir. The study area lies between the geocoordinates 18 0 21' 00" to 18 0 25'48" North latitude and 73 0 25'12'' to 73 0 37' 12" East Longitude. Warasgaon reservoir constructed on Mose River which is a major tributary of Mutha River. It is 40 K.m from west of Pune City near Warasgaon. Total catchment area is 132.64 sq.k.m. The total Gross storage of dam is 374.00 M.cu. The live storage is 364.00 M.cum and dead storage is 10.00 M.cu. The flood discharge is 1416 cusecs. The reduced level from Riverbed is 579.43 m. The total length of dam is 780 m.

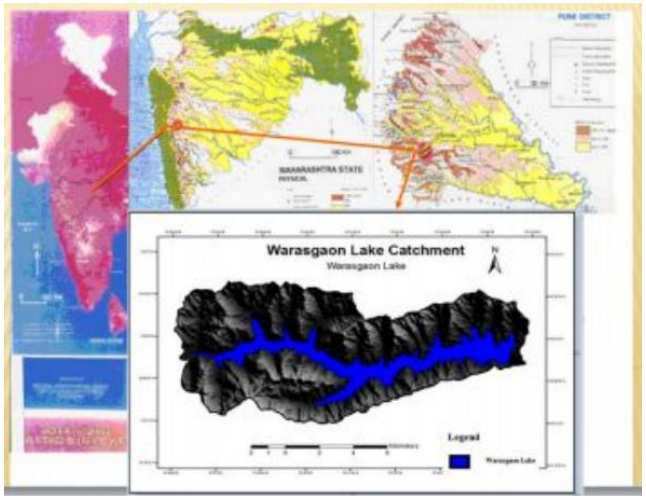

Fig 2.0 Location Map of the study Area

This dam is a typical Masonry Type. The altitude varies between 600 mtr–1080 mtr above MSL the Warasgaon Backwater Lake is about 18 k.m in length on the river Mose.

Methodology

In order to fulfil of the above research outlined, the methodology will be adopted on the following lines and can be separated in two components: first one is the field Component. This will consist of field survey. Like survey of study area with GPS and to collect the Soil samples to infer the soil properties, then infiltration measurement to determine the infiltration capacity of the area. One more important to do the ground truthing for filed check, using toposheet (Change detection). Second one is Laboratory Component. In this Base map preparation will be done using toposheet nos. 47 F/ 11 & 7 covering the study area. High resolution RS data of the entire catchment will be procured from NRSC as well as from Landsat data for delineation of watershed. Digitization of various layers will be performed using GIS software's to build a geodatabase in GIS Environment. Generation of the thematic layers: The toposheets of the watershed (47 F/ 11 & 7) in the scale of 1:50,000 were collected form Survey of India, Dehradun. The total area of Warasgaon Lake Catchment (132.64 sq.k.m)was delineated taking into consideration the contour map, drainage map .Global mapper and GIS were used for generation of various thematic layers namely contour map, drainage map, land use/land cover map and other data sets of the study area. These layers are used as input parameters in USLE. A Digital Elevation Model (DEM) represents spatial variation in altitude. The DEM (prepared from Survey of India toposheets 1:50,000 scale) was used to generate slope map. The base map of the study area has been prepared using 1:50000 scale Toposheet published by SOI. After geo-referencing the map, delineation of watershed along with subbasins have been performed.

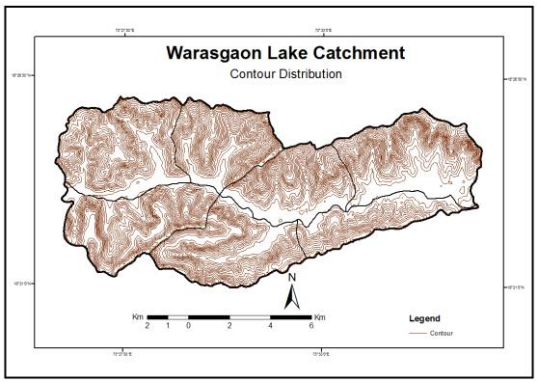

Fig 2.1Contour Map of the Study Area

A Digital Elevation Model is a raster or grid-based terrain model. Each cell in the DEM will have a value representing the elevation of the particular area.DTM/DEM is digital models of a topographic surface using Geoinformation on height, slope, aspect, breaksin slope and other relief features. The three values are important in DEM and DTM generation viz. latitude x longitude y and height z.The collection of data, analysis, evaluation, query running and interpretation of geographic information on the natural and manmade features of the terrain, combined with other relevant factors, (U. S DoD terminology).The enhancement of computer technology and the widespread use of DEM.

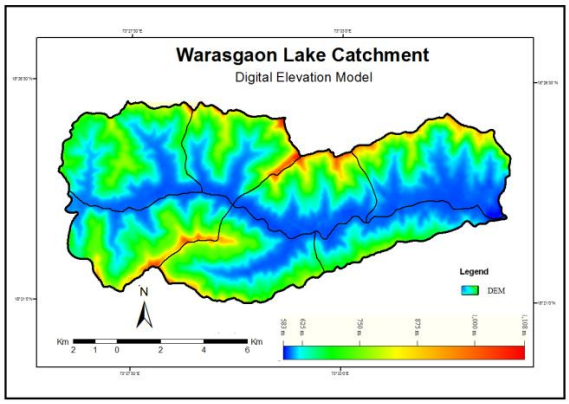

Fig 2.2 Digital Elevation Model of the Study Area

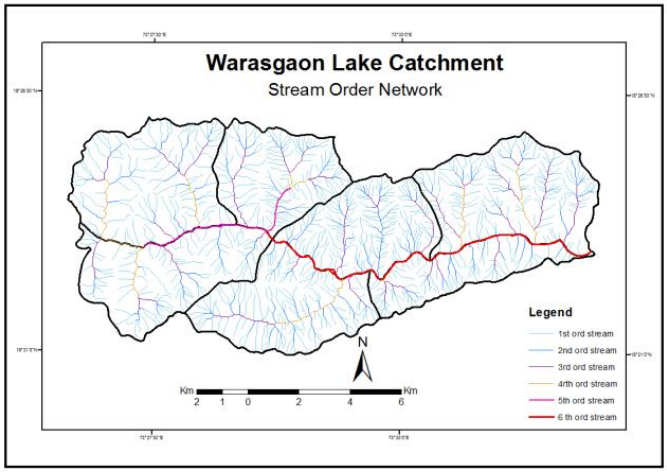

Fig 2.3 Drainage Map of the Study Area

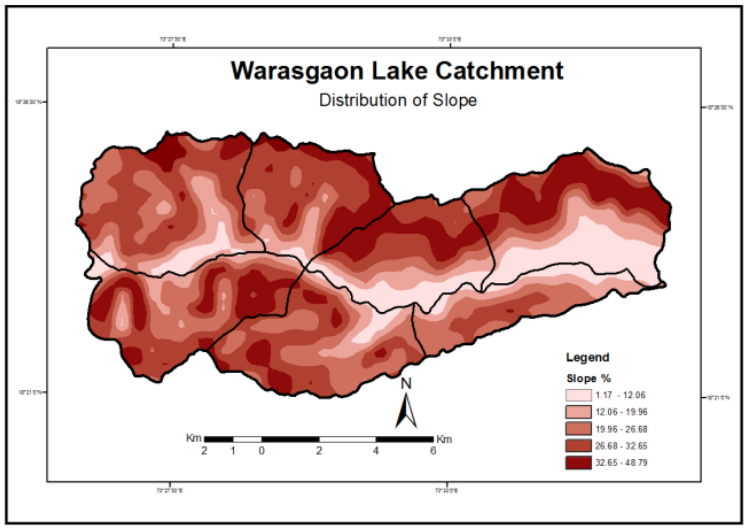

Fig 2.4 Slope Map of the Study Area

3.Soil Erosion Model USLE (Universal Soil Loss Equation):

Computation of various parameters required for USLE based on the field measurements of soil environment rates in the study area. Several researchers have adopted this equation to estimate the soil loss during the past 30 years. The USLE (Universal Soil Loss Equation) was proposed for estimating sheet and rill erosion sediments losses from cultivated fields. It predicts the long-term average annual rate of erosion on a field slope based on the parameters of rainfall pattern, soil type, topography, crop system and management practices. These factors are combined in a number of formulas in USLE, which returns a single number, the computed soil loss per unit area, equivalent to predicted erosion in kg/m2 /year. In the present study an attempt has been made to estimate the actual soil loss in Warasgaon Lake Catchment watershed area through Universal Soil Loss Equation (USLE) and applying the integrated analysis of spatial data in GIS. A= R x K x L x S x C x P ---------- (1) Where, A = Annual soil loss from sheet and rill erosion in (tons/acre/year). R = Rainfall-runoff erosivity factor, K = Soil erodibility factor, L = Slope length factor, S = Slope steepness factor, C = Cover management factor, P = Support practice factor.

Estimating (P) Support practice factor

P factor is the support practice factor in USLE equation. It throw back the effects of practices that will bring down the amount and rate of the water runoff and thus reduce the amount of erosion.

The P factor values from generated thematic map are less than 0.22 and more than 0.88. Utilizing P factor values, thematic map of P factor was prepared in ArcGIS 10.1, Data grid generated in Global Mapper 20

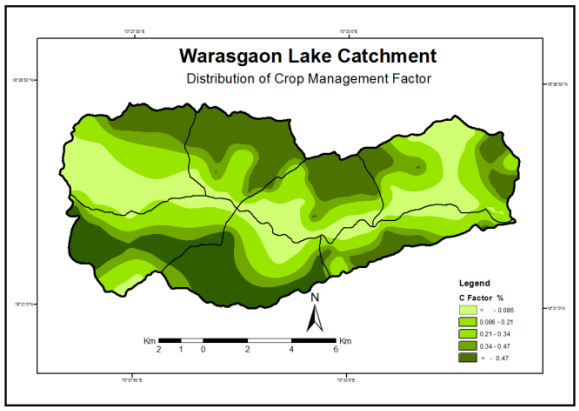

Fig 2.5 Cover and Management Factor Map of the Study Area

Table 2.1 'C' and 'P' value for estimation of C factor and P factor in soil loss equatio

Sr. No.	Land Use / Land Cover	'C' Value
1	Stony/rocky	0.0336
2	Forest	0.04
3	Built-up land	0.024
4	Cropped land	0.58
5	Fallow land	0.6
6	Water body	0.009
7	Scrub	0.55

Estimating (K) Soil Erodibility Factor

K factor is a measure of the vulnerability of soil particles to detachment and transport by rainfall and runoff. This factor concern the rate at which different soil erode due to immanent soil properties of the study area.Necessary and imperative data for estimation of soil erodibility were obtained by collecting soil samples with GPS from representative of the study area and further it is scrutinized in laboratory. Almost 184 soil sample data were used for preparation of soil mapping. The soil erodibility factor (K) for the present Warasgaon lake catchment is reckon by using the relationship between soil texture class and organic matter content as proposed by (Stewart *et al*. 1975).

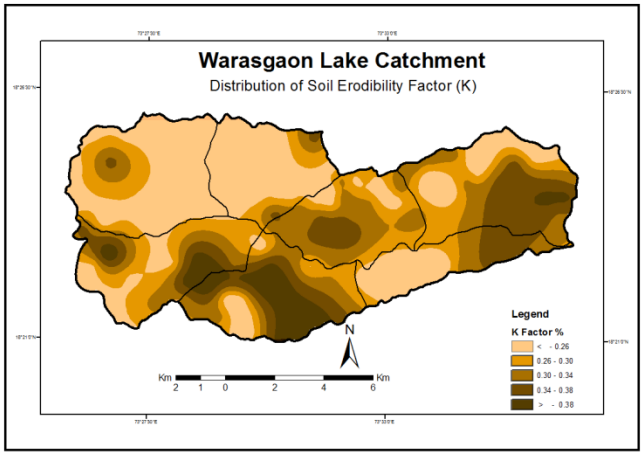

Fig 2.6 : K Erodibility Factor Map of the Study Area

	P_{om}(%)		
Textural Class	**<0.5**	**2**	**4**
Sand	0.05	0.03	0.02
Fine sand	0.16	0.14	0.10
Very fine sand	0.42	0.36	0.28
Loamy sand	0.12	0.10	0.08
Loamy fine sand	0.24	0.20	0.16

Loamy very fine sand	0.44	0.38	0.30
Sandy loam	0.27	0.24	0.19
Fine sandy loam	0.35	0.30	0.24
Very fine sandy loam	0.47	0.41	0.33
Loam	0.38	0.34	0.29
Silt loam	0.48	0.42	0.33
Silt	0.60	0.52	0.42
Sandy clay loam	0.27	0.25	0.21
Clay loam	0.28	0.25	0.21
Silty clay loam	0.37	0.32	0.26
Sandy clay	0.14	0.13	0.12
Silty clay	0.25	0.23	0.19

Table.2.3 Values of soil erodibility factor K_{fact}

Estimating (LS) Slope length and Steepness Factor

LS represent the slope length-gradient factor these two are topographical factors which effect on rate of soil erosion. In USLE, slope length factor L, and a slope steepness factor S, combines the effect in one index. Steeper slopes produce higher overland flow velocities. Steep slopes accumulate runoff from massive areas and also result in higher flow velocities. Thus, both result in increased erosion potential. A value of 1.0 applies to standard 5^0 slopes, 22m long. The appropriate values area obtained from map are less than 1.40 and more than 8.20 mtr. As the slope values expand LS value decreases. LS factor appear to be the most foremost factor in carrying out soil loss in the study area.

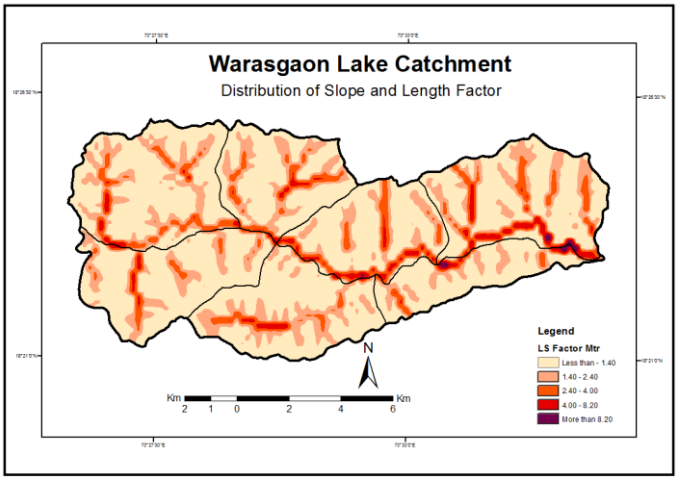

Fig 2.7 K Slope length and Steepness Factor Map of the Study Area

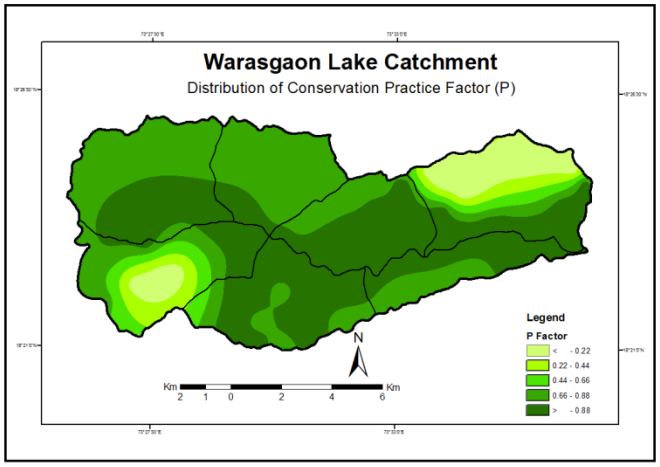

Fig 2.8 P factor

Rainfall-Runoff Erosivity (R) Factor

Most suitably called the erosivity index, it is the process of a statistic calculated from the annual summation of rainfall energy in every storm (correlates with raindrop size) time its maximum 30 - minute

intensity. The rainfall erosivity factor R factor defined as the average annual sum of individual storm.

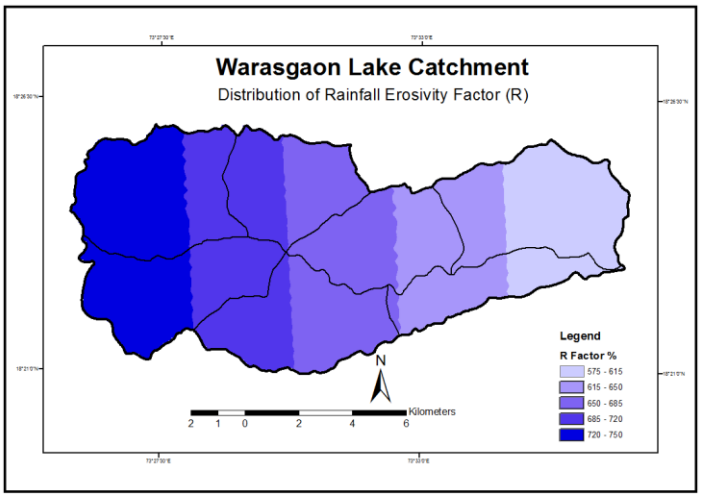

Figure 2.9 -: Rainfall Erosivity Map of the Study Area

Soil Loss Potential (Kg/m2/yr)	Area (sqkm)	% Total Area	Soil Erosion Class
2 to 28	20.07	15.13	Medium
28 to 56	48.85	36.83	High
56 to 86	39.61	29.87	Very High
86 to 140	19.48	14.69	Low
140 to 299	4.63	3.49	Very Low
Total	132.64	100	

TABLE 2.4Extent of the area under Soil Loss

Estimation Of Soil Loss.

After interpreting the thematic map of Soil Loss of Warasgaon Lake Catchment area, the whole watershed is divided into five soil loss category as very low, low, Medium, High and Very High category of Soil Loss. The vulnerability of soil loss is measured through GIS technique. After getting the raster dataset of Soil loss it is transformed in thematic map. Later this map gone through the georeferencing process again. After georeferencing the category of soil loss digitized and converted into vector polygon. The following distribution of soil loss is categorized as per their soil loss area distributed in whole Warasgaon Lake Catchment.

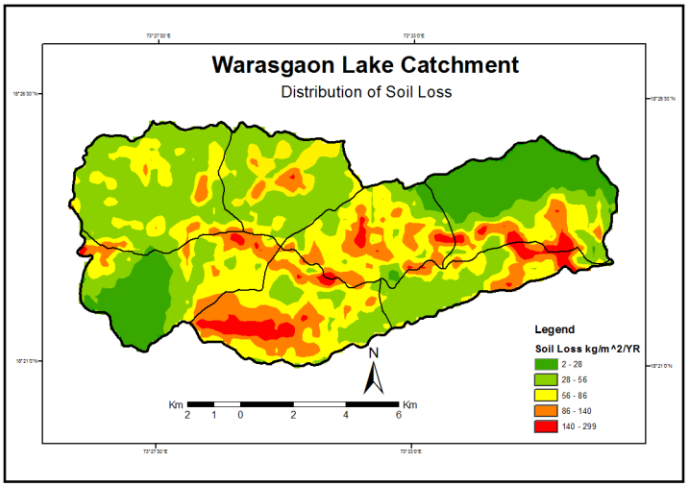

Fig 2.10 Average Annual Soil Loss map of Study Area.

Soil Loss							
Name of subwatershed	**Total area in sqkm**	**2 to 28**	**28 to 56**	**56 to 86**	**86 to 140**	**140 to 299**	
Sakhrisubwatershed	20.065	7.14	4.97	5.3	2.42	0.24	20.065
Dasave	16.427	Nil	10.48	4.88	1.03	0.04	16.427
Palase	16.866	0.78	3.03	8.1	4.35	0.6	16.866
Warasgaon	23.428	12.14	4.48	3.71	2.26	0.84	23.428
Tev	19.907	Nil	3.26	8.23	6.33	2.08	19.907
Dhadwali	11.779	Nil	5.91	2.96	2.08	0.83	11.779
Dhamanvohal	24.169	Nil	16.721	6.439	1.008	Nil	24.168
	132.64	**20.07**	**48.85**	**39.61**	**19.48**	**4.63**	**132.64**

Table No.2.5 Extent of the area under Soil Loss

Summary and Conclusions:

A detail methodology for land degradation has designed applying GIS & Remote sensing techniques which may focus the basis for land resource management. In the present study, the database has been generated through the intensive fieldworks (Primary data) for soil samples collection and field observation of infiltration rates measurements, observation, ground truthing of LULC classes etc. Total 184 soil samples were collected according to different slope units. Infiltration rate at 184 sites, respectively for the total study area. GPS has been used for soil survey in the field which has helped in locating the sample and observation sites on map. Base Map has been used for this purpose using toposheets. Other data like toposheets, has been taken from C-DAC Pune. Geology data from Irrigation department Pune. Climate data international grid, For remote sensing data, has been collected from C-DAC and online source like Bhuvan. Laboratory work has been carried out for soil analysis, further mapping and related GIS work carried out in the GIS LAB. After competing Map work the interpretation of the same was done .The present work has been carried out using GIS and RS Technology. Which is very effective and useful in assessment and evaluation of land resource management of warasgaon lake catchment.Average annual soil loss was calculated by multiplying five factors: R; the erosivity factor, K; the soil erodibility factor; LS, the topographic factor; C, cover and management factor and P; support practice factor. The average soil loss predictions range between 2- 299 kg/m2 /yr. Sub-basin wise soil loss was calculated and the study area was categorized into 7 sub-basins (Sakhari, Warasgaon,Dhamanovhal, Dhadwali, Tev,Palase and Dasave) and it was revealed that highest soil loss was observed in the sub-basins TevDhadwali and Palase respectively Based on the soil loss model, the study area was classified into five erosion classes ranging from 2 to more than 299 kg/m2 /yr. However, these above Soil loss classes termed as Erosion classes, as Very Low, Low, Medium, High and Very High.

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Difficulties of Students in the Study of Abstract Algebra

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Abstract

In the study of abstract algebra which required to apply and to combine many mathematical concepts and capabilities in addition to making decision. However, students were suggested to have difficulties in abstract algebra. The point of interest of this take a look at is to discuss the important mathematics skills and cognitive competencies in getting to know that brought about the problems in issues among college students from college students' factor of view. The observed changed into accomplished on three focused institution samples that were selected via functional sampling. A combined qualitative and quantitative approach is used as a way to have clearer understanding. Apart from the questionnaire given, centered institution interviews had been carried out. Interviews had been recorded and transcribed. Information locating becomes analyzed descriptively. Data findings confirmed that respondents lacked in many mathematicalskills together with number-fact, visual-spatial and information skills. Records skill changed into the maximum essential. The deficiency of those mathematics skills and additionally of cognitive capabilities in mastering inhibits the problem-solving in abstract algebra. This understanding on how the deficits motivated the study of difficulties in abstract algebra is expected to provide effective guide strains in preparing diagnostic contraptions and studying modules so that you can increase the mathematics skills.

Keywords: Difficulties, Problem solving, Mathematics skills.

Introduction

"Problems in abstract algebra are reality hard. I did now not know the way to do it. That's why i did no longer end it. I don't likeAbstract Algebra". If teaching and learning manner isn't similarly powerful for all college students, the difficulties in obtainingMathematics skills via the students could get worsen. Knowledge of college students difficulties in mathematics skills wished in problem solving is one of the manners to help this group of college students.The abilities of students are divided into three domains; i) knowledge; ii) application and iii) reasoning. This statement confirmed that, students did now not completely obtain arithmetic abilities wished particularly in problem-solving. This finding ought to now not be taken lightly. One of the principal aspects in arithmetic curriculum is to provide useful individual's abilities to accumulate trouble solving and making choice. If the problems in many obtaining mathematical capabilities involved can be addressed, better programmes may be prepared to assist the ones college students who're struggling with abstract algebra.Student's perspective on the problems confronted is probably a guiding principle in preparing diagnostics tool and explicit programmes in an effort to help this group of college students. Information of the difficulties confronted amongst college students is vital in getting ready meaningful modules and programmes. Interest on unique mathematics abilities would possibly cause greater meaningful teaching and mastering technique. However, studies on problem-solving that have been inter-related to the mathematics abilities are still insufficient despite the fact that the expertise of the mathematics abilities involved inside the problem solving difficulties is crucial.

Rationale of the study

Problem-solving is classified into components as how the problems are delivered-linguistic (using phrases) or nonlinguistic (the use of picture or problem based totally) and the illumination of the problem shape – information, objective and movement-plan. Thethree section problem solving system changed into tailored for the observation. This three section problem solving method consists of;

i) reading and understanding problem.
ii) organizing strategy and solving problem.
iii) confirmation of the solution.

Each section involved a one-of-a-kind mixture of mathematical competencies and special cognitive competencies. On this look at, cognitive skills of mastering have been restricted to the capacity to focus, to make perceptions, to apply common sense, to memorize and to don't forget. The skills to provide precise concentration, to make meaningful perceptions, to think logically and to apply reminiscence successfully are crucial factors in studying competencies and solving problems. Those skills range among students. Cognitive and psychological factors may want to affectthe potential to use abilities and wondering in problem-solving. The students would possibly skilled difficulties in thinking and learning after they verified difficulty in giving interest, describing orientation of form and space, making perception by means

of visual and auditory, memorizing simple things and know-how language. As a result, students would possibly struggle in exceptional levels within the system of trouble-solving. In keeping with Goldin (1998), help structures consisting of verbal-syntax, imaging, arithmetic notation, making plans, organizing & controlling and affective structures are critical aspects in problem solving. Any interference in the systems may bring about problems in problem solving.Loss of many mathematics skills caused problems in problem solving. Students are required to use and combine many mathematical concepts and capabilities during the process of making selection and problem-fixing. The deficiency in visual-spatial talent might reason trouble in differentiating, relating and organizinginformation meaningfully. But, the lacked of mathematics skills among college students are various. This take a look at seemed into five types of mathematics skills.

i) Number fact skill (talent of quantity information, tables and mathematics main);
ii) Arithmetic skill (accuracy and logarithm in computational and mathematical operating-manner);
iii) Information skill (know-how to connect statistics to an idea, operational, and experience as properly the information to switch statistics and transform problems into mathematical sentence);
iv) Language skill (proficiency of terms and relevance of mathematical records)
v) Visible-spatial skill (abilities to visualize mathematical concepts; manage geometrical shape and area meaningfully).Incomplete mastery of variety statistics, weakness in computational, incapability to attach conceptual aspects of math, inefficiency to transfer knowledge, difficulty to make meaningful connection amongst facts, incompetency to transform data mathematically, incomplete mastery of mathematical phrases, incomplete understanding of mathematical language and difficulty in realize and visualizing mathematical idea might bring about difficulties. These should cause making numerous mistakes and confusion in the method of problem-solving. Conceptual know-how and procedural know-how are vital to skills in problem solving (Geary 2004). These abilities must be supported by means of cognitive structures that manage consciousness and interference in records processing. A side from that, language and visual-spatial abilities are also important to interpret and to manipulate statistics correctly within the operating memory. This will impact the diploma of difficulties despite pedagogical, affective, body structure and psychosocial elements. Theoretically, primarily based on lacked in arithmetic talents that might brought about difficulties in mathematics mainly in problem-solving might be due to interference in cognitive skills.

Objectives

The objectives of this study are as follows:

i) To studyimportant components of skills that might have an effect on college students'problems in difficulties in the study of abstract algebra.
ii) To deficits of the abilities in arithmetic and cognitive elements of getting to know influence the students problems in arithmetic study of abstract algebra.

Methodology

The take a look at was completed using a combination of qualitative and quantitative techniques to benefit clear information of college students' problems in arithmetic study as well as to triangulate findings. Three grade college faculties (urban, sub-urban and rural) located in India had been chosen using functional samplings. In each college, college students from an average magnificence may be selected by using the counsellor. Some of 105 students aged 20 years antique have been decided on for the look at. In each college, tailored questionnaires encompass three segments: a) on demography; b) related to mathematics skills; and c) related to cognitive ability of learning changed into given out to students.Subjects concerned were constrained on numbers. It is followed by means of 45 minutes targeted group interview the use of a tailored interview protocol. Each interview became recorded and transcribed. Objects and assemble measured within the questionnaires turned into proven the usage of rasch version. Later the reliability of the questionnaires used was showed.Quantitative statistics become analyzed descriptively the usage of possibilities and qualitative data was analyzed descriptively the use of coding.

Analysis and Data Analysis

The following table 1 shows the evaluation of the contributors. Common, the percentages of under common students in sub-city and rural colleges are better as compared to city colleges. This phenomenon may because of the difference in surroundings and circle of relatives returned floor that could affect the cognitive and affective improvement. The psychosocial aspect may want to influence the difficulties faced amongst students. Furthermore the distinction inside the maturity of the scholars should motive variant in the problems confronted amongst students in mathematics. Mathematical problems may want to become cumulative within a time body if no longer nicely supervised.Early information and identity of the difficulties is important for any intervention to be advanced.

Group of Participant	Colleges	College Type	Students	Below Average
G1	C1	Rural	35	64%
G2	C2	Sub-Urban	35	56%
G3	C3	Urban	35	47%

Table 1: Evaluation of Contributors

What are the most important components of skills that might have an effect on college students' problems in difficulties in the study of abstract algebra?

As seen within the findings, mathematics abilities' problems were acknowledged among respondents (Table 2).The arithmetic abilities among respondents showed loss of records competencies. For college 1 (G1), college 2 (G2) and college 3 (G3), less than 40% of the respondents had all the sub-abilities in information competencies including making connections, manipulating data, mentioning mathematical sentence and determining method to be used. Manipulating facts and stating mathematical sentence had been located to be the primary sub talent of facts skill that stimulated the problems in problem-solving.Any other essential talent was visual-spatial talent. All businesses appear to be lacked in form orientation. Building a connection between problem and diagram also a mission to the respondents, particularly to the ones in sub-urban and rural college. Consistent with Garderen (2006), deficiency in visible-spatial talent may reason trouble in differentiating, pertaining to and organizing information. For language skill, respondents in number one faculty lacked in information the phrases while, respondent in college lacked in understanding the mathematical language. Those lacking caused barriers in know-how the goal of the problem that affected the potential to solve the trouble. Consistent with Geary (2004), language and visible-spatial skills help to interpret and control records efficaciously in the working memory.

Skills	Respondent	Students skills in %		
		G1	G2	G3
Number fact skill	Concept	53.8	55.4	46.9
	Basic operations	42.3	49.5	38.6
	Construction of tables	42.5	29.9	33.8
	Basic knowledge	62.6	82.5	58.3
Arithmetic skill	Working	33.2	38.9	36.7
	Accuracy	33.5	25.4	30.8
	Algorithm	54.1	27.6	50.2
	Procedure	55.3	52.7	28.1
Information skill	Making connection	19.9	18.2	30.4
	Manipulating information	30.3	18.7	22.4
	Mathematical sentence	15.5	24.0	42.7
	Determination of formula	40.8	30.6	25.1
Language skill	Terms	46.2	30.3	47.6
	Language	37.9	25.9	28.8
	Number value	66.2	45.4	52.2
	Objective	47.1	23.9	35.7
Visual-spatial skill	Arrangement	78.3	83.0	62.4
	Orientation	42.6	29.7	33.3
	Application	42.6	30.1	34.5
	Problem connection	49.9	29.9	29.9

Table 2: Respondents Mathematical skills

The main sub abilities in arithmetic skill which precipitated the difficulties faced among respondents in arithmetic are showing the operating–system systematically and making sure the accuracy of the operating manner. In addition, range facts skills regarding principles, simple operational and fluency of tables have been more problematic to number one respondents compared to secondary respondents even though there has been nevertheless some of secondary respondents who still did now not collect the fluency in reciting tables. Moreover, students who were valuable in conceptual understanding have been observed to lack in arithmetic and procedural talents. Thus, there might be interplay among these types of abilities.The primary cognitive capabilities of studying that could reason respondents' difficulties in mathematics was the potential to memorize and don't forget the data which is associated with making connection of their questioning. Table four indicates that memorizing and recalling wide variety statistics and manner, in addition to making perceptions triggered problems to majority of the respondents The deficits could bring

about the problem of statistics talent greater that 50% from every organization had troubles on this location. Respondent would possibly face problems in retrieving the data concerned as well as to take into account the beyond getting to know studies. As a result they could not convey that means into the problem. Zahrah et al. (2003) had observed that scholars have fundamental difficulty in retrieving standards, formulation, records and technique at some point of problem. Desk four also indicates that the potential to provide attention had been no longer as true as the ability using logic. It turned intocrucial to the respondents. They might have many things to consider rather than getting to know. The awareness at the psychosocial and socioeconomic wishes in life and the have an effect on of environment would possibly affect their attention ongaining knowledge of. But, respondent have been observed that allows you to use their logic wondering. This improvement may partner with the maturity in cognitive development. Even though on the age, youngsters need to already achieve the formaloperational phase but there may be version according to the cognitive maturity of the students.

Learning Aspects	**Student skills in %**		
	G1	**G2**	**G3**
Concentration ability	49.1	35.2	39.2
Logical thinking ability	76.7	61.4	72.9
Memorize ability	49.7	32.3	34.7
Recall ability	45.5	25.7	27.4
Don't forgetting ability	42.2	22.5	25.0

Table 3: Respondent cognitive skills of study

The findings will be used in the making plans of method to train this group of students greater correctly. Coaching arithmetic ideas and capabilities the use of contextual technique with good judgment can be adapted for this organization of college students but further studies is vital.

How do the deficits of the abilities in arithmetic and cognitive elements of getting to know influence the scholars' problems in arithmetic study of abstract algebra?

Within the method of problem solving, college students had to undergo three-hierarchy phase of trouble-solving. However, many students had did not carry out the obligations of the primary section that is analyzing and expertise trouble. Respondenthad showed problems in this challenge.Gs1: "…We always make mistakes in coping with the facts in the questions…we don't understand which truth to apply first….We are not sure how to make connection… which fact and formula to use...What truth to look for….In fact we got so burdened on a way to solve the problem..."Other than know-how the troubles, other difficulties faced via respondents had been making choice on how to clear up the troubles. Often, when the respondents had understood the troubles, they nonetheless could not remedy the problems. They faced issue in making connection of the troubles. This problem may because of the deficits in quantity truth talent and information talent. Connection among statistics and records, records and formulas can bemisguided. Records switch into the objective of the problem can be deceptive. Furthermore, lack in those abilities would possiblycause incompatible planning. Planning on how to execute the solving was hard and wrong. Those create mistakes and confusion in the manner of study of abstract algebra.G2: "….I were given confused with the questions, instructor. ….What does the question need, what concept to use…the way to answer the query…"Theycould not convey which means to the trouble or would possibly misunderstand the meaning. The false impression induced uncertainty to what have to they do with the problems. Which statistics become intended for use? What turned into the tale in the back of the problem? All this questions of their mind triggered them confusion that might lead to mistakes.The cause why students misunderstood problem should vary among college students. As the respondent mentioned;G3: "...I've problem to understand the language inside the query...So for me information the problem takes time…"In abstract algebra, language abilities and visible spatial skills were important inside the system of information issues. Giving which means to the problems was important in an effort to understand the objective to accomplish. In any other word, many of the respondents believed that arithmetic hassle-solving was tough, tedious, needed quite a few understanding, running methods and time which create the obstacles of their mathematics performance and the problems they faced. However in real, the boundaries were not the arithmetic problems but the deficits of most of these arithmetic skills in the students that brought about the problems. If students should master the talents needed, arithmeticIssues might not be the trouble any greater. Therefore, prognosis to the competencies involved is a way to assist students to recognize their weak spot and attempt to conquer it. But analysis primarily based only on perceptions is not enough.Diagnosis primarily based on performance ought to additionally be finished for a more complete prognosis.

Conclusion

This concludes that students faced problems in abstract algebra problem solving because of incompetency in obtaining many mathematical skills and lacking in cognitive talents of learning. Data ability changed into determined to be the most vital arithmetic abilities. Although college students obtained other arithmetic abilities, without the transfer of information ability, they could not recognize and make powerful connection of the records inside the problems.Generally, the majority of the student did not acquire this ability completely. Cognitive abilities in getting to know including the potential to take into account, memorize and understand have an impact on the performance of problem-solving. Difficulty in abstract algebra skills experienced by students is a task for students to triumph over. In adequate language talent, records ability and in mastery of quantity reality ability inhibits the performance of study of abstract algebra. These lacking, result in uncertainty, confusion and inaccuracy inside the selection making and making connection amongst data. Furthermore, information does not forget, became observed to be difficult for the duration of making significant connection within the troubles and will have an impact on the efficiency of every segment in problem-solving. The information of the difficulties faced via students in any particular area and section is the approach to reply to this problem. Primarily based on the understandings, it may provide a guide line for teachers as well as researchers to plot better strategies and effective teaching strategies. Development of diagnostic devices, modules and procedures had been crucial to help the scholars for you to result in extra meaningful teaching and getting to know method. The knowledge of the issue, information, competencies and dedication of teachers are keys in helping this organization of students' fulfillment presently as well as in future.

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Measuring Residents' Attitude for Tourism Development at Nagaon Beach of Raigad district

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Abstract

Tourism has experienced rapid growth in the past few decades. It is one of the world's most important sources of economic outcomes and employment generation. Most of the tourists centers have documented that it is an important component of life. Each of the tourist destinations has its own characteristics such as scenic beauty, biodiversity, pleasant climate, historic monument, religious importance etc. The local peoples provide facilities like accommodation, food, transport, amenities to the tourist. That is why tourists enjoy the destination. Opinion of native people is very significant to know effects of tourism on local development. So here, Nagaon beach tourist destinations (villages) of Raigad district have been selected for study purpose.

Keywords:-Beach tourism, Opinion of Local People, Rural development.

Introduction:-

In general, tourism development within a host community often has impact on the community both in positive and negative ways. These impacts have been well documented and are usually classified as economic, social and cultural impacts. Tourism is a cause for economic and changes in socio-demographic factors such as age, gender, income, length of stay, education level ethnicity. Tourism is a commercial activity and therefore tourism can create employment opportunities, foreign exchange earnings and also increases the standard of living of host people.As per the national tourism policy, tourism should be directly useful to native people. It becomes crucial to know the attitudes of native people about the effect of tourism on inclusive development of villages near tourist destinations. The attitudes of native people has been useful technique to know the impact of tourism on local population as well as it is an vital means for making policy for successful tourism development (Ap,1992). Numerous researchers like Potdar(2003), Ramotra and Potdar (2009), Konde (2015), Gadhe (2015), etc. have carried out perception-based study to identify effect of tourism on local people.The Raigad district has an enormous potential for develop the tourism industry because of geographical features likes coastal location, creeks, tidal inlets and beaches, water bodies and waterfall as well as ancient forts and religious temples Pimple (2014). There are 24 Beaches like Alibag, Mandava, Kihim, Akshi-Nagaon Kashid, Murud, Diveagar, Shrivardhan, Harihareshweretc are playing a vital role in Beach tourism(Raigad district Tourism Development Plan 2013).

Objective: -Main objective of the present work is to measure the Impact of Beach Tourism (Physical and Economic) activity at Nagaon village in Raigad district.

Study Region: -The geographical location of Nagaon village is on 18^0 26' 30" North latitude and 72^0 54' 20" East longitudes. The village is located in Alibag Tehsil. Geographical area of Nagaon village is about 280.65 hectares. Total population village is 3837. Out of these 2013 (52.5%) males and 1824 (47.5%) are females. Nagaon is situated at the state highway no – 4 and it is about 11 km far from Alibag. Alibag is a tehsil and places of district headquarter. The distance between Alibag from Mumbai and Pune is 104 Km and 149 Km respectively.

Methodology: - The study has primarily based on primary data. The examination about attitude of native people about physical and economic effect of tourism on the sample village has been accomplished by using questionnaire. About 98 local people from Nagaon village were randomly selected for study. The answer of every question was ranked on five points "Likert scale" ranging from 1 to 5. The answers are ranked like 1 for strongly disagree, 2 for disagree, 3 for undecided, 4 for agree and 5 for strongly agree. Here, it must be noted that the further analysis is based on the answers given by concerned person. The result thus obtained may be based on the assumption that the respondents give correct answers. Subsequent discussion may be useful to understand the method.

Attitude of Hosts towards the Physical and EconomicImpact of Tourism on Nagaon Village

Physical aspects are the key attraction of tourists in beach tourism. Tourism imparts itself to interaction between native people and tourists, which can be reagent for transformation in cultural and community life (Smith, 1998). The assessment of physical impact of tourism is more difficult. The quality of the environment, both natural and man-made, is essential to tourism. However, tourism's relationship is in complex with environment. It involves many activities that can have a diverse environmental effect.There are both negative and positive impacts of tourism on the local environment. The economic effect of tourism has been usually be noticed as a positive force which increases total income for the local people, direct and indirect employment and tax revenues; it also encourages secondary economic growth.

Economist consider the tourism as an „basic income" from tourism, it helps to pay for goods and services, imported from other regions and contribution to government revenues through taxes, that can be used to develop community and infrastructural facilities and service to asset in general economic development.

Table No 01:- Hosts Response to Physical and Economic Impact of Tourism at Nagaon Beach

Sr. No.	Opinion of Local People	Mean	SD
1	Increase in domestic income.	4.22	0.62
2	Increase in number of shops/ hotels	4.07	0.72
3	Homes on rent is the source of income	3.93	0.99
4	Commercial approach of local people	3.86	0.69
5	Behavior of tourists	3.80	0.82
6	Increase in price of commodities/ services	3.76	0.97
7	Opportunity for job/ business	3.68	0.87
8	Increase in demand of labourers	3.60	0.93
9	Opportunity for purchase	3.59	0.67
10	Development of basic infrastructure facilities	3.39	0.82
11	Pressure on public infrastructure	3.26	1.01
12	High population density	3.24	0.93
13	Supply of pure and optimum water	3.15	0.95
14	Pollution	3.05	1.02
15	Decrease in open space around the beach	2.94	0.80
16	Road condition	2.83	0.84
17	Need of separate parking space	2.72	0.89
18	Status of waste management	2.67	1.02
19	Increase in price of houses/ land	2.55	0.94

Source: Field Survey

The table no 01 shows that outcomes of mean and standard deviation for the opinion of the hosts people about physical and Economic impactof tourism at Nagaon. The attitude of local peoples of Nagaon village is grouped into three groups like Positive Impacts, Medium scaled impacts and Negative impacts of beach tourism on Village. The exercise about calculation of Attitude of Local people is based on perception of native people of Nagaon village.As shown in Table no 01, it is clear idea regarding the resident's attitude towards the impact (physical and Economic) of tourism on the destination. Residents of Nagaon village felt that, the positive impact such as Increase in domestic income (4.22), Increase in number of shops/ hotels (4.07), Homes on rent is the source of income (3.93), Commercial approach of local people (3.86), Behavior of tourists (3.80), Increase in price of commodities/ services(3.76).It is observed in the field inquiry that according to Opinion of Local People above mentioned aspects are favorable for tourism development at Nagaon beach all the aspect are directly and indirectly helpful to local peoples economy. It creates number of business and job opportunity to local people which directed in our tourism policy.As per the opinion of local people some medium scaled impacts of beach tourism wasobserved on Nagaon village.Increase in Opportunity for job/ business (3.68), Increase in demand of labourers (3.60), Opportunity for purchase (3.59), Development of basic infrastructure facilities (3.39), Pressure on public infrastructure (3.26), High population density (3.24), Supply of pure and optimum water (3.15), Pollution (3.05).it is observed that due to growing tourism activity opportunities for business was increased at Nagaon which is resulted in to increase in requirement of laboures in the business. It also creates Opportunity for purchase things in local market as well as responsible for the development of infrastructure required for tourism. Along with this some kind of pressure on public infrastructure at village.Medium scaled impacts are also observed on Increase in population density,Supply of pure and optimum water, Pollution is noted by natives of Nagaon.According to natives of Nagaon due to growing tourism activity on Nagaon beach it creates some of the Negative impact (physical and Economic) such as Decrease in open space around the beach (2.94), Road Condition (2.83), Need of separate parking space (2.72), Status of waste management (2.67), Increase in price of houses/ land (2.55). it is noted that Decrease in open space near the beach, Condition of Road, separate parking space and waste management is essential for tourism development.

Conclusion:

Therefore, exercise about Measuring Residents' Attitude for Tourism Developmentis based on observation of native people may be useful for future planning of tourism development. It is observed in the study that out of total 19 aspects about opinion of local people regarding the impact of tourism on Nagaon village maximum factors are favorable for tourism development. It is also noted in the study that some of the opinion of residents of Nagaon are shows the negative impact of tourism in the village. To minimize the negative impact of Beach tourism on Nagaon village Local People, Local businessperson's and local administrators should accept norms of ecotourism for sustainable tourism development.

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Agro Processing Industries: Avoided by Farmers

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Abstract:

The agriculture or farming is our traditional business. By birth, we have been seen that, the farmer is doing hard work in agriculture and at the time of selling these agricultural products in market, farmer get very less amount. We are experiencing this phenomenon from log period. But now it must be stop with the help of Agricultural Industries (Agro-processing industries). Agriculture plays a vital role for the economic development of Maharashtra as well as India. Majority i.e., 54.77% (Census, 2011) population is living in rural area of Maharashtra. For the development of rural population there is need to start Agro-Processing Industries (API). Butgenerally, it is seen that farmers are not interested in such API. They directly sell their agricultural production to various industries or in Bazar Utpanna Samiti of that particular region. The present study investigates the cause behind it with reference to Beed district of Maharashtra State (India).

Key Words: Maharashtra, Agro-processing Industries, Farmers, etc.

ntroduction

The agriculture or farming is our traditional business. By birth, we have been seen that, the farmer is doing hard work in agriculture and selling it to industry or in Bazar Utpanna Samiti of that particular region. At the time of selling these agricultural products, farmers get very less amount. We are experiencing this phenomenon from log period. But now it must be stop with the help of Agricultural Industries or Agro Processing Industries (API). Reddy and Kumari (2014) undertake the study to understand the Performance of Agro-Based Industries in IndiaThe main occupation of rural people in Maharashtra as well as India is agriculture and allied activities. Maharashtra state is thesecond largest state in population and third largest state in areaof India. It has an area of 307,713 sq. km. with 35 districts, 358 blocks and 43663 villages and a population of 61,545,411 (54.77%) out of total population112,372,972 (Census, 2011).The districts of Maharashtra are grouped into six revenue divisionsi.e., Aurangabad Division, Amravati Division, Konkan Division, Nagpur Division, Nashik Division and Pune Division. Maharashtra has typical monsoon climate, with hot, rainy and cold weather seasons. Tropical conditions prevail all over the state. Rainfall in Maharashtra differs from region to region. Rainfall particularly concentrates to the Konkan and Sahyadrian Maharashtra. Central Maharashtra receives less rainfall. However, under the influence of the Bay of Bengal, eastern Vidarbha receives good rainfall in July, August and September.The agriculture is the mainstay of the Maharashtra.Beed is district include in Aurangabad Division of Maharashtra. The total area occupied by the district is 10693 sq. km. (Out of this 158.31 sq. km. Area covered by Urban area and 10534.69 sq. km. by Rural area). The total area of Beed is about 3.45% of Maharashtra. For administrative convenience Beed district has been divided into six revenue divisions i.e., Beed, Gevrai, Ashti, Majalgaon, Ambajogai and Parli.

Rational of the study

Maharashtra's economy is predominantly agrarian. It is the main occupation of the people. Both food crops and cash crops are grown in the state. Principal crops include rice, jowar, bajra, wheat, pulses, turmeric, onions, cotton, sugarcane and several oil seeds including groundnut, sunflower and soybean. The state has huge areas, under fruit cultivation of which mangoes, bananas, grapes, and oranges are the main ones.The agro-processing industries play the important role in employment generation. Further, the increasing consumption of fruits & vegetables, milk & milk products, poultry, meat, fish and flowers due to changing lifestyle indicates substantial growth potential. This potential needs to be tapped to the greater extent for enhancing farmer's income. It's indicating that, there is huge need of agro-processing industries though the farmers are avoiding it.

The objectives of the Study

The study has been conducted in the view of following objectives:

i. To recognize the awareness of people about API.
ii. To identify the reasons that farmers are avoiding API.

Hypothesis of the Study

The present study has been directed by keeping in view that, money or finance is the main reason behind the avoidance of API by farmers.

Data Collection and Methodology

For the present research study researchers have undertaken the survey in selected Krishi Utpanna Bazar Samitee(i.e.,Beed, Ambajogai and Dharur out of six revenue divisions of Beed). The sample for the study is 150 (50 from each Krishi Utpanna Bazar Samitee)farmers (respondents) visiting to sell their

agriculture production at Krishi Utpanna Bazar Samiteewhich have been selected by purposive sampling method. By undertaking the interview, the data/responses have been collected from respondents.

Data Analysis and Interpretation

Considering the objectives of the study, the researcher has collected the responses from respondents and the same has been presented in tabular form as follows:

Agro Processing IndustriesAwareness

The economic development of any country or region is depends upon the Industries and in respect to rural area, it mostly depends upon the Agro Processing Industries (API) in that particular region. Here, researchers are interested to recognize the awareness of respondents about API. It has been presented in table 6.1.

Table 6.1Agro Processing IndustriesAwareness

Sr. No.	Krishi Utpanna Bazar Samitee	Aware	Unaware
1	Beed	38 (25.33%)	12 (8%)
2	Ambajogai	44 (29.33%)	6 (4%)
3	Dharur	36 (24%)	14 (9.33%)
Total		**118 (78.67%)**	**32 (21.33%)**

Source: Primary Data

The table 6.1 revealed that, 78.67 percent of respondents are aware about the API whereas 21.33 percent respondents are unaware. Majority, 44respondents are from AmbajogaiKrishi Utpanna Bazar Samiteefollowed by Beed (38 respondents) and Dharur (36 respondents) from GeoraiKrishi Utpanna Bazar Samitee, whereas from DharurKrishi Utpanna Bazar Samitee, majority 6 respondents are unaware about it.

Reasons that Farmers are Avoiding Agro Processing Industries

As researchers have find out that majority farmers are aware about the API with the help of table 6.1. Thought, farmers are avoiding to start the API. Here, researchers have find out some reasons from respondents which shown in table 6.2.

Table 6.2Reasons to Avoid Agro Processing Industries

Sr. No.	Reasons	Ranking Based on Responses of Respondents
1	Lack of Finance	142
2	Marketing Problem	136
3	Lack of Human Resource	125
4	Natural Calamities	120
5	Infrastructural	118
6	Management	109
7	Government Rules and Regulations	58
8	Other Reasons	16

Source: Primary Data

In table 6.2 researcher got various reasons from respondents which pull back them to start the API. Here, the main reason to avoid the API is lack of finance (142) followed by Marketing and associated problems. As, researchers have consideredhypothesis for the study that, finance is the main reason which pull back farmers to start the API, it has been accepted by considering the table 6.2. which shows the utmost ranked reason is “lack of finance”.

Conclusion

The majority farmers (respondents) are aware about the Agro Processing Industries (API). But, due to lack of finance farmers are avoiding to API.

Recommendations

In this study, researchers have found the importance of API, but due to lack of finance farmers are avoiding it. The researchers have recommended that, the financial institutions should provide assistance to farmers for Agro Processing Industries.

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The Study of Rainfall And Sugarcane Landuse In Satara District

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Abstract

The agricultural sector is boost sector of Indian economy, where big human population is directly and indirectly engaged in agriculture. Where, all farmers have cultivated various crops in three seasons of year. But, monsoon climate have provided high water through maximum rainfall to agriculture in different parts of India, therefore, Sugarcane is vital crop mainly cultivated on large area in every year. Therefore, the Satara district has taken for study which is considered as the core district of sugarcane cultivation occupies about 8.94 percent of total hectares in the Maharashtra State. This paper is an attempt to analyze the correlation between rainfall and Sugarcane Landuse in Satara District. Where, Spearman's Rank order method is applied for analyzes the correlation of between rainfall and Sugarcane Landuse and calculated r = -0.32 i.e. moderate negative or direct correlation.

Keywords: Rainfall, Sugarcane, Monsoon, Landuse, Satara.

Introduction

The climate is vital part of atmosphere which controlling the biodiversity of earth. Our India comes in monsoon type of climate and this monsoon climate is the chief source of Indian agriculture. Actually, agricultural sector is boost sector of Indian economy, where big human population is directly and indirectly engaged in agriculture. But, monsoon climate has distinct rainfall characteristics, followed irregular and concentrated distribution pattern of rainfall. Its variation and concentration have controlled the surface and sub-surface water availability, which is big water provider of agriculture for different crops. Therefore, all farmers have cultivated various crops in three seasons of year with pattern of rainfall. But, monsoon climate have provided high water through maximum rainfall to agriculture in different parts of India, therefore, Sugarcane is vital crop mainly cultivated on large area in every year. This crop is a significant commercial crop of India which balancing rural local economy.

The Satara district is placed in the western region of the Maharashtra state where, about 64653 hect. Farmland of district occupied by Sugarcane crops . Where, principle river Krishna, also, other important rivers- the Koyna, the Nira, the Man, the Tarali, the Urmodi, the Vasna, the Yerala, the Venna, the Kudali, etc. are the water source of agriculture through Koyna Dam, Dhom Dam, Mhaswad Dam, Veer Dam, Kanher Dam, Uttarmand Dam, Morana Dam, Yeralwadi Dam etc. especially for Sugarcane crop belts of district.

Study Area

The Satara district selected for the study of rainfall and Sugarcane Landuse. The study area Satara district encompasses the south-western part of Maharashtra state with its particular historical uniqueness and distinctive set of physical features. It is situated over Sahyadri Mountain ranges, locating between on $17^0 5'$ to $18^0 11'$North latitude and $73^0 33'$ to $74^0 54'$East longitude. There are numerous landforms like Krishna River, Mahadeo and Bamnoli hill ranges,Sitabai and Aagashive are some other hills in the district. Where, 30, 03,922 persons are habited according to 2011 Census. This district is covered totally 10,484.0 Sq. k.m area with its 742 m (2,434 ft) elevation from the mean sea level. This area receives 310.6 mm to 3576 mm of normal annual rainfall. Satara district has composed from eleven tahsils and 1739 villages. Eleven tehsils are Satara, Karad, Koregaon, Man, Khatav, Phaltan, Jaoli, Patan, Khandala, Wai, Mahabaleshwar.

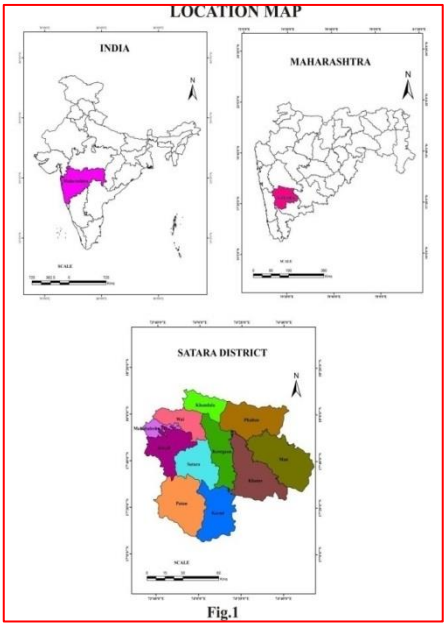

Fig.1

Objectives

The main objectives of this research paper are as under:

1. To study the spatial distribution of rainfall in the study region.
2. To study the spatial distribution of Sugarcane Landuse in the study region.
3. To examine the correlation between correlation of between rainfall and Sugarcane Landuse in the study region

Database And Methodology

The paper is primarily based on the secondary data sources. To complete the objectives data regarding rainfall and Sugarcane land use of Satara District is obtained from Socio-economic abstract (2019-20), statistical abstract of Satara District. The collected data are processed to examine the pattern of rainfall and Sugarcane land use in Satara District. Arc GIS 10.5 software applied for preparing the map and to show the spatial pattern of rainfall and Sugarcane land use in Satara District. The tahsils of Satara District are grouped into three categories i.e. high, moderate and low rainfall area on the basis of simple statistical method. To analyze spatial pattern of Sugarcane land use area, the same technique is applied for calculation. The Spearman's Rank Order method is used for analyzes the correlation between rainfall and Sugarcane land use area.

Formula:- Rank Order Spearman's Method

$$r = 1 - \sigma \Sigma d^2 / n^2 - N$$

Spatial Pattern Of Rainfall Days

The overall Sataradistrict have received rainfall about 79 days in 2019-2020. But, the tahsil level rainfall days varies from tahsil to tahsil it ranges from 49 days to 118 days. All 11 tahsils of Satara district are divided into three categories as following: (in table no. I and Fig. no. 2)

Table No. I

Rainfall Days In Satara District (2019-20)

Sr. No.	Name of Tahsils	Rainfall Days	%
1	Mahabaleshwar	118	80.1
2	Wai	78	78.9
3	Khandala	60	79.8
4	Phaltan	49	59.1
5	Man	49	27.9
6	Khatav	52	75
7	Koregaon	77	60.1
8	Satara	93	75.7
9	Jaoli	101	57.7
10	Patan	99	46.7
11	Karad	74	73.9
	Total	79	65.4

Source: Socio-Economic Abstract of Satara District (2019-20)

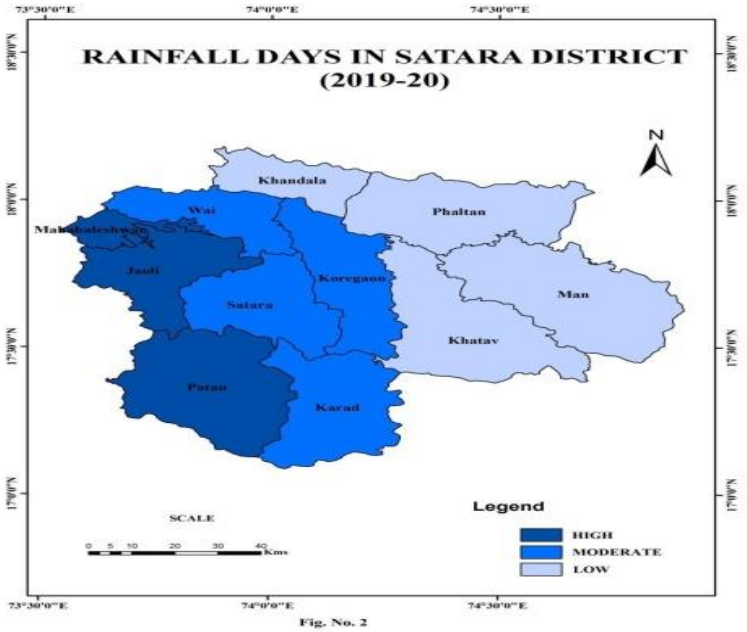

Fig. No. 2

High Rainfall Days (above 95 days)

Above 90 days rainfall received tahsils are included in high category. High rainfall days was recorded in the tahsils of Jaoli, Patan and MahabaleshwarModerate Rainfall Days (70 days to 95 days) From 70 days to 95 days rainfall are received tahsils included in this category. Moderate rainfall days was recorded in the tahsils of Satara, Koregaon, Karad, WaietcLow Rainfall Days (below 70 days) Below 70 days rainfall are received tahsils are included in low category. The Low rainfall days is found in the tahsil of Khandala, Phaltan, Khatav and Man.

Spatial Pattern Of Sugarcane Landuse

About 64653 hectare land area comes under the sugarcane landuse in 201920. But the tahsil level agricultural landuse is varies from tahsils to tahsils ranges from 328 hectare to 27504 hectare. All 11 tahsils are categorized into three groups as follows: (in table no. I and Fig. 2)

Table No. II

Sugarcane Landuse In Satara District (2019-20)

Sr. No.	Name of Tahsils	Landuse(in Hectares)	Percent
1	Mahabaleshwar	328	1.93
2	Wai	4156	9.63
3	Khandala	1331	3.34
4	Phaltan	7019	8.89
5	Man	937	1.06
6	Khatav	3015	2.75
7	Koregaon	5908	7.45
8	Satara	12765	15.14
9	Jaoli	1087	3.09
10	Patan	603	0.74
11	Karad	27504	24.43
OTAL		64653	8.40

Source: Socio-Economic Abstract of Satara District (2019-20)

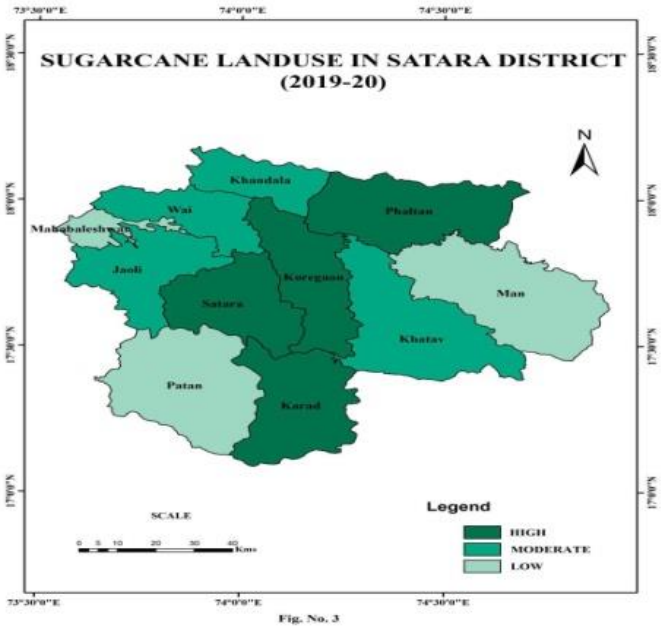

Fig. No. 3

High Sugarcane Landuse

The tahsils which have the Sugarcane landuse area above 5000 hectare are included into high category. High Sugarcane landuse area was observed in the tahsils of Karad (24.43%), Satara (15.14%), Phaltan (8.89%), and Koregaon (7.45%).

Moderate Sugarcane Landuse

The tahsils which have the Sugarcane landuse area area ranges from 1000 hectares to 5000 hectares are included in the moderate category. Moderate Sugarcane landuse area was shown in the Wai (9.63%), Khatav (2.75%), Khandala (3.34%), Jaoli (3.09%) etc. tahsils.

Low Sugarcane Landuse

The tahsils which have Sugarcane landuse area below 1000 hectares are included in this group. Low Sugarcane landuse area was observed in the tahsils of Man (1.06%), Patan (0.74%) and Mahabaleshwar (1.93%).

Correlation Between Rainfall And Sugarcane Landuse

The Spearman's Rank Order method is used for the calculation of the correlation of rainfall and sugarcane landuse in Satara District. The formula are-

$$r= 1-6(\Sigma d^2)/N(N^2 -1)$$

Table No. III

The Rainfall And Sugarcane Landuse In Satara District

Sr. No.	Name of Tahsil	Rainfall Days	Rank	Landuse (in Hectares)	Rank	d^2
1	Jaoli	101	2	1087	8	36
2	Karad	74	7	27504	1	36
3	Khandala	60	9	1331	7	4
4	Khatav	52	8	3015	6	4
5	Koregaon	77	6	5908	4	4
6	Mahabaleshwar	118	1	328	11	100
7	Man	49	11	937	9	4
8	Patan	99	3	603	10	49
9	Phaltan	49	10	7019	3	49
10	Satara	93	4	12765	2	4
11	Wai	78	5	4156	5	0

Source: Socio-Economic Abstract of Satara District (2019-20)

$r = 1-6(\Sigma d^2)/N(N^2 -1)$

Here, r = Correlation, N= Number of Observation, D= deviation

$r = 1-6*290/11 (11^2-1)$ **r = -0.32**

It is observed that there is moderate negative or direct correlation i.e. p= -0.32 between the rainfall and sugarcane landuse in Satara district. There are the some reasons-especially physiography, slope, plain area, fertile soil, climate and irrigation system for moderate negative or direct correlation in Satara district.

Conclusion

There are wide disparities in the rainfall and sugarcane landuse area of SataraDisrict. The highest the rainfall days are observed in Mahabaleshwartahsil whereas lowest in Man tahsil of Satara district. The highest Sugarcane landuse was observed in Karadtahsil and lowest in Mahabaleshwartahsil. But the correlation between the rainfall and sugarcane landuse found moderate negative or direct correlation i.e. r = 0.32. It means high rainfall days, low Sugarcane landuse. It was observed higher the rainfall days, lower the Sugarcane landuse i.e. Mahabaleshwartahsil. That tahsil has 118 rainfall days and just 328 hectares Sugarcane landuse area.

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Social Study of Rural Community in Mandangad Tahsil

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Introduction:-

MandangadTahsil is hilly and mountainous place and it remains backward in Socio-economic aspects. Rural area is constrasting to the urban area in the respects of Socio – economic development.Most of the services facilities and fundamentalneeds are not reached in the most of rural area. Therefore, the rural-urban interaction is essential for development of rural area Till today, Adiwasi (aborigine) community is deprived from education, social-cultural, political and economical development. Therefore, they have to face many problems and difficulties especially the rural people of this district. That's why these rural communities are deprived from the stream of development, and exploited. To find out some difficulties and problems of these communities and suggest some remedies for the well development, the research scholar has selected the subject entitled "Social Study Of Rural Community In Mandangad Tahsil"

Significance Of The Study:-

Mandangad Tahsil is undeveloped and it is surrounded by hilly and mountainous area. So, Mandangad Tahsil is remains very backward because maximum rural community of this district is belong to various backward castes and tribes. Many benefits or schemes of government schedule are do not reached up to the rural backward people so that they are deprived from the progress difficulties of rural undeveloped community and put them forth the government as well as to make the awareness. The research scholar has selected a subject for research entitled "Social Study of Rural Community in Mandangad Tahsil"By selecting this Topic, the main purpose of the research scholar is to present the nature of contemporary developed and undeveloped rural- urban area community and identify various difficulties of rural area. As it has been tried to mention in the entitled thesis.

Objectives:-

The main reason of sorrowfulness regarding rural & undeveloped community in Mandangad Tahsil is in their life style. Even society & government do not have tried to change the life style of this rural community within many previous years. Even they are not going to change their life style for certain economical and social development. That's why in the research work the following objectives are being considered.

To study the life style of rural and urban population in Mandangad Tahsil
Social and economical condition.

Methodology:-

The information regarding research topic is being collected through questionnaires, various report of tribal institutions, government offices, reference books associated to the subject, magazines and daily newspaper.The various statistical techniques, graphs, diagrams and maps are being used in this study where they are necessary.

Review of the Social Condition of Rural Community

Review of the Social Condition of Rural Community:

Living in any area/territory along with the valleys and mountains, speaking simple/ordinary language and has origin life style, this group of people is called Rural /aborigine. A group of families using common language, living in a particular territory, admitting about origin, and have vast ratio of illiteracy but depend on blood relationship, Keeping social and political traditions and customs as per past generations, like this same group of people is called 'Tribal castes'. I have to study about primitive Rural community so that it is very essential to think about the ancient opening social system of this community. Natural environment and cultural environment affect human professions/businesses. In an ancient social system, primitive tribes have been done primitive businesses. From millions of years, we, the human beings are living on the earth. But there is different types of natural environment therefore, there are different kinds of human activities too. That's why in different types of area/ territory, there are various kinds of life style, businesses, cultural and social conditions. In the present age, there is not much difference between developed social life style, but Rural community is facing many things that are mentioned above. Primitive Rural community has closely adjusted their life to the environment. But we can also say that since long period of time, human beings have compromise adjust with natural environment. On the Contrary, Adiwasi has done conflict with Nature by their limited energy and fulfilled fundamental needs, and till doing so. But in Maharashtra, the journey of life goes from independent/ free producer, Self-interested community to the dependence, exploited labors. Rural means hard laborers/

workers or the journey of Rural community from Katodi to labors. Within these activities Rural community is exploited not only physically mentally, culturally, but also economically. So that they are not devaluated and became backward, Compared to the present developed and developing Communities in our state. But till today they are living their life. Rural community is always doing different types of primary businesses that are depend on Nature. There are two sub-castes in Ruraltribe- these are- (1) Rural(2) Bhatkar (Wandering). These sub-castes are depend on Nature too. But according to the businesses, these are divided/ classified into different kinds of sub-castes. These two sub-tribes are very hard worker, so that, they are physically fit& healthy. Along with Adiwasi tribes, Ruralis also Worshiping Nature. They are accepting the power and strength of Nature. Mostly Adiwasi/ aborigine community is living in the contact of Nature so, they are keeping their Gods and Goddesses, religious customs and traditions, believes and similar religious rituals. Therefore, they are bearing similarities regarding many social activities.

The History of Rural Community:

Ruralis an aborigine tribe so, it is very essential to study the history of Rural community. Groups of Adiwasi community scattered in every direction and angle of Indian society. In India, They are Known by different names. e.g. Living in forests so called them "King of Forests" Backward compared to developed society so called, "Primitive" or "People of Mountains". The persons who are studying about this community have also provided many names. For example, Morten Lassi, Risle, Elvin, Shooburn, Tallent, Thakkar etc. have provided them the name like "Aboriginal or Aborigines' and 'Backward Hindus" But Dr. Hatan has called them 'Primitive Tribes' As per our constitution, they are known by the name of "scheduled Tribes" Dr. Das has explained/described them "Submerged Humanity" In 1950, before the approval of our constitution constitutional committee has thought about ancient tradition, remarkable culture, geographical classification and shyful nature considering these four criteria, this community included in "Scheduled tribes", and regarding these criteria, proper serves have been taken place in every states of our Nation, and declared by our president in 1950. Who are aborigine/ primitive? for finding the answer of this question, we have to consider many definitions done by various social anthropologists. Some of the definitions are considered for detail understanding of aborigine tribes, especially Rural community too.

D.N. Mujumdar:

"A Tribe is a collection of families or group of families bearing of common name, members of which occupy the same territory, speak the same language and observe certain taboos regarding marriage, profession or occupation and have developed a wall assessed system of reciprocity and Mutuality of obligations.

Socio- Economic Review:

It is very essential to study the social and economical condition of Rural community for requiring some information about their various aspects of life.

Conclusion –

After over all study of the Rural Community in Mandangad Tahsil of Ratnagiri District, I come to know the conclusions as follow. The percentage of productive people is more than total population of Rural community in Mandangad Tahshil.**61.19%** persons are from the age-group between**15 to 59**to total populations and **38.81%** is of unproductive persons in the age group between**0 to 14** and above **60** years old. But the women and men are the same in the productive persons. In Ruralcommunity**33.62%** males and **27.97%** female are from **61.19% to** total production persons. The women have importance, equal to men in economical development in this community.

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Distribution of Primary Schools in Karad Taluka Dist. Satara (MS)

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Abstract

Education is one of the important basic need for human being. In 21st Century in the educational field, various types of progress because of the technologist development. Today there are number of means for students for getting knowledge. Students use these means and get a verygood achievement in the educational field. Government are also creating various facilities in the educational field for the student progress.India, having crossed the one billion mark on 2000 become one of the most populated countries in the world. Second only to China. In India a census is calculated to calculate the population after every 10 years. These peoples are to be equipped and trained to achieve progress in various fields and education is one of it.

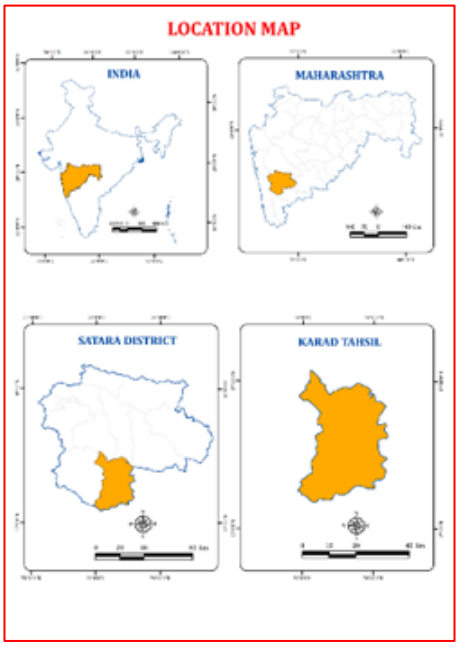
Key words: Cluster, Distribution of Primary schools.

Introduction

Karad is an important educational hub in Satara district. Former chief minister of Maharashtra LateYashwantrao Chavan Saheb and former president of Karad Nagarparishad Respected P. D. Patil Saheb have worked hard to make educational facilities in Karad Taluka. Hence in Karad Taluka has various educational societys. From play group to research center each and every educational facilities are available in Karad Taluka. Primary school is a basic foundation of education. Regarding this issue basic facilities of educational are available in Karad Taluka.

Objectives To study the distribution of Primary schools in Karad Taluka.

Methodology The researcher have been given field visit for the study. So the primary information is received by the field work. Secondary data collected from Udise Report Panchyat Samitte, Karad.After collecting the primary and secondary data researcher has used to come up with different statistical methods for tabulation and attempted to showthe obtained information through a map and diagrams.



Study Region

Karad Taluka is extends from $17^0$16' north to $17^0$33' north latitude and $73^0$52' east to $74^0$16' east longitude. It comprises in area of 405.8 sq. Km. Its maximum temperature is up to 42^0C and minimum 15^0 C. Annual rain fall is 700 mm, relative humidity has 85 per cent in the Fig. no.1.1 rainy season and climate is monsoonal type. It is favourable and healthy for human living and other living things.

Analysis and data analysis

Cluster Wise Distribution of Primary Schools.

Cluster means center of aggregation of small regions. In Karad Taluka has total 25 clusters. Banavadi, Charegaon, Kole,Chikhali, Goleshwar, Helgaon, Indoli, Kale, Karad, Koparde (Hav.), Malkapur, Masur, Oand, Pembar Rethare(Bk), Supane, Tambave, Umbraj, Undale, Vadgaon Haveli, Vahagaon, Wathar, Wing, Yelgaon and Yevati these are clusters in Karad Taluka. In Malkapur and Karad, there is maximum distribution of primary school. Because Malkapur and Karad is a city region. Population of this region is higher than other cluster region.

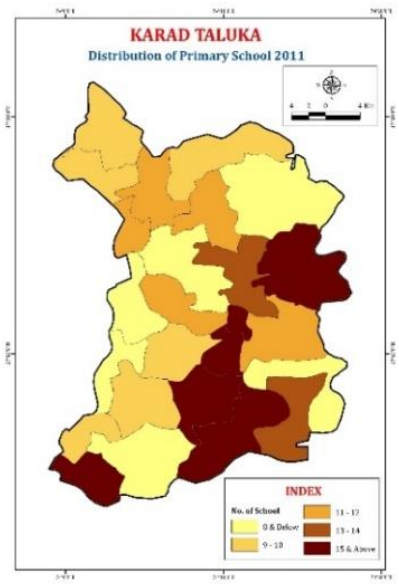
Table No.1.1 Cluster Wise Distribution of Primary School (2011-2018)

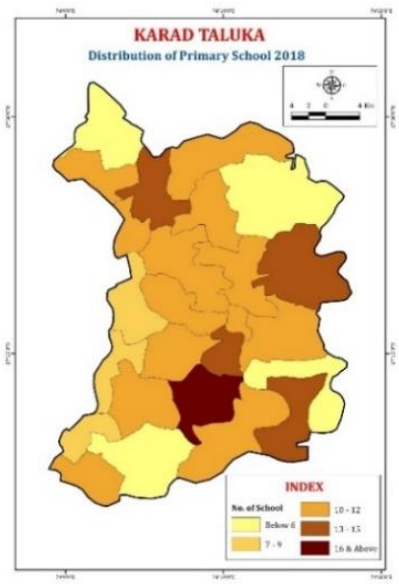
Sr. No	Name of Cluster	2011		2018	
		In No.	Percent	In No.	Percent
1	Banavadi	15	5.41	14	5.42
2	Charegaon	11	3.97	11	4.26
3	Chikhali	6	2.16	5	1.93
4	Goleshwar	11	3.97	11	4.26
5	Helgaon	9	3.24	10	3.87
6	Indoli	10	3.61	11	4.26
7	Kale	15	5.41	16	6.20
8	Karad	18	6.49	12	4.65

9	Kole	8	2.88	8	3.10
10	Koparde (Hav.)	13	4.69	11	4.26
11	Malkapur	18	6.49	15	5.81
12	Masur	12	4.33	11	4.26
13	Oand	10	3.61	10	3.87
14	Pembar	9	3.24	6	2.32
15	Rethare(Bk)	14	5.05	14	5.42
16	Supane	12	4.33	11	4.26
17	Tambave	8	2.88	8	3.10
18	Umbraj	12	4.33	13	5.03
19	Undale	5	1.80	4	1.55
20	Vadgaon(Hav.)	7	2.52	6	2.32
21	Vahagaon	6	2.16	11	4.26
22	Wathar	15	5.41	11	4.26
23	Wing	9	3.24	10	3.87
24	Yelgaon	15	5.41	12	4.65
25	Yevati.	9	3.24	7	2.71
	Total	277	100	258	100

Source-Udise Report Panchyat samitte, Karad

Above given table shows the cluster wise distribution of primary schools in Karad Taluka of 2011 and 2018. In the year of 2011 in Karad Taluka has 277 primary schools. In Karad City (MCI) and Malkapur cluster has respectively 18 primary schools. In these cluster has highest primary schools because Karad City (MCI) and Malkapur is like a twin cities. This is city region and these cities are more populated and in urbanizing situation. In Banavadi, Kale, Wathar and Yelgaon having 15 primary schools, an account of 5.54 per cent respectively. After that Rethare (Bk.) have 14 primary school i.e. 5.05 per cent. In Koparde Haveli 13, Masur 12, Supane 12 and Umbraj 12 has primary school. It means that 4.69, 4.33, 4.33, and 4.33 percent respectively. In Charegaon 11, Goleshwar 11, Helgaon 9, Indoli 10, Oand 10, Pembar 9, Wing 9, and Yevati has 9 primary schools and their per cent is 3.97, 3.97, 3.24, 3.61, 3.61, 3.24, 3.24, and 3.24





respectively. In Chikhali 6, Kale 8, Tambave 8, Vadgaon Haveli 7, and Vahagaon has 6, primary school respectively, and their per cent is 2.16, 2.88, 2.88, 2.52, and 2.16 respectively. In these cluster have low primary school because this cluster is slightly different from the main stream of Karad city and the population ratio is less.In the year of 2018 in Karad Taluka there were total 258 elementary schools. This proportion is lower than in 2011. Because the Government of Maharashtra school scrutiny scheme seems to be hit this year. In this year in Kale cluster has 16 i.e. 6.20 per cent which is highest no.of elementary schools, in Malkapur cluster has 15, Banavadi, Social Study Of Rural Community In Mandangad Tahsil Vishnu JaybhayeRethare (Bk.) has 14 respectively,Umbraj13, KaradandYelgaon12 respectively, Charegaon, Indoli, Koparde Haveli, Masur, Supane, Vahagaon and Wathar has 11 respectively, Helgaon, Oand and Wing 10 Primary Schools. Following map shows (fig. No. 1.2,1.3) the distribution of primary schools in Karad Taluka as per data. In the year of 2011and 2018, Malkapur and Karad (M CI) there is maximum distribution of primary school. Because Malkapur and Karad is a city region. Population of this

region is higher than other cluster region. As well as Karad and Malkapur, Kale, Banavadi, Koparde Haveli, Masur, Rethare (Bk.), Umbraj and Yelgaon has maximum distribution ofprimary schools.

Conclusions

i) In Karad Taluka has basic educational facilities for primary education.

ii) Banvadi, Kale, Karad,Malkapur, Rethare(Bk.), Umbraj and Yelgaon is an fast growing educational center for primary education.

iii) There is a lack of hygine.

Recommendations

i) In Karad Taluka there should be attractive and sufficient infrastructure for Primary schools.

Fig.no.1.3ii) There should be basic and clean amenities for primary school students.

iii) There should be health center for primary school students.

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A Study of the Analysis of Indian Agricultural Development

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Introduction:

`India is an agricultural country. Agriculture is the occupation of most people in India. Indian agriculture is dependent on nature. Therefore, proper agricultural income cannot be guaranteed. Indian agriculture is plagued by several problems which are deep rooted. Some of them are natural and some others are manmade. Indian agriculture, as a system, has remained subsistence farming. Despite a record production of foodgrains in 2019-20 (296.65) million tonnes, horticulture production and 188 million tonnes milk production. Indian farmers, as a lot, are laggard in Socio-Economic pattern of the country. Indian farmers produce more but earn a little. The government has made some changes in all agriculture related matters for the development of farmers. In particular, some decisions have been taken in 2020 on agriculture, horticulture, animal husbandry, dairy, fisheries, training and skills development, research and career development, as well as many other issues related to farmers in the agricultural sector. One of the major causes of poverty in Indian agriculture is the lack of a proper market for its goods. In most cases, farmers sell their produce in the village because of the expensive and inefficient transportation system or they have to sell their produce at a pre-determined price from the lender or trader. India is an agricultural country, with about 70% of its people directly or indirectly dependent on agriculture. And 66% of rural laborers in India depend on agricultural enterprises for their income. Farmer suicide accounts for 11.2% of all suicides in India. Since agriculture continues to be the mainstay of the rural economy even after three decades of liberalisation, the neglect of agriculture is tantamount to the neglect of the entire rural economy. With each passing year, the problems of Indian agriculture are deepening.

Hypothesis of The Need for Education to Acquire Knowledge & Skills:

Hypothesis is the proposed explanation for an event. In order for a hypothesis to be a scientific hypothesis, a scientific method is required that an individual can test it. Although the terms "hypothesis" and "theory" are often used interchangeably, scientific assumptions are not the same as scientific theory. The need for education to acquire knowledge and skills Some assumptions have been used for this research article.[1]

1. There are errors in the current agricultural problems.
2. Contribution to agricultural development.
3. There were measures to improve agricultural production.
4. There was a need for a farmer welfare scheme.
5. There are agricultural infrastructure.

Research Methodology:-

I select descriptive and analytical the research methodology. This study mainly based on secondary data. The required data have been collected from various Reports, journals and books. For this present research paper research have selected descriptive and analytical research mythology.

Objectives of the Study:

The objective of the study is to highlight A Study of An Analysis of India Agricultural Development. I express an opinion on the following objective of the research paper.

1. To know the contribution of Agricultural development.
2. To know defects in the present system of Agricultural Issues.
3. To identify the measures to improve Agricultural product.
4. To know the need of farmers welfare scheme.
5. To know the need of the Agricultural infrastructure.

Today India breaks into top ten agriculture produce exporters. India broke into the global Top 10 list of agricultural produce exporters in 2019 with a sizeable share in the export of rice, cotton, soya beans and meat. This was revealed on July 23, 2021 by a WTO (World Trade Organization) report on the trends in world agricultural trade in the past 25 years, In 2019, Mexico and India, with 3.4% and 3.1% share in global agriculture exports respectively, replaced Malaysia (7th) and New Zealand (9th) as the largest exporters, while the US which topped the list in 1995 (22.2%), was overtaken by the European Union in 2019 (16.1%). The US's share fell to 13.8% in 2019. Brazil maintained its ranking as the 3rd largest exporter, increasing its share from 4.8% in 1995 to 7.8% in 2019. China climbed from the 6th spot in 1995 (4%) to 4th place in 2019 (5.4%). The top rice exporters in 1995 included Thailand (38%), India (26%) and the US (19%), In 2019, India (33%) overtook Thailand (20%) to top the list, while Vietnam (12%)) overtook the US to the 3rd spot. The Top 10 exporters accounted for more than 96% of exports in both

1995 and 2019. India is also the 3rd largest cotton exporter (7.6) and the 4th largest importer (10%) in 2019. It had not featured in the Top 10 list in 1995. In the largest traded agriculture product, soya beans, India (0.1%)) has a meagre share, but was ranked 9th in the world. In the meat and edible meat offal category, India was tanked 8th in the world with a 4% share in global trade. While India was the 7th largest wheat and meslin exporter in 1995, it does not feature in the Top 10 list in 2019. However, India lagged behind as a value-added contributor to world agriculture exports. India's share of foreign value-added content in its agriculture exports was also low at 3.8% June primarily due to high tariffs on agriculture imports to protect the domestic market. India's Agri Exports Register 17% Growth During FY 2020-21 Sharp growth in exports of Sesamum cereals, oil meals, sugar, cotton, fresh Niger seed vegetables and vegetable oil boosted Cotton India's agriculture exports by 17.34 per cent in 2020-21 to $ 41.25 billion after hovering around $ 38 billion or lower in the last three years with the farm sector responding positively to opportunities presented by the Covid-19 pandemic. India's overall goods exports Bangladesh contracted 7.26 per cent in 2020-21, Arabia recording $ 290 63 billion, but the by the disruptions of the Covid - 19 pandemic. The steepest growth in exports in 2020-21 was seen in items such as non-basmati rice growing by 136-04 per cent to $ 4.79 billion, wheat by 774.17 per cent to S 549-16 million, other cereals by 238. 28 per cent to 694.14 million. Other agricultural products, which posted significant increase in exports, as compared to 2019-20, were oil meals ($ 1.57 billion - growth of 90.28 per cent), sugar ($ 2.78 billion - growth 41.88 per cent), raw cotton ($ 1.89 billion growth 79.43 per cent), fresh vegetables ($ 721.47 million growth 1071 per cent) and vegetable oils ($ 602.77 million- growth 254.39 per cent.[2] Agriculture in India has an image problem. The specific issues faced by Indian agriculture are as follows: There is a high and persistent variation in agricultural prices varying implementation across the country and widely of across different states and even national price support policies districts within states. Productivity growth lags behind that of other countries in the region. Agricultural productivity varies dramatically across India, often being well below the technology frontier Agricultural finance and financing inefficiencies particularly for small and marginal farmers. Structure of agricultural markets constrains the price realization for farmers. Agricultural marketing system is still in the grip of middle men despite several attempts of the government. Supply chains are long and fragmented. There is an inefficient value chain in agriculture; wastages across the entire agri - value chain. There is a decline in public investment in agriculture. Adverse terms of trade. Fragmented land use patterns persist, and farmers seem to be trapped in their low-income occupation, unable to exit. India seems to produce an excess and export agricultural crops that are intensive in scarce resources such as water and land. Despite numbers and periodic protests, farmers' incomes have languished. Other problems: gaps in physical rural infrastructure - reliable power, cold storage, roads and transport systems - linkages to input markets and domestic downstream sectors are weak. The major highlights of the Ministry of Agriculture & Farmers Welfare during the year 2020 are follows:Unprecedented Enhancement in Budget Allocation: In the year 2120-21, the Budget allocation has been increased by more than 6 times to 1,34,399.77 crore. , the Budget allocation for Department of Agriculture in the year 2013-14 was only 21933.50 crore. Record Foodgrains Production: The foodgrains production has increased from 251.54 million tonnes in 2015-16 to 296.65 million tonnes in 2019-20 which is the highest ever foodgrains production.As per third advanced estimates, harticulture production during 2019-20 is 319.57 MMT which is the highest ever for Indian horticulture.[3] Determination of Minimum Support Price at One-and-a Half-Times the Cost of Production: Government has increased the Minimum Support Prices for all mandated Kharif, Rabi and other commercial crops with a return of at least 50 per cent over all India weighted average cost of production from the agricultural year 2018-19. MSP for Paddy has increased to Rs.1868 per quintal in 2013-14 marking an increase of 43%. Minimum Support Price for Wheat increased from Income. 31000 per quintal in 2013-14 to through 1975 per quintal in 2020-21.Paddy procurement for kharif 2020-21 has progressed smoothly and purchase of 356.18 lakh MT of paddy up to 8.12.2020 against 295.79 lakh MT of corresponding date of last year, showing increase of over 20%.Income Support to Farmers through PM KISAN: Pradhan Mantri Kisan Samman Nidhi (PM - KISAN) was introduced by the Central government in February 2019 under which 6,000 per year is transferred to the beneficiary farmer's account per year in three installations. Pradhan Mantri Fasal Bima Yojana (PMFBY) Pradhan Mantri Fasal Bima Yojana (PMFBY) has completed 4 years of its implementation covering over 23 crore farmer applications and benefitting over 72 crore applicants.Institutional Credit for Agri culture Sector: Increase from 7-3 lakh crore in 2013-14 to 13.73 lakh crore in 2019-20 with a target to reach 2 lakh crore concessional credit farmers through Kisan Credit Cards is sanctioned 15 lakh crore in 2020-21. Agri Infrastructure Fund Agriculture Infrastructure Fund: (AIF) was launched in August, 2020. Promotion of Fro: (Farmer Agricultural Producer Organizations): Scheme for Formation and Promotion of 10,000 FPOs with total budgetary provision of 6,865 crore has

been launched on 29.02.2020 Under the scheme formation of 10,000 FPOs across the country is targeted in five years period till 2023-24, while providing adequate handholding to each FPO for five years from the formation for which support will continue till 2027-28. An amount of 40-16 crore has already been released in 2020-21 towards formation of FPOs. National Bee and Honey Mission: (NBHM) NBHM has been launched in 2020 as part of the Atmanirbhar Bharat Abhiyan Rs. 500 crore for the period 2020-21 to 2022-23 has been allocated for the sector Projects worth 100 crore are targeted for December 2020.[4]

Improvement in Farm Produce Logistics, Introduction of Kisan Rail: A farmer friendly mobile application 'Kisan Rath' app to facilitate the farmers and traders in search of transportation vehicles for primary and secondary transportation for the movement of agricultural and horticultural products The country's First Kisan Rail started between Deolali and Danapur station on 08.07.2020. Another Kisan Rail has been operated between Anantpur in Andhra Pradesh to Adarsh Nagar, Delhi. Till 11.12.2020, 84 trips have been made by these Kisan Rails carrying 23,219 tonnes earning a revenue of 901.3 lakh for the Government.

Conclusion:

Admittedly, Indian agriculture faces many challenges. A large contribution is being made by the government for the development of agriculture. Today, research studies have shown that the government has taken a number of farmer welfare measures to improve agricultural production. Efforts are being made to enhance agricultural infrastructure. To improve agricultural production. The need for farmer welfare scheme is being known.

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Agricultural Marketing in India-With special reference to Himachal Pradesh

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Abstract

Agricultural marketing system is an efficient way by which the farmers can dispose their surplus produce at a fair and reasonable price. Improvement in the condition of farmers and their agriculture to a large depends on the elaborate arrangements of agricultural marketing. The marketing system should focus on overall welfare of all the segments (producers, consumers, middlemen and traders) society. The subject of agricultural marketing includes marketing functions, agencies, channels, efficiency and costs, price spread and market integration, producer's surplus, government policy and research, training and statistics on agricultural marketing and imports/exports of agricultural commodities. Agricultural marketing system is an efficient way by which the farmers can dispose their surplus produce at a fair and reasonable price.The Centre introduced three Bills in the parliament on September 17th, 2020 which seek to replace the recent ordinances to allow barrier-free inter-state trading of farm goods and contract farming. The roll-out of the laws heralded a transition of India's agro-marketing as signs of a weakening of the Agriculture Produce Marketing Committee (APMC) networks are now seen across major farm production centres, which may bolster bargaining strength of farmers.However, the Bills passed in Parliament are yet to achieve broad acceptance from the local farming bodies across the country and are still at a weaning stage. Agriculture is the main occupation of the people of Himachal Pradesh and has an important place in the economy of the State. Himachal Pradesh is the only State in the country whose 89.96 per cent population (Census 2011) lives in rural areas. The study is based on secondary data available on official websites of the government, research papers and articles. In this study agriculture marketing strategies, flaws and suggestions to improve the same in India as general and Himachal Pradesh in specific, have been touched upon. In addition agriculture marketing activities related to APPLE ((Malus pumila)) as an agro product in district Solan, Himachal Pradesh has been studied briefly.

Keywords-*Agriculture, Agro Marketing, APMC, Famers, Surplus Produce.*

Introduction:

Agriculture is distinctive from industry and plays an important role in the economic maturity of a nation. India's prosperity depends largely upon the agricultural prospect. Agriculture and associated sectors participate nearly 22%of Gross Domestic Product (GDP) of India. Infact, around 65-70% of the populationare reliant on agriculture for their living. It plays an important role in the overall socioeconomic advancement of the nation. Almost 43 percent of India's geographical area hasbeenoccupied by the agriculture sector. It is still the only greatest provider to India's GDP even after a decline in the similar in the agriculture share of India[1].The agricultural marketing system is understood and developed as a link between the farm and non-farm sectors. A dynamic and growing agriculture sector requires fertilizers, pesticides, farm equipment, machinery, diesel, electricity, packing material and repair services which are produced and supplied by the industry and non-farm enterprises. Themarketing system should focuson overall welfare of all the segments (producers, consumers, middlemen and traders) society. The subject of agricultural marketing includes marketing functions, agencies, channels, efficiency and costs, price spread and market integration, producer's surplus, government policy and research, training and statistics on agricultural marketing and imports/exports of agricultural commodities. The overall objective of agricultural marketing in a developing country like India is to help the primary producers viz. the farmers in getting the remunerative prices for their produce and to provide right type of goods at the right place, in the right quantity and quality at a right time and at right prices to the processors and/or ultimate consumers on the other[2].Agricultural marketing system is an efficient way by which the farmers can dispose their surplus produce at a fair and reasonable price. Improvement in the condition of farmers and their agriculture depends to a large extent on the elaborate arrangements of agricultural marketing.

The term agricultural marketing include all those activities which are mostly related to the procurement, grading, storing, transporting and selling of the agricultural produce[3].The Centre introduced three Bills in the parliament on September17th,2020 which seek to replace the recent ordinances to allow barrier-free inter-state trading of farm goods and contract farming. The roll-out of the laws heralded a transition of India's agro-marketing as signs of a weakening of the Agriculture Produce Marketing Committee (APMC) networks are now seen across major farm production centres, which may bolster bargaining strength of farmers.Introducing two of these bills — The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020 and The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill, 2020 – in the Lok Sabha, Agriculture Minister Narendra Singh Tomar said that

states had not embraced the reforms in the APMC Act in a uniform manner as suggested by the Centre in the past. The lack of homogeneity in the laws was obstructing a competitive pricing environment for the farmers and was also becoming an impediment to the evolution of a modern trading system[4].However,the Bills passed in Parliament are yet to achievebroad acceptance from the local farming bodies across the country and are still at a weaning stage.Agriculture is the main occupation of the people of Himachal Pradesh and has an important place in the economy of the State. Himachal Pradesh is the only State in the country whose 89.96 per cent population (Census 2011) lives in rural areas. Therefore, dependency on Agriculture/ Horticulture is imminent as it provides direct employment to about 62 per cent of total workers of the State. Agriculture happens to be the premier source of State Income (GSDP). About 10 per cent of the total GSDP comes from agriculture and its allied sectors. Out of the total geographical area of State (55.67 lakh hectare) the area of operational holdings is about 9.55 lakh hectares and is operated by 9.61 lakh farmers. The average holding size is about 1.00 hectare. Distribution of land holdings according to 2010-11 Agricultural Census shows that 87.95 percent of the total holdings are of small and marginal farmers. About 11.71 percent of holdings are owned by Semi medium and medium farmers and only 0.34 percent are held by large farmers[5].

Objectives: To study the concept of agricultural marketing by exploring present state of agricultural marketing,conditions for satisfactory development, Flaws and steps taken by the Govt. for Improvement of Agricultural Marketing in India.

To explore the problems and suggestions regarding agroproducts marketing in Himachal Pradesh.

To get a brief view of Agriculture marketing activities related to APPLE as an agro product in district Solan, Himachal Pradesh.

Research Methodology: The study is based on secondary data available on official websites of the government, research papers and articles. In this study agriculture marketing strategies, flawsand suggestions to improve the same in India as general and Himachal Pradesh in specific,have been touched upon. In addition agriculture marketing activities related to APPLE as an agro product in district Solan, Himachal Pradesh has been studied briefly.

Findings of the study: Agriculture marketing strategies, flaws and suggestions to improve have been enumerated as under:

1.1 Present State of Agricultural Marketing in India[6]:

In India, four different systems of agricultural marketing are prevalent as mentioned below:

Sale in Villages:

Sale in Markets:

Sale in Mandis:

Co-Operative Marketing:

Regulated Markets

Conditions for Satisfactory Development of Agricultural Marketing in India:

The following are some of the important conditions for the satisfactory development of agricultural marketing in India:

Eliminating Middlemen

Freedom from Moneylenders

Storage Facility

Bargaining Capacity

Regulated Markets

Adequate Transport Facility

Agricultural Marketing Societies

Market Intelligence.

Flaws in Agricultural Marketing in India[7]:

Glaring flaws inagricultural marketing in India have been highlighted as under:

Lack of Storage Facility

Distress Sale

Lack of Transportation

Unfavorable Mandis

Intermediaries

Unregulated Markets

Lack of Market Intelligence

Lack of Organization

Lack of Grading

Unfavorable Conditions

Steps Taken for Improvement of Agricultural Marketing in India:

The Government has taken following significant steps for the improvement of agricultural marketing in India:

Warehouses

Development of Marketing Societies and Regulated Markets

Infrastructure Facilities

NAFED

Commodity Boards

Standardization and Grading

2.1 Himachal Pradesh State Marketing Agricultural Board

The Himachal Pradesh Agricultural & Horticultural Produce Marketing (Development & Regulation) act, 2005 (As assented to by the Governor on 25th May, 2005) is an act to re-enact the law to provide for improved regulation in marketing of agricultural produce, development of efficient marketing system, promotion of agro processing and agricultural exports, establishment and proper administration of markets for agricultural produce in the State of Himachal Pradesh.It also ensures level playing field for competitive markets to operate through setting of minimum standards for facilities, procedures and systems, thereby promoting the establishment of well administered and efficient infrastructure for marketing of agricultural produce in and from the State of Himachal Pradesh.At present 10 market committees are functioning and 58 markets have been made functional out of which 19 mandis have been enrolled under e-markets. Under this head of development, no funding is made from State Plan and revenue generated under this Act is utilized for raising infrastructure needed for ensuring remunerative marketing of the Agriculture Produce. The H.P. Agricultural Produce Market Act has also been amended on the lines of Modal Act circulated by Government of India. With this a provision has been made for setting up the private markets, direct marketing, contract farming and single point levy of entry fee. The markets are also being computerized. All the activities have been taken up by the Marketing Board through their own funds[8].

Different Programs carried by H.P. State Marketing Agricultural Board[9]:

Construction of Market Yards

Taking into consideration the need to develop the markets all over the State, the Board is undertaking State level planning and execution of construction work of market yards to create infrastructural facilities like-shop-cum-godowns, auction platform, farmer's rest houses, internal roads, compound wall, drinking water facilities, canteen banking facilities etc.

Modernization and expansion of existing market yards

The H.P. State Agricultural Marketing Board has already taken initiative to expand and modernize the different marketing yards in the state. The Principal Market yards, Dhalli (Shimla) is being taken up in the first phase.

Construction of Link Roads

In the absence of proper roads, farmers are compelled to sell their produce to local traders. In order to overcome this obstacle, the Board is constructing link roads so that farmer could bring their produce to the market throughout the year under all weather conditions.

Construction of Ropeways

Due to difficult terrain the construction of road is cumbersome and expensive in hilly areas.Hence, The Board is constructing ropeways to link these areas to road head. The ropeways require less time and money to install. There is proposal for taking up this activity on large scale as there is lot of scope of this activity in hilly areas of H.P.

Construction of Collection Centers

Farmers bring their produce to the roadside and keep on waiting for the transport and traders. Since there is no facility for the protection of agricultural produce, it remains open to vagaries of weather, theft etc. To save the farmer from such losses, a scheme to construct collection centers at strategic points has been initiated.

Farmer's awareness Camps

Farmer's awareness camps are being organized to make them aware of post-harvest management, agricultural marketing, market regulation etc. Each training camp comprises of 100 farmers. The officials of H.P. Marketing Board, Market Committees, Agriculture and Horticulture departments Agriculture/ Horticulture University etc. also participate in these camps as resource personnel.

Farmer Exposure Visits

Agricultural universities and related institutes throughout the country are constantly developing improved and scientific techniques of post- harvest management. By and large, the farmers in the adjoining areas of these institutes/ organizations are availing these opportunities. Not only their crop yield has increased but their income has also increased significantly.

Distribution of Plastic crates

Fruits and Vegetables are highly perishable in nature. Therefore, Farmers have been encouraged to adopt new packaging material. For this purposeplastic crates have been distributed among farmers on subsidized rates with the help of National Horticulture Board for this purpose. These crates are light weight and occupy less space. They are also sturdy, durable and have a smooth surface. They can be used for collecting, grading and for temporary storage.

Market News Service

To avoid the exploitation of farmers, daily market rates of 24 agricultural commodities prevailing in 10 markets of the state are being collected by the market committees and are being broadcasted through AIR, Shimla/ Doordarshan.

Strengthening of farmers through Market Information

In order to establish a nation-wide information network for speedy collection and dissemination of market information and data for its efficient and timely utilization & to facilitate collection and dissemination of information related to better price realization by the farmers, Ministry of Agriculture Govt. of India, has launched an ICT based Central Sector Scheme of Agricultural Marketing Information Network (AGMARKNET). Market information is important for farmers in production planning and marketingas also for market participants for arriving at optimal trading decisions.On AGMARKNET portal (http://agmarknet.nic.in) over 300 plus markets are regularly reporting price related information. 14 nodes of Himachal Pradesh are also sendingdata to this portal. Any farmer/ orchardist can access the rates of their produce in the markets of the country through this website.

The AGMARKNET portal also serves as a single window for accessing websites of various organizations concerned with agricultural marketing. It is also linked with Online Commodity Exchange of India Limited, providing futures prices in respect of oilseeds, fiber crops etc. International price-trends of various agricultural commodities available on FAO website are also accessible through the portal.

An e-directory of AGMARKNET is also available for facilitating effective and timely exchange of information among markets and other users. Once the farm produce is standardized and labeled, backed by quality certification, it can be directly offered for sale on web site in national and international markets.

Agricultural produce market committee (APMC):

The Market Committee Solan came into existence in the year 1975 comprising of Solan Distt and Rajgarh Tehsil of Sirmour Distt. and since then 13 regulated Markets with modern marketing facilities have been constructed so far at Solan, Kandaghat, Kunihar, Dharampur, Chakki-Ka-Mor, Terminal Market Parwanu, Jagjitnagar, Banalgi, Nalagarh, Ramshaher, Arki, Kunihar and Rajgarh where the provision of the Himachal Pradesh Agriculture Produce Market Act 1969 (Act No. 9 of 1970), which has been repealed vide section 86 of the Himachal Pradesh Agricultural and Horticultural Produce Marketing (Development & Regulation) Act 2005 (Act No. 20 of 2005) as assented to by the Governor on 25th May, 2005 for better regulation of Sale purchase of Agricultural Produce and to provide marketing & information facilities to the growers of the district.

Agriculture marketing activities of APPLE in district Solan, Himachal Pradesh:

Apple (Malus pumila) is commercially the most important temperate fruit and is fourth among the most widely produced fruits in the world after banana, orange and grape. China is the largest apple producing country in the world..An Agri-export zone has been established in **Himachal Pradesh** covering the districts of Shimla, Sirmour, Kullu, Mandi, Chamba and Kinnaur considering the vast potential for increasing exports. Initial targets are for exporting apples to neighbouring countries as well as to west Asia and to the south-east Asian countries. With increase in production of apples in the State, the State government is taking effective steps for its marketing besides providing packing material, transportation, ensuring adequate procurement of apples under Market Intervention Scheme, so that the growers get remunerative prices in the markets[10].At Solan APMC has constructed a modern market with all required modern facilities with a cost of about Rs. 6.5 crores in which facilities such as farmers' rest House dormitory, banking facilities shopsand auction platforms have been provided. Constant efforts are being made by the NHB and the State Govt. for imparting modern technologies to the growers in apple producing states[7].

Grey areas in Implementation[11, 12]:

1. Though Agricultural Produce Marketing Committees (APMCs) under the Agricultural Produce Marketing Committee Act, 1964 control and regulate buying and selling operations at all regulated agriculture marketing yards but there are lot of inefficiencies involved in practices of APMCs. However amended APMC Act prevents anticompetitive practices. There is no compulsion on the producer to sell their produce in APMC market yards, producer are quite free to sell directly to private companies or private market yards or farmers-consumer market under amended APMC Act.
2. Agricultural and Horticultural Produce Marketing (Development and Regulation) Act, 2005. The Act, commonly known as APMC Act, is supposed to protect the interest of the farmer and horticulturist but it is not being implemented properly." It is observed thatlicences for working as commission agents are issued to unscrupulous elements without required verification and these agents cheat the growers, who are unorganized.

Findings &Suggestions:

1. It was found that the large chain of commission agents affects the orchardists profit so it is very important to choose the cost saving channel so that the commission could be saved.
2. It can be concluded that distribution strategy play a prominent role in the apple distribution because of the highly perishable nature, it get easily perished and bruised. However, when examined the perception of orchardists regarding different distribution channels, commission agents and wholesaler were regarded as good channels of distribution by majority of the growers.
3. The HPMC, private companies and retailers were considered as average channels of distribution. Similarly, benefits derived by adopting a particular channel of distribution, it is revealed from the study that majority of the orchardists reported that it can enhance goodwill of producers and built harmonious relation with commission agents. It can ensure repeat purchase and can prove as efficient and cost effective channel of distribution.
4. The distribution strategies play an important role in apple marketing. It is suggested that there should be proper channels of distribution and storage facilities so that apple could be stored in the market well in time as to avoid spoilage. With the help of marketing mix, a sound distribution strategy can be developed therby the interest of apple growers could be saved and exploitation in mandis can be minimised.

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Problems and Prospects of Agricultural Marketing in India

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Abstract:

Indian agriculture can play a vital role in economic development. It is therefore agricultural production should be stepped up. The increase in agricultural production calls for a simultaneous improvement in the marketing system. Thus for the country predominantly dependent upon efficient agricultural marketing system is very essential and vital. The agricultural sector today is facing serious threats and challenges. The farmers are so poverty stricken and indebted. As a consequence, the death toll of farmers' suicides is rapidly increasing at an alarming rate. The contribution of agriculture to GDP has been declining year after year. There is shift in agricultural labour force. The statistical data reveal that agricultural labour forces are shifting towards the construction industry, textile industry and other unorganized sectors, causing scarcity of labour force. The excess use of fertilizer, pesticides further affects the productivity. Significant role in the economic development of a nation. India's prosperity depends upon the Agriculture is different from industry and plays a significant agricultural prosperity.There are many kinds of agricultural products produced in India and the marketing of all these farm products generally tends to be a complex process. Agricultural marketing involves many operations and processes through which the food and raw materials move from cultivated farm to the final consumers. Agriculture provides goods for consumption and exports and manufacturing sectors. The suitable from the cultivated farm to the marketing system should be designed so as to give proper reward or return to the efforts of the tiller of the soil. Market information is a means of efficiency of marketing system and promoting improved price formation. It is crucial to the farmers to make informed decisions increasing the efficiency about what to grow, when to harvest, to which market produce should be sent and whether or not to store it. Awareness of farmers on different components of market information and its utility was very poor (20 to 55 %) as compared to that of traders (90%). Out of the expectations of farmers on grades, quality, prices in potential markets, price projections; only real time arrivals and prices were documented and disseminated with traditional approach. Hence there is a need to create awareness among the farmers through the agricultural extension agencies like the State Department of Agriculture, Krishi Vigyan Kendra's so that the marketing information on agriculture commodities are incorporated in the extension services along with production aspects to the farmers.

Keywords : Agriculture, Cultivation, Marketing, food-grains and productivity.

Introduction:

Agricultural marketing consist of two major concepts viz., first concept agriculture aims at "agriculture" and "marketing". The producing the agro food products with the use of natural factors for the welfare of human. It is fully depends on natural processing. The second concept marketing refers to the activities that are done by the business organizations to promote their products and services to their targeted customers. In marketing the targeted customers can be attracted and maintained by creating strong customer values for them in the organization. It is possible through, effective market survey, market trending, better customer service and satisfaction, customer focus and continuous follow up. The concept agricultural marketing includes many activities starts from production process till its retailing. The activities involved are production planning, cropping and harvesting, warehousing, grading, final distribution. There are varieties of agro transportation and products which are produced with dual purpose of domestic consumption as well as exporting. In the chain of agricultural marketing number connecting links such as farmers, suppliers, beneficiaries' and functionaries, importers, exporters, external beneficiaries' customers are involved.

Agricultural Marketing: The term agricultural marketing is composed of two words - agriculture and marketing. Agriculture, in the broadest sense means activities aimed at the use of natural resources for human welfare, and marketing connotes a series of activities involved in moving the goods from the point of production to the point of consumption. specification, the subject of agricultural marketing includes marketing functions, agencies, channels, efficiency and cost, price spread and functions, agencies, channels, market integration, producer's surplus etc, assembling, grading, storage, transportation and distribution.

Definition Of Agricultural Marketing: According to the National Commission on Agriculture, Agricultural marketing refers to all those processes which relate to taking the agricultural product from the farmers to the consumers. Agricultural marketing includes gathering the agricultural produce, their

standardization, and grading, their storage, sending them to the market through various middlemen, selling in the market and arranging the required finance, etc.

Functions Of Agricultural Marketing:

The major marketing functions involved in agricultural marketing are:

- Concentration
- Grading
- Processing
- Warehousing
- Packaging
- Distribution

Concentration: The foremost function to be performed in agricultural marketing is to collects the agro produce ready to sale in a central place for economic buying purpose.

Grading of Agro Produce: Grading is the process of segregating the huge amount produce into different categories on the basis of variety, quality, size, etc. This can help to establish standards for those produce.

Processing: It is the stage where the farm products are transformed into consumable products. For example: paddy into rice processing.

Warehousing: Warehousing is storing the products from production till its consumption. This helps to preserve the products from spoil, contamination, etc.

Packaging: Packaging of products is another essential function for easy handling, preventing from deterioration, attracts customers, etc. Distribution: The last function performed in all marketing is distribution of products from the place of warehouse to retail outlet for final consumption.

Importance Of Agricultural Marketing:

- Break the vicious circle of poverty
- Optimum utilization of agricultural resources
- Enhance the standard of living
- Basis of employment opportunity
- Basis of industrial development
- Creation of utilization
- Basis of foreign trade
- Source of national revenue
- Create the environment for investment

Challenges Ofagriculturalmarketing:

- The major challenges in domestic agricultural marketing are as follows:
- Variation in Market Fees/Market Charges
- Neglect of Rural Markets
- Absence of a Common Trade Language
- Controls Under Essential Commodities Act
- Variation in Goods and Service Tax
- Other Barriers

Problems And Prospects Of Agricultural Marketing:

Too Many Intermediates:

The one main defect of Indian Agricultural marketing is the presence of too many middlemen and the exploitation of farmers by them. On one hand, these middlemen exploit the farmers by purchasing the produce at lower prices, and on the other hand, they exploit the customers by demanding higher prices from them. The only aim of a number of commission agents, brokers etc. is to derive a higher income from the middle processes. These middlemen take undue advantage of the poor former on the basis of their financial resources.

Defective Weights and Scales

One of the biggest defects of agricultural marketing arises due to weights and scales. Usually, in rural areas bricks, etc. are used as weights and in urban markets also defective weights are found. Thus, the grain of the farmer is weighed by a heavier weight for their own gain. Most of the traders keep separate weights for purchase and sale of grain.

Illiteracy and Lack of Unity among Farmers

The Indian farmers are illiterate who are easier to be fooled by the money lenders, traders, middlemen, due to their simple nature. Similarly, lack of unity among farmers also causes their exploitation because Indian farmers are spread in distant areas in rural places. They are unable to meet with each other and resolve their problems, as a result, they do not get a fair price for their produce.

Lack of Financial Resources

In rural areas, there is a lack of financial resources, due to which even their emergency requirements are not fulfilled. In such conditions, the farmers sell their produce before its ripening. Similarly, some financial facilities, like, installments on loans for pumping-set, tractor, thrasher, etc. have to be paid on a monthly or quarterly basis due to which they have to sell the product as soon as possible. Thus, as the lack of financial assistance, is a problem for the farmers; so does the receipt of loan also puts them in the problem.

Lack of Organised Marketing System

Agricultural marketing is also very defective in India because here organized marketing is not in vogue, like, cooperative societies, government marketing activities, regular markets, etc. As a result, the farmer remains entangled In exploitation. Thus, the lack of an organized marketing system is harmful to the farmers. That is -why; the farmer sells his product personally to different people. The middle takes full advantage of the unorganized farmers.

Lack of Transport Facilities

The roads from Villages to cities are usually unmade which are not capable of transport during the rainy season. The bullock carts can take the product only up to a limited area. During a lack of transport facilities, the farmer is unable to take his produce to the appropriate market and is unable to receive a fair price for his product.

Lack of Store Houses

An important deficiency of Indian agricultural marketing is the lack of storehouses. Due to lack of this facility, the farmer is unable to keep his product safely until it can fetch a fair price, and he is forced to sell his product at a low price. The insufficient and unscientific facilities of shortage which are available, waste large quantities of grains. Approximately 20% to 30% gains are lost due to rats, insects, etc. and the farmers have to bear crores of loss due to lack of these facilities.

Lack of Standardization

The lack of standardization and grading is clearly visible in the Indian Agricultural marketing, due to which fixing a deal in relation to these products becomes difficult. Due to the lack of proper standardization and grading the customers have a problem in purchasing the product.

Lack of Awareness of the Market

The Indian farmer has no knowledge about marketing. He believes in information acquired from the businessmen and money lenders of the village. Mostly, the Indian farmers are illiterate so they cannot read the newspaper. Thus, they do not have sufficient knowledge about the market. Now, government transmits the rates of the market on the ratio, which has definitely benefited them.

Corrupt Policies of the 'Mandis'

If we observe the condition of the mandis, this fact is no more hidden that the middlemen and the traders jointly make fool the simple farmers. The Indian Organizing Society has clarified the following facts relating to the corrupt policies of the mandisThe inappropriate marketing system is so deep laden in India that about 5% of the amount is deducted from the farmer's produce in the name of donations, 'dharmada', 'chanda' etc.The farmers are paid low prices, as they lack appropriate knowledge about market prices, their fluctuations, government policies, etc. Thus, by keeping the rates secret, the farmers are cheated.Before the sale, large amounts of grains are taken from the farmers as samples. By declaring the product to be of substandard quality minimum prices are paid for it.

Measure To Improve The Agriculture Marketing

It is a well-known fact that agriculture has been the life of the Indian economy. However, its contribution is lower than that of service and manufacturing in the GDP. But, most of the services have been emerged due to modern agriculture. That is why; it has been concluded that marketing is a very important factor in economic growth. Therefore, we should improve the marketing facility. There are many measures, which can improve the agriculture marketing. There should be many improvements to make Indian agricultural marketing system more effective in the changing marketing scenario. The following measures may be taken into account in order to develop a well-organized marketing system for agricultural goods.

Improve Transport Facilities: For a well organized system. Indian leader or governors' have to give more priority towards the development of road facilities in rural areas which linked with markets in the urban area. It will help the farmers to sell their products in the market directly to the customers.

Increase in Credit Facility: System should provide loan to farmers for storage facilities and for purchasing high quality of improved seeds. The government have to build space for storing stocks of varieties of goods.

Market Reforms: The government have to help in the improvement of the marketing system of national market leaders have to recognized and markets supervisors have to check the cost of farming.

To Build New Markets: Manufacturer goods centre should be present near the new markets as its government duties. So the goods can be transported easily. It shall ensure that farmers should get the proper cost of their products.

Freezing Facilities: It is really needed and a part of the systematic structure of the market. It is very useful for goods or products like delicious fruits and vegetables. It government duty to spend for the cold storage for the Agricultural sector.

Proper merit of Products: Various organizations are present which are working for the rank of farming products. It's really urgently needed to spread out among the organization for good marketing way.

5.7. Market Information: Market information should be known by the farmers through, televisions, newspaper and radio. Governments should be convent towards the betterment of the marketing system.

Marketing Research: Farmers should be allocated with sufficient expenditure of their products through the government for marketing research. It made farming selling more and more effective and beneficial for the producers.

Suggestions

Quality of equipment, trustworthy, sustainable and original infrastructure, including the exchange of border infrastructure in order to provide help to the socio-economy development and peoples, well-fare with a good concern towards the affordability and equitable excess of all pupil of its country.Promotion of exclusively and sustainable industrialization by 2030 is raised up thoroughly as it shares the industry's employment and GDP. If a path were national circumstances and twice the status at least come under a developed nation. More and more small scale industries and enterprise are present in a developed nation for the betterment of financial work with good affordability of cash to the farmers and its interruption into goods and values of marketing. It helped in the domestic support of cyber information and its betterments for the researcher and the inventor's contributions towards the developing nation. Which includes good environment-friendly laws for the inter alia, companies varieties and the better value addition to the communities of a developing nation.

Conclusion

Conclude, agriculture is an important sector contributing more revenue to the Indian economy. So, for any type of marketing, we people thought for the profit that (much you lose and how much we won) involved the marketing at the same time for we people giving more and more important towards certain values, culture, principles and philosophies for contributing a little for the Indian economy and also we treat the farms equally by changing on the marketing prices. Taking important reforms for the proper distribution or the invention of the marketing prices the mechanism was regulated to decorate and making strong agriculture marketing. As to provide equal benefits for the small scale farmers from the benefits of farming products it needed integration and also need informed with the market information like fluctuation and strongly demanding the supply to connect with the core of the Indian economy. Moreover, marketing at agriculture needs effective, initiative efforts for the various levels by conquering them as farmers, primary consumer, secondary consumers and tertiary consumers however our government had brought significant ideology towards agriculture marketing with innovative ideas and creative minds approach to bringing up foods of the labour farmers. Now it is hoped that agricultural marketing in India will get a momentum very soon and agriculture as a contributor to GDP will play a crucial role in the coming years.

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Sustainable Management of Natural Resources

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Abstract

Human have been using natural resources in their environment. Biodiversity, Land & Water weremanaged by human to be able to Survive in the hand diverse à eco regions of the world.• These practise and processes and called Natural Resource Management.Natural Resource Management (NRM) is formally defined, as the practices for the Sustainableutilization and conservation of the natural resources ensuring nutritional and environmental security forpresent and future generations. Around 8,500 *BC, humans started to plant grains instead of gathering them in the wild. This happenedin the area the spans modern day Egypt, Israel, Turkey and Iraq which was known as fertile crescent. By* 7,000 *BC, humans began to domesticate animals such as sheep, pigs and goats. A thousand yearslater, they domesticate Cattle. Since then many innovative practices of cultivation and livestock rearing have been established. Butthe term Agriculture was Cloned for these practices much later only in the* 15*th-century. The cultivation of land for effective crop growth and raising of livestock. farmers engagedirectly in articulation by preparing soil and planting crop. Narrating those crops and preparing them soil in the market is also part of agriculture activities.*

Key Words *– Sustainable, Biodiversity,Articulation, Stalinisation*

Introduction

Farmers also grow fodder, raise livestock. Mono-culture is cultivation of a single species of crop. Poly-culture is cultivation of multiple - species of crops at the same time.

Silvia-culture is an agricultural system using domesticated trees. Agriculture helped humans to settle down in One place, use the land for production of Food. It was a major change from the nomadic lives that humans led till then. Perhaps the most Significantimpact of agriculture on the natural environment is the transformation of landscapes. Hunter-gathers hunted their pray and obtained the food directly. Farming required people to work. Longer hours for the same amount of food. But farming increased food security. As farming spread,Competition for resources, particularly land and water, increased consequently, conflicts betweenCommunities for control of those resources also increase. Agriculture led to the narrowing human fond base. Today, wheat, rice, corn, potatoes, sugar. Only handful of other grains and legumes account for the restAnimal raising depends primarily on cattle, pigs, poultry, and sheep. Agriculture provided secureaccess to food. It helped humans to develop the complex cultures seen today, to pursue science and toimprove the quality of life for all humanity.

Importance of sustainable management of natural resources

Firstly, sustained agricultural productivity is closely linked to the quality of ecosystem services)benefits communities obtain from nature) that natural resources provide. For agriculture production,these include soil formation, erosion control and fertility, nutrient cycling, water provision andpurification, pollination, pest control, carbon sequestration, resilience to natural disasters (drought etc).Loss of ecosystem services results in reduced productive capacity of farms and lower yields which affectthe net incomes of farmers. Over-exploitation of natural resources is instrumental in the plating yields in irrigated agriculture systems. It perpetuates poverty and hunger in dry lands. Secondly, natural resources provide rural communities with fuelwood, fodder, food and othermaterials. They can be a source of non-farm income through ancillary activities such as tourism. Thus,conservation and appropriate use of land, water, biodiversity and forest resources is vital for sustainingthe profitability of agriculture, maintaining livelihoods and social well-being in rural communities. There have been schemes to address natural resource use in relation to agriculture. These includeprogrammes on soil health (the Soil Health Card Scheme being the most recent avatar), development ofdrought-prone and degraded lands, water conservation and watershed management (now part ofPMKSY), rained areas development, activities under MNREGA etc.However, issues of underdeveloped institutional capacities, especially for decentralised planning andImplementation, low resource availability, lack of coordination, duplicity of efforts in the absence ofconvergence and gaps in monitoring have impeded translation of programme objectives to gainfuloutcomes. What is under-appreciated is the agro-climatic diversity, socio-economic and culturalvariability that farming communities harbour.An integrated and holistic view of natural resource management that also links with better agrarianoutcomes is also missing.

Stress on natural resources

Land degradation and desertification that afflicts 30 per cent of the land is on the rise. Inappropriateagricultural practices are destroying soil fertility and leading to erosion, water logging, and

Stalinisationand soil compaction.Reports indicate that around 54 per cent of India falls under high and extremely high water stressregions and groundwater wells are decreasing. Farmers in several regions face acute water shortage.Since over 85 per cent of the groundwater is utilised by the agriculture sector, burgeoning groundwateruse based on subsidies, incentives for water-intensive crops and low water use efficiencies in agricultureare pushing the nation towards water scarcity.There is also erosion of agro-biodiversity — seeds, crop varieties and livestock due to over-emphasison select high-yielding varieties that poses a threat to food and nutrition security. The importance oftree species in enhancing farm health and farmers&39#; nutrition is disappearing.

Management of natural resources

Operational sing land use planning and sustainable land management practices and multi-stakeholderdialogue is the key. Strengthening capacities, especially at block and district levels, for development ofnatural resource plans, implementation and ownership of the interventions are necessary. Plans need tobe developed on the basis of the characterisation of the bio-physical resources, with an understandingof resource variability and dynamics and socio-economic realities.Secondly, a move away from resource management in silos to a systems approach that recognisesfunctional linkage between soils, water, biodiversity and forests and its impact on ecosystem servicesprovided is needed. A re-emphasis on the watershed approach that integrates multiple resource use andconservation will be helpful.Thirdly, the association between sustainably managing biophysical resources and improvedagricultural productivity and equity need focus. Emphasis must be laid on people&39#;s participation and theuse of local knowledge and practices such that resource conservation measures are developed in waysthat contribute to the socio-economic well-being of communities.Agriculture operates on a multifunctional scale. While its social and economic functions are important,its ecological functions and impacts are also significant. Unless the natural resource base is managedsustainably and in ways that benefits the local populations, improves system productivity, cultivatesagro-ecosystem resilience and maintains ecosystem services, long-term gains from agriculturedevelopment for the economy, farmer livelihoods and rural development will not be possible. In the fortunes of agriculture, therefore, requires polices and institutional arrangementsthat pay heed to farmers as well as the needs of the environment.

Better use of natural resources

(1Natural resources, especially those of soil, water, plant and animal diversity, vegetation cover,renewable energy sources, climate, and ecosystem services are fundamental for the structure andfunction of agricultural systems and for social and environmental sustainability, in support of life onearth. Historically the path of global agricultural development has been narrowly focused on increasedproductivity rather than on a more holistic integration of NRM [Natural Resource Management] withfood and nutritional security. A holistic, or systems-oriented approach, is preferable because it canaddress the difficult issues associated with the complexity of food and other production systems indifferent ecologies, locations and cultures.AKST [Agricultural Knowledge Science and Technology] to resolve NRM exploitation issues, such as themitigation of soil fertility through synthetic inputs and natural processes, is often available and wellunderstood. Nevertheless, the resolution of natural resource challenges will demand new and creativeapproaches by stakeholders with diverse backgrounds, skills and priorities. Capabilities for workingtogether at multiple scales and across different social and physical environments are not welldeveloped. For example, there have been few opportunities for two-way learning between farmers. Andresearchers or policy makers. Consequently farmers and civil society members have seldom beeninvolved in shaping natural resource management policy. Community-based partnerships with the private sector, now in their early stages of development, represent a new and promising way forward.

(2Use existing AKST to identify and address some of the underlying causes of declining productivityembedded in natural resource mismanagement, and develop new AKST based on multidisciplinaryapproaches for a better understanding of the complexity in NRM. Part of this process will involve thecost effective monitoring of trends in the utilization of natural resource capital.

(3Strengthen human resources in the support of natural capital through increased investment)research, training and education, partnerships, policy) in promoting the awareness of the societal costsof degradation and value of ecosystems services.

(4Promote research to facilitate less exploitative NRM and betterstrategies for resource resilience, protection and renewal through innovative two way learningprocesses in research and development, monitoring and policy formulation.

(5Create an enabling environment for building NRM capacity and increasing understanding of NRMamong stakeholders and their organizations in order to shape NRM policy in partnership with public andprivate sectors.

(6Develop networks of AKST practitioners (farmer organizations, NGOs, government, private sector) tofacilitate long-term natural. resource management to enhance benefits from natural resources for thecollective good.

(7Connect globalization and localization pathways that link locally generated NRM knowledge and Innovations to public and private AKST.

(8When AKST is developed used creatively with active participation among various stakeholders acrossmultiple scales, the misuse of natural capital can be reversed and the judicious use. and renewal ofwater bodies, soils, biodiversity, ecosystems services, fossil fuels and atmospheric quality ensured forfuture generations.

Conclusion

Natural resources, especially those of soil, water, plant and animal diversity, vegetation cover,renewable energy sources, climate, and ecosystem services are fundamental for the structure andfunction of agricultural systems and for social and environmental sustainability, in support of life onearth.The cultivation of land for effective crop growth and raising of livestock. farmers engagedirectly in articulation by preparing soil and planting crop. Narrating those crops and preparing them soil in the market is also part of agriculture activities.sustained agricultural productivity is closely linked to the quality of ecosystem services that natural resources provide.

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Environmental Literature as A Genre

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In the present literary scenario post-colonial theory has achieved much acclaim through various discourses. As Gayatri Spivak has argued that the human subaltern cannot always be heard without the meditation of more privileged supporters. As such how subordinated non-human can be heard. Hence it's time to think about the natural world, which is dominated and destroyed partially by human-world. In this period of Globalization, we also use to call 'Global Village' in which all the matters i.e. social, political, cultural, religious etc. are revolving around the environment.In this post-modern period, we become fully aware about the environmental issues. The calamities like - global warming, soaring temperature, air pollution, water pollution, heavy rainfall, droughts, flood, earth quakes, disturbance of seasons, less winter seasons made us aware about the crucial role of environment to the human world. We cannot ignore that it is the physical world and its cycle on which human world survives.In this decade these ecological problems made us aware that due to human being's blind use of resources and the invention of so called scientific development, explosion of population, implementation of nuclear power energy plants, enlargement of irrigation and fertile land, Dam projects etc. has disturbed the ecological system and that's why environment started reacting vigorously against human being.How we ignore that human species is one of the elements of natural world system. If we dissect the human body, we do find the elements of nature – carbon, iron, hydrogen, water etc. For our survival we are totally depend upon nature i.e. water, air, food etc. From the very birth to the end of life, we are totally depending upon the ecological aspects. Instead of caring the environment and it's values, human being knowingly or unknowingly has been destroying it for the sake of so called development.Post-modern man has become aware about the fact and reality. Hence each and every nation has been trying to take effort to restore the eco-system. Prominently U.S.A. and particularly UNO have been functioning well from the last mid-decade, through various ways and policies. The first global climate change agreement brought developed countries together on meeting carbon emission target to control global warming.Till the 1990's environment was at best a marginal topic only deals with social responsibility and green activism. But now-a-days it has become a serious ' Global Concern.' As far as Indian context is concern, UPA government also launched 'The National Action Plan' in 2008 for correcting the environment. Globally we are experiencing soaring temperature, shorter winters and unseasonal rainstorms. Now this Global warming started to impact on sea level, rain patterns, agriculture, food, and usable water resources. Due to global warming the seasons are becoming unpredictable India, being a tropical area has highly complex eco-systems due to geographical, regional, social and cultural diversities. Hence it is very difficult to restore, if it fully destroyed. India has started to face the critical situations created by man to the natural world. History itself is the proof that Indians have faced tragedies of two kinds - 'asmani and sultani' as per old saying. For example in 2004, tsunami perished thousands of people.Ironically, we say that our country has done much progress in agriculture but it was true in past. In fact the growth of Indian agriculture is below 3 % a year in the last decade due to shortage of water, drought, soil degradation and short winter season. And every year, 20 % percent agricultural products have been decreasing due to land and soil degradation. Indian economic business is the worst and unkind to the environment. Growth of coal mines in Chhattisgarh, Andrapradesh, Orissa, Jharkhand, and West Bengal has barren the land by spreading fly dust and heat. Total ecological system is being collapsed. In short, post modem civilization has made this natural world as part of human world i.e. Nature as a part of production.

Why Environment literature?

Literature is called the mirror of society. But the literature which depicts environment is a special kind of mirror. It delineates the ecological issues with reality. Literature reflects the contemporary issues and how it could remain unaffected by such hot ecological problem. In post modem literature, we find some writers have taken effort to portray the realistic and bitter condition of human and non-human world and attempt to lead us to think and implement. Only literature is capable than other social sciences or such as far as restoration of natural world is concern due to its effect which directly touches the heart and head and allows every one for his or her involvement. Nowadays academicians are responding to the global environment crisis by turning to the new field of literary ecology. Literary person has become more curious and aware about the environmental degradation. Hence literary academicians need to interpret the work through the perspective of environment issues. One of the most important academic events attracted literary person to go through this new branch of knowledge i.e. ' Eco-criticism', a new theory brought by Cheryll Glottfelty and Harold Fromm in 1996 by publishing ' The Eco-criticism Reader's Publication.' It has broad approach and it is also known as 'Green studies', 'Eco-poetics' and 'Environmental Literary

Criticism'. Glottfelty simply defines 'eco-criticism is the study of literature and environment'. Eco-criticism has an interdisciplinary point of view, where all sciences support and analyses the environment to get possible solution for the correction of the surrounding environment. Eco-criticism mean not only the application of ecology and ecological principals to the study of literature, but also the theoretical approach to the interrelation web of natural, cultural and supernatural phenomena. It is the discourse which explores literary texts. Camilo Gomides, an eco-critic gives an operational definition. He says that eco-criticism is: "The field of enquiry that analyses and promotes works of art which raise moral questions about human interactions with nature, which also motivating audiences to live within a limit that will be binding over generations".Ecology, a way of thinking about nature and Environment considers as a more inclusive term that describes the natural and human world. Arthur Lovejoy rightly observes that the term nature i.e. environment expresses the standard of human values, the identification of the good with which is 'natural' according to nature. Rajiv Gandhi also said directly the same in his speech in the context of environment: 'development which destroys the environment eventually destroys development itself.' Through the perspective of ecology or environment, we may able to classify this genre in subgenres such as - cultural ecology, socio ecology, eco-environmental etc. In Environmental literature environmental issues are an integral part of human and ecological existence. That's why it offers a common ground between human and non human to show that how they can co- exist in various ways. Significantly Glottfelty Says: "an environmental problems compound works as usual seems unconsciously frivolous. If we are not part of the solution, we are part of the problem. "(Glottfelty, 1996 xxi)Our cities and villages are located near or at the bank of big or small rivers itself proves that Indian culture always have accepted to remain part of ecological system for survival. There is much co-existence between human and non-human world for caring each other for the survival and economy. In Indian perspective, we do find number of myths, legends, folklores and abhangas with full of natural landscapes and its relation to the human world. We do find the image of nandi(bull), snake, peacock, elephant, tiger, tortoise etc. in or at the gates or feet of temples, which suggest the religious and holy attitude to these non-human world. Indians extend his gratitude to these non-human worlds like God as such. It means in Indian cultural and religious context natural world has much importance and reverence as well. Natural world has deep history at the center of our everyday life and culture. In Indian mythologies there are many references of natural objects which we have considered holy.In Kamala Markandaya's 'Nectar in Sieve' (1954), she bitterly projects degradation of ecology. In the novel, there is a clash between western materialism, agro-industrialism and Indian rural eco-system, which is danger. The south Indian village is unable to save the eco-system and rural ecological values due to materialistic greed. In another novel 'The Coffer Dams', also there is the conflict between tradition and modernity. The emergence of scientific and technological knowledge and it's use for establishment of new factories and industries, dams and buildings kills the very beauty of surrounded natural world. The history of human evolution tells us that nature - jungle, river, country side, mountains are an integral parts of human life, and which is threatened by modern development. 'The Coffer Dams' is apparently an ecological statement. The damming of a free flowing river that feeds a hundred eco-systems is a direct attack on environment and its cycle.

Conclusion

Why should why we learn ecology literature? Because it leads us further maturity and growth that goes beyond humanity to including non-human world.

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A Study on Agri - Preneurship in India

Dr. Vijay Kumar Gonekar

Abstract –

Indian Economy Is Basically An Agrarian Economy; It Can Serve A Platform For Agricultural Entrepreneurship Food Processing And Other Allied Activities."Agri Prenership Have The Potential To Contribute To A Range Of Social And Economic Development Such As Employment Generation, Income Generation, Poverty Reduction And Improvement In Nutrition Health And Overall Food Security In In The National Economy. Agri Preneurship Has Potential To Generate Growth, Diversifying Income Providing Employment And Entrepreneurial Opportunities In Rural Areas. This Paper Mainly Focused On Basic Concepts of Agripreneurship, And Need Of Agripreneurship Development In India"

Key Word - Agriculture Preneurship Economy Agriculture Products Farmers

Introduction -

Agriculture has alwaya been the backbone of the Indian economy and despite concerted industrialization in the last six decades, agriculture still occupies a place of pride, the significance of agriculture in the national economy arises from the role it plays in Indian national income, employment and export.Agricultural products –Tea, sugar, oilseeds tobacco, spices etc. constitute the main export item of india, broadly the proportion of agricultural goods which were exported came 40% of our exports.

Indian economy is basically an agrarian economy, it can serve as a platform for agricultural entrepreneurship, food processing and other allied activities.Large number of persons, employed in agriculture are disguised nature which forces them to migrate from rural to urban areas further creating pressures on cities. This situation can be changed by generating employment opportunities for the rural areas. Agri-preneurship can be used as best treatment for the solution of this problem. Developing entrepreneurship in agriculture will result to -

1. Control migration from rural to urban areas
2. Support industrial development in rural areas
3. Generate employment opportunities for rural youth.

Objectives Of Study -

1. To know and understand the concept of rural entrepreneurship
2. To study the need and scope of agri-preneurship in india.
3. To anlyaze the problems faced by agri entrepreneurs
4. To suggest remedies to solve the problems of Agrientrepreneurs.

Hypotheses Of The Study -

1. Agri-preneurship provides additional income source to the farmers in their own land.
2. Due the development of agri- preneurship farmer's problem would be solved.

Research Methodology –

The research paper is conceptual in nature. In order to develp basic insight regarding the concept. The researcher has made use of secondary data. The researcher has referred books, journals, magazines and newspaper in addition to visits to various websites

Agricultural Entrepreneurship –

Agricultural entrepreneurship primarily related to the marketing and production of various agricultural products. Agricultural entrepreneurship in also related to agricultural inputs. Examples of areas where agricultural entrepreneur's associate themselves include dairy, forestry and horticulture, production and marketing of agricultural inputs and outputs.

Need For Developing Agri Preneurship In India –

India is likewise called as "agriculture commanded nation." Agriculture assumes vital part in the Indian economy is confirmed by the certainties that it contributes 22 percent to the aggregate gross residential items, gives business to around 65 percent of the aggregate work constrain and contributes 14.70 percent of aggregate fares of the nation. Over the period of time, the contribution of agricultural sector in GDP in India has declined to 13.70 % in 2012-13 from 51.9% in 1950-51. This decline is result of the shift from traditional agricultural economy to industry and service sector this performance are very meages if we considers the size of the employment in this sector, in 2013-14 the GDP contribution of agricultural sector has been improved to 18% more than 50% of people are employed in agricultural sector contributing to only 14% of GDP, with respect to agricultural production India stands second but as far as export are concerned it is ranked 14th in the world. It is reported that the India's average agricultural production per hectare is only half of the of the world's average (50%) which indicate the need and potential for development of this area.

Scope Of Entrepreneurship Development In Agriculture –

There is a vast scope for entrepreneurial activities in the agriculture sector. By establishing a link between agriculture and allied industries. The rural entrepreneurs can exploit opportunities in the areas of farming processing and marketing. The government has given priority to agriculture related programmed and ensured flow of credit to small and marginal farmers through refinancing facilitates and by establishing national bank for agriculture and rural development.Opportunites for Agri Entrepreneurship **(See in the nextpage)**

Problems in Developing Agri-Preneurship –

Developing entrepreneurship in agri-business is as much useful is not so easy and simple. In fact, there are several challenges but not confined to the following only, involved in developing entrepreneurship in agri-business.

1. Lack of skilled and managerial manpower in rural areas in mainly due to the absence of suitable educational institutions in rural areas. Moreover, people even otherwise belonging to rural areas do not want to go back to rural areas suffer from.
2. Rural Areas suffer from the lack of or weak infrastructural facilities in term of road, rail, electricity, market information network etc. This is turn adversely effects the effective use or agri resources available on the one hand and efficiency and mobility of labour on the other.
3. Major marketing problems faced by agri-entrepreneurship are lack of marketing channels and networks promotional facilities support system, poor quality of products, and competition with medium and large scale enterprises.
4. Lack of required equipments and technology has been one of the major challenges faced by agri-preneurs.
5. Farmers demanding the production on credit basis, insufficient cash in hand while starting the business, illiteracy and lack of knowledge of the farmers. In proper marketing and infrastructure etc.

Suggestions -

1. The agri entrepreneurship should be provided finance at concessional rate of interest and on easy repayment basis.
2. Agri-entrepreneurship should be ensured of proper supply of scarce raw materials on priority basis. A subsidy may also be offered to make.
3. Proper encouragement and assistance should be provided to rural entrepreneurs for setting up marketing co-operatives. These co-operative shall help in getting the inputs at reasonable rate and the are helpful in setting their products at remuneration prices.
4. Training is essential for the development of entrepreneurship. It enables the rural entrepreneurship to undertake the venture successfully as it imparts required skills to run the enterprises.
5. The financial institutions and bank which provide finances to agri entrepreneurs must create special cells for providing easy finance to rural entrepreneurship **Conclusion -** Agri entrepreneurship is a key figure in economic progress of india. Agri entrepreneurship is the way of converting developing country into developed nation. Agri entrepreneurship is the answer to removal of rural poverty in india. It is suggested that agro based entrepreneurship mission and the agro based entrepreneurship education should go hand in hand. Mass Employment generation is possible with agri based industrialization.

Opportunites for Agri Entrepreneurship

Agri and Food Inputs	**Producation and warehousing**	**Logistics and Distribution**
Seeds	Food Corporation of India	Ports
Fertilizers	State Warehousing corporation	Reefes Transport
Agro chemicals	Central Warehousing	Caterers
Agri biotech	Pvt. Warehousing	
Farm machinery	Cold Storages	
Irrigation	Floriculture	
Poultry Feed and equipment	Greenhouses	
Dairy feed and equipment		
Aqua and fishery fees and equipment		
Food packaging		
Trading	**Processing**	**Food Retail and Food Service**

Edibile Oil	Grain Milling	Hyper Markets
Spices	Edible Oil Fast Food	
Grain	Dairy Beverage Chains	
Fruits and Veg.	Fruits and Veg	Oliver Market
Commodity Exchanges	Sugar	
	Bakery	
	Poultry	
	Marine and Fishers	

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Multiple Benefits of Fenugreek: Overview

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Abstract

Fenugreek (Trigonella Foenum Graecum) is one of the most popular medicinal plant. It has been generally used everywhere in the world. The Fenugreek is a member of leguminious family. It is a herb that is similar to clover. Fenugreek seeds and leaves are used in medicine, and in cooking. The Fenugreek potential health benefits such as antioxidant, anti-diabetic, hypocholesterolemic, lactation aid, antibacterial, gastric stimulant, anticancer and immunological activities etc. Fenugreek has essential nutrients elements such as choline, biotin, inositol, vitamin-A, vitamin-B, vitamin-D, Iron, soluble and insoluble fiber, protein and gum content. It is wonderful functional and medicinal value of Fenugreek. The plant is used in traditionally in Indian ayurvedic medicines.

Keywords: Fenugreek (Trigonella Foenum Graecum), Anti-Diabetic, Anti-Inflammatory, Phytochemicals, Fenugreek gum, Health benefits.

Introduction:

Fenugreek (Trigonella Foenum Graecum) is one among the traditional oldest cultivated medicinal plants. Fenugreek cultivated 70-97 different types of species cultivated around the world. Fenugreek commonly known as menthi in Hindi, It is belongs to the fabaceae family. It is wonderful functional and medicinal value of Fenugreek. The plant is used traditionally in Indian ayurvedic medicines. Fenugreek is using since thousands of years ago for treatment of medicinal use for skin, hair condition. The Fenugreek contains rich in several phytochemicals, alkaloids, steroids, carbohydrates, proteins, mucilage, fiber, amino acids, saponins, and mineral. Fenugreek contains potential health benefits such as antioxidant, anti-diabetic, hypocholesterolemic, lactation aid, antibacterial, gastric stimulant, anticancer and immunological activities etc. It contains essential nutrients elements such as choline, biotin, Inositol, Vitamina-A, Vitamin-B, Vitamin-D, Iron, soluble and insoluble fiber, protein and gum content. It has been used as flavor enhancer in several traditional foods. Its seeds and powder also are utilized in many Indian dishes for their nutritional profile.

Cultivation And Morphology: Fenugreek is most common vegetables plant grown all over the country. It is annual plant, belongs to leguminous. Fenugreek roots are massive finger like structure (Basu.2006, Mehrafarin.et.al.2011) Fenugreek stem long cylindrical, an erect, smooth, herbaceous plant that can grow up to a height of 40-80 cm. Fenugreek having pinnate compound leaves, trifoliate, stipulate long stalked leaves are similar to clover in shape. Flowers are in pea-shaped white (or) yellow in color, pods are thin and crescent-shaped and brownish to yellowish brown in color and having 15cm long each pod contains 10-20 seeds. The seeds are small 6-8 nm long, hard, smooth, oblong, yellow to brownish yellow in colors. Bulk of the seed is dietary fiber and protein both of which have no taste or flavor. Fenugreek is fast growing plant, it is grows on dry grass lands, cultivated or uncultivated lands. It is drought tolerant plant and grows well in tropical climate throughout the year, especially mostly in rabbi season good for cultivation. A rich well drained loamy soil is best suitable for fenugreek cultivation, and the germination time of 5-10 days, after germination trifoliate leaves are appearance. Names, scientific classifications are as follows.

Taxonomy

Kingdom: Plant,
Family:Fabaceae,
Genus:Trigonella,
Species:T.Foenum-graecum,
General and English name: Fenugreek,
Indian Name:Methi, Kasurimethi, sagmethi

Medicinal Properties Of Fenugreek Fenugreek seeds, green leaves having several health benefits, and medicinal qualities like antioxidant, anti-diabetic, hypocholesterolemic, lactation aid, antibacterial, gastric stimulant, anticancer and immunological activities.

Vitamins And Minerals Of Fenugreek: Fenugreek mainly contains essential nutrients elements such as choline, biotin, inositol, Vitamin-A, Vitamin-B, Vitamin-D, Iron, soluble and insoluble fiber, protein, and gum content, and niacin, nicotinic acid where as germinating seeds contains ascorbic acid, and pyridoxine, calcium pantothenate. Fenugreek have a good amount of sulphur and phosphorous. It is also having high amount of zinc, calcium and iron.

Fenugreek Gum: Fenugreek gum is derived from the endosperm of the seeds, it is having galactose and mannose. It can be used for stabilizing, thickening, and emulsifying food agents. Fenugreek gum comparing with other gums it is very less exploited in the food industry.

Improve Production Of Milk: Fenugreek seeds, green leaves are used in lactation aid; it helps to stimulate breast milk production. After delivery of women's drank three cups of Fenugreek tea daily for two weeks it improves mother's breast milk.

Anti-Diabetic: Anti-diabetic 4-Hydroxyisoleucine (amino acid) stimulates insulin production thereby control blood sugar level. Polyphenolic compounds show anti-diabetic effects curative, effects of fenugreek seed powder is a potential neuropathic medicine in diabetes. Took 50 gms of fenugreek seed powder at lunch and dinner it control the diabetes. (kaviarasan.et.al.2007)

Anti-Oxidant Activity: Fenugreek having Flovonoids to helps in anti-oxidant activity. Fenugreek seed extract has been reported to stop lipid per oxidation and hemolysis in RBC. Fenugreek seed having anti-oxidant and protects cellular structures from oxidative damage.

Phytochemicals: Fenugreek has rich in several phytochemicals, carbohydrates, alkaloids, steroidal, amino acids, saponins and minerals. It has been used as a flavor enhancer in several traditional foods. The different saponins are to be found to be high level concentration in the fenugreek. The photochemical constituents act as hypoglycemic, cholagogic factor, and antilipidemic, and their use should be promoted to manage hypercholesterolemia and diabetes mellitus.

Conclusion: The Fenugreek is having the major medicinal properties such as antioxidant, anti-diabetic, hypocholesterolemic, lactation aid, antibacterial, gastric stimulant, anticancer and immunological activities etc. Fenugreek mainly contains essential nutrients elements such as choline, biotin, inositol, vitamin-A, vitamin-B, vitamin-D, Iron, soluble and insoluble fiber, protein and gum content. It is having beneficial influence on digestive problems, including constipation, loss of appetite, and gastric. The Fenugreek is useful in the treatment for number of diseases. The Fenugreek seed helps not only reduce blood sugar levels due to its high concentrations of phytochemicals, but also helps to reduce low density cholesterol. The Fenugreek helps the functional, nutritional and therapeutic characteristics of fenugreek can be exploited further in the development of healthy products.

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Geographical Study of Population Dynamics in Osmanabad District

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Abstract:

Population dynamics denote the trend of changes in population of a region. An attempt has been made to analyze the spatio-temporal changes in population growth, sex-ratio, density and literacy rate as well as levels of urbanization. The most striking changes in the population characteristics of Osmanabad is seen in the sphere of urbanization and density of population. High density of population has caused human pressure on the land, which created huge difference man-land ratio. As per 2001 census, the man-land ratio was 0.66 hectares in the district. The sex-ratio has been continuously declined from 1961 census in the district with only some exception. As regard to males and females literacy rate, there is more difference among males and females literacy rate within the district. In 1961, the urban population was recorded 69,638 number (9.59 percent to the total population), which increased to 4, 38,853 number (29.92 percent) in 2001.

Key words: Population dynamics, density, sex-ratio, literacy rate.

Introduction:

Of all geographic attributes, population is by far the only animate element, which has far reaching effects in modifying the physical-cultural face of the earth (Tiwari, 1978, p. 125). Its size determines the nature and pattern of human development, while its distribution shows the varying nature of man's adjustment with physical sources (Singh, 1977, p. 21). The physical attributes of an area become resources, only when its people are able to use them. The relationship between population and resources is greatly hampered by socio-economic development of a nation. Which is becomes one of the main issues in the national as well as international, mainly because of rapid population growth in the post-independent period.

The Study Area: Osmanabad district is situated between 17^0 37′ to 18^0 42′ North latitudes and 75^0 17′ to 76^0 47′ East longitudes, with a total geographical area of 7569 sq.kms. The district has shares the boundary with Beed district in north, Latur district in east, Karnataka state in south-east, Solapur district in south-west and Ahmednagar district in the north-west.

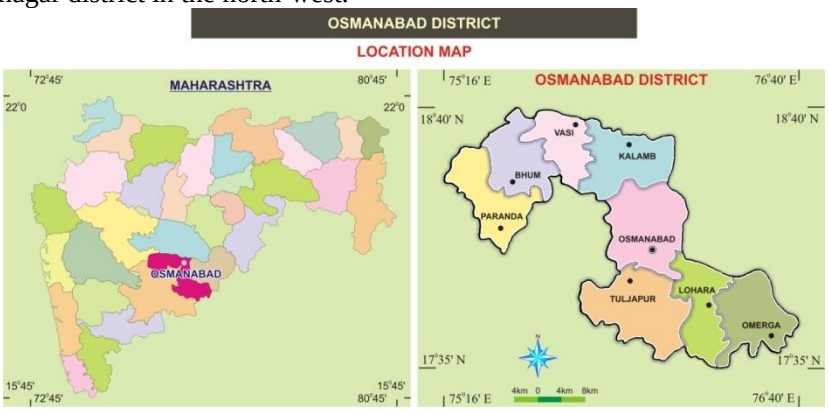

Fig. 1: Location Map of Osmanabad District in Maharashtra State.

Osmanabad has total population of about 14,86,586 (2001), out of which 70.47 percent live in rural area and 29.53 percent in urban area and district lives on the Balaghat Plateau. The plateau region rises rather steeply from the plain in the west and slopes gently towards the east. The climate of the district is generally dry except during the monsoon season, Osmanabad district has comprised eight tahasils, viz. Omerga, Lohara, Tuljapur, Osmanabad, Kallam, Washi, Paranda and Bhoom. The average density of population is 196 persons / km^2 (2001).

Objective of the Study:

The main objective of this study is to examine the dynamics in population characteristics of Osmanabad district.

Data base and Methodology: The study is based on secondary data, collected from census publications, covering the period from 1961-2001. The collected statistics of population has been processed and tabulated. Cartographic method is used to show the statistical data.

Population Growth: The population of Osmanabad district has been increased about 7,60,550 persons during the last 40 years from 7,26,036 (1961) to 14,86,586 (2001), at an average annual rate of 2.48 percent.

Table – 1. Population Growth of Osmanabad District (1961 – 2001)

Years	Total Population	Percent Decadal Variation		Percent Annual Growth	
		Osmanabad	Maharashtra	Osmanabad	Maharashtra
1961	7,26,036	20.35	23.60	2.02	2.36
1971	9,28,227	28.28	26.45	2.80	2.70
1981	10,29,702	10.75	24.54	1.07	2.40
1991	12,76,327	23.88	25.70	2.30	2.50
2001	14,86,586	16.50	22.60	1.60	2.20

Source: Osmanabad district statistical abstract.

Which is less than the average corresponding growth rate of the state (3.05 percent) from 1961-1971. The population increased by 28.28 percent when planned economy took place in the country with the significant changes in its demographic structure. Whereas, 1971-1981 decade, the population growth (Table-1) of the district was recorded 10.75 percent, which is less than state average (24.54 percent). During the period of 1981 and 1991, the population growth of the district was marked from 10.75 to 23.88 percent in the corresponding decades, which was very close to the average growth rate trend (Table-1). Surprisingly, during the last decade (Fig.-2), 1991-2001, the rate of population growth shrinks down to 16.50 percent, which shows on stability in the growth. Which would have been altered the land use pattern with in district. As a result, saturation stage might have reached in the district, which checked the population growth.

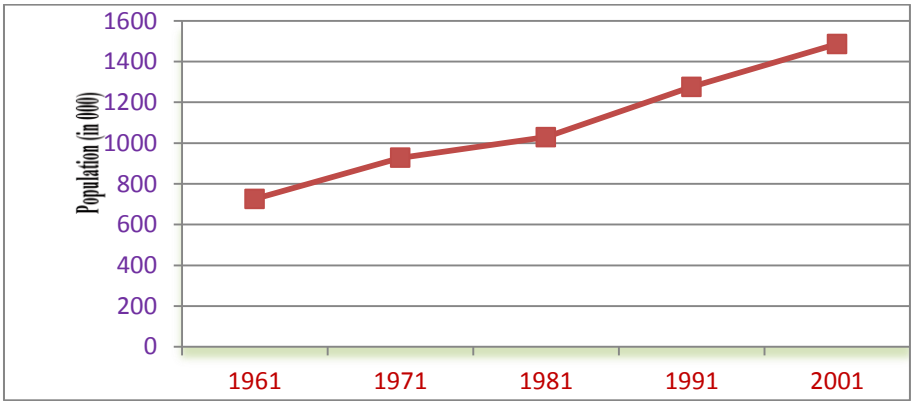

Fig. 2. Trend of Population Growth in Osmanabad District.

Sex-ratio:

The sex-ratio denotes male-female ratio in population. For this, number of females per 1000 males is commonly taken into account. A very high preponderance of one sex would tend to led to a lowered fertility and slower growth and thus, it creates demographic imbalances. Table – 2 illustrates the changes in the sex-ratio of the district as well as state from 1961 to 2001. It is noticed that the sex-ratio has been continuously declined since the 1961 census, with only some exceptions. In the beginning of 1961 census, the district sex-ratio was 948, which declined to 932 in 2001. Whereas, state sex-ratio was marked 936 in 1961, as against in 2001 was 922. However, the district sex-ratio was higher than the state sex-ratio in period understudy. Prevailing practices of dowry system, dowry death, low status of women in the family etc. are responsible for the determination of sex-ratio of Osmanabad district.

Table – 2. Population Dynamics of Osmanabad district for 1961-2001.

Year	The Sex-ratio (No. of females per 1000 males)		Density (Persons/sq.km.)		Literacy rate (Percentage)	
	Osmanabad	Maharashtra	Osmanabad	Maharashtra	Osmanabad	Maharashtra
1961	948	936	100	129	19.70	29.80
1971	947	930	129	164	29.10	39.20
1981	958	937	136	204	42.99	47.20
1991	937	934	169	257	57.27	64.90
2001	932	922	196	314	69.02	76.90

Source: Census of India, 1961 – 2001.

Density of population:

Density of population can be defined as the number of persons inhabiting one sq.km. of an area on an average and is calculated by dividing the population by an area. Man-land ration is a very important

aspect of demographic study. The density of population in Osmanabad district was 100 persons /sq.km. in 1961, which increased to 196 persons /sq.km. in 2001. Whereas, in the state 129 persons /sq.km. in 1961 and 314 persons/sq.km. in 2001 (Table-2). The density of population both Osmanabad and Maharashtra state was became double during the period understudy. As consider to increase in population density; it is noticed that high decadal increase of 29 percent and 24.26 percent were seen in the decades 1961-71 and 1981-91 respectively in the district, whereas in Maharashtra. The decadal increase was registered 27.13 percent and 25.98 percent respectively during the same period of time. In the last decade (1991-2001) increase in population density was recorded 15.97 percent in the district, as against 22.17 percent of the state.

Literacy:

There are some differences between literacy and education. As per the latest census definition, a person aged seven and above, who can both read and write with understanding in any language is treated as literate.It is not necessary that a person, who is literate, should have received any formal education or should have passed any minimum educational standard. The census 2001 results indicate that the district has registered 69.02 percent growth in literacy as against 76.90 percent in the state. Literacy, both among males and females has increased considerably after independence. The literacy rate of population aged seven years and above has improved from 19.70 percent in 1961 and 69.02 percent in 2001. According to 2001 census 80.42 percent males and 56.89 percent females in the district are literates. Whereas, state literacy rate among males and females are recorded 86.00 percent and 69.00 percent was observed in the same year. Still there is a wide gap between male and female literacy rates and government has to make consented efforts to increase pace female literacy. Literacy rate of different tahasils with that of district, it is observed that literacy rate of Osmanabad (72.75%) and Kallam (70.81%) is above the district. Whereas, all the remaining six tahasils of Osmanabad district, the literacy rate is to be low. Among the districts in Maharashtra, as per 2001 census, Osmanabad rank twenty fourth in the respect of literacy rate.

Urbanization:

India is known as country of villages because vast majority of the population is still living in rural areas, the urban population is increasing day by day. The process of urbanization is very gradual and slow. In the year 1961, the urban population was recorded 69638 (9.59%), which increased to 438853 (29.52% to the total population) in 2001. This indicate, almost ⅓ of the total population of the district resided in urban area. Whereas, in Maharashtra the urban population was 28.80 percent in 1961 and which was increased to 42.40 percent in 2001. It can be summarized that against the 29.52 percent urban population in Osmanabad, 42.40 percent of population in the state resided in urban areas in 2001. In 2001, there were eight towns in the district. As record the decennial growth, highest growth was seen (48.92%) in 1990's, which is increased to 20.17 percent in 2000's. Highest proportion of urbanization is found in Osmanabad tahasils, whereas lowest is marked in Kallam in the same year.

Conclusion:

The excessive population growth has substantially modified the demographic characteristics of the district. Whereas, the population growth rate moves up and down trend. The growing imbalance in the sex-ratio is also noticed in the Osmanabad district, which is recorded 932 females per 1000 males (2001), it is higher than the state sex-ratio (922). In fact, Osmanabad district marked a lower density (196 persons / sq.km. in 2001) as compared to the state average density (314 persons / sq.km.). According to the 2001 census, total literacy rate was registered 69.02 percent, which is not sufficient. In the recent past urbanization process is continuously accelerated in the district, that's why, presently 29.52 percent of population is living in urban area.

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Remote Sensing and GIS Application In Agriculture And Natural Resource Management

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Abstract:

Agricultural production systems are extremely subject to regional differences in climate, soil, and topography. All of these aspects must be examined on a spatiotemporal basis in order to ensure sustainable agriculture management. For its assessment and administration, sophisticated tools such as remote sensing, global positioning systems, and geographic information systems can be very useful. . Remote sensing and geographic information systems (GIS) are critical tools with a wide range of applications for addressing these concerns. Crop discrimination, crop growth monitoring / stress detection, crop inventory, soil moisture estimation, crop evapo-transpiration calculation, site-specific management / precision agriculture, and crop acreage estimation are only a few of the applications for these technologies in agriculture. Producers, managers, and policy planners can benefit greatly from timely and reliable information on crop acreage, growth condition, and yield estimation when making tactical decisions about food security, import/export, and economic effect. Remote sensing and GIS techniques can be used to provide such information on a regional scale. Land use / land cover analysis, as well as damage assessment due to drought, floods, and other extreme weather events, can all benefit from remote sensing and GIS. In this study, an attempt was made to assess and evaluate the most recent material.

Key words: Climate change, Crop acreage estimation, Crop growth monitoring, Crop yield prediction, Geographical information system, Remote sensing

Introduction

Global warming coming about because of green house impact has undermined the maintainability of normal assets also, agribusiness in numerous areas over the world's surface. Huge ascent in outrageous climate occasions has been noticed internationally in the new past. Nilam twister of 2012, Uttrakhand avalanches and surges of 2013 and Hudhud tornado of 2014 are the new instances of such occasions in India, which have sweeping long haul financial effects. A dangerous atmospheric devation set off climatic changes and outrageous climate occasions altogether affect agribusiness. As a result of enormous varieties in climatic conditions, crops need to experience the ill effects of various kinds of stresses prompting diminished yield usefulness and year to year inconstancy. Under such conditions, quickly arising far off detecting and geospatial innovation can be of extraordinary assistance for crop development observing, distinguishing proof and the executives of various kinds of stresses and local yield assessments to support the normal assets and horticultural usefulness. Atzberger (2013) has represented five significant uses of far off detecting in agribusiness including biomass and yield assessment, vegetation life and dry season pressure observing, appraisal of harvest phenological improvement, crop grounds assessment and cropland planning, planning of unsettling influences and land use land cover changes notwithstanding accuracy horticulture and water system the executives.Agribusiness in India is ruined because of little land-possessions, deficient assets and absence of agro-innovative data. Under the changing climatic situations, horticultural arranging and utilization of farming advancements need exact spatio-transient meteorological and yield data for precise information investigations, estimates and their compelling application in agrarian arranging and the executives choices, water system planning, crop pressure the board and readiness for cataclysms and maintainability of regular assets and environments over various districts. The expansive target of manageable agribusiness is to adjust the innate land assets with crop prerequisites, giving unique consideration to enhancement of asset use towards accomplishment of supported efficiency over an extensive stretch (Lal and Penetrate, 1991). Albeit the regular strategies for obtaining climate and yield development status data are dependable, yet they are work serious and tedious. Nonetheless, as of late far off detecting (RS) and topographical data framework (GIS) advancements are acquiring significance for gaining spatio-fleeting meteorological and yield status data for supplementing the conventional techniques. Far off detecting information can enormously add to the checking by giving convenient, concise, cost-effective and redundant data about the world's surface.Quick spatiotemporal assessment of extreme weather events and agricultural development status, including crop stress detection and damage, is necessary under changing climatic conditions.Using traditional methods to assess is tough. In such circumstances, geospatial technology, such as remote sensing and GIS, can be used to acquire and manage large amounts of spatio-temporal data by utilising satellite data, digital maps, and simulation models, among other things. Because of the rapid and recurring data availability, quick analysis, and generation of relevant information for decision-makers and policy planners, this technology is extremely beneficial.

Remote sensing technology has the potential to transform the way we live.Remote sensing is a low-cost option for collecting data over wide geographic areas (De beurs and Townsend, 2008). By superimposing several basic layers and using remote sensing and GIS, it is possible to create spatio-temporal basic informative layers and generate useful integrated information. Floodplain mapping, hydrological modelling, surface energy flow, urban development, land use changes, crop growth monitoring, and stress detection are just a few of the applications for this technology. Today, remote sensing has the potential to be a useful management tool in precision agriculture for site-specific crop management (Casady and Palm, 2002).

Aspects fundamentals

The core notion of remote sensing data gathering is based on the spectral reflectance characteristics of various surface components. The introduction of multispectral and hyperspectral remote sensing technology has broadened the technology's uses in a variety of industries. Because multispectral reflectance and temperatures of crop canopies are linked to two major plant physiological processes, photosynthesis and evapotranspiration, these technologies have a lot of potential in agriculture. Chlorophyll pigment absorbs blue and red light and reflects green light . The proportion of radiation that is reflected.

Bug pervasion

The far off detecting approach in surveying and observing creepy crawly defoliation has been utilized to relate contrasts in ghostly reactions to chlorosis, yellowing of leaves and foliage decrease throughout a given time-frame accepting that these distinctions can be connected, grouped and deciphered (Franklin, 2001). The scope of far off detecting applications has included distinguishing and planning defoliation, portrayal of example unsettling influences and so forth and giving information to bother the executives choice emotionally supportive network (Lee et al., 2010). The chance of anticipating and weakness of backwoods braid to creepy crawly defoliation has additionally been accounted for as device for convenient administration (Luther et al., 2004). William et al. (1979) assessed various kinds of vegetation records on Landsat symbolism gained previously, then after the fact defoliation to separate among sound and unfortunate vegetation cover. Corridor et al. (2003) likewise utilized Landsat multi-transient change identification way to deal with map defoliated woodland of Canada which showed comparable outcomes with different investigations being done. Clerke and), (not really settled the degree and seriousness of vagabond moth invasion in Virginia utilizing symbolism gained by SPOT. Creepy crawly defoliation episode has additionally been contemplated utilizing MODIS information (Kharuk et al., 2007). De beurs and Townsend (2008) presumed that MODIS information address a significant instrument for bug harmed defoliation and assurance of vegetation records in plot scale.

Water asset the board

In the new many years, the shortage of water assets is being competent at worldwide and local level and, accordingly, should be overseen prudently by applying the cutting edge advances. Distant detecting is one of the successful apparatuses for surveying and checking the water assets. This innovation has been broadly utilized in water asset applications (Gitelson and Merzlyak, 1996; Zagolski et al., 1996; McGwire et al., 2000; Coops et al., 2002; Underwood et al., 2003) and specifically, hyperspectral distant detecting is arising as the more top to bottom method for examining spatial, otherworldly and fleeting varieties to determine more precise assessments of data needed for water asset applications. The approach of microwave far off detecting has made conceivable the evaluation of soil dampness accessibility from distant detecting information.

Accuracy horticulture

Far off detecting innovation is a critical part of accuracy cultivating and is being utilized by an expanding number of researchers, designers and huge scope crop cultivators (Liaghat and Balasundram, 2010). Accuracy cultivating focuses on decreased expense of development, further developed control and further developed asset use productivity through data got by the sensors fitted with the ranch apparatuses. Variable rate innovation (VRT) is the most exceptional part of accuracy cultivating. Sensors are mounted on the moving homestead hardware containing a PC which gives input proposal maps and in this way controls the utilization of data sources dependent on the data got from GPS recipient.

Water and nutrient stress

One of the most important domains where we can use remote sensing and GIS in conjunction with precision farming is nutrient and water stress management. Using remote sensing and GIS to detect nutrient challenges can aid in site-specific nutrient management, lowering crop costs and increasing fertiliser usage efficiency. Water conservation in semi-arid and arid settings can be achieved by the application of precision technology. Drip irrigation, for example, along with information from remotely

sensed data such as canopy-air temperature difference, can be utilised to increase water use efficiency through redistribution.

and researched dampness classes in flood plain regions comparable to water changes, aggregation of residue and sediments for various land-use classes and erosive effects of floods. Roux and Dartus (2006) additionally assessed release and flood hydrographs from pressure driven data got from distantly detected information. Advancement techniques were additionally used to limit inconsistencies among reproductions and perceptions of flood degree fields to assess stream release.

Identification and control of weeds

Remote sensing technology uses differences in spectral reflectance characteristics of weeds and crops to identify weed infestation in crop stands and to aid in the development of weed maps by detecting the location of weeds within an agricultural field, allowing site-specific/need-based herbicides to be applied. Kaur et al. (2013) found that solid stand or pure wheat plots had greater radiance ratios and NDVI values than solid weed plots. Beyond 30 DAS, it was discovered that utilising radiance ratio and NDVI, pure wheat can be discriminated from pure Rumex spinosus populations. Rumex populations at various levels.

Evapo-transpiration estimation.

ET estimation is necessary for water resource management tasks such as water and energy balance calculations, irrigation scheduling, reservoir water losses, runoff prediction, meteorology, and climatology . Using remotely sensed data and surface energy balance techniques, it is possible to estimate spatial variability in evapo-transpiration across a large area.

Conclusion: With the rising pressure on natural resources due to the increasing human population, remote sensing and GIS can be used to manage these precious limited resources in an effective and efficient manner. Geospatial information are quite useful in the identification and analysis of factors that affect the utilization of these resources. Hence, with the detailed understanding of these factors, sound decisions can be arrived at that will ensure the sustainable use of natural resources to meet the needs of the current as well as future generations.

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Study Of Fish Marketing Trends Of Siddheshwar Reservoir, Hingoli District Maharashtra.

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Abstract

The Siddheshwar reservoir is a medium sized reservoir of about 2574 ha area, constructed on Purna River at Rapur camp Tq.Aundha Nagnath, Dist, Hingoli and near village Siddheshwar Tq. Aundha Nagnath, Dist, Hingoli in 1968. The reservoir lies in between north latitude 19°-0'-20" and East longitude 76°-45'-00". The reservoir is naturally situated in hilly region on both sides. Reservoir area is included in the survey of India toposheet map no 56A/10. It was the first ever-major project in Marathwada region to initiate the process of economics development of Marathwada region. The reservoir is having catchment area of 7770 sq km. the reservoir. During 05 years study duration i.e June 2005 to May 2010, the fish catch was distributed and marketed by different methods in different seasons. In India most of the fish produced and captured are sold in local domestic markets. Indian reservoir fish marketing are based on the needs and suitability of fishermen fish wages including their time and money conservation, as fishermen is involved in harvesting process hence pays less time to fish sale on regular basis. Hence Indian reservoir fish marketing trends are different and are under developing stage with unsatisfactory infrastructure and physical facilities.

Key words: Marketing trends, Inland Fish market, Siddheshwar reservoir,

Introduction

The present work was undertaken to study the Fish marketing trends in siddheshwar reservoir of Hingoli district with respect to study the Fishing tender and tender cost, Fish seed stocking , working pattern of fish Co-operative society, Fish harvesting, Fish fauna, and Fish marketing includes fishermen involved in fish marketing, market place including building infrastructure, cold storage, hygiene and sanitation facility, major species sold, women involvement and price structure and marketing system/trends of Siddheshwar reservoirMost of the markets were set on roadside in open in unclean, unhygienic conditions. Carps species constituted maximum share in total species sold followed by cat fishes.. Price rate structure in the fish marketing varied with different factors such as species, size, quality, season etc. Study also showed no involvement of women in fish marketing activities. The study also shows need of development of basic facilities in fish marketing system of Siddheshwar reservoir.

Material and method:

For the study of Fish marketing trends of Siddheshwar reservoir and various aspects of its fishery management, the data was collected by the survey to visit to D.F.D.O office Parbhani, fisher communities on the reservoir near the embankment and distributed on the periphery and backwater of the reservoir in 13 different villages. The data on structure and working of fish cooperative society was collected from fishermen and chairman of fish co-operative society named Mahatma Phule Matsyavyvasai Sahakari Sanstha Maryadit, Hiverkheda, Tq. Aundha Nagnath Dist. Hingoli.(4007/5000/2002/on dated 16/07/2002 and from chairman of Jai Jawan Matsyavyvasai Sahakari Sanstha Maryadit, at Shiraramwadi, Tq Jintur Dist. Parbhani. Reg No PBN/JTR/AGR/(0)/901/86 on dated 20/11/1986 during 2005 to 2008 by personal interviews, by questionnaires and photography. To get high yield of fish from the reservoir identification of problems in reservoir fishery management, sustainable use of natural resources, application of new techniques, socio-economic development of the dependant fisher community are essential considerations. Hence, to study the Fish Marketing trends of Siddheshwar reservoir as a case study the points taken into consideration are Fishing tender and tender cost, Fish seed stocking , working pattern of fish Co-operative society, Fish harvesting, Fish fauna, and Fish marketing includes fishermen involved in fish marketing, market place including building infrastructure, cold storage, hygiene and sanitation facility, major species sold, women involvement and price structure and marketing system/trends of Siddheshwar reservoir was collected by survey, study, observations, questionnaires and photography from active fishermen during June 2005 to May 2010 and the data was analyzed.

Result and Discussion.

1 Fishing tender and tender cost and Fish seed stocking

The history of Siddheshwar reservoir fishing tender allotted (lease holder) Agencies from year 2001 states that the fishing tender is not allotted to any fishing agency i.e. remained blank in 2001-2002 and fishing license were issued to fishermen from State fisheries department for fishing in Siddheshwar reservoir (D F D O, Parbhani). From year 2002, the fishing tender was allotted to fish co-operative societies. The detail of fishing tender allotted (leaseholder) Agencies is given in table 1

Table .1. Siddheshwar reservoir Fishing tender Leaseholder Agencies and tender cost (2001 to 2010).

Sr. No	Name of fishing agencies	Year of allotments	Fees paid by the agencies To Government	Fish seed stocked
1	Blank year	2001-2002	112 fishing license issued to fishermen by D.F.D.O,Parbhani	Not Stocked
2	Mahatma Phule Matsyavyvasai Sahakari Sanstha Maryadit, Hiverkheda, Tq. Aundha Nagnath Dist. Hingoli.(4007/5000/2002/on dated 16/07/2002	2002-2003	Rs 80680	22.75 lakh fry
3	Mahatma Phule Matsyavyvasai Sahakari Sanstha Maryadit, Hiverkheda, Tq. Aundha Nagnath Dist. Hingoli.(Div. office L. No 4007/5000/2002/on dated 16/07/2002	2003-2004	Rs 80680	0.45 lakh fry
4	Jai Jawan Matsyavyvasai Sahakari Sanstha Maryadit, Shiraramwadi, Tq.Jintur Dist. Parbhani. with RegNo PBN/JTR/AGR/(0)/901/86 on dated 20/11/1986 (Div. office L. No 4007/2340/2004/on dated 22/07/2004)	2004-2005	Rs 80680	0.27 lakh semifingerlings
		2005-2006	Rs 80680	0.875 lakh fry
		2006-2007	Rs 80680	5 lakh spawn
		2007-2008	Rs 80680	Not Stocked
		2008-2009	NA	Not stocked
		2009-2010	NA	Not stocked

Source; A.F.D.O, Siddheshwar Bhategaon and Masoli fish seed Hatchery Private Fish seed hatcheries and and D.F.D.O Parbhani.

2.Fish seed stocking;

According to Maharashtra, state government decision of Animal Husbandary, Dairy and fisheries Department G.R.No fishery Dept/1999/20L.N./8 ADF-13 on dated 15th October 2001. The maximum no of fingerlings to be stocked in Siddheshwar reservoir of 2574 ha average water spread area is 15.47 lakh. The fish seed was purchased from Government fish seed hatcheries located at Siddheshwar and Bhategaon of Hingoli district and Masoli fish seed hatchery of Parbhani district. The details of fish seed stocked in Siddheshwar reservoir during 2001 o 2010 is given in Table 1.Both the working societies have not stocked Fingerlings and that's the main reason of less yield of Fish.

3.Working pattern of fish Co-operative society working on Siddheshwar reservoir

According to Divisional fisheries Office letter No. 4007/2340/2004 on dated 22/07/2004 the fishing rights of the Siddheshwar reservoir were given on lease to the Jai Jawan Matsyavyvasai Sahakari Sanstha Maryadit, Shiraramwadi, Tq Jintur District Parbhani from State Fisheries Department (D F D O, Parbhani), for duration July 2005 to June 2010. There was no any office of the fishermen co-operative society in Shriramwadi or other villages present around the Siddheshwar reservoir. .As the fishermen society was facing the financial problem for fishing tender cost and seed stocking cost the chairman had invested his own money for fishing tender fees and seed stocking every year.The present tender cost of Siddheshwar reservoir is Rs 80680 per year this fish tender cost is fixed some for 5 (Year 2005 to 2010) years means the chairman of the fishermen co-operative society has to pay Rs 80680 every year.Discussion with the chairman of society and fishermen of Siddheshwar reservoir it was found that the society is not well managed for its working pattern. There is no assurance of getting profits to the society as compare to money investment for tender cost seed stocking cost and salary to the temporary employees of the society. The chairman alone manages the tender cost as his own investment. They has not completed annual Audit of the society since from its registration from Dist co-operative society Audit office Parbhani. The fishermen working with this society are 70-100 in number from 13 villages around periphery of reservoir are not related to tender cost and seed stocking etc. the number of fishermen involved in fishing were not constant throughout the year. Every fishermen have to pay Rs 200 per month as fishing license fees towards the chairman of the society and chairman collects Rs 5/kg of fish catch from the fishermen during

marketing of the catch to collects the money fishermen the chairmen of the society has employed 4 to 5 personsThe fish catch from Siddheshwar reservoir increase during monsoon hence the income to the chairman and fishermen of society is more. While after monsoon the chairmen collects only monthly fishing license fees due to negligible fish catch, the chairman is not interested to collect the commission from the fishermen of their fish sale. When the structure and working of the society is studied in detailed then it can be concluded that it is a business of single person under the heading of Jai Jawan Matsyavyvasai Sahakari Sanstha Maryadit, Shiraramwadi, Tq. Jintur Dist. ParbhaniAs per the Maharashtra government Resolution once the reservoir tender for fishing is discontinued by the fish co-operative society then the reservoir fishing tender will be open tender for private parties or agencies and once the fishing tender cost by the private parties is fixed then it will remain as minimum cost of tender for a year. Either for the next year fishing tender cost same to previous year or it may be more than previous year, to avoid the problem of shifting of fishing tender towards private parties the chairman of the society wants to maintain the working of the society. From 2009 onwords society is not able to fill the lease amount to fisheries Department. It can be concluded that the Jai Jawan Matsyavyvasai Sahakari Sanstha Maryadit, Shiraramwadi, Tq. Jintur Dist. Parbhani is not a successful fish Co-operative society.

4.Fish harvesting; On Siddheshwar reservoir fishing is carried out throughout the year. Indian Major carp species and exotic carp species stocked in Siddheshwar reservoir and other local fishes were harvested by using various kinds of nets named by various traditional names. Gillnet, drag net, drag bag net, Hooks and line were used to catch the fishes. To operate the fishing nets the thermocoel rafts of 1 to 2 person carrying capacity were used. As this crafts were not suitable to carry large sized heavy drag nets and drag beg nets commonly called Zorli or Wadap. Hence, 3 to 4 thermocoel rafts were connected to each other laterally to form large sized platform.The thermocoel rafts is navigated by single fishermen with the help of hand flipper made of single bamboo stick of 5 feet length with plastics flippers fitted at both the end of bamboo.

4.Fish Fauna-

The Fish Species found in the Siddheshwar reservoir are 41 species of fishes belonging to 8 orders and 15 families was found.

5 Fish Marketing

a.Fishermen involved in fish marketing;,Total 93 fishermen population recorded involved in fish harvesting and fish marketing during study period belongs to 13 villages around the Siddheshwar reservoir, their details are given in Table No 2. The fishermen involved in Fish harvesting and marketing belongs to various caste and tribes are as: 41 Andh (44.08%), 07 Banjara (7.52%), 15 Boudh (16.12%), 04 Hatkar (4.30%), 02 Koli (2.15%), 14 Muslim (15.53%), 05 Vanjari (5.37%) and 05 Yellam (5.37%). During study duration June 2005 to May 2010, the fish catch was distributed and marketed by different methods in different seasons

Table2 Siddheshwar reservoir fishermen caste and tribe and their population according to their villages (June 2009 to May 2011)

Sr. No	Name of village	Taluka	District	Caste and tribe	Population
1	Rupar camp	Aundha	Hingoli	Muslim-09	09
2	Jod pimpri	Aundha	Hingoli	Andh-03,Banjara04,Boudh03, Hatkar-02	12
3	Shriramwadi	Jintur	Parbhani	Andh-09, Banjara-02,hatkar-02	13
4	Takalkhopa	Jintur	Parbhani	Koli-02	02
5	Bhuskawdi	Jintur	Parbhani	Andh-05,Muslim-05,Vanjari-06	15
6	Sorja	Jintur	Parbhani	Baudh-05,	05
7	GadadhGhavan	Jintur	Parbhani	Andh-03,Boudh-02	05
8	Dabha	Jintur	Parbhani	Andh-02	02
9	Siddheshwar	Aundha	Hingoli	Banjara-01, Yellam-05	06
10	Dhegaj	Aundha	Hingoli	Boudh-02	02
11	Lad pimpri	Aundha	Hingoli	Boudh-03	03
12	Durchuna	Aundha	Hingoli	Andh-11	11
13	Wadchuna	Aundha	Hingoli	Andh-08	08
Total					**93**

Source; Information collected from Fisher community of Siddheshwar reservoir during study..

b. Market place including building infrastructure: Very few fishermen of Siddheshwar reservoir sale their fishes directly in the near by villages or at Rupur camp, Aundha Nagnath and Jawla Bazar market at higher rate. 8 to 10 middlemen or fish trader regularly came to the fisher community villages presented around the Siddheshwar reservoir and purchase the fish catch from reservoir site.

No any special building found as market place around Siddheshwar resevoir to sale the fish catch except Rupur camp. Occassionaly very few fishermen sale the fishes at Rupur camp in open space mostly along roadside. Fishermen bring fishes in gunny or cloth bags, fishes are set on open gunny bags or clothe on road side for sell. Even there was no any temporary roofs of Plastic cover for covering the fishermen. Fishermen use knives for cutting and special scrappers to remove scales and small wooden platform for fish cutting, Cut fishes were generally given in plastic carry bags.

c. Cold Storage: All the fish catch is sold in fresh condition in surrounding villages or to Fish traders. Though cold storage facilities are integral part of fish marketing as fish is highly perishable. The cold storage facilities incluing Ice, and Freezing equipments were not found during study period in siddheshwar fish marketing places like Rupur camp, Aundha Nagnath and Jawla Bazar..

d. Hygiene and sanitation: In all fish markets fishermen sell mostly fishes in fresh condition. During study period hygiene and sanitation conditions of all above fish markets were found to be very poor. Fishes were sold in open along roadside on gunny sheets, polythene sheets, Cutting knives and platform were not found in proper hygienic condition.

e.Major Species sold: Most common species sold are Catla, Rohu, Mrigal, Common carp, Silver carp, Grass carp, Murrel, Cat fishes Mastacembalus armatus,, small freshwater weed fishes etc. Carps were major species in all the fish market places.

f..**Women involvement** : it is observed that all the fish sellers were male in the fish marketing and there is no any involvement of women in fish marketing. Very rare involvement found in sorting and drying of small fish species after drag net operations during summer

g Fish price and Marketing system/trends and Traders involved in siddheshwar reservoir: In Siddheshwar reservoir, the peak season of fishing is from July to September and from March to June of every year. Number of fishermen were increased in fishing duration July to September, when the reservoir water is muddy due to inflow of water during rainy season. The fish catch was also abundant. Every fishermen get at least 200 to 600 kg fish in rainy season duration i.e. from June to September of every year. During this period large sized fishes or even brooders were trapped in the gill net of size 3 kg to 5 kg the regular catch of each fishermen varies i.e. 3 to 45 kg per day in rainy season. (June to September). 8 to 10 middlemen or fish trader regularly came to the fisher community villages presented around the Siddheshwar reservoir and purchase the fish catch at rate rupee 30 to 35 per kg for *Rohu, Catla, Mrigal, Cyprinus*, and other local fishes larger than 1 Kg. The occurrence of cat fishes and *Mastacembalus armatus* species is less but it was purchased at rate Rs 60 to 80/kg from fishermen and the small sized fishes less than 200 gm body weight were purchased at rate Rs 20 to 25/Kg. Very few fishermen of Siddheshwar reservoir sale their fishes directly in the nearby villages or at Rupur camp, Aundha Nagnath and Jawla Bazar market at higher rate. In winter season, the occurrence of fish catch was very low due to less stocking of fish seed stocking in Siddheshwar reservoir. The fishermen engaged in fishing were also less i.e. up to 20-25 in number in winter season (October to February.) During this period every fishermen engaged in fishing get fish catch upto 0-15 kg per day. During winter season 4 to 6 fish traders collect the fish from the fishermen of villages like Rupur camp, Shriramwadi, Jod Pimpri, Bhuskwadi and Durchuna at rate Rs 35 to 40/kg for *Rohu, Catla, Mrigal*, and for cat fishes and *Mastacembalus armatus* at rate Rs 60-80/kg and small sized fishes at rate Rs 20 to 25/KgDuring winter season the fish catch of fishermen either consumed by their family members or the fish was sale in the surrounding villages and market places at higher rate by few fishermen.In summer season when reservoir water level is decreased, the fishermen of villages Bhuskwadi, Durchuna and Jod Pimpri used the drag bag net or Zorli net for fishing. For every fishing operation 3 to 6 fishermen were involved. Hence, the fish catch was increased to only those fishermen who used the Zorli or Wadap net. The fish catch of Zorli net includes all types of fishes and the fish catch was distributed among the fishermen. Entire fish catch of Zorli net was purchased by middleman at rate Rs 30/kg to *Rohu, catla, Mrigal* and *Cyprinus* species and at Rs 60 to 80 per kg for cat fishes and *Mastacembalus armatus* and at Rs 20 to 25 per kg to small sized fishes. Whereas some fishermen sale their fish catch at higher rate in Surrounding villages and market places.

Table 3 Fish sale rates of Siddheshwar reservoir Fishermen during 2005 to 2010

Sr. No	Fish species	Monsoon season		Winter Season	
		Rate of fish sale at the site of Siddheshwar Reservoir	Rate of fish sale in Surrounding villages and marketplaces	Rate of fish sale at the site of Siddheshwar Reservoir	Rate of fish sale in Surrounding villages and marketplaces
1	Carp species	30-35	40-50	35-40	50-70
2	Cat fishes and Mastacembalus armatus	60-80	80-100	60-80	80-120
3	Weed fishes and larvivorousfishes	20-25	25-30	20-25	30-40

In the development of the reservoir fisheries sector of Purna river basin, the Siddheshwar reservoir fishery development is the best option as compared to Yeldari by application of Pen-culture, Cage Culture methods.During the study period of this reservoir, the potential of this reservoir was remained unexploited. As productivity is concerned, it has good productivity (Dhimdhime 2004), therefore there is wide scope for the development of the fishery sector in this reservoir.The hygienic conditions of fish markets should be improved tremendously so that hygienic fish consumption will become easier process in days to come.

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Socio-Economic Status of Fishermen of Siddheswar Reservoir of Hingoli District Maharashtra

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Abstract

The Siddheshwar reservoir is a medium sized reservoir of about 2574 ha area, constructed on Purna River at Rapur camp Tq. Aundha Nagnath, Dist, Hingoli and near village Siddheshwar Tq. Aundha Nagnath, Dist, Hingoli in 1968. The reservoir lies in between north latitude 19°-0'-20" and East longitude 76°-45'-00". The reservoir is naturally situated in hilly region on both sides. Reservoir area is included in the survey of India toposheet map no 56A/10. It was the first ever-major project in Marathwada region to initiate the process of economics development of Marathwada region. The reservoir is having catchment area of 7770 sq km. the reservoir. The present work was mainly undertaken to investigate Socio-economic Status of Fisher communities, Caste and tribe and their population, Involvement of fisherwomen in fishing, Housing, Educational status, Modern facilities, Wages and Income. The present work was mainly undertaken to investigate Socio-economic status of Siddheshwar reservoir Fishermen for a period of 2 years during June 2009 to May 2011 and it is first effort in this direction from this reservoir.

Key Words- Reservoir fishery, Socio-economic status, Siddheshwar reservoir.

Introduction

The Siddheshwar reservoir is a medium sized reservoir of about 2574 ha area, constructed on Purna River at Rapur camp Tq.Aundha Nagnath, Dist, Hingoli and near village Siddheshwar Tq. Aundha Nagnath, Dist, Hingoli in 1968. The reservoir lies in between north latitude 19°-0'-20" and East longitude 76°-45'-00". The reservoir is naturally situated in hilly region on both sides. Reservoir area is included in the survey of India toposheet map no 56A/10. It was the first ever-major project in Marathwada region to initiate the process of economics development of Marathwada region. The reservoir is having catchment area of 7770 sq km. the reservoir. The present work was mainly undertaken to investigate Socio-economic Status of Fisher communities, Caste and tribe and their population, Involvement of fisherwomen in fishing, Housing, Educational status, Modern facilities, Wages and Income. The present work was mainly undertaken to investigate Socio-economic status of Siddheshwar reservoir Fishermen for a period of 2 years during June 2009 to May 2011 and it is first effort in this direction from this reservoirThe Siddheshwar reservoir fishing tender is allotted to Jai Jawan Matsyavyvasai Sahakari Sanstha Maryadit, Shiraramwadi, Tq Jintur District Parbhani from State Fisheries Department (D F D O, Parbhani), for duration July 2005 to June 2010. The fishermen working with this society are 93 in number from 13 villages around periphery of reservoir. The number of fishermen involved in fishing were not constant throughout the year. Every fishermen have to pay Rs 200 per month as fishing license fees towards the chairman of the society and chairman collects Rs 5/kg of fish catch from the fishermen during marketing of the catch.

Material and Methods

To study the socioeconomic status of fisherman of Siddheshwar reservoir, the data was collected by the survey to visit to D.F.D.O office Parbhani, fisher communities on the reservoir near the embankment and distributed on the periphery and backwater of the reservoir in 13 different villages. The data on structure and working of fish cooperative society was collected from fishermen and chairman of fish co-operative society named Jai Jawan Matsyavyvasai Sahakari Sanstha Maryadit, at Shiraramwadi, Tq Jintur Dist. Parbhani. Reg No PBN/JTR/AGR/(0)/901/86 on dated 20/11/1986 by personal interviews, by questionnaires and photographyTo get high yield of fish from the reservoir identification of problems in reservoir fishery management, sustainable use of natural resources, application of new techniques, socio-economic development of the dependant fisher community are essential considerations. Hence, to study socio-economic status of fisher communities of Siddheshwar reservoir includes, caste and tribe and their population, Involvement of fisherwomen in fishing , housing , educational status, modern facilities, wages and income, of Siddheshwar reservoir was collected by survey, study, observations, questionnaires and photography from active fishermen during June 2009 to May 2011 and the data was analyzed.

Result and Discussion

The Siddheshwar reservoir is a medium sized reservoir of about 2574 ha area, constructed on Purna River at Rapur camp Tq.Aundha Nagnath, Dist, Hingoli and near village Siddheshwar Tq. Aundha Nagnath, Dist, Hingoli in 1968**.** Siddheshwar reservoir is easiest place to reach by all kinds of vehicles. It is located near the town Aundha Nagnath, one of the taluka in Hingoli district. To reach the Siddheshwar reservoir one has to travel 10 km from Aundha Nagnath town by Aundha Nagnath-Jintur road and have to

take a left turn and travel 5 km from Aundha Nagnath-Jintur road to Rupur camp. Another way to reach the Siddheshwar reservoir, one has to travel 31 km from town Jintur to Aundha Nagnath and have to take Right turn and travel 5 km from Jintur - Aundha Nagnath road up to Rupur camp. Except this road other road facilities are poor and remote It was observed in Siddheshwar reservoir fish market system that, each group of fishermen of village had made tie-up or agreement with fish traders for fish sale. i.e. whatever the fish catch harvested in a day by all fishermen of a village was marketed to the fixed fish retailer on the site of reservoir on credit basis. This retailer collect the harvested fish catch between 10:00 am to 10:30.am. 8 to 10 middlemen or fish trader regularly came to the fisher community villages presented around the Siddheshwar reservoir and purchase the fish catch at rate rupee 30 to 35 per kg for *Rohu, Catla, Mrigal, Cyprinus*, and other local fishes larger than 1 Kg. The occurrence of *Mastacembalus armatus* species is less but it was purchased at rate Rs 60 to 80/kg from fishermen and the small sized fishes less than 200 gm body weight were purchased at rate Rs 20 to 25/Kg. Very few fishermen of Siddheshwar reservoir sale their fishes directly in the nearby villages or at Rupur camp, Aundha Nagnath and Jawla Bazar market at higher rate.

a) Fisher population: Around the Siddheshwar reservoir, 13 villages are present closer to reservoir water. In these villages, the fisher communities of different caste and tribes are present. During the present study period June 2009 to May 2011, the fisher population was recorded and it is 93. Out of 16 villages, there are 07 villages included in Tq. Aundha Nagnath Dist. Hingoli and 06 villages included in Tq. Jintur Dist. Parbhani. The fishermen population status of Siddheshwar reservoir is given in Table 1. The age group wise distribution of fisher population of Siddheshwar reservoir present in 13 surrounding villages is given in Table 2

Table1 Siddheshwar reservoir fishermen caste and tribe and their population according to their villages (June 2009 to May 2011)

Sr. No	Name of village	Taluka	District	Caste and tribe	Population
1	Rupar camp	Aundha	Hingoli	Muslim-09	09
2	Jod pimpri	Aundha	Hingoli	Andh-03,Banjara04,Boudh03, Hatkar-02	12
3	Shriramwadi	Jintur	Parbhani	Andh-09, Banjara-02,hatkar-02	13
4	Takalkhopa	Jintur	Parbhani	Koli-02	02
5	Bhuskawdi	Jintur	Parbhani	Andh-05,Muslim-05,Vanjari-06	15
6	Sorja	Jintur	Parbhani	Baudh-05,	05
7	GadadhGhavan	Jintur	Parbhani	Andh-03,Boudh-02	05
8	Dabha	Jintur	Parbhani	Andh-02	02
9	Siddheshwar	Aundha	Hingoli	Banjara-01, Yellam-05	06
10	Dhegaj	Aundha	Hingoli	Boudh-02	02
11	Lad pimpri	Aundha	Hingoli	Boudh-03	03
12	Durchuna	Aundha	Hingoli	Andh-11	11
13	Wadchuna	Aundha	Hingoli	Andh-08	08
Total					**93**

Source; Information collected from Fisher community of Siddheshwar reservoir during study.

Table 2 Age group wise distribution of fisher population during June 2009 to May 2011.

Sr No	Age group	Fisher population	Percentage
1	18-30	08	8.60%
2	31-40	27	29.00%
3	41-50	36	38.70%
4	51-60	18	19.35%
5	61 onwards	04	4.30%
	Total	**93**	

b) Caste and tribe:The fishermen population present in 13 villages around the Siddheshwar reservoir belongs to different caste and tribes. The fishermen caste and tribes are Andh (Adiwasi), Banjara, Boudh, Hatkar, Koli, Muslim, Vanjari and Yellam. Details of caste and tribe wise fisher population were given in table 3.

c) Involvement of fisherwomen in fishing and other activites. There was no remarkable involvement of fisherwomen in the Siddheshwar reservoir fishery. All the fisherwomen were involved in household activities.

Table 3 Distribution of fishermen population according to Caste and Tribe (June 2009 to May 2011)

Sr. No	Caste and tribe	Fishermen population	Percentage
1	Andh (Adiwasi)	41	44.08 %
2	Banjara	07	7.52 %
3	Boudh	15	16.12 %
4	Hatkar	04	4.30 %
5	Koli	02	2.15 %
6	Muslim	14	15.53 %
7	Vanjari	05	5.37 %
8	Yellam	05	5.37 %

d) Housing. The houses of fisher communities distributed in 13 villages around Siddheshwar reservoir are simple types constructed with the stone, bricks clay and cement. Maximum houses are of tin protection with hut like structure .All housing system is in small plot of 1000 to 2000 sq feet area.

e) Wages and income. There was no fixed and assured income to the fisher community because Siddheshwar reservoir fishery management was very poor during the study period i.e. June 2009 to May 2011. Similarly, the fish seed stocking by (Reservoir fishing Lease Holder fish) co-operative society was inadequate as compared to the vast area of the reservoir. The fisher community income was Rs 50 to 300 per day to single fishermen in monsoon period (July to September). In winter and summer season the income of every fisherman varies, it depends upon the fishing efficiency and no of nets arranged for fishing by a single fisherman. The income in winter and summer season was indefinite and varies from Rs 0 to 200 per day. However, the fishermen number get decreased in winter and summer season, but the fish catch was also poor. Most of the fishermen catch the fishes for their own consumption. The average income of every fishermen engaged fishing in winter and summer season is about Rs 25 to 200 per day. Those fishermen who were not engaged in fishing during winter and summer season were in search of jobs like farm work and labour works. Some fishermen of Andh (Adiwasi) community belongs to village Bhuskawdi, Durchuna and Jod Pimpri engaged in fishing by using Wadap or Zorli net such fishermen income in summer duration was comparatively more than the other fisher community of Siddheshwar reservoir. it is about Rs 60 to 300 per day.

f) Educational facilities and educational status: Marathi is the main language of communication and learning in the villages present around the Siddheshwar reservoir. Information about educational facilities and educational status of fishermen, fisherwomen and fisher community children was collected by survey and personal interviews of fisher communities of 13 villages present around Siddheshwar reservoir. in most of the villages Marathi medium primary schools are present, where as High school and Jr. college and Sr. college are not present in any village. To study the educational status 74 fishermen (full time + part time) were interviewed from 7 villages. According to 74 fishermen interview, out of 74 fishermen 42 were illiterates and 32 fishermen were literate. In literate fishermen 27 fishermen had taken education from 1^{st} to 7^{th} standard and 05 fishermen were educated upto 8^{th} to 10^{th} standard. Out of 115 fisher community children 09 children were found illiterates and 106 children were educated. Out of 106 educated children 85 children were learning in primary school, 10 children were learning in 8^{th} to 10^{th} standard and 11 fisher community children were educated up to 11^{th} and 12^{th} standard. According to 74 fishermen of 07 villages present around Siddheshwar reservoir most of the fisherwomen were illiterate.

g) Fishing license fees: Jai Jawan Matsyavyvasai Sahakari Sanstha Maryadit, Shiraramwadi, Tq.Jintur Dist. Parbhani had started fishing license scheme to member as well as non-member of the society. Jai Jawan fish co-operative society charges Rs 200 per month for fishing in Siddheshwar reservoir to its member as well as non-members of Siddheshwar reservoir have to pay Rs 5 /kg as a commission to the society for sale local fishes and Indian major carps.

h) Modern facilities Modern facilities were very inadequate in fisher community of Siddheshwar reservoir. In very few houses of fisher community, Black and white televisions were present. Use of Mobile and Motorcycle was very less in Siddheshwar reservoir fishermen. Only 05 to 07 % fishermen

were having mobile phone sets and 3-4 % fishermen having motorcycles, used for fish transportation from site of catch to fish market places

Table 4 Educational status of fishermen present around Siddheshwar reservoir during June 2009 to May 2011.

Sr No	Name of village	Fisher population	Educational status				
			Illiterate	1st to 7th	8th to 10th	11th to 12th	Graduation
1	Shriramwadi	13	06	05	02	--	--
2	Jod pimpri	12	07	04	01	--	--
3	Rupar camp	09	06	03	--	--	--
4	Bhuskawdi	15	09	04	01	--	--
5	Siddheshwar	06	02	04	--	--	--
6	Durchuna	11	07	04	--	--	--
7	Wadchuna	08	05	03	--	--	--
	Total	**74**	**42**	**27**	**05**	**--**	**--**

Table 5 Educational status of fishermen child present around Siddheshwar reservoir during June2009 to May 2011.

Sr No	Name of village	Fisher population	Educational status				
			Illiterate	1st to 7th	8th to 10th	11th to 12th	Graduation
1	Shriramwadi	20	02	16	--	02	--
2	Jod pimpri	15	01	10	02	02	--
3	Rupar camp	16	--	13	02	01	--
4	Bhuskawdi	25	--	19	05	01	--
5	Siddheshwar	10	01	06	01	02	--
6	Durchuna	16	03	12	--	01	--
7	Wadchuna	13	02	09	01	01	--
	Total	**115**	**09**	**85**	**11**	**10**	**--**

Source; Information collected from Fisher community of Siddheshwar reservoir during study.

Discussion:

During the study period of this reservoir, the potential of this reservoir was remained unexploited. The tender cost (Minimum or Upset Price) for this reservoir was Rs 80,680. For the fish cooperative societies established on this reservoir, but this tender business was not filed hence the reservoir remained non-tenderedAs productivity is concerned, it has good productivity (Dhimdhime, 2004), therefore there is wide scope for the development of the fishery sector in this reservoir. and also be the best option for application of Pen-culture, Cage Culture methods. Siddheshwar reservoir was characteristically loaded with variety of weeds, located in all corners of reservoir.Naturally the Siddheshwar reservoir support the weed fish occurrence, hence, in the existing situation of flood water loss from the reservoir, along with the weed fishes, there is loss of IMC and other fishes. The new trend of catfish development, Murrel culture could be established through cage culture and pen culture practice along with IMC stocking which will definitely helpful in socio-economic upliftment of fisher community.

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The Study of Molar Refractivities and Polarizability Constants of Diphenoxylate Drug Molecule

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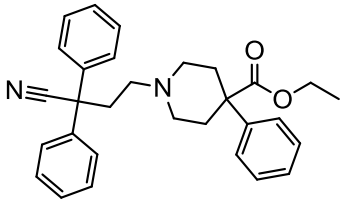
Abstract

Molar refractivities, molar polarizability constants, and refractive indices Diphenoxylate Drug Moleculehave been examined in Methanol and Acetone at varying concentrations (0.63 x 10^{-3} to 10.00 x 10^{-3} M) and temperatures of 27^0C (±0.1 ^{0}C).The above system molar refraction was work out theoretically. These observations were used to compare experimental and theoretical molar refraction values. The molar refractivity (R) and molar polarizability (α) values are observed to reduce the solute concentration.

Keywords: Molar refraction, Refractive indices, polarizability constants, bb'sRefractometer.

Introduction

Diphenoxylate is a phenylpiperidine based centrally active opioid that is used to treat diarrhea in combination with atropine. The atropine in diphenoxylate prevents drug addiction and overdose by decreasing intestinal contractions. Diphenoxylate is an opiate receptor agonist that inhibits peristalsis and constricts sphincters by stimulating mu receptors in the gastrointestinal tract. Diphenoxylate has a direct influence on the bowel's circular smooth muscle, which could lead to gastrointestinal transit time segmentation and lengthening.The structure of drug moleculeas shown inthe following figure,



Diphenoxylate

IUPAC Name: Ethyl 1-(3-cyano-3,3-diphenylpropyl)-4-phenylpiperidine-4-carboxylate
Chemical Formula: $C_{30}H_{32}N_2O_2$
Exact Mass: 452.25
Molecular Weight: 452.59
Elemental Analysis: C, 79.61; H, 7.13; N, 6.19; O, 7.07

As we know that, the most essential additive feature of liquid is its refractive index. When a ray of light passes through one medium and then through another, it undergoes refraction or a change in direction. When it moves from a less dense to a more dense medium, the direction of refraction changes, as does the angle of refraction, and the refractive index change. The refractive index is the ratio of light's viscosity in a vacuum to its viscosity in the medium, and it is affected by temperature and wavelength. The results of this inquiry on the dipole association of ligand intermolecular attraction between solution and solvent, the dielectric constant of medium, polarizability, and mutual compensation of dipole obtained directly by light. These findings are far more useful for drug transmission, stability, and action, hence this research is very important.The density and refractive index of a binary liquid mixture of Eucalyptol and Hydrocarbon at various temperatureswas investigated by Sangita Sharma et al.[1]. The dielectric constants and refractive indices of binary mixes of ethyl acetate with toluene, ethyl benzene, o-xylene, p-xylene, and p-dioxane were investigated by Oswal et al.[2]. The refractivity properties of several homologous series, such as n-ethanoates, methyl alkanoates, ethyl alkanoates, and others, were measured in the temperature range of 298.15 to 333.15 oK by Oswal et al.[3]. At 303^oK, Sonar et al.[4] investigated the refractivity of various heterocyclic compounds. The refractive index of 1,3diarylcarbamides in varying percentages of the binary liquid combination was examined by Ubarhande et al.[5]. The refractometry of Strizinothiocarbamides in varying percentages of the dioxane-water mixture was examined by A.M. Kshirsagar et al.[6]. Drug-amino acid interactions of glycine and aq. isoniazid ternary combinations were studied by Deosarkar et al.[7]. The verification of molar refraction as an additive and constitutive property of binary liquid mixtures of water-ethanol and ethylbenzene has been explored by Javed et al[8]. Isehunwa et al.[9] explored the estimation of the refractive indices of several binary mixes recently.Conversely, research into the molar refractivity and molar polarizability constants of new substances Diphenoxylate Drug Moleculein the solvent mixes such as Methanol-Water and Acetone-Water under equivalent experimental conditions are limited. As a result, the current work aims to conduct a systematic analysis of the aforesaid new compounds using refractometry at a temperature of 27°C.

Experimental Section

The importance of substituted heterocyclic compounds is paramount. The above compound solutions are prepared by dissolving an appropriate amount by weight in two distinct solvents: ethanol and THF. All of the weight was placed on a Contech balance (0.001gm.) for density measurement. At various concentrations (0.625×10^{-3} to 10×10^{-3}M), the refractive index of solvents and solutions is determined by Abbe's Refractometer having accuracy with± 0.1 unit. The Prism box is sustained at a fixed temperature by flowing water from the Thermostat at 27°C. A glass test piece with a known refractive index was used to calibrate the refractometer that came with it. Solvent molar refraction and solution mixture molar refraction are calculated using the following equation,

$$Rm = [(n^2+1)/(n^2-1)]m/d = 4\pi N_o \alpha \text{ ----------(1)}$$

$$Rm_{(solution)} = X_1Rm_1 + X_2Rm_2 \text{ ----------(2)}$$

Where

Rm → molar refraction,

n → refractive index,

d → density of solution,

No→ Avogadro'snumber,

α → polarizibility constant,

Rm_1& Rm_2 → molar refractivity of solvent & solute and

X_1& X_2 → mole fraction on solvent & solute in solution.

The precise volume of the substance molecules in a mole is represented by the molar refraction. The solute's molar refraction can be measured as

$$Rm(solute) = Rm(mixture) - Rm(solvent) \text{ ----------(3)}$$

For the above system observations and calculations,Abbe's refractometer is used to measure the refractive index of solvents and solutions at varying concentrations, and the values of molar refractions and polarizability constants are estimated and reported in tables 1

Concn. in mole/litre	**Medium**					
	Methanol-Water			**Acetone-Water**		
	RI	**Rm**	**$\alpha*10^{-25}$**	**RI**	**Rm**	**$\alpha*10^{-25}$**
10×10^{-3}	1.329	1.918	7.6	1.356	1.813	7.2
5×10^{-3}	1.315	0.997	4.0	1.342	0.937	3.7
2.5×10^{-3}	1.305	0.511	2.0	1.330	0.482	1.9
$1.25X\ 10^{-3}$	1.292	0.267	1.1	1.318	0.249	1.0
$0.625X\ 10^{-3}$	1.279	0.137	0.5	1.305	0.129	0.5

Table 1: System for Diphenoxylate Drug Molecule

Result And Discussion

The molar refractivity and polarizability constants decrease as the concentration of the solution decrease, as shown in table 1. The values of **Rm** and **α** are similarly found to be higher in the polar solvent methanol than in the non-polar solvent Acetone. Polar solvents form H-bonds with solutes and may form complexes with them, whereas non-polar solvents do not establish H-bonds with solutes and do not interact with them. Because the dipole in the compound is perpendicular to the longer axis of the molecule, intermolecular attraction occurs, which is accompanied by an increase in the value of molar refraction and molar polarizability constant as the concentration of solution increases due to mutual dipole compensation. Such research has been reported by Sonar et al.[4], Ubale et al.[10], Burghate et al.[11], and Agrawal et al.[12].Molar refractivities and polarizabilityConstants of amoxycillin, loperamide and Lorazepam in protic and non-protic media at 29^0C studies by .K.N.Sonune et.al.[13].

Conclusions

Results obtained from the experimental data shows that heteroatomic moiety has a very important role in hydrogen bonding meaning is that molar refractivity and polarizability constants decrease as the concentration of the solution when decrease.

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Nature Vs Nature in the plays of Manjula Padmanabhan

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Introduction:-

Manjula Padmanabhan is one of the playwrights of the women theatres who tries to expose the maladies with the help of her dramatic arts. Nature Vs Nature is one of the significant elements of her play. She tries to attack on the artificial and commercial relations as well as tries to insist upon the natural instincts. Her plays brought her name and fame where the artistic world is dominated by the male playwrights. She writes with the tapping sensibility which would appeal the audiences. Her plays Harvest, Lights Out! and Hidden Fires stand for nature Vs nature. The word nature remains an ambiguous. It is an outcome of the neo-classical literature. Surfacely nature means the natural objects such as trees, hills, mountains, rivers, flowers etc. in literature described in order to glorify the nature. But its our nature that tampering the beauty of the nature. Due to our material mentality we people are ready to sell any type of the organ or parts of our body in order to meet our uncontrolled needs. Harvest is one of the plays of her where she tries to expose the artificial based lives of the characters like Om who is described as a jobless fellow married to Jaya who is dominated by the passions. On the contrary Ma (Mother) who is indulged in the luxurious life irrespective of their income. Jeetu is the representation of the ultra modern values described as the male prostitute. Overall analysis of the family is that nature Vs nature. To live life according to nature is considered as a humane approach in the society. Manjula Padmanabhan casts a light on the stark realities of the modern denizens. It is Om who is the major character of the play trying to meet the familial needs. He is a jobless who goes up to the extent to sell his body organs one after another through the NGO Inter plant services (IPS) North American based. It is an NGO which used to appeal the needy people to sell their vital organs across the world in return the donors would gate the day today amenities. It was a profession were needy people entangled to sell their organs. The playwright felt sorry over the indifferent natures of the family members Because nobody cares of Om's sacrifices to run the family. It is a modern world where everybody is intoxicated and dominated by the materialistic pleasure irrespective of their relations for example Ma who used to reproach her daughter in law where Jaya would like to live her romantic life with her brother in law Jeetu because her husband Om became weak and sick by selling one after another organs. At last the condition of Om becomes worst of which he could not compel to stand any organ of the body result died wretchedly.On the contrary Jeetu who was fully indulged in selling his machoness as the male prostitute as well as in the romance with Jaya. At last he also became weak and sick as he went to sell his body organs to the Inter Plant Services (IPS) result in his death. Finally Ma and Jaya remained lonely as helpless as. In this way Manjula Padmanabhan is a kind of playwright who would like to cast a light on the inhuman nature Vs nature Harvest is a medical and agricultural term which is considered as mature or ready to pay. According to the title of the play something is consumerable as our body in to that not in extent to sell. While on the cotrary Jaya whose body is ready to impregnate but she fears of after getting conception or being motherhood she would loose her virginity. Therefore she went on using contraceptives in order to avoid pregnancy. It is nothing but a natural promscuity. It is a moral turpitude wherte Om being a jobless would sell his body organs in order to meet the famlilial needs while Jeetu sells his body in order to have the carnal pleasure. Unfortunately unless we practice according to the nature end is artificial. Om,Jeetu and Jaya became the victim of the system. Therefore while living in the society one should not try to controll the nature.

Hidden Fires:-

Robert Frost is a well known American poet who quoted the right kind of the world in his noted poem Fire and Ice.

The world will end in fire
The world will end in ice

Both are enough to bring the end of the world. Hidden Fires is a kind of play which tries to highlight the communal pandemic state of the society. It is the Indian society built upon the hetrogenous identities. But while living in the society Indians colour their identities as communal identities. As a result of the communal identities people run amok to eastablish their communal spiritis on the name of the religion, caste,sect,gender etc.Hidden Fires represents the hatredness

towards one another in the society. Unity in diversity is embeded in the constitutional frame work as a social document. But it is a society since one can witness through out the pages of history a great line of communal rights. During the British Raj communal rights broke out due t the enstrangement of our natures by which we were considered as immature and half wits. Since the Indian Independence scores of the communal rights have been witnessed by the world. Hidden Fires exposes the hatredness and anger shown by the Indians. It is a play run through the monologues where the narrator agitates over the cold blooded Godhra Riot in Gujrat. It is a play run through the monologues with which readers get covinced or confused over the inhuman activities of us. For example Famous last words, Know the truth, Hidden Fires, Points and Invocation. Hidden Fires is the first monolog in the series of the play in which a man who was standing in his shop. Suddenly he heard a sound, he and a woman costumer saw someone was running and a mob was chassing having sticks is nothing but the representation of our inhuman nature. Since scores of mob lynching incidents took place on the name of died and deportments.

Lights Out!

Lights Out ! is a play of which action takes place in Mumbai Santacruz. Manjula Padmanabhan's plays picturize the vulnerable and sensitive incidents causing perpetual nuissance in the society for example rapes in the broad daylights and inactions of the eyewitness audiences.It becomes the routinal characteristic of the metropolitian cities like Mumbai,Banglore,Chennai,Delhi etc. According to her the life and death of a girl is null and void in the Indian society.Either male or female eyewitness community members do not have anything with the raped and the rapists. Leela is the central character who used to brood over the routinal incidents, she used to complain her husband who is the representative of the middle class society who is not ready to approach the policestation as well as the guest also having the same sensibility. The play highlights helplessness of Leela in case of bringing justice to the raped. According to Leela the modern middle class community members become accustomed such inhuman incidents so that very difficult to breathe freshly. In this way one can conclude Manjula Padanabhan's plays try to expose the human and inhuman nature of the society. According to the great playwright Mahesh Dattani Manjuala Padamanabhan is a playwright who takes a culdge to expose the sensitive issues of the society.

Primary sources:-

1) Harvest
2) Hidden Fires
3) Lights Out!

A Review of IoT for Smart Framing in Agriculture Sector

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Abstract:

Agriculture is one of the key sectors of Indian economies, and it is very popular at a worldwide level. Approximately it contributes 17% to GDP whereas 61.5% people including farmers, labors, transportations, etc. are depending on the agriculture sector. So, the impact of agriculture is directly affected on the Indian economy along with related sub-sectors and people. Emerging trends and techniques are being used in farming i.e. IoT which includes the use of the internet, computers, and information technology termed Smart Farming. As there is a completion to produce the best quality products and provide the services to the people, hence technology is likely to provide the concerned uses and their benefits to the subsequent sectors and people. The present research paper reviews the concept of IoT and its uses, advantages, and applications in the field of agriculture.

Keywords: IoT (Internet of Things), Agriculture, Smart Farming, Information Technology

Introduction:

In the agriculture sector farming has been through various stages along with new tools and techniques from the 18th to 20th century. The use of computer tools and techniques has changed the entire scenario of respective fields. The farmer needs proper knowledge like weather conditions, water level, type of seeds, fertilizers, government schemes, yield information, markets, etc. So that they can have a broader view of their working, capital management, crop management, and other necessary related services. At the global level countries like China, Japan, US, Brazil, etc. is well known for their agriculture production. Especially with the help of Computers and IOT, the outcomes are beneficial. Farmers require agricultural information and knowledge to make informed decisions and meet their informational demands. In the agriculture domain through the development of a knowledge management system, inquiries of farmers can be answered with the help of multimedia which is easily accessible. The application of information and communication technologies (ICT) has been shown to expand the possibilities of promoting agriculture in several aspects and sectors in developing countries. Technology has overcome obstacles by using a wireless, network, cellular, etc. to overcome the utilization of energy, power, and cost-consuming types of equipment which was helpful in agricultural development. At present, the key issue in the current domain is the utilization of resources like manpower and water which is lacking in many parts of the country. The agricultural system needs to be monitored regularly. The developed framework is used to reduce wastage by automating the total agricultural system. Farmer can get any required data or information as well as a monitor on the agricultural sector. IoT is a network of interconnected devices that can be transfer data efficiently without human involvement. All farming sectors can be done using smartphones and IoT devices.

Literature Review

1. According World bank "Four countries in Sub-Saharan Africa are among the top ten reformers worldwide promoting favorable regulations for farmers in the areas measured, a report issued by the World Bank finds". [1]
2. As per the Word bank quotes that "Agriculture is the economic backbone of many developing countries. It contributes about 25% of GDP in low-income countries, and 80 % of the extreme poor live in rural areas. The report highlights the need to accelerate reforms to address outdated legal regulations that fail to meet farmers' needs and remove bureaucratic obstacles that impede business processes. [2]
3. According to Indian Budget 19-20 "Only Agriculture contributed to positive growth while Service and Industry contributed to the contraction in GDP. This sector is largely affected by COVID-19 pandemic on the nation's economy in 2020-21 with a growth of 3.4 percent in both quarters Q1 and Q2, ensuing

in an raise in its GDP share to 19.9 percent in 2020-21 from 17.8 percent in 2019-20. This shows that agricultural activities for Rabi harvesting and Kharif sowing were mostly unaffected by the COVID induced lockdown.[3]

4. Industry and Services are estimated to contract by 9.6 per cent and 8.8 per cent during the year. In Industry, Mining is likely to deal by 12.4 percent, Manufacturing by 9.4 percent and construction by 12.6 percent. The utilities sector has stated a great recovery and is set to record a affirmative growth of 2.7 percent in 2020-21. Within Services Sector, trade, hotels, transport & communication are expected to contract by 21.4 per cent. [4]
5. Quite a few 24 Indian IoT Startups for agriculture sector has been observed by India Electronics and Semiconductor Association (IESA), which obtain financial help are Wifinity, Nimble Wireless, GOQii, Ducere, SensGiz, Systemantics, Ray IT, Altizon, GreyOrange, iIdeaForge, LogiNext, Silvan Innovation, Connovate, Entrib, Altiux Stellapps, Ecozen , ConnectM Eravaku, CardiacDesign Labs, Ineda Covacsis, iBoT, and Embrace. [5]
6. Prof. Shruti Kedia mentioshed in her book "There are many companies functioning to use IOT in agricultural India, Financial safety to farmers is provided by 12 percent of all IOT startups in India. Avanijal's app help farmers to save water by irrigating their lands, Smart farm machineries are building by Green Robot with the help of Robotics and 3D vision technology. In Indian agriculture IOT Program Green Robot and Avanijal are front-runners in Qualcomm Design, which combine Qualcomm technologies and its platforms and inspire Indian companies to produce inventive hardware designs". [6]
7. According Prof. Ashton K. in the Journal Internet of Things (IoT) RFiD Journal stated that "The future where every day physical objects will be connected to the internet and be able to identify themselves to other devices. IOT new generation revolution of the Internet and it will result in a large number of applications such as smart living, smart home, healthcare systems, smart manufacturing, environment monitoring, and smart logistics. This paper provides integration, summarizes and surveys some of the security techniques particularly hybrid techniques that can be useful with healthcare applications in IoT environment". [7]

Objectives

1. To study the importance of IOT in agriculture sector.
2. To explore the new trends of computer and IOT in the crop management.
3. To identify possible benefits of IOT in Smart Farming.

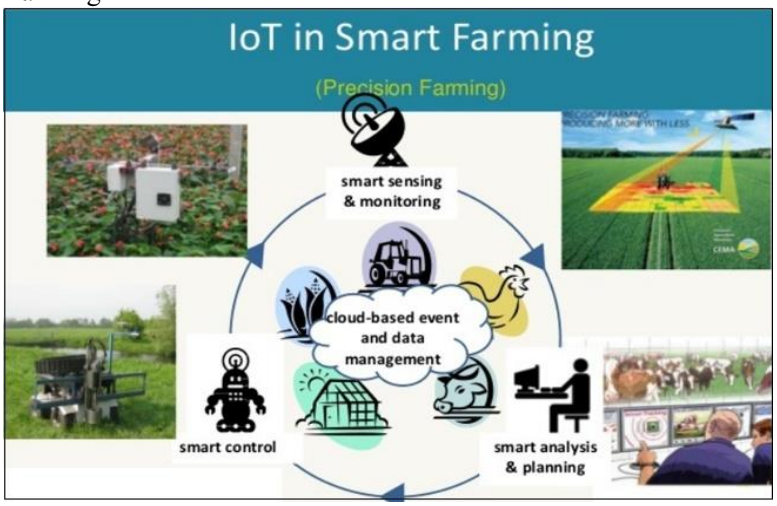
Hypothesis

1. Agriculture sector is a backbone and plays a significant role in economical development of the country.
2. Smart farming leads to better crop management and yield.

Role of IOT in Smart Farming and Agriculture

As agriculture sector plays a vital role in the overall economical development through different related sectors and provides work to the massive people of the country. The use of IOT in farming coined new term i.e. Smart Farming. Below figure shows the different types of uses of IOT in Smart Farming.

Fig "IOT in Smart Farming"



Source: https://www.arcweb.com/sites/default/files/Images/blog-images-2/IOT%20in%20Smart%20Farming.png

Following are few applications of IOT in Smart Farming.

1. Water management
2. Soil Monitoring
3. Drones for Field monitoring
4. Computerized Irrigation Systems
5. Monitoring and controlling systems
6. Agri Products and Fertilizers
7. Weather Predictions, etc.

Research Methodology

The present paper is a review based study. So, different types of data sources are used for literature review like journals, books and web ports. Approximately 89 Lakhs farmers are in Maharashtra state. [8] So it is not feasible to take opinions or feedback from these farmers. By using Simple random sampling technique 300 farmers from Aurangabad district have been selected at district and taluka level. Their responses are taken through questionnaire. Data analysis and interpretations is done by using spreadsheet (Ms-Excel) and conclusions are drawn.

Conclusion

The majority of the farmers from this region are affected by some problems like bad weathers, economical conditions, crop loans, insufficient man power, etc. Though government is providing various schemes to support the farmers. But at the same time there have been suicide cases in the past so it shows the bad economical condition of the farmers. Poor conditions of the farmers do not allow them to get new technologies in the farming. Other side about 10% farmers is using some of IOTs in their farming and reported lot benefits of it. Certain measures to be taken for more understanding, spreading knowledge of IOTs through campaigns.

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Sustainable Management of Natural Resources

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Abstract

Human have been using natural resources in their environment. Biodiversity, Land & Water weremanaged by human to be able to Survive in the hand diverse à eco regions of the world.• These practise and processes and called Natural Resource Management.Natural Resource Management (NRM) is formally defined, as the practices for the Sustainableutilization and conservation of the natural resources ensuring nutritional and environmental security forpresent and future generations. Around *8,500* BC, humans started to plant grains instead of gathering them in the wild. This happenedin the area the spans modern day Egypt, Israel, Turkey and Iraq which was known as fertile crescent. By *7,000* BC, humans began to domesticate animals such as sheep, pigs and goats. A thousand yearslater, they domesticate Cattle. Since then many innovative practices of cultivation and livestock rearing have been established. Butthe term Agriculture was Cloned for these practices much later only in the *15*th-century. The cultivation of land for effective crop growth and raising of livestock. farmers engagedirectly in articulation by preparing soil and planting crop. Narrating those crops and preparing them soil in the market is also part of agriculture activities.

Key Words – Sustainable, Biodiversity, Articulation, Stalinisation

Introduction

Farmers also grow fodder, raise livestock. Mono-culture is cultivation of a single species of crop. Poly-culture is cultivation of multiple - species of crops at the same time.

Silvia-culture is an agricultural system using domesticated trees. Agriculture helped humans to settle down in One place, use the land for production of Food. It was a major change from the nomadic lives that humans led till then. Perhaps the most Significantimpact of agriculture on the natural environment is the transformation of landscapes. Hunter-gathers hunted their pray and obtained the food directly. Farming required people to work. Longer hours for the same amount of food. But farming increased food security. As farming spread,Competition for resources, particularly land and water, increased consequently, conflicts betweenCommunities for control of those resources also increase. Agriculture led to the narrowing human fond base. Today, wheat, rice, corn, potatoes, sugar. Only handful of other grains and legumes account for the restAnimal raising depends primarily on cattle, pigs, poultry, and sheep. Agriculture provided secureaccess to food. It helped humans to develop the complex cultures seen today, to pursue science and toimprove the quality of life for all humanity.

Importance of sustainable management of natural resources

Firstly, sustained agricultural productivity is closely linked to the quality of ecosystem services)benefits communities obtain from nature) that natural resources provide. For agriculture production,these include soil formation, erosion control and fertility, nutrient cycling, water provision andpurification, pollination, pest control, carbon sequestration, resilience to natural disasters (drought etc).Loss of ecosystem services results in reduced productive capacity of farms and lower yields which affectthe net incomes of farmers. Over-exploitation of natural resources is instrumental in the plating yields in irrigated agriculture systems. It perpetuates poverty and hunger in dry lands. Secondly, natural resources provide rural communities with fuelwood, fodder, food and othermaterials. They can be a source of non-farm income through ancillary activities such as tourism. Thus,conservation and appropriate use of land, water, biodiversity and forest resources is vital for sustainingthe profitability of agriculture, maintaining livelihoods and social well-being in rural communities. There have been schemes to address natural resource use in relation to agriculture. These includeprogrammes on soil health (the Soil Health Card Scheme being the most recent avatar), development ofdrought-prone and degraded lands, water conservation and watershed management (now part ofPMKSY), rained areas development, activities under MNREGA etc.However, issues of underdeveloped institutional capacities, especially for decentralised planning andImplementation, low resource availability, lack of coordination, duplicity of efforts in the absence ofconvergence and gaps in monitoring have impeded translation of programme objectives to gainfuloutcomes. What is under-appreciated is the agro-climatic diversity, socio-economic and culturalvariability that farming communities harbour.An integrated and holistic view of natural resource management that also links with better agrarianoutcomes is also missing.

Stress on natural resources

Land degradation and desertification that afflicts 30 per cent of the land is on the rise

. Inappropriateagricultural practices are destroying soil fertility and leading to erosion, water logging, and Stalinisationand soil compaction.Reports indicate that around 54 per cent of India falls under high and extremely high water stressregions and groundwater wells are decreasing. Farmers in several regions face acute water shortage.Since over 85 per cent of the groundwater is utilised by the agriculture sector, burgeoning groundwateruse based on subsidies, incentives for water-intensive crops and low water use efficiencies in agricultureare pushing the nation towards water scarcity.There is also erosion of agro-biodiversity — seeds, crop varieties and livestock due to over-emphasison select high-yielding varieties that poses a threat to food and nutrition security. The importance oftree species in enhancing farm health and farmers&39#; nutrition is disappearing.

Management of natural resources

Operational sing land use planning and sustainable land management practices and multi-stakeholderdialogue is the key. Strengthening capacities, especially at block and district levels, for development ofnatural resource plans, implementation and ownership of the interventions are necessary. Plans need tobe developed on the basis of the characterisation of the bio-physical resources, with an understandingof resource variability and dynamics and socio-economic realities.Secondly, a move away from resource management in silos to a systems approach that recognisesfunctional linkage between soils, water, biodiversity and forests and its impact on ecosystem servicesprovided is needed. A re-emphasis on the watershed approach that integrates multiple resource use andconservation will be helpful.Thirdly, the association between sustainably managing biophysical resources and improvedagricultural productivity and equity need focus. Emphasis must be laid on people&39#;s participation and theuse of local knowledge and practices such that resource conservation measures are developed in waysthat contribute to the socio-economic well-being of communities.Agriculture operates on a multifunctional scale. While its social and economic functions are important,its ecological functions and impacts are also significant. Unless the natural resource base is managedsustainably and in ways that benefits the local populations, improves system productivity, cultivatesagro-ecosystem resilience and maintains ecosystem services, long-term gains from agriculturedevelopment for the economy, farmer livelihoods and rural development will not be possible. In the fortunes of agriculture, therefore, requires polices and institutional arrangementsthat pay heed to farmers as well as the needs of the environment.

Better use of natural resources

1) Natural resources, especially those of soil, water, plant and animal diversity, vegetation cover,renewable energy sources, climate, and ecosystem services are fundamental for the structure andfunction of agricultural systems and for social and environmental sustainability, in support of life onearth. Historically the path of global agricultural development has been narrowly focused on increasedproductivity rather than on a more holistic integration of NRM [Natural Resource Management] withfood and nutritional security. A holistic, or systems-oriented approach, is preferable because it canaddress the difficult issues associated with the complexity of food and other production systems indifferent ecologies, locations and cultures.AKST [Agricultural Knowledge Science and Technology] to resolve NRM exploitation issues, such as themitigation of soil fertility through synthetic inputs and natural processes, is often available and wellunderstood. Nevertheless, the resolution of natural resource challenges will demand new and creativeapproaches by stakeholders with diverse backgrounds, skills and priorities. Capabilities for workingtogether at multiple scales and across different social and physical environments are not welldeveloped. For example, there have been few opportunities for two-way learning between farmers. Andresearchers or policy makers. Consequently farmers and civil society members have seldom beeninvolved in shaping natural resource management policy. Community-based partnerships with the
2) private sector, now in their early stages of development, represent a new and promising way forward.
3) Use existing AKST to identify and address some of the underlying causes of declining productivityembedded in natural resource mismanagement, and develop new AKST based on multidisciplinaryapproaches for a better understanding of the complexity in NRM. Part of this process will involve thecost effective monitoring of trends in the utilization of natural resource capital.
4) Strengthen human resources in the support of natural capital through increased investment
5))research, training and education, partnerships, policy) in promoting the awareness of the societal costsof degradation and value of ecosystems services.
6) Promote research to facilitate less exploitative NRM and betterstrategies for resource resilience, protection and renewal through innovative two way learningprocesses in research and development, monitoring and policy formulation.

7) Create an enabling environment for building NRM capacity and increasing understanding of NRMamong stakeholders and their organizations in order to shape NRM policy in partnership with public andprivate sectors.
8) Develop networks of AKST practitioners (farmer organizations, NGOs, government, private sector) tofacilitate long-term natural. resource management to enhance benefits from natural resources for thecollective good.
9) Connect globalization and localization pathways that link locally generated NRM knowledge and
10) Innovations to public and private AKST.
11) (8When AKST is developed used creatively with active participation among various stakeholders acrossmultiple scales, the misuse of natural capital can be reversed and the judicious use. and renewal ofwater bodies, soils, biodiversity, ecosystems services, fossil fuels and atmospheric quality ensured forfuture generations.

Conclusion

Natural resources, especially those of soil, water, plant and animal diversity, vegetation cover,renewable energy sources, climate, and ecosystem services are fundamental for the structure andfunction of agricultural systems and for social and environmental sustainability, in support of life onearth.The cultivation of land for effective crop growth and raising of livestock. farmers engagedirectly in articulation by preparing soil and planting crop. Narrating those crops and preparing them soil in the market is also part of agriculture activities.sustained agricultural productivity is closely linked to the quality of ecosystem services that natural resources provide.

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Sustainable Development Goal–Zero Hunger Change in Cropping Pattern

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Since Independence, A Lot Of Changes Had Been Recorded In Respect Of Cropping Pattern To Fulfill The Demands Of Large Population Of India. As, These Changes Added The Gross Profit To The Farmer's Earning Still They Also Bestow Some Adverse Outcomes To The Society. In This Context, The Cropping Pattern Is Always In Change As Per The Public Demand Of Agriculture Products I. E. Cereal Crops And Cash Crops Etc. For Agricultural Growth And Development, Some Major Common Factors Those Affecting Cropping Pattern Of Any Region Depends Upon Geographical Features As Soil, Climate, Rainfall Etc. Along With Farmer's Thoughts Of A Particular Area. Apart From This, It Depends On The Nature And Availability Of Irrigation Facilities.

Cropping Pattern

Fundamentally, Cropping Pattern Refers The Production Of Area Under Various Crops At A Point Of Time. It Is A Dynamic Concept In Determining The Level Of Agricultural Production Which In Turn Would Reflect On The Agricultural Economy Of An Area. It Is Noteworthy That The Best Farming Practices Always Followed By Certain Cropping Patterns As Well As Cropping System For Raising Their Productivity And Maintaining The Fertility Of Soil. There Are Three Types Of Cropping Patterns

1. Mixed Cropping Pattern : Growing Two Or More Crops Simultaneously On The Same Piece Of Land To Minimize The Risk Of Crop Failure.

2. Inter-Cropping Pattern : Growing Two Or More Crops Simultaneously In The Same Field In A Definite Pattern To Increase The Productivity Per Unit Area.

3. Crop Rotation : Growing Of Different Crops On The Same Land In Pre-Planned Succession For Allowing Soil To Recover Its Lost Nutrients.

Causes That Responsible For The Change In Cropping Pattern:

In Our Country, Agriculture Is The Primary Source Of Livelihood For About 58% Of Population. So, It Is Rational And Appropriate To Place Greater Emphasis On Advanced Development In Agricultural Sector. Generally, In Agrarian Activities, Farmers Always Cultivate Crops Those Have High Yield To Uplift Their Economic Conditions. The Changes In The Cropping Pattern Are Mainly Occurred Because Of:

1. Whenever, Agriculturists Find Seed Of Any Crop Which Can Increase Farm Production, They Adopt It Immediately To Get More Yield.
2. Increase In The Prices Of Non-Food Grains Or Cash Crops.
3. Cultivation Of Food Crops Has Become Very Much Expensive Due To Introduction Of New Technology In Indian Agriculture.
4. Minimize The Large Involvement Of Labour And Domination Of Consumption Over Production I.E. Decrease The Cost Of Production.

Factors Those Affect The Cropping Pattern

Factors Which Generally Do Affect The Cropping Pattern Are Broadly Classified As: Physical, Economic, Technological, Fiscal, Institutional And Political

1. Physical Factors Land, Soil, And Climate Are Very Important Physical Factors. To Determine The Nature And Extent Of Land Use Patterns In Agriculture. These Factors Have Significant Effect On The Cropping Season, Selection Of Crops, Crop Combinations, Productivity Of Crops, Cost Of Production And Consequently On The Profit Which Are Obtained From The Agricultural Produce.

Land (Relief) : Generally, The Type Of Farming Depends On The Degree Of Slope Of Land. The Broken Surface Usually Results In A High Proportion Of Nontillable Pasture Land. Under Such Condition Livestock Play An Important Role In The Farming System. While In Plain Areas, Crop Cultivation Are Largely Grown With The Help Of Machinery And Labour.

Soil : Cropping Pattern Is Based On Type Of Soil. In Fact, Certain Crops Are Affected By The Texture Of The Soil Where As Others By Chemical Contents, And The Water Holding Capacity. The Physical Soil Factors Are More Prominent Than Chemical Factors In Analyzing The Fertility Value Of Land.

Climate (Temperature And Rainfall) : Temperature And Rainfall Are The Chief Aspect Of The Physical Environment Affecting The Type And Intensity Of Cropping. Hence, The Study Of The Distribution And Intensity Of Precipitation, Temperature And Frost Free Period Becomes Indispensable. Each Crop Has Upper And Lower Range Of Temperature, Rainfall, And Humidity Conditions Beyond Which It Fails To Survive.

2. Economic Factors

The Nature And Types Of Cropping Are Influenced By Various Economic Factors Such As The Prices Of Agricultural Products And Inputs Incurred. Important Economic Factors That Influence The Cropping Pattern Are:

Distance : Whenever Distance Affecting The Cropping Patterns Is Considered, It Is Related To The Freight Charges. This Factor Has Its Natural Influence Which Is Exerted In All Locational Pattern Of Crop Distribution. (Applied: Von Thunen Theory)

Market Price : Market Price Of A Commodity Is Determined By The Virtue Of Demand And Supply. The Adjustment Between Demand And Supply Usually Requires A Proper Span Of Time. Cultivators Are Used To Adjust A Particular Crop For Cultivation In The Scale Of Farm-Gate Price And Thus, One Would Select That Product Or Combination Of Products Which Would Yield Highest Economic Rent At A Particular Location.

Infrastructure : There Are Two Categories Of Infrastructure— Soft And Hard. The Soft Infrastructure Comprises Rural Services Like Banking, Credit Extension Facilities, Seed Provision, Local Transport, Communication And Marketing Of Agricultural Produce Etc. While, The Hard Infrastructure Usually Includes Road Transportation. These Transport Services Cause Unique Change In The Patterns Of Agricultural Land Use.

Farm Size (Land Holding) : Actually, Farm Size And Soil Fertility Have A Type Of Relationship Where The More Fertile Is The Soil, The Smaller Is The Farm Size And Vice-Versa. In Similar Manner, The Level Of Mechanisation And Farm Size Are Also Closely Related Where Higher Is The Level Of Mechanisation, Greater Is The Farm Size. So, There Is A Close Association Between The Farm-Size And Cropping Pattern. The Farmers With Small Land Holdings Are Primarily Interested In Producing Food Grains For Their Own Needs. But, They Would Go In For Cash Crops Only If They Have Met Their Requirements Of Food Grains. Recently A Trend Has Been Changed That All Small And Large Farmers Try To Produce Some Cash Crops.

Agricultural Labour (Man Power) : The Agricultural Workers Are Mostly From The Unorganised Sector Who Mainly Belong To One Category—Unskilled Workers. Probably, They Have Migratory Nature And Their Annual Earnings Are Much Smaller Basically Because Of Low Rates Of Wages And Seasonal Character Of Employment. In Present Days, Somehow Agriculture Is Constantly Requiring A Semi-Skilled Labourer.

Market Demand : The Prices Of A Commodity Can Be Fixed On The Bases Of Demand And Supply Rule. In Case, The Demand Is More Than The Supply, The Rates Certainly Will Be Higher Side While Goods Are Available In Market In Ample Quantity, The Rates Will Be Lower Side.

3. Technological Factors Modern Technological Applications In Agriculture Consist Of Adoption Of New Farming Techniques, Research And Development Programmes. Their Aim Is To Bring The Diversification And Increase In Agriculture Production. The Use Of Fertilizers, High Yielding Varieties Of Seeds, Pesticides And Weedicides, Improved Irrigation Facilities, New Agricultural Implements And Contour Bunding Etc. Are Some Of The Examples Of Such Techniques. Apart From These, The Changes In The Transport Technology Also Bring About Far Reaching Modifications In Various Cropping Pattern.

Fiscal Factors (Financial) : The Fiscal Or Monetary Factors Pertain To A Treasury. The Impact Of Agricultural Taxation And Capital Input Has Profound Influence On The Cropping Pattern Of A Region.

Agricultural Taxation : Broadly, Agricultural Taxation Includes Taxes Paid By The Farmers Whether It Is Directly Or Indirectly. Direct Taxes On Agriculture Consist Mainly Of Land Revenue, Cesses And Surcharges On Land Revenue, Cesses On Crops And Agricultural Income Tax. On The Other Hand, Indirect Ones Are The Sales Tax, Import Duty, The Motor Vehicle Tax. Out Of These Taxes, Land Revenue Is The Oldest Of All Taxes And Most Important Tax On The Agricultural Land.

Capital : The Availability Of Capital In Rural Areas Is Important Factor To Explain The Localization Of Crop Land Use Types. Considering A Society Where Farmers Are Of Varying Economic Status; Rich Farmers Will Be Diverting Their Attention More Toward The Cultivation Of Cash Crops And Superior Grains. While, The Poor Farmers Will Divert Their Resources Towards The Cultivation Of Inferior Grains In Order To Fulfill Their Basic Requirements Of Life. Further More, Various Financial Institutions Are Providing Help The Farmers To Promote Agricultural Activities.

4. Social Factors The Cropping Pattern Of A Region Is Some How Influenced By Various Social Factors Such As Religion, Caste And Customs/ Traditions And Education.

Religion : The Influence Of Religion Is Very Indicative On The Locational Pattern Of Cropping/Agriculture. For Examples, In Christian Societies Piggaries Are Encouraged, While In The Islamic Societies Piggaries Are Discouraged. Similarly, Cow Slaughter In A Hindu Society Is Strictly

Prohibited. Therefore, The Requisition Of Particular Fodder Is Needed For Domestication Of Animals In A Region.

Caste And Customs : There Is A Strict Purview Of Customs And Traditions, As Well As, Dietary Habits Prevailing In The Region That Sometimes Become More Important To Cultivate A Particular Crop.

Literacy Levels : In A Region With Low Level Of Literacy, People Are Generally Unfamiliar With New Methods And Techniques Of Agriculture. So, They Grow Inferior Grains With The Use Of Primitive Type Of Techniques To Bear A Self-Sustained Economy. Contrastly, The Community With Higher Levels Of Literacy Grow Superior Grains And Prefer To Grow Cash Crops.

5. Political Factors (Policies) Till Today, The Influence Of Government Policies On The Location Of Crops Is Well Stabilized. But In Other Prospects, Government Policies Can Also Be Helped To Change Cropping Pattern For Improving Economic Conditions Of The Cultivators. In This Respect, Main Steps Worked Out By The Government Is The Systematic Formal/Informal Farm Education. Several Agricultural Universities And Schools Receive Financial Aids From The Government To Promote Advanced Technological Practices. Sometimes Government Pay More Attention Towards The Production Of A Particular Crop. Accordingly, Government Offers Such Possible Facilities To The Farmers For Encouraging The Production Of High Yielding Crops.

Impact Of Change In Cropping Pattern When The Cropping Pattern Of A Region Changes, It Merely Imposes To Increase The Productivity But It Also Entails The Deterioration Of Physical Properties Of The Land. The Comprehensive Discussion Of These Issues Is Described As Under:

1. Economic Impact

In India, Crop Production Strategy Is Regularly Followed With The Green Revolution Time And Now, It Has Significantly Helped To Expand Food Output Including Heavy Stocks. So, The Change In Cropping Pattern Accelerates The Agrarian Economy And Improve Living Standard Of Indian Farmers.

2. Social And Cultural

The Progress In Agriculture Brought A Change In Human Society. One Modification Is That People Afford To Live In Permanent Settlement After Earning More Income From Agriculture. They Also Become Strong To Celebrate Their Cultural Activities.

3. Environmental

(A) Decrease In Biodiversity : The Change In Cropping Pattern Activities Have Significant Impact On Wild Species Of Flora And Fauna. Species Capable Of Adapting To The Agricultural Landscape May Be Limited Directly By The Disturbance Regimes Of Farming. So, The Process Of Change In Cropping Pattern Creates A Drastic Shift In Species Composition Of A Particular Area.

(B) Receding Water Table : With More Ground Water Available, Farmers Shifted Easily From Semi Arid Cereals To High Yielding Varieties Of Cash Crops Those Require Huge Quantity Of Chemicals And Assured More Irrigation. As A Result, Ground Water Level Gradually Goes Down.

(C) Affect The Land And Soil : With Use Of Modern Machinery And Techniques, Farmers Do Get Tilling Their Farms Again And Again To Raise The Yield Of Crops. However, Heavy Tillage Modifies The Landscape As Well As Soil Texture.

(D) Biomagnification : Although Agrarian Income Has An Important Role To Play In Promoting Sustaining Development But To Day, A Current Need To Increase Food Production Pressurizes The Farmers To Change The Cropping Pattern With Intensive Use Of Pesticides And Chemical Fertilizers. Therefore, The Problem Raises When These Chemicals Enter Into The Food Chain And Amplify At Each Trophic Level That Is Called Biomagnification. This May Result In Catastrophic Health Hazards. Ultimately, The Use Of Such Type Of Chemicals Under Agriculture Chemotherapy Techniques For Increasing Crop Yield Become Fatal To Life.

(E) Eutrophication : While Change In Cropping Pattern, There Is Use Of Large Amount Of Various Chemicals In Farms And These Are No Longer Able To Assimilate By The Plants. Later, These Are Discharged Into Water Bodies Through Streams Which Results In Eutrophication. Furthermore, In This Process These Chemicals Deplete Oxygen Of The Water Bodies That Harm The Aquatic Life.

Suggestion

1. *Use Of Biofertilizers— Accelerate The Consumption Of Biofertilizers Instead Of Chemical Fertilizer To Improve Of Quality Of Soil.*
2. *To Prepare And Maintain The Quantity Of Biofertilizers, Feed Good Quality Of Fodder To Domestic Animals.*
3. *Apply Both Conventional As Well As Modern Methodology Of Ploughing And Irrigation.*
4. *Reduce The Use Of Weedicides And Pesticides. Hence, Use Traditional Methods To Control The Weeds And Pests Such As Weeding An D Hoeing, Organic Pest Management Etc.*

Reading Habit of Users of 'A' Grade Public Libraries in Nanded City

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Introduction:

The great easiest Sir Richard Steele Said, "Reading is to mind what Excises to body" it is said that healthy is one who includes the habit of reading is one's younger day's reading is preliminary an intellectual activity and reading habit is a sort of attribute of man being like other habit of reading is and individual develop during the course of time psychologically habit of is a product of tearing however according to Derrayan reading is a arts of interpreting printed Tools and written words."

Reading is considered as stepping stone of success not just in school but also throughout that adult life of an individual reading is regarded as a process a made of thinking of a kind of real experience and involves many complex skills the ability to precise printed words, to skim for information and them perhaps read intensely with adult riders, it is also found that reading contributes significantly to job success, career development and ability to respond to change.

Reading:

Reading is in art. Anyone who is truly reading is grasping seizing something and working with it. The derive to read is the desire to known. We read because we want to know more. Reading is both sensory and a mental process. It involves use.Of the eye and the mind reduced to world calling and which is no reading. It becomes a sensorial activity which only takes in to account the work of eye without taking in to consideration the brain mechanisms reading is a visual and mental phenomenon. The world reading consist seven alphabets. The separate meaning of each alphabet is given below.

R – Regularity
E – Effort to collect information's
A – Accepts the challenges
D – Development of knowledge
I – Interaction with books
N – Nutrition of brain
G – Grasping power of written symbol.

Reason of the Selection Topic:

In our society there is general thinking at about users of public libraries is that "They are mostly like literature for reading" But researcher is interested know which kind at reading material they are used for reading whether above statement is true and false? "A" Grade Public libraries are audit good compare to other public libraries. In Nanded city here are two public libraries are running successfully. So that researcher is selecting a Topic "Reading habit of Users of "A" Grade public Libraries in Nanded city.

Aims and Objective of Study:

1. To know type of materials Reading habit of users.
2. To know which types of material read by readers to know the interest of users.
3. To know current awareness of users about periodicals.
4. Most of language wise reading materials are to be used. Read by readers.
5. To know which type of reading materials use of by in readers.

Scope and limitations Of the Study:

Researcher has selected a Topic "Reading habit of users of "A" Grade public libraries in Nanded city."

Researcher not considered others users apart from "A" Grade public Libraries for present study. All data collected as on 31st March 2016.

Hypothesis of Study:

1. Most of users reading newspaper in the library.
2. Drama is maximum user's favourite reading material.
3. Drama is maximum user's favourite reading material.
4. Maximum users are satisfied with library environment.
5. Review of Related Literature:
6. Krolak (2005):
7. The present article entitled "The role of libraries in the creation of literate environments". The objective of this paper is to show how library and information services in public and school libraries in community learning centres or NGO resources centres work towards creating literate environments that support basic education for all.

8. Sharma, A.K. & Singh (2005):
9. The present study on reading habit of faculty members based on a user survey carried out at University of Delhi. The article is a Questionnaire based study. In order to carry out the study a questionnaire was designed for the faculty members of the Delhi University in natural sciences.
10. Leff, B. (2006):
11. Present study conducted on "The reading habits of medicine clerks at one medical school: Frequency, usefulness and difficulties". The purpose of this study is to describe the reading habits of medicine clerks which previously have not been describe. Understanding issues related to student reading habits may provide insights and opportunities for medical educators to develop methods to improve clerks' clinical clerkship experiences and their information literacy skill.
12. Abdul Karim (2007):
13. The present research study conducted on "Reading habits and attitude in the digital age". The aim of this study is to know the reading habits and attitude of the Bachelor of IT students and the Bachelor of Arts students from the International Islamic University, Malaysia. This study is based on a survey method. This study was conducted to found out the reading habits and attitude of the students of IT and Arts. The IT students rely more than the Arts-based students.

Total No. Of Public Libraries as on 31 March, 2016 is as under:

Sr. No.	Particulars	No. Of
	Government Libraries	
	Director of Libraries	1
	Asst. Director of libraries officers	6
	State Central Library	1
	Government Divisional Libraries	6
	Dr. Babasaheb Ambedkar Govt. Research Library, Dapoli, Ratnagiri.	1
	District Library Officer, Office	35
	Digital Library sub centre- Andheri, Nanded, Ghansangvi	3
	Total	53
Sr. No.	Particulars	No. Of
	Aided Public Libraries	
1.	District Libraries 'A' grade	34
2.	Taluka Libraries- A(133), B(109), C(30)	272
3.	Other Libraries-A(162), B(1955) and C(4053)	6170
4.	Class D-Libraries	5514
5.	Grampanchayat Libraries (Taluka B-4, C-3, other A-5, Other B-48, Other C-69 & Class D-25)	154
	Total	12,144
	Research Institutes Libraries	37
	Total	37

(www.dolmaharashtra.org.in)

Data Analysis:

Researcher has chosen Nanded city's 'A' grade public libraries for their research. The title of research is, "Reading habit of users of "A" grade public libraries in Nanded city". Researcher has found two "A" grade public libraries in Nanded city. These two libraries name are given below:

- Late. Rammanohar Lohiya Public Library, Nanded
- Shri. Huzur Saheb Public Library, Nanded

Above two libraries are well developed libraries in Nanded city. Researcher has select survey method their research. He has survey two libraries. Selected tool is questionnaire for data collection. Researcher has prepared questionnaire and 32 questions are included in this questionnaire. Data collection details are given below:

Sr. No.	Name of Public Library	Distributed questionnaire	Received Questionnaire	Percentage
01	Late. Rammanohar Lohiya Public Library, Nanded	200	123	61.5%
02	Shri. Huzur Saheb Public Library, Nanded	150	96	64.00%
	Total	350	219	62.57%

Table No. 1

Sr. No.	Options	No. of response	Percentage
01	Male	171	78.08%
02	Female	48	21.91%
	Total	219	100%

Table no. 1 shows that maximum 78.08% of library users are male and only 21.91% of library users are female.

Which type of reading material do you read in the library?

Table No. 2

Sr. No.	Options	No. of response	Percentage
01	Magazine/Journal	55	25.11%
02	Literature Books	32	14.61%
03	Newspapers	91	41.55%
04	Other	41	18.72%
	Total	219	100%

Table no. 2 shows that maximum 41.55% of library users are read newspapers, 25.11% of library users read magazine/journals, 18.72% of library users read other reading materials and 14.61% of library users read literature books.

Do you regularly read the Newspaper?

Table No. 3

Sr. No.	Options	No. of response	Percentage
01	Yes	166	75.79%
02	No	53	24.20%
	Total	219	100%

Table no. 3 shows that 75.79% of library users are regularly read newspapers and only 24.20% of library users are not regularly read newspapers.

Which language do you prefer to read literature books?

Table No. 4

Sr. No.	Options	No. of response	Percentage
01	Marathi	148	67.57%
02	Hindi	31	14.15%
03	English	12	5.47%
04	Any other	07	3.19%
	Total	219	100%

Table no. 4 shows that maximum 67.57% of library users are preferred Marathi language literature books to read, 14.15% of library users preferred Hindi language literature books to read, 5.47% of library users preferred English language literature books to read and only 3.19% of library users preferred other language literature books to read.

Which kind of literature do you prefer to read?

Table No. 5

Sr. No.	Options	No. of response	Percentage
01	Poetry	51	23.28%
02	Drama	88	40.18%
03	Novel	67	30.59%
04	Other	13	5.93%
	Total	219	100%

Table no. 5 shows that maximum 40.18% of library users are preferred Drama to read, 30.59% of library users preferred Novels to read, 23.28% of library users preferred Poetry and 5.93% of library users preferred other literature to read.

Are you satisfied with find conductive environment in the library?

Table No. 6

Sr. No.	Options	No. of response	Percentage
01	Most satisfied	53	24.20%
02	Satisfied	86	39.26%
03	Not satisfied	64	29.22%
04	No comments	16	7.30%
	Total	219	100%

Table no. 6 shows that 24.20% & 39.26% of library uses, it is included 63.46% of users are satisfied with find conductive environment in the library. Some library users i.e. 29.22% are not satisfied with library environment and 7.30% of library users are no comments on this question.

Which audio visual material is mostly used?

Table No. 7

Sr. No.	Options	No. of response	Percentage
01	D.V.D.	48	21.91%
02	CD-ROM	112	51.14%
03	Other	59	26.94%
	Total	219	100%

Table no. 7 shows that maximum 51.14% of library users are mostly used CD-ROM, 21.91% of library users are used DVD and 26.94% of library users are used other materials.

Conclusions:

After data collection and analysed researcher has drafted some conclusions and suggestions. They are given below:

1. *Researcher has study 'A' grade public library users reading habit. He has distributed total 350 questionnaires and gets 62.57% of user's response.*
2. *In Nanded city's 'A' grade public libraries 78.08% of library users are male and only 21.91% of library users are female.*
3. *Most of users are come for reading newspaper.*
4. *Maximum 75.79% of users are regularly read the newspaper.*
5. *Near about 67.57% of users are preferred to read Marathi language & literature books.*
6. *Most of users are preferred to read Drama books.*
7. *63.46% of users are satisfied with conductive environment in the library.*
8. *51.14% of users are used CD-ROM audio visual material.*
9. *References:*

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Renewable Energy Technologies: Roadmap to Future Generations

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Abstract:

Renewable Energy Technologies such as solar energy, hydropower energy, geothermal energy, wind energy and bio mass energy can be used in order to improve living conditions. Generally, Renewable Energy has a lot of advantages than fossil fuels due to clean the air, can reduce air pollutants and carbon emissions. Renewable Energy Resources can play a key role in providing energy needs as well as underneath the environment resources. These resources, along with fuel economy measures will definitely become the proper choice of suitable technology option for an successful energy management. The key component of greenhouse gases is carbon dioxide, there is a global alarm about reducing carbon emissions by the usage of renewable energy resources. Converting fron non-renewables to renewables, to help mitigate climate change is an excellent way which needs to be sustainable in order to meet energy demand for future generations. The Global Warming ultimately leads to significant changes in the world's climate, which will turn into a major impact on human life and the constitute for a better environment. Therefore, effort has to be completed to reduce the usage of fossil energy and to encourage green energies for future generations.

Keywords: Renewable Energy Resources, Solar Energy, Wing Energy, Green Energy, Global Warming, Climate Change.

Definition of Renewable Energy and Non Renewable Energy:

Renewable energy

1. Renewable energy is energy obtained from sources that are essentially inexhaustible. Examples of renewable resources include wind power, solar power, geothermal energy, tidal power and hydroelectric power.
2. Renewable energy, often referred to as clean energy, comes from natural sources or processes that are constantly reloaded.
3. The most important features of renewable energy is that it can be harnessed without the release of harmful pollutants.

Non-renewable energy

1. Non-renewable energy is the conventional fossil fuels such as coal, oil and gas, which are likely to deplete with time.

Introduction:

Renewable Energies like solar energy, wind energy and water power are generated from natural energy sources and in contrast to fossil fuels, these sources of energy never scurry out. With a way minor impact on the surroundings, using renewable energy helps to protect our globe by considerably reducing the quantity of carbon emissions that we produce. By using renewable energy sources, we also reduce our reliance on fuel gas and oil capital, which implies that we can avoid the rising value of energy bills and improve our energy security. Renewable energy is energy derived from resources that are regenerative, and do not deplete over time. Renewable energy offers our planet a chance to reduce carbon emissions, clean the air, and put our civilization on a more sustainable footing. It also offers countries around the world the chance to improve their energy security and spur economic development. Modern biomass encompasses a range of products derived from photosynthesis and is essentially chemical solar energy storage.

Types of Renewable Energy Technologies:

1. Solar Energy: Solar energy is the most profuse unending energy resource on earth and it is existing for use in its direct (solar radiation) and indirect (wind, biomass, hydro, ocean, etc.) forms. Solar energy, knowledgeable by us as heat and light, can be used through two ways: the thermal way uses the heat for water heating, cooking, drying, water purification, power generation, and other applications the photo voltaic way exchanges the light in solar energy into electricity, which can be used for a number of reasons such as lighting, pumping, communications, and power supply in unelectrified regions. Solar energy is the free and non- diminishing power resource of energy. The solar radiation received outside the earth's atmosphere is 1367 W/m2.

Fig.1. Schematic Diagram of Solar Energy Source

On an average of the radiation received by the planet is 800 W/m2. The planet collects billions of MW solar power daily that is the way enough to fulfill the energy demand of the country. The average amount of radiation received in India is about 200 MW/km with a geographic region of 3.287 million kilometer sq. This accounts to 657.4 million MW of solar power. The percentage of the land (85%) is used for the agriculture and forests, 6.7% of land used for housing, 5.8% of land is either infertile, snow bounded or fit for human habitation. The percentage (12.8%) of surface area mounting to 4.413 million sq. can be used for solar power plant installations.

Sectors	International Level	National Level	State Level
Industry	51.7%	29%	25%
Transport	26.6%	30%	0.6%
Domestic	13.9%	27%	49%
Commercial	7.8%	9%	17%
Others	0	5%	8.4%

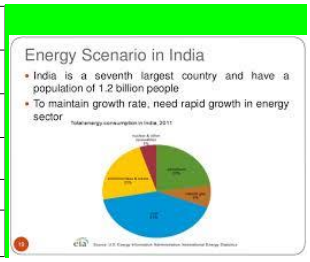

Fig.2. Diagrams of Sector wise Energy Consumption Pattern and Energy Scenario in India.

Solar power in India is a quickly developing industry. India is densely populated and has high solar insolation, an ideal combination for using solar power in India. The country's solar installed capacity reached 23 GW as on 30 June 2018. India expanded its solar-generation capacity 8 times from 2,650 MW as on 26 May 2014 to over 20 GW as on 31 January 2018. The 20 GW capacities were initially targeted for 2022, the government achieved the target four years faster than scheduled. The country added 3 GW of solar ability in 2015-2016, 5 GW in 2016-2017 and over 10 GW in 2017-2018, with the average current value of solar electricity dropping to 18% below the average value of its coal-fired counterpart.The Ministry of New and Renewable Energy (MNRE) has planned a trajectory so as to meet the target of 100 GW by 2022. A capacity of 23.12 GW was installed up to July 2018. The MNRE, working in conjunction with the Indian Renewable Energy Development Agency (IREDA) to promote the utilization of all forms of solar power as well as to increase the share of renewable energy in the Indian market.

2. Wind Energy:

•Wind energy is a free, renewable resource, so no matter how much is used today, there will still be the same supply in the future. Wind energy is also a source of clean, non-polluting, electricity. Unlike conventional power plants, wind plants emit no air pollutants or green house.•It's a clean fuel source. Wind energy doesn't pollute the air like power plants that rely on combustion of fossil fuels, such as coal or natural gas, which emit particulate matter, nitrogen oxides, and sulfur dioxide—causing human health problems and economic damages' gases.

Fig.3. Schematic Diagrams of Wind Energy Electricity Generation and Wind forms

Wind energy is being developed in the mechanized world for environmental reasons and it has holds in the developing world as it can be installed quickly in areas where electricity is immediately needed. In many occasions, it may be a cost-effective solution if fossil fuel sources are not gladly available. There are many applications for wind energy in remote regions, worldwide, either for supplementing diesel power or for supplying farms, homes and other installations on an individual basis.

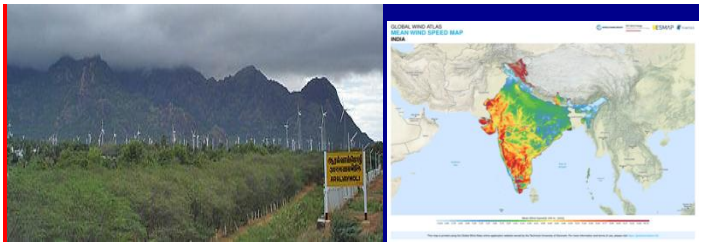

Fig.4 Diagrams of the largest wind farm of India in Muppandal, Tamil Nadu and Mean wind speed in India

Wind power accounts for nearly 10% of India's total installed power generation capacity and generated 52.67 TWh in the financial year 2017-18, which is nearly 3% of total electricity generation. The capacity utilisation factor is nearly 16% in the financial year 2017-18 (19.62% in 2016-17 and 14% in 2015-16). 70% of wind generation is during the five months duration from May to September corresponds with Southwest monsoon duration. In India, solar power is complementary to wind power as it is generated mostly during the non monsoon period in daytime.The 30th June, 2018 the installed capacity of wind power in India was 4,293 MW, mainly extend across Tamil Nadu (7,269.50MW), Maharashtra (4,100.40 MW), Gujarat (3,454.30 MW), Rajasthan (2,784.90 MW), Karnataka (2,318.20 MW), Andhra Pradesh (746.20 MW) and Madhya Pradesh (423.40 MW). India has set an striving target to generate 60,000 MW of electricity from wind power by 2022.

Table.1. Some of India's largest wind farms are:

Largest wind farms in India[33]				
Number	**Wind farm**	**Producer**	**State**	**Current capacity (MW)**
1	Muppandal wind farm	Muppandal Wind	Tamil Nadu	1,500
2	Jaisalmer Wind Park	Suzlon Energy	Rajasthan	1,275
3	Brahmanvel windfarm	Parakh Agro Industries	Maharashtra	528
4	Dhalgaon windfarm	Gadre Marine Exports	Maharashtra	278
5	Chakala windfarm	Suzlon Energy	Maharashtra	217
6	Vankusawade Wind Park	Suzlon Energy	Maharashtra	189
7	Vaspet Windfarm	ReNew Power	Maharashtra	144

Alternative Renewable Energy Technologies:

Hydropower: Hydro-power is another source of renewable energy that converts the potential energy or kinetic energy of water into mechanical energy in the form of watermills, textile machines, etc., or as electrical energy (i.e., hydroelectricity generation). It refers to the energy produced from water (rainfall flowing into rivers, etc.). Hydro-power is the largest renewable energy resource being used for the generation of electricity. Only about 17% of the vast hydel potential of 150,000 MW has been tapped so far.

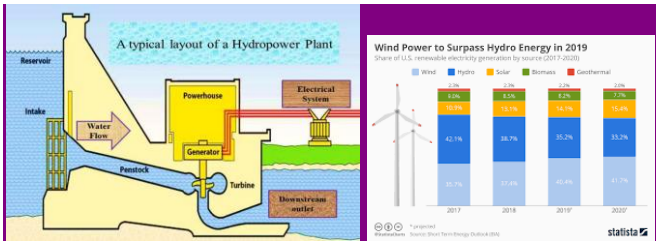

Fig.5. Diagrams of Hydro Power energy generation and Hydro energy in 2019

In India, hydropower projects with a station capacity of up to 25 megawatt (MW) drop under the category of Small Hydropower (SHP). India has an estimated SHP potential of about 15,000 MW, of which about 11% has been tapped so far. The 31st March, 2020, India's installed utility-scale hydroelectric capacity was 45,699 MW, or 12.35% of its total utility power generation capacity. Further, smaller hydroelectric power units with a total capacity of 4,380 MW (1.3% of its total utility power generation capacity) have been established.

2. Biomass Energy:

•Biomass is organic material that comes from plants and animals, and it is a renewable source of energy.

•Biomass contains stored energy from the sun. Plants absorb the sun's energy in a process called photosynthesis. When biomass is burned, the chemical energy in biomass is released as heat.

Fig.6. Schematic Diagrams of types of biomass and Biomass Energy

Energy production from food wastes or food processing wastes, especially from waste edible oils, seems to be attractive based on bio-resource sustainability, environmental protection and economic consideration. Biomass power generation in India is an industry that attracts investments of over Rs. 600 crores every year, generating more than 5000 million units of electricity and yearly employment of more than 10 million man-days in the rural areas.In 2018, India has set target to produce 15 million tons (62 mmcmd) of biogas/bio-CNG by installing 5,000 large scale commercial type biogas plants which can produce daily 12.5 tons of bio-CNG by each plant. The number of small family type biogas plants reached 3.98 million.

3. Geothermal Energy:

•Geothermal energy is heat from within the Earth.

•We can recover this heat as steam or hot water and use it to heat buildings or generate electricity.

•It is a natural part of the energy flow within the Earth's depths.

•Most of the commercial-grade production geothermal energy is harvested along localized "geothermal systems", where the heat flow is near enough to the surface that hot water or steam is able to rise either to the surface, or to depths that we can reach by drilling.

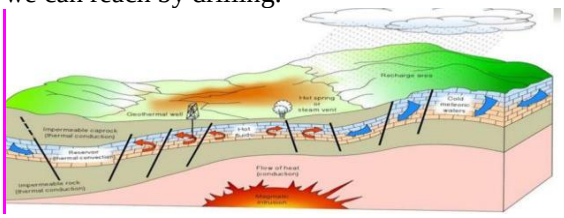

Fig7. . Schematic Diagram of Geothermal System

Geothermal is energy generated from heat stored in the earth, or the collection of absorbed heat derived from underground. Immense amounts of thermal energy are generated and stored in the Earth's core, mantle and crust. Geothermal energy is at present contributing about 10,000 MW over the world and India's small resources can augment the above percentage. The resource is little used at the moment but the Government has an ambitious plan to more than double the current total installed generating capacity.

Tidal power:

1. Tidal power or tidal energy is a form of hydropower that converts the energy obtained from tides into useful forms of power, mainly electricity.
2. Tides are more predictable than the wind and the sun.
3. Among sources of renewable energy, tidal energy has traditionally suffered from relatively high cost and limited availability of sites with sufficiently high tidal ranges or flow velocities, thus constricting its total availability.

Fig.8. Diagram of Tidal power generation

Fuel Cell:

Fuel-cell technology is a clean, consistent and sustainable approach to meet electricity demand. It is a form of an energy storage device, and work similar to a battery, operating on the principle through which atoms of hydrogen and oxygen chemically merges to form water and electricity. This reaction is followed by ejecting heat. Electricity is produced when gaseous fuel combines in the existence of a catalyst (platinum nanoparticles).The reaction of molecular hydrogen, which results in two H^+ ions and two

electrons. Hence, by virtue of an electromotive force which conducts the electrons, electricity is produced. The hydrogen and oxygen combine to form water, while concurrently producing electricity.

$$H_2 + O_2 \rightarrow H_2O + \text{heat}$$

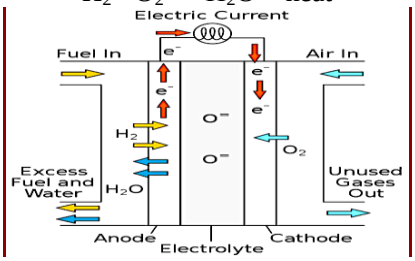

Fig. 8.Diagram of a Hydrogen Fuel Cell

Green Energy:

Green energy includes natural energetic processes that can be harnessed with little pollution. Anaerobic digestion, geothermal power, wind power, small-scale hydropower, solar energy, biomass power, tidal power, wave power and some forms of nuclear power. Green energy is energy that is produced in a manner that has less of a negative impact to the environment than energy sources like fossil fuels, which are often produced with harmful side effects. "Greener" types of energy that often come to mind are solar, wind, geothermal and hydro energy. There are several more, even including nuclear energy, that is sometimes considered a green energy source because of its lower waste output relative to energy sources such as coal or oil.

Fig.9. A Solar trough arry is an example of Green energy

Green Energy is energy that can be extracted, generated, and/or consumed without any significant negative impact to the environment. The planet has a natural capability to recover which means pollution that does not go beyond that capability can still be termed green. Green Energy is generated from alternative energy sources that get powered by various natural events and cannot get depleted with use. The 3 main sources of Green Energy are water, wind and solar energy that can limit the dependence on fossil fuels dramatically. Falling water has had been in use to power dams so as to produce electricity. Even though dams generate clean energy, they leave a negative impact on the ecosystems surrounding the area.

Effect of Global Warming and Climate Change:

Global Warming Effect:

Global Warming is the recent problem to the whole world. Governments and various organizations of all developed and developing countries are trying to reduce it. Global warming is the unusually rapid increase in Earth's average surface temperature over the past century primarily due to the greenhouse gases released by people burning fossil fuels. The global average surface temperature rose between 0.6 to 1.0 degrees Celsius for last 100 years. This is caused by green house effect. Near about 30% of incoming sun radiations are reflected back to space from the outer side of earth's atmosphere and remaining 70% enters the earth's atmosphere, from these radiations (visible light spectrum) a fraction is absorbed by earth, and earth re-radiate this absorbed energy in form of heat, i.e., infrared radiationsGreen house gases such as carbon dioxide, nitrogen oxide, methane, fluorinated gases and water vapours absorb heat caused by these infrared radiations and slow its escape from the atmosphere. Thus infrared radiations remain in the earth's atmosphere for long time and because of this earth's surface temperature increases. Carbon dioxide emission is highly responsible for global warming. By various studies it is predicted that earth's average surface temperature could rise between 2°C and 5°C by the end of the 21st century.

Climate Change Effect:

Climatic change due to global warming caused by greenhouse gases, mainly carbon dioxide (CO2) produced during the burning of fossil fuels, have been causing important changes in the ecosystems and leading to nearly 150,000 additional deaths every year. This augment is mostly caused by the untenable use of fossil fuels and the changes in the use of the land.

Conclusions:

Energy is a requirement in our everyday life as a way of improving human development leading to economic growth and productivity. The rerenewable energy technologies will help mitigate climate change is an excellent way but needs to be sustainable in order to ensure a sustainable future for generations to meet their energy needs. Renewable technologies are considered as clean sources of energy and optimal use of these resources decreases environmental impacts, produces minimum secondary waste and are sustainable based on the current and future economic and social needs. Renewable energy technologies provide an exceptional opportunity for mitigation of greenhouse gas emission and reducing global warming through substituting non-renewable energy sources (fossil fuel based). Green energy is an valuable replacement to these non-renewable sources of energy because Green energy is a pollution free. Efforts in developing countries designed at improving institutional training, strengthening institutions and improving capacity of research on Global Warming and climate change will increase awareness, promote adaptation and stable development. Finally, renewable energy technologies provides vast benefits and can contribute drastically in the national energy mix at least economic, environmental and social costs and it is expected that the share of renewable energy in the total generation capacity will increase in future.

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A Temporal Changes In Kukadi Canal Irrigated Area A Study In Parner Tahasil" Ahmednagar (M.H)

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Abstract

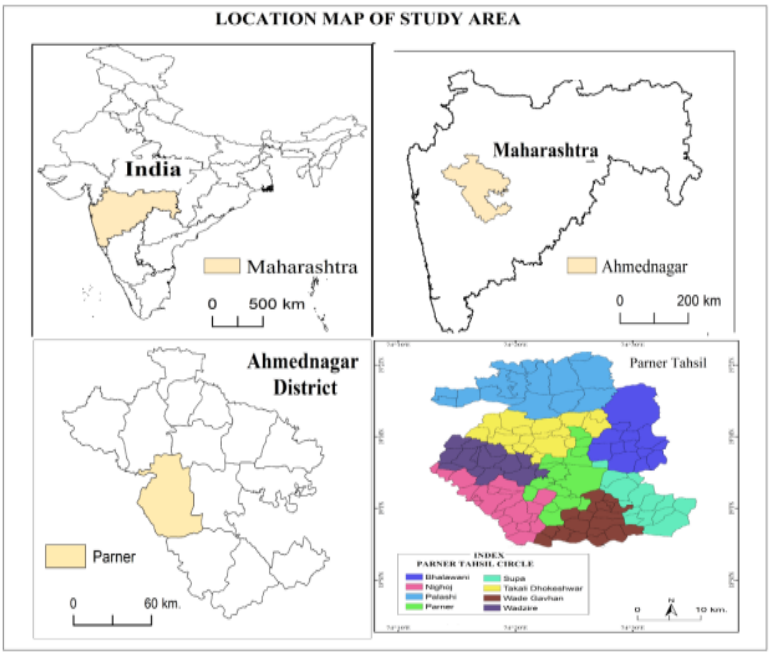
Irrigation is the most important role in agricultural development fix water resources affect in agricultural and social development depended only rainy season only seasonal crops be growing agriculture irrigated crops might ready high yields crops use and properly irrigation facility available irrigation essential part of agriculture development Present study in parner tahsil selected study area under before and after Kukadi canal project which 20 village 1996 to 2006 in this ten year mostly changes in irrigation development before and after increase in irrigated area canal 20 km to 79 km reach to water supply 36% to 67 % increase to irrigated area in 2006 In 1996 in this year 8835.70 hector area in irrigated but after used of canal irrigation 2006 16632.55 hector area in irrigated in 20 village

Key Words- water resources, irrigation facilities, canal irrigation

Introductions

Irrigation in a region or country will depend several factors as a surface, rock structure, , quality and quantity of ground water, catchment area and soil profile of the land. These factors vary considerably from place to place. parner Tahsil receives inadequate rainfall distribution is uneven. it becomes essential water, which has poured, canals, tanks etc. inadequate rain during the growing season. Therefore, an integrated development of water and land resources irrigation variation in parner tahsil mostly 70-80% area not a fixed irrigation facility canal irrigation sources of agriculture but canal irrigation not a every point need for lift irrigation This research paper examine to Before development in canal irrigation area under irrigation and after canal irrigation development growth and development area under different irrigation, methods of irrigation and limitation of irrigation, changes intensity of irrigation in tahsil highlighting the spatial distribution increased area irrigation in parner tahasil selected area.

Study Area



The Parner tahsil selected for the study to present work. The tahsil is confined by 180 49'40" N. to 190 21'13"N. Latitudes and 740 10'22"E to 740 38'34" E. longitudes geographically .it located on "Deccan Plateau" and "Rain shadow zone Therefore tehasil Characterized with low rainfall and it is identified as "drought prone area There are 131 villages in parner tahsil parner tahsil is largest tahasil in Ahmednagar district . Parner tehasil geographical area of 1,930.28 Sq. Km. And 750sq .mi total population parner tahsil 2001 census population in praner tahsil 246552 total area in parner tahsil 1868 sq.. density of population 132 km^2 literate population 71.5% and other area in used in 13.71% and most area in Agricultural area under 76.55% total population

Objective

the main objective of present study area solve the problem related irrigated area

1. To known geographical set up Parner tahsil
2. To study changes irrigated area in study region

Hypothesis Whether the irrigation sources development and it's affected in irrigated area

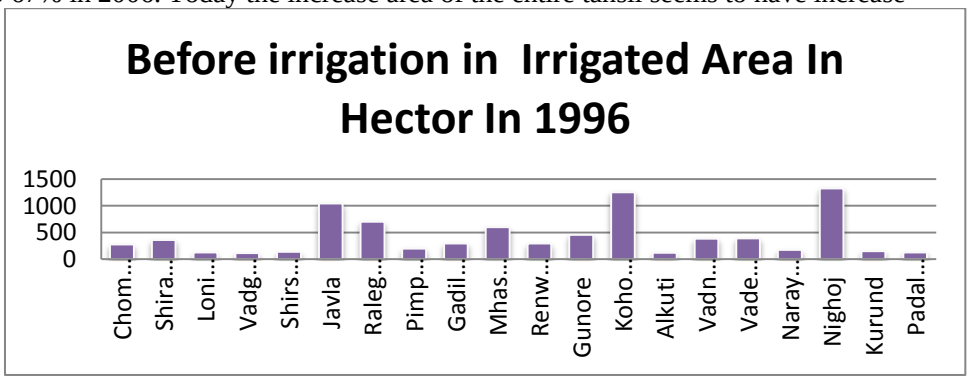
Methdology-The present paper in secondary data .data have been collected statistical abstract in Ahmednagar district and village area count tahasil agricultural office in parner and kukadi canal branch in parner tahasil The suitable map and graphs represented data and analysis to subject matter the main irrigated practices in study area observed in 1996to 2006 to area under irrigated before in kukadi canal in 1996 in 20 village 8835 hectors area in irrigated kukadi canal irrigated area in 2006 in 20 village 16632 hectors area irrigated 36% to 67% area is increases to the kukadi canal irrigated area

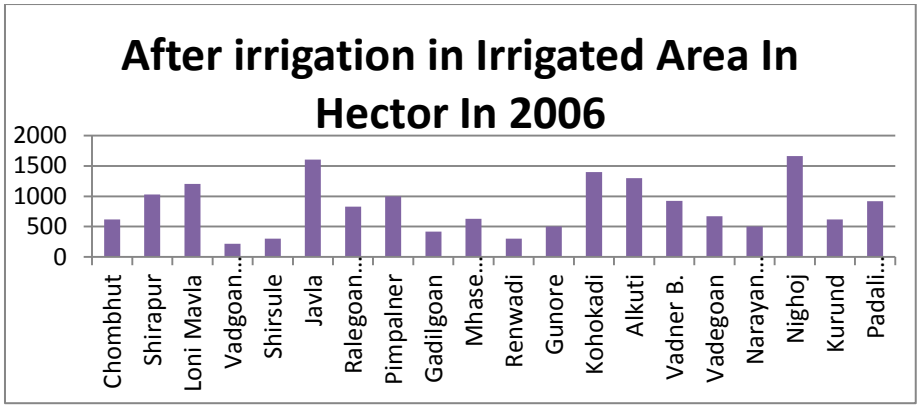
Data Analysis Parner tahsil kukadi canal project under irrigated village and total area in hector

Sr.No.	Village Name	Before irrigation in Irrigated Area In Hector In 1996	After irrigation in Irrigated Area In Hector In 2006	Total Area In Hector
1	Chombhut	275.65	616.00	710.28
2	Shirapur	359.24	1028.33	1969.88
3	Loni Mavla	123.87	1205.00	1707.89
4	Vadgoan Gund	116.00	215.20	434.02
5	Shirsule	140.00	300.00	437.46
6	Javla	1046.07	1605.00	2155.94
7	Ralegoan Therpal	700.00	828.35	1001.31
8	Pimpalner	201.00	1000.00	1707.96
9	Gadilgoan	296.88	417.00	455.81
10	Mhase (Khurd)	600.00	627.00	865.86
11	Renwadi	292.68	300.00	343.58
12	Gunore	458.00	500.00	665.60
13	Kohokadi	1254.00	1400.00	1565.86
14	Alkuti	123.50	1300.50	1851.44
15	Vadner B.	383.07	925.20	1079.34
16	Vadegoan	387.70	672.27	1110.89
17	Narayan Gavhan	174.06	500.00	1587.62
18	Nighoj	1323.03	1660.00	2860.25
19	Kurund	151.95	615.70	1010.42
20	Padali Ranjangoan	129.00	917.00	1016.67
Total	8835.70	8835.70	16632.55	24538.08

(Source: Village Area Count and Tahsil Agriculture Office Parner)

A study of 20 villages in Parner tahsil which come under irrigation in the pre-irrigation in kukadi canal shows that 8835.70 hectors of this 20 villages were under irrigation in the year 1996 considering all the source of irrigation which the availability of irrigation facilities i.c 20 km to 79 km. Of canal after the canal reaches the benefit area and farmers get water through the area under all irrigation sources seems to have increase to 16632 hectors in the year 2006 in the net increase is 7796.15 hectors. The total area of this 20 villages is 24538.08 hectors compared to this area the total irrigated area was 36% in 1996 and it has increase to 67% in 2006. Today the increase area of the entire tahsil seems to have increase





Conclusion

Before kukadi canal in 1996 which 20 village irrigation area minor development and socio-economical development less but after kukadi irrigation project developed in parner tahsil that time the catchment area of kukadi canal in 20 village agriculture and socio-economic development in 20 village out of 131 village The irrigation area of Nighoj village has increased the most area has come 1660 hectors and javla and kohokadi irrigation area has become increased which this situation after kukadi irrigation project.

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A Dicot Wood from the Deccan Intertrappean Beds of Shibla (M.S.), India

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Abstract :-

The paper describes the anatomy of a new species of fossil wood from the Deccan Intertrappean Beds of Shibla(Lat. $19^0$58.141'N and Long. $78^0$40.838'E)a small village of Pandharkwada tehsil of Yeotmal District (M. S.), India. This fossiliferous locality is a treasure of black cherts having petrified fossils of varying group of plants from Pteridophytes to Angiosperms. The woods and roots are preserved deeply inside the big black cherts and exposed after breaking.

Keywords :- Petrified, Chert, Fossiliferous

Introduction:-

Although petrified woods arereported by various authors from many fossiliferous localities of Maharashtra State. Some of the dicotyledonous woods described from these localities are, *Barringtonioxylonmahurzarii*(Shallom, 1960), *Aeschynomenetertiara* (Prakash, 1963), *Anacardioxylonsemicarpoides*(Prakash andDayal, 1965), *Hibiscoxylonintertrappeum*(Trivedi andAmbawani 1971), *Shoreoxylonmahurzarii*(Paradkar, 1972), *Aristolochioxylonprakashii*(Kulkarni and Patil, 1977), *Sterculioxylonbaradense*(Sheikh and Kolhe, 1978), *Aeschynomenoxylonnawargaoensis*(Shete and Kulkarni, 1982), *Grewioxyloncandisum*(Bande and Shrivastava, 1995), *Ailanthoxylon indicum*(Prasad et al., 2007), *Erythroxylon mahurzarii* (Kapgate, 2007), *Barringtonioxylondeccanense*Shallom(Shrivastava et al., 2009)**.** The present investigation adds further to knowledge of the fossil flora of these localities.

Material And Method:- A piece of chert having the petrified material of wood have brought into the laboratory; After breaking the chert material have been exposed in its transverse section. With the help of tiles saw T. L. S. and R. L. S. have been taken. After eatchingwith HF (Darrah, 1936)and by using cellulose acetate peel method the required slides are made for the further study. The peels are mounted on DPX mountant. Photographs of the slides are taken for the detail study of the wood. Camera lucida diagrams have drawn to measure frequency of vessels, appearance of vessels and size of the various other structures.

Description:-

Topography :- The specimen under study is a petrified piece of Dicotyledonous wood showing primary as well as secondary structures. The collected fossil wood specimen measures about 3 cm in diameter and 8 cm in length. The primary tissues are present but growth rings are absent.

Pith :- Central part of wood consist ill preserved and crushed pith. It consists loosely arranged parenchymatous cells which are oval to isodiametric in shape (Plate 1, fig. 1).

Primary xylem :-Pith is surrounded by ill preserved primary xylem. It consist ill preserved xylem and phloem (Plate 1, fig. 1).

Seconadaryxylem :- It is compact and surrounded on primary xylem. It consist of vessels, xylem parenchyma, wood rays and fibres.

Vessels :-The wood is diffuse porous andvessels are visible to the naked eyes as small dots on the transverse surface. The vessels are medium sized and solitary; distribution is long radial multiples type and occur in radial rows of 2 – 3, sometimes as in older regions in clusters of 3 – 6. But near to pith region contain solitary or in multiple of 2. Circular to oval in cross section with flat contact walls when in groups, often with contiguous rays on one side, sheathed with parenchyma, evenly distributed (Plate 1, fig. 2).Smaller vessel measure up to 60µm to 80 µm and larger one up to 120 µm to 150µm in diameter. They are circular in transverse plane. Their boundary walls are thick. The vessel frequency is 15 to 18per square mm. (Plate 1, fig. 2). Rays are seen contiguous with vessel. Perforation plates are simple and oblique, (Plate 2, figs. 2, 3 and 4). Intervascular pit pairs are simple, alternate, bordered and rounded to oval in shape (Plate 2, figs. 4 and 5).

Xylem Parenchyma :-It is predominantly Paratracheal vascicentric type. One celled thick parenchyma forms complete ring around the vessels. (Plate 2, fig.1).

Woodrays : The wood rays are microscopic. They are heterogeneous, biseriate to multiseriate (Plate 1, fig. 4). Rays are heterocellular consisting of erect and procumbent parenchymatous cells. Biseriate xylem rays are 09 to 15 cells and few 11 to 15 cells in height. Multiseriate xylem rays are 13 to 18 cells in height. The frequency of xylem rays is 12 to 15 per square mm. The average diameter of xylem rays measure up to 30 to 60 µm. Narrow rays and broad rays are clearly differentiated. Narrow rays are comparatively abundant.

Broad rays are few. Both the types of xylem rays are intermixed with each other (Plate 1, fig. 3; Plate 2, fig. 2).

Wood fibers :- The wood fibers are thin walled and oval. They are mostly non-septate. They are short and measures 480 – 550 µm in length and breadth varies from 20 - 30µm. These are closely placed. After 2- 3 tyers there appears medullary rays.These fibers are non- storied(Plate 1, figs. 3 and 4; Plate 2, fig. 2).

Discussion And Identification

From the above study the fossil wood specimen shows following anatomical features.

1. Wood diffuse porous.
2. Vessels are long radial multiples of 3 – 6.
3. Paratrachealvasicentric xylem parenchyma.
4. Rays are biseriate to multiseriate and heterogenous.
5. Perforation plate is simple and oblique.
6. Bordered pit pairs alternate.
7. Non- septate fibers and non-storied.

By considering above features, for identification of the present fossil wood, key given by Records and Chattaway(1939), Metcalfe and Chalk (1950) and Shallom (1963) were used.

Comparison :- The characters of the specimen mentioned above suggest its relationship to the wood of the families such as Aristolochiaceae, Celastraceae, Combretaceae, Erythroxylaceae, Guttiferae, Labiatae, Lecythidaceae, Linaceae, Loganiaceae, Malvaceae, Meliaceae, Ochnaceae, Phytollacaceae, Piperaceae, Rhamnaceae, Schrophulariaceae and Tiliaceae(Metcalfe and Chalk, 1950; Esau, 1969; Fahn, 1989) in having diffuse porous nature of the wood, predominantly solitary vessels in multiples of 3 to 6, simple and oblique perforation plate and alternate bordered pitting.Finally summing up the comparison and discussion on the described fossil fruit, it can be concluded that the present specimen under investigation resembles much of the woods of family Rhamnaceae with minor differences, it is further compared with different genus of the family but do not have similarity with any of them. Hence, the present fruit is named as *Rhamnaceoxylonchitaleyii* gen. et. sp. nov. The generic name is after the family and specific name is after an eminent palaeobotanistChitaley madam.

Diagnosis :-

Rhamnaceoxylonchitaleyii gen. nov.

Wood diffuse porous. Growth rings absent. Central pith is ill preserved and surrounded by primary and secondary xylem elements. Secondary wood consist of vessels of medium size, frequency in between 15 to 18 per sq. mm. Typical simple peforation plate; intervascular pitting alternate, bordered and small; tyloses absent; Parenchyma vascicentric paratracheal; Wood fibers aseptate and non-storied.

Rhamnaceoxylonchitaleyii gen. et. sp. nov.

Wood diffuse porous. Growth rings absent. Ill preserved central pith surrounded by primary and secondary xylem elements. Scattered vessels, medium sized and solitary, in multiples of 2 – 4,Smaller vessel measure up to 60µm to 80 µm and larger one up to 120 µm to 150µm in diameter; vessel frequency 15 to 18 per sq. mm. Perforation plate simple with transverse or oblique septa. Intervascular pits alternate, bordered and contiguous. Xylem parenchyma abundantly paratracheal vascicentric type. Wood rays heterogenous with erect and procumbent parenchymatous cells; biseriate to multiseriate; ray frequency 12 to 15 per sq. mm. Biseriate xylem rays are 09 to 15 cells and few 11 to 15 cells in height. Multiseriate xylem rays are 13 to 18 cells in height. Wood fibers aseptate and non-storied.

Holotype :- MHW / Wood 1/ Deposited at Botany Dept. J. M. Patel College, Bhandara.

Horizon :- Deccan Intertrappean Beds of Maharashtra state,

Locality :- Shibla (M.S.)

Age :- Uppermost Cretaceous.

Rhamnaceoxylonchitaleyii gen. et. sp. nov

Explanation of text figs. 1 to 4

1. T. S. of wood with central pith.
2. T. S. of wood showing vessels, medullary rays and fibres.
3. T. L. S. of wood.
4. R. L. S. of wood.

Rhamnaceoxylonchitaleyii gen. et. sp. nov

Explanation of text figs. 1 to 5

1. T. S. of wood showing vessels in multiples of 2 to 4 and xylem parenchyma.
2. T. L. S. of wood showing bi- to triseriate medullary rays.
3. T. L. S. of wood showing vessels with septa and pitting.

4. Magnified view of vessel showing septa and pitting.
5. Bordered pitting in magnified view.

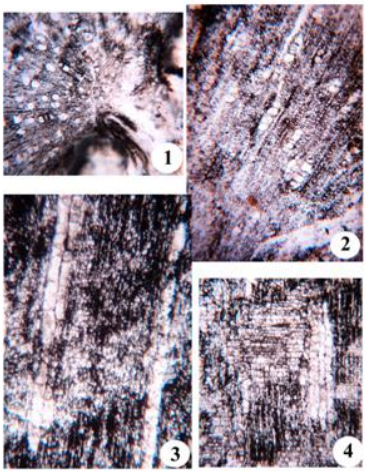

Plate 1, figs. 1 to 4

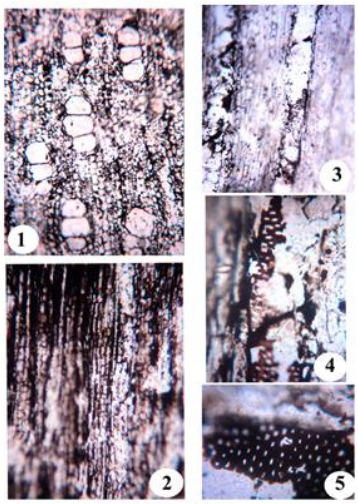

Plate 2, figs. 1 to 5

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India's Sustainable Development Goals and Agrarian Reforms- Polices and Challenges

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Introduction:

The 2030 Agenda for Sustainable Development, was adopted by all United Nations Member States in 2015, which provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. There are 17 SDGs which are an urgent call for action by all countries — developed and developing — in a global partnership. India's push in the right direction in achieving Sustainable Development Goals (SDGs) related to clean energy, urban development and health has helped it improve its overall SDG score from 60 in 2019 to 66 in 2021, according to NITI Aayog's SDG India Index 2020-21. Besides SDGs on eradication of poverty and hunger, measures related to the availability of affordable, clean energy in particular, showed improvements across several States and Union Territories. The campaign to improve the access of households to electricity and clean cooking fuel has been shown to be an important factor. While this is cause for cheer, the Index reveals that there has been a major decline in the areas of industry, innovation and infrastructure besides decent work and economic growth, again made worse by the lockdowns imposed by the governments seeking to tackle the COVID-19 pandemic. But the stark differences between the southern and western States on the one hand and the north-central and eastern States on the other in their performance on the SDGs, point to persisting socio-economic, agrarian crisis and governance disparities. These, if left unaddressed, will exacerbate federal challenges and outcomesThe SDG on inequality shows an improvement over 2019, but the indicators used to measure the score have changed. The 2020-21 Index drops several economic indicators and gives greater weightage to social equality indicators such as representation of women and people from marginalised communities in legislatures and local governance institutions, and crimes against SC/ST communities and certain farmer issues and agrarian crisis in india.. By dropping the well-recognised Gini coefficient measure and the growth rate for household expenditure per capita among 40% of rural and urban populations, the SDG score on inequality seems to have missed out on capturing the impact of the pandemic on wealth inequality.

India's Agenda

The 2030 Agenda for Sustainable Development calls on countries to begin efforts to achieve the 17 SDGs over the next 15 years. The 15-year cycle of the anti-poverty Millennium Development Goals (MDGs) came to an end with 2015 paving the way for the SDGs, an even more ambitious set of goals to banish a host of social ills by 2030. The 17 Sustainable Development Goals (SDGs) are our shared vision of humanity and a social contract between the world's leaders and the people. India is seen as critical for the success of the SDGs, given that improving the lives of 1.4 billion Indians would make a major dent in the goal of improving the lives of all humanity. Even before the SDGs came into effect, India told the UN that it is already implementing the new goals in the form of several initiatives launched by the Indian government. It is said that the SDGs are in themselves a strong endorsement of the developmental vision articulated by the Indian government under the leadership of many Prime Ministers. In fact, most if not all the initiatives launched by Prime Minister Modi can be related to one or more of the SDGs. Such as many ambitious programmes launched by the Indian government like 'Make in India', 'Digital India', 'Smart Cities' and the 'Skills India' initiative aim at boosting economic development and manufacturing in the country and help lift millions out of poverty.

State Wise Performance

India's rank has slipped by two places from last year to 117 on the 17 Sustainable Development Goals (SDGs) adopted as a part of the 2030 agenda by 193 United Nations member states in 2015. The State of India's Environment Report 2021 revealed that India's rank was 115 last year and dropped by two places primarily because major challenges like ending hunger and achieving food security (SDG 2), achieving gender equality (SDG 5) and building resilient infrastructure, promoting inclusive and sustainable industrialisation and fostering innovation (SDG 9) remain in the country. India ranks below four South Asian countries — Bhutan, Nepal, Sri Lanka and Bangladesh, it said. The overall SDG score of India is 61.9 out of 100. Elaborating State-wise preparedness, the report said Jharkhand and Bihar are the least prepared to meet the SDGs by 2030, which is the target year. While Jharkhand lags in five of the SDGs, Bihar lags in seven. It said the States/UTs with the best overall score which are on the path to achieving the SDGs are Kerala, Himachal Pradesh and Chandigarh.

Agrarian Issues

India should urgently look at comprehensive reforms to make agriculture a sustainable and scalable industry. India has made big strides in agriculture. Post-liberalisation, the yield has increased, and

is the third-largest producer by value. However, the sector realises only 50 to 60% of its potential. Price realisation is affected by the APMC Act and middlemen. Except for a few crops (rice, wheat) and a few States (Punjab, Haryana, Andhra Pradesh), the selling price for the farmer is 15-50% below the minimum support price (MSP).The country's food processing value addition is less than 10% of the produce while for most developed economies this is 100 to 300%.

Farming As A Sustainable Occupation

The agriculture sector employs over 52% of the workforce, contributing to only 14% of the GDP. Incomes have been stagnant over the last decade with the average worker earning less than 60-70% of the income of their counterparts in the city. With labour moving to rural India and depressed consumer demand, incomes could drop by about 10-20%. Agriculture and food processing GDP contribution has to rise to close to 20% while surplus labour needs to be deployed in manufacturing and food processing. The sector needs to grow at 5% per annum, which is double the historical growth rate. Increasing remuneration via MSP has drawbacks. It couldn't be enforced beyond three States and it triggered food inflation and macroeconomic instability. There are other ways: increased price realisation for the farmers, so that they get most of the consumer surplus, and use of technology and supply aggregation platforms for storage, logistics and better price discovery. There is potential to create a segment of processed and branded food, to increase farmers' income.

Conclusion

The country should follow a five-point agenda for reform: focus on sustainable yield improvements through scientific farming practices; improve agriculture marketing to increase farmers' price realisation through policy changes; set up an Integrated Agriculture Export Mission to scale up food processing and exports to increase value addition from 10% to 50%; promote direct marketing through farmer producer organisations; and, seriously work on reforms in the agriculture sector.

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Watershed Management for Sustainable Development

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Abstract:

Watershed management is an ever-evolving practice involving the management of land, water, biota, and other resources in a defined area for ecological, social, and economic purposes. Watershed is a geo-hydrological unit draining to a common point by a system of drains. Watershed development refers to the conservation; regeneration and the judicious use of all the natural resources particularly land, water, vegetation and animals and human development within the watershed. All land-based productive activities are dependent on the topography of the area, soil type, available biomass and water and call for adopting an integrated management approach, which can be better evolved within a natural domain such as the watershed. This is because a watershed is an intricate, dynamic and natural functional unit established by physical relationships and social communication and actions. Thus, watershed as a unit enables planners and implementing agency to consider all inputs, processes and expected outputs systematically which are essential for a holistic development approach.

Keywords: Watershed Management, Sustainable Development, Ecological, Social, Economic & Natural resources.

Introduction:

The term "watershed", this has traditionally been the subject of hydrologists and soil conservationists. According to the Soil Conservation Society of America, a watershed is a geo-hydrological unit comprising land and water within the confines of a drainage divide. Apparently, communities and their socio-economic activities, which have been the prime matter of concern for watershed management endeavors, have been overlooked by this definition. To reflect a more complete definition, a watershed can include the notions of both a biophysical and socio-economic unit comprising all natural resources, people and their socio-economic activities within the confines of a drainage divide. Watersheds vary in size. They may be as small as watersheds of rivulets or as large as watersheds of major rivers. Integrated approach and scientific management of the natural resources like soil, water, plant, human, animal and environment is required for overall development and sustained production. These natural resources can be best utilized and managed in an effective and gainful manner through watershed approach[1].Watershed is a geo-hydrological unit draining to a common point by a system of drains. Watershed development refers to the conservation; regeneration and the judicious use of all the natural resources particularly land, water, vegetation and animals and human development within the watershed. All land-based productive activities are dependent on the topography of the area, soil type, available biomass and water and call for adopting an integrated management approach, which can be better evolved within a natural domain such as the watershed. This is because a watershed is an intricate, dynamic and natural functional unit established by physical relationships and social communication and actions. Thus, watershed as a unit enables planners and implementing agency to consider all inputs, processes and expected outputs systematically which are essential for a holistic development approach. In a country like India, where the majority of the population is engaged in livelihoods largely dependent on the natural resource such as agriculture, factors like quality, availability and access to natural resources occupy a crucial role in influencing incomes earned by households. In a situation like this, watershed development and management practices play a dual role of natural resource conservation as well as livelihood enhancement. For instance, improved soil quality and water availability facilitate higher crop productivity and more fodder for livestock, which in turn augments income earned by the people engaged in such occupation.Watershed management is the study of the relevant characteristics of a watershed aimed at the sustainable distribution of its resources and the process of creating and implementing plans, programs and projects to sustain and enhance watershed functions that affect the plant, animal, and human communities within the watershed boundary.[2] Features of a watershed that agencies seek to manage to include water supply, water quality, drainage, stormwater runoff, water rights and the overall planning and utilization of watersheds. Landowners, land use agencies, stormwater management experts, environmental specialists, water use surveyors and communities all play an integral part in watershed management.

The sustainable watershed planning is to protect the area's water resources and habitat supported by those resources for future generations, while meeting present needs. Science, planning and educational outreach are the three pillars of a sustainable watershed management effort. During the last few decades, watershed management has gained recognition and importance in both environmental protection and the well-being

of people living in watershed areas. For example, in its 'Bhutan 2020' policy document, the Bhutan government named watershed management as the "single most important strategy to maintain the resource base to support the national economy"[3]

Watershed Development programs began in the early 1970s as a way to address food security and rural poverty in India's rainfed regions. The GOI's initial interest in WSD was spurred by a growing realization that there were production limits to agriculture from India's Green Revolution[4]

Concepts of watershed management

Many countries are now trying to place watershed management within the context of natural and human systems[5&6.] The World Bank and the United Nations Food and Agriculture Organization (FAO), amongst others, use watershed management approaches to assess the environmental benefits of development projects and aim to improve the provision of goods and services from watersheds including agriculture, forestry, and fisheries in a sustainable manner[7&8]. Components of watersheds such as low-lying lakes can serve as indicators for overall ecosystem health and change as they aggregate materials from the water and air[9] and thus are an appropriate means to assess the larger system. Watershed management recognizes that people are affected by the interaction of water with other resources and that people can influence the nature and magnitude of those interactions.[10]

Watersheds for sustainable resource management

Watersheds are natural environmental and land management units that determine the health of a nation. Poor ecosystem management within watersheds has and will result in the impaired functioning of the watershed, which in fragile environments can lead to ecosystem collapse.[11] Watershed management has moved from a focus on physical water and soil utilization and conservation to the integration of social, economic, and environmental development.

Watershed management approaches: There are two approaches related to Watershed Management:

Integrated Approach:

This approach is related to the integration of technologies within the natural boundaries of a drainage area for optimum development of land, water, and plant resources to meet the basic needs of people and animals in a sustainable manner. This approach aims to improve the standard of living of common people by increasing his earning capacity by offering all facilities required for optimum production[12]. In order to achieve its objective, integrated watershed management suggests to adopt land and water conservation practices, water harvesting in ponds and recharging of groundwater for increasing water resources potential and stress on crop diversi1cation, use of improved variety of seeds, integrated nutrient management and integrated pest management practices, etc.

Consortium Approach:

Consortium approach is related to the collective action and community participation including of primary stakeholders, government and non-government organizations, and other institutions. Watershed management requires multidisciplinary skills and competencies. Easy access and timely advice to farmers are important drivers for the observed impressive impacts in the watershed. These lead to enhance awareness of the farmers and their ability to consult with the right people when problems arise. It requires multidisciplinary proficiency in field of engineering, agronomy, forestry, horticulture, animal husbandry, entomology, social science, economics and marketing. It is not always possible to get all the required support and skills-set in one organization. Thus, consortium approach brings together the expertise of different areas to expand the effectiveness of the various watershed initiatives and interventions.

Watershed development aims to balance the conservation, regeneration and use by humans of land and water resources within a watershed. Common benefits from successful watershed development projects include improved agricultural yields and increased access to drinking water. The overall attributes of the watershed development approach, by and large, are : promoting economic development of the rural area, employment generation, and restoring ecological balance.[13]

Some Objectives are:

Environmental- For protecting vegetative cover for the whole year, to create ecological balance in the watershed area, protecting fertile top soil, utilizing the land based on its capabilities, in situ conservation of rain water, increasing ground water recharge.

Economic- It draws attention for increase in cropping intensity through inter and sequence cropping, maximizing farm income through agricultural related activities such as dairy, poultry, sheep and goat farming, improved and sustained livelihood status of the watershed community with special emphasis on the poor and women, etc.

Institutional-It includes formation of watershed committees and self-help- groups, establishing sustainable community organization, etc.

Social-It includes alleviation of poverty, awareness generation, improving skills of the local community, capacity building activities, women‟s participation in decision-making process, empowerment of the community, etc.[14]

Conclusions:

It is evident that watershed management has transitioned to a more holistic resource management approach, employing integrated and adaptive management strategies to account for biological, physical, and social elements within the landscape. Technological advancements have significantly contributed to this well-rounded approach. The improvements in watershed management and technology provide more comprehensive and multi-dimensional information for decision makers to assess the status of a watershed and implement necessary regulations. The consideration of both ecological and socio-economic concerns can remedy social issues, environmental degradation, and improve the health and management of a watershed. That being said, there is still room for improvement in watershed management strategies and research. Future watershed management should involve integrated watershed management techniques based on the latest science and technologies, as well as local knowledge and stakeholder input. Strategies should account for social and ecological needs and the potential changes associated with climate change. By developing management strategies in this way and continuing to improve research techniques and technology, environmental and social situations within watershed should continue to improve and thrive.

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Water Resources Issues and Management in India

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Abstract

Water Is One Of The Most Essential Natural Resources For Sustaining Life. Its Development And Management Play A Vital Role In Agriculture Production. Integrated Water Management Is Vital For Poverty Reduction Environmental Sustenance And Sustainable Economic Development. Water Resources Of A Country Constitute One Of Its Vital Assets. The Rainfall India Shows Very High Spatial And Temporal Variability And Paradox Of The Situation Is That Mousinram Near Cheerapunji Which Receives The Highest In The World Also Suffers From A Shortage Of Water During The Non-Rainy Season, Almost Every Year The Total Average Annual Flow Per For The Indian Rivers Is Estimated As 1953 Km. The Total Annual Replenish Able Groundwater Resources Are Assessed As 432 Km. The Annual Utilizable Surface Water And Groundwater Resources Of India Are Estimated As 690 Km. And 396 Km. Per Year, Respectively With Rapid Growing Population And Improving Living Standards The Pressure On Our Water Resources Is Increasing And Per Capita Availability Of Water Resources Is Reducing Day. Due To Spatial And Temporal Variability In Precipitation The Country Faces The Problem Of Flood And Drought Syndrome. Overexploitation Of Groundwater Is Leading To Reduction Of Low Flows In The Rivers, And Salt Water Intrusion In Aquifers Of The Coastal Areas.

Keywords: Drought, Flood, Groundwater, Recharge, Contamination, Arsenic

Introduction

Water Is Essential For Human Civilization, Living Organisms And Natural Habitat. It Is Used For Drinking, Cleaning, Agriculture, Transportation, Industry, Recreation And Animal Husbandry, Producing Electricity For Domestic, Industrial And Commercial Use. Water Is Essential To Human Life. In Fact, Since 60% Of The Human Body Is Water, It Can Be Said That Water Is Life Itself. Without Water, No Field Of Human Activity Can Be Complete. Today, The World Is Debating If Flow Of Information Is More Important Than The Flow Of Energy. That Is Good Question. But The Flow Water Is Still More Important. It Is Fundamental To The Economy And To Ecology And To Human Equality. The Issue Of Water Is Becoming Still More Critical In View Of Climate Change And Related Environmental Concerns.

Objective

The Specific Objectives For The Present Study Are : To Study The Water Resources Issues In India And To Study The Water Resources And Management In India

Methodology

The Present Work Is Based On Secondary Data And An Essential Data Was Collected From Different Sources Such As Central Groundwater Board (2017), Dynamic Groundwater Resources Of India (As On 31st March 2013) Ministry Of Water Resources, River Development & Ganga Rejuvenation, Government Of India, June 2017, Has Been Collected.

Drought And Flood Management

Significant Regional Variations Exist In India When It Comes To The Experience With Water. On The One Hand, Groundwater Sources Are Being Savagely Exploited And Deplicted In Some Of The Northern And Western States. On The Other Hand, In Eastern And North Eastern States, There Is The Challenge Of Overflowing Rivers And Regular Flooding, Year After Year, This Damages Human Habitation And Is Leading To Tragedies In Countless Families. Only A Multi-Stake Holder And Multi-Pronged Approach Can Address Such Calamities. This Includes Achieving An Interlinking Of Rivers Where Feasible. It Also Necessitates A Basin-Wide Management Of River System To Both Keep Rivers Clean As Well As Serve The Purpose Of Different Types Of Users The Drought Has Usually A Season Or More. This Deficiency Results In A Water Shortage For Some Activity, Group, Or Environmental Sector. Drought Should Be Considered Relative To Some Long-Term Average Condition Of Balance Between Precipitation And Evapotranspiration In A Particular Area, A Condition Often Perceived As "Normal: It Is Also Related To The Timing (I.E., The Principal Season Of The Occurrence, Delays In The Start Of The Rainy Season, Occurrence Of Rains In Relation To Principal Crop Growth States) And The Effectiveness (I.E. Rainfall, Intensity, Number Of Rainfall Events)" Of The Rains. Other Climatic Factors Such As High Temperature, High Wind And Low Relative Humidity Are Often Associated With It In Many Regions Of The World And Can Significantly Aggravate Its Severity. There Can Be Meteorological Drought (Degree Of Dryness And The Duration Of The Dry Period)

The Pattern Of Development Of The Drought-Prone Areas Will Have To Be Quite Different From That Of The Others. Some Of The Methods That May Be Suggested As Technical Strategies To Mitigate The Adversities Of Drought Are Mentioned Below.

1) Creation Of Surface Storage
2) Planning For Less Dependable Yield
3) Prevention Of Evaporation Losses From Reservoirs
4) Adjustment In Sanctioned Water To A Reservoir Or Its Releases.
5) Reduction In Conveyance Losses
6) Equitable Distribution
7) Maintenance Of Irrigation Systems
8) Better Irrigation Practice
9) Irrigation Scheduling
10) Cropping Pattern
11) Conjunctive Use Of Surface And Groundwater
12) Watershed Development
13) Creation Of Large Storages
14) Integrating Small Reservoirs With Major Reservoirs
15) Transfer Of Water From Water Excess Basins To Deficit Basins.

In India, Flood Protection Measurer Using Embankments Were In Existence For Centuries. This Is Evident From The Old Embankments Constructed By Private Individuals For The Protection Of Their Lands. The Inadequacy Of The Individual Efforts In The Sphere Of Flood Control Led To The Governmental Interest In The Problem Chiefly During The Past Century.

Groundwater Legislation And Aquifer Recharge

Water Being A State Subject, It Is Primarily The Responsibility Of The Concerned State Governments To Make Suitable Legislation To Regulate Utilization Of Groundwater With A View To Protecting Groundwater Regime And Taking Measures Against Over Exploitation And To Ensure Equitable Distribution Of This Resource, The Union Government Circulated A Model Bill To Regulate And Control The Development Of Ground Water To All State/Uts 1970. The Model Bill Was Re-Circulated In 1992, 1996 And Again In 2005 For Adoption. So Far, 15 States/Uts Have Adopted And Implements The Groundwater Legislation On The Lines Of The Model Bill.Central Groundwater Board (Cgwb) Has Prepared A Conceptual Document Entitled "Master Plan For Artificial Recharge To Groundwater In India" Involving Groundwater Scientists/Experts. The Master Plan Envisages Construction Of 1.11 Crore Rainwater Harvesting And Artificial Recharge Structures In The Country At An Estimated Cost Of Rs.79, 178 Crores To Harness 85 Bcm (Billion Cubic Metre) Of Water. The Augmented Groundwater Resources Will Enhance The Availability Of Water For Drinking, Domestic, Industrial And Irrigation Purpose. The Master Plan Has Been Circulated To All State Governments For Implementation. Cgwa Has So Far Notified 162 Critical/Overexploited Areas In Parts Of Nct Delhi, Haryana, Punjab, Andhra Pradesh, Rajasthan, Madhya Pradesh, Gujarat, West Bengal, Uttar Pradesh, Karnataka, Tamilnadu Ut Of Puducherry And Ut Of Diu For Control And Regulation Of Development Of Groundwater Resources.

Groundwater Contamination

Central Groundwater Board (Cgwb) Regularly Monitors Groundwater Quality Of Shallow Aquifers On A Regional Scale, Once Every Year. Groundwater Quality Data Generated During Various Scientific Studies And Groundwater Quality Monitoring Indicate That Groundwater In Major Part Of The Country Is Potable. However, Some Parts Of Various States Are Contaminated By Salinity, Arsenic, Fluoride, Iron, Nitrate And Heavy Metals Beyond The Permissible Limits Of Bis. The Possible Sources Of Contamination Of Groundwater Are Either Geogenic Or Anthropogenic In Nature. Anthropogenic Contamination Of Groundwater Is Due To Industrial Discharges, Landfills, Diffused Sources Of Pollution Like Fertilizers And Pesticides From Agricultural Fields Etc. Various Steps Taken To Check The Groundwater Pollution Are-

1) Control Of Industrial Pollution Under The Provision Of Water (Prevention And Control Of Pollution) Act, 1974 By Consent Mechanism Being Applied By State Pollution Control Boards (Spcbs)/Pollution Control Committees (Pccs) In Union Territories.
2) A Mutually Agreed Time Targeted Program Is Implemented Under Corporate Responsibility On Environment Protection (Crep
3) Establishment Of Common Effulged Treatment Plants (Cetps) For Cluster Of Small-Scale Industrial Units.

4) Continuous Water Quality Monitoring Systems Are Being Established On Industrial Units In The Country, Through The Directives Issued By Cpcb, Far Getting Real-Time Information On The Effluent Quality.

For Improving The Coverage Of Safe Drinking Water To The Rural Population, The Ministry Of Drinking Water And Sanitation Supplements The Efforts Of The States By Providing Them With Technical And Financial Assistance Through The Centrally Sponsored National Rural Drinking Water Programme (Nrdwp). It Is The State Government Who Plan, Design, Approve, Execute And Operate And Maintain The Schemes For Providing Safe Drinking Water To The Rural Population.

Arsenic Problem In Groundwater

Arsenic In Groundwater Is A Geogenic Contaminant I.E. Caused By Natural Geologic Processes. Arsenic Containing Groundwater In Ganga River Basin Is Hosted By The Sediments Deposited By The Rivers During The Late Quaternary Or Holocene Are (<12 Thousand Years). The Incidence Of High Arsenic In Groundwater Reported From Various Parts Of The Country, Particularly In The Ganga Plains Is A Serious Threat To The Health Of Human Being. According To The Wealth Health Organization Website, Long-Term Exposure To Arsenic Through Drinking Water And Food Can Cause Cancer And Skin Lesions. Over The Last Three Decades Numerous Measures Have Been Initiated Which Includes The Alternate Arrangement For Supply Of Arsenic Free Water To The Affected Populace And Providing Arsenic Removal Plants. Arsenic Occurrences In Groundwater In These Areas Are Highly Sporadic In Nature And All The Sources In These Areas Are Not Necessarily Contaminated. There Is Urgent Need To Make People Aware About The Negative Impact Of Arsenic In Ganga Basin And Other Regions Of The Country. An Exhaustive Work Plan Is Required To Be Prepared To Meet The Challenges Posed By The Presence Of Arsenic In Groundwater. Everyone Right From An Individual To Government Including Social Organizations And Ngos Have To Join Hands To Make People Aware Of The Arsenic Problem.

Groundwater Resources : Assessment And Planning

The Current Practice Of Groundwater Resource Assessment In India Does Not Have Any Provision For The Static Storage That Is Necessary For Mitigation Of Droughts An Important Role Of The Groundwater System. There Is A Need To Develop The Discipline Of Drought-Hydrogeology By Integrating The Domains Of Drought Analysis And Groundwater Modeling. This May Brodly Require Following Components : Drought Analysis, Deficit Irrigation, Estimation Of Static Storage Need, Incorporation Of Static Storage In The Planning Process, Development Of Soft Models Of The State Variables.

Participatory Water Management

Water Shortage Is One Of The Biggest Problems That The Country Faces Today. A Big Reasons For This Problems Is The Poor Management Of Available Resources. On One Hand, We Over-Exploit Our Rivers, Lakes, Groundwater And Other Sources Of Water, But On The Other Hand, We Allow Colossal Amounts To Run Off Into The Sea Unutilized. The Role Of Participatory Water Management Needs To Be Emphasized In Addressing The Problem Of Water Scarcity In The Country. To Address This Problem, The Government, The Civil Society And The Local Level Communities Must All Work Together To Find Ways To Preserve, Protect And Augment The Available Water Resource. There Are Examples From States Like Maharashtra And Gujrat Where Such Participatory Management Of Water Have Helped Turn Water Starved, Barrent Farmlands Into Fields Producing Multiple Crops In A Year.Long-Term Sustainability Of Water Resources Can Be Assured Only Through Holistic Management Programs That Take Care Of Both Demand-Side And Supply-Side Management. Supply-Side Management Involves Efforts At Arresting The Decline In Groundwater Levels By Regulating The Withdrawals And Increasing Water Use Efficiency. Demand Side Management Is This Dependent On Community Participation. It Requires The Community To Make Efforts At Ensuring That Water Is Extracted In A Sustainable Manner, The Cropping Pattern Is Suited To The Area, Drip/Sprinkler Irrigation In Encouraged, And People Of The Community Resort To Water Budgeting. There Is A Need To Promote And Encourage Participatory Management As A Solution To Long-Term, Sustainable Development Of Water Resources In The Country. Participatory Management Recognizes Groundwater As A Common Property Resource When This Management Of Groundwater Has Resulted In Many Success Stories In The States Of Maharashtra (Tamaswada Nalah Treatment), Gujrat (Upleta Taluk, Rajkot), Maharashtra (Beed, Jalna, Satara), Andhra Pradesh, Tamil Nadu (Annavasal) To Name A Few.

National Water Informatics Centre

National Water Informatics Centre (Nwic) Has Recently Been Created By The Ministry Of Water Resources, River Development And Ganga Rejuvenation. It Would Be A Repository Of National Wide Water Resources Data And Would Work As A Subordinate Office Under The Ministry Of Water

Resources, River Development And Ganga Rejuvenation. The Management Of Water Resources Is A Highly Complex And Tedious Task That Involves The Expertise Of Multi-Disciplinary Domains And Depend On Historical And Real Time Reliable Data And Information. For This, The First Requirement Is To Develop, Maintain And Update Regularly A Comprehensive 'Water Resources Information System' (Wris) In Public Domain For Awareness And Involvement Of All Concerned For Effective Integrated Water Resources Management. This Is Also A Pre-Requisite For Scientific Assessment, Monitoring, Modeling And Decision Support System (Dss) And Integrated Water Resource Management (Iwrm). In This Backdrop, Nwic Is Expected To Provide A 'Single Window' Source Of Updated Data On Water Resources And Allied Themes; And Value-Added Products And Services To All Stakeholders For Its Management And Sustain Development, Functions Of Nwic Include-

1. Provide Single Window Source Of Updated Data On Water Resources And Allied Themes And Also Value-Added Products And Services To All Stakeholders For Its Management And Sustainable Development.
2. Empower, Inform And Enrich Every Citizen With Upto Date And Reliable Water Data And Information (Excluding Classified Data) Through Web-Based India Water Resources Information System) (India-Wris) On Gis Platform
3. Develop Value-Added Products And Services For All Aspects Of Integrated Water Resources Management Through Research, Capacity Building, Linkages, Outreach And Better Governance In Water Resources Sector.
4. Collabrate With Leading Research Institutes Nationally As Well As Internationally To Provide Technical Support To Other Central And State Organizations Dealing With Water, Emergency Response For Hydrological Extremes.

Conclusion

This Paper Has Presented A Broad View Of The Key Issues In Water Resources Management In India And Suggest Measures To Resolve Them. Most Of The Water Planning And Development In The Country Has Been Done As Per Administrative Boundaries Rather Than By Using River Basins As The Hydrological Unit. This Has Led To Water Conflict As Most River Basins Are Shared By Several States And Water Demand For Meeting Domestic, Industrial And Agricultural Needs Within Each State Has Gone Up Significantly. A Localized Water Management Approach Is Need To The Hour. It Should Empower Village And Neighborhood Communities And Build Their Capacity To Manage, Allocate And Value Their Water Resources. Any 21st Century Water Policy Must Factor In The Concept Of The Value Of Water. It Must Encourage All Stakeholders, Including Communities, To Expand Their Minds-And To Graduate From Allocating A Quantum Of Water To Alloating A Quantum Of Benefits. Of Course, This Quantum Of Benefits Will Be Dynamic. It Will Inevitably Be Linked To The Mapping And Forecast Of Livelihood Patterns In Human Society. And These Keep Evolving. Attainment Of Identified Goals Is Possible By Developing And Adopting Appropriate Technologies In The Water Sector And With Greater Involvement Of Public In Wrd And Management.

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Agro Based Industries and Rural Development

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Abstract
India is plentiful in regular assets like minerals, woodlands, seas, soil, and streams. These assets alongside developing talented labor, have given freedoms for creating and giving different fundamental necessities to our everyday daily routine and driving a worked on norm of experiencing. Since Independence, through concentrated topographical study, countless mineral assets situated in various pieces of the nation have been dug and used for the setting up of different mineral-based businesses. These ventures have advanced critical financial turns of events and gave a great deal of business openings for our kin. Then again, however for certain logical and mechanical data sources our agrarian, creature cultivation, and marine produce have expanded significantly. Notwithstanding, the necessary foundation, utilization of better innovation, and gifted labor for creating related agro-businesses have not made any critical headway contrasted with other created nations. For instance, it is accounted for that, while around 14% of the complete labor force in created nations is occupied with the agro-mechanical areas, in India, just around 3% discover work in this crucial area.

Introduction

Almost 70% of individuals in India live in provincial regions and generally rely upon agribusiness for their business. In the created world, because of motorization and present day innovation in the rural area, relatively many less workers are occupied with food creation, making it more affordable. Further, in these nations, an organization of agro-based ventures gives better work openings and subsequently improves their expectation for everyday comforts. It is broadly understood that in India, neediness end by giving the right sort of work and influencing financial improvement likewise in country regions is fundamental.In India, lately, however agrarian creation in various areas is expanding at a relatively quicker rate, because of obsolete reaping and capacity rehearses, almost 25 to 30 percent of horticultural produce is squandered. For creating agro-ventures, the as a matter of first importance errand ought to be to have sufficient passing mark crude material. A climate well disposed cycle for development to deliver more harvests should think about working on the fruitfulness of the dirt by for the most part utilizing natural manures like fertilizer and furthermore utilizing natural pesticides. It very well might be referenced here that, use of an excessive number of synthetic manures and pesticides as being done these days, is making a great deal of mischief the dirt, the close by water bodies additionally the vegetation. The measure of natural waste created from homegrown, rural and different sources can be handled to deliver adequate measures of manure to meet the prerequisites of ranchers in the region. Sewage slime and human excreta ought to likewise be appropriately handled to be utilized as manure.Further, by embraced huge scope estate of trees like neem, karanj and developing haldi (turmeric), garlic, and so forth, adequate measure of natural pesticides can be created to be used for horticultural purposes. The other issue looked by the ranchers is a deficiency of water for water system in the mid year and winter seasons. Through reaping water both on a superficial level and in-ground on limited scope at reasonable locales close to farming fields, it is feasible to meet the water prerequisites over time for water system and furthermore for resulting food preparing units.

Issues of Agro Industries

The agro businesses in India are dealing with a few issues identified with the accessibility of legitimate foundation, storerooms, gifted staff, suitable innovation, monetary help, and market. The vast majority of the informed young people of India in light of their restricted information about the extent of agro enterprises and monetary and other related issues including creation innovation, stockpiling, and so on don't dare to begin any such industry. Further, they are additionally totally ignorant of the market circumstance, the instrument to sell their items in neighboring regions, and benefiting help of government and other concerned offices. More modest agro businesses likewise face firm contest for promoting their items, especially when greater ventures come into the image. In some cases, business visionaries need to go through a great deal of hardships and pay more to profit infrastructural offices including land, appropriate hardware, reasonable transportation framework, and so on schedule and furthermore face a ton of issues for acquiring the legitimate crude material and sending the completed items to the open market.
Ordinarily, agro enterprises face the executives issues because of the shortfall of expert administrators in their units and in some cases trouble of the accomplices because of personal stake. This might cause prosecution among the accomplices and result in failing of the units. At times, the business people redirect assets to some different regions like structure houses, directing a marriage in the family, and so forth,

influencing creation because of monetary imperatives. Once in a while, agro-based ventures don't utilize the right number of gifted labor and this influences the quality and usefulness just as benefit.
Further, now and again, disappointment because of need of legitimate work culture in the unit, brings about inactive labor causing high creation costs. The utilization of obsolete innovation brings about substandard items and significant expenses. The substandard items in this way delivered don't get great market. What's more, ordinarily, especially little agro businesses deal with issues like non-accessibility of crude material and furthermore the dispatch of submitted completed products on schedule. Further, creation is influenced impressively because of an absence of putting away space.

Steps for Promoting Agro Industries

To advance agro-enterprises, it is important to redress certain current issues. In such manner, a few ideas need due to be thought of.

(1) It has been accounted for that the creation of rice, wheat, sugarcane, and milk in India lately, has been very palatable. Notwithstanding, because of helpless post-collect administration, the misfortunes in rural creation in the nation are extremely high. It has been assessed that the after creation misfortunes in food products are to the tune of Rs 75 to 100 thousand crores for every annum. These misfortunes are caused during capacity, taking care of, and transportation. It is accounted for that the degree of misfortunes can be brought down to under 50% of the current level by taking on legitimate agro-preparing innovation and move framework and the rest 50% can likewise be saved by creating appropriate infrastructural offices like grain stockpiling structures, cold stores, and handling frameworks.

(2) To work with the making of an ideal air for agro ventures, monetary help, supply of legitimate crude materials, framework, proper innovation, gifted labor, brief transportation, and showcasing of completed merchandise are fundamental.

(3) At the town or panchayat level, jobless people ought to be recognized and prepared in ability improvement focuses to be utilized in various agro ventures, which are to be set up nearby.

(4) The public authority should take a functioning part in fostering a straightforward system to advance these businesses. Keeping in see the current issues, the State Government should consider the previous experience in regards to the disappointment of numerous agro businesses in their space and take fundamental measures to redress those, something else, business visionaries and jobless youth won't approach with certainty to partake in this undertaking.

(5) For every particular agro-based unit, "Bundle Deal" by the state government might go far in advancing these ventures in a fruitful way. The 'Bundle Deal' for a specific industry ought to contain vital consent for land, giving infrastructural offices, finance, water, power, supply of crude materials, proper innovation for creation of finish products, transportation and their advertising. This would help impressively little business visionaries to begin the enterprises in a base period absent a lot of deferral and monetary heightening.

(6) Besides giving business area workplaces to these undertakings, both in India and abroad, the public authority should give the most recent advancement in isolated areas and expand quality control workplaces. To deal with the advancement for agro organizations keeping in see the overall example, the public authority should stir the science and development relationship in the country to take up R&D work in different agro taking care of areas.

To help the improvement of agro organizations, it is proposed to set up District Agro Industries Corporation (DAIC). This organization should be responsible for recognizing agro-endeavors projects particularly subject to the unrefined materials open nearby while making significant infrastructural workplaces, perceiving and planning close by entrepreneurs.The DAIC should screen execution of adventures just as help the business visionaries in getting rough material, structure workplaces, and organizations, transport and market for the things. Thusly, agriculture and agro ventures ought to go close to one another and give adequate business openings and as needs be work on the monetary conditions of the residents. In this task, the area similarly as state, and central governments have a mind boggling impact to play. By embracing eco-obliging "Cycles for the Production of Crops" close by applying proper post assemble development and setting up related agro-adventures, it will in general be achievable to deal with

the monetary conditions of commonplace people and as such curb the inflow of the jobless natural mass to metropolitan areas.

Conclusion

The agro based endeavors acknowledge uncommon significance in the Indian economy, where cultivation is spine of the Indian economy through giving work opportunities to more than 60% people and live hood to larger piece of people. In india more than 70% people are living in natural district.

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The Concept of Sustainable Development

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Summary

Sustainable development is an organizing principle for human life on Earth. It posts a desirable future state for human societies in which living conditions and resource-use meet human needs without undermining the sustainability of natural systems and the environment, so that future generations may also have their needs met. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The world must quickly design strategies that will allow nations to move from their present, often destructive, processes of growth and development onto sustainable development paths.

Objective

1. To understand the concept of sustainable development
2. Examine the need and significance of sustainable development in the current context.
3. Analyse the components and types of sustainability.

Introduction:

The satisfaction of human needs and aspirations is the major objective of development. The essential needs of vast numbers of people in the developing world for food, clothing, shelter, jobs - are not being met. A considerable share of world population still lives in a pathetic condition. Even their basic needs are questioned. A world in which poverty and inequity are endemic will always be prone to ecological and other crises also. Sustainable development requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life.

Sustainable development is an organizing principle for human life on Earth. It posts a desirable future state for human societies in which living conditions and resource-use meet human needs without undermining the sustainability of natural ecosystems and the environment, so that future generations may also have their needs met.Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

1. It contains within it two key concepts:
2. the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
3. the idea of “limitations”imposed by the state of technology and social organization on the environment's ability to meet present and future needs.
4. Sustainable development treys to bring together concern for the carrying capacity of natural systems with the social and economic challenges faced by humanity.

. Living standards that go beyond the basic minimum are sustainable only if consumption standards everywhere have regard for long-term sustainability. Yet many of us live beyond the world's ecological means, for instance in our patterns of energy use. Perceived needs are socially and culturally determined, and sustainable development requires the promotion of values that encourage consumption standards that are within the bounds of the ecological possible and to which all can reasonably aspire As early as the 1970s, 'sustainability' was employed to describe an economy "in equilibrium with basic ecological support systems. Scientists in many fields have highlighted The Limits to Growth, and economists have presented alternatives, for example a 'steady state economy', to address concerns over the impacts of expanding human development on the planet Meeting essential needs depends in part on achieving full growth potential, and sustainable development clearly requires economic growth in places where such needs are not being met. Elsewhere, it can be consistent with economic growth, provided the content of growth reflects the broad principles of sustainability and non-exploitation of others. But growth by itself is not enough. High levels of productive activity and widespread poverty can coexist, and can endanger the environment. Hence sustainable development requires that societies meet human needs both by increasing productive potential and by ensuring equitable opportunities for all. The term 'sustainable development' rose to significance after it was used by the Brundtland ommission in its 1987 report ‘’Our Common Future”. In the report, the commission coined what has become the most often-quoted definition of sustainable development: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The concept of sustainable development has in the past most often been broken out into three

Major Conventions and Policies related to Sustainable Development

There are a number of international as well as regional interventions which brought out the concept of sustainable development. We are going to discuss some of the remarkable steps in this regard In 1987, the

United Nations World Commission on Environment and Development released the report Our Common Future, now commonly named the 'Brundtland Report' after the commission's chairperson, the then Prime Minister of Norway, Gro Harlem Brundtland. The report included what is now one of the most widely recognised definitions: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Agenda 21 clearly identified information, integration, and participation as key building blocks to help countries achieve development that recognises these interdependent pillars. It emphasises that in sustainable development everyone is a user and provider of information. It stresses the need to change from old sector centred ways of doing business to new approaches that involve cross sectoral co-ordination and the integration of environmental and social concerns into all development processes. Furthermore, Agenda 21 emphasises that broad public participation in decision making is a fundamental prerequisite for achieving sustainable development. A useful articulation of the values and principles of sustainability can be found in the Earth Charter. It offers an integrated vision and definition of strong sustainability. The document, an ethical framework for a sustainable world, was developed over several years after the Rio Earth Summit in 1992 and launched officially in 2000. The Charter derives its legitimacy from the participatory process in which it was drafted, which included contributions from hundreds of organizations and thousands of individuals, and from its use since 2000 by thousands of organizations and individuals that have been using the Earth Charter as an educational instrument and a policy tool. Indigenous people have argued, through various international forums such as the United Nations Permanent Forum on Indigenous Issues and the Convention on Biological Diversity, that there are four pillars of sustainable development, the fourth being cultural. The Universal Declaration on Cultural Diversity (UNESCO, 2001) further elaborates the concept by stating that " cultural diversity is as necessary for humankind as biodiversity is for nature"; it becomes "one of the roots of development understood not simply in terms of economic growth, but also as a means to achieve a more satisfactory intellectual, emotional, moral and spiritual existence". In this vision, cultural diversity is the fourth policy area of sustainable development.

The United Nations 2005 World Summit Outcome Document refers to the "interdependent and mutually reinforcing pillars" of sustainable development aseconomic development, social development and environmental protection.became three basic ideas of Sustainable Development Based on this ' triple bottom line', numerous sustainability standards and certification systems have been established in recent years, in particular in the food industry.Well-known standards include organic, Rainforest Alliance, fair trade, UTZ Certified, Bird Friendly, and The Common Code for the Coffee Community.

The core principles of sustainability

The set of five Sustainability Principles is offered in order to advance and restore some rigor to the underlying ideas. Its development was informed by a number of existing frameworks and was inspired, in particular, by the work of R Buckminster Fuller. The principles can receive a specific operational meaning in relation to particular sectors of the economy, development issues, business strategies, investment guidelines, or initiatives taken by individuals. They are expressed in relation to five fundamental domains:

1. The Material Domain:Constitutes the basis for regulating the flow of materials and energy that underlie existence.
2. The Economic Domain:Provides a guiding framework for creating and managing wealth.
3. The Domain of Life:Provides the basis for appropriate behaviour in the biosphere.
4. The Social Domain:Provides the basis for social interactions.
5. The Spiritual Domain:Identifies the necessary attitudinal orientation and provides the basis for a universal code of ethics.

By their very nature language, logic and action force separation, discrimination and choice. A balanced and full integration of all five principles is essential, however, for more conceptualizing and realizing sustainability as a state. The whole set has to be integrated into a single unity in which the five principles come together as one.The five domains underlying the principles interact and co-define one another and, as in a holographic image, each embodies the whole general scheme in its own sphere. When the principles are thus integrated and seamlessly inform choices and actions, a state of sustainability, which otherwise appears as a difficult, distant goal, can be realized spontaneously and completely.

With minerals and fossil fuels, the rate of depletion and the emphasis on recycling and economy of use should be calibrated to ensure that the resource does not run out before acceptable substitutes are available. Sustainable development requires that the rate of depletion of non renewable resources should foreclose as few future options as possible.

Development tends to simplify ecosystems and to reduce their diversity of species. And species, once extinct, are not renewable.

Components and Types of Sustainability

The major components of sustainable development are:

1. Establishing ecological limits and more equitable standards - This requires the promotion of values that encourage consumption standards that are within the bounds of the ecological possible and to which all can reasonably aspire
2. Re – distribution of economic activity and re – allocation of resources – Meeting essential needs depends in part on achieving full growth potential and sustainable development clearly requires economic growth in places where such needs are not being met.
3. Population control – Though the issue is not merely one of population size of the distribution of resources, sustainable development can only be pursued if demographic developments are in harmony with the changing productive potential of the ecosystem. Conservation of basic resources – Sustainable development must not endanger the natural systems that support life on Earth; the atmosphere, the waters, the soils and the living beings.
4. More equitable access to resources – Growth has no set limits in terms of population or resource use beyond which lies ecological disaster. But there are ultimate limits and sustainability requires that long before these are reaches, efforts are made to ensure more equitable access to resources.
5. Carrying capacity and sustainable yield – Most renewable resources are part of a complex and interlinked ecosystem, and maximum sustainable yield must be defined after taking into account system – wide effects of exploitation.
6. Retention of resources – Sustainable development requires that the rate of depletion of non – renewable resources foreclose as few future options as possible.
7. Diversification of the species – Sustainable development requires the conservation of plant and animal species.
8. Minimize adverse impacts – Sustainable development requires that the adverse impacts on the quality of air, water, and other natural elements are minimized so as to sustain the ecosystem's overall integrity.

Types of sustainability

It refers to the sustainability in the ecological and other environmental parameters. Environmental sustainability is the process of making sure current processes of interaction with the environment are pursued with the idea of keeping the environment as pristine as naturally possible based on ideal-seeking behaviour. Thus, environmental sustainability demands that society designs activities to meet human needs while indefinitely preserving the life support systems of the planet. This, for example, entails using water sustainably, only utilizing renewable energy, and sustainable material supplies. *Social sustainability*

Social harmony is the main concept here and it can be referred as the ability of a community to absorb inputs, such as extra people, for short or long periods of time and continue functioning either without the creation of social disharmony as a result of these inputs or by adapting its functions and relationships so the disharmony created can be alleviated or mitigated. *Cultural sustainability* It refers to the sustainability in the cultural aspects related to tourism which are existing or being mitigated.

Economic sustainability Sustaining economic viability is the basic concept in this. Economic development has traditionally required a growth in the gross domestic product. This model of unlimited personal and GDP growth may be over. Sustainable development may involve

improvements in the quality of life for many but, particularly for the affluent, may necessitate a decrease in resource consumption.

5. Need and significance

It is to be noted that each person took into account the effect of his or her actions upon others. But each is unwilling to assume that others will behave in this socially desirable fashion, and hence all continue to pursue narrow self-interest. Communities or governments can compensate for this isolation through laws, education, taxes, subsidies, and other methods. Most important, effective participation in decision-making processes by local communities can help them articulate and effectively enforce their common interest.

Interdependence is not simply a local phenomenon. Rapid growth in production has extended it to the international plane, with both physical and economic manifestations. There are growing global and regional pollution effects, such as in the more than 200 international river basins and the large number of shared seas. As a system approaches ecological limits, inequalities sharpen. Thus when a watershed deteriorates, poor farmers suffer more because they cannot afford the same anti-erosion measures as richer farmers. When urban air quality deteriorates, the poor, in their more vulnerable areas, suffer more health damage than the rich, When mineral resources become depleted, late-comers to the industrialization

process lose the benefits of low-cost supplies. Globally, wealthier nations are better placed financially and technologically to cope with the effects of possible climatic change.

The Settled agriculture, the diversion of watercourses, the extraction of minerals, the emission of heat and noxious gases into the atmosphere, commercial forests, and genetic manipulation are all examples or human intervention on natural systems. Until recently, such interventions were small in scale and their impact limited. Today's interventions are more drastic in scale and impact, and more threatening to life-support systems both locally and globally. This need not happen. At a minimum, sustainable development must not endanger the natural systems and support life on Earth: the atmosphere, the waters, the soils, and the living beings should be preserve. Hence, our inability to promote the common interest in sustainable development is often a product of the relative neglect of economic and social justice. The world must quickly design strategies to fetch sustainable development paths. This will require policy changes in all countries, with respect both to their own development and to their impacts on other nations' development possibilities also. We recognize that poverty, environmental degradation, and population growth are inextricably related and that none of these fundamental problems can be successfully addressed within isolation. Arriving at a commonly accepted definition of 'sustainable development' remains a challenge for all the actors in the development process.

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Declining Size of Holdings and Increase use of Chemical fertilizers in Farming-Need for Sustainable Agriculture in the State of Manipur

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Abstract-

The paper attempts to show that due to excessive population pressure on land in the recent years,there has been increasing marginalization of agricultural land holdings in the state of Manipur. This small size of land holdings urges the farmers to adopt intensive farming system involving the use of high level of chemical fertilizers in order to extract the maximum production out of the small size of holdings. Given this condition,the paper highlights the need for sustainable farming practices in Manipur.

Keywords- Chemical Fertilizers, Sustainable Agriculture, Size of holdings, Environment

Introduction-

Human population like other living species depends on natural resource for production, consumption and releasing of waste.One of the major challenges that the world faces today is managing the ever growing population and its material requirements. This increasing demand of a growing population leads to increase in the pressure on the demand for food, water and other natural resources(Muthukrishnan,2015). This growing conflict between population growth and maintenance of ecological systems had become an issue of both national and international importance.Environmental concerns associated with agriculture relate mainly to the sustainability of resources base for agricultural production such as soil quality, protection of biodiversity and habitats and environmental service of resources influenced by agricultural land use. Sustainable agriculture may be defined as any set of agronomic practices that are economically viable, environmentally safe and socially acceptable.The adoption of modern methods and technology in agriculture such as the use of high yielding varieties of seeds, tractors, irrigation facilities, pesticides, ferlilizersetc was prominent in India after the introduction of the "Green Revolution" technology in the 1960s.As a result of green revolution, India could achieve self-sufficiency in food grain production by using modern methods of agriculture like better quality of seeds, proper irrigation, chemical fertilizers and pesticides(Kapila,2008-09). Much of this success is attributed by the intensive use of chemical fertilizers. On the one hand, the introduction of 'Green Revolution' Technology in India in the 1960s with its package of inputs like the use of HYV seeds, adequate plant nutrition (via inorganic chemical fertilizers), methods of pest control and assured supply of water (irrigation) led to an impressive gain in food production thereby allowing food production to keep in pace with population growth. Food grain production increased from 83 million tonnes in 1960-61 to about 252.7 million tonnes (fourth estimate) in 2014-15. Fertilizer consumption likewise has been showing a continuous upward trend, with consumption from less than 1 million tonnes of total nutrients in the mid - sixties to almost 25.6 million tonnes in 2014-15. About 50 per cent increase in agricultural production in the post green revolution era is attributed to the use of fertilizers. According to the report given by the Ministry of Agriculture and Farmer's welfare, fertilizers are going to be crucial input in future as well, given the increasing food demands of growing population and insufficient availability of alternative nutrients sources. The country will require about 300 million tonne of foodgrains by 2025 to feed its ever growing population. This would necessitate the use of about 45 million tonnes of nutrients. While about 6-8 million tonnes of nutrients could be supplied through existing organic sources, the rest has to come from chemical fertilizers. Therefore, the fertilizer industry has to keep in pace with the growing population and increasing food demands of the country.On the other hand, prolonged use of these inputs led to degradation of good agricultural land and reliance on chemical and other non-renewable inputs in the long run will have a negative impact on food security and human health in general (V.Patil, W.S.G and Hugar,L.B. 2005). Therefore, this process of agricultural development also has negative impact to the environment.The focus of this paperis to show that thepopulation growth in the state of Manipur is leading to shrinking of the size of holdings and therefore, the farmers adopt all possible techniques to extract maximum production from farming including the application of chemical fertilizers which pose a serious threat to the health of the people.The paper stresses on the need for sustainable agriculture in the state of Manipur.

Size of holdings, fertilizer use and the Need for Sustainable Agriculture in Manipur

The state of Manipur lies in the extreme north eastern corner of India. It is bounded on the east by Myanmar, on the north by the state of Nagaland, on the west by Assam and on the south by the state of Mizoram and Myanmar. Manipur lies between 23.83N and 94.7E longitude. It has an area of 23,327 sq.kms. Agricultural sector contributes a major share of the total state domestic product and provides employment to about 52.19 share of the total workers in Manipur(Economic Survey,2008-09). As

population increases, demand for food also increases. In 1951, the population of Manipur was 5,77,635 while in 2011, it is 28,55,791(Primary Census Abstract-2011).

Though the advent of Green Revolution has led to a rise in the productivity of the state, there is a need for serious concern regarding the harmful impact of the implementation of modern inputs in agriculture. The farmers of the state instead of using the age old indigenous methods of farming started using new technologies such as chemical fertilizers, insecticides, pesticides, fungicides and weedicides in order to boost up the agricultural productivity.For instance, average yield of paddy in Manipur increases from 2123.83 kg/hectare (in 1991-92) to 2240.18 kg/hectare in 2011-12. On the other hand, consumption of chemical fertilizers also increases from 9,353 (in tonnes) to 17119(in tonnes) in these years, that is, from 1991-92 to 2011-12(Statistical Yearbook 2015).

An analysis on the level of agricultural development in terms of productivity level and input use profile in two villages of Manipur through field level study during the period 2007-08 shows that the use of chemical fertilizer is not only high but the cultivators have used all kind of fertilizers like urea, phosphate, DAP in combinations. It seems that the villagers are quite aware of the required dosage of different plant nutrients and they have used pesticides across all size classes.

The two villages are i)*Taobungkhok*which is eight kilometres away from Imphal under the *Patsoi* Assembly constituency of Imphal west district of Manipur.

ii)*Tejpur*, is a new village located at about forty five kilo metres away from Imphal under the *Hiyanglam*constituency of *Thoubal*district of Manipur.

It is reflected in thedatas that majority of the holdings in both the villages are small and marginal holders. Holdings are classified in *Sangam* (0.62acre), *Marak* (2 *sangams* or 1.24 acre) and *paree*etc in village parlance. . A hectare is equivalent to a *paree(*2.48 acres) and a *paree* is divided into four *sangams.* In *Taobungkhok*, out of the 296 land holding households, there are 156 households (52.7 per cent) under the smallest size category of 0-1 acre and 60(20.3 per cent) households under the size class of 1-1.5 acre. There are again, 43 households (14.5 per cent) under the size category of 1.5-2 acre. The size category of 2-3.5 acre has 19 households (6.4 per cent). There are 12 households (4.1 per cent) under the size category of 3.5-5 acre and the highest size category of 5 and above have the lowest number of households, that is, only 6(2.0 per cent) during the surveyed year. Similarly in *Tejpur* , out of the total of 136 landholding households, the lowest size category of 0-1 acre have the highest number of holdings , that is, 39(28.7 per cent), there are 35(25.7 per cent) households under the size category of 1-1.5 acre, 21(15.4 per cent) households under the size category of 1.5-2 acre, 30(22.1 per cent) households under the size category of 2-3.5, 8 (5.8 per cent) households under the size category of 3.5-5 and there are only three households (2.2 per cent) under the highest size category of 5 and above acres. This smallness of holding indicate that land has been split up from generation after generation and the size of holdings became smaller and smaller because of inheritance or sale of small parcels over time(Lisam,2011).Since majority of the holdings in the villages are of small and marginal holders, yield rates on an average are considerably high. *Taobungkhok* has a yield rate of 3105 kg of rice per hectare and for *Tejpur*, it is 2898 kgs per hectare against the state average of 2450 kgs per hectare and All India average of 2203 kgs per hectare during the surveyed years ,that is, 2007-08 As regards fertilizers, the farmers in both the village reported the use of high levels of fertilizers such as Urea, Potash, Diammonium Phosphate (DAP) in order to boost up their production.

This is one of the major reasons for the high level of productivity in both the village. Another significant feature observed in both the village was that the small farms use high dosage of fertilizers than the higher size classes. The lowest size classes below one acre in *Taobungkhok*use 225.19 kgs of plant nutrients on an average against 206.36 kgs by the top size class, the second highest size class of 1-1.5 acres also used the higher fertilizer doses at 203.64 kilograms per acre. Similarly in Tejpur, the average amount of plant nutrient used by the lowest size classes of 0-1 and 1-1.5 acre are 223.14 and 184.45 kilograms which is much higher than that of the highest size classes at 158.63 kilograms. It is also observed that in both the village, the use of chemical fertilizers is not only high but the cultivators have used all kind of fertilizers like urea, phosphate, DAP in combinations. Apart from this, they have also used pesticides across all size classes.As regards the size of land holdings in Manipur, it is seen to be declining at a faster rate. Medium and large holdings have virtually disappeared while the area operated in small and marginal holdings accounted for a major proportion of the total holdings. Table 1 show the distribution of operational holdings in 26^{th} and 59^{th} round of NSS (Manipur)

Table 1, Distribution of operational holdings in 26th and 59th round of Nss (Manipur)

Size Class	Number of operational holdings('00)		Area of Operational Holdings ('00 ha)	
	26th Round	59th round	26th Round	59th Round
Marginal(0-1 hectare)	595(51.56)	1918(82.57)	324(24.96)	844(49.65)
Small (1-2 hectare)	410(35.53)	355(15.28)	565 (45.53)	441(31.16)
Semi-medium (2-4 hectare)	135(11.70)	45(1.94)	336(25.88)	104(7.35)
Medium (4-10 hectare)	13(1.12)	5(0.21)	65(5.01)	26(1.84)
Large (10 hectare)	1(0.09)	-	8(0.62)	-
All Sizes	1154	2323	1298	1415

Note: Figure in the Parenthesis indicate percentage
Sources-1. NSS,26th Round, Report No.215, 2.NSS,59thRound,Report No.492

Data given in the 26th and 59th round of NSS shows a high degree of marginalization of holdings and almost disappearance of medium and large holders. The proportion of marginal holders that constituted 51.56 per cent of all holdings rose to 82.57 per cent from the 26th and 59th round. Area operated also rose from 24.96 per cent to 49.65 per cent. The small holder's proportion declined from 35.53 per cent to 15.28 per cent while area operated by them also declined from 43.53 per cent to 31.16 per cent during the same period. Semi-medium holders also fell from 11.70 per cent to 1.94 per cent and area operated slightly declined from 25.88 per cent to 7.35 per cent. There has been a decline in the share of holding of the medium farmers from 1.12 per cent to 0.21 per cent and area operated declined from 5.01 per cent to 1.84 per cent. The large farmers disappeared in the 59th round.It clearly emerges from the NSS figures that 82.57 per cent of the peasantry are marginal farmers operating on unviable pieces of land averaging about 0.44 hectares of land. Together they hold only 49.65 per cent of total cultivated area. The small farmers (1-2 hectare) constituted about 15.28 per cent of the peasantry holding with 31.16 per cent of land and operate on barely viable farms of an average size of 1.24 hectares. The semi-medium farmers (2-4 hectares) have drastically decreased in numbers and hold on to only 1.94 per cent of land and operate on an average size of 7.35 hectares.

Conclusion-

It is evident that there has been increasing marginalization of land holdings in the state of Manipur. This small size of holdings urges the farmers to follow the intensive cultivation system using high amount of chemical fertilizers, insecticides, fungicides, etc in order to extract maximum production out of the small size of holdings.The use of these chemical fertilizers increases crop production on the one hand and on the other hand, their overuse has pose serious challenges to the balanced and sustainable growth. Accordingly, scientists and researchers view that continuous use of chemical fertilizers depletes essential soil nutrients and minerals that are naturally found in fertile soil. Hence,the issue of the need for sustainable agricultural practices in Manipur must be looked at carefully for the overall well-being and growth of the economy.

Note: The surveys referred to in this article are part of my doctoral thesis submitted to Manipur University

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Innovative Library Services in Digital Era.

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Abstract :-

'Library Is A Temple Of Knowledge And Users Are The Devotees Of The Library.' In Digital Era The Nature Of The Traditional Libraries Is Changing And The User's Quest Of The Knowledge Is Increasing. Users Are Not Satisfied With The Traditional Libraries. They Are Always In Search Of New Knowledge In Short Span Of A Time. In This Article Author Tried To Focus Of Changing Role Of Libraries And Librarian In Digital Era.

Key Words :-Ict, E- Resources, N-List, Resource Sharing.

Introduction

The Concept Of Library Which Was Considered Only As The Storehouse Of Books Has Changed In Modern Era. Due To The Impact Of Ict. Traditional Role Of Library Has Changed In Digital Age And Analysis Of The Library System Needs As It's A Point Of Departure To Fix The Library' S Present Position Seen Form A Number Of Parameters And Asked How This Position Relates To The Tendencies And Changes Demand For New Services. Libraries Give The Various Types' Information Services I.E. Traditional &Digital Or Web Based Information. Role Of Academic Libraries Is Totally Changed. A Great Responsibility Vests On The Shoulders Of The Present Day College Librarians In Making Their Libraries A Knowledge Reservoir. It Should Be Upgraded In Terms Of Ict Infrastructure. Quality Of Success Of Library & Popularity Of Library Depends On The Quality Services Requirement Of Its Stakeholders & Accordingly Indenting, Select, Procure, Process, Organize And Give Services By Right Resources At The Right Time In Right Manner To The Entire Community.

E-Resources 2. Consortia 3. Resource Sharing &Net Working 4. N-List.

E-Resources :-

E-Journal: Electronic Journals Are Simple Having Advanced Search Facility On Internet. It Can Be Browsed At Any Moment On Net By Any User. This Facility Can Made Available By Academic & Commercial Institution. An Institution Can Select A Model Suitable To Them. It Also Has Free Access.

E-Database:E-Database Is An Organized Collection Of Information Of The Particular Subject Or Multi Displinary Subject Areas, Information Sources Within E-Database Can Be Searched &Retrieved Electronically. There Are So Many Databases Can Be Searched & Retrieved Electronically. There Are So Many Databases Available On The Network; They Are Either Charged Or Free.

E-Dissertations & E-Thesis: This Is One Of The Primary Sources Of Information For Researcher. The Preservation At This Type Of Documents Can Be Made Available In The Digital Form By The Academic Libraries. "Inflibnet Has Made Available The Thesis & Dissertation In Digital Form. Dr. B.A.M.U. Aurangabad Has Also Giving This Type Of Facility E-Resources Are Used Commonly Now Days In Major Academic Libraries.

Online Services Of Academic Libraries:

Following Online Services Can Be Given By Academic Libraries:

1. E Journal, E-Books, Web Forms, Articles, Databases, Films, Audio Digital Products Online Publishing. Public Domain & Commercial Online Databases Are Available On Internet.

Need Of E=Resources:

Best Reading For The Largest Number At The Least Cost Is A Great Challenge Before Librarians. Library May Think Of Subscribing Online Databases. Membership Of Consortia May Also Help In Meeting The Demands Of User Community. A Good Number Of Standard Publishers Have Started E-Publishing.

The Use Of E-Resources:

1. Easy Access To Latest Information;
2. Great Saving Of Time;
3. Use Any Time Anywhere
4. Portability;
5. Saving In Physical Space In Storing And Use;
6. Unlimited Concurrent Use;
7. Downloading, Saving, Reading And Forwarding Facility At Click Of A Button;
8. Hearing Impaired May Go In For Audible E-Resources;
9. No Fear Of Users Misplacing Of Hiding The Resources; Etc.

Major Consortia :-

Some Of The Important Consortia Are As Follows:

Resource Sharing And Networking:

The Use Of Information Technology Has Added New Dimensions To The Concept Of Resource Sharing And Networking In The Libraries. Network Among Related Libraries For Rendering Effective And Efficient Services To The Library Users, Save Money And Time. Today In It Environment, More And More Libraries Have Shared Their Resources Through Networks. This Has Resulted In Easy Accessing And Providing Services Though The Resource Sharing.

Resource Sharing:

Resource Sharing Is A Sort Of Implied Agreement Amongst Participating Libraries Where In Each Participant Is Willing To Share Its Resources With Resources Of Its Partners.

N-List:-

Ugc Is Facilitating The Availability Of E-Books And E-Journals In The Colleges Through The National Library And Information Services Infrastructure For Scholarly Content (N-List) Programmer Funded By Mhrd, Govt. Of India. The Program Me Funded By Mhrd, Govt. Of India. The Program Me Facilitates Access To About 1,00,000 E-Books And 600 E-Journals To All The Colleges Agriculture, Engineering, Management, Medical, Pharmacy, Dentistry And Nursing Colleges. They Payment Of Rs. 5900/-As Annual Membership Fee.

The Above Mentioned Content Is Made Accessible Form College, Home Or Anywhere Through Individual Login Id And Password To All The Users Including Faculty Members And Students. The Website For Same Is Http://Nlist.Inflibnet.Ac.In/

Mission Of The N-List :

1. Access To Scholarly Information For All Educational Institutions.
2. Provide Access To Subscription – Based Scholarly Information (E-Books And E-Resources) To 600 Colleges From All Over India.
3. Provide Access To Scholarly Content Available In Open Access Through Subject Portals And Subject Gateways.
4. Bridging Digital Divide And Moving Towards A Information – Rich Society.

Why To Join N-List Programme:

1. The Govt. Of India Has Committed Itself To Extend Access To Qualitative E-Resources To Students, Researchers And Faculty In Colleges Through The N-List Programe;
2. It Will Enable Access To Scholarly Information In E-Format At Highly Discounted Rate;
3. It Will Facilitate Desk Top Access To High-Quality E-Resources To Your Students And Researchers 24 Hours A Day 7 Days A Week And 365 Days A Year.
4. In The Maharashtra State There Are More Than 799 Colleges From Different Universities Are Covered Under 12b Act Of Ugc And Other Colleges Are Also Eligible To Join The N-Nist. Above Table Shows That At Present 383 Colleges Are Joined To The N-List Program Me.

Conclusion

In This Way In This Article Author Has Tried To Focus On Changing Role Libraries And Library Professionals In Digital Era.And How The Ict Has Changed The Traditional Role Of Libraries In Digital Era. In Digital Era The Quest Of Knowledge Of Users Of Library Are Increasing Day By Day. Librarians Also Need To Be Punctual In His Work.

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Agricultural Land Use and Land Efficiency in Kanakapura Taluk of Ramanagr District; Karnataka

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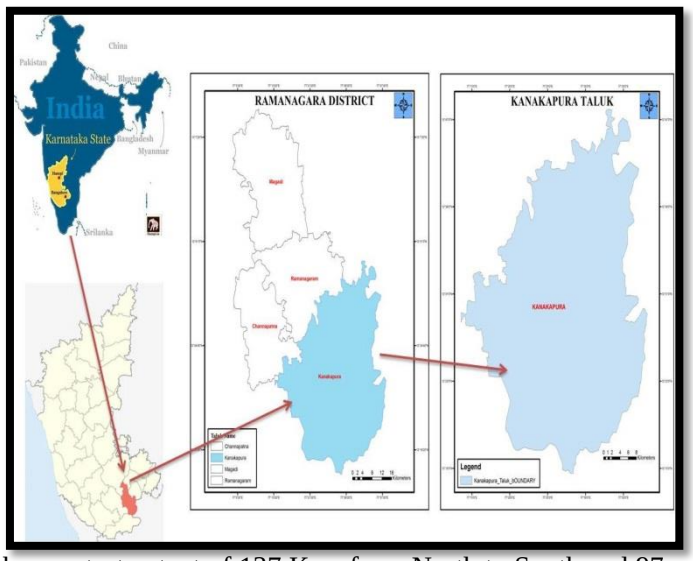
Abstract:

The study, it has been the proposal and presented of agricultural development plan, critical deliberation and assessment of existing conditions and effective constituents of agricultural **utilization of land**, **efficiency of land use** and regional imbalances in the selected area.

Introduction:

Agriculture is a basic economy and provides livelihood for about 64 percent of the people in India. It is clear from the above facts that it is the largest industry in the country which has occupied an important place. Agriculture provides food grain to the people, fodder to the animals and raw material and stimulation to the industrial development, such as cotton, sugarcane, oilseeds etc,. The need for agricultural development in Kanakapura taluk assumes greater importance because the area has been effectively utilized for agriculture and this is the main occupation of the people. Kanakapura, like other talukas of the Ramanagra district, is basically as an agricultural and rural based area. Agriculture is the mainstay of Kanakapura taluk's economy. Directly or indirectly it gives an employment to more than 47 percent of its population and 86 percent of the total working population. Despite limited irrigation facilities and precarious rainfall, the people of the area are able to cultivate hardly cereals, pulses and oil seeds. The agricultural development in this area is a testimony of the brave gallant people who have survived and conquered the natural hazards like droughts.

Location and Extent of the Study Area:



Kanakapura taluk is one of the forth taluk in Ramanagara district, situated in south eastern part of the district. Kanakapura is located at 12° 33′ north - 12° 55′ North latitudes and 77° 25′ east ° 42′ East longitudes . It has an average elevation of 638 meters from MSL. Kanakapura is situated 56 km south to Bangalore and 26 kms from Ramanagara on the Arkavathi river bank. Kanakapura taluk takes its name from Kānikāranhalli, Kanakanahalli finally Kanakapura. Kanakapura is a part of the Southern Karnataka Plateau, and is located in the South-eastern corner of Karnataka State. It has the greatest extent of 137 Kms from North to South and 97 kmsfrom East toWest, covering a total geographical area of 1594.00 Sq. km. It is the largest taluk, while Channapatna is the smallest with an area of 543 sq. km. in Ramanagara district. Kanakapura is the largest Loksabha Constituency in India and largest taluk in Karnataka state in the area, now it is named as Bangalore rural Loksabha constituency. The most conspicuous areas of very high and very low area of the taluk are located at 600 and 900 metres of contour lines above the mean sea level respectively.

Objectives of the Study:

The objectives of the present study are as follows,.

To identify the human activities in changing of land use.

To know the hobli levels of land use in the taluka

To analyze the land use pattern of the study area

To analyze the efficiency of land use in the study area

It is researcher's hope that the study in the above mentioned objectives will be significant role of the area development. The study has been designed in hobli wise for the entire taluk.

Methodology:

It is truism that no research results are very better than methods by which they are obtained. The

study is attempted at two levels i.e., at the taluk level and within the hobli-level has been selected for analysis. In order to analyze the physical personality of land utilization and land use pattern on the basis of primary and secondary data. The secondary and primary data have been cartographically represented to show the land use pattern.

Land Utilization (Classification of Land):

Land is a primary important source of production. Physical attributes and socio-economic structure no doubt, put a stamp upon its use pattern. The land use and crop distribution pattern indicates a greater influence and control imposed by rainfall distribution, physiographic and soil conditions.[5] Land use is central to all discussion of land problems and policies.[6] Present land-use is the result of different causes. Many of which are directly related to nature and quantity of land resource, others have their origin in cultural, social and economic conditions of the past in the study area. In this way existing settlement pattern, population, socio-techno-economic variables, infrastructural facilities and living standards are the main determinants of land utilization. Its significance is further increased in Kanakapura taluk whose economy revolves around agriculture. Agriculture land use is the dominant structure of the resource base in Kanakapura taluk.

Land Utilization in Kanakapura Taluk (Area in Hectares)

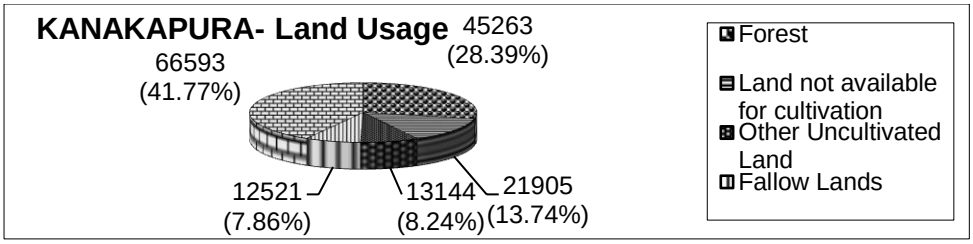
Description	**Kanakapura Taluk**		**Bangalore (R) District**	**Ramanagara District**	**Kanakapura taluk percentage to the district**	
	2001	**2011**			**Bangalore 2001**	**Ramanagara 2011**
Forest Land	45263 (28.39%)	45263 (28.39%)	81268	69946	55.69	64.71
Land not available for cultivation	21905 (13.74%)	22000 (13.80%)	94003	50564	23.30	43.51
Other un-cultivated land	13144 (8.24%)	13144 (8.24)	53022	29790	24.79	44.12
Fallow lands	12521 (7.86%)	16291 (10.22%)	50730	37370	24.68	43.59
Net Area Cropped	66593 (41.77%)	62728 (39.35%)	306408	172380	21.73	36.39
Total Geographical Area	159426	159426	585431	355912	27.23	44.79

Source: Raita Samparka Kendra, District Statistical Office, Ramanagara-2001.

The secondary data of different category of land utilization is collected from the Raita Samparka Kendra (formers contact center) in six hoblis and Agriculture office Kanakapura. The data of land-use have been classified into five categories i.e;

Forest land, Land not available for cultivation, Other un-cultivated land, Fallow lands and Net Area Cropped.

Quite a large part of area of the taluk 41.77% (2001) is under cultivation, it is decreased to 39.35% by 2011. Much of the area has been converted into residential sites- this is impact of urban shadow of Bangalore. 13.74% (2001) of land is under land not available for cultivation; it is slightly increased to 13.80% (2011). This is because heart of Karnataka has occupied and restricted for different purpose. Fallow land is 7.86% (2001) and it increased to 10.22% (2011). While there is no changes in the forest land and other un-cultivated land during a decade. 28% falls under forest land, 8.24% other un-cultivated land in the study area.



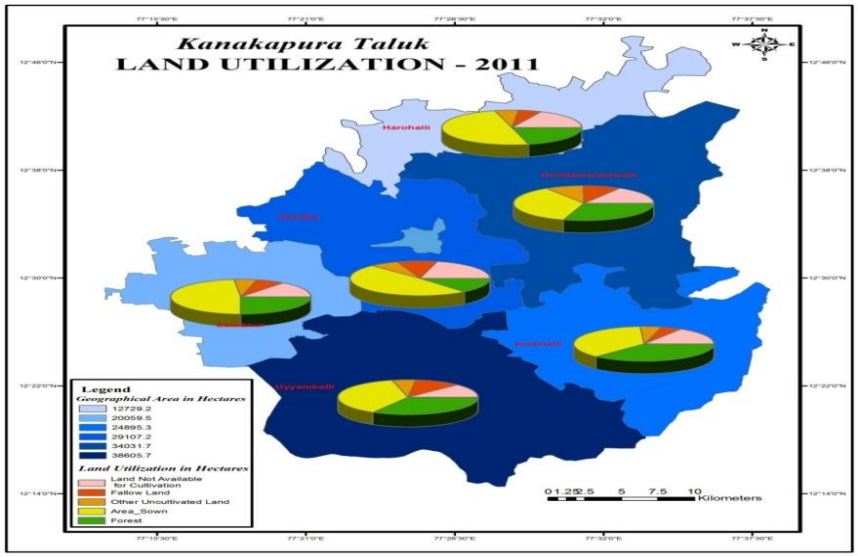
Hobli-Wise Land Utilization :

The pattern and intensity of land resource is seen in the study unit through the distribution of cultivated land, which is outcome of the early strata of agricultural practice, dependency and population pressure combined with physical factors. It is interesting to compare the agricultural land among all the hoblis of the taluk.

Hobli-Wise Land Utilization-2011(Area in Hectares)

Hoblis	Geographical Area	Land not available for cultivation		Fallow Land	Other uncultivated land			Area Sown	Forest
		Non-Agricultural land	Barren land		Cultivable-waste	Permanent pasture	Trees and groves		
Kanakapura	29107.16	2236.14	3447.44	3674	31	2157	19	14238.34	3304.24
Harohalli	12729.18	920.42	1088.06	899	25	926	17	6352.20	2501.50
Maralawadi	34031.66	1220.34	3513.35	3838	36	3746	34	10951.52	10692.45
Kodihalli	24895.32	1486.76	1886.10	1437	35	1669	31	8453.59	9896.87
Uyyamballi	38605.71	867.20	2942	4847	32	2909	20	13127.34	13858.66
Sathnure	20059.48	847.14	1545.05	1596	31	1407	19	9605.01	5009.28
Total 2011-12	159426.51	7578	14422	16291	190	12814	140	62728	45263
Total 2001-02	159426.51	7558	14347	12521	190	12814	161	66614	45263

Source: District Statistical Bureau, Ramanagara, 2011.



Hobli-Wise Land Utilization in Kanakapura Taluk

Forests:

The importance of forest lies in its capacity to meet a large human wants. Forests supply men with wood to make weapons, to have fire and to build houses etc. The forest occupies 45263 hectares (2011) forming 28.39 percent of the total geographical area of 159426 hectares in the taluk. Land under forest found largely in Uyyamballi, Doddamaralawadi and Kodihalli hoblis and less forest area found in kasaba hobli.

Net Sown Area:

Net sown area or cropped area is the land which is being actually tilled for raising any type of crop like food and cash crops or fodder etc. It has considerable variation in a decade. The Net area cropped has been decreased from 41.77% in 2001 to 39.35% in 2011 census to the total geographical area in the taluk. In the study area, high concentration of cultivated land is found in kasaba hobli 14238.34 hectares (22.70%) followed by Uyyamballi (20.93%), Doddamaralawadi (17.46%), and Sathnur (15.31%). It is because of irrigation facilities and vast geographical area. The lowest area under cultivation is found in Kodihalli (13.48%) and Harohalli (10.13%). It is because of its hilly topography and lowest geographical area.

Non-Agricultural Land:

Area under non-agricultural land is included land occupied by settlements, roads and canals are occupies 4.75% of the total area. The maximum land under non-agricultural use is found in Kanakapura (29.51%), followed by Kodihalli (19.62%), Uyyamballi (16.10%) and the minimum is found in Sathnur (11.18%) to the total area of non-agricultural land use of the study unit.

Cultivable Waste:

The land continuously idle at least for the last ten years is called cultivable waste or unfertile land. Highest waste land found in Daddamaralawadi 36 hectares and Kodihalli 35 hectares and lowest is in Harohalli hobli 25 hectares. The cultivable land of each hobli of the taluk can be ploughed after reclamation. The record of cultivable waste in the study areas shows that it accounts to 0.12 percent of the total area of the taluk.

Permanent Pasture And Grazing Land:

Permanent pasture and grazing land include all such land which is under grass cover owned by Government or private owner. These may be permanent pasture which is kept reserved as village having common grazing ground and the unreserved grass lands where the cattle of any locality are allowed for stray grazing.

Fallow Land:

It consists of two categories, i.e., current fallow (5901 hectares) and other than current fallow land (10390 hectares). The fallow land comprises about 16291 hectares (10.22%) in 2011, but it was 12521 hectares (7.86%) in 2001, it is an increasing trend during a decade. Current fallow land indicates the land left fallow during the current year only and other than current fallow means land left fallow temporarily out of cultivation for a period of not less than one year and not more than five years.

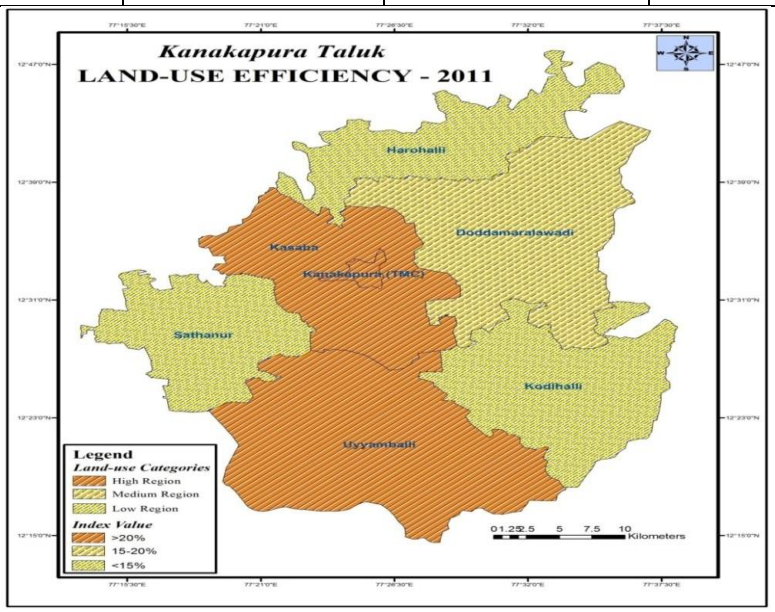
Barren Land:

It consists about 9.00 percent (2001 census) and 9.05 percent (2011 census) of the total geographical area of the taluk. Maximum land under this category is found in Doddamaralawadi (24.36%), kasaba (23.90%) and Uyyamballi (20.40%). The minimum is found in Harohalli (7.54%) and Sathnur (10.71%) hobli.

Land-Use Efficiency:

Land-use efficiency can be explained in relation to constant increase in production capacity of land-use to efficient and beneficial use of capital and labour. The intensity of land-use reveals the degree of land-use development[8]. Singh R.B. (2001) published a book on Land Use and Land Cover Change Studies. He made an impact analysis study in Land Use/Land Cover Change in Agriculturally Developed Regions in India. Land use efficiency of the study area has been computed on the basis of ranking co-efficient by using five variables, i.e., net area sown, land not available for cultivation, uncultivated land, irrigated area and the area sown more than once. The percentage of land not available for cultivation, uncultivated land have been arranged in on side and percentage figures for net area sown, cropped area sown more than once , irrigated land among all hoblies are arranged on the other side. The total percentage of all five variables for each hobli divided by 5 (Number of variables) to get ranking co-efficient. Thus land use efficiency have been identified in the area on the basis of these ranking co-efficient values as high, medium and low. The Uyyamballi and Kasaba hoblies recording high land use efficiency, whereas Doddamaralawadi exhibit medium land-use efficiency. Kodihalli, Harohalli and Sathnure hoblies recording low land use efficiency.

Land-use Categories	Index Values	No. of Hoblies	Percentage of total Hoblies
High Region	Above 20 %	2	42.98 %
Medium Region	15 - 20 %	1	19.36 %
Low Region	Below 15 %	3	37.66 %
Total		6	100%



Conclusion:

The data of land-use have been classified into five categories i.e., (a) Forest land (28.39%), (b) Land not available for cultivation (13.75%), (c) Other un-cultivated land (10.39 %), (d) Fallow lands (8.04%) and (e) Net Area Cropped (39.35%). The need for agricultural development in Kanakapura taluk assumes greater importance because the area has been effectively utilized for agriculture and this is the main occupation of the people. It gives an employment to more than 47 percent of its population and 86 percent of the total working population. Along with the proposal of agricultural development plan, critical deliberation and assessment of existing conditions and effective constituents of agricultural utilization of cropped area, crop combination, irrigation, productivity potential, efficiency etc., has been discussed. Land-use efficiency can be explained in relation to constant increase in production capacity of land-use to efficient and beneficial use of capital and labour. Per-capita cultivable land resource in the taluk is 0.20 hectares which is greater than the district's average of 0.16 and lower than state's average of 0.21. The cropping pattern is based on both time and space sequence of crops, September is the most critical month for the farmers as excess or deficiency of rainfall has effects large scale on both kharif and rabi season crops. Physio-graphy, climate, soil and water resources are primarily significant determinants of crop distribution. The cropping intensity has been recorded 106.19 for the entire taluk. Highest cropping intensity is found in Uyyamballi 108.04, Sathnure, and exhibits lowest cropping intensity of 104.62.

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Sustainable Agriculture & Rural Development

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Abstract:

The place of agriculture in the Indian economy is very important. Although industrialization is on the rise, the importance of agriculture and agribusiness remains and will continue to be so in the future. At the same time, despite the increasing urbanization, the proportion of people still living in rural areas is still high. Although the agricultural sector has made significant gains in food-grains and other products through many experiments with the help of new technologies, the agribusiness is still dependent on the monsoon rains. This is evident once again due to last year's severe drought. Also, due to the unfortunate suicides of farmers in Maharashtra and many parts of the country, agriculture has become more unreliable. Those who want to work in the rural sector should study the concept of rural development. The need for development of rural areas as well as the methods used to measure rural development, what efforts are required for sustainable development in rural areas is all covered in this topic.

Keywords: *Rural development, Indian economy, Agribusiness, Agriculture Sustainable Development, Importance of agriculture.*

Introduction:

Excessive use of chemical fertilizers and pesticides is making the land barren. The land that was once plowed with a wooden plow began to be plowed with an iron plow. But with the increase in chemical methods, the land has become stronger and is now being plowed by tractors. In some places plowing is not done even by tractor. Therefore, soil texture should be improved by different methodologies. Farmers will be encouraged to form different Farmers Producers Association by bringing them together through groups. Assessing the strength of this collective power, need to arrange the conferences for discussions and guide the farmers on how to have group farming, collective purchase of agricultural inputs, collective sale of agricultural commodities, loan-insurance, etc. Rainfall dependent farming is a very risky and complicated process. However, the government believes that a large increase in agricultural production can be achieved if the focus is on this sector. The overall development of agriculture through integrated farming system will make it easier to combine food grains, fruits, flowers, livestock, agro-forestry, fisheries and agro-based industries.

Increase the productivity and livelihood of the farmers:

The program was undertaken to increase the productivity and livelihood of the farmers, especially the marginalized and marginal farmers. Sustainable increase in agricultural productivity in rainfall based areas, adoption of diversified and integrated farming methods to prevent losses due to droughts, floods and other erratic rainfall, provide sustainable employment using up-to-date production and processing technology, increase income of rainfall based farmers. The original objective of the sustainable development program to make full use of the potential of resources through integrated farming system by consolidating all the existing schemes.

Different Programs for Development of Agriculture:

Use of multiple cropping methods, crop rotation, intercropping methods; It will also provide sustainable livelihood to the farmers by using fruits, livestock, fisheries, beekeeping etc. as well as enable them to cope with natural calamities. In these agricultural development programs, land degradation will be avoided due to minimum tillage, minimum tillage, crop rotation etc. This will help in making full use of inputs and maintaining ecological balance. Considering natural resources, facilities, inputs, cultivation and processing of crops, fruits, produce, aromatic and medicinal crops will be facilitated according to the actual situation. In addition, assistance need to be provided for farming, land cultivation, wells, pump-sets, micro-irrigation, seeds and seedlings. In particular, multi-source farming system (sustainable) will be promoted with very few smallholder farmers as the focal point; this will help in maintaining the livelihood of the farmers. Project-based production methods should be implemented by setting up groups on an area of at least 50 hectares to make full use of shared resources. Farmers who are willing to adopt new methods in their current farming system need to be assisted. Farmers who have the ability to adopt fodder production, seed production, greenhouses, farm ponds, farm lining, and bore-wells those may be eligible for agriculture development program.

Schemes for Increasing Productivity in Sustainable Agriculture:

Rain based farming is a very risky and complicated process. However, the government believes that a large increase in agricultural production can be achieved if the focus is on this sector. The overall development of agriculture through integrated farming system will make it easier to combine food grains, fruits, flowers,

livestock, agro-forestry, fisheries and agro-based industries. The basic objective of the proposed sustainable agricultural development program should to maximize the use of natural resources while developing the potential of various sectors related to agriculture. Capacities of natural resources as well as facilities created through MGNREGA, ROHYO, National Agricultural Development Plan, National Horticulture Mission and various watershed treatments will be utilized. This will help in increasing productivity, avoiding adverse weather conditions, food security, rural livelihood and secure income for the rural population. In order to increase the utilization of sustainable agriculture, the facilities created through the Watershed Development Mahatma Gandhi Rural Employment Guarantee Scheme will be integrated with improved water management systems. The sustainable agricultural development programs will provide lining support to farmers in lands with high water infiltration. Assistance will be given to water level management and water conservation at the source by assisting the elements like land leveling, dam closure, leveling, mulch, *sari-varamba*, semicircular dam, cultivation method etc.

Need to Train The Young Farmers:

Young farmers in the group should be given training in horticulture, vegetable production, floriculture, spices, medicinal and aromatic plants, controlled farming etc. Training should be given to women members of farmers' families for training in dairy, animal husbandry, fisheries, poultry, processing industries, goat-sheep rearing etc. These are matters which need to be met from other available schemes, such as various crop schemes, National Horticulture Campaign, National Agricultural Development Plan, National Rural Development Plan, Farm Program, etc. The benefit of the remaining components should be provided from the available components of the dry land sustainable agriculture scheme. There should be provision of care should be taken to ensure that the benefits to be paid from various schemes and components of the Dry Sustainable Agriculture Scheme remain within the eligible limits (provision) of Rs. 1 lakh and Rs. 80,000 fixed under this scheme.

Implementation of Irrigation System

The most important thing to do in agriculture is irrigation system. Awareness and training (water literacy) is essential for proper use of water at the village level. But since it is not possible to teach or inform all this to a single farmer, the farmer's union in 3-4 villages should be a union or a farmer's production company and all the farmers should join the farmer's union, the producer company. This will enable farmers to work together to improve agriculture, conduct various experiments and demonstrations, and implement water conservation measures. If the farmers are aware and organized, the schemes can be implemented effectively. It will also be beneficial to organize and produce and sell collective crops or do the primary process at your village level. Farmers have no choice but to come together in the coming period. The point now is to make agriculture sustainable and to prioritize it. Water should be given priority and ponds and small ponds should be constructed for water storage in the villages as well as for storing rain water. A special campaign should be launched to store or supply enough water for agriculture in the village for at least 9 months. There is a need to speed up the removal of sludge from small projects as well as old projects without setting up large projects. It is also important to consider the fact that agriculture is being fragmented in the future and it has become equally important to prevent fragmentation otherwise the cost of production in small chunks and the yield, money will be a nuisance. Therefore, a lot of work needs to be done to increase production as well as agri-business.

Village Development Campaign:

On the occasion of the golden jubilee year of the establishment of the state of Maharashtra, a village development campaign has been launched to bring about sustainable village development in the state. This development will be expected in the three areas of Physical, Social and Livelihood with the financial, technical and administrative support of the government and the initiative of the people. This program is for quality physical infrastructure. An important principle in the concept of sustainable rural development is that while creating high quality physical facilities in the village, the use of natural resources should be considered in a balanced manner.

The population is growing day by day and the natural resource wealth is declining, so many issues like 'Global Warming' are taking root. Creating a prosperous and prosperous village by conserving, preserving and protecting the environment is the need of the hour, so the government launched the Environmental Balanced Prosperous Village Scheme in the year 2010-11.

Out of the total 27920 Gram Panchayats in the state in the first year, a total of 12193 Gram Panchayats are eligible for the above criteria and they have been given a population wise fund of Rs. 389.89 crore in the first year. The funds received by the Gram Panchayat have been utilized for the sustainable development of the village.

Conclusion:

Above research paper is focuses on sustainable agriculture and by its proper implementation make rural development. So Agri-entrepreneurship should be promoted. There are many plans on this too but I don't understand where they are implemented. Therefore, timely supply of agriculture to agriculture as well as primary or secondary processing of agricultural produce in the area should also benefit the farmers. The future is easy only if the agricultural crisis is settled. If the political maelstrom continues like this, it will be a nightmare for the farmers and tax collectors. Also, if we want to see progress in the country and the state, we have to take these factors very seriously and take concrete action. Everyone should pay attention to this because today and tomorrow agriculture and the system that complements it must be changed if we are to move fast. The policy makers should see this as a very important and priority issue only then the farmer (food provider- *Annadata*) will be happy and everyone become happy.

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Correct time duration in life cycle stages family formicidae species of *Meranoplus Bicolor & Crematogaster Contemta* during rainy season in at Mahad

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Abstract
The value of the Formicidae (Insecta, Hymenoptera) community in forensic investigations is poorly studies in Larval Growth of flesh fly *meranoplus bicolor* and *crematogaster contemta* was studied in outdoor ambient temperatures in rainy seasons. The various types of physical evidence can be found at almost any crime scene and detail estimation of post mortem interval (PMI) in the investigation of distrustful death, the forensic measurer flesh flies are essential for accuracy in estimation of PMI. The types of evidence and where it is found can assist investigators to develop a sense of how the crime was committed. The family sarcophagidae species of *meranoplus bicolor* and *crematogaster contemta*. Were reared in laboratory condition for studying their time duration of different stages of life cycle under the fluctuating temperature in winter seasons. *Meranoplus bicolor* took 266 hours 38 minutes, where as the *Crematogaster Contemta* took 302 hours 21 minutes, during monsoon season respectively. This study shows that forensic investigators will have to take each of these variables into consideration from the development of insects in order diptera to give clear or exact estimation of postmortem interval.

Keywords: *Forensic Insect, PMI in Rainy season , life cycle duration; Temp change.*

Introduction

The mahad taluka is a very remote and tremendous rainfall region due to this biotic fauna are available on the several various species are observed in family sarcophaidae but the actual time duration determining studies of the species meranoplus bicolor and are studied. The entomofauna present at a crime scene represents an important evidence about the place and the time of death, frequently assisting in the calculation of the postmortem interval (PMI). (Cotts EP1992).[9] Forensic entomology uses arthropods, mainly from the class Insecta, in criminal investigations. It applies to several areas, namely to medical–legal cases, urban and stored products infestations (Smits KGV 1986)[5] The medical–legal branch of forensic entomology focuses on arthropods that are found or infest human corpses. These colonizers can be used in various ways in the investigation: to estimate the PMI through the study of their life cycle or succession patterns of colonization; to know if the body was moved; or to associate suspects with the crime scene.(Richard C.S. 2011) [6].

The family formicidae includes flesh-flies the well-known scavenger insects belonging to the order diptera fleshfly is usually the first insects to come in contact with dead body remains Worldwide. There are 1250 species in the biogeographic region of the world. Developmental data for primary flesh flies provide the most accurate means of estimating the PMI using arthropod insect's information (Greenberg 1991).[1] It is presumed that the first individuals that arrives at, and lay eggs in a corpse do so within hours after death. The provided information the body is outside and there are no obvious barriers preventing egg-laying (such as environmental restrictions and whether the body is covered, buried or indoors). Therefore, time of death is assumed to be close to the time the first eggs are deposited. (Catts and Goff 1992)[9].

Discussions:

The information from carrion entomofauna is particularly useful in the calculation of the PMI .However, knowledge about several groups of arthropods belonging to this community, such as the Formicidae, is scarce. This family represents an important part of the sarcosaprophagous community and needs to be studied in greater depth in order to overcome the lack of knowledge about this group of insects in forensic context. The environmental conditions of spring and summer regarding temperature, humidity and food availability explain the greater diversity of ant species and a larger number of individuals present in the environment [Goff ML 1997] [8]. Indeed, these seasons presented the greater specific time calculate in life cycle stages.

The present study also supports this statement. In order for insect developmental analysis to yield an accurate PMI estimation, data must be available for the earliest colonizing species collected from the corpse at the time of discovery. The rearing was conducted outdoor at the mean ambient fluctuating temperature of 25.10 °C and mean relative humidity 51.1% in monsoon season. (Gunn2006)[10]. Reported that the eggs of this genus fly hatch in the reproductive track of female fly and it lays first instar larvae.

All the first instar larvae were collected within duration of one hour after the decayed meat was placed outside for baiting. It has been reported that the viviparous females of formicides do not deposit all

their larvae in the same carrion like fleshflies, rather spreading them among several carcases, (Galonte (2008). [11]. While comparing the life cycle of flesh fly meranoplus bicolor and crematogaster contemta the former spend more than 50% of their immature life cycle in the pupation period, Kumara, et al (2013) [12]. The Studied lifecycle of *meranoplus bicolor* and reported at constant temperature of 28 °C and the duration of total development up to adult 426.8 ± 18.3 hours. Singh et al (2006) [13]. The report that the life of cycle of *meranoplus bicolor* was observed and completed life cycle within 16 days during monsoon season with temperature ranged between 21-43 °C and relative humidity between 14-55% with no rain fall. Galloway et al (1989) [14]. The studied life cycle of in crematogaster contemta during rainy sesaon in Southern Arizona and concluded that temperature and sunlight greatly influenced the duration of larval growth, whereas cloudy weather prevent larviposition in this species.(Sukontasan et al 2010) [15]. Although there may be several early-arriving species, the oldest 12 individuals are the most relevant because they represent the first eggs deposited on the body. Because certain species can oviposit beginning a few hours following death and continuing for at least two weeks (smith K.G 1986). [16]. The larvae of sarcophagidae feeds on remains or other decaying matter. Most species of fleshflies studied thus far are anautogenous; female requires a substantial amount of protein to develop mature eggs within her ovaries (about 800 µg per pair of ovaries in Phormiaregina). Both male and female adult sarcophagidae ranges from 6 to 14 mm in length.

The adult size depends on species and food availability to the larval stages. The majority of these species are metallic in appearance with colour ranging from brilliant green or blue to bronze or shiny black (Ambrose DP (2007) [2]. fleshfly eggs are about 1.6 mm × 0.5 mm, white or yellowish, looks like rice balls when laid. While the female fleshfly typically lays 160 to 200 eggs per batch, she is usually iteroparous, laying around 2000 eggs during her course of life. The sex ratio of fleshfly eggs is usually 50:50 .Khole (1978)[3]. Upon reaching carrion, female deposit eggs onto the body. Since development is highly predictable if the ambient temperature is known, fleshfly are considered a valuable tools in forensic science to determine post mortem interval (PMI).Traditional estimation of time since death are generally unreliable after72 hours and often entomologist are the only officials capable of generating an actuating approximate time interval.

This research work was taken up in order to study the time duration of different stages of *Sarcophaga Bullata* & *Sarcophaga Carnaria* during winter season so as to prepare the baseline data that will help the forensic experts to find correct PMI in Indian conditions.

Materials and Methoods

The experiments were carried out from july 2019 to October 2019 .The temperate Mediterranean climate with humid rainy, [Geiger 1954][17]. The present research work was carried out at research laboratory. The species *meranoplus bicolor* and *crematogaster contemta* flies were used as the biomaterials and different appliances and tools were used.

Collecting and rearing of fleshflies

The species *meranoplus bicolor* and *crematogaster contemta* flies were collected from mahad taluka, district of Raigad, Maharashtra, India. For the collection of flies fresh liver sample was purchased from the local slaughter house. Partially putre fied liver and meat was exposed in the sampling site and within few minutes the flies were attracted. The flies' were collected by the insect net and after identification they were released in the insect rearing cages. Honey solution (water and honey) soaked in tissue paper was kept in petridish and fresh sliced liver meat of cattle was provided daily in separate petridishes in the rearing cages. After few days the mated adult female started laying eggs on sliced liver meat. The eggs were collected with the help of fine brush directly after laying. The fleshflies laid eggs on the sliced liver meat which was later on reared in in laboratory condition at rainy seasons. The plastic jar was taken for rearing the instars of fleshfly larvae. The liver meat was then placed into 8 cm deeper jar covered with fine mesh to prevent the entry of parasitoids.

The two experiments were conducted at the same time. Two groups of 65 larvae separately transferred into three plastic jars and fed them fresh liver meat daily till pupation. Observation was taken on hourly basis. The maggots were observed and collected with the help of forceps and preserved in small bottle throughout their developmental stages at different time duration. As the third instars larva finished feeding and reach wandering phase, they left the food and travel to the soil for pupation. After few days the adult fly emerged out from the pupa. The total time taken by each stages of *meranoplus bicolor* and *crematogaster contemta* life cycle during winter seasons was recorded. The temperature and humidity were recorded daily with the help of Hygrothermometer clock. The experiment was repeated three times.

Statistical Analysis

Statistical analysis was performed using the excel sheet, data were analyzed by using two way analysis of variances (ANOVA) and significance level at $P \leq 0.05$.

Observations and Results

In present research work it is observe that the fleshflies' reaches from Ist instar larvae to IInd and then IIIrd instar larvae after their moulting completion. The time duration of different stages of *meranoplus bicolor* & *Crematogaster contemta* during rainy seasons are as follows.

1)Meranoplus bicolor (Rainy season)

The average temperature and humidity during the experiment was 24.1°C and 49.6% respectively. Table 1 showed the time duration of different stages of meranoplus bicolor during rainy season. Result revealed that the eggs took 21 hours 39 minutes for incubation. After incubation there are three stages of larval instars (i.e. Ist instar, IInd instar and IIIrd instar). The duration of Ist instar larva took 25 hours 37 minutes and post mortem interval (PMI) duration persisted 46 hours 16 minutes since egg laid. The IInd instar larva took 27 hours 40 minutes to reach third instar larva and PMI duration was 73 hours 56 minutes. The IIIrd instar larva persisted 49 hours 11 minutes while PMI duration since egg laid upto IIIrd instar was 122 hours 07 minutes. The pre-pupal stage took 22 hours 47 minutes and PMI duration was 144 hours 54 minutes. The time taken by pupal stages upto adult fly emerged was 119 hours 44 minutes while the total duration took by meranoplus bicolor in rainy season was 264 hours38 minutes (Table 1).

Ife cycle stages		Duration (H:MM)	PMI (H:MM)
Eggs		21:39	
Larva	Ist instar	25:37	46:16
	IInd instar	27:40	73:56
	IIIrd instar	49:11	122:07
Pre-pupa		22:47	144:54
Pupa		119:44	264:38
Total duration		264:38	

Table1: Time duration of different stages of life cycle in *Meranoplus bicolor* during winter season.

2)Crematogaster Contemta (Rainy season)

The average temperature and humidity during the experiment was 26.1°C and 41.5% respectively. Table 2 showed the time duration of different stages of *Crematogaster Contemta* during rainy season. Result revealed that the eggs took 20 hours 03 minutes for incubation. After incubation there are three stages of larval instars (i.e. Ist instar, IInd instar and IIIrd instar). The duration of Ist instar larva took 49 hours 18 minutes and post mortem interval (PMI) duration persisted 69 hours 21 minutes since egg laid. The IInd instar larva took 29 hours 21 minutes to reach third instar larva and PMI duration was 98 hours 42 minutes. The IIIrd instar larva persisted 55 hours 12 minutes while PMI duration since egg laid upto IIIrd instar was 153 hours 54 minutes. The pre-pupal stage took 26 hours 38 minutes and PMI duration was 180 hours 32 minutes. The time taken by pupal stages upto adult fly emerged was 121 hours 49 minutes while the total duration took by *Crematogaster Contemta* in rainy season was 302 hours 21 minutes (Table 2).

Ife cycle stages		Duration (H:MM)	PMI (H:MM)
Eggs		20:03	
Larva	Ist instar	49:18	69:21
	IInd instar	29:21	98:42
	IIIrd instar	55:12	153:54
Pre-pupa		26:38	180:32
Pupa		121:49	302:21
Total duration		302:21	

Table2: Time duration of different stages of life cycle in *Crematogaster contemta* during winter season.

. **Conclusion:**

This study is a first approach to the season dynamics of the Formicidae family as a part of the sarcosaprophagous community in mahad. It is advisable to carry out more studies in rainy season at several

points in the same region. This study confirms the forensic importance of the ants, since they interfere with the cadaveric fauna and may be useful as geographic and seasonal indicators. None of the species found proved but to be useful for the direct calculation of PMI, which would be interesting and of great value for forensic investigation, since it would, for example, allow detecting movements of the body postmortem.

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Digital Farming Using Internet Of Things (IOT) For Sustainable Agriculture

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Abstract:

Digitization has reduced the manual work - which was time consuming, error prone and inefficient thus saving corporations millions. With advancements in AI, the data analysis capabilities have improved further so much so that all the appliances in our house can be managed by virtual assistants that can understand human voice commands and respond. Proving to be a boon to every sector, Digitalization is slowly also revolutionizing the vast and complex Agriculture sector that remains the centre of world economy as still over 60% of the global population depends on it for survival. Digital farming is "Consistent application of the methods of precision farming and smart farming, internal and external networking of the farm and use of web-based data platforms together with Big Data analyses"

Keywords: *Internet of Things, Digital Farming, Smart, Technology*

Introduction:

The Internet of Things (IoT) is about making "dumb" things "smart" by connecting them to each other and to the internet. It enables physical objects to be sensed and controlled remotely, creating opportunities for more direct integration between the physical world and computer-based systems.

IoT enables devices embedded with sensors to connect to and interact with each other via the internet. Devices can be remotely monitored and controlled in real time, and can include anything from pumps, sheds and tractors to weather stations and computers.

What are the opportunities?

IoT is about the power of data. Our world is digitally connected and data is a critical asset.

Data from devices can guide farmers' decisions, helping them farm smarter and safer and adapt more quickly to changing conditions.

The ability to monitor farm conditions and infrastructure remotely can free up time, labour and capital to invest, allowing farmers to focus on other things.

Connecting physical resources on farms to the internet promotes:

- Remote monitoring of farm conditions and infrastructure, saving time and labour on routine farm checks
- Improving producers' decision making through data analytics
- faster and quicker insights from real-time data across the value-chain, helping farmers respond to what the market wants
- Efficiency in how we produce food to ensure less wastage, expediency to market, and enhanced traceability to demonstrate safe and sustainable food to our customers
- Building the capabilities to respond to new and emerging technologies and investing in research and development to contribute to ongoing innovation and improved productivity.

IOT in Agriculture: 8 Technology Use Cases for Smart Farming (And Challenges To Consider)

With the growing adoption of the Internet of Things (IoT), connected devices have penetrated every aspect of our life, from health and fitness, home automation, automotive and logistics, to smart cities and industrial IoT.

Thus, it is only logical that IoT, connected devices, and automation would find its application in agriculture, and as such, tremendously improve nearly every facet of it. How could one still rely on horses and plows when self-driving cars and virtual reality are no longer a sci-fi fantasy but an everyday occurrence?

Farming has seen a number of technological transformations in the last decades, becoming more industrialized and technology-driven. By using various smart agriculture gadgets, farmers have gained better control over the process of raising livestock and growing crops, making it more predictable and improving its efficiency.

This, along with the growing consumer demand for agriculture products, has contributed to the increased proliferation of smart farming technologies worldwide. In 2020, the market share for IoT in agriculture reached $5.6 billion.

What is smart agriculture? The definition and market size

There are many ways to refer to modern agriculture. For example, AgriTech refers to the application of technology in agriculture in general.

Smart agriculture, on the other hand, is mostly used to denote the application of IoT solutions in agriculture. So what is smart agriculture using IoT? By using IoT sensors to collect environmental and machine metrics, farmers can make informed decisions, and improve just about every aspect of their work – from livestock to crop farming.

For example, by using smart agriculture sensors to monitor the state of crops, farmers can define exactly how many pesticides and fertilizers they have to use to reach optimal efficiency. The same applies to the smart farming definition.

Although smart agriculture IoT, as well as industrial IoT in general, aren't as popular as consumer connected devices; yet the market is still very dynamic. The adoption of IoT solutions for agriculture is constantly growing. Namely, COVID-19 has had a positive impact on IoT in the agriculture market share. Disruptions in the supply chain, and the shortage of qualified workers, has propelled its CAGR to 9,9%. In fact, as per recent reports, the smart framing market share is set to reach $6.2 billion by 2021.

At the same time, the global smart agriculture market size is expected to triple by 2025, reaching $15.3 billion (compared to being slightly over $5 billion back in 2016).

Because the market is still developing, there is still ample opportunity for businesses willing to join in. Building IoT products for agriculture within the coming years can set you apart as an early adopter, and as such, help you pave the way to success.

But why should you consider building an IoT application for agriculture in the first place?

The Benefits of smart farming: How's IoT shaping agriculture

Technologies and IoT have the potential to transform agriculture in many aspects. Namely, there are **5 ways IoT can improve agriculture**:

- **Data, tons of data, collected by smart agriculture sensors,** e.g. weather conditions, soil quality, crop's growth progress or cattle's health. This data can be used to track the state of your business in general as well as staff performance, equipment efficiency, etc.
- **Better control over the internal processes and, as a result, lower production risks**. The ability to foresee the output of your production allows you to plan for better product distribution. If you know exactly how much crops you are going to harvest, you can make sure your product won't lie around unsold.
- **Cost management and waste reduction thanks to the increased control over the production**. Being able to see any anomalies in the crop growth or livestock health, you will be able to mitigate the risks of losing your yield.
- **Increased business efficiency through process automation**. By using smart devices, you can automate multiple processes across your production cycle, e.g. irrigation, fertilizing, or pest control.
- **Enhanced product quality and volumes**. Achieve better control over the production process and maintain higher standards of crop quality and growth capacity through automation.

As a result, all of these factors can eventually lead to **higher revenue**. Now that we have outlined how IoT can be advantageously applied in the sphere of agriculture, let's take a look at how the listed benefits can find their application in real life.

IoT use cases in agriculture

There are many types of IoT sensors for agriculture as well as IoT applications in agriculture in general:

1.Monitoring of climate conditions

Probably the most popular smart agriculture gadgets are weather stations, combining various smart farming sensors. Located across the field, they collect various data from the environment and send it to the cloud. The provided measurements can be used to map the climate conditions, choose the appropriate crops, and take the required measures to improve their capacity (i.e. precision farming).

Some examples of such agriculture IoT devices are allMETEO, Smart Elements, and Pycno.

2. Greenhouse automation

Typically, farmers use manual intervention to control the greenhouse environment. The use of IoT sensors enables them to get accurate real-time information on greenhouse conditions such as lighting, temperature, soil condition, and humidity.

In addition to sourcing environmental data, weather stations can automatically adjust the conditions to match the given parameters. Specifically, greenhouse automation systems use a similar principle.

For instance, Farmapp and Growlink are also IoT agriculture products offering such capabilities among others.

GreenIQ is also an interesting product that uses smart agriculture sensors. It is a smart sprinklers controller that allows you to manage your irrigation and lighting systems remotely.

3. Crop management

One more type of IoT product in agriculture and another element of precision farming are crop management devices. Just like weather stations, they should be placed in the field to collect data specific to crop farming; from temperature and precipitation to leaf water potential and overall crop health.

Thus, you can monitor your crop growth and any anomalies to effectively prevent any diseases or infestations that can harm your yield. Arable and Semios can serve as good representations of how this use case can be applied in real life.

4. Cattle monitoring and management

Just like crop monitoring, there are IoT agriculture sensors that can be attached to the animals on a farm to monitor their health and log performance. Livestock tracking and monitoring help collect data on stock health, well-being, and physical location.

For example, such sensors can identify sick animals so that farmers can separate them from the herd and avoid contamination. Using drones for real-time cattle tracking also helps farmers reduce staffing expenses. This works similarly to IoT devices for petcare.

For example, SCR by Allflex and Cowlar use smart agriculture sensors (collar tags) to deliver temperature, health, activity, and nutrition insights on each individual cow as well as collective information about the herd.

5. Precision farming

Also known as precision agriculture, precision farming is all about efficiency and making accurate data-driven decisions. It's also one of the most widespread and effective applications of IoT in agriculture.

By using IoT sensors, farmers can collect a vast array of metrics on every facet of the field microclimate and ecosystem: lighting, temperature, soil condition, humidity, CO_2 levels, and pest infections. This data enables farmers to estimate optimal amounts of water, fertilizers, and pesticides that their crops need, reduce expenses, and raise better and healthier crops.

For example, **CropX** builds IoT soil sensors that measure soil moisture, temperature, and electric conductivity enabling farmers to approach each crop's unique needs individually. Combined with geospatial data, this technology helps create precise soil maps for each field. **Mothive** offers similar services, helping farmers reduce waste, improve yields, and increase farm sustainability.

6. Agricultural drones

Perhaps one of the most promising agritech advancements is the use of agricultural drones in smart farming. Also known as UAVs (unmanned aerial vehicles), drones are better equipped than airplanes and satellites to collect agricultural data. Apart from surveillance capabilities, drones can also perform a vast number of tasks that previously required human labor: planting crops, fighting pests and infections, agriculture spraying, crop monitoring, etc.

Drone Seed, for example, builds drones for planting trees in deforested areas. The use of such drones is 6 times more effective than human labor. A **Sense Fly** agriculture drone eBee SQ uses multispectral image analyses to estimate the health of crops and comes at an affordable price.

7. **Predictive analytics for smart farming**

Precision agriculture and predictive data analytics go hand in hand. While IoT and smart sensor technology are a goldmine for highly relevant real-time data, the use of data analytics helps farmers make sense of it and come up with important predictions: crop harvesting time, the risks of diseases and infestations, yield volume, etc. Data analytics tools help make farming, which is inherently highly dependent on weather conditions, more manageable, and predictable.

For example, the **Crop Performance** platform helps farmers access the volume and quality of yields in advance, as well as their vulnerability to unfavorable weather conditions, such as floods and drought. It also enables farmers to optimize the supply of water and nutrients for each crop and even select yield traits to improve quality.

Applied in agriculture, solutions like **Soil Scout** enable farmers to save up to 50% irrigation water, reduce the loss of fertilizers caused by overwatering, and deliver actionable insights regardless of season or weather conditions.

8. End-to-end farm management systems

A more complex approach to IoT products in agriculture can be represented by the so-called farm productivity management systems. They usually include a number of agriculture IoT devices and sensors, installed on the premises as well as a powerful dashboard with analytical capabilities and in-built accounting/reporting features.

This offers remote farm monitoring capabilities and allows you to streamline most of the business operations. Similar solutions are represented by FarmLogs and Cropio.

In addition to the listed IoT agriculture use cases, some prominent opportunities include vehicle tracking (or even automation), storage management, logistics, etc.

Things to consider before developing your smart farming solution

As we can see, the use cases for IoT in agriculture are endless. There are many ways smart devices can help you increase your farm's performance and revenue. However, agriculture IoT apps development is no easy task.

There are certain challenges you need to be aware of if you are considering investing into smart farming.

1. The hardware

To build an IoT solution for agriculture, you need to choose the sensors for your device (or create a custom one). Your choice will depend on the types of information you want to collect and the purpose of your solution in general. In any case, the quality of your sensors is crucial to the success of your product: it will depend on the accuracy of the collected data and its reliability.

2. The brain

Data analytics should be at the core of every smart agriculture solution. The collected data itself will be of little help if you cannot make sense of it. Thus, you need to have powerful data analytics capabilities and apply predictive algorithms and machine learning in order to obtain actionable insights based on the collected data.

3. The maintenance

Maintenance of your hardware is a challenge that is of primary importance for IoT products in agriculture, as the sensors are typically used in the field and can be easily damaged. Thus, you need to make sure your hardware is durable and easy to maintain. Otherwise you will need to replace your sensors more often than you would like.

4. The mobility

Smart farming applications should be tailored for use in the field. A business owner or farm manager should be able to access the information on site or remotely via a smartphone or desktop computer.

Plus, each connected device should be autonomous and have enough wireless range to communicate with the other devices and send data to the central server.

5. The infrastructure

To ensure that your smart farming application performs well (and to make sure it can handle the data load), you need a solid internal infrastructure.

Furthermore, your internal systems have to be secure. Failing to properly secure your system only increases the likeliness of someone breaking into it, stealing your data or even taking control of your autonomous tractors.

6. **Connectivity**

The need to transmit data between many agricultural facilities still poses a challenge for the adoption of smart farming. Needless to say, the connection between these facilities should be reliable enough to withstand bad weather conditions and to ensure non-disruptive operations. Today, IoT devices still use varying connection protocols, although the efforts to develop unified standards in this area are currently underway. The advent of 5G and technologies like space-based Internet will, hopefully, help find a solution to this problem.

7. **Data collection frequency**

Because of the high variety of data types in the agricultural industry, ensuring the optimal data collection frequency can be problematic. The data from field-based, aerial and environmental sensors, apps, machinery, and equipment, as well as processed analytical data, can be a subject of restriction and regulations. Today, the safe and timely delivery, and sharing of this data is one of the current smart farming challenges.

8. **Data security in the agriculture industry**

Precision agriculture and IoT technology imply working with large sets of data, which increases the number of potential security loopholes that perpetrators can use for data theft and hacking attacks. Unfortunately, data security in agriculture is still, to a large extent, an unfamiliar concept. Many farms, for example, use drones that transmit data to farm machinery. This machinery connects to the Internet but has little to zero security protection, such as user passwords or remote access authentications.

Some of the basic IoT security recommendations include monitoring data traffic, using encryption methods to protect sensitive data, leveraging AI-based security tools to detect traces of suspicious activity in real-time, and storing data in the blockchain to ensure its integrity. To fully benefit from IoT, farmers will have to get familiar with the data security concept, set up internal security policies, and adhere to them.

Conclusion:

IOT leverages farmers to get connected to his farm from anywhere and anytime. Wireless sensor networks are used for monitoring the farm conditions and micro controllers are used to control and automate the farm processes. To view remotely the conditions in the form of image and video, wireless cameras have been used. A smart phone empowers farmer to keep updated with the ongoing conditions of his agricultural land using IOT at any time and any part of the world. IOT technology can reduce the cost and enhance the productivity of traditional farming.

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Health and Environment Effects of Air Pollution

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Introduction:

Pollution is now a common place term. That our ears are attuned to. We hear about the various forms of pollution and read about it through the mass media. Air pollution is one such form that refers to the contamination of the air, irrespective of indoors or outside. A physical, biological or chemical alteration to the air in the atmosphere can be termed as pollution. It occurs when any harmful gases, dust, smoke enters into the atmosphere and makes it difficult for plants, animals and humans to survive as the air becomes dirty. Air pollution can further be classified into two sections- Visible air pollution and invisible air pollution. Another way of looking at Air pollution could be any substance that holds the potential to hinder the atmosphere or the well being of the living beings surviving in it. The sustainment of all things living is due to a combination of gases that collectively form the atmosphere: the imbalance caused by the increase or decrease of the percentage of these gases can be harmful for survival.

Causes of Air pollution

1. **Traffic (Burning of Fossil Fuels):** Sulfur dioxide emitted from the combustion of fossil fuels like coal, petroleum and other factory combustibles is one the major cause of air pollution. Pollution emitting from vehicles including trucks, jeeps, cars, trains, airplanes cause immense amount of pollution. We rely on them to fulfill our daily basic needs of transportation. But, there overuse is killing our environment as dangerous gases are polluting the environment. Carbon Monoxide caused by improper or incomplete combustion and generally emitted from vehicles is another major pollutant along with Nitrogen Oxides, that is produced from both natural and man made processes.

2. Agricultural activities: Ammonia is a very common by product from agriculture related activities and is one of the most hazardous gases in the atmosphere. Use of insecticides, pesticides and fertilizers in agricultural activities has grown quite a lot. They emit harmful chemicals into the air and can also cause water pollution.

3. Exhaust from factories and industries: Manufacturing industries release large amount of carbon monoxide, hydrocarbons, organic compounds, and chemicals into the air thereby depleting the quality of air. Manufacturing industries can be found at every corner of the earth and there is no area that has not been affected by it. Petroleum refineries also release hydrocarbons and various other chemicals that pollute the air and also cause land pollution.

4. Mining operations: Mining is a process wherein minerals below the earth are extracted using large equipments. During the process dust and chemicals are released in the air causing massive air pollution. This is one of the reason which is responsible for the deteriorating health conditions of workers and nearby residents.

5. Indoor air pollution: Household cleaning products, painting supplies emit toxic chemicals in the air and cause air pollution. Have you ever noticed that once you paint walls of your house. It creates some sort of smell which makes it literally impossible for you to breath.

Effect of Air pollution on Human health: We know air pollution is a bad thing without even thinking about it. Have you ever coughed when a truck drove past belching out its sooty exhaust? Instinctively, you cough to clear your lungs and protect your body and you might even cover your face with your handkerchief or sleeve to filter the air until it feels safe to breath deeply again. You don't have to be told that pollution like this might harm your health always see to steer clear of it: Your body takes action automatically. The only trouble is, we can't always see of smell air pollution, tell when it's affecting us, or know how it might harm us days. Months, or even years in the future. Sometimes the connection between air pollution and human health is obvious as in the Bhopal Disaster. Another notable incident happened in London. England in 1952 when thick, deadly pollution known as the Great Smog, caused by people burning coal in home fires and coal-fired power plants, killed an estimated 4000 people other times, it's much more difficult to make the link. Some estimates suggest perhaps 10-20 percent of cancers are caused by air pollution of one kind of another, but cancers can take a long time to develop and many other things can cause them too. Proving a direct link with a particular kind of air pollution (say, a garbage incinerator in your community or a neighbor who persistently burns plastic on garden bonfires) is very difficult. According or a World Health Organization (WHO), air pollution is one of the world's biggest killers; it cause around two million people to die prematurely each year. Many of these deaths happen in developing countries (over half a million in India alone), but wealthier industrial nations suffer too in the United

States, for example, around 41,000 people a year are estimated to die early because of air pollution. Imagine how much media coverage there would be it two million people (that's roughly the population of Houston, Texas or the West Midlands conurbation in England) were killed in a terrorist incident of an earthquake. Because air pollution kills quietly and relentlessly, and its finger is hard to detect on the trigger, people barely seem to notice or care. Deaths aren't the only human consequence of air pollution. For every person who dies, exposed to high levels of dust sometimes suffer years of misery before dying from illnesses such as silicosis.

Effects of Air pollution on Environment

1. Global warming: Another direct effect is the immediate alterations that the world is witnessing due to Global warming. With increased temperatures world wide, increase in sea have already signaled an impending disaster if actions for preservation and normalization aren't undertaken soon.

2. Acid Rain: Harmful gases like nitrogen oxides and sulfur oxides are released into the atmosphere during the burning of fossil fuels. When it rains, the water droplets combines with rain can cause great damage to human, animals and crops.

3. Eutrophication: Eutrophication is a condition where high amount of nitrogen present in some pollutants gets developed on sea's surface and turns itself into algae and adversely affect fish, plants and animal species. The green colored algae that is present on lakes and ponds is due to presence of this chemical only.

4. Effect on Wildlife: Just like humans, animals also face some devastating affects of air pollution. Toxic chemicals present in the air can force wildlife species to move to new place affect sea animals.

5. depletion of Ozone layer: Ozone exists in earth's stratosphere and is responsible for protecting humans from harmful ultraviolet (UV) rays. Earth's ozone layer is depleting due to the presence of chlorofluorocarbons in the atmosphere. As ozone layer will go thin, it will emit harmful rays back on earth and can cause skin and eye related problems. UV rays also have the capability to affect crops.

Solution for Air Pollution

1. Use public mode of transportation: Encourage people to use more and more public modes of transportation to reduce pollution. Also, try to make use of car pooling. If you and your colleagues come from the same locality and have same timings you can explore this option to save energy and money.

2. Conserve energy: Switch off fans and lights when you are going out. Large amount of fossil fuels are burnt to produce electricity. You can save the environment from degradation by reducing the amount of fossil fuels to be burned.

3. Understand the concept of Reuse and Recycle: Do not throw away items that are of no use to you. In-fact reuse them for some other purpose. For e.g. you can use old jars to store cereals or pulses.

4. Emphasis on clean energy resources: Clean energy technologies like solar. Wind and geothermal are on high these days. Governments of various countries have been providing grants to consumers who are interested in installing solar panels for their home. This will go a long way to curb air pollution.

5. Use energy efficient devices: CFL lights consume less electricity as against their counterparts. They live longer. Consume less electricity, lower electricity bills and also help you to reduce pollution by consuming less energy.

Several attempts are being made world wide on a personal, industrial and governmental levels to curb the intensity at which Air Pollution is rising and regain a balance as far as the proportions of the foundation gases are concerned. This is a direct attempt at slacking Global warning . We are seeing a series of innovations and experiments aimed at alternate and unconventional options to reduce pollutants. Air Pollution is one of the larger mirrors of man's follies, and a challenge we need to overcome to see a tomorrow.

Conclusion:

Environmental degradation poses a significant threat to human health worldwide. Harmful consequences of this degradation to human health are already being felt and could grow significantly worse over the next 50 years. Because environment and health are so intimately linked. So too should be environmental and health policies. However, health impacts are non-marketed and thus hard to quantify in monetary terms. The subsequent risk of being ignored in policy –making is a major concern worldwide.

1. Save energy: Making electricity in conventional power plants generates pollution, so anything you can do to save energy will help to reduce pollution (and global warming as well). Switch to low-energy lamps. Use a laptop computer instead of a desktop. dry your clothes outdoors. And heat insulate you home. Sounds too worthy? Just remember this: every bit of energy you save also saves your money you can spend

on something better! If you're not sure how you're wasting energy. Use an electricity monitor to help identify your most inefficient appliances.

2. Save water when you can: Producing cool, clean water needs huge amounts of energy so cutting water waste is another good way to save energy and pollution. 3. Cut the car: Sometimes we have to use cars. But often we can get a bus or a train or (for shorter distances) walk or cycle. Cars are now the biggest source of air pollution in most urban areas, so traveling some other way through a town or city helps to keep the air clean. When you have to use your car, drive efficiently to save fuel and money, and cut pollution. It's particularly important to avoid car use when smog is bad in your city.

4. Cut out garden bonfires: Did you know that a garden bonfire can contain up to 350 times having a bonfire is one of the most selfish things you can do in your local neighborhood. Compost your garden refuse, bury it, or dispose of it some other way.

5. Never burn household waste: If you burn plastic, you release horrible toxic chemicals into the local environment, some of which will be sucked up your own nose! Recycle your trash instead.

6. Garden organically: Would you spray pesticides on your dinner? So why spray them on your garden? You can tackle virtually all garden pests and diseases in more environmentally friendly organic ways. Buying organic food is a good option is you can't grow your own.

7. Cut the chemicals: Do you really need to spray an air freshener to make your home feel nice? Yes, you fill your room with perfume but you're also choking it with chemical pollution. Why not just open a window instead? How many of the chemicals you buy do you really need to use? Why not try cleaning with microfiber cloths instead of using detergents?

8. Use water-based paints and glues: Avoid the nasty solvents in paints, varnishes, and wood preservatives. Remember that of anyone's going to suffer from the air pollution they create, you're first inline.

9. Reduce, reuse, and recycle: Buying new stuff is run, but reusing old things can be just as good 10. Don't smoke: Cigarettes contain an addictive chemical called nicotine that makes you want to go on smoking them. They cause all kinds of health problems, but they also cause very localized air pollution.

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Spatial Distribution of Market Centers in Latur District: A Geographical Study

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Abstract:

Marketing geography describes the various facts of retailing as aspect of geography which is concerned with territory economic activities and especially the distributive trades. The distribution of market centers is influenced by different physical and cultural factors. rural economy market plays a vital role in the interactions and exchanging the local products through certain norms where 'system of rural market serves as the nodal points for the collection and distribution of large range of goods and services of both local and external origin' Therefore attempt is made here to analyze spatial distribution of market centers in Latur District. The paper is based on secondary data. To analyze spatial distribution of market centers Statisticl techniques i.e. mean and Standard Devivation has been utilized. The study reveals that there is great influence of geographical factors on distribution of market centers in Yevatmal District.

Key Words: Spatial Distribution, Market centers.

Introduction:

"Marketing geography describes the various facts of retailing as aspect of geography which is concerned with territory economic activities and especially the distributive trades" (Davies, 1976).

Geographers are mainly concerned with the spatial distribution of geographical phenomena. The distribution of market centers is influenced by different physical and cultural factors. Each factor has its own influence and affects directly or indirectly on the distribution of market centers (Pawar & Lokhande 2000). There is a great variation also in the distribution of market centers at tahsil level e.g. there are 15 market centers in Nilanga tahsil while they are only 02 market Centers in Jalkot tahsils. The correlation between number of market centers and area, inhabited villages and population etc. may give a more realistic picture (Gharpure & Pawar, 1919).

Objectives:

The main objective of the present study is to analyze the spatial distribution of Market centers in Latur district.

Data Base and Methodology:

The present research work of spatial distribution market centers has been based secondary data. To fulfill the objective the data regarding number of markets area has been collected from socio-economic reviews and district statistical abstract of Latur district for the year of 2001.

After collection of the data, the data is processed to analyze spatial distribution of market centers the density of market center per 100 km^2 the markets per 100 habitation villages and markets per 10,000 population has been calculated then on the basis of mean and standard deviation the tahsils of Latur district are grouped into four categories on the basis of these statistical techniques the conclusions are drawn.

Study Area:

The Latur district is located South-western part of Marathwada of Maharashtra state. The absolute location of district is 17°52' to 18°50' north latitude and 76°12' to 77°18' east longitudes. The total geographical area of district is 7157 square kilometers,which constitutes 2.32 per cent of the total area of the Maharashtra state. The district has hot and dry climate with average annual rainfall is 650 MM., as per 2001 Census, Latur district has 20, 80,285 population.For administrative purpose the district is divided into 10 tahsils. The percentage of cultivation and agricultural labours is 54.5 and 27.6 to total workers indicates that agricultural is the main occupation of the district.

Discussion

Tahsil-wise market centers:

The District as a whole has 70 Market centers in 2010, but spatial distribution of market centers various from tahsil to tahsil on the basis of mean and standard deviation the tahsil of Latur District is categorized into four categories.

Tahsils of low number of market centers:

The tahsils which have numbers of market centers below mean minus1 standard deviation are included in this category. The table indicates that low number of market centers are recorded in Jalkot Shirur anantpal and Udgir tahsils in 2010, due to the rugged topography and forested area which resulted into lower development of transportation and low agricultural production.

Table-1: Distributional Of Market Centers in Latur district (2010)

Latur	11	999	1.10
Renapur	05	552	0.90
Ahmedpur	06	783	0.76
Jalkot	02	347	0.58
Chakur	09	668	1.35
Shirur-Anantpal	03	330	0.90
Ausa	10	1263	0.79
Nilanga	15	1050	1.43
Deoni	05	396	1.26
Udgir	04	769	0.52
District	**70**	**7457**	**0.98**
Mean	**7.0**	**--**	**0.96**
SD	**2.30**	**--**	**0.29**

Source: *- Compiled By Researcher On The Basis Of Socio Economic Review & District Statistical Abstract Of Latur District 2010.*

Tahsils of medium number of market centers:

The Tahsils which have numbers of market centers in between above mean minus1Standard deviation to mean are included in this category. The moderate numbers of market centers are recorded in Deoni, Renapur, and Ahmedpur tahsils in 2010.

Tahsils of high number of market centers:

The tahsils which have numbers of market centers above mean to mean plus1standard deviation are included in this category. The table exhibits that high number of market centers are found in Ausa, and Latur

Tahsils of very high number of Market centers:

Tahsils which have numbers of market centers above mean plus 1 standard deviation are included in this category. The very high number of market centers are found in the tahsils of Nilang manly because of these are located in Manjara basin, where fertile soil is available; furthermore these tahsils having high rainfall, both these high rainfall and fertile soils resulted into high agricultural productivity, high density of population and high Accessibility.

Density of market centers:

The number of market centers not gives clear idea of spatial distribution therefore attempt is made here to present tahsil- wise density of market centers on the basis of mean and standard deviation. The tahsils of Latur District are divided into four category i.e. tahsil of low, medium, high and very high density.

Tahsil of low density:

The tahsils having density of market centers below mean minus 1 standard deviation (below 0.52- per 100 sq. km) are included in this category. The table indicates that there is only one tahsil in Latur District, which having low density and it is Udgir tahsil because it is situated in Satmala range where topography is very rugged.

Tahsils of Medium density:

The tahsils which having density of market centers above mean minus1 standard deviation to mean (0.53 to 0.98) are included in this category. The table exhibits that medium density is recorded in Jalkot, Shirur Anantpal, Ahmedpur and Ausa tahsils.

Tahsils of high density:

The tahsils which having density of market centers above mean to mean plus 1 standard deviation (0.99 to 1.26 per 100sqkm) are included in this category. The table indicates that high density of market centers per 100 square killometers is recorded in Deoni and Latur tahsils because these tahsils are situated in plain with fertile soil.

Tahsils of very high density:

The Tahsils having density above mean plus 1 standard deviation (above 1.27) are included in this category. The table indicates that very high density of market centers are found in Chakur and Nilanga tahsils because these tahsils are situated along the bank of Manjara river and having very fertile soil and high rainfall such Phygiography and climatic conditions are favorable to agricultural production as well as development of transportation.

Conclusion:

The above discussion indicates that there is great influence of geographical factors on distribution of market centers in Latur District. low number of market centers in Udgir tahsils is a result of rugged topography area. While very high number of market centers in Nilanga manly due to their location in Manjara basin leads to high agricultural productivity, development of transportation.

Low density of market centers only in Udgir tahsil is mainly due to adverse topography. high density of market centers in Nilanga and Chakur tahsils and very high density of market centers in Soil condition which leads to transportation development and high agricultural productivity.

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CHALLENGES AND MARKETING STRATEGIES FOR MSMES

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Abstract
In the period of globalization advertising turns out to be always significant. To accomplish feasible development in market firms attempting to turn out to be more worldwide which initiates extreme contest for MSMEs. They need to contend global players in homegrown market. There are different factors like abilities inclination and information important to contend viably. The absence of framework, coordination and promoting support are among the fundamental difficulties looked by little and medium endeavors, Most MSMEs units get into the powerless or wiped-out mode inside the initial 16 months of activity. In this paper we have made and endeavor to celebrate the difficulties and advertising procedures for MSMEs, likewise we attempted to foster some inventive showcasing techniques to conquer the difficulties.

Keywords: - marketing challenges, Strategies, skills and knowledge.

Introduction: Small industry has been one of the significant boards of India's financial improvement system since Independence. India agreed high need to Micro, Small and Medium ventures (MSMEs) from the earliest starting point and sought-after help arrangements to make these endeavors suitable and lively and over the long run, these have become significant supporters of the GDP. In spite of various security and strategy measures for the past such countless years, MSMEs have remained generally little, mechanically in reverse and ailing in seriousness. The launch of the Indian economy in 1991 added issues to the MSMEs. Toward the start, limited scope endeavors thought that it is hard to endure. Somewhat recently, the financial climate has changed for MSMEs. In this unique situation, re-investigate the essential issues of MSMEs, past, present and future possibilities, particularly in the strategy structure.

In the Indian context, we have not really far characterized medium endeavors plainly. What is neither little nor enormous is as a rule inexactly characterized as medium. Further, undertaking incorporates organizations, administrations and ventures. In the broadband of 'Small', the conversation stretches out to medium too. One more conceivable implication for the MSMEs is the small assembling ventures.

Role Of Msmes In Economy

Because of quick creating current innovations and creation scales, the little and medium endeavors have become exceptionally basic for monetary development. This area is currently vital for those countries whose want is to be prosperous as it is the beginning stage of mechanical turn of events. Huge Scale Enterprises (LSEs) of today were MSMEs previously and MSMEs of today would be LSEs of tomorrow. This standard holds useful for all nations of the world.

Importance Of MSMEs

MSMEs are considered the engine of economic growth in both developed and developing countries as they:

- Provides minimal expense work since the unit cost of people utilized is lower for MSMEs than for huge measured units.
- Assists in territorial and nearby improvement since MSMEs speed up country industrialization by connecting it with more coordinated metropolitan area.
- Help accomplish reasonable and evenhanded circulation of abundance by territorial scattering of financial exercises.
- Contribute fundamentally to trade incomes due to the minimal expense work serious nature of its items.
- Have a beneficial outcome on the exchange balance since MSMEs for the most part utilize native crude materials, lessening reliance on imported apparatus, crude material or work.
- Assist in encouraging self-improvement and innovative culture by uniting abilities and capital through different loaning and expertise upgrade plans.
- Impart the versatility to withstand monetary disturbances and keep a sensible development rate since being native is simply the way to supportability and adequacy.
- Firms with deals under $1 million burn through 2x - 3x more on R&D per $ of deals than the normal. What's more, result is MSMEs' delivering 55% a bigger number of advancements than LSEs'.
- Converts the crude material inside the country into semi-completed things and later pass it on the LSEs that have capital, expertise and gear to measure these into completed products.
- Provide country individuals a chance for money age and self-improvement since they can work at home. This assists with accomplishing reasonable and impartial conveyance of abundance by making cross country non-oppressive open positions.

- Attracts direct unfamiliar speculation since multinationals and large combinations have begun to re-appropriate from nations with solid MSME areas. The low work cost makes creation of semi completed merchandise extremely practical for enormous concerns working in global business sectors.
- The MSMEs go about as motors through which the development destinations of non-industrial nations can be accomplished.

Advantages Of MSMEs

The benefits of MSMEs in an economy, be it work concentrated or in any case are complex. Hence, the advancement of little and medium ventures in any nation affects the reasonable and dynamic development of a country. It has various benefits over huge scope businesses. A portion of these is referenced beneath:

- It creates more positions per unit of capital and is more capital productive.
- Similarly, it is additionally emphatically incorporated into the homegrown economy.
- Small ventures utilize a high level of nearby crude materials. The greater part of nearby consumable items is created by limited scope ventures. It taps the assets at the grass root levels.
- The advancement of small and medium enterprises actuates fast development of enormous scope producing over the long haul.
- It likewise creates less expensive labor and products to everybody which endeavors to break the pattern of the steadily expanding value climbs. The expanded business and the merchandise/administrations delivered has a positive outcome on the GNP of a country. This turns into an impetus in breaking the destitution cycle.
- The independent companies are amazingly adaptable on the grounds that they work close to the client, consequently it can adjust as indicated by the always changing requirements of the client.

Challenges Of Small And Medium Scale Enterprises In India

In the current monetary lull MSME area has been hit exceptionally hard because of raising loan fees and monetary crunch. The little size and limit of the organizations and their absence of mindfulness have reared numerous impediments to their development, for example, Under-usage of limit, Inadequate and inauspicious credit streams, Inability in innovation up degree, Insufficient crude material acquisition Inability to advertise completed products and Ineffective checking and criticism component. The issue which keeps on being a major obstacle for the advancement of the area is the absence of admittance to opportune and satisfactory credit.

Expanding rivalry and globalization, alongside the need to create quality items, best case scenario, costs, have provoked the business to present new item advancement techniques with current innovation. The need to advance mechanically predominant strategies for item improvement remains constant, particularly for players in the MSME section. The little and medium venture area is broadly viewed as the driving force of the Indian economy. Little and medium undertakings (MSME) add to the mechanical, monetary, innovative and territorial advancement in completely created and non-industrial nations. The Indian MSME market is esteemed at $5 million. The 11 million MSME units, which make up the Indian MSME area. Produce more than 8000 items. These establish 95 % of every modern unit and contribute 40% to mechanical yield. The MSME area likewise assumes a critical part in the advancement of pioneering abilities and structures a significant piece of the nation's fare profit.

The commitment of MSME's in the mechanical advancement of the nation has been striking. At the state level, the public authority plays had the significant impact in guaranteeing development by building up different establishments to help this area. Which incorporate little industry Development Corporations (SIDC) and a few Centers for Entrepreneurship Development (CEDs). There are many organizations that presently support MSMEs at the public level. These incorporate the National Research Development Corporation (NRDC) and the Bureau of Indian Standards (BIS).

Notwithstanding, since the mid 1990's Indian MSMEs have been presented to extraordinary Competition because of expanding globalization. This has made endurance and development of this area troublesome.

Infrastructure Development

The quality of the infrastructure affects the growth prospects of MSMEs to a great extent, especially in a developing country like India. Here, 77% of the population lives in villages. Many rural areas still suffer due to the deplorable state of basic infrastructure like transport, telecommunications and electricity. The integration of rural industries with mainstream industries is proving to be difficult for these reasons. This has been identified as a key deterrent to the growth of MSME clusters in rural areas.

Technologically Handicapped

Innovation assumes a critical part in the advancement of MSMEs. Innovation helps in developing a multipronged methodology as well as in augmenting business openings for these undertakings. Advancements for MSMEs should target fueling development and business spryness. They ought to be not difficult to incorporate with existing frameworks and cycles, and help in utilizing impart and data the executives. Today, most MSMEs in provincial regions embrace fabricating utilizing old strategies and obsolete innovation. In any case, today, the opposition is wild, dissimilar to before, when purchasers were just anticipated buying the best items at the most reduced costs. There are extra difficulties to be met. The deluge of minimal expense items from china has made it significantly harder for Indian producers to contend exclusively on the value front. China is viewed as the world's assembling lawn, because of its low assembling and work costs when contrasted with those in India.

Forthcoming Market Trends And Information

One of the components restricting the development of MSMEs is the absence of satisfactory data. When MSMEs start the business, they might be keen on thinking about the providers of explicit hardware that suit their necessities, specialized data and market patterns for their items. This data is once in a while accessible at the grassroots level.

New Product Development

The MSME market requires a solid new item improvement base. In India, most MSMEs work on the plans given to them by homegrown or unfamiliar purchasers. There is next to no advancement in item plan improvement, and surprisingly the innovation utilized by the MSMEs in India is outdated. This has direct ramifications on the overall revenues, and a plunge in efficiency levels. The utilization of customary instruments, old procedures, helpless work usefulness, they have not been utilized generally, bringing about no considerable impact on the yield.

Promoting Problems

The idea of advertising is truly changing so does the issues related with the showcasing. The Indian MSMEs are confronting a ton of issues identified with showcasing in the public and global fields. This is primarily because of the way that these associations have a place with rustic or semi metropolitan regions where the assets are effectively accessible to them and modest work is related with. Yet, with regards to selling of these items the MSMEs need to confront a trouble in making an impression and mindfulness in the personalities of metropolitan and other likely purchasers about the quality and related parts of their items and administrations.

The Way Ahead

There is a solid need to discover approaches to oversee current innovation and work market requirements, which obstruct the usefulness of MSMEs. Strategy creators and exploration establishments have over and again called attention to the requirement for broad examination on the MSME area.

What these MSMEs need today is information and admittance to new innovation, sufficient monetary guide, significant degrees of R&D and versatility to the changing patterns in their individual businesses.

With the expanding rivalry, globalization and the vulnerability because of the worldwide slump, MSMEs should constantly fuse the most recent innovation into their creation measures just as in their showcasing and the executives' capacities, to reduce expenses, acquire proficiency and consistency. This will assist them with becoming fruitful, and add to the Indian economy over the long haul. Generally speaking, the little business area has performed well, and has empowered the nation to accomplish extensive mechanical development and broadening.

Conclusion

There is a phenomenal significance of Small and medium Enterprises in the country. This is on the grounds that the quantity of units is greatest in the country. This area, contributes a significant sum in the turn of events and work. This area accomplishes crafted by giving work to minorities, in reverse class individuals and furthermore to ladies. This area is overflowing with issues like lack of power and advancement of fundamental foundation alongside the issues identified with market. To tackle these issues and foster the MSME area, significant endeavors have been done in the 11th arrangement. Anyway, these endeavors are sufficiently not. For the improvement of rustic and ranch bunch, various divisions ought to be shaped. Essentially, in the improvement of mechanical service for metropolitan Micro and Small and Medium Industries explicit endeavors ought to be finished. MSMEs consistently addressed the model of financial arrangements of Government of India which stressed sensible utilization of unfamiliar trade for import of capital merchandise and sources of info; work serious method of creation; business age; no concentration of dispersion of monetary force in the possession of few (as on account of large houses); debilitating monopolistic acts of creation and advertising; lastly powerful commitment to unfamiliar trade procuring of

the country with low import-escalated tasks. MSMEs are the development motor of the economy and assist with supporting different areas like administrations.

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A Study of Farmers' suicide: Psychological Perspectives Approaches in Maharashtra

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Abstract
Background: Almost 90% of persons who commit or attempt suicide have a diagnosable mental disturbance. Farmers are an occupational category with high suicide risk and their risk is sort of that of the non-farming population. But there's no conclusive evidence on whether farmers have more psychiatric morbidity than the overall population. Are other causes also thanks to the increased suicide risk of farmers? Since research data about this is often often inconclusive, we decided to match the research approaches and findings on farmers' suicide conducted by mental state professionals thereupon of other professionals.
Methods: a scientific search of published literature on farmers' suicide for a period of 10 years from 2010 to 2020 was conducted using the electronic databases, Pub Med and Google Scholar, using the keywords "farmers' suicide".
Results: 30 articles were retrieved through Pub Med search and 10000 articles through Google scholar search. Pub Med retrieved and Google Scholar retrieved articles were then compared keeping Maharashtra India as reference points.
Conclusions: Comprehensive studies on farmers' suicide, analyzing the various perspectives and causes, objectively and concurrently were lacking, especially from Maharashtra. There have been no studies from Maharashtra about interventions or their impact on farmers' suicide. A segmented approach into farmers' suicide research has its limitations. Novel methodologies incorporating diverse perspectives is required from Maharashtra for better understanding of the enigma of farmers' suicide, so as that steps are often taken to affect such a public health and social issue. Keywords: Maharashtra, Farmer, Suicide

Introduction

Worldwide, suicide is among the three leading causes of death among those aged 15-44 years and thus the second leading cause within the 10-24 years age group. Per annum a few million people die from suicide; giving a "global" death rate of 16 per 100,000. Mental disease may be a well-researched risk factor for suicide. Farmers are an occupational category with high suicide risk. Though farming is taken into account as a peaceful and healthy way of life, agriculture has the very best rates of mortality in any industry. In some farming communities, suicide rates are reportedly above the overall population. Nevertheless, data from the extant literature is inconclusive on whether psychological state problems are over represented during this communities.1 during a study of suicides among farmers in Maharashtra, multifactorial causation was the finding. There have been more mental disorders in farmers but only common mental disorders, during a backdrop of history of alcoholism, alcohol use and psychosocial issues like marital, family problems and economic hardships. Depression and alcohol dependence syndrome (ADS) was significantly more in victims than in controls.2 Are the increased rates of farmers' suicide due to an increased prevalence of mental disorders in them or are there other causes attributable? Since there is no conclusive evidence about this, we decided to compare the research approaches and findings on farmers' suicide conducted by mental health professionals with that of other professionals.

Methods

A systematic search of published literature on farmers' suicide for a period of 10 years from the year 2011 to 2020 was conducted. Two electronic data bases, Pub Med covering articles from medical field and Google Scholar covering articles from all fields (medical and nonmedical) were searched from January 1, 2011 to December 30, 2020 with the keywords "farmers' suicide". The Pub Med search picked up 30 articles. The abstracts and full text articles from Pub Med were studied. Of the 30 articles retrieved, 10 were specifically about suicides of farmers. Four were from Maharashtra India .Studies from Maharashtra India were selected and studied. Maharashtra India were chosen based on the availability of large Pub Med data on farmers' suicide from Maharashtra .Besides Maharashtra are traditionally agriculture oriented and the suicide rates of farmers in the Maharashtra are high. 100 hits from Maharashtra. Out of these, we selected the first ten articles different district from Maharashtra, as sorted "by relevance". Google Scholar sorts articles based on 'relevance' (i.e. the most frequently cited articles) or by 'date' and we decided to sort articles "by relevance". From the articles thus selected, we excluded those articles already obtained from Pub Med search. These 'Google scholar only' articles were then compared with the Pub Med retrieved articles, keeping Maharashtra as reference points. We adopted this approach in order to compare the research on farmers' suicide between that of the medical and non-medical personnel.

Results

The studies were conducted by professionals from mental health and public health. The studies from Maharashtra explored the role of climatic factors in the causation of farmers' suicide. The climatic factors especially drought as a precipitating factor and their implications were studied. One of these articles explored the role of protective support systems and one study emphasized the inequitable gender relations contributing to suicide. Two of the Pub med retrieved Indian studies were from Maharashtra state. There was also one narrative review. There were no intervention studies. One of the qualitative studies from Maharashtra on farmers' perceived reasons for suicide, cited multifactorial reasons involving economic, environmental, social and political.3 Another study was done by psychological autopsy method, which pointed to financial indebtedness and other economic issues as the important triggers to suicide. Of the 17 Google scholar retrieved Indian articles, majority were by economists and sociologists. Their emphasis was purely on financial indebtedness, fall in economic position, globalization, debt trap and pressure from local money lenders, impact of green revolution, crop failure and faulty government policies including ex gratia payment and the faulty way of spending by the farmers. The studies from India found economic crises and government policies as detrimental. Modern farming methods involving excessive use of chemicals caused environmental degradation and low fertility of the soil. The use of genetically modifiable (GM) seeds which require use of chemical fertilizers had compounded to the problem. Genetically modified seeds caused repeated crop failure due to loss of land biodiversity. The ensuing high cost of cultivation ultimately led to debt trap and suicide. Government policies related to market prices, debt trap by private money lenders were also significant issues. The government's failure to implement policies for the welfare of the poor small farmers was also significant. Providing relief to families of deceased farmers had led to paradoxical effect. Farmers committed suicide to enable financial assistance to the families.4 Google scholar literature review from Maharashtra yielded only one monograph. The common articles which were also there in Pub Med were excluded. The study was conducted by public health and labor studies personnel. While firearm use was the most common method of suicide in Maharashtra, pesticide use was the common method in India pointing to a link between accessibility and suicide attempt.

Discussion

When research on farmers' suicide of Maharashtra, certain interesting findings emerged. In Maharashtra there was a schism in research approach. Pub Med articles were by professionals from mental and public health. Humanities' stream had abundant literature focusing on the economic and political factors paving the way for farmers' suicides. The mental health aspects were not taken into consideration. The qualitative and verbal psychological autopsy studies from Maharashtra also reported economic factors and crop failure as causes. There were no methodologically robust studies from Maharashtra. We did not come across personnel from medical and non-medical streams conjointly involving in research regarding farmers' suicide in Maharashtra. Suicide should not be reduced to a mental health issue solely. A comprehensive approach to suicide would also reduce stigma, which is one of the factors which prevent people from disclosing and seeking help.5,6 On the other hand farmer's suicide should not be seen as a mere socioeconomic and political issue. There were no intervention studies from Maharashtra. There is some evidence on the low rate of psychiatric morbidity in farmers as compared to the general population.7,8,9,10 Therefore do farmers have a low threshold of vulnerability to suicide? The complex intertwining of the biological and the psychosocial issues have to be explored together to generate novel hypothesis which could provide effective solutions. Innovative methodologies in research, incorporating heterogeneous aspects should be evolved to address the problem of farmers' suicide which would generate effective solutions.

Limitations we had selected the literature only of the time period of 10 years from 2011 to 2020. Only a selective study of the literature of that period was done.

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Role of Small Scale & Cottage Industries in the Economic Growth of Indian Economy

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Abstract

In Indian economy small-scale and cottage industries occupy an important place, because of their employment potential and their contribution to total industrial output and exports. The Government of India is focusing on Startup and Make in India. But Make in India and Startup India is not possible without contribution from SMEs of India. It is non-debatable question that SMEs increase the social justice by distribution of wealth among large numbers of people. It also creates more local employment than big entities. The SMEs, by number, dominate the world business stage. There is no debate on the importance and contribution of SMEs in the economic development of any country. The last census of the SMEs in India was 4th censes of SMEs held in the year 2006-07. The precise and up -to date data on SMEs are difficult to obtain due to scattered and unorganized sector.

Keywords: Small Scale Industry, cottage industry, Industrial Policy, Development, Rural Employment.

Introduction

History shows that the industrialization is the engine of economic development of a country. The highly developed countries of the West like, U.S.A., Britain, Australia, New Zealand, and also Japan and China in Asia are the great example. It cannot be denied that small scale enterprises play a significant role in nation's economy. In manufacturing sector, small scale enterprises are those which have plants value between twenty five lakh rupees to five crore, while in services sector it refers whose enterprises which have more than ten lakh rupees but does not exceed two crore rupees. These industries have inherited artistic skills and local technologies. Small scale enterprises provide vast economic opportunities to theunderprivileged sections of the society, the poor, the middle class etc. through employment and income generating. These units are boon especially for low income and technologically backward districts. Generally, a small enterprise produces unique products and services however producers have to face various obstacles to compete with large producers of organized sector. At times, productions of such goods involve the traditional artisans and skilled craftsmen who learn the art of production formfrom their ancestors. Their goods produced by these units include dress fabrics suchas khadi, wool, muslin, leather, silk, cotton etc, & many precious items like jewellery, ornaments, statues, idols, gems, stones, etc. and also edible items like spices, oils, honey, and these goods have huge demand in Indian as well as foreign markets. Small scale and cottage industry is back bone of Indian economy due to its employment generation ability and high share in export and secondary sector output. Therefore government had taken several measures to promote these industries. Due to reduction in the trade barriers, Indian small and cottage industry has gone through a very tough internal and external competition. Many time small scale industry and cottage industry are used interchangeably. However, general perception is that cottage industry are small family based business run by the family members only while in SSI hired labour involved in the production process. These both kinds of industry the generally agricultural based and running their business operations in rural areas.Therefore they are important source of livelihood in rural areas.

REVIEW OF LITERATURE

Cherunilm (1982) in his research article states that the village and small industries with their low capital output ratio and high employment potential as well as high export potential of their products occupied a very important place in the Indianeconomy.

Das and Sirajuddin (1991) In their evaluation of report found that there is a need to take effective measures to expedite the growth of khadi and Village industries andalso for the all-round development of this sector. A committee was constituted under the chairmanship of the Prime Minister of India which proposed an action plan for the development of Khadi and Village Industries

Khan and Fatima (2017) find out the issue faced by micro entrepreneur in public andprivate banking and suggest policy measures. They have done a primary survey of 80

micro enterprises. To find out the significant difference ANOVA was used. Results showed that terms and condition about banking product would not tell to customers. Micro enterprises was facing collateral problem in getting credit, and this issue was severe for customers of private bank. According to entrepreneurs behavior of public sector bank employee was not good, they demand bribe for sectioning the loan. Micro entrepreneurs told that their problems are not solved in single visit. Private Banks change the rate of interest with prior information. Authors suggested that publicsectors bank staff should be provided a proper training, Policies should make to reduce the collateral problem because micro entrepreneur are not much well off to provide collateral, there should be liberal rule for them.

Objectives Of The Study

The primarily aim of this study is to examining over the year changes in small scale enterprises and analyze the business environment for the export of products from small scale enterprises. Specific objectives are as follows:

1. To analyze the policy changes to strengthen the small scale and cottageenterprises over the years.
2. To analyze the internal business environment of small scale enterprises exportunits.
3. To analyze the performance of small scale and cottage industries in India.
4. To suggest the growth strategies for export units of small scale enterprises.

Role of small scale and cottage industries

1. Industrial Policy for Small Scale Industry in India

The prestige of handicrafts began from the end of the eighteenth century and the decline became very marked about the middle of the nineteenth century. First time in India, industrial policy was made for Khadi production in 1920. The purpose was mainly boycotting the foreign goods in general and cloths in particular. In December 1923, all India Khadi Board was established. The visionary personality behind the creation of this board was Mahatma Gandhi.

In order to provide an organized direction to industrialization, the Government of India announce first Industrial policy resolution in 1948. Industrial Policy Resolution 1948 gave stress on the important role of the SSIs in economic growth of India. When the first five-year plan, was formulated, Small Scale Sector (SSS) primarily comprised cottage and village industries.

2. Employment Opportunities in Small Scale Enterprises

SSI offer vast employment prospects to the rural masses. Small scale enterprises particularly cottage industries occupy a central place in rural development programmes. Small scale enterprises promote creative appetite among individuals as well as promote their entrepreneurial and technical skills. The declining in living standard in rural population can be partly attributed todiminishing opportunities employment in rural areas. The small scale enterprises have come out as a potential sector to provide employment in backward rural areas over the time.

3. Various Famous Small scale enterprises Industries in India

Small scale enterprises are classified into traditional and modern enterprises. Khadi, handloom, handicrafts and coir are traditional enterprises. Many of these industries require labours with artistic skills and skilled craftsmanship. These traits generally flow from father to son that are often handed down in a family from father to son. These industries are labor intensive and do not require sophisticated machinery. In contrast, modern industries require machinery and heavy capital.

4. Present Condition of Small Scale Enterprises

The Indian Small scale enterprises mostly unorganized. These types of industries have origin in villages here underemployment and unemployment is common. The medium and large scale industries which are high capital intensive pose a major risk to SSEs. Indian SSE industries face number of challenges. The village artisans are mostly uneducated and poor. The artisans use outdated modes of production techniques. But of late with the increase in education and awareness, they are now shifting to more improved methods. Government provides held to these enterprises by organizing the training facilities. Other obstacles in the development of SSEs are supply of raw material and finish goods marketing at low prices. The raw materialcost in rural areas is comparatively high in remote villages and unavailability of organized marketing channels creates hurdles in production.

Conclusion

History shows that the economic development of a country is brought about byindustrialization. Small scale enterprises are specifically suited for the efficient utilization of local resources and to achieve self-sufficiency with respect to certain types of essential consumer goods like food, handicraft items cloth and agricultural implements. A number of factors play a vital role in expansion of small-scale industries. Present study aims at analyzing the performance small scale industries, asit would guide the policy makers to understand external and internal business environment of SSIs export.

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Study the effect of aqueous leaf extract of Adulsa *(Adathoda zeylanica L.)* on growth of *Macrophomina Phaseolina Fungus by using different concentrations*

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Abstract:

Macrophomina phaseolina (Tassi) Goid is a soil borne fungus causes root rot diseases to Sarpagandha (*Rauwolfia serpentina*). The fungus infects the root and lower stem of over 500 plant species and is widely distributed in the United States (Wyllie, 1988). The efficacy of *Adathoda zeylanica* aqueous leaf extract against growth of *Macrophomina phaseolina* was studied by using aqueous leaf extract of Adulsa at different concentrations i.e., 1.00, 2.00, 3.00, 4.00, 5.00, 6.00, 7.00, 8.00, 9.00 and 10.00 % for their antifungal efficacy.

Key words- *Macrophomina phaseolina*, Sarpagandha, *Adathoda zeylanica, aqueous etc.*

Materials and Methods:

Preparation of aqueous plant part extracts:

Healthy fresh leaves of Adulsa plant were collected from local region. These collected leaves, washed thoroughly with fresh water and finally rinsed with sterile distilled water.

Fifty gram leaves of Adulsa plant were cut into small pieces and grinded in a grinder by adding 50 ml sterile distilled water. Extracts thus, obtained were filtered through double layered muslin cloth in 150 ml flasks and plugged. The concentration of aqueous leaf extract was considered as 10 %. The extracts then autoclaved at pressure 15 lbs for 20 minutes. Potato Dextrose Agar (PDA) medium was prepared and sterilized at 15 lbs pressure for 20 minutes. The sterilized extracts were considered as standard plant extracts and used for the testing of antifungal activity.

The different concentrations were prepared i.e. 1.00, 2.00, 3.00, 4.00, 5.00, 6.00, 7.00, 8.00, 9.00 and 10.00 percent. The 10 ml extracts of different concentrations were individually added in 10 ml melted, cooled and sterilized PDA at the time of pouring in the petriplates and incubated at room temperature. After solidification, a 5 mm disc of actively growing 7 days old pure culture of *Macrophomina phaseolina* was incubated aseptically in the centre of plate. Three repetitions were made for each treatment. Medium without phytoextracts served as control. The observations of fungal growth in diameter were observed and recorded and percent growth inhibition was also worked out as per the method.

Experimental results and discussion:

The efficacy of *Adathoda zeylanica* L**.** against *Macrophomina phaseolina* by aqueous extract was evaluated at different concentrations i.e., 1.00, 2.00, 3.00, 4.00, 5.00, 6.00, 7.00, 8.00, 9.00 and 10.00 % for growth control by using Poisoned Food Technique as shown in table 1.*Adathoda zeylanica* efficacy at 1 % concentration shows 10.84 to 66.22 % in 1 to 7 days of incubation periods, at 2% concentration gives 12.15 to 74.25 %, at 3 % concentration shows 14.84 to 75.22 %, at 4 % concentration gives 16.16 to 76.45 %. at 5 % concentration gives 17.14 to 77.24, at 6% concentration shows 19.17 to 79.25, at 7% concentration gives 20.14 to 79.25, at 8 % concentration gives 22.10 to 84.35, at 9% concentration shows 25.00 to 87.74 and at 10 % concentration gives 35.46 to 92.65 inhibition of the growth of the pathogen with aqueous leaf extract concentration viz. recorded at 1 to 7 days of incubation period. The efficacy of *Adathoda zeylanica*, at 10 % concentration gives maximum inhibition of pathogen growth with increase in incubation period.

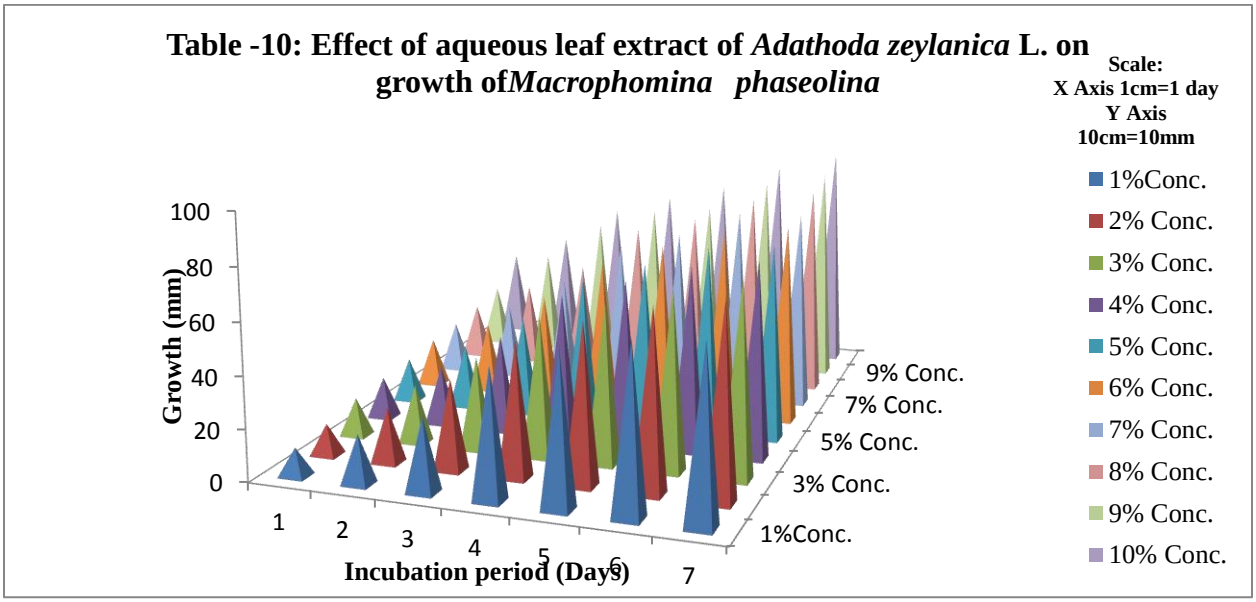
Table-1: Effect of aqueous leaf extract of *Adathoda zeylanica* L. (Adulsa) on growth of *Macrophomina phaseolina.*

Incubation Period (Days)	Percent inhibition (%)									
	Concentration (%)									
	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
1	10.84 (6.22)	12.15 (6.97)	14.84 (8.53)	16.16 (9.29)	17.14 (9.86)	19.17 (11.01)	20.14 (11.61)	22.10 (12.76)	25.00 (14.47)	35.46 (20.76)
2	18. 94	21.35	22.94	23.37	25.35	28.35	30.38	33.45	42.05	45.44

	(10.91)	(12.32)	(13.26)	(13.51)	(14.68)	(16.46)	(17.68)	(19.54)	(24.84)	(27.02)
3	28.45 (16.52)	35.17 (20.59)	36.45 (21.37)	38.19 (22.45)	39.47 (23.24)	42.42 (25.09)	43.45 (25.75)	44.47 (26.40)	58.85 (36.04)	60.89 (37.50)
4	49.75 (29.83)	52.00 (31.33)	54.75 (33.39)	57.10 (34.99)	58.40 (35.97)	59.45 (36.47)	61.45 (37.91)	63.56 (39.79)	66.89 (41.98)	68.75 (43.43)
5	58.25 (35.79)	61.90 (38.45)	62.25 (38.49)	64.92 (40.47)	65.96 (14.26)	67.95 (42.80)	67.95 (42.80)	69.92 (44.36)	70.00 (44.72)	75.18 (49.35)
6	64.00 (40.10)	69.54 (44.45)	70.00 (44.77)	72.64 (47.13)	74.56 (48.20)	76.56 (50.58)	78.60 (52.54)	79.98 (53.93)	82.60 (56.88)	85.76 (60.60)
7	66.22 (41.46)	74.25 (47.94)	75.22 (48.78)	76.45 (49.86)	77.24 (51.05)	79.25 (53.03)	79.25 (53.03)	84.35 (57.51)	87.74 (61.33)	92.65 (67.92)
S.E ±	2.35	2.56	2.51	2.52	2.60	3.08	3.16	2.61	3.13	3.42
C.D at 5%	7.24	7.89	7.74	7.76	8.00	9.50	9.73	8.05	9.65	10.53

Figures in parenthesis are ARCSIN transformed value.

Table -10: Effect of aqueous leaf extract of *Adathoda zeylanica* L. on growth of*Macrophomina phaseolina*



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A Study of Per Capita Net Sown Area in Hingoli District

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Abstract :-

There is a basic difference between land classification and land capability survey in land classification, and is divided in to various classes largely on the basis of existing fertility and productivity at the current level of technological development in land capability survey there are many factors that are taken into account to assess the capacity of land, existing and potential, for production of crops for example, location, which will include degree of slope, aspect, and drainage, climate, The physical and chemical characteristics of soil. A part from these, certain social and economic factors are also taken into consideration, for example, Rent and Rules, social and economic conditions of the region and the facilities that are available for the disposal of the products. This area means the Actual cultivated area during the agriculture year. It is known as net cropped area or Net sown area. The above use categories or classification and definitions have been accepted by all the states leading to the transformation and trends for 10 years of these categories of land use are shown in tables and discussed in the subcategories.

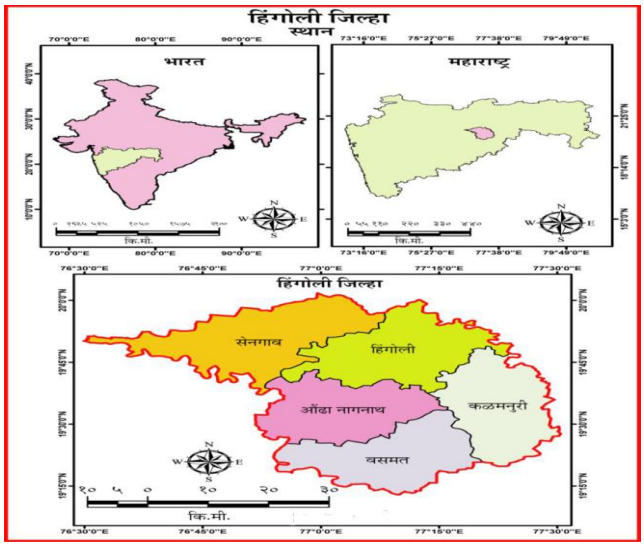
Keywords :- Population, net sown area, per capita net sown area, Hingoli district.

Introduction:- Land use is the surface from all developed and vacant land on a specific point at a given time and space. This leads one back to the village farm and the famers in the field's gardens, pastures, fallow land forces and to the isolated farmstead. The entire land area of Earth surface is 57 million 58 miles sq 14 billon hectares but a large area of the earth is uninhabited and in the percent circumstance, there no chance for habitation again as big chink of the earth is hilly where there are mountains plateaus and Rocks this cannot be brought under cultivation. Land is the basic resource of human society. Its utilization shown a reciprocal between the prevailing ecological conditions of as Regional and man. The term land use is employed for varied surface and dynamic uses of the land and soil survey eig l

Study area:-

Hingoli district is situated in Northern part of Marathwada in state of Maharashtra it is bordered by Akola and Yavatmal District on the northern side, Parbhani is the eastern side and Nanded district in the south eastern sided and lies between 19°20'N to 20°00'N and 76°20'E to 78°00'E respectively. The district of Maharashtra is one of the newest districts in the state. It comes into existence as a result of the division of Parbhani district in ist may 1999 it consists of two sub division mainly Hingoli and Basmat and five talukas, Hingoli, Kalamnuri, Sengaon, Aundha Nagnath, and Basmat.

Location map of Hingoli District:



Aims and objectives:-

Following are the main aims and objectives of the present research paper.

1) To study of per capita net sown area in Hingoli district in 2009.
2) To study of per capita net sown area in Hingoli district in 2014.
3) To find out the results and conclusion.

Source of data:

For the period 2009 to 2014, the data collected from various secondary sources. The data is assembled from secondary sources were processed and presented by statistical and cartographic techniques not only basis of secondary data but with the help of various statistical and cartographic methods and techniques.

Secondary data from socio economic review district census handbooks gazetteers agricultural epitomes' season and crop report published by department of the agricultural the present research work author

Discussion:-

Tahsil wise per capital net sown area in hingoli District. There is very close association between population has increased per capita net sown area. Population has been growing in hingoli District from 2009 to 2014 and per capita net sown area is increased. The highest per capital net sown area has been recorded in sengaon (0.55 hectare) tahsil while be the lowest per capita net sown are was observed in basmat (0.30 hectares) tahsil during the period 2009. In 2014 the maximum per capita net sown area was recorded in sengaon (0.47 hectares) tahsil and the lowest per capita net sown area was found in aundha nagnath (0.33 hectares) tahsil the hingoli district average per capital net sown area was recorded 0.38 hectors in 2009. In 2014 the hingoli District average per capita net sown area was increased (0.39 hectares) tahsil wise per capita net sown area was recorded in aundha nagnath (0.43 hectares) hingoli (0.36 hectare), kalmnuri (0.35 hectare) tahsils in the during period 2009 In 2014 tahsil wise per capita net sown area was found in hingoli (0.44 hectares), kalmnuri (0.38 hecters), basmat (0.35 hectares) tahsils in the study area.

Table No. 1.1: Population net sown area per capita in Hingoli District

	2009			2014		
Name of Tahsils	Total Population	Net sown area	Per capita net sown area	Total Population	Net sown area	Per capita net sown area
Hingoli	211000	75700	0.36	184000	80900	0.44
Kalamnuri	197000	70400	0.35	206000	78300	0.38
Sengaon	169000	93900	0.55	204000	95900	0.47
Aundha Nagnath	152000	65200	0.43	181000	59300	0.33
Basmat	257000	77000	0.3	222000	78600	0.35
Hingoli District	986000	382200	0.38	997000	393000	0.39

Source: Data is compiled by researcher on the basis of district Socio- Economic review and statistical abstract of Hingoli District 2009-2014.

Figure 1.1: Total Population in Hingoli District, 2009-2014.

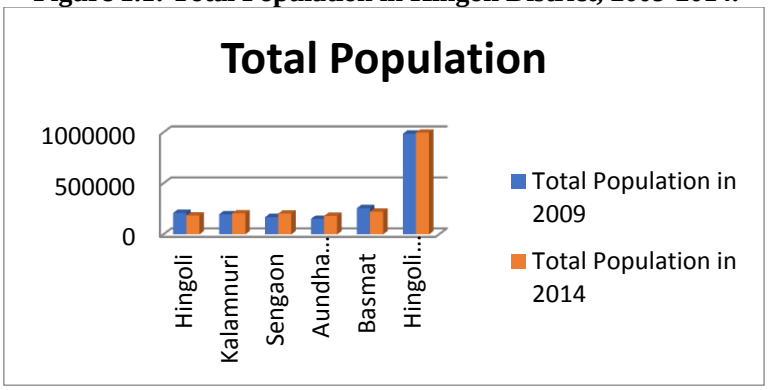


Figure 1.2: Net sown area in Hingoli District, 2009-2014.

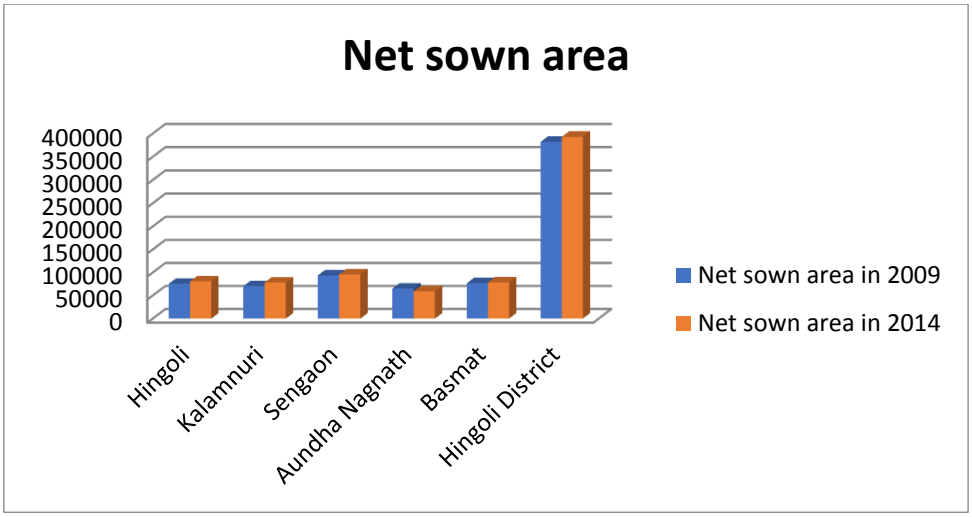
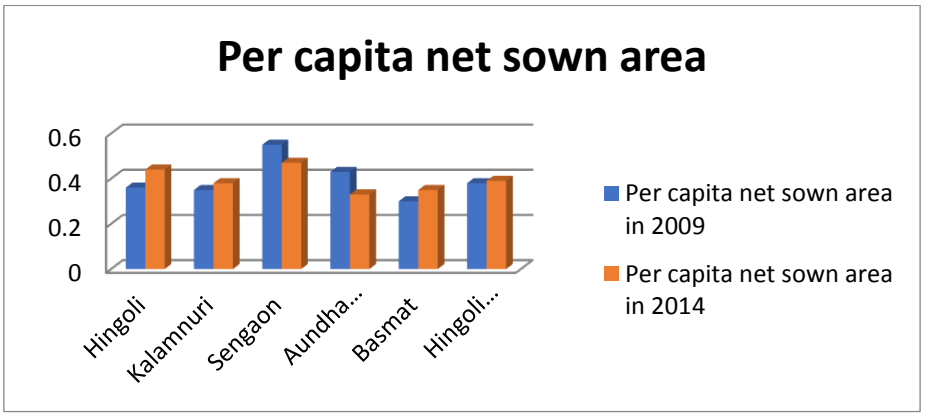


Figure 1.3: Per capita net sown area in Hingoli District, 2009-2014.



Conclusion:-

Table No 1.1 indicates the tahsil wise per capita net area in hingoli district during the period 2009 to 2014. The highest per capita net sown area was found in sengaon tahsil and the lowest per capita net sown area was recorded in basmat tahsil during the period 2009. In 2014 the highest per capita net sown area was found in aundha nagnath tahsil. The hingoli district average per capita net sown area increased was 0.38 hectare in 2009 in 0.39 hectare in 2011. Tahsil wise per capita net sown area has decreased was found in aundhanagnath, hingoli, kalmnuri tahsils during 2009 In 2014 tahsil wise per capita net sown area has increased was recorded in hingoli, kalmnuri and basmati tahsils in the study area.

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Irrigation Facilities for Agriculture in India

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Abstract

Water is a critical input into agriculture in nearly all its aspects having a determining effect on the eventual yield. Good seeds and fertilizers fail to achieve their full potential if plants are not optimally watered. Adequate availability of water is important for animal husbandry as well. Fisheries are, of course, directly dependent on water resources. India accounts for about 17% of the world's population but only 4% of the world fresh water resources. Distribution of these water resources across the vast expanse of the country is also uneven. The increasing demands on water resources by India's burgeoning population and diminishing quality of existing water resources because of pollution and the additional requirements of serving India's spiraling industrial and agricultural growth have led to a situation where the consumption of water is rapidly increasing while the supply of fresh water remains more or less constant. As a result ground water tables in most cities are falling at alarming rate of 2 to3 meters per year. Water scarcity has many negative impacts on the environment, including lakes, rivers, wetlands, and other fresh water resources. Additionally, water overuse can cause water shortage, often occurs in areas of irrigation agriculture, and harms the environment in several ways including increased salinity, nutrient pollution, and the degradation and loss of flood plains and wetlands. Furthermore, water shortage makes flow management in the rehabilitation of urban streams problematic. Owing to poor water resource management system and climate change India faces a persistent water shortage. As per OECD environmental outlook 2050, India would face severe water constrains by 2050. Indian agriculture accounts for 90% water use due to fast track ground water depletion and poor irrigation systems.

Key words: *importance of water, availability of water, agriculture development*

1. Introduction:

India ranks 2nd worldwide in farm output. Agriculture and allied sectors like forestry and fisheries accounted 13.7% of the GDP (Gross Domestic Production) in 2013, and employed 50% of the workforce. The irrigation infrastructure includes a network of canals from rivers, ground water, well based systems, tanks and other rain water harvesting products for agriculture activities. Today ground system is the largest, covering 160 million ha of cultivated land in India with 39 million ha irrigated by ground water, 22 million ha by irrigated canals and about two third of cultivation in India is still depending on monsoon. India is the world's largest producer of fresh fruits and vegetables, milk, major spices, various crops such as jute, staples such as millets and castor oil seed. It is also the second largest producer of wheat and rice. The average size of the around 138 million farms was around 1.15 ha in 2010/11 and average size of large-scale farmers' farms (170.000) is around 37 ha in 2016 (BMEL India country report 2016). Agricultural extension has only one extension worker per 800-1000 farmers and degree of mechanization reaches less than 50% (BMEL India country report 2016). Indicators of water stress and scarcity are generally used to reflect the overall water availability in a country or a region. As per the international norms, a country is classified as water stressed and water scarce if per capita water availability goes below 1700 m^3 and 1000 m^3, respectively. With 1544 m3 per capita water availability, India is already a water-stressed country and is moving towards turning into water scarce.

2. Objective:

1. To study the irrigation facilities for agriculture in India.
2. To observe the water availability and agriculture development in India.

3. Irrigation Facilities in India

India is not a water rich country and is further challenged due to negative impact of climate change; enormous wastage owing partly to poor management and distorted water pricing policies. The Northern Ganga River Basin has abundant water resources, whereas the Southern River Basin has few, but with high levels of pollution in ground water and surface water. Increase in population and changing lifestyles has increased demand for water (largely for irrigation) in both urban and rural areas. India has 18% of world population, having 4% of world's fresh water, out of which 80% is used in agriculture. India receives an average of 4,000 billion cubic meters of precipitation every year. However, only 48% of it is used in India's surface and groundwater bodies. A dearth of storage procedure, lack of adequate infrastructure, inappropriate water management has created a situation where only 18-20% of the water is actually used. India's annual rainfall is

around 1183 mm, out of which 75% is received in a short span of four months during monsoon (July to September). This result in run offs during monsoon and calls for irrigation investments for rest of the year. The population of India is likely to be 1.6 billion by 2050, resulting in increased demand for water, food and energy. This calls for infrastructure expansion and improved resource utilization.

3.1 Intensity of irrigation in India

Since India is a country with an important agricultural sector, and over 55% of population is dependent on agriculture, many state governments are offering incentives to ensure availability of water for irrigation purposes, such as: State government of Punjab (Northern India) are offering free electricity for ground water pumping. Moreover, states of Gujarat and Maharashtra offer high subsidy for solar pumps. Variations in irrigation intensity are due to among others varied geographical conditions in different parts of the country. Rugged mountains, sandy deserts and rocky terrains deep aquifers from which extracting water becomes an expensive proposition tend to have very poor irrigation facilities. Fertile alluvial plains with perennial rivers and potable groundwater as well as areas of less than 125 cm of annual precipitation are by far, the areas of high percentage of irrigation. The highest intensity of irrigation exists in the Kashmir Valley, large parts of the states of Punjab (Northern India) and Haryana, the Ganga-Yamuna Doab of the state of Uttar Pradesh (Northern India), Western part of the South Bihar (Eastern India) Plain, Birbhum, West Bengal (Eastern India), Lakhimpur, Assam (Northeastern, the Godavari Krishna Deltas and Chengalpattu district), Tamil Nadu (Southern India). The intensity of irrigation in these areas is above 60% and in some parts of Punjab (Northern India) it exceeds 75%. Dry areas of Ladakh district in Jammu and Kashmir and Lahul and Spiti district in Himachal Pradesh (Northern India) cannot raise crops without irrigation. Large parts of the Northernplain and East coastal plain have an average irrigation intensity varying from 30 to 60%. Parts of Brahmaputra Plain, the Chambal Valley and those of the Peninsular plateau have low intensity of irrigation varying from 15 to 30%. The areas of low intensity are those which either do not need irrigation by virtue of high and dependable precipitation or have not been able to develop irrigation facilities due to unfavorable geographical conditions such as rugged topography, lack of surface and ground water, among others. More areas with low irrigation intensity due to inappropriate geographical factors include large parts of Rajasthan to the west of the Aravali Range, parts of Bihar plain (Eastern India), central part of Peninsular plateau, the Maharashtra (Western India) and Kerala coasts, Manipur, Mizoram and Tripura. Andaman and Nicobar Islands (Southern India) have 0% irrigation intensity due to adequate precipitation throughout the year. The area, production and yield in food grain in 2013-14 and the proportion of area under food grains irrigated in 2011-12.

3.2 Groundwater based irrigation

At present, irrigation consumes about 84 %of total available water. Industrial and domestic sectors consume about 12 and 4 %of total available water, respectively. With irrigation predicted to remain the dominant user of water, “per drop more crop” is an imperative. The efficiency of water use must improve to expand area under irrigation while also conserving water. Irrigation infrastructure in India has seen substantial expansion over the years. The total irrigation potential created from major, medium and minor irrigation schemes has increased from 22.6 million ha during preplan period to 113 million ha at the end of the 11th Plan. Because this irrigation potential represents 81% of India’s ultimate irrigation potential estimated at 140 million ha, the scope for further expansion of irrigation infrastructure on a large scale is limited. Over the years, there has been significant shift in the sources of irrigation. The share of canal in net irrigated area has declined from 39.8 % in 1950-51 to 23.6 % in 2012-13. Alongside, the share of groundwater sources has increased from 28.7 % to a whopping 62.4 % during the same period. This expansion reflects the reliability and higher irrigation efficiency of 70-80% in groundwater irrigation compared with 25-45% in canal irrigation. While proving to be a valuable source of irrigation expansion, injudicious utilization of groundwater through the explosion of tube wells has raised several sustainability issues. The area, production and yield in food grain in 2013-14 and the proportion of area under food grains irrigated in 2011-12 are enlisted in Table 1

This shows the total Area, production and yield in food grain in 2013-14 and the proportion of area under food grains irrigated in year 2011-12.

Table 1

Area, production and yield in food grain in 2013-14 and the proportion of area under food grains irrigated in 2011-12.

States	Area (m. hect) (2013-14)	%of India (2013-14)	Production (million tons) (2013-14)	%of India (2013-14)	Yield (kg per hectare) (2013-14)	% area irrigated (2011-12)
Uttar Pradesh	20.23	16.05	50.05	18.90	2474.00	76.10
Punjab	6.560	5.20	28.90	10.92	4409.00	98.70
Madhya Pradesh	14.94	11.85	24.24	9.50	1622.00	50.50
Andhra Pradesh	7.61	6.04	20.10	7.59	2641.00	62.50
Rajasthan	13.42	10.64	18.30	6.91	1364.00	27.70
West Bengal	6.24	4.95	17.05	6.44	2732.00	49.30
Haryana	4.40	3.49	16.97	6.41	3854.00	88.90
Maharashtra	11.62	9.22	13.92	5.26	1198.00	16.40
Bihar	6.67	5.29	13.15	4.97	1971.00	67.40
Karnataka	7.51	5.95	12.17	4.60	1622.00	28.20
Tamil Nadu	3.55	2.81	8.49	3.21	2396.00	63.50
Odisha	5.15	4.09	8.33	3.15	1617.00	29.00
Gujarat	4.29	3.40	8.21	3.10	1917.00	46.00
Chhattisgarh	4.95	3.93	7.58	2.86	1532.00	29.70
Assam	2.53	2.01	4.94	1.87	1952.00	4.60
Jharkhand	2.24	1.77	4.19	1.58	1874.00	7.00
Uttarakhand	0.89	0.71	1.78	0.67	2001.00	44.00
All India	126.04	100.00	264.77	100.00	2101.00	49.80

3.3 Programs supporting irrigation

It is worth mentioning that Government of India has taken many initiatives in the past. Yet the canal irrigated area decreased by 38 lakh13 hectares during that period, as infrastructure is old, water supply is unreliable, further there are no incentives. Similarly, even after a decade of a 50 to 90% subsidy for the micro irrigation, it covers less than 5% of India's cultivated area. The government schemes have succeeded in some states although faltered in others. Electric powered ground water exploitation has thus emerged is a unique confluence of physical, policy and political factors that have trapped many states in a vicious spiral of decline ground water, deteriorating water quality, stagnant crop productivity, deteriorating power service delivery and poor financial health of power generation companies. Most state governments provide subsidized or free electricity to farmers. It is well recognized that this has resulted in water use overuse and resulted in declining groundwater tables. It is estimated that Indian farmers use 2 to 4 times more water to produce a unit of major food crop than in China or Brazil.14 Of this maximum 45% is shared by tube wells followed by canals and wells. The various sources of irrigation in India for the years 2010-11 are listed in Table 2.

Table 2, Sources of irrigation in India (2010-11)

Canals	Tanks	Wells	Tube wells	Others	Total
17005.7	2249.4	1149.4	29108.2	4289.2	64624.7

(**Source:** Department of Agriculture and Cooperation (Agriculture Census 2010-11)

Government has given considerable importance to the development of command area under canals. Earlier during 1950-1951, the canal irrigated area was 8.3 million ha which is now 17 million ha. Despite that, the relative importance of canals has come down from 40% in 1951 to 26% in 2010-11. Wells and tube wells accounted for 29% total irrigated area in 1951 and they had a share of 64% of the total irrigated area in 2010-11.

4 Conclusions

Different results of this research have been put forward for using water efficiently, some are listed below:

1. The method of irrigation followed in the country is flood irrigation, which results in a lot of water loss. Greater efficiency in irrigation was achieved through Proper designing of irrigation system for reducing

water conveyance loss. Adoptions of water saving technologies such as sprinkler and drip irrigation systems have proven extremely effective in not just water conservation but also leading to higher yields. New agronomic practices like raised bed planting, ridge-furrow method of sowing, sub-surface irrigation and precision farming which offer a vast scope for economizing water use.

2. Water productivity can be improved by adopting the concept of multiple water use, which is beyond the conventional sectoral barriers of the productive sectors. There is scope for increasing income through crop diversification and integration of fish, poultry and other enterprises in the farming system. The multiple water use approach can generate more income benefits, and decrease vulnerability by allowing more diversified livelihood strategies and increasing the sustainability of ecosystems.
3. Emphasis should be given on water resources conservation through watershed development in suitable areas and development of micro-water structures for rainwater harvesting. The promotion of water conservation efforts has direct implications for water resources availability, groundwater recharge, and socio-economic conditions of the population in India.
4. The effective water management is critically linked with the performance of local level water institutions. Therefore, institutional restructuring in favor of participatory irrigation management and water users associations (WUAs) needs to be strengthened.
5. National Water Policy is emphasizing the concept of Participatory Irrigation Management and WUA through active involvement of people in execution of irrigation project. According to the latest data available, 56,539 WUA manage 13.16 million ha of irrigated land. It will be useful to evaluate the effectiveness of this participatory approach.

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Challenges and Issues of Indian Agriculture

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Abstract:

Agricultural sector employs more than half of the labour force in India. It plays a critical role in lifting people out of poverty. This sector is important for two reasons: i) Poor household tends to spend a large share of their income on food; and ii) Majority of people lives in rural India are depend on agriculture for their livelihoods. Green revolution in 1970 has the credit to change situation of Indian agriculture. But today agriculture in India is facing a crisis. This is due to the problems that Indian agriculture sector could not tackle over the time. This paper explains these problems and identifies the priority areas which should be taken care to get rid of the agricultural crisis.

Keywords: Agricultural sector, Small and fragmented land-holdings, Seeds, Manure, Mechanisation

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Introduction

The Agriculture in India dates back to Indus Valley Civilization and even earlier in some parts of Southern India. Since independence of India, agriculture continue to be the backbone of country's economy. still majority of the population is depending upon agriculture for their livelihood. Similarly, majority of the people are living in the villages and therefore, the people at large still believe that" rural India is the real India."

India ranks second worldwide in farm outputs. As per 2018, agriculture employed more than 50% of the Indian work force and contributed 17%–18% to country's GDP.[1] India's agriculture exports jump 17.34% to $41.25 billion in FY20 making it the ninth largest agricultural exporter worldwide, and the sixth largest net exporter. In 2016, agriculture and allied sectors like animal husbandry, forestry and fisheries accounted for 15.4% of the GDP (gross domestic product) with about 41.49% of the workforce in 2020. India ranks first in the world with highest net cropped area followed by US and China.[2]

The economic contribution of agriculture to India's GDP is steadily declining with the country's broad-based economic growth. Despite these recent accomplishments, agriculture has the potential for major productivity and total output gains, because crop yields in India are still just 30% to 60% of the best sustainable crop yields achievable in the farms of developed and other developing countries. Additionally, losses after harvest due to poor infrastructure and unorganized retail cause India to experience some of the highest food losses in the world.

Problems Faced By The Agriculture Sector

A 2003 analysis of India's agricultural growth from 1970 to 2001 by the Food and Agriculture Organisation identified systemic problems in Indian agriculture. Some of the major problems have been discussed as follows.

1. Small and fragmented land-holdings:

In Indian agriculture, the biggest piece is of small holdings of land and as a result of this, both output and incomes are having bearing impact. This means lesser is the land holding lesser is income of the farmers. India has 141 million hectares of net arable land. In the year 1951 there were 6.99 crore land holdings and in the year 1996 the number went up to 11.55 crore. In during the year 2011 this was stood at 11.88 crore. In the year 1996 the average size of land holding was 1.41 hectare. But in the year 2011 this average figure went down to 1.15 hectare.[3] Thus, small and marginal farmers accounted for 86 percent of the total land holdings. If we go further to the problem of small and fragmented holdings is more serious in densely populated and intensively cultivated states like Kerala, West Bengal, Bihar and eastern part of Uttar Pradesh where the average size of land holdings is less than one hectare and in certain parts it is less than even 0.5 hectare.

Rajasthan with vast sandy stretches and Nagaland with the prevailing 'Jhoom' (shifting agriculture) have larger average sized holdings of 4 and 7.15 hectares respectively. States having high percentage of net sown area like Punjab, Haryana, Maharashtra, Gujarat, Karnataka and Madhya Pradesh have holding size above the national average. Another 19 per cent were small holdings (1-2 hectare) taking up 17.3 per cent of the total operated area. In 2000-01 percentage of marginal farmers increased to 63 percent of the total farmers.[4]

As land holdings are small, more people invariably work on the farms in the rural areas and coupled with the obsolete technology, farm incomes come down.

2. Seeds:

Seed is a critical and basic input for attaining higher crop yields and sustained growth in agricultural production. Distribution of assured quality seed is as critical as the production of such seeds. Unfortunately, good quality seeds are out of reach of the majority of farmers, especially small and marginal farmers mainly because of exorbitant prices of better seeds.

The role of seed industry is not only to produce adequate quantity of quality seeds but also to achieve varietal diversity to suit various agro-climatic zones of the country.

3. Manures, Fertilizers and Biocides

Indian soils have been used for growing crops over thousands of years without caring much for replenishing. This has led to depletion and exhaustion of soils resulting in their low productivity. The average yields of almost all the crops are among the lowest in the world. This is a serious problem which can be solved by using more manures and fertilizers. Manures and fertilizers play the same role in relation to soils as good food in relation to body. Just as a well-nourished body is capable of doing any good job, a well-nourished soil is capable of giving good yields.

It has been estimated that about 70 per cent of growth in agricultural production can be attributed to increased fertilizer application. Thus, increase in the consumption of fertilizers is a barometer of agricultural prosperity. However, there are practical difficulties in providing sufficient manures and fertilizers in all parts of a country of India's dimensions inhabited by poor peasants.

Cow dung provides the best manure to the soils. But its use as such is limited because much of cow dung is used as kitchen fuel in the shape of dung cakes. Reduction in the supply of fire wood and increasing demand for fuel in the rural areas due to increase in population has further complicated the problem. Chemical fertilizers are costly and are often beyond the reach of the poor farmers. The fertilizer problem is, therefore, both acute and complex. It has been felt that organic manures are essential for keeping the soil in good health. Biocides (pesticides, herbicides and weedicides) are used to save the crops and to avoid losses. The increased use of these inputs has saved a lot of crops, especially the food crops from unnecessary wastage. But indiscriminate use of biocides has resulted in wide spread environmental pollution which takes its own toll.

4. Lack of mechanisation:

In spite of the large-scale mechanisation of agriculture in some parts of the country, most of the agricultural operations in larger parts are carried on by human hand using simple and conventional tools and implements like wooden plough, sickle, etc. Little or no use of machines is made in ploughing, sowing, irrigating, thinning and pruning, weeding, harvesting threshing and transporting the crops. This is specially the case with small and marginal farmers. It results in huge wastage of human labour and in low yields per capita labour force.

So, there is urgent need to mechanise the agricultural operations so that wastage of labour force is avoided and farming is made convenient and efficient. Agricultural implements and machinery are a crucial input for efficient and timely agricultural operations, facilitating multiple cropping and thereby increasing production.[5]

Some progress has been made for mechanising agriculture in India after Independence. Need for mechanisation was specially felt with the advent of Green Revolution in 1960s. Strategies and programmes have been directed towards replacement of traditional and inefficient implements by improved ones, enabling the farmer to own tractors, power tillers, harvesters and other machines. Strenuous efforts are being made to encourage the farmers to adopt technically advanced agricultural equipment's in order to carry farm operations timely and precisely and to economise the agricultural production process.

5. Challenge of Productivity:

Because of the larger number of small and marginal farmers, i.e., 86 percent there has been the persistent problem of low productivity one hectare of land in India produces less than 40 percent when compared with developed countries. It is important to point out here that increase in Minimum Support Price (MSP) is not a viable solution to the problem. It is just like spoon feeding and how long it would carry out. In order to sustain farmers' income on regular basis and bringing economic prosperity to the

farmers' community, the only viable and available solution is "enhance the productivity of farm house holdings.

Conclusion:

The serious issues in Indian agriculture are related to knowledge and infrastructure. Although there isn't a lack of initiatives and institutions to challenge these issues, we have to become improved at managing structures to achieve success in our endeavours. At the same time, we should look into new approaches like private sector participation and harnessing of indigenous knowledge to improve performance. Small farmers who are especially exposed to the monsoons should be focused upon and services like credit and crop insurance should be made more accessible. This will safeguard that agricultural sector remains viable and caters the country's needs. Most importantly efforts are need to reduce population pressure on agriculture by diversifying the agriculture and overall rural economy by enhancing the rural non-farm activities.

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To Prepare Physical Fitness Norms For 9th & 10th School Going Boy's Students

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Abstract:

Physical education is now widely recognized. State government is a vital component of a well-rounded education. It is also acknowledged that physical education, like intellectual subjects, plays an essential role in the coordinated development of the personality. The current study will be a pioneering attempt in developing school-wide criteria for evaluating physical fitness. Data was collected for this purpose, and the obtained data was statistically treated. Standard Tests were introduced to assess the pupils' physical fitness abilities. The goal of this research is to "Prepare the Physical Fitness Norms for 15th and 16th grade pupils." We sampled 250 boys in 9th grade and 250 boys in 10th grade from the various reasons of the Latur District School. The following items were included in the Physical Fitness test: 10mX4m, 12 minute Run & Walk Test, Sit-ups, Sit & Rich, B. M. I., 50 meter Dash, Push Ups, Sitting Ball Throw Shuttle Run, Skipping Rope, and a Volleyball Test on the Wall The study's goal was to assess physical fitness components in 9th and 10th grade students and to develop age-specific standards for physical fitness components in children. For sampling, we employ the lottery technique. After confirming content validity and reliability, all tests were included. Before the norms were determined, all of the scores were checked for normality. Standard procedures were followed to perform this research project because it was a normative survey study. The researcher used a step-by-step approach to creating and establishing standard norms. In this study, a new set of physical fitness standards was created using the percentile technique, and the results were expressed as percentile norms. Rank order technique was used to create the grading scale. A grading system was created using the scores, which were divided into four categories of 25% each, i.e. Excellent, Good, Average, and Poor. The study's findings were used to create standards that might be used to evaluate a student's performance on a specific physical fitness test. Students in 9th and 10th grade males have a fitness variable that may be measured. The defined standards can be utilized as criteria for determining a student's fitness. Students can be differentiated using the grading table that has been developed.

Introduction:

Physical education is now widely recognized. The state government is a vital component of the overall educational system. It is also acknowledged that physical education, like intellectual subjects, plays a vital role in the coordinated development of a child's personality in order to make him a physically fit and psychologically acceptable citizen. Since independence, there has been a spirit in our country's youth activities. Youth development programs were established under both official and private auspices. All of these programs, such as physical education, scouts and guides, the national discipline system N.C.C., and others, make a significant contribution to the school found difficult to manage in India, which formed a committee in May 1959 under the leadership of Pt. H.N. Kunzrud.

1) Determine the relative benefits and roles of various physical education schemes.

2) Recommend measures to ensure effective coordination of approved schemas to avoid duplication and resource waste.

3) Investigate methods for establishing the most effective plans and activities for promoting physical education, character development, and discipline among pupils.

Objectives of the study:

-The study's goals were to evaluate physical fitness components in 9th and 10th grade students, -as well as to develop age-based standards for physical fitness components in children.

Methodology:

The purpose of this study was to develop physical fitness criteria for evaluation and performance assessment of 9th and 10th grade students. Standard procedures were followed to perform this research project

because it was a normative survey study. The researcher used a step-by-step approach to creating and establishing standard norms.

"To Develop Physical Fitness Standards for Students in 9th and 10th Grades."

Population:

The present study's population is made up of boys in 9th and 10th grades from several Talukas in the Latur region. It is split into four sections. There are three of them: south, north, and east and west. Researchers selected 250 9th and 10th grade students from each block. The Physical Fitness Test was used by the researchers to gather data.

Sample:

The sample for the current study was chosen using the purposive sampling approach. The data was collected for the 9th and 10th grades. The table below shows the details of the data collection. A total of 500 boy samples were used to compile the data.

9^{th} std. - 250

10^{th} std. - 250

Procedure of the Study:

The following is the detailed process for the aforementioned stages of the study:

Physical Fitness Test Table: The investigator has evaluated the following physical fitness test Table based on many study papers.

Details of test for 9th ^{and} 10th standard

Sr. no	Test	Criterion Measure
1	12 minute Run & Walk Test	Cardiovascular Endurance
2	Sit-ups	Muscular Endurance
3	Sit & Reach	Flexibility
4	B. M. I.	Body Composition
5	50 meter Dash	Speed
6	Push-ups & Modified Push-ups	Muscular Strength
7	Sitting ball Throw	Power
8	10 m.×4m. Shuttle Run	Agility
9	Skipping Rope	Co-ordination
10	Ball Valley	Co-ordination

Data Analysis and Interpretation:

Data collection was completed, and the data was then processed using statistical analysis; the findings of the step-by-step data analysis are provided below. The raw data obtained from the tests done on the individuals was transformed into norms. The statistical methods that were carried out were as follows.

Descriptive Statistics: The obtained score was subjected to descriptive statistics. The average and median were determined. The skewness and kurtosis were used to determine the normalcy of the scores. Outliers were eliminated from the data, therefore some of the scores were deleted. With the aid of Box plots in SPSS, the outliers were discovered.

Norms: For students in grades 9 and 10, the percentile for each test item will be determined.

Data analysis:

500 people were tested in a total of ten tests. The table shows the results of the specified physical fitness tests.

Sr. No.	Name of test items	Measurement unit	Sr. No.	Name of test items	Measurement unit

1	Body Mass Index	Units	**6**	Shuttle run	Seconds
2	12 Minute Run & Walk	Meters	**7**	Shitting Ball Throw	Number
3	Push ups/Modified Push up	Number	**8**	Skipping	Number
4	Sit & Reach	Centimetres	**9**	Wall Volley	Number
5	50 yard dash	Seconds	**10**	Sit ups	Number

Data Analysis:

The descriptive statistics of the obtained score were calculated. The average, median, and mode were determined. The skewness and kurtosis were computed to determine the scores' normalcy. With the aid of Box plots in SPSS, several of the scores (outliers) were eliminated. To generate norms, the Percentile technique was utilized. According to the tests, the descriptive statistics and percentile norms are provided in detail below.

Percentile norms for 9th grade males were computed for the 12 minute run or walk, sit ups, sit and reach, 1 minute skipping and shuttle run, push ups, wall volley, sitting ball throw 50 meter sprint, and BMI. **Percentile Norms of 9th Std. Boys**

Percentile.	12 min. R/W	Sit Ups	Sit & Reach	1 min. Skipping	10x4m. Shuttle Run	Push ups	Wall Volley	Sitting Ball Throw	50m Dash	B M I
5	1491	16.	20	27	10.13	10	37	3.60	7.60	17.67
10	1512.3	19	21	34	10.38	12	38	4.10	7.95	18.11
15	1560	20	22	42	10.50	13	40	4.32	8.1	18.44
20	1562.6	20	23.2	47	10.64	14	42	4.4	8.21	18.67
25	1629	21	24	51	10.79	14.	43	4.50	8.46	18.83
30	1629.3	23	24	54	11.01	15	44	4.59	8.51	19.39
35	1635	23	25	56	11.14	16	44	4.88	8.55	19.61
40	1693.2	25	25	59	11.47	16	46	5.14	8.59	20.08
45	1704	25	26	61	11.54	17	46	5.32	8.75	20.58
50	1711	25	26	64	11.68	17	47	5.4	8.91	20.82
55	1792	27	26.05	67	11.78	18	48	5.46	9.15	21.38
60	1793.2	27	27	70	11.91	18	49	5.5	9.36	21.63
65	1801	28	28	74	12.01	19	51	5.55	9.50	21.83
70	1810	29	29	79	12.52	19	52	5.6	9.55	22.38
75	1909	30	30	82	12.64	20	53	5.67	9.57	22.63
80	1919.4	30	32	86	12.80	21	55	5.9	9.70	22.73
85	2087.3	31	33	90	13.28	22	56	6.3	10.04	23.50
90	2224.9	32	37	99	13.63	23	58	6.5	10.51	23.77
95	2295	33	41	102	14.55	25	60	6.62	10.82	24.17

Percentile norms for 10th grade males for a 12-minute run or walk, a sit-up sit-and-reach, a one-minute skip, and a shuttle run were computed as follows.

Percentile Norms of 10th Std. Boys

Percentile	12 min. R/W	*Sit Ups*	Sit & Reach	1 min. Skipping	10*4m. Shuttle Run
5	1353.1	18.	20	25.	11.2155
10	1490	20	22	35	11.46
15	1550	20	23	41.	11.5465
20	1561.2	21	24	46	11.716
25	1628	22	25	48	11.9875

30	1629	23	26	52.	12.257
35	1645	23	26	58	12.5085
40	1654.4	24	27	60.	12.64
45	1699.9	24	28	64.	12.78
50	1704.5	25	29	70	12.955
55	1732	25	30	72	13.31
60	1790.8	26	32	74.	13.51
65	1795.3	26	33	76	13.65
70	1844.8	27	35	80	13.86
75	1910.75	28	37	84	14.1825
80	1977.4	28	38	86.	14.558
85	2015	29	40	93.	14.9105
90	2097.2	30.	45	97	15.456
95	2204.45	33	48	101	15.67

Grading:

A grading scale of the selected physical fitness tests conducted on the students was also created based on the analysis and raw score received. Rank order technique was used to create the grading scale. It is described in full further down. A grading system was created using the scores, which were divided into four categories of 25% each, i.e. Excellent, Good, Average, and Poor. In the table below, the grade is listed.

Grading Scale on Item-wise Performance for 9th School going boys student

Test-Items	Poor	Average	Good	Excellent
12 Minute Run & Walk	Below 1629	1630 to1711 21	1712 to 1909	Above 1909
Push ups/	Below 14	15 to 17	18 to20	Above 20
Sit & Reach	Below24	25 to 26	27 to 30	Above 30
50 yard dash	Above 9.57	9.56 to 8.91	8.90 to 8.46	Below 8.46
Shuttle run	Above 12.64	12.63 to11.68	11.67 to10.79	Below10.79
Shitting Ball Throw	Below 4.50	4.51 to 5.40	5.41 to 5.67	Above 5.67
Skipping	Below 51	52 to 64	65 to 82	Above 82
Wall Volley	Below 43	44 to 47	48 to 53	Above 53
Sit ups	Below 21	22 to 25	26 to 30	Above 30

Grading Scale on Item-wise Performance for 10th School going boys student

Test-Items	Poor	Average	Good	Excellent
12 Minute Run & Walk	Below 1620	1621 to 1704	1705 to 1977	Above 1977
Sit & Reach	Below 25	26 to 29	30 to 38	Above 38
Shuttle run	Above 14.56	14.55 to 12.78	12.77 to 11.98	Below 11.98
Skipping	Below 48	49 to 70	71 to 86	Above 86
Sit ups	Below 22	23 to 25	26 to 28	Above 28

All statistical analyses are discussed in detail:

Physical education is now considered an integral element of the general education system by the state government. It is also acknowledged that physical education, like intellectual subjects, plays an essential role in the coordinated development of the personality. The current study will be a pioneering attempt in developing school-wide criteria for evaluating physical fitness. Data was collected for this purpose, and the obtained data was statistically treated. Standard Tests were introduced to assess the pupils' physical fitness abilities. After confirming content validity and reliability, all tests were included. All the scores were tested for normality before their norms were calculated. After which the scores were converted into norms by computing them into percentile using SPSS.

From the analysis and the raw score obtained a grading scale of the selected physical fitness tests conducted on the students was also prepared. The grading scale prepared using Rank order method. Using the scores which were divided into four groups of 25 % each and grading system was prepared, i.e. Excellent, Good, Average and Poor.

Summary:

Physical education is now considered an integral element of the general education system by the state government. It is also acknowledged that physical education, like intellectual subjects, plays an essential role in the coordinated development of the personality. The current study will be a pioneering attempt in developing school-wide criteria for evaluating physical fitness. Data was collected for this purpose, and the obtained data was statistically treated. Standard Tests were introduced to assess the pupils' physical fitness abilities. After confirming content validity and reliability, all tests were included. Before the norms were determined, all of the scores were checked for normality.

The goal of this research is to prepare 15th and 16th grade pupils for physical fitness standards. There are 250 boys in 9th grade and 250 boys in 10th grade. The following items were included in the Physical Fitness test: 10mX4m, 12 minute Run & Walk Test, Sit-ups, Sit & Rich, B. M. I., 50 meter Dash, Push Ups, Sitting Ball Throw Shuttle Run, Skipping Rope, and a Volleyball Test on the Wall In this study, a new set of physical fitness standards was created using the percentile technique, and the results were expressed as percentile norms. Result of the study prepared norms suitable to evaluate the student's performance on selected physical fitness test.

Conclusion:

Physical fitness standards for 9th and 10th grade boys in the Latur District were developed, which may be used to grade pupils in this element of the mandatory physical education program in the curriculum.

- Students in 9th and 10th grade boys have a quantifiable fitness variable.
- The generated standards can be utilized as criteria for evaluating the students' fitness.
- The created grading table can be utilized to distinguish students.

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Application of Agriculture Technology in Drought Prone Agriculture Area in Osmanabad Tahasil: A Geographical Analysis

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Introduction:

Agriculture is a back bone of the Indian economy, today more than 55 percent peoples are engaged in agricultural sector mostly in rural India. Indian agriculture is a gamble of monsoon hence the Irrigation is important for the development of agriculture. Various types of Techniques and Methods used to increase the agricultural productivity specially in water scarcity region or in drought prone area. Drought is a natural disaster, its occurs frequently after 4-5 years on the Deccan plateau, most of the parts of Maharashtra plateau consist of under the drought prone area and Osmanabad district is one of them. According to 2001, about 20,000 villages in 23 districts, 28.40 million and 4.5 million hectors cropped area affected by drought. The main aim of the present paper is to examine the role of agricultural technology for the agricultural development in drought prone area.

Keywords:

Agriculture Technology, Drought Prone, Drought, Level of agricultural technology and level of agricultural performances, irrigation etc.

Objective:

The main aim of the present paper is to examine the role of agricultural technology for the agricultural development in drought prone area.

Study Area:

Osmanabad tahasil is an administrative headquarter which is situated on 18.11° N, 76.18° E of Osmanabad district of Marathwada region in Maharashtra State. Osmanabad is a major drought prone tahasil in Osmanabad district. The average annual rainfall is about 760 mm and temperature is 27^0C. Due to irrigation facility farmers are using agriculture technologies various.

Methodology:

The present paper is based on the secondary data, secondary data is obtained various published and unpublished books, journal's, district Irrigation department, Irrigation department of Maharashtra State, statistical abstract and socio-economic abstract etc. The following methodology has been employed for the present paper.

Levels of Agricultural Technology:

For the calculation of the levels of agricultural technology the equation developed by Dutt and Sen Gupta in 1969 which further modified by Jasbir Singh in 1994) is employed here and composite index values have been obtained. The equation is a below –

$$\text{Ite} = \frac{\text{Ie}}{\text{Ir}} + \frac{\text{Te}}{\text{Tr}} + \frac{\text{Toie}}{\text{Toir}} + \frac{\text{Poie}}{\text{Poir}} + \frac{\text{Fe}}{\text{Fr}} + \frac{\text{Pe}}{\text{Pr}} \ldots$$

Where,

Ite = implies the composite index of the level of agricultural technology.
I = means percentage of irrigated area to total cropped area.
T = abbreviates tractors per 1000 hectares of cultivated area.
Toi = means tractor operated implements per 1000 hectares cultivated area.
Poi = power operated implements 1000 hectares cultivated area.
F = stands for fertilizer consumption per 1000 hectares cultivated area.
P = means pesticide consumption per 1000 hectares cultivated area.
e and r subscripts symbolize respectively the Revenue circles and the entire region(Tahasil)

The above procedure is adopted to compute the index value of each Revenue circle. To sum up index value of all parameters then multiplied by 100 to derive the Degree of agricultural technology. The Index value of agriculture parameter is sum up multiplied by 100 to derive the degree of agriculture technology.

Degree of agricultural technology$= \frac{\Sigma \text{LQs}}{\text{N}} * 100$

Here, N specifies the number of parameters of agricultural technology.

Level of Agricultural Performance:

$$VW = \frac{Yae}{Yar} + \frac{Pae}{Par} + \frac{Ybe}{Ybr} + \frac{Pbe}{Pbr} + \frac{Yce}{Ycr} + \frac{Pce}{Pcr} + \quad N = \Sigma LQS/N \ldots$$

Where,

VW – denotes weighted composite index of regional inequality in agricultural Performance.

P - implies cropland occupancy of crop 'a' in kilograms per hectare. a, b and c subscripts denote crops considered, e and r subscripts denote Revenue Circle and Tahasil respectively.

N - is number of crops holding more than 5 per cent of the total cropped area.

LQS – means location quotients in the present study the crops like Jowar, Wheat, Maize, Bajra, Sugarcane etc. are selected as they have occupied cultivated area significantly.

The summed up location quotients (LQS) were divided by the number of crops considered in the Revenue circle and multiplied by 100 to obtain the weighted composite index for the level of agricultural performance.

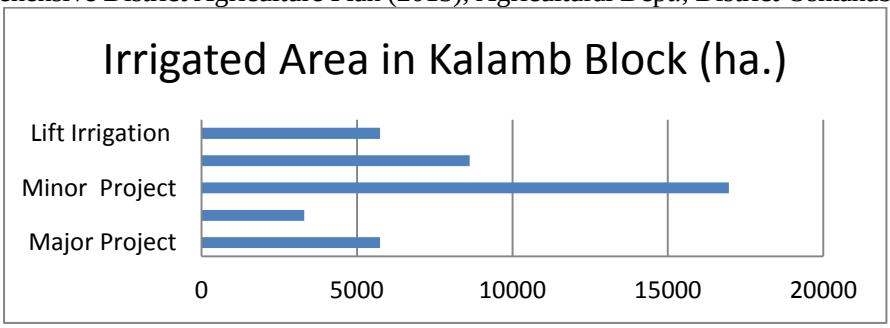
Thus, weighted composite level of agricultural performance $N = \frac{\Sigma LQS}{N} * 100$

RESULT DISCUSSION

Irrigation potential of Osmanabad tahasil:

Block	Total cultivable Area (ha.)	Total Irrigated Area (ha.)	Surface Irrigation (ha.)	Ground Water Irrigation (ha.)
Osmanabad	112900	26888	25999	889

Source: Comprehensive District Agriculture Plan (2015), Agricultural Dept., District Osmanabad.



Source: District Handbook (2015), Water Resource Department, District Osmanabad.

Graph 1.1

Table No. 1 shows that the Irrigation Potential of Osmanabad tehsil for year 2015. In the Osmanabad Tahsil to the total geographical area about 112900 hectors area occurs under the Cultivation. Total Irrigation area of the district was 26888 hectors means only 23.81 percent area under the irrigation; in which 25999 (96.69) area under the surface Irrigation and renaming was under the ground water irrigation.

Levels of Agricultural Technology in Osmanabad Tahasil (2015):

Level of Agricultural Technology of Osmanabad Tahsil diversely distributed in all over the tahsil and this disparity level of agricultural technology are accountable for regional imbalances in the levels of agricultural performance. Therefore, an attempt has been made to measure the regional inequities to identify backward and advanced areas in terms of agricultural technology which is effect for agriculturally developed in Osmanabad Tahasil.

Spatial Variations in the levels of Agricultural Technology:

The study reveals that there are three different zones are formulated.

>100 - High	65 to 100 Medium	< 65 Low

In the above table shows classification High, Medium and Low level agriculture Technology Zone. High level of Agricultural Technology Region- above 100, Moderate level of Agricultural Technology Region- between 65 to 100 and Low level of Agricultural Technology Region bellow 65. Moderate level of Agricultural Technology Region- between 65 to 100. In 1990, Osmanabad Tahsil have recorded moderate agriculture level technology with 98.85 (between 65 to 100 Index value)

As fallowed as in 2015 after the calculation of index values classified with the help of standard deviation method can conveniently be described into three different zones, Moderate level of Agricultural Technology Region- between 65 to 100, In that same year Osmanabad Tahsil have recorded 151.00 (above 100 index value) high level of Agricultural Technology.

The study identifies three level of Agriculture Technology Region which is prepared as follows 1. High level of Agricultural Technology Region above 100, 2 Medium level of agricultural technology region 65 to 100. Osmanabad tahasil is recorded 98.85 in application of agricultural technology in the year 1990 and 151.00 in 2015 it is due to certain irrigation facilities i.e. Micro Irrigation substantial development of agro-industries, like sugar industries are also plying vital role for promoting the use of new agricultural technology-Shade net, Polyhouse, high literacy rate of tahasil the forward looking attitude of farmers.

Level of Agricultural Performance in Osmanabad Tahasil (2015):

The proportion of cultivable land per man has been decreased noticeably during the recent past. The increase in crop production is must in India since the areal spread of crop land has almost reached its saturation limit (Vidyanath, 1985). It needs, therefore to improve the agricultural productivity. Agricultural productivity is a function of various factors like physical, socio-economic technical and organizational. The level of agricultural productivity as a concept means the degree to which the economic, cultural, technical and organizational variables are also to exploit the biotic resources of the area for agricultural production (Singh, J. 1984).

Regional Pattern of the Levels of Agricultural Performance:

It is simplified that the composite index values and the level of agricultural performance is positively correlated. It is examined with the help of composite index values.

The index value has been classified **High level of Performance Region** (above 600 index value), **Moderate level of Performance Region** (between 200 to 600 index value), **Low level of Performance Region** (below 200 index value). It includes Osmanabad Tahasil in Moderate performance region. This has been due to assured supply of water mainly from Major, minor irrigation projects. As a result of Osmanabad Tahsil includes zone possesses moderate level of agricultural performance. In this zone Horticulture cultivation is dominant crop cultivators have implemented modern technology. This has led to moderate level of performance of agriculture. Framers take forward step to accepted new techniques and different crops in deferent session so overall impact of performance is indicating to using agricultural technology also through the implementation area treatment of soil conservation. Therefore, Osmanabad tahasil is located drought prone area but the efficiency and application of agricultural technology is positively correlated to removal of agriculture drought prone area on the earth.

Relationship Between, levels of Agricultural Technology and levels of Agricultural Performance in Osmanabad Tahasil

Levels of Agricultural Technology	Level of Agricultural Performances	Block
High	**Moderate**	**Osmanabad**

Source: Compile by Author.

Conclusion:

From general process of development, agricultural change cannot be assumed separately. In the agricultural development the agro-technical elements are playing significant role. There are diverse technologies used with varied intensities leading to variations in agricultural efficiency per unit of time and space. With inadequate supply of water to agriculture it is very essential to adopt new soil conservation technique, micro irrigation techniques and farmers of the Osmanabad tahasil change their old farming methods and adopted new as well as practical methods of farming, so it is useful for the agricultural development in the Osmanabad Tahsil.

The application of agricultural technology shows that considerable income from sugarcane, grapevine, green gram, Bajra as well as Shade net, poly house farming with forward looking approach of farmers where less of important role of co-operative societies, factories etc. The levels of agricultural Performance are maintaining moderate i.e. between 65 to 100 percent are confined in Osmanabad having sure supply of water, dominance of all crops and pomegranate cultivation.

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Water Resources Conservation and Management

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Abstract
India has 15% of the world's population and only 5% of the world's water resources, which are reducing quickly. The need of water is expected to extend from 38-39 billion cubic mtr now to around 220 in 2024. Without Water we cannot see Crop and greenery anywhere. Shortage and excess of water affects the growth and development of the plants as well as production and value of yield. There are several methods to decrease such losses and to expand soil moisture. These are cropping, planting of trees, use of fog and dew by net-surfacing tricks or polythene pieces, outline farming, transmission of water from excess areas to shortfall areas by inter-linking water systems through Pipes, canals, purification technologies such as concentration, electro-dialysis and reverse osmosis, use of efficient watering systems such as drip irrigation and sprinklers will decrease the water consumption by plants. The very vital step in the direction of finding solutions to issues of Water Resources Conservation and Management is to change people's views and lifestyles; this includes everyone.

Keywords: Water, Management, technology, net-surfacing tricks, drip-irrigation.

Introduction

The most familiar and widely used words in the world for Water are Paani, Jal, Tanni, L'eau, Wasser, Acqua perhaps. Water does not need introduction; the importance of this is recognized to one and all. Though, in spite of water being the basic human need, this precious resource is being wasted, contaminated and getting exhausted. Each drop of water is valuable but we continue to waste it like it is a free natural product. 97% of water on this planet is salty and is not fit for human uses. Out of the 1.9% of fresh water reserves, 1.2% is locked up in form of ice in several areas around the world. Hence, only 1.1% of total water reserves are accessible for our domestic & manufacturing use. Numerous cities in India and everywhere the world are already facing water shortages because of reduced rainfall, artificial climatic changes, decrease in ground water levels, population growth, industrial development and astounding amount of water wastages due to carelessness by users & decrepit water supply systems. The significance of water in a country's economic growth should not be underestimating.

Water pollution, inaccessibility of drinking water, insufficient sanitation, open dumping of wastes, loss of forest area are some of the problems confronted by numerous parts of our country. Heavy toll of baby mortality because of water borne diseases, the daily fight for obtaining water, misconduct of waste water, inadequate sanitation are common features and are leading to thoughtful moments on human health and the economy of the country. The situation demands immediate involvement in the management of these speedily growing problems, especially through a combined attitude for water, sanitation and related issues.

Water Resources Conservation

Water Resources conservation can be defined as:

1. Any valuable deduction in waste of water loss or use.
2. A minimum use in water proficient by operation of water resource conservation or water efficacy measures.
3. Enhanced water management rehearses that decrease or increase the valuable use of water and water resources conservation measure is an action, social change, device, technology, or improved design or process implemented to cut water loss, waste, or use. Water efficacy is a device of water conservation. That results in additional effective water use and therefore diminishes water demand. The value and cost-effectiveness of a water efficacy measure need to be evaluated in relation to its special effects on the use and cost of other natural resources.

The aims of water resources conservation efforts include:

- To confirm obtainability for future generations, the removal of fresh water from an environment should not exceed its natural replacement rate.
- Water pumping, delivery, and excess water treatment facilities use an important amount of energy. In some regions of the world over 13-14% of total electricity consumption is keen to water management
- Diminishing human water consumption assist to reserve fresh water habitats for local wildlife and traveling waterfowl, as well as decreasing the need to build new dams and other water diversion infrastructure.

Water Resources Conservation Technologies

Process of water conservation may be identical of protection against loss or waste. For a short time stated it means putting the water resources of the country for the finest advantageous use with all the technologies at our command. Water resource conservation fundamentally purposes at matching demand and supply. The tactics for water resource conservation may be demand focused on or supply oriented and management oriented. The strategies may be different depending upon the field of water use, domestic, irrigation and industrial use.

1. **Rainwater Harvesting-** Rainwater harvesting fundamentally means gather rainwater on the roofs of building and store it underground for future use. This recharging captures groundwater reduction and also increases the declining water table and can assist increase water supply. Rainwater harvesting and manual recharging are becoming very important issues. It is vital to stop the decay in groundwater levels, capture seawater ingress, i.e. stop sea water from moving landward, and preserve surface water run-off during the rainy season.

Advantages

1. It decreases the cost for pumping of ground water
2. It gives independence to water supply.
3. It increases the quality of ground water through thinning when recharged
4. It gives high excellent water, soft and low in minerals.
5. This rooftop rainwater harvesting is not expensive & very easy to build, function and maintain. In the desert area RWH (rainwater harvesting) only relief.
6. Rainwater provides good quality water in coastal areas & Islands.

2. **Use of Seal Water for Irrigation**- Sea water is extensively available but hardly used for agriculture because it limits plant growth and yield. Salt resistant diversities of crops have also been developed in recent times.
3. **Soak pit construction**- Water run offs and water sorting are combated by constructing soak pits near water points like hand pumps. This is a sanitation measure and also assists in recharge of ground water.
4. **Well Irrigation Practices-** Conservation of water in the agricultural sector is vital since water is needed for the growth of plants and crops. A reducing waters table and increase in salinity due to overuse of chemical fertilizers and pesticides has made matters serious. Many methods of water harvesting and recharging have been and are being applied all over the world to hold the problem. The local people have used simple techniques that are suitable to their region and reduce the demand for water in such areas where rainfall is low and water is scarce.
5. **Contour farming-** This technique is implemented in hilly areas and in lowland areas for paddy fields. Farmers recognize the efficacy of contour-based systems for preserving soil and water.
6. **Tippy Tap for water conservation**: - This is a simple tool which distributes a limited amount of water slowly and simplifies a full hand wash. In case of piped water supply, every time the tap is opened for a hand wash, an average of 400 - 500 ml of water is used. Spending Tippy Tap it is possible to have a good hand wash with only 70 to 80 ml of water.
7. **Tree plantation-** This technique is very useful in water catchments area as well as bank of river and clean-up drives near water bodies are some of the other creativities occupied up to reserve our water resources.
8. **Long Distance Transfer of Water**- Transfer of water from surplus basins by making storage at suitable locations and inter-linking several systems is yet another tactic for increasing the benefits considerably
9. **Desalination**- To enhance the reduction of fresh water resources in coastal areas due to excessive abstraction, desalination like distillation, electro-dialysis and reverse osmosis are available. Selection and use of these processes is site specific.
10. **Eco Lawns**- As a step towards water conservation and propagation of innate plant species, drought resistant plantation (plants requiring less water) should be carried out.

Measures Of Water Resourse Conservation

Water conservation measures in industries should include: (i) review of alternate production processes and technologies from water consumption point of view; (ii) ensuring sound plant maintenance practices and good housekeeping, minimizing leaks; and (iii) optimization of treatment to achieve maximum recycling. Another recognized method for max water recovery is that the water pinch analysis technique. Though, this method only emphases on maximizing freshwater and waste water decrease through recycle and regeneration.

1) Fix minor showerheads to minimize the movement of the water.

2) Usage only as much water as you need. Close the taps proper after use. While brushing or other use, do not leave the tap running, and open it only when you require it. Ensure that there is no leak of water in taps.

3) Usage a washing machine that does not consume excess water. Do not leave the taps running while washing clothes, dishes etc.

4) Count of Every drop.

5) If in case water left in your water bottle does not throw it away, pour it over some plants.

6) Re-use water as much as possible.

7) Change our approach & ways for water conservation

Technique To Improve Water Management

- The very thin line between forests and water, and the traditional association between agriculture and water, essential to be recognized and protected to ensure continued productivity.
- National water management policies must take responsibility of the influence of trade in water-intensive goods on water obtainability and environments integrity. E.g. In the area of water scarce regions, people can grow crops with low water requirements and of high value compared to the water used. Options for improving the water balance by importing water intensive goods from water-rich regions should be explored, where suitable and cost-effective.
- The possible of rainwater harvesting for expanding rural and urban water supply is gradually becoming recognized. This substitute should be further discovered and utilized.
- Proper water pricing must be vital part of water policies. Though, care need to be taken to ensure that the poor and socially disadvantaged are not denied access. Moreover, there must be sufficient observing and control of market mechanisms.
- It is essential to study and examine the impacts of subsidies on water use.
- Our traditional water management approaches and systems were both maintainable and responsible. These need to revived and invigorated. Strategies should be recognize and build on these.
- Ethics of reuse and recycling of water resources must be merged into water management plans and strategies. There must be monetized motivations given for water conservation.

Education And Awareness

- Awareness and education on the significance of protection of the seaside and ocean atmosphere assist to meet social and financial necessities and ambitions of the country in the long run.
- Awareness camp on present regulations for managing of coastline areas needs to be conducted. Education and communication fact on the need for conservation and protection of unusual and endangered species need to be developed.
- Outcomes of research on marine resources, their growth and management need to be explained. The educational and communication material targeted at the public need to be developed in regional languages.
- Prospects for communications between communities, strategy makers, controlling agencies, NGOs, scientists, etc. must be increased.
- Suitable tactics and decision making tools that would improve the abilities of professionals, Government, and non-government establishments to take up local and community level action programs essential to be developed.

Conclusion

Problems of Water will not be solving by themselves. On the contrary, they will get worse unless we, as a global community, re-join and consume water responsibly. Therefore, before it is too late, we all, as a person, families, societies, companies & organizations, pledge towards using water wisely. Cleverness is not in richness but in conservation, so that our next generations can continue to enjoy the delightful feeling and touch of water.

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Rainfall Variability in Sangli District (Maharashtra)

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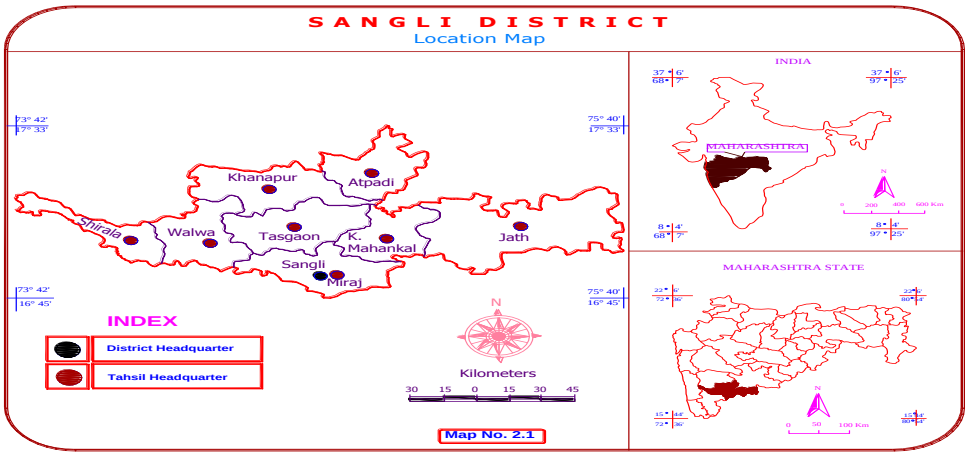
Introduction:

Water is the most important Natural source for all living things without water living things are does not survival on the earth surface; more than 70% of the Population in India is engaged in Agricultural. Rainfall is the best indicator to show the development of Agricultural. Indian economy is completely associated with the monsoon. Temperature and Rainfall is the huge parameters which affecting Agriculture activity of man.

Study Area:



The Sangli district is one of the district of Maharashtra states. It is located in the western part of Maharashtra. Sangli district.it is situated between 16^0 45'north to 17^0 33'north latitudes and 73^0 42' east to 75^0 40' east longitude. It is bounded by Satara and Solapur district in the north, Bijapur district in the east, Kolhapur and Belgaum district in the south and the Ratnagiri district to the west.

The east-west length of Sangli district is about 205 km and south- north width of the district is about 96 km. The area of the district is 8572.00 square kilometers and it is 21^{st} highest geographical area in Maharashtra state. It is at a height of 553 meter from normal Sea level. According to 2011 census there are 724 villages in Sangli District .There are 705 Grampanchayat and 10 Panchayat Samiti in the District.

Objectives:

The Present Study has been undertaken with fallowing Specific Objectives:

1) To study the average annual rainfall during the year 1991 to 2015 in study area
2) To find out trends of rainfall and Co –efficient of variations.

Data Base and Research Methodology:

The present study is based on secondary source of data it has collected from Indian Metrological Department for 25 years. Agricultural statistical information state Economic Review in Sangli District. The Data has been collected from 1991 to 2015 the trends of rainfall is calculated and re-present by mean.

Rainfall:

Distribution of rainfall over a region depends, apart from the latitudinal location, on the nature of topography and the distance from the sea. These features affect differently the seasonal rhythms of the air circulation and therefore also the rainfall distribution (Subrahmanyam).

The rainfall begins with an approach of South-West Monsoon from the middle of June and lasts up to the end of September. Sometimes the rainfall receives from the Bay to Bengal Cyclones during October and November. The uneven distribution of rainfall is a remarkable characteristic of the region. The western hill tracts of Shirala tahsil on an average receives rainfall of over 1000 mm in a year, whereas the Krishna basin, in the centre has about 750 mm rainfall. The north-eastern and eastern part receives lowest rainfall in the region averaging about 500 mm.

The rainfall is heavy in Shirala tahsil area. Yearly average rainfall is 1085 mm in the areas bordering Shirala tahsil on the east. As we go towards west of the region, the rainfall goes on increasing and in the extreme west the rainfall in about 6000 mm.

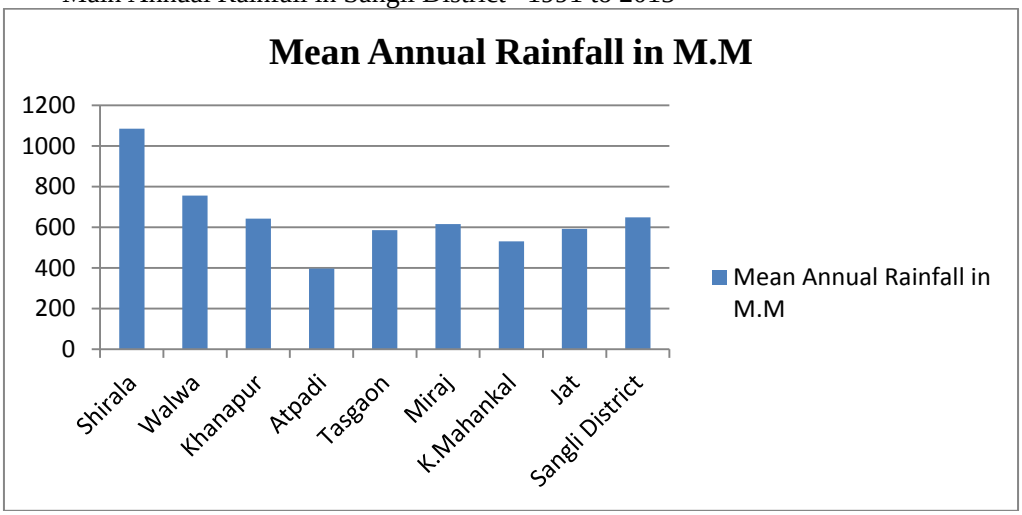
Table No. 2.4: Mean Annual Rainfall and Co-efficient of Rainfall Variability in Sangli District (1991 to 2015)

Name of the Tahsil	Mean Annual Rainfall in M.M	Co-efficient of Rainfall Variability in %
Shirala	1085	23.65
Walwa	756	30.73
Khanapur	642	22.11
Atpadi	397	36.92
Tasgaon	586	32.08
Miraj	616	30.94
K.Mahankal	530	27.61
Jat	592	27.01
Sangli District	649	19.63

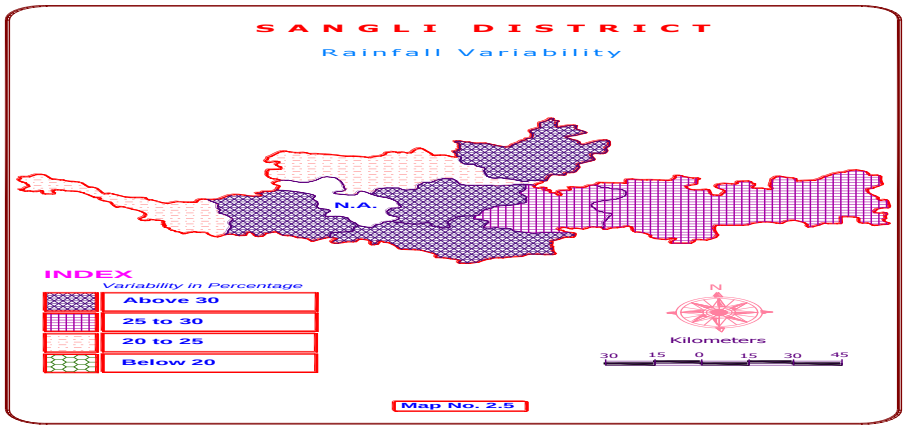
***Source:**-1) Socio-Economic Abstract of Sangli District 1994-95, 2015-16.*
2) Compiled by the researcher.

Thetahsil of Walwa, western part of Khanapur, Tasgaon and western part of Miraj fall within the rainfall range of 600 mm to 1000 mm. The rainfall goes on decreasing as we go towards east from the western boundary of Walwa tahsil. Therest of the region i.e. eastern part of Tasgaon and Miraj; Kavathe Mahankal, Atpadi and Jat tahsils receive scanty rainfall which is less than 600 mm.

Main Annual Rainfall in Sangli District 1991 to 2015



The other peculiar characteristic of the rainfall is that the average number of rainy days is about 49. Nearly 68% of the total rainfall receives during June to September and 19% during October and November. The region receives showers with thunder during the month of May.



Rainfall Variability:

The rainfall statistics have important bearings on water resources management, adjusting cropping pattern, improving the technique for flood forecasting etc. It is an established fact that any departure from the normal rainfall for a definite period will inevitably upset the characteristic water balance for that area leading to reduced fields or crop failure. A variability of rainfall in excess of 20% of the normal implies a great risk in farming (Singh). Thus a study of coefficient of rainfall variability (CV) is essential. Coefficient of Variation is worked out in percentage (Table No. 2.5 and Map No. 2.9) with the help of following formula:

$$C.V. = \frac{\text{Standard deviation}}{\text{Mean}} \times 100$$

Above 30 percent rainfall variability was noticed in Walwa, Atpadi and Tasgaon tahsils whereas 25 to 30 percent rainfall variability was found in K. Mahakal and Jat tahsils of the region. Below 25 percent rainfall variability was observed in Shirala and Khanapur tahsils of the study region.

Conclusion:

The rainfall varies from west to east. The extreme western part receives heavy rainfall and therefore, this region has very low concentration of population. The central part of the district receives moderate rainfall and hence, the intensity of population concentration is high. About one-third of the area under study, i.e. the eastern drier part of the district receives very low amount of rainfall inducing the drought condition. Obviously, this region is having moderate to low concentration of population.

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