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On

Changing Trends in Agriculture and its Impact on Rural Development

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Changing Trends in Agriculture and Its Impact On Rural Development

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Agriculture is on old age traditional occupation in India and still practicing in the modern world. The locational characteristics of the nation are determined by the nature and accordingly agriculture is practised. Indian economy is basically an agrarian economy with rural mass and contributing the national economy to the expected level.

The rural mass population is highly significant and contributing to the tune of 72.2 percent of the total population residing in 6,41,000 rural settlements along with 27.8 percent urban population lives in more than 5,100 towns and over 380 urban agglomerations as per the 2011 census. Over one decade lot of changes have been identified and many rural settlements have been in the fold of urbanisation process and increased the urban centres as per the requirement in different geographical space in the nation.

Our nation is proud to be in the arable land and has an area of **394.6** million acres, which is the second largest in the world, after the United States. Its gross irrigated crop area of 82.6 million hectares (215.6 million acres) is the largest in the world.

Indian irrigation infrastructure, i.e major and minor canals from rivers, groundwater, well-based systems, tanks and water harvesting projects for agricultural activities are responsible for the productions of not only the agricultural productions but also horticultural crops and plantations. The groundwater system is the largest. Of the 160 million hectares of cultivated land in India, about 39 million hectare can be irrigated by groundwater wells and an additional 22 million hectares by irrigation canals. Only about 35% of agricultural land in India was reliably irrigated. About 2/3rd cultivated land is dependence upon the monsoon.

The good old slogan that the Monsoon is gambling in Indian Agriculture is still holds in the nation. Due to this, uncertainty of Monsoon and its fluctuations is paved the way for drought and heavy rain is responsible for flood and both are equally responsible for changing the agriculture and the situations being harmful for agricultural activities. Inspit of this, the agricultural activities are managing in the nation in an effective manner.

The ***raising the production of food grains*** are an out come from the green revolution, which has brought drastic changes in agriculture through the introduction of new agricultural strategy. Annual growth rate of 2.08 per cent was recorded during 1970s. Annual growth rate of 3.5 per cent in food grains in 1980s is the hallmark of the green revolution that enabled India to become self sufficient in food grains and even a marginal exporter. The decade of 1990s could not maintain this pace and annual growth rate has fallen to 1.7 per cent which is just about equal to annual population growth. Total production of food grains has increased from 176.39 million tonnes to 233.9 million tonnes in a span of a decade. With the increase in size of population and the demand for food grains is likely to rise at the rate of 2.00 to 4.00 per cent in near future. If the country can maintain 4.00 per cent growth rate in agricultural production then after meeting its domestic demand, the country can export the surplus amount of food grains to the foreign countries in which it has favourable position.

The ***Diversification of Agriculture*** is another important dimension for changing agriculture in Indian scenario. Recently, it has been observed in the agriculture that the agricultural sector has been diversified to produce commercial crops and horticultural crops viz., fruits, vegetables, spices, cashew, areca nut, coconut and floricultural products like flowers, orchids etc., dairy and other animal husbandry products. The demand for these products has also been increasing. Liberalisation of the economy has created ample scope for

the development of agricultural sector both in terms of increased production and trade. The food processing units have been expanded with a adoption of new technology for the packaging, storage and transportation of horticultural products have brought so much of changes not only in the employment but also enhanced the economy.

The ***Development of Agriculture in Backward Areas*** has changed the agriculture in the nation. The agriculturally backward areas, having no irrigation system, dry land farming has been initiated. The other activities like horticulture, floriculture, animal husbandry, fishery etc. have been encouraged. Application of modern improved techniques in these areas has resulted in the development of many backward areas which were previously subjected to wide spread poverty.

The amazing growth of population requires many infrastructural developments, not only the housing in the urban areas but also corridor developments. The transportation system in all the means has been improved, the special economic zones have been identified and industrial estates haven set up, the power generating units have been set up and the urbanisation is a continuous process. This kind of process is responsible for ***conversation of agriculture land into non- agriculture*** on one side and merging the rural settlements into the fold of urbanisation on another side. One or the other way, the rural settlements have an impact by losing the well fertile agriculture land and agriculture laborious are force to migrate from the rural settlements.

Recently, the ***real estate business*** has emerged and become a big industry in India, where the conversation of agricultural land into non-agriculture is the main task of the people involved in this business. Therefore, it is not only a greatest threat to the future generation but also harmful to the environment.

The ***rural migration*** is another important draw back to the rural development mainly due to the non-availability of working days in all the seasons. However, the Employment Guarantee Scheme has been implemented in the rural areas but have not fully benefitted to the rural mass.

The main objective of ***rural development is to remove poverty of the people*** and fill the widened gap between the rich and the poor. Rural poverty alleviation has been the primary concern in the economic planning and development process of the country. The rural development which encompasses the entire gamut of improvement in the overall quality of life in the rural areas can be achieved through eradication of poverty in rural areas by paying more attention to the primary activities by providing required facilities and assured employability to the rural mass. The fallowing observations might have attracting the researchers to conduct the research in an effective manner to achieve the rural development.

1. The nature has provided an agriculture land to be used for agriculture purpose only by maintain the soil fertility.
2. The access of irrigation and using chemical and fertiliser is harmful not only for the production but also to the soil.
3. At any cost, the agriculture land should not convert into non-agriculture.
4. The rural settlements should not be in the threat due to any kind of infrastructural development.
5. The urban centres are not to be developed in the agricultural land.
6. The agricultural land should not be under the process of Industrialization.
7. The rural mass should have an employment opportunity in the agricultural sector.
8. The required technology must be extended to the ruralities, then only the rural development may achieve.

These are the important areas where an academicians have to focus in a deeper roots in a micro level and to take up an innovative research using remote sensing and GIS and to prepare a working model in the changing agriculture scenario with rural development of

view. Hope, the participants may present their papers in different dimensions on the focal theme of the conference in the forthcoming sessions may be the good guidelines for future prospects.

I wish the conference is most fruitful, effective and successful.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Levels of Agricultural Development in Osmanabad District: A Geographical Study

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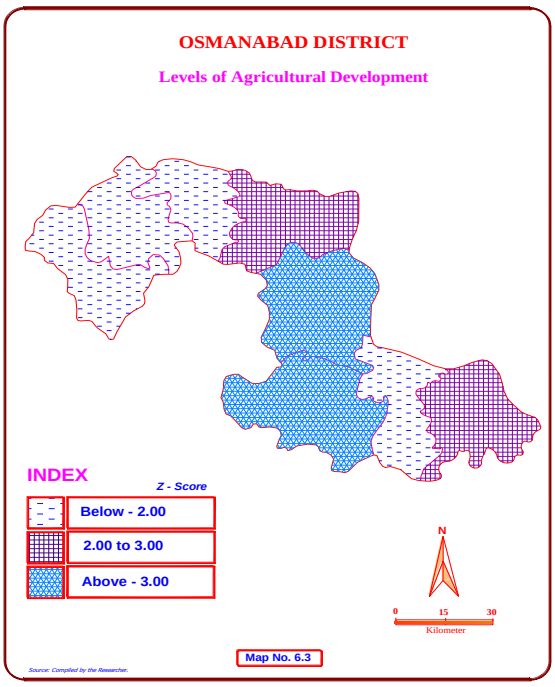
Abstract:

Disparities in productivity across the district and even within crops persist with significant increase in small and marginal land holdings. Agricultural development denotes the equality of agricultural system of the region. It is multidimensional concept which mainly includes development in real strength of cropped area? Farming system and irrigated area, high yielding improved verities of seeds, chemical fertilizers, insecticides and pesticides and specialization and commercialization of agriculture(Mohammed-1986)The changing scenario of agro-economy drew attention of researcher on diffusion of technological development in agriculture. Major Indian population depends on agricultural produce, so vast rural mass tries to earn their lively hood from agriculture. Fast increasing pressured of growing population on agriculture, tradition methods of techniques of production cannot crop with growing demand. As a result new techniques and commercial crops are adopted to developagro-economy.

Key Word: Spatial Variation, Levels of Development, Z-Score.

Introduction:

In the Osmanabad district spatial variation in the adoption of improved agricultural practices to ascertain level of agricultural development, The spatial variation is determined with the help of six variables viz. Net sown area, irrigated area, agricultural implements, Agricultural workers, Osmanabad districts central co-operative banks and crop productivity of yield index of Rice, wheat, Jowar, sugarcane, Groundnut and gram crops. Besides this the development of talukas are taken with their respective categories viz. high, medium and low on the basis of scores of standard deviation. These analysis have been carried out by transfer and combining the data relate to 11 variables using Z-score to get composite scores, on the basis of composite score the talukas have been classified into high, moderate and low development categories. As a result of the analysis shows that the modern technological inputs through agro service centers have reciprocal relationship with agricultural development in the studyarea.The growth rates of total food of grain production were less in the last two decades making traditional farming a nonviable agriculturalactivity.



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 24th 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.

Objective:

1) The main objective of the study is to levels of Agricultural development.
2) To calculate Standard Score for Agricultural Development.

Database andMethodology:

The assessment of agriculture development secondary data used for the period 2010-11, collected from District Statistical Handbook, Socio-Economic Abstract of district profile of Osmanabad districts. To determining the level of agricultural development various indicators variable have been used such as Net Sown Area, Irrigated area, Agricultural Implement, Agricultural Workers and Number of ODCC Banks.For calculation overall levels of agricultural development and it's even, distribution the data of all variables indicators have been transformed into Z-score techniques. To determine levels of agricultural development in the study region indices are selected. The selection of indices is of paramount significance in this respect. The indicators selected should clearly reflect the agricultural picture of the component areal unit of the study area. The talukas have been awarded proportionate weights on the basis of the data of the indicators.

The lowest value of *i*indicator in the talukas X_1, X_2, X_3…. X_n (say in X_5) has been awarded the score of 1. The weights of i indicator in remaining talukas have been determined on the basis of the following formula:

$$Wix_1 = \frac{i\,x_1}{i\,x_5}$$

Where,

Wix_1 = weight of i indicator in taluka x_1

ix_1 = numerical value of i indicator in taluka x_1

ix_5 = numerical value of i indicator in talukax_5

On the basis of the above formula, the weights of all the indicators in each talukas have been computed and in order to classify taluka according to their levels of development, the composite Z-score have been grouped into high, medium andlow.

The result of the standard score obtained for different indicators were aggregated by composite standard score (CSS). So that regional disparities in the level of development of the study regions may be obtained on a common sale. The composite Z-score may be algebraically expressedas;

$$CSS = \frac{\sum Zij}{N}$$

Whereas,

CSS - Composite Standard Score

Zij - Scored of an Indicator J in the districts

N - Number ofindicators

In order to classify the talukas according to the magnitude of development the composite score were divided into three classes that are high, medium andlow.

List of the Selected Indicators \Variables

X1-Percentage of Net sown area to total cropped area

X2- Percentage of Irrigated area to total cropped area

X3- Number of Agricultural Implement

X4-Number of Agricultural Workers

X5-Number of ODCC Banks

Agricultural development is a multidimensional activity and key to which is crop productivity as one of the vital aspect of rural development. The objective of agricultural development is usually increased growth of agricultural output to provide the livelihood to growingpopulation.

Distribution ofVariables/Indicators:

Net sown area(X1): The net sown area can be defined as the total area sown in a year. High net sown area higher will be the crop production and reflected in agricultural development. The top position occupied by the Tuljapurtaluka (3.67) evident from Table No.1.1 out of 08 talukas are under thiscategory.

The medium group ranges from 2.00 to 3.000 there are only three talukas under this category Osmanabad (2.98), Omerga (2.19) and Kalamb (2.13) and fourtalukasi.e.Paranda, Bhum, Washi and Loharaareunderthirdcategoryi.e.lowdevelopment.

Table No. 1.1 :Osmanabad District: Standard Score for Agricultural Development

Sr. No.	Taluka	X1	X2	X3	X4	X5	Composite Index
1	Osmanabad	2.98	3.09	6.35	3.70	4.80	4.19
2	Kalamb	2.13	3.07	2.70	2.00	3.00	2.58
3	Omerga	2.19	2.62	1.59	2.65	4.20	2.65
4	Tuljapur	3.67	3.69	4.61	2.75	3.20	3.58
5	Paranda	1.29	1.28	2.29	1.18	1.60	1.53
6	Bhum	1.53	1.52	1.65	1.22	1.40	1.46
7	Washi	1.03	1.00	1.00	1.00	1.00	1.01
8	Lohara	1.00	1.19	2.80	1.47	1.20	1.53

Source: *Compiled by the researcher.*

Irrigated area(X2):

Irrigation is very vital for any kind of agricultural development and prerequisite for the success of modern technology in agriculture. The need of artificial and additional water supply is always felt in successful farming operation. Irrigation plays significant role in the entire agriculture sector. The changing trends in intensity of irrigation portrays main's dynamic attempt to overcome environmental limitations to transform the potential of the area into agricultural resource (Singh 1974). The total irrigated area has been calculated as percent of the total sown area and further calculated Z-score of total irrigated. The high level of irrigation has been observed in Tuljapur (3.69), Osmanabad (3.08) and Kalmab (3.07) whereas medium level of irrigation is only one taluka indicates i.e. Omerga (2.62). Low level of irrigation was noticed in Bhum (1.52), Paranda (1.28), Lohara (1.19) and Washi (1.00) talukas.

Agricultural Implements (X3):

Advanced agricultural technology is not only the package of Hybrid seeds and other modern inputs, but it also incorporates new agricultural practices. This has made the mechanical power necessary for some operations which is very necessary during scarcity of labours relatively high wages labours particularly during peak season. Agricultural implements development or in other works these are the key to the modern agricultural development. High level agricultural implements has been recorded in Osmanabad (6.35) and Tuljapur (4.61) talukas, which the medium level of agricultural implements shown byLohara(2.80),Kalamb(2.70) andParanda(2.29)and Bhum, Omerga and Washi are in lowest category due to barran land, rugged topography, lack of irrigation.

Agricultural Workers(X4)

Agricultural workers are also important factors for agricultural development like chemical fertilizers. HYV seeds machineries etc. There are many activities in the field which

they perform. The highest number of agricultural labour has been found in Osmanabadtaluka (3.70) whereas a medium level development region was noticed in Tuljapur (2.75), Omerga (2.65) and Kalamb (2.00). Lohara, Bhum, Paranda and Washitalukas are showinglowestlevelofdevelopmentinagriculturallabours / workers.

Osmanabad District Central Co-OperativeBank (X5)

ODCC Bank plays very important role in the agricultural development. The phenomenal growth in the consumption of chemical fertilizers and other modern inputs can be made possible largely because of liberal provision of credit or loan to the cultivators by the co-operative of government. These Banks provide loan and subsidies to the farmers in terms of cash or machines and tools like tractors and pump sets. With the help of these facilities farmers accelerated the productivity of differentcrops.

Branches of ODCC Bank not equally distributed in the study regions. The high Z-score of ODCC Banks has been recorded in Osmanabad (4.80), Omerga (4.20), Tuljapur(3.20) and Kalamb (3.00) talukas and low level talukas are recorded in Paranda (1.60), Bhum(1.40), Lohara(1.20) andWashi (1.00).

The Spatial Pattern and Level of AgriculturalDevelopment:

Table No. 1.2:Osmanabad District: Spatial Pattern and Levels of Agricultural Development

Sr. No.	Z-Score	Level of Development	Number of Taluka	Talukas
1	Above 3.00	High	02	Osmanabad, Tuljapur
2	2.00 to 3.00	Medium	02	Omerga, Kalamb
3	Below 2.00	Low	04	Paranda, Bhum, Lohara, Washi

Source: *Compiled by the researcher.*

The spatial distribution of variables and agricultural development is not uniform in Osmanabad district. It provides very significant information about level of agricultural development. The study highlights that the majority of district come under high development of agriculture and it located at middle and southern part of studyregion.Agriculture is not developed in Paranda, Bhum, Lohara and Washi due to industrialization, conducive topography and irrigation facilities. For the development there

is need of irrigation facilities restrict during theagriculture. (Map No. 1.1)

The study highlights the impact of location and Agro Service Centers on agricultural development planning for the study region.

Conclusions:

High level agricultural implements has been recorded in Osmanabad (6.35) and Tuljapur (4.61) talukas, which the medium level of agricultural implements shown byLohara(2.80),Kalamb(2.70) andParanda(2.29)and Bhum, Omerga and Washi are in lowest category due to barran land, rugged topography, lack of irrigation.

The z-score value of all variable transformed and combined with help of Z-score and composite score was prepared (table-composite value). The composite score ranges from 1.01 to 4.19. Washitaluka is lowest in Osmanabad district. Osmanabad and Tuljapur is the most developed block in Osmanabad district and Washi is at the bottom. On the basis of composited Z-score the talukas have been categorized into three classes viz. high, medium and low which clearly shows the spatial variation in level of agricultural development in Osmanabad district on an average two talukas namely Osmanabad (4.19) and Tuljapur (3.58) which ranges their composite Z-score above (3.00) are highly developed talukas while medium level agricultural development regions was found in Omerga (2.65) and Kalamb (2.58) and remaining 4 talukas are under low categories of developmentParanda(1.53), Lohara(1.53),Bhum(1.46) and Washi(1.01).

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Sweet Orange Production, Productivity and Area of Jalna District A Geographical Study

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Abstract: -
Maharashtra is one of the leading states in the country in Horticulture Development.Employment Guarantee Scheme Linked Horticulture Development Programme Considering the very congenial climatic conditions and soil types, an ambitious scheme namely Employment Guarantee Scheme linked Horticulture Development Programme has been launched in 1990-91.The diverse agro-climatic conditions of the state are very congenial for cultivation of various horticultural crops. Jalna district is a leading producer of sweet orange in production and productivity in Maharashtra state. In the last decade area and production of sweet orange is decreasing by some bad climate condition. Jalna district falls in drought prone area, here people seriously face the water scarcity problem hence natural and artificial factor make big effect onsweet orange production in jalna district. In this paperattempt has been made to analyze the overall scenario in Jalna district.
Keyword-Field work, Production,Productivity and Area**.**

Introduction: -

The India occupies sixth position among citrus growing countries in the world. The sweet orange was cultivated in china for many centiries before it was introduced into Europe, most likely during the early fifteenth century, Columbus is credited with bringing sweet orange seeds among the fruits.Citrus group enjoys prime economic importance. In India citrus occupies 10.5 percent of total area under fruits. It is the third largest fruits industry next to mango and banana. In citrus sweet orange is one of the most important commercial crops in India.Sweet orange serves as the most refreshing delicious and health promoting juicy fruit and as such, they deserve a prominent place in diet. Its juice is rich in vitamin 'C' and is good source of vitamin 'A' and 'B'...Sweet orange is the most widely grown citrus fruits in India and the world. This is mainly due to the Govt. policies like establishment of separate Department of Horticulture in 1981 and linking horticulture development with Employment Guarantee Scheme in 1990. Creation of various infrastructure facilities like establishment of horticulture nurseries, irrigation facilities also helped for horticulture development.The importance of the sweet orange industry to India's agricultural economy is not likely to decline in the foreseeable future as vast expanseof India continue to be developed for sweet orange production and productivity.

Selection of the Topic: -For the present research paper Jalna district has chosen as a study region because of the following factor.

The study region is socially-economically backward and has poor cold storage and marketing facility.

Research Objective: -

1) To study the geographical condition of Jalna District.
2) To study the spocio-temporal changes of sweet orange area, production and productivity in Jalna District.

Hypothesis: -

1. There is impact on sweet orange production due to conducive geographical condition of Jalna district.
2. There is scope for improvement in economical/financial condition due to sweet orange production, productivity and area.

Research Methodology:

The present study is based on different sources of data. The data analysis includes the theoretical statistical and quantitative methods will be used to analyze actual area under sweet orange production and potential of horticulture crop**.**For the calculation of co-efficient of variation following formula is used.

$$C.\ V. = \frac{S.D.}{Mean} X\ 100$$

C.V. = Co-efficient of variation.

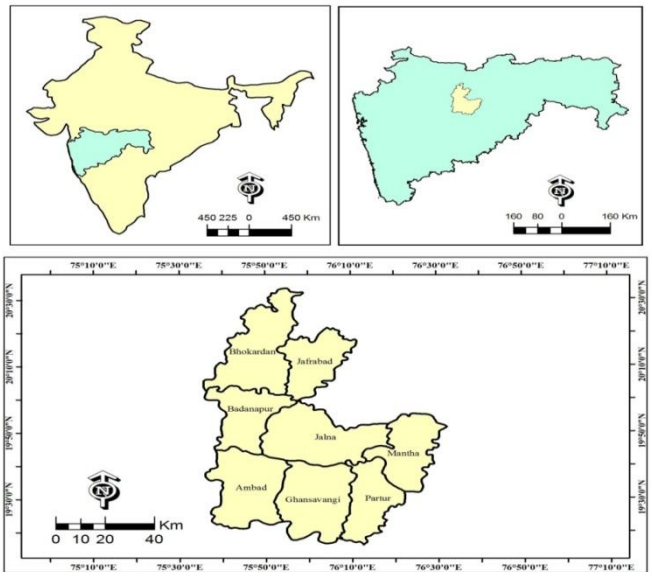
S.D. = Standard deviation.

Present study has been carried out with the help of secondary data obtained from soci-economic abstract of jalna district, national horticulture hand book. etc and other secondary data. Tools Mean, Standard deviation, C.V. Method by Enyedi technic –Productivity index.

Study Area of the Research: -

Jalna district is situated at the central part of the Maharashtra state of republic of India and northern direction of Marathwada region. Especially district lies between 19^0 01' North to 21^0 03' North Latitudes and $75^0$04; East to $76^0$04' East longitude. Jalna district erstwhile a part of Aurangabad district was formed on 1st May, 1981 by carving out jalna, Bhokardan, Jffrabad and Ambad tahsil of Aurangabad district and Partur tahsil of Parbhani district. The boundaries of Jalna are adjacent to Parbhani and Buldhana on East, Aurangabad on West, Jalgaon on North and Beed on South. Jalnadistrict covers an area of 7,728 sq.km which is 2.47(%) percent of the total state area. It has population of 19.58 lakh as per 2011 census.

Jalna District location Map



Source: -Survey of India.

Sweet Orange Area, Production and Productivity in Jalna district

Sr.No.	Year	Area ('000ha')	Production ('000mt')	Productivity (mt/ha)
1.	2004-05	15400	154000	10
2.	2005-06	16500	165000	10
3.	2006-07	17000	187000	11
4.	2007-08	17400	174000	10
5.	2008-09	18100	181000	10
6.	2009-10	18644	223728	12
7.	2010-11	19000	418000	22
8.	2011-12	36736	840519.68	22.88
9.	2012-13	17985	359700	20
10.	2013-14	13000	299000	23
	Ave.Mean	18976.50	300194.77	15.09
	S.D.	6483.29	210241.83	6.01
	C.v.	34.16	70.04	39.83

Source- Agriculture Dept. Of Jalna district.

Y T

Enyedi crop productivity Index: -Pn =- ------ = ------ *100

Yn Tn

Productivity Index: -

Y =The total Production of the selected crop in unit area,Yn =The total production of the same crop on nation scale ,T =The total cropped area of the unit area,Tn =The total cropped area at nation scale.

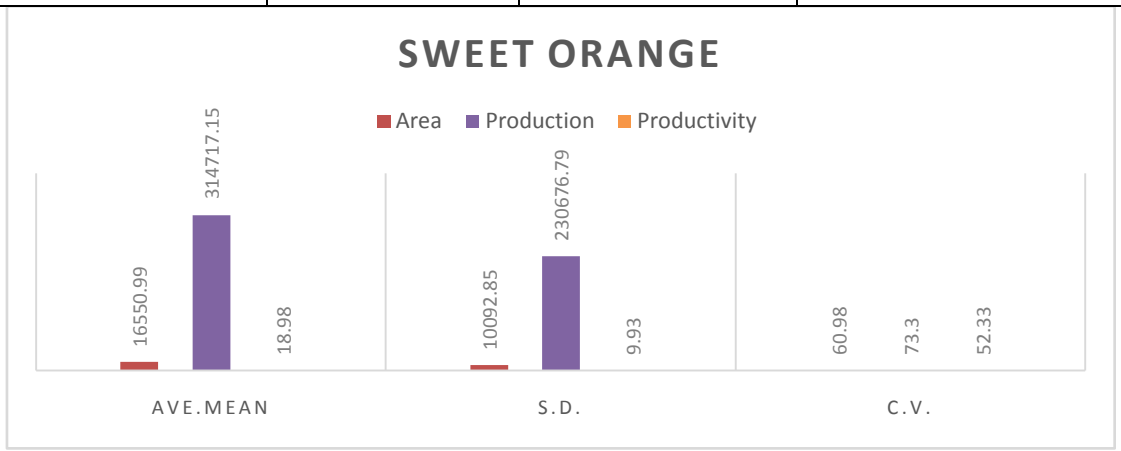
Tahsil wise sweet orange Area, Production and productivity in Jalna District.

Sr.no	Years/Thsils	2003-2004		2004-2005	
		Area(ht.)	Production (mt)	Area (ht)	Production(mt)
1.	Bhokardan	86	58	108	62
2.	Jalna	796	112	815	123
3.	Badnapur	1705	615	1,815	645
4.	Ambad	3659	1525	4,108	2,253
5.	Ghan.gi	2047	1192	2,347	2,107
6.	Partur	928	252	1,010	342
7.	Mantha	10	222	1,941	855
8.	Jafrabad	-	-	-	-
	Total	12,642	4,721	14,822	7,137

Source:-Completed by author.

Jalna district in sweet orange Average mean,S.D.,C.V.

Formula	Area (ha.)	Production(mt.)	Productivity(mt/hat)
Ave.Mean	16550.99	314717.15	18.98
S.D.	10092.85	230676.79	9.93
C.v.	60.98	73.30	52.33



Source-: -Completed by Researcher

Summary: -Salient Features of the Employment Guarantee Scheme. 25 fruit crops covered under the scheme.Sweet Orange is a major fruit crop in Marathwada region of the State. 0.77 lakh hectares area is under this crop and 0.34 lakh hectares is under production. The total production is about 5.18 lakh M.T. Since 1998-99, control market is started at Jalna for sweet orange growers in their production area. Irrigation is always interlinked with the modernization of the system of agriculture or horticulture. Particularly drip irrigation technology becomes more popular in the field of horticulture. But the drip irrigation technology has not become popular in Jalna and has not been adopted by the cultivators. Land

use pattern of the study region shows that in the year 1991-92 the highest 89.02 percent net sown area had seen in Ambad tahsil. This pattern changes and for the year 2009-10the highest 90.15 percent net sown area had seen Ghansawangi tahsil. Average Min in sweet orange Jalna district area 16550.99(ht.),Production 314717.15 (mt.) and Productivity 18.98 (mt/ha).Study of exotic varieties of sweetorange to find out suitable seedless and firm skinned varieties need to be taken up. Varieties suitable for processing. Artificial factors like Cold-storage facilities have seen only in Jalna tahsil remaining tahsil have no Cold-storage facilities whereas greenhouse farming of sweet orange is very less.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Identification of Rural Service Centres Of Western Khandesh Region of Maharashtra State

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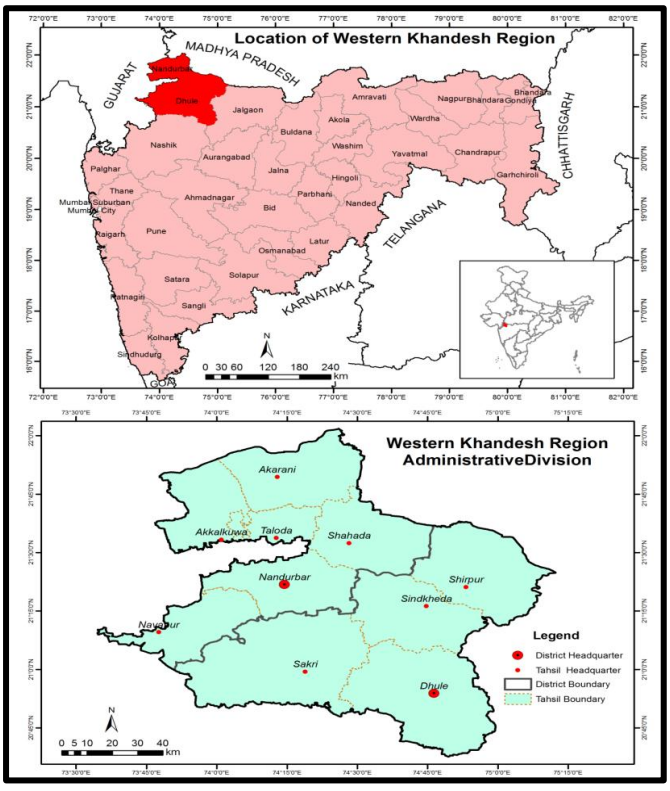
Abstract
The term, Rural Service Centre plays an important role in the life of the villagers. The main role of a Service Centre is to render services to the surrounding area. In the present study an attempt is made to evolve the methodology for identifying Rural Service Centres of Western Khandesh Region of Maharashtra and to study them according to their hierarchical orders.
Key Words: Rural Service Centre, Centrality, Centrality Score, Hierarchical Order

Introduction

From ancient times, Service Centres have occupied a pre-eminent position in the rural life-system. They provided focal points for the provision of services and goods for people living in isolated and dispersed areas. Being centres of collection and distribution, Rural Service Centres assume even greater significance today, as convenient nodes for propagating socio-economic development and providing vital linkages in the communication and delivery systems. A Study of service centres helps to better understand the region in sharing the functions of a rural set up. It takes in to account the growth poles of the region and gives a glimpse of the possible bases for expansion in the future'. (Job, 1980) The term 'Rural Service Centre' is mainly concerned with 'Central Place' and the term 'Central Place' was first time used by Mark Jefferson in 1931. This term, however, becomes more significant after the classical study of Walter Christaller in 1933.

STUDY REGION



Western Khandesh region is situated in the middle Tapi basin which is lying in the south of the Satpura Mountain. Its latitudinal extent is between 20°.38' North and 22°.03' North and longitudinal extent is from73°.31' East to 75°.11' East. it is bounded by two districts of Maha rashtra i. e. Jalgaon in the East and Nasik in the South. The area of the state of Madhya Pradesh is sprea d along the northern border while in the west Gujarat state are bounded.

Western Khandesh Region is located in north-western part of Maharashtra. It occupies approximately 13,150 sq. km area. This area is 2.35 percent of the total land area of Maharashtra state.

Topographically Western Khandesh Region can be divided in to four parts, Northern mountainous region of Satpura, Western hilly region, Southern plateau and hilly region and Central Tapi basin plain. The entire region of Western Khandesh Region is drained by the middle Tapi - a principal river system. The climate of the region is hot and dry, but in mountainous and hilly region climate is comparatively cool.

As per the 2011 Census, the population of Western Khandesh Region is 3699157 which is 3.29 present of the total population (112374333) of Maharashtra State.

Objectives

1. To explain the term service center and identify the Rural service centers in the region under study.
2. To arrange the Rural Service Centres in Hierarchical order and study them according to their orders.

Need of Study

Rural Service centre is an accessible location from which goods and services are provided for rural people living in the surrounding area. Rural Service Centre is the functional unit of grocery shops, general merchandise shops, minor repair facilities, tailor shops, barber shops, restaurants, primary and middle schools, health, post, transport, co-operative, community centres and other necessary infrastructural facilities. Sometimes service centres may improve life style of the surrounding community, because the standard of rural life depends upon availability of facilities. Ifthese amenities and services are inadequate, they are rendered by these Service centres.Considering with the functional importance of rural service centre in rural area it is necessary to find out and study them in any given area.

Database

In the present geographical study, a systematic approach has been used and balanced geographical account of Rural Service centres of Western Khandesh Region has been developed on the application of firm statistical base.

The secondary data have been collected from the District Census Handbooks, District Gazetteer, Government Websites.

Methodology

In the present study, for determination of Rural Service Centres in Western Khandesh Region, following three methods have been applied. The service centre provides available amenities and services to its surrounding population. The amenities are in terms of units while services engaged in tertiary services are served by workers. It is therefore, centrality scores can be calculated with the help of threshold population required for each amenity. For these, following two first methods are applied.The third method – Christaller's Method is applied to the workers engaged in tertiary activities especially 'Other workers'.

1. Threshold Value Method
2. Average Weightage Method
3. Christaller's Method of Centrality

By applying these methods, centrality scores of all villages in the district havebeen calculated and those villages which have surplus centrality scores are considered as Rural Service Centres.

Methods For Measuring Centrality

Threshold Value Method

This method is based on **Threshold Population Weightages.** In this method, following steps are involved-

Step-1. Classify selected amenities of rural settlements in the study region by different population sizes.

Step- 2. Prepare frequency table for each amenity. Apply quartile technique.

Formula –

$$Q_1 = L + \frac{(\frac{N}{4} - Cf)}{f} \times CI$$

Step – 3. Consider the calculated value of Q1 as a threshold population for that particular amenity / service. Threshold population means the initial population or demand for establishing a particular function in a settlement or area.

Step- 4. Assign 1 Weightage to the value of Q_1 (Threshold population).

$$\text{Expected Weightage of 'X' Amenity Of 'A' Place} = \frac{\text{Total Population of 'A' Place}}{\text{Threshold Value of 'X' Amenity}}$$

Step- 5. Determine the expected weightage of each amenity of every settlement with the help of threshold population and total population of the settlement.

$$\text{Differences between the actual number and expected weightage of 'X' Amenity of 'A' Place} = \frac{\text{Actual Number of 'X' Amenity of ' A' Place}}{\text{Expected Weightage of 'X' Amenity of 'A' Place}}$$

For example

1) If a village is having 3 primary schools and the total population of that village is 2000.

2) Assuming that, the calculated Q1 value for one primary school in the region is 1000. Which means the value is considered as a threshold population for establishing 1 primary school in a village.

3) Considering 1 weightage for a threshold population, the expected weight required for the village would be 2. This means the village has 1 weightage surplus, which would be used for rendering the service of primary school to the surrounding population.

Step- 6. Find out amenity- wise differences between the actual number of amenities and expected weightages of a settlement.

Step-7. Calculate total differences of weightages of all amenities in a settlement.

Step-8. Ifthe particular village is having aSurplus Centrality score, the village is said to be as a rural service centre.

Step-9. On the basis of this technique, determine the total number of rural service centres in the study region.

Step-9. With help of Zip's graphical method of hierarchical order, find out the various hierarchical orders of all rural service centres in the region under study.

Average Weightage Method

In this method, ratio of average amenity and average population per village in the district as a whole is considered as one weightage. This ratio is considered as a threshold value for occurring a particular amenity in a region under consideration.This method is applied by following manner-

Step- 1. Calculate average population per village in the district

$$\text{Population Per Village} = \frac{\text{Total Rural Population in the Region}}{\text{Total No. of Villages in the Region}}$$

Step- 2. Calculate average number of particular amenities per village in the region.

$$\text{'X' Amenity Per Village} = \frac{\text{Total 'X' Amenities in rural area of the Region}}{\text{Total No. of Villages in the Region}}$$

Step- 3. Consider 1 weightage for the calculated ratio.

$$\text{'X' Amenity Per Person} = \frac{\text{'X' Amenity Per Village}}{\text{Population Per Village}}$$

Step- 4. Determine the expected weightage of each amenity of every settlement with the help of 'X' Amenity per Person.

$$\text{Expected Weightage of 'X' Amenity of 'A' Place} = \text{'X' Amenity Per Person} \times \text{Total Population of 'A' Place}$$

Step- 5. Find out amenity-wise differences between the actual number of amenities and expected weightage of a village.

Step- 6. Calculate Centrality Score of settlements by adding of all amenity–wise differences of a particular settlement.

Step- 7. Determine Service Centres with the help of surplus centrality score of all villages.

Christaller's Method of Centrality

This Method is based on Walter Christaller's centrality formula. In this method, the centrality of a particular place is determined by the following equation-

$$Ca = Ta - \left(Pa \times \frac{Td}{Pd} \right)$$

Where,

Ca is Centrality of 'A' Place,
Ta is Total Number of Tertiary Workers of 'A' Place
Pa is Total Population of 'A' Place
Td is Total Number of Tertiary Workers in the Region
Pd is Total Population of the Region

In this method, two steps are involved-

Step- 1. Find out centrality of a particular place (Rural settlement) by applying above mentioned formula.

Step- 2. Determine the Rural Service Centres with the help of centrality score of all villages.

By applying the above research techniques, the following results are obtained:

Table No.1, Western Khandesh Region: Total number and proportion of Rural Service Centres to total number of rural settlements, identified with the help different methods

Sr. No.	Tahsil	Rural Service Centres By					
		Threshold Value Method		Average Weightage Method		Christaller's Centrality Method	
		Numbers	Percentage	Numbers	Percentage	Numbers	Percentage
1	Dhule	64	39.26	5	3.07	73	44.79
2	Shirpur	40	27.59	4	2.76	63	43.45
3	Sakri	40	17.78	2	0.89	161	71.56
4	Shindkheda	44	31.21	5	3.55	89	63.12
5	Nandurbar	51	34.23	7	4.70	93	62.42
6	Shahada	43	23.63	9	3.85	104	57.14
7	Nawapur	29	18.59	5	3.21	123	78.85
8	Taloda	7	7.61	11	11.96	60	65.22
9	Akkalkuwa	16	8.47	18	9.52	162	85.71
10	Akrani	7	4.32	23	14.20	128	79.01
Region		**341**	**21.27**	**89**	**5.77**	**1056**	**65.13**

(Computed by Author)

Rural Service Centres In The Study Region

When above mentioned methods of centrality have been applied to all rural settlements in the study region, following results are obtained (Table. No. 1)

1By Threshold Value Method, there are in all 89 (5.54%) Rural service centres identified in 2011. 2.Out of the 1604 villages in the Region 65.13 percent (1056) villages are observed as Rural Service Centres by Average Weightage Method.3.By Christaller's Method of Centrality, 341 (21.27) villages are identified as Rural Service Centres in the entire Region.

Identification Of Rural Service Centres According To Threshold Value Method

The rural service centres in Western Khandesh Region have been identified with the help of the Threshold value method. It has been found that 89 (5.54%) rural settlements in the study region have been identified as rural service centres. This indicates that, considering the initial requirement of demand which is expressed in terms of threshold population, the services and amenities like education, health and other infrastructural facilities available in Western Khandesh Region are inadequate. All these rural service centres are classified in hierarchical orders with the help of Zip's graphical method.

Table No. 2, Western Khandesh Region: Classification of Rural Service Centres according to their hierarchical orders (According to Threshold value Method)

Sr. No.	Tahsil	Hierarchical Order of Service Centre				Total
		I	II	III	IV	
1	Dhule	-	1	1	3	5
2	Shirpur	-	-	1	3	4
3	Sakri	-	-	-	2	2
4	Shindkheda	-	1	2	2	3
5	Nandurbar	-	2	1	4	7
6	Shahada	-	4	1	4	9
7	Nawapur	-	-	1	4	5
8	Taloda	1	2	1	7	11
9	Akkalkuwa	1	4	5	8	18
10	Akrani	1	2	7	13	23
Region		3	16	20	50	89

(Computed by Author)

It is observed in Fig. No.3 and Table No. 2 that relatively high concentration of Rural Service Centres was found in the western tahsils. This might be due to the population size of villages located in these tahsils is small. The regional threshold population calculated for each service is comparatively high. In this situation, if the small village gets facilitated with a lower order service it would keep certain surplus service which would be useful for the villages located in its service area. In the southernareas the number of Rural Service Centres was very limited in 2011. This naturally indicates that the rural settlements located in this part were relying more on the tahsil headquarters for availing the services and facilities. It becomes clear from the Fig. No. 3that; the north-western hilly and tribal part of the region have high concentration of Rural Service Centres. It includes all kinds of hierarchical orders. Specifically, among them are 1st order Rural Service Centres like Ukhalsag in Akkalkuwa tahsil, Chippal in Akrani Tahsil and Halalpur in Taloda tahsil. Out of 89 identified Rural Service Centres, 16 Rural Service Centres were in 2nd order, 20 in 3rd order and 50 in 4th order of hierarchy. Majority of them are located in the north-western mountainous tahsils. The reason for this high concentration is again the same. The size of rural settlements in this region is small, but due to government's policy of tribal development they are provided with lower order services by which some of these villages got the status of service centres. In the remaining part of the study region, we find few Rural Service Centres scattered randomly all over the region. In this part the big settlements and urban centres provide the various services to their surrounding hinterland.

Western Khandesh Region: Hierarchical Orders of Rural Service Centres according to Surplus centrality scores (Threshold Value Method,2011)

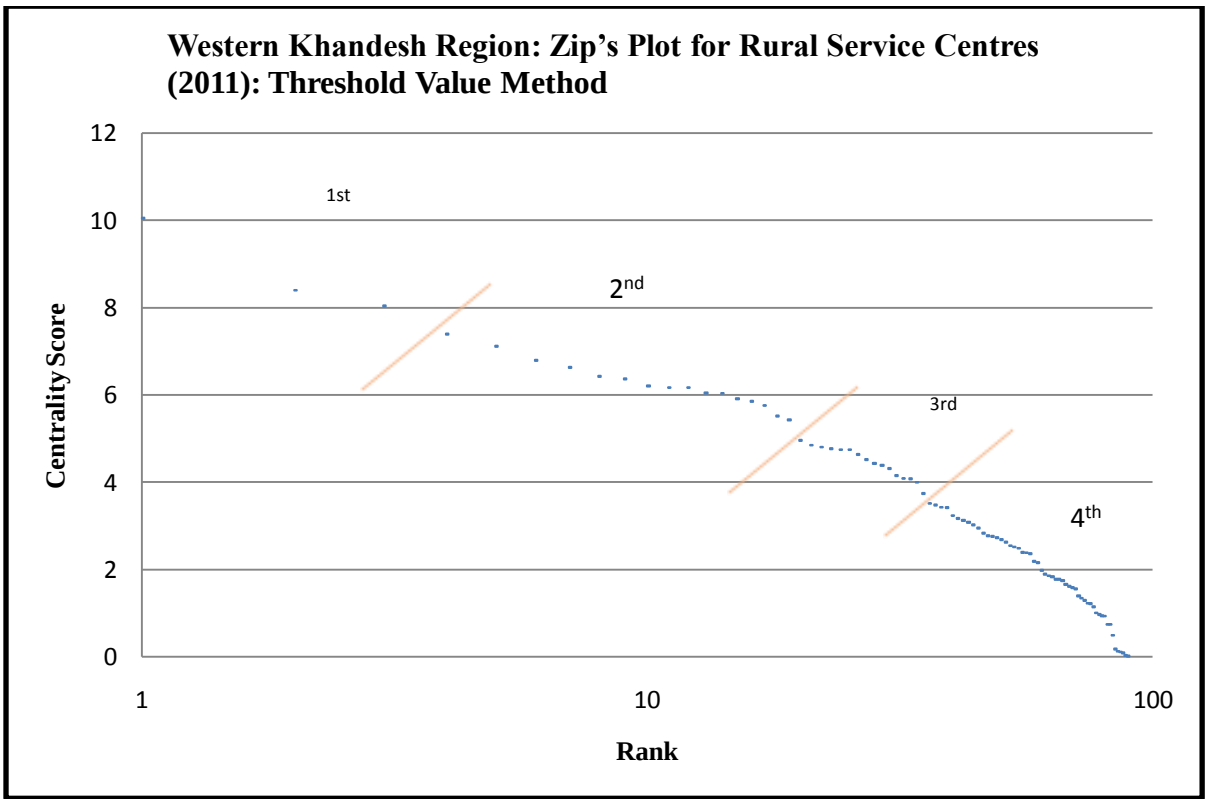


Fig. No. 2

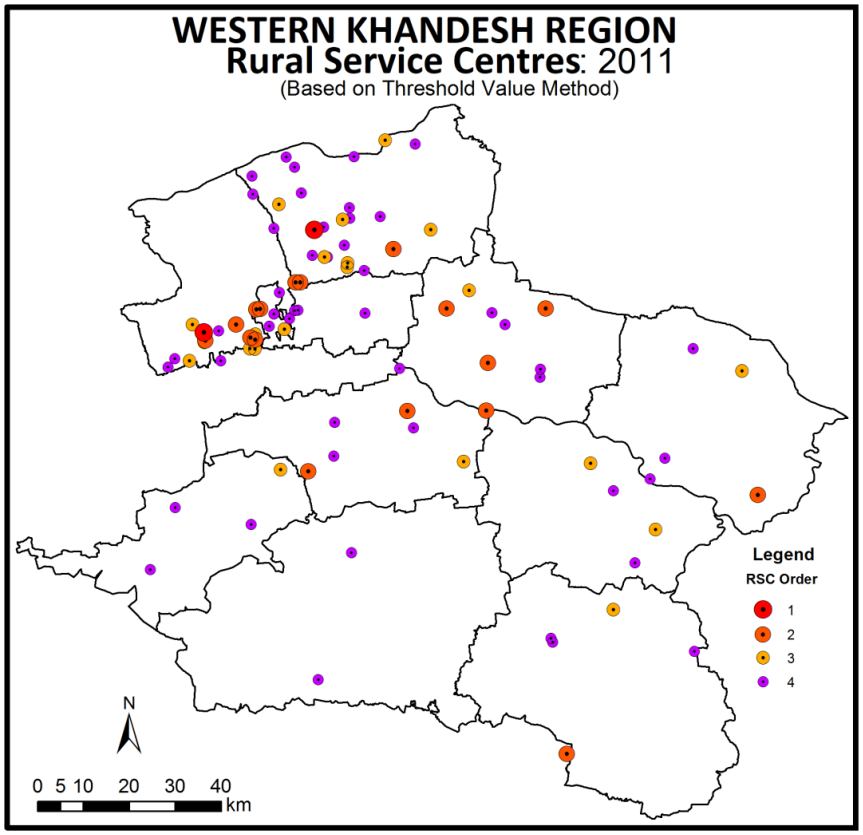


Fig. No. 3

Identification Of Rural Service Centres According To Average Weightage Method

This method could give us a more reliable device, as it eliminates the local demand and clearly shows the surplus of importance. According to 2011 census out of 1604 villages 1056 (65.83%) villages were determined as Rural Service Centres in the study region. The Table No. 3 and the Fig. No 5 bring to the conclusion that a large number of villages (65.83%) in 2011 have surplus centrality scores in the region. This is because; a village may serve as a market centre or an important location for dispensary, or perhaps have educational institution. Even small villages with its small population and one or two amenities also can boast of some surplus centrality scores and consequently serve as a Rural Service Centre. In the region, therefore, 65.83 percent villages perform the role of Rural Service Centres. Though, their capacity of rendering services is very limited, they provide one or two services to the nearby villages. The proportion of such service centres as expected was more in the western half of the tribal region

The first order service centers in the region in 2011 were Kudashi, Walheri and Dhadgaon located in Sakri, Taloda and Akranitahils respectively.

There were only three second order service centres, especially located in Nawapur tahsil (2) and Akrani tahsil (1).Third order Rural Service Centres were 11in number. Two each were located in the eastern and the western parts of the region. Their distribution was like this - Sakri tahsil 4, Akrani tahsil 3, Akkalkuwa tahsil 2, and Nawapur and Shahada tahsils have one each.Near about 13 villages were identified as Rural Service Centres in the arrangement of the 4^{th} hierarchical order. These centres were spread over in Nawapur (4), Akkalkuwa tahsil (3), Sakri and Akranitahsils (each having 2), Shahada and Shindkheda (1 each). In remaining part of the region the Rural Service Centres were not existed in this order. The lower order (5^{th}) of hierarchy included 1026 (97.15%) Rural Service Centres of the region. The highest number of Rural Service Centres (162) was located in Akkalkuwa tahsil and the lowest number of villages was from Taloda tahsil (Table No. 3). In most of all these service centres higher order service centres were fewer in number. Most of these lower order service centers were clustered around relatively larger centres which show their interdependence.

Table No. 3

Western Khandesh Region: Classification of Rural Service Centres according to their hierarchical orders (According to Average Weightage Method).

Sr. No.	Tahsil	Hierarchical Order of Rural Service Centres					Total
		I	II	III	IV	V	
1	Dhule	-	-	-	-	73	73
2	Shirpur	-	-	-	-	63	63
3	Sakri	-	-	4	2	154	160
4	Shindkheda	-	-	-	1	88	89
5	Nandurbar	-	-	-	-	93	93
6	Shahada	-	-	1	1	102	104
7	Nawapur	-	2	1	4	116	123
8	Taloda	1	-	-	-	59	60
9	Akkalkuwa	-	-	2	3	157	162
10	Akrani	1	1	3	2	121	128
Region		3	3	11	13	1026	1056

(Computed by Author)

Western Khandesh Region: Hierarchical Orders of Rural Service Centres (Average Weightage Method,2011)

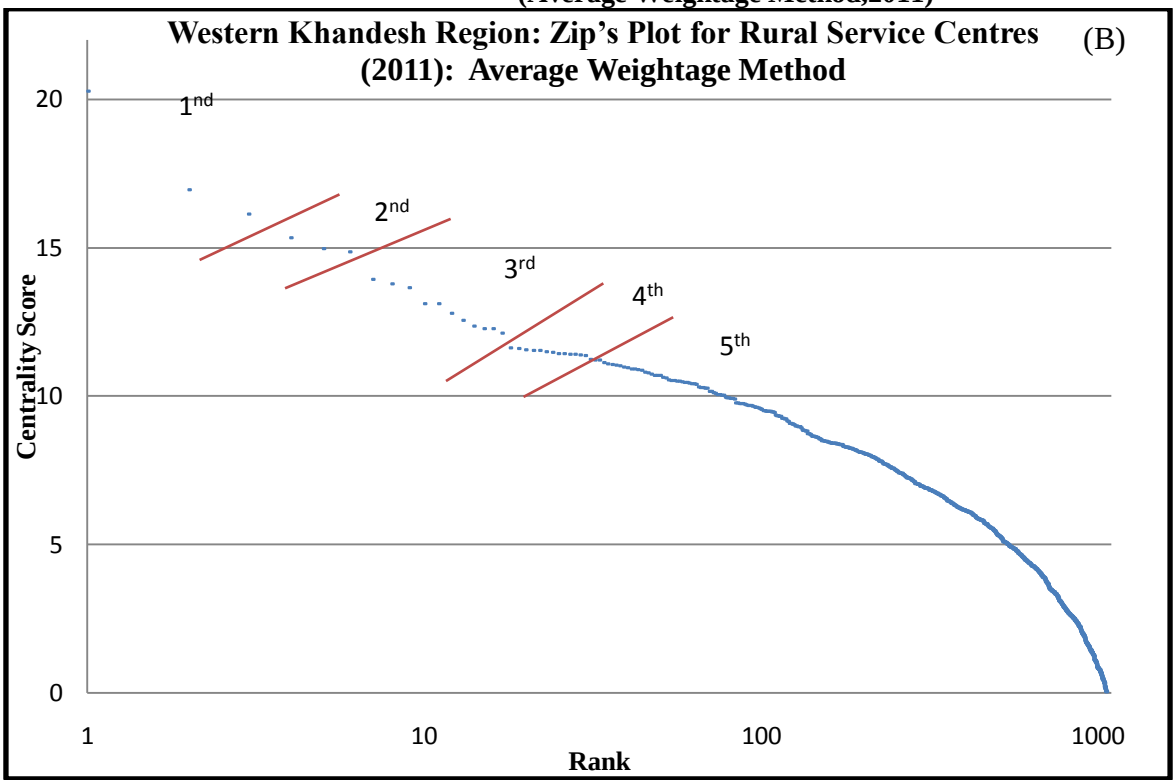


Fig. No. 4

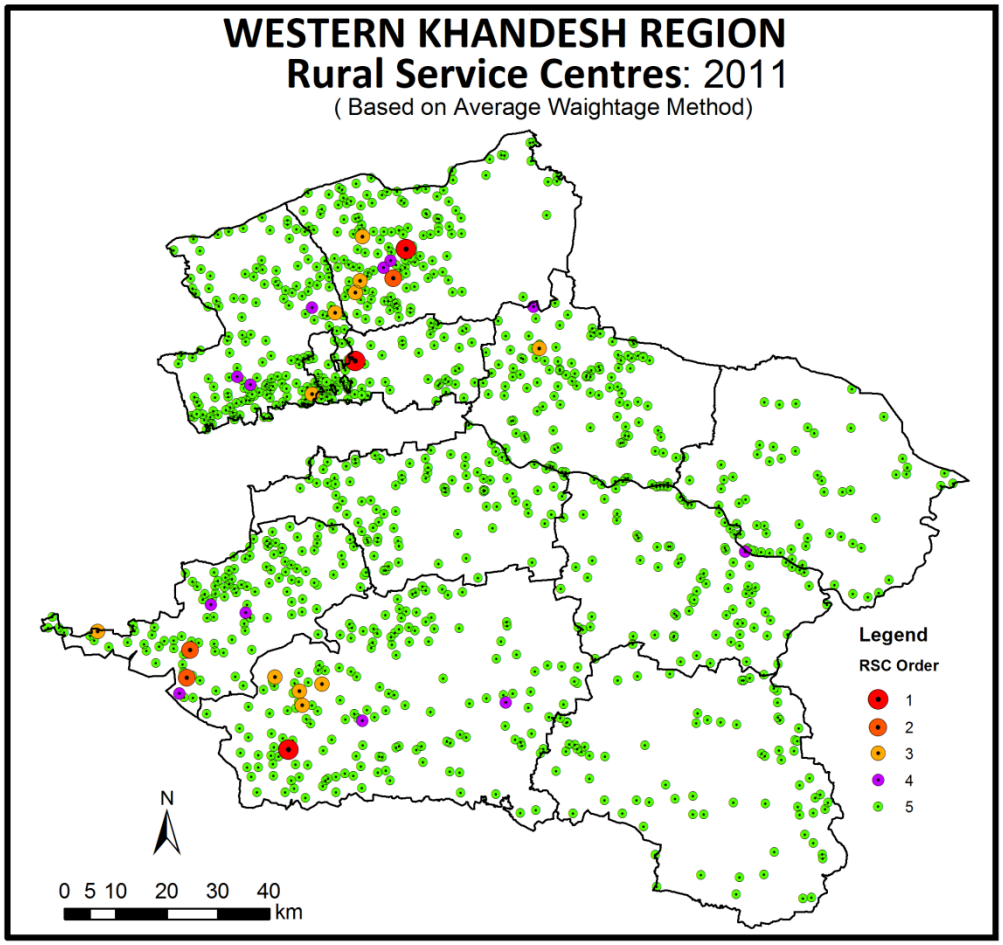


Fig. No. 5

Identification Of Rural Service Centres According To Christaller's Method Of Centrality

Based on Christaller's Method of Centrality, in this method other workers engaged in the services like education, medical, glossary, transport and facilities like market etc, are considered as tertiary workers. These workers especially considered as other workers provide various services to the villagers. Considering with the number and the proportion of rural service centres existed in the region, the availability of services in the rural area of the region is adequate.Most of the dependent villages for their services are relying on the nearby large settlements or urban centres.

Seven classes of Rural Service Centres are emerged in the entire region. These orders in the hierarchy of Rural Service Centres make an efficient system of nodes and routes for the delivery of goods and services. There are 341 Rural Service Centres in Western Khandesh region. These Rural Service Centres contain 34 percent of rural population. Out of 341 Rural Service Centres in the region only 3 Rural Service Centres are included in the first or highest order of hierarchy. Maximum numbers of Rural Service Centres (225) are included in the seventh or lowest order of hierarchy. The highest centrality score (+3490.33) has been recorded in Pimpalner (Sakri Tahsil), while the lowest (+0.0024) in Wankute (Nandurbar Tahsil).In this entire region, from first order to fifth order of hierarchy, Dhule Tahsil has the highest number of Rural Service Centres. (Table No. 5)

Shindkheda, Pimpalner and Songir are the first order Rural Service Centres as per Christaller's Centrality method. They are large settlements and acquired the central locations. Shindkheda is a tehsil place in which educational, medical, commercial and transport services are available in surplus quantity. Pimpalner is also a large settlement; its population is 23365 as per 2011 census. Pimpalner is a large market centre in Sakri tehsil and providing various services to the surrounding semi-tribal region. The third higher order service centre isSongir. It is situated on National Highway No.6. Due to its most accessible location, it has different kinds of businesses. Except Sakri tehsil, the Second order rural service centres are identified in all tehsils in the region under study. More than 80 percent rural service centres are in lower order. These rural centres generally provide one or two lower order services to their surrounding villages.

Table No. 4

Western Khandesh Region: Classification of Rural Service Centres according to their hierarchical orders (According to Christaller's Method of Centrality)

Sr. No.	Tahsil	Hierarchical Order of Rural Service Centres							Total
		I	II	III	IV	V	VI	VII	
1	**Dhule**	1	2	2	9	6	10	34	**64**
2	**Shirpur**			3	3	3	9	22	**40**
3	**Sakri**	1		1	6	2	6	24	**40**
4	**Shindkheda**	1		2	2		9	30	**44**
5	**Nandurbar**			1	4	1	6	39	**51**
6	**Shahada**		1		6	5	3	28	**43**
7	**Nawapur**			2	1		2	24	**29**
8	**Taloda**				1			6	**7**
9	**Akkalkuwa**				1	1	2	12	**16**
10	**Akrani**						1	6	**7**
Region		**3**	**3**	**11**	**33**	**18**	**48**	**225**	**341**

(Computed by Author)

Western Khandesh Region: Zip's graphical method of Hierarchical orders of Rural Service Centres: Christaller's Centrality Method (2011)

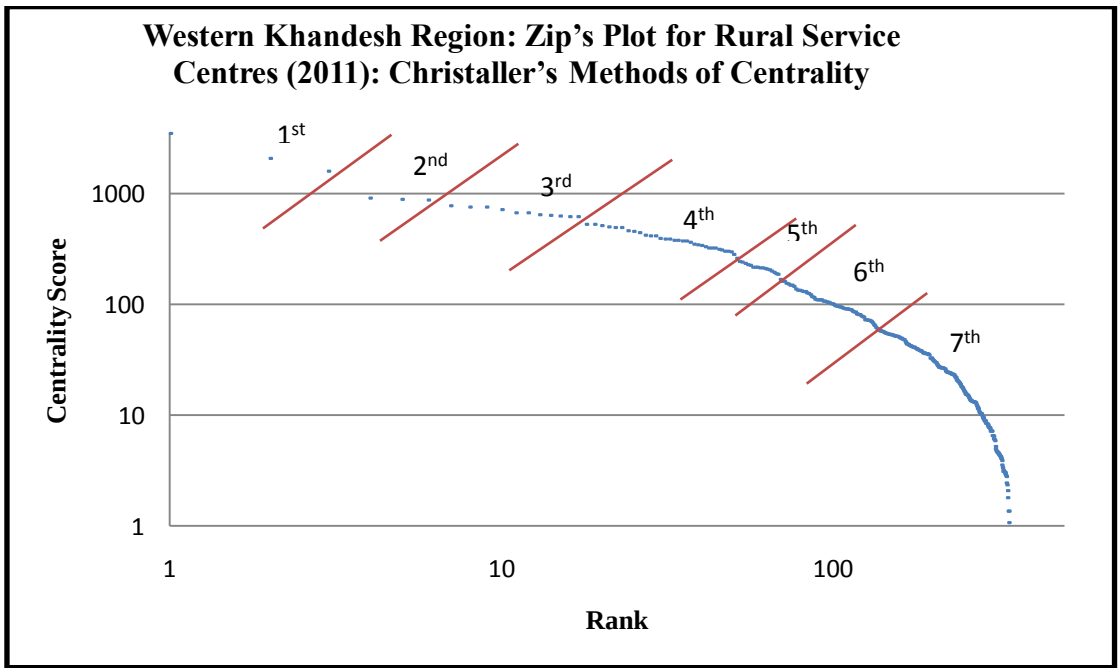


Fig. No.6

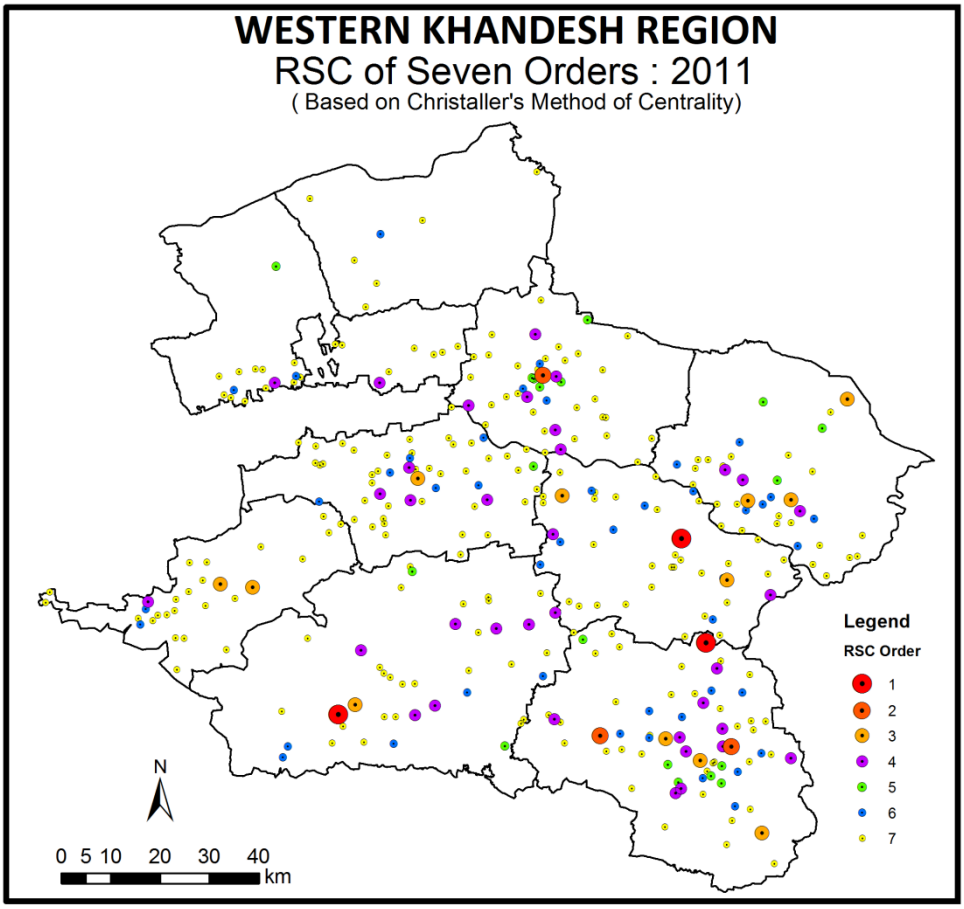


Fig. No. 7

Table No. 5

Western Khandesh Region: Hierarchical Order-Wise Rural Service Centres (2011): Based on Various Centrality Methods

Hierarchical Order of Rural Service Centres	No. of Rural Service Centres			
	Centrality Scores	Christaller's Method of Centrality	Average Weightage Method	Threshold Value Method
1st or Highest	3490.33 to1602.72	3	3	3
2nd	913.90 to881.24	3	3	16
3rd	775.45 to 620.35	11	11	20
4th	530.81 to 285.15	33	13	50
5th	262.46 to 188.45	18	53	0
6th	168.95 to 85.53	48	973	0
7th or Lowest	82.70 to 0.002471	225	0	0
Total	**3490.33 to 0.002471**	**341**	**1056**	**89**

(Computed by Author)

Considering with the comparative study of all rural service centres identified with three methods, it becomes clear that, the total number of rural service centres identified with the help of first method – Threshold value method – is very insignificant, This might be due to the availability of amenities in relation to threshold population is quite inadequate. In the second method,amenity wise expected weightagesare calculated with the help of ratio-number of amenity per village per person. Itbrings to the conclusion that a largenumber of rural amenities are available consequently a large number of rural service centres are identified in the study region. The third method considers total rural workers engaged in tertiary pursuits. The resulted number of rural service centres is quite reasonable as compared to above two methods.

Conclusion

Rural Service Centre plays an important role in the life of the villagers. The main role of a Service Centre is to render services to the surrounding area. In the present study an attempt is made to evolve the methodology for identifying Rural Service Centres of Western Khandesh Region of Maharashtra and to study them according to their hierarchical orders. The service centre provides available amenities and services to its surrounding population. The amenities are in terms of units while services engaged in tertiary services are served by workers. It is therefore, centrality scores can be calculated with the help of threshold population required for each amenity. For these, following two first methods are applied. The third method – Christaller's Method is applied to the workers engaged in tertiary activities especially 'Other workers'.

1. Threshold Value Method
2. Average Weightage Method
3. Christaller's Method of Centrality

By applying these methods, centrality scores of all villages in the region have been calculated and those villages which have surplus centrality scores are considered as Rural Service Centres. The rural service centres in Western Khandesh Region have been identified with the help of the Threshold value method. It has been found that 89 rural settlements in the study region have been identified as rural service centres. This indicates that, considering the initial requirement of demand which is expressed in terms of threshold population, the services and amenities like education, health and other infrastructural facilities available in Western Khandesh Region are inadequate. As per this method, the extensive part of the rural area is without service centres. The occurrence of insignificant number of service centres explains that availability of amenities in the rural areas of Western Khandesh Region is exceedingly inadequate. There were rare settlements which have their own amenities like basic infrastructure etc.

According to Average Weightage Method in entire region near about more than half villages are rural service centres, it is a good sign for the development of rural area. According to Christaller's Method of Centrality, the number and the proportion of rural service centres existed in the region, are adequate. Most of the dependent villages for their services are relying on the near by large settlement or on urban centres. Finally the selection of the research methods depends upon the availability of amenities and services, total number of villages and total rural population. In the present paper though the threshold population method is a sound technique but here in this study it has not shown the satisfactory result. Other two methods are quite applicable as they have given a reasonable numbers of rural service centres in the region under study.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Agricultural Development and Environmental Degradation in India

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Abstract-

Man is continually making an attempt to adopt himself to the surroundings in consonance with the requirements. He is not a creature of the surroundings. The environmental impact of agriculture is that the result that completely different farming practices wear the ecosystems around them, and the way those effects may be derived back to those practices. The environmental impact of agriculture varies wide supported applies used by farmers and by the dimensions of practice. Farming communities that try and scale back environmental impacts through modifying their practices can adopt property agriculture practices. The negative impact of agriculture is associate previous issue that is still a priority at the same time as consultants style innovative means that to cut back destruction and enhance eco-efficiency. although some pastoralism is environmentally positive, trendy animal agriculture practices tend to be additional environmentally harmful than agricultural practices centered on fruits, vegetables and alternative biomass. The emissions of ammonia from kine waste continues to lift considerations over environmental pollution. environmental impact of agriculture involves impacts on a range of various factors: the soil, to water, the air, animal and soil selection, people, plants, and therefore the food itself. Agriculture contributes to variety larger of environmental problems that cause environmental degradation including: temperature change, deforestation, diversity loss, dead zones, recombinant DNA technology, irrigation issues, pollutants, soil degradation, and waste. attributable to agriculture's importance to international social and environmental systems, the international community has committed to increasing property of food production as a part of property Development Goal "End hunger, succeed food security and improved nutrition and promote property agriculture".

Introduction

Agriculture development agriculture development in terms of enlargement of agricultural land therefore major language changes , increase agricultural productivity and web agricultural production through the applying of contemporary scientific techniques and advanced Technologies , multiplied the assembly and use of agrochemicals enlargement in irrigational facilities and irrigated areas, development of high yielding sorts of seeds so as to fulfill the food demand . ever increasing population of the country has little doubt solve the food downside of Bharat however has additionally created and is making hazaar environmental issues of significant concern . do the pace of Agricultural Development should be maintained if we have a tendency to don't wish to let the swarming millions die of Hunger however environmental degradation mustn't be allowed to continue because of aggriculture development as a result of it might additionally cause irreparable loss to human society . because of boost of causes factors chiefly deforestation , accelerated eroding and irrigation , natural hazards like floods land is degraded and waste land is increasing . By the tip of twentieth century the country had 129.57million hecaters of wild of those thirty five.5 million hectares wherever degraded forest space and ninety three.6 vi million hectares of degraded non forest space. The land has been rendered wild because of a number of evolution and natural factors ,viz wind and water erosion .

Aims and objectives:

1) To understand what's environmental degridation.
2) To grasp the causes of environmental degridation.
3) To findout the answer to the environmental degridation and agriculture downside. Hypothesis: 4) To review what proportion impact of agricultural development on surroundings.
5) To findout some conclussions and solutions.

Data Base:

This study is completely supported secondary knowledge like censuses and knowledge collected by numerous books and analysis papers, journels, and websites.

Agricultural activity and Land degridation in India: Land degradation could be a international downside mostly associated with agricultural use, deforestation and temperature change. Causes include: Land clearance, like clearcutting and deforestation. Agricultural depletion of soil nutrients through poor farming practices.Following agricultural activity impact ashore digridation in Bharat

1) Deforestation:

forest square measure in valuable property of a nation as a result of they supply raw materials to trendy Industries timber for building functions habitats for varied sorts of animals and microorganisms, sensible friable and nutrient wealthy soil having high content of organic matter . provide protection to soil by binding the soil through the network of their roots and by protective the soil from direct impact of falling Rain drops . they encourage and increase in filtration of fresh water and will Allo most recharge of groundwater resources.

2) Overgrazing:

Soil is that the earth's fragile skin that anchors all life on Earth. it's comprised of numberless species that make a dynamic and sophisticated scheme and is among the foremost precious resources to humans. multiplied demand for agriculture commodities generates incentives to convert forests and grasslands to farm fields and pastures. The transition to agriculture from natural vegetation usually cannot hold onto the soil and lots of of those plants, like low, cotton, palm oil, soybean and wheat, will really increase eroding on the far side the soil's ability to keep up itself. continuing overgrazing reduces inputs of soil organic matter as a result of less plant biomass is offered as litter, that successively, reduces soil organic matter, nutrients, and organic phenomenon activity. This ends up in deteriorated soil structure, that will increase the potential for erosion and reduces water-holding capability of soil.

3) Overirrigation:

Irrigation has contributed considerably to impoverishment alleviation, food security, and up the standard of life for rural populations. However, the property of irrigated agriculture is being questioned, each economically and environmentally. The multiplied dependence on irrigation has not been while not its negative environmental effects.In the states of geographical area, Haryana and Western province, over irrigation is chargeable for land degradation because of water-logging resulting in increase in salinity and pH within the soil.irrigation has LED to the matter of water work and salinity in a number of the states. The working party brought by the Ministry of Water Resources in 1991 calculable that about two.46 million hectares in irrigated commands suffered from water work.

4) floods and drought:

The Perennial downside of Floods and Droughts in Bharat - a close Analysi India basically forms a separate geo-hydrological and environmental condition unit because of its isolation from the remainder of the Eurasian dry land. Thus, the issues of floods and droughts in Bharat kind a definite unit of study whereas learning international environmental condition and water regimes. However, within the age of humans, the social science issue has come back to dominate discussions on disasters. In the last 2 years, there are devastating floods within the Kosi-Ganga plains in province, Brahmaputra plains in province and province, urban flooding in city and erratic flooding throughout monsoons in central Bharat. On the opposite hand, drought to has persevered even within the absence of associate El-Nino.Flooding is caused by the inadequate capability inside the banks of the rivers to contain the high flows brought down from the higher catchments because of significant precipitation. Flooding is accentuated by erosion and silting of the watercourse beds, leading to a discount of the carrying capability of watercourse channels; earthquakes and landslides resulting in changes in watercourse courses and obstructions to flow; synchronization of floods within the main and tributary rivers; retardation because of periodic event effects; encroachment of floodplains; and haphazard and unplanned growth of urban areas. Some components of the country.

5) Poor Agriculture Management :

Agricultural management could be a key force touching soil processes and functions. Triggered by biophysical constraints yet as fast structural and technological developments, new management practices square measure rising with mostly unknown impacts on soil processes and functions. This impedes assessments of the potential of such rising practices for property intensification, a paradigm coined to handle the growing demand for food and nonfood merchandise. In terms of soil management, property intensification means soil productivity is multiplied whereas alternative soil functions and services, like carbon storage and environment for organisms, square measure at the same time maintained or maybe improved. ndian farmers don't seem to be applying comfortable amount of fertilizers on their lands and even the applying of farm yard dung manure is additionally inadequate. Indian farmers square measure still applying seeds of indifferent quality.

Conclusions and Suggestion:

1) Overgrazing happens once the consumption of vegetation Biomass is by eutherian and alternative grazers .to stop overgrazing and stop environmental degradation.

2) Deforestation is extremely harmful to our community . Vishal reject and avoid inflicting deforestation as a result of forest conservation support life on earth .it maintains quality of water and air .

3) Tiny and fragmented land Holdings , seeds, irrigation , lack of mechanisation,soil erosion , agricultural promoting square measure main downside in Indian agriculture .
4)May destroy soil macropores and therefore the soil organisms that make a soil's structure. Beneath such conditions, the soil may be additional prone to compaction, crusting, and high bulk-density issues

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"Changing Trends in Agriculture and its Impact on Rural Development"

Literacy in Sangli District (Maharashtra)

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Abstract: - In this paper the present study reveals the tahsilwise literacy rate in Sangli District during 1991-2011.Sangli is the 21st highest geographical area in Maharashtra state and Sangli District population constituted 2.51 percent of total Maharashtra population. It has studied on the basis census of 1991-2011. Literacy plays an important role to develop any society. Literacy is defined as the ability to read and write with understanding if any language as per the census of Maharashtra. The highest (70.10%) literacy was observed in Miraj tahsil and lowest (42.21%) literacy was found in Jat tahsil in 1991.In this paper discussed the literacy rate show the diagrams, graphs, table were interpreted in the light of literacy in Sangli District.
Key words: - Population, Literacy Rate, Increased and Decreased.

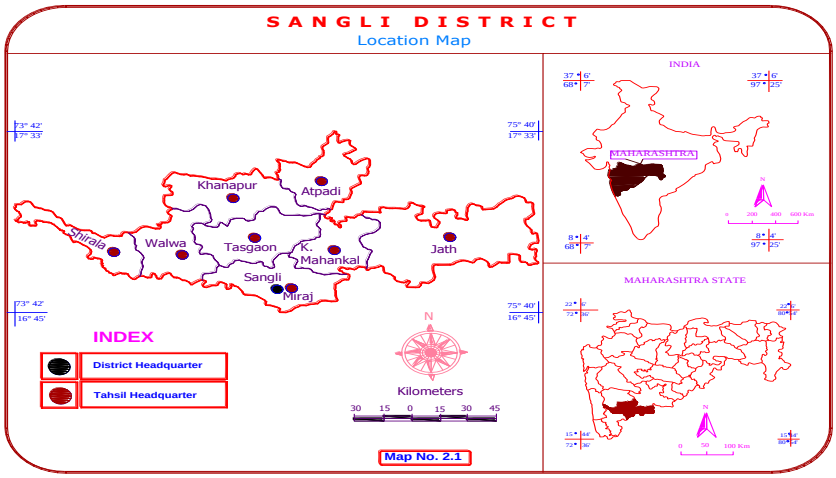
Introduction: -

Education is universally acknowledged as one of the key inputs contributing to the process of national and individual development. Literacy is an index of human development and quality of human life any person above the age of seven years, who can read and write in any language is treated as literate. Literacy is one of the indicators of social development. Knowledge is linked with literacy and a formal education. Literacy is one of the most important of life as well as future development human beings of the particular district. Literacy for all children above 6 years, youths and adults is still an ever moving target; literacy is the heart of basic education for all and helps creating literate environment and societies. International Literacy Day was celebrated by UNESCO on November 1965.The most importance of the Literacy to individuals, communities and societies of international day each year.

Literacy is essential for eradicating poverty and mental isolation, for cultivating peaceful and friendly international relations and for permitting the free play of demographic processes (Chandna, 1980, p.98).

Study Area:-

Sangli district is a part of the famous 'Deccan plateau'. It lies in the southern part of Maharashtra. It is situated between 16^0 45'and 17^0 33'North latitude and 73^0 42' and 75^0 40' East longitude (Map.2.1) and has an area of 8572 square kilometers. and a population 28,32,143 as per the 2011 census, with eight tahsils having 724 villages there are 705 Grampanchayat and 10 Panchyayat Samiti in the district(Census2011).It extends from the eastern slopes of Sahyadri ranges in the north-westerly direction for about 205 kms. in length and south-north width of the district is about 96 km. Average hight of Sangli district above mean sea level is 553 meters.



The district is bounded on the north by Satara and Solapur district; on the south by the River Warana and Kolhapur district; on the west by Ratnagiri district; on the south-east and east by the common state boundaries of Maharashtra and Karnataka States.

Objectives:

The Present Study has been undertaken with fallowing Specific Objectives:

1) To study arithmetic literacy rate of Population in study area.
2) To find out the population literacy rate during 1991-2011.

Data Base and Research Methodology:

The present study is based on secondary source of data it has collected from decennial census reports of Government of Maharashtra. The data have been analyzed for literacy rate is computed in percentage. The literacy rate is measured given the following formula.

$$\text{Literacy Rate} = \frac{\text{Literate Population}}{\text{Total Population above 6 age}} \times 100$$

To make the comparative analysis the literacy rate of changes has also been computed. It can give better understanding regarding the literacy rate Sangli.

Literacy:

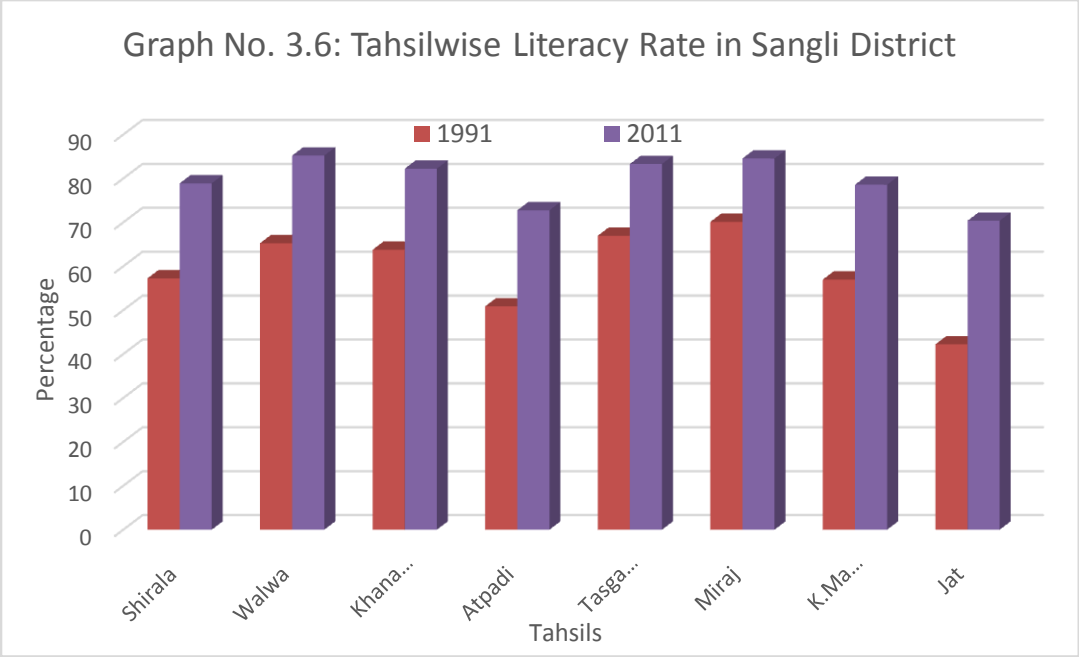
Literacy is necessity for all those who wish to practice the agricultural occupation on modern lines. Literacy and population growth are two factors which bring about a change in agriculture. Therefore, the worth of literacy has to assess by its effectiveness as an instrument of agricultural development on progressive lines.

Table No. 3.6.Indicates that the distribution of literacy was not uniform in 1991 and 2011 in the study region.

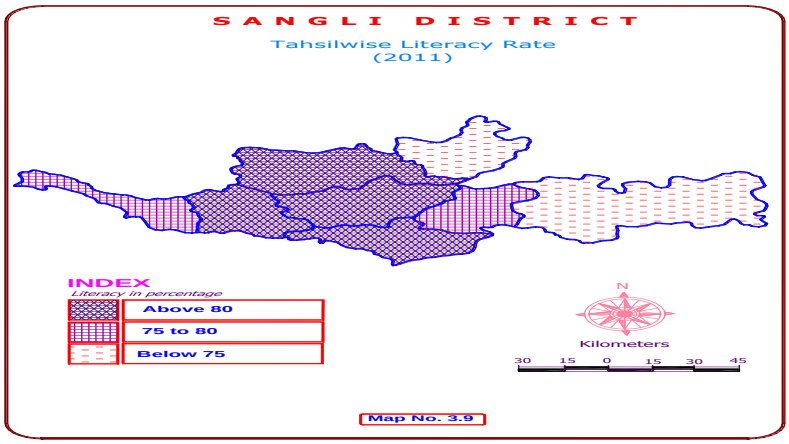
Table No. 3.6: Tahsilwise Literacy Rate in Sangli District.

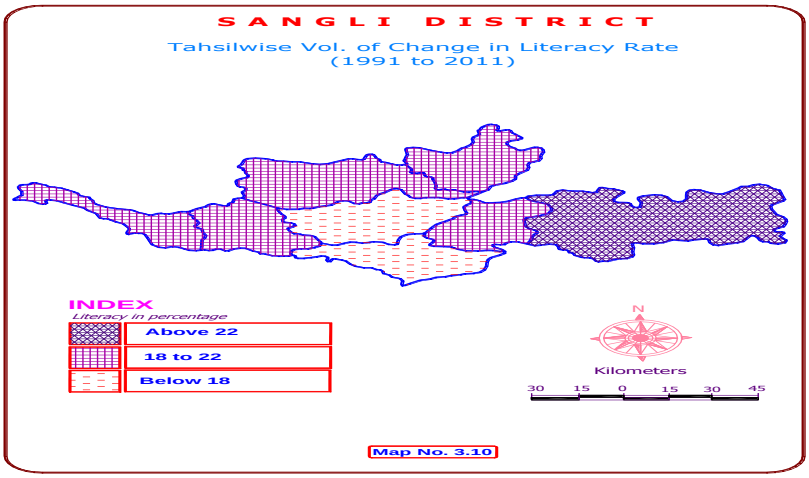
Name of the Tahsil	1991	2011	Volume of change (in %)
	Percentage of Literacy	Percentage of Literacy	
Shirala	57.24	78.88	21.64
Walwa	65.25	85.21	19.96
Khanapur	63.75	82.23	19.23
Atpadi	50.87	72.74	21.87
Tasgaon	66.94	83.29	16.35
Miraj	70.10	84.54	14.44
K.Mahankal	56.97	78.57	21.6
Jat	42.21	70.37	28.16
Sangli District	62.61	81.48	18.87
Maharashtra	55.77	82.91	21.14

Source: *Computed by the researcher on District Census Handbook of Sangli District 1991-2011*



The highest (70.10%) literacy was observed in Miraj tahsil and lowest (42.21%) literacy was found in Jat tahsil in 1991. Below 60% literacy rate was found in Shirala, Atpadi, Kawate Mahakal and Jat tahsils while 60 to 70% literacy rate was recorded in Walwa, Khanapur and Tasgaon tahsils in 1991. Above 60% literacy was noticed in Miraj tahsil of the study region.





In 2011, below 80% literacy rate was recorded in Shirala, Atpadi, Kawate Mahakal and Jat tahsils whereas 80 to 85% literacy rate was observed in Khanapur, Tasgaon and Miraj tahsils. Above 85% literacy rate was found in Walwa tahsil of the study region. Literacy percentage is more as compared to Maharashtra which was higher. About Above 20% positive change was noticed in Shirala, Atpadi, Kawate Mahakal and Jat tahsils whereas 15 to 20% positive change was observed in Walwa, Khanapur and Tasgoan tahsils. Below 15% positive change was found in Miraj tahsil of the period of investigation (Map No. 3.10).

Conclusion:- Paper the present study reveals the tahsilwise literacy rate in Sangli District These Variation can be attributed to social, cultural and economical factors severely impact on literacy of district the high literacy is observed in Miraj tahsil and lowest literacy was found in Jat tahsil. The Growth rate of literacy varies tahsil to tahsil in Sangli District. For increasing the Literacy in especially in rural area need to provided transport facilities, totally free education and strong protection for girl, all student scholarship facility, bank loan facility, etc

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Applications of Green Chemistry Principles In Agriculture Development

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ABSTRACT
Green chemistry involves the design and development of products and processes that minimize or eliminate the use and generation of chemicals hazardous to the environment and human health. The principles of green chemistry involve the development of green catalysts and use of non-toxic reagents. Green chemistry emphasizes the use of reactions improved atom efficiency, use of solvent free or environmentally benign recyclable solvent system and use of renewable resources. Nowadays, green chemistry plays a new paradigm in the field of agriculture. Sustainable agriculture and green chemistry are both revolutionary fields and intertwined. In last few years, for sustainable production in agriculture use of renewable biomass resources increases to generate bio-based food products with low inputs, zero waste, substantial social values and minimizing environmental impact. This article provides a good insight about green chemistry principles in sustainable agriculture.
Keywords: Green Chemistry, agriculture, pesticides, sustainable agriculture, chemical hazards

INTRODUCTION

The problem of poverty in developing countries increases the demand of more productive and industrialized economies, which cause the global and local environmental pollution, and the non-sustainable use of natural resources. Environmental pollution threats, ranging from atmospheric pollution in cities, acid rain, municipal solid waste, deforestation and desertification, the reduction of ozone layer and signs of climate change were overlooked. The idea of sustainable eco-development was presented for the first time in 1987 in the report of the World Commission on Environment and Development of the United Nations.

In last few years, the production of synthetic pesticides was increasing and the modern agriculture methods produced major Green house gases e.g. emission of 84 % nitrous oxide (N2O) annually in all over the world. The adverse impact of contamination in agrochemical fields through indirect or direct exposure of improper use of pesticides, affects the animals and human health. Pesticides includes all chemicals which are used to control or kill the pests, but these pesticides in food chain coupled with biomagnifications and bioaccumulation having adverse effects on entire animals and human life. To minimize these harmful effects, employment of organic farming should be increased in place of synthetic pesticides. These pesticides also cause the contamination of ground water and led to eutrophication of rivers and lake waters, and the movement of toxic chemicals from surroundings into an organism. There are some pesticides e.g. DDT, which are soluble and accumulate in fatty tissues and causes bio magnifications in food chain.

Green chemistry involves the design and development of products and processes that minimize or eliminate the use and generation of chemicals hazardous to the environment and human health. The principles of green chemistry involve the development of green catalysts and use of non-toxic reagents. Green chemistry emphasizes the use of reactions improved atom efficiency, use of solvent free or environmentally benign recyclable solvent system and use of renewable resources.

GREEN CHEMISTRY:

In 1998, **Paul Anastas** and **John C. Warner** developed the 12 principles of green chemistry. Green chemistry starts with molecular level and eventually indicating the most important environmentally benign processes and products. In 2001, at University of Colorado, Boulder, and IUPAC CHEMRAWN XIV Conference on Green Chemistry: Towards Environmentally Benign Processes and Products, was organized and in this conference a number of chemists discuss the effects of agricultural and industrial activities on atmospheric chemistry. They advised "design-for-environment" framework to work with consumers and assure the safety of foods and crops developed by green methods for green agricultural practice.

Nowadays, green chemistry plays a new paradigm in the field of agriculture. In last few years, for sustainable production in agriculture use of renewable biomass resources increases to generate bio-based food products with low inputs, zero waste, substantial social values and minimizing environmental impact.

Sustainability of agriculture is the core area which requires green chemistry strategies in agrochemical field for implanting the judicious use of pesticide and fertilizers.

GREEN PRINCIPLES APPLICATION IN AGRICULTURE

Beginning with the selection of renewable, non-toxic feedstocks.
The design of safe and energy efficient synthetic procedures.
Maximum incorporation of all materials into the product, eliminating auxiliaries when possible.
Generating durable, non-toxic products with preserved function.
Ensuring the natural degradability of all products and by-products at the end of life.

The principles of green chemistry are especially relevant to the manufacturing of agrochemicals due to their direct impact on human and environment health. However, current agricultural practices are still based on intensive production methods using unsustainable technologies developed during the 'green revolution'.

This technology is characterized by the extensive use of high yielding crop varieties, chemical fertilizers, pesticides and irrigation. According to market research by Food Think, 66% of Americans feel the agriculture industry is not transparent about food production practices citing primary concerns of the use of pesticides and insecticides, animal antibiotics, and animal hormones.

As consumer focus shifts towards establishing a sustainable and secure food supply, the agrichemical industry will require a second 'green revolution' utilizing green chemistry principles to continue providing products relevant to agricultural practices.

The bio pesticides itself has scalable and green technology which has direct implication on sustainable agriculture for broad range production. The innovative work used for the preparation of bio catalysis processes using reductases, transaminase, oxidases, hydrolases etc. Nowadays, innovative enzymes are used for synthesis of biocatalysts which offered economical benefits in pharmaceutical and agriculture.

Nowaday, the manufacturer emphasizing the replacement of conventional solvents to green solvents for worker safety in chemical and environmental protection. The selection of right solvents has always increase the benefits to environment, safer to user and improved awareness. Currently, the green solvents represented the around 10% market. In the last few years, laboratory synthesis and manufacturing in industry replacing into catalyst free reactions and catalyst free reactions on water and in water.

Recently, organic solvents with high volatility and inherent toxicity were change by the ionic liquids (ILs). Ionic liquids are organic salts usually melt below 100^0C , high thermal stability, nearly non-volatility under normal conditions; dissolve non-polar and polar organic, inorganic compounds. For these reason, ionic liquids called"designer solvents".

The renewable energy resources such as solar, wind, hydroelectric, biomass, biorefifineries, geothermal and ocean energy are important resources for future sustainable development, so it will replace carbon containing sources and reduces the emission of global warming. In the last years, third-generation biofuels (high yielding-low input feedstock) derived from renewable feedstock.

There are 234 registered pesticides in India. Out of them, 4 are WHO class Ia pesticides, 15 are WHO class IbPesticides and 76 are who class II pesticides. Initially in 1952, a plant for production of BHC started in India and now in Asia, India is the second largest manufacturers in pesticides. In India, 76% of pesticides used is insecticides, as against 44% globally.

Recently, a large number of deaths of farmers increase due to pesticides poisoning. There is a list of highly or extremely hazardous seven pesticides which are continued to be used in India despite of being banned in many countries. Pesticides like Monocrotophos and Oxydemeton-methyl are considered Class-I pesticides by WHO. "Since Class-I pesticides can be fatal at a very low dose, many of these are banned in several countries", but allowed to sold in India and still use of these pesticides in some area of countries, which cause death of farmers. In India, according to official estimate, death of at least 10,000 people every year due to direct pesticide poisoning.

As we see some of the chemicals still used conventionally in agriculture which are associated with adverse impacts to environment and human health. There are growing concerns towards about how we farm for sustainable agriculture, what inputs would supply to it, what technologies to employ. The green chemistry will shift the agriculture towards sustainable development.

DISCUSSION

Green chemistry seeking the goal towards farm profitability, community prosperity and improving soil quality by reducing the dependence use of non-renewable resources e.g. synthetic fertilizers and pesticides, minimizing the adverse effects on water quality, wildlife and safety. There are various alternatives of chemical farming such as biological agriculture, organic farming, natural farming, bio-dynamic agriculture, ecological agriculture. Bio-pesticides are organic in nature, so these can be employed

in farming for controlling the pests, insects, weeds and also for plant physiology and productivity. These bio pesticides are bio-degradable to the environment. Therefore, for sustainable developments, shift the agricultural farming into green chemistry manufacturing processes, use of crop protection and production and develop green agrochemicals.

Thus, sustainable agriculture and green chemistry are both revolutionary fields and intertwined. For this green chemists needs that the farmers used green technology for sustainable agriculture and farmers needs safe and green agricultural inputs. The biocatalysts have been used increasingly in agrochemicals, pharmaceuticals and food industries, these can help in reducing the waste and improving the yield of products.

The population of world stands at 7 billion and increases up to 9.3 billion by 2050. This will required food production to be increased by 70% in order to meet the demand. Therefore, it is necessary to increases the crop productivity, reduced pre-harvest loss and post-harvest lost from pest attack by employing biochemical processes with green techniques. The agrochemical industries have carrying major growth in futures. The industry, regulatory bodies, government and academia can build a collaborative work together and employs their ideas of green chemistry practices.

CONCLUSION

There are mainly three aspects by which green chemistry connects with sustainable agriculture. First, the principle of green chemistry recommended the use of bio-based materials or use feedstock or raw materials which are renewable e.g. agricultural waste products. Chemists should emphasize the work on developing the bio pesticides, bio fertilizers and biocatalysts for transforming the agricultural materials into high value products and also enhancing their production and protection. Secondly, use of green chemistry in site remediation by interaction with agriculture. In a traditional farming, farmers do not know how to deal with valuable tool, leave some unwanted chemicals which contaminated the environment (in soil, air and water). Green chemists at Carnegie Mellon University have investigated the TAML® catalysts. This green catalyst is safe to remove the specific chemicals including pesticides, from water. Thus, green chemists to help the farmers how to tackle with contamination, removing pollutant, unwanted chemicals and manage the use of recycled water. At last, green chemistry generates the new green inputs for sustainable agriculture productions and protections.

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"Changing Trends in Agriculture and its Impact on Rural Development"

The Irregation In Latur

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Abstract
The irrigation sector in Maharashtra is one of largest in the country, both in terms of the numi of large dams and the live storage capac Nevertheless, the irrigation sector of Maharash has been facing multifarious problems. While water availability for the future use of irrigation has been reducing at a fast rate, the demand for wat for irrigation purposes has been alarming increasing due to agricultural expansion an intensification. According to the estimate of the Maharashtr Water and Irrigation Commission (GoM, 1999 water available from both surfacel and groundwate can irrigate at most about 60 per cent of the cultivated land. The actual utilisation of irrigation potential created through major and medium irrigation (MMI) sector was only 1.73 million hectares (60.05 per cent) as against the created potential of 2.88 million hectares up to the end of ninth plan period (Gol, 2003). This is very low when compared to the average utilisation percentage of the country (CWC, 2000).

Introduction

Latur District Godavari Marathwada Irrigation Development Corporation falls in Aurangabad division. The head of the district is Manjaramnar. Its tributaries are Tarana, Tavarja and Tiruya. The average rainfall in the district is 455 to 755 mm. The main crops grown are wheat, groundnut, maize, sugarcane, gram, tur, green gram, fruits and vegetables. Due to lack of rainfall in all parts of the district, we have to depend on irrigation. Since it is not, we have to depend on irrigation. Irrigation is of paramount importance in the agricultural economy. The availability of more water for irrigation depends on the natural geographical location of the district. It also depends on the depth of water in the soil of the district. The water level in Latur district is generally 15.90 meters. There are also differences in water levels in different parts of the country. In Ausa, Latur and Ahmedpur talukas it averages 13.50 meters to 13.90 meters and in Nilanga and Ahmedpur talukas it averages 18.60 meters and 16.80 meters respectively. Although the concept of irrigation is very old, the means of irrigation have changed dramatically in recent times. In the past, irrigation was done only through Viviro. Ponds were mostly used for drinking water. Therefore, the farming business was totally dependent on rainfall. Moreover, due to erratic rainfall in the district, agricultural production could not go much and consequently adversely affected the economy of the district. In order to improve the situation after independence, the government has given priority to irrigation in the land reform program. And a policy to use available rivers, lakes, wells, etc. for irrigation. Accordingly, large and medium irrigation schemes in the district.

Manjara Project:

On 20th August 1975, the first administrative provision of Rs. Accordingly, the construction of Manjara Dam was completed in 1982 and the distribution system was completed in 1986. The area is 2279 km2. Irrigation is 250.70 D.L.H. The motor is Awda. Useful reserves of the dam are 103.32 D.L.H. I There are two from this dam and 90 km. Motor and right canal 78 km. M. The total area under benefit is 18.223 hectares. The cat project cost Rs. According to the revised administrative approval given on 30th August 1983 at an estimated cost of Rs. 3060.41 lakhs. Including the works, the second revised administrative approval has been given by the government on 9th January, 2003 at the revised estimated cost of Rs. 176.02 crore. The use of water for direct irrigation from Manjara project started from 1980. Provision has also been made for maximum irrigation of 16148 hectares in the year 2000-2001 on this project. Ex: - For domestic use, for industrial sector.The total length of the left canal is 90 km. Of which 0-50 km. The length of the canal falls in Beed district, while 50-90 km. That means 40 km long canal comes in Latur district. The length of the right canal is 78 km and the length of the canal is 18 km in Osmanabad district. Latur Ta. 9070 hectares Renapur Ta. 7673 ha. The area comes under irrigation.Irrigation capacity created at the end of 2007 in Latur district is 6977 hectare area in Latur taluka, 2517 ha. Area, Renapur 5902 ha. The area falls under irrigation. While in the year 2006-2007 Latur Ta. Total water storage 224.093 D.L.H.

Terna projects:

This project is in demand in Umarga taluka of Osmanabad district on Terna river. Beed Irrigation Board Parli Vaijnath Irrigation Scheme Progress and Current Status Latur District 2004 This

project is under construction. Work on the project began in 1959. At that time the project cost Rs. 80.30 lakhs and the length of the dam was 1677,500 meters. The height of the dam was 17.690 meters. Work on the right canal was completed the same year. The left canal was then removed from the dam. And its length is 16.090 km. So much was done. ' The storage capacity of the dam has been increased from Rs. 1652 lakhs on 25th June, 1993 to Rs. At present the water storage of this dam is 113.95 dlh. I Is. And dead stock is 41.51 dlh m. Two canals have been constructed from this dam and the length of right canal is 103 km. It is 0-30 km. Length falls in Osmanabad district. 30-130 is 73 km. The longest canal passes through Latur district. Length of left canal is 92 km. It passes through the entire Latur district. The total irrigation capacity of Latur district through these two canals is 25,518 ha. At present it is 3,146 hectares in Osa taluka and 7,859 hectares in Nilanga taluka. The area falls under irrigation. The project uses water mainly for kharif crops. At present out of the total 19.610 hectare irrigated area of this project till June 2004 a total of 8775 hectare irrigated area has been created.

Ashiv Upsa Irrigation Scheme:

This scheme is also included in Godavari Marathwada Irrigation Development Corporation, Support Department, Aurangabad Irrigation Scheme Progress and Current Status as per Latur District June 2004. Approximately Rs.212.21 crore has been spent for this Upsa Irrigation Scheme till the year 2003-04. At present 3524 hectare in Osa taluka, 2626 hectare in Nilanga and 2807 hectare in Umarga taluka are planned to be irrigated. The total water storage in this upsa scheme is 8.00 lakh.l.m. Some of the water is also used for industrial use. The Government of Maharashtra has allocated Rs. The updated cost for the above project is Rs. Rs. 2070720 lakhs and for upsa irrigation scheme Rs. The updated cost is Rs. 33,70089 lakhs and Rs. 212.12 crore has been spent on the project in 2006-2007 Total Irrigation Capacity 8957 Crops Total usable water reserves are 176.963. Water 93.803 D.L.P. I use stocks. Industrial 106. Mr. water is used. This was 38373 in 2006/2007.

Masalaga:

The project is being constructed near Masalga village in Nilanga taluka on the 16th tributary of Manjra river in Latur district. The earthen dam work of this project started in the year 1981 and Kandabharani was completed in the year 1994. The total length of this earthen dam is 2,077 motors and the maximum height is 12.39 meters. The length of the drain is 150 meters and it is built in stone. The total cost for this project is approximately Rs. 24,702 crore from 2003-2004 and two canals have been constructed from this project. The length of the ninth canal is 12.30 km. The total water storage of the left canal is 14.676 cubic meters. Out of which useful reserves are 13.599 D.L.H.M. Is. From this dam 13.599 cubic meters of water is used for irrigation. While for drinking 3.544 D.L.H.M. Water is used. Due to the canal in this project, a total of 1346 hectares in Nilanga taluka came under crop. 819 hectare through right canal and 545 hectare through left canal.

Devarjan Project:

This project has been constructed on Dev river near Devarjan village in Udgir taluka. The work of this earthen dam started in the year 1977 and was completed in the year 1992. The total length of Mati dam is 1535 meters and the maximum height of the dam is 150. Area is 2517. Area is 6286. Total water in Ausa taluka is 121.288 mm. Is. Useful water 91.221.l.h.m. Is. Out of this 62.572 m. Is. So supply drinking water 14.061.h.m. Is. While industrial 10.660 d.l.h.m.

Girkachal Co. Bandhara:

The project is located at Girakchal in Nilanga taluka. Work on the project started in 1981 and was completed in 1982. The height of the dam is 10.65 meters and the length of the canal drawn from the dam is 19.12 km. The total useful water reserves in this dam are about the same. Water is used. Also 0.15 sq.m. Used for drinking water. 2.140 ha from Nilanga taluka from this dam. The area is under water. Rs 2.68 crore was spent on this project in 2006-07. The total area under irrigation is 2140 ha. 2140 is in the irrigated area of this project in Nilanga taluka. Total useful water reserves 9.78 dlh.m. Is. Irrigation capacity is the same. And the area suitable for drinking is 0.15 dlh.m.

VT M.Project:

Work on the project began in 1977 and was completed in 1998. The project has cost about Rs 2.41 crore. The height of this dam is 12.86 motor and the length of canal drawn from the dam is 19.12 km. That's it. The total water storage in this dam is 9.51 cubic meters. Out of which total useful water reserves are 8.27 dlh.m. 8.27 lakh cubic meters for irrigation. Water is used. And 0.15 d.l.h.mo. In the year 2006-2007, the total area was under 3289 crops. 1227 crore was spent this year. Total water storage is 2.32 D.L.H. I There is water. Potable use 7.29 dlh.m. Water is 15.29 dl cubic meters of water being used for irrigation.

Tawarja:

This dam was built on the river Tavarja in the year 1986. 5.54 crore has been spent for this project so far. The height of this dam is 14.27 meters. Also the length of canal drawn from this dam is 20 km. That's it. The total water storage in this dam is 27.73 dlh.m. The total useful reserves are 20.35 sq.m. Is. Out of which 20.35 sq.m. If water is used then 6.42 dlh.m. Water is used. In Latur district 4.040 hectare area has been irrigated from this dam, 1989 hectare in Latur taluka and 2.051 hectare in Osa taluka. Water is used for sugarcane as well as rabi jari, groundnut, leafy vegetables etc. 5.54 crore was spent for this project in the year 2006-07. In Osa taluka 2051 hectare area is under crop. 15.29 sq.m. for irrigation There is water. 6.42% water is used for drinking.

Aurad Co. Bandhara:

This dam is located in Nilanga taluka. The construction of this dam was completed in 1982. The project was completed in 1982 in Osmanabad taluka. Is. The project has cost Rs 951 crore till 2003-04. Irrigation capacity constructed till June 2004 in Ahmedpur Tal. 1710. That's it. The total water storage in this dam is 12.04 dlh.m. Total useful water reserves are 10.35 ... m. The water is used for irrigation. Through this project 896 hectare area of Latur taluka has come under irrigation.Apart from this project, some projects have been completed in the district and Rs. 9.51 crore has been spent for this project till 2006-07. Has been spent. Irrigation capacity till June 2007 is 896 hectare area in Latun taluka.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Health Awareness Among Rural Women: A case study of Shirur Tehsil, Pune, Maharashtra

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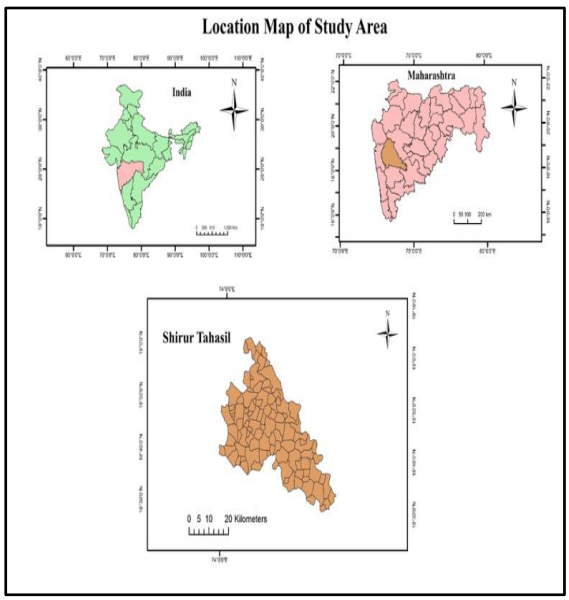
Abstract:
Women's health is at a crossroad. Every state of the country endorsed efforts to advance women's health by adopting the 2030 Agenda for Sustainable Development and are taking them forward through the Sustainable Development Goals and the Global Strategy for Women's and Children's. Studies at global level have been done by a number of national and international institutions like WHO but rural areas needed to focus. According to a United Nations report on healthcare, in India 77% of the population lives in rural areas with only 25% of the healthcare infrastructure. The rural population, health care necessities are different from the urban population due to various social economic reasons. Women are mainly engaged in the agriculture labour movement and there are many challenges like issues in agriculture, health issues, no appropriate primary education and less awareness of various government schemes and benefits. Based on the above various issues, the present study aims to find out the awareness of health issues among women in rural areas in Shirur Tehsil, Pune district, Maharashtra in India. Data has been collected by 250 respondents to acquire information related to health awareness, medical facility, government initiative, education and gender bias in accessing healthcare. The findings of the study found that the respondents have full awareness and perception about health issues and also they were aware of the various schemes and initiatives taken by the government to uplift the rural women and children to live healthy and better lives in rural areas. No gender bias found in rural areas in accessing healthcare facilities but girl children have limitations related to playing games and diet.
Keywords: Health awareness**,** Health issues, Development of rural women

Introduction:

According to WHO, in 1948 "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. People who are healthy have a strong incentive to develop their knowledge and skills because they expect to enjoy the benefits over a longer period ***(Bhavani L. 2017).*** Health is an important dimension of well-being and the most important factor for the development of a region ***(Joseph and Phillips, 1984).*** It is a determinant of human development and an indicator of socio-economic development of a nation. Health issues are an important and fundamental right for the growth and overall development of any nation ***(Hadule S. G. 2017).***



Women's health differs from men's in many unique ways. As guardians of family health, women play an important role in maintaining the health and overall well-being of her community. Women represent the overall health of the family i.e. family and community health is related to women's health. Therefore, women's health seems to be important not only at the individual level but also at the national level. Women's unfavorable status in India can be seen from discrimination in the allocation of household resources, such as food, and in access of health care and education as well as marriage at young ages ***(Seilan, A.2009).***Women's health is also affected by their biology and social conditions such as poverty, jobs and family responsibilities. Because of these responsibilities, women neglect their own health.Improving women's health is an integral part of human development as women's poor health affects the next generation of children and has a direct or indirect effect on the economy.

Study Area:

Shirur Tahsil is selected for the present research work. It lies in eastern part of Pune district of Maharashtra. The absolute geographical location of the study area can be expressed as from 18º 49'N to19º34' N latitude and74º 22' E to 75º 03' E longitude, comprising 1552 sq. km geographical area. It is confined by Ahmednagar District to east and north-east, Ambegaon Tehsil to north-west and Haveli Tehsil to South. The total rural population of Shirur tahsil was 321,644 as per census of 2011. Out of total rural populations 152842 women population and rural and o-6 year sex was the 919 and 846 respectively. The tahsil rural female literacy rate was 63.63percent in 2011.

Objectives:

1. To assess the demographic status and its impact on health of women and family members
2. To Assess the awareness among of rural women towards the available government medical facilities for rural population
3. To examine healthy habits of respondents
4. To study the major health issues of women and it's causes
5. To evaluate the impact of age, education, routine check- up, local medical facility on health of respondents.
6. To examine the gender bias withinfamilies in accessing healthcare

Data Source and Methodology:

This work has descriptive nature and convenient sampling method applied for Primary data collection. Primary data has been collected by 250 respondents to acquire information related to health awareness, medical facility, government initiative, education and gender bias in accessing healthcare and use of statistical and cartographic techniques.

Result and Discussion:

Thedatapertainingtodemographicprofileofthe respondents presentedin table 1.

Table1.Demographic profile

Demographic variables	Category	Frequency	Percentage
Educational Qualification	Below 10thStd	64	25.6
	10thStd	42	16.8
	12thStd	51	20.4
	Degree	78	31.2
	PG	15	6
	Total	**250**	**100**
Age	15 to 20	15	7
	21 to 25	28	12
	26 to 30	22	9
	31 to 35	47	19
	Below 35	**112**	**45**
	Above 35	**138**	**55**
	Total	**250**	**100**
Occupation	Student	19	7.6
	Business	38	15.2
	Government service	47	18.8
	Self- employment	48	19.2
	Daily wager	25	10
	Private	33	13.2
	Farmer	40	16
	Total	**250**	**100**
No. of children in a family	One Child	103	41.4
	Two Child	72	28.6
	Three Child	25	10
	More than Three	50	20
	Total	**250**	**100**

(Source: Primary Data)

From the above table it is inferred that variation is found in the number of family members due to the number of children in every family. It has been found that 20% of families have more than 3 children in their family and the reason behind that is expecting boys to take care of parent's old age. With regard to educational qualification 25.6% of the respondents belong to below10thstandard, 16.8% of the respondents belong to the 10th standard, 20.4% of the respondents belong to 12thstandard, 31.2% of respondents belong to degree and 6% of respondents belong to PG only. Similarly, 45% of the respondents belongs to the age group of 15 to 20, 8% of the respondents belongs to the age group of 21 to 25, 22% of the respondents belongs to the age group of below 35 and 55% of the respondents belongs to the age group of above 35.Based on the respondents occupation, 7.6% of the respondents belongs to student, 15.2% of the respondents belongs to business, 18.8% of the respondents belongs to government service, 19.2% of the respondents belongs to self-employment, 10% of the respondents belongs to daily wager, 13.2% of the respondents belongs to private and only 16% of the respondents belongs to farmer. The study found that 31.5% of respondents agreed with the effect of family size on the female health. 89 % respondents were aware about both physical and mental health, 66% respondents' visits to hospital at least once in a year for their routine check-up, 84% respondents believe medical treatment and medicines prescribed by doctors only. 99.6% respondent replied that health of women in families is most important and 51% women are taking efforts to be healthy by balance diet and exercise.Each female respondent has health problems and responded female are observed major health problem at shown in Fig. 1.

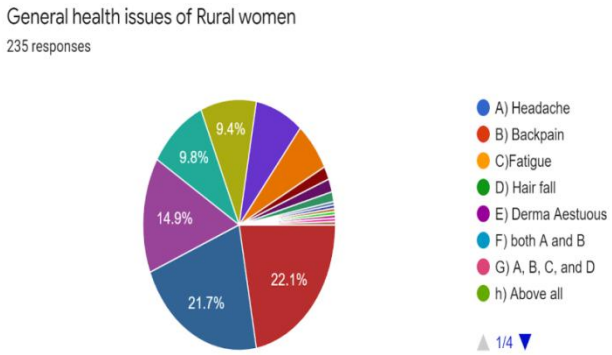


Fig.No.1

Total 75 % women have not opted any type of insurance cover, whereas only 16% have health, 8% have life and 12% have both insurance cover to secure their lives.That is, the study found that factors such as age, education, daily diet, exercise, family financial and social status, health insurance policies taken by family members, sources of information influencing the overall health status of family members, and overall health awareness of female respondents. Gender bias not found because for girls to play outdoor games (92.8%), access to a healthy diet. health related information source in study area are like television, newspapers, internet, magazine, health worker etc. but observed lack of awareness due to lack of education women are not yet totally aware about her health and 93% agreed that education have influence on their individual and family health, women have replied that education and health are most important and preferred factors in this era (45%). The responder family spends hardly 3000 to 10000 rupees for their monthly diet and health. Rural women haven't even taken advantage of the PradhanmantriSwastyaPatra scheme introduced by the Government; it shows poor aptitude among rural women towards the available government medical facilities.

Conclusion:

The present study focuses on rural women's health issues and awareness. From the above analysis it can be concluded that now all the facilities like healthcare delivery, disease prevention, diagnosis and treatment are available in the public or private sector in rural India. But rural women do not seem to be aware of this. Rural women are seen neglecting their own health. The main factor affecting human health is education and its lack of study area especially among women. As per 2011, female literacy in the field of study is only 63.63 % was. Therefore, women in rural areas need to be aware of the importance of their health and the need to pay attention to it. At the same time, they need to be fully informed about government schemes and initiatives. In addition, the government needs to formulate a comprehensive revised national health policy and a long-term vision plan for rural women's health. Due to better health is of women is determines of standard life because healthy people contribute productivity towards nation building and high economic growth.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Resource management and agriculture in the periurban interface of Karnataka, Belagavi: Problems and prospects

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Abstract
This paper outlines pressures on agricultural land in periurban Karnataka, Belagavi. A survey of agricultural practices underlines the recent and rapid transition from agricultural to urban land use in the peri-urban interface, and show farmers are reacting by reducing fallow periods. Farmers are also intensifying agriculture near streams and rivers through increased use of irrigation, in response to growing urban markets for a wider range of vegetables. We identify specific problems of water resource pollution and waste management, with particular reference to farmland irrigation. We report the results of composting interventions as a community-based waste management strategy. We consider integrated organic waste recycling as a generic strategy to help protect periurban natural resources, enhance food production through nutrient recycling, and improve community sanitation.
Keywords: agriculture, Karnataka, periurban interface, resource management, waste management

Introduction: -

The periurban interface of cities in developing country contexts has received growing attention in recent years and was the focus of significant research effort by the UK Department for International Development's (DFID) Natural Resources Systems Pro-gramme from 1995 to 2006. Principal among effects of rapid urbanization has been conflict over land use in the periurban interface, between traditional forms of agriculture and the ever growing demand for housing and commercial premises. Loss of land for building has frequently marginalized periurban farmers, whose livelihoods are often prejudiced by insecure tenure. Short-term planning in this pressurized environment typically leads to agricultural intensification on remaining accessible land and insufficient attention to declining soil status. Significant challenges have emerged in terms of access to land, soil ameliorants, water and water quality (increasingly polluted by periurban waste, urban waste disposal and industrial activities).Yet urban and periurban agriculture is often claimed to be a key livelihood opportunity for many citizens. The challenges to agriculture in the periurban interface include adapting farming systems sustainably, managing water resources for agriculture in the face of rising nonagricultural demand, and exploring opportunities for waste recycling in order to protect soil fertility. This paper considers these issues in relation to the periurban interface of Karnataka. Belagavi second city.

The increasing pollution and waste disposal problems found in many Belagavi cities, resulting from rapid growth and urbanization, widespread poverty, inadequate and weak local governance and limited financial resources have become distinctive features of Karnataka and its immediate periurban inter- face that pose major challenges to environmental protection, waste management, food security and urban and periurban agriculture. The pollution and waste disposal problems are most acute in periurban areas, where waste management services are seldom adequate or provided despite rapidly increasing settlement densities hence, substantial opportunities exist for community-based waste management strategies that promote nutrient recycling. Thesestrategiesturnorganicwasteintocompostatcommunityandhouseholdlevelsfor use as agricultural fertilizer in urban and periurban agriculture. While not problem-free, such approaches have the potential to create a positive outcome overall by increasing urban and periurban agricultural production through appropriate soil fertility management; by protecting the environment through the recycling of organic waste; and by generating income and livelihoods, which in turn enhance urban and periurban food security

Ii. Periurban Karnataka

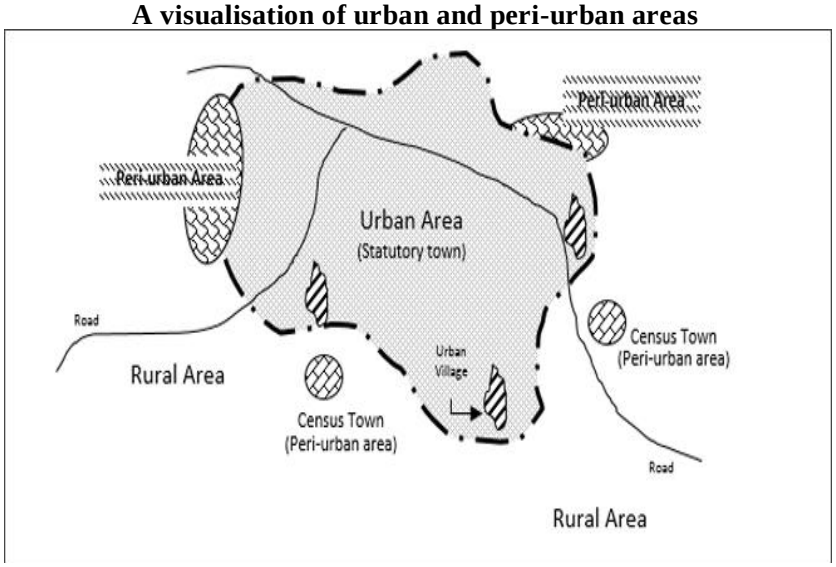
As in many rapidly developing urban regions, the Karnataka periurban interface is characterized by high rates of conversion of agricultural land to private housing and increasing pressure on natural resources through waste dumping, wood collection, and sand

winning/mining. Land tenure is a

complexissueinperiurbanKarnatakaaslandmaybeheldbythegovernmentforpublic facility, by families(‘family land), by the community(‘stool and’, controlled by the community chief), and individuals. The debate ties around pressures of development have focused to an extent on community land. The role of the chief in controlling and selling land for development is critical. Customarily, the proceeds of stool and sales should revert to the community, and those farming the see community land should be compensated by access to appropriate parcels of alternative farming land. This has not always been the case, especially with progressive monetization of transactions and as the extent of suitable and not covered by buildings declines. Numerous conflicts have arisen, leading some farmers to abandon agriculture, and generate insecurity and short-term planning strategies among remaining farmers, often resulting in exploitative soil ‘nutrient mining’ approaches.

The city and its suburbs lie across a major drainage divide (Figure 1). The main watersheds in the area flow from more rural catchments across the periurban zone and into the city. Having passed through the built-up area, the main streams then flow through periurban Karnataka and then further out into more rural areas. As a result, a range of water quality and supply problems affects the periurban interface. Further, budgetary pressures have resulted in the inability of public services to meet waste collection demands in the periurban interface adequately, despite the construction of two new waste collection facilities since 2000. This has been partially due to a process of ‘peripheral neglect’, in which municipal and district authorities focus their resources in core rather than peripheral areas such as the periurban interface

A visualisation of urban and peri-urban areas



This is set against a pattern of declining rainfalls in the Karnataka area, from the 1960s average of 10000 mm to that of about 10,068 mm in the decade 1989–1998 (data obtained from Belagavi Meteorological Service, Shambra Airport station), a trend mirrored else- where in western ghat. However, rainfall totals have risen margin- ally since about 2000, if characterized by relatively high variability, with a fitted trend line rising from 9974 mm in 2010 to 9900 mm in 2011 (Shambra Meteorological Service, Belagavi Airport station). With significant population increase, from perhaps 10000 (1960) to substantially over 1 million, and increasing periurban house building and groundwater abstraction, the necessity to protect agricultural land and to better manage water resources for agriculture becomes apparent.

SoilsofKarnatakaperiurbaninterfacearedevelopedoverhighlyweatheredphyllites, greywackes, schists and gneiss, and are predominantly reddish silty clays and silty clay loams,generallywelldrainedbutwithlowchemicalfertilitybelowathinorganictopsoil (Adu,1992:32).Adu(1992:121–22)reportsthatthesesoilsaredeficientinphosphorus and that where cultivation has been carried out continuously for long periods soil nitrogen levels are ‘very low’. Heavy leaching has depleted the soil of elements such as calcium and magnesium, resulting in relative concentrations of iron and aluminum compounds. Low organic matter content ren ders these soils susceptible to erosion and careful agricultural management isrequired.

The terrain is generally moderately dissected, with slopes of 5° to 15° and local

amplitude of relief of up to 30 m. Summits are often relatively flat-topped, and under- lain by laterized concretionary gravels. Asserts that improper cultivation practices, particularly on steep upper and middle slopes, have led to widespread accelerated erosion, in turn leading to the exposure of subsoil gravel and to shallow soil depths.

Iii.Research Methodology

A range of scientific and social scientific research techniques was applied in studies carried out between 2001 and 2005 as part of a wider In order to determine the nature of the agricultural system, in-depth semi structured interviews, backed up where possible by systematic on-site observation, were held with a sample of 35 farmers (26 male, 9 female) in Savadatti, Chikodi, Raibag Following local custom, the village chiefs were approached to gain community access so that, inevitably, initial interviews were with their associates. But a cross-section of farmers was accessed subsequently via the snowballing method. Questions focused on identifying basic farming practices, including soil and water management, and investigating indigenous technical knowledge. Wherever possible, farmers were invited to conduct interview discussions in their fields, thus providing independent corroboration or otherwise of their statements via more participatory methods derived from participatory rural appraisal. All our interviews were conducted in English (while accompanied by a local interpreter). MonthlywaterqualitydatawereobtainedfortheperiodSeptember1999–September 2001.SampleswereanalyzedattheKarnataka-basedlaboratoriesof the Belagavi Water Company and Karnataka Environmental Protection Agency; both using standard procedures associated with the portable laboratory **Niranjan Karagi's Nirnal world's cheapest portable water filter systems.** Heavy metal determinations were carried out at the Chemistry Department laboratories of Angadi Institute of Technology Karnataka, In order to conduct composting experiments, household surveys in 6 periurban Talukas Athani, Bailhongal, Belagavi, Chikkodi, Gokak, Hukkeri, Khanapur, Ramdurg, Raibhag and Saundatti. Were undertaken to identify behavioral patterns, with respect to disposal of house hold refuse.Villages were selected to ensure that a range of differentperiurbancharacteristics(environmental,geographical,social,eco-nominalandpolitical)wasrepresented.Thesingleuniversalcharacteristicthat applied to all selectedTalukas was that open refused umpswe reused;thatis,now as tecollection servicesexisted.Focus group discussions were also held in study Talukas, including discussions with separate subgroups comprising of chiefs and elders, farmers, women, and village youth. Focus group sessions/workshops were held specifically related to the composting initiatives. Following action planning discussions, specific designs and types of household level composting micro projects were chosen. Sketches and diagrams were used to illustrate the principles of container composting, and then suitable compost container designs were drafted for local construction.

These consistedofsimpleandeasilyreplicabledemonstrations,distributedatprominentpoints in each village. Once the various containers had been constructed, their use was implemented, as noted above, through training workshops conducted by community- level facilitators and community-chosen representatives working with a S E V A K stands for Society for Empowerment through Voluntary Action in Karnatakaon a -funded livelihoods project, thereby also contributing to local empowerment through enhancement of the community facilitators' capacity to produce and analyzeknowledge.

Iv.Agriculture In Periurban Karnataka

The dominant farming system in periurban Kumasi is sedentary agriculture with mixed croppingandsomerotationofcassava,maize,exoticvegetables,plantainandsugarcane, And relatively little monocropping. The most common rain fed strategy is intercropped maize and cassava. Cassava, maize and plantain are the main crops and urban and periurban backyard gardening features extensively. Many farmers around Karnataka have turned recently to irrigation particularly in bottom lands with access to water, and to year-round intensive cultivation of lettuce, tomatoes,

Indigenous indicators of soil fertility sampled among 35 periurban farmers inKarnataka, 2001.

Indicator	No.	Percent
What shows that a soil is fertile?		
Soil color	24	67
Soil texture	16	44

Fallow trees	10	28
Crop growth quality	9	25
Crop growth yields	9	25
Established fallow	5	14
What shows that a soil is declining in fertility?		
Declining yields	21	58
Pest invasion	16	44
Weed invasion	15	42
Sandy or coarse topsoil texture	7	19
Changes in soil colour	5	14
Changes in greenness of fallow vegetation	3	8

In our interviews, limited use of organic fertilizers (2 farmers – both male – using mostly chicken manure) was reported, but there was relatively common use of chemical fertilizers (11 farmers – 9 male, 2 female), almost exclusively on relatively high value crops such as tomatoes, okra, 'garden eggs' (aubergines) and peppers. Inadequate finance was most often quoted as a constraint on chemical fertilizer use. Three farmers were using herbicides incorrectly as pesticides, while 9 farmers admitted to using (banned) DDT. It is clear that farmers here use low amounts of fertilizer overall, the main reasons being continued reliance on fallows to restore fertility and inadequate resourcestopurchasefertilizer.Thislowapplicationestimateconcealspossiblehotspots such as intensive tomato production near Karnataka where excess fertilizers may well be appliedandresultinleachingintostreamsandgroundwater.Use of fallow continues except in the most urbanized villages, although fallow periods are being reduced the average fallow period claimed by farmers was four–five years, though many said that this had reduced recently. On the other hand, one farmer had cultivated two plots alternately (one year fallow) for six years and three farmers admitted to a two-year fallow; the maximum fallow period claimed was six years. Permanent intercropping is more common in the relatively urbanized communities. Monocropping is uncommon, although many farmers perceive the market advantages of concentrating effort on cash crops such as lettuce andtomatoes.

V. Water Use And Agriculture In Periurban Karnataka

Althoughtheseculartrendinrainfallsinceabout1960isdownward,despiteaslightrise and relatively high variability in the last decade, there is still sufficient precipitation for traditional forms of rainfed agriculture in Karnataka periurban interface. The trend towards irrigation to diversify and intensify cropping relies on use of Belagavi streams and rivers, which isproblematic In terms of chemical pollutants, farmers surveyed generally believe that river water provides detectable fertilizer benefit to irrigated crops, and it would be expected that the polluted waters downstream of Belagavi would make a significant contribution to the nitrogen requirements of irrigated crops there. However, the use of nitrogenous fertilizers leads to both the export of nitrogen in crops and the build-up of nitrate in groundwater. The maximum accumulation of nitrogen is likely to occur in water- saturated landscapes, such as those valley bottoms in and around Karnataka, and down- stream at Malaprabha, where sugarcane and water cocoyam are grown. The role of the sea reasinnitrogen cycling deserves further investigation.

` Wider use of irrigation for fresh vegetables, a distinct possibility in view of increasing markets in Belagavi and Dharawad, is a potential source of increased agricultural demand on water in the periurban interface, which also may present a significant threat to human health.

Vi.Domestic Solid Waste And Agriculture

Due to inadequacy of municipal refuse collection services in Karanatak periurban inter- face, domestic solid waste accumulates in dumps in and around communities. Daily domestic waste is largely organic, consisting mainly of food scraps (cassava, yam and cocoyam peels, and plantain skins) and wood ash, and represents a potential source of nutrients for agricultural soils. Composting and reuse of organic waste is a means of recycling nutrients and restoring soil fertility (Drechsel & Kunze, 2001), particularly here with the high engagement (90 per cent) in local (less than 4 km from the house- hold) agricultural activities and the need for soil ameliorants in these same areas. Our household survey indicated high potential for a household- level waste separation and composting programme, reinforced by communities' willingness to

participate and by their eagerness to improve village sanitation while also contributing to their agricultural livelihood.The main container composting method demonstrated was block-built compost bins, chosen because of the wide availability of building blocks, standard bricks or the traditional sun-baked blocks. Each double chamber compost bin is sufficient for a household with an extended family. Larger versions consisting of three high capacity chambers were also demonstrated, suitable for up to five households.Early spontaneous uptake of the technology was encouraging, with the number of installations almost doubling within three months of project initiation. However, the main obstacle to further uptake was cited as financial constraints. Further more, in the case of block-built compost containers, in the space of 12 months from micro project initiation the price of cement had doubled, thus placing these materials beyond the financial means of many periurban residents. Despite this, an element of longer-term sustainability was demonstrated and using locally resourced materials such as cane or bamboo for container construction could reduce costs.Aimed initially at the backyard gardening level, the potential of these methods to both reduce waste flows and enhance soil status has been demonstrated. The wider development potential of this strategy, based on concepts of integrated organic waste recycling, is now outlined.

Vii. Integrated Organic Waste Recycling

Farmerresponsestodecliningsoilfertilityhaveincorporatedwhatarelocallyviewed as 'modern' farming methods including the adoption of monocropping techniques that are accompanied by the use of chemical fertilizers and pesticides. Furthermore, rapid land use changes have encouraged adoption of these so-called modern farming methods as farmers with insecure land tenure attempt to achieve short-term gains through nutrient mining rather than investing in alternative and longer-term soil fertility mea sures. Land tenure insecurity reduces the incentives for farmers to adopt organic-based soil amelioration measures. This then raises an important longer term sustainability issue that must be addressed when planning and developing integrated organic waste recycling strategies, particularly if there are no alternative markets to retail and distribute compostproducts.

In Karnataka, and indeed much of western ghat, closing the rural–urban nutrient cycle remains a largely theoretical concept, as municipal authorities have yet to exploit such options systematically. This situation contrasts with the outcomes achieved in the very different geopolitical and social conditions of Belagavi, and Some Forest regions where nutrient recycling principles have been implemented and have proven very successful in practice Besides increased capture and storage of carbon, nutrients and water, other potential advantages from closing the nutrient recycling loop include reduction in the volumes of foodstuffs that are imported, reduced need for commercial/inorganic fertilizers (and pesticides) and increased environmentalprotection.

Viii. Conclusion

This paper investigated problems of agricultural resource management in Karnataka periurban interface and, on the basis of empirical research, proposed potential solutions. There can be no doubt that rapid land use change – from agricultural to urban/built-upis having a profound effect on agriculture. In periurban areas where rainfed agriculture still predominates, the loss of agricultural land has resulted in reduced fallow periods and consequently lower overall soil fertility levels. Ongoing pollution of the river system has significant implications for irrigation agriculture. The field surveys showed that more farmers are accessing river water for irrigation in response to increasing opportunities for selling a range of vegetables to urban markets, although results reported here and elsewhere indicate that both river water and groundwater are being polluted from a wide variety of sources. Chemical pollution may be broadly neutral in that it provides a source of nutrients for plants, but theundesirablelevelsofcoli formbacteriaandheavymetalsareaconcern.However,the build-upofheavymetalsinfloodplainsedimentsispotentiallyproblematicinthe longer term.

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Intramural Spatial Variation of Agriculture Performance in Osmanabad District: A Geographical Study

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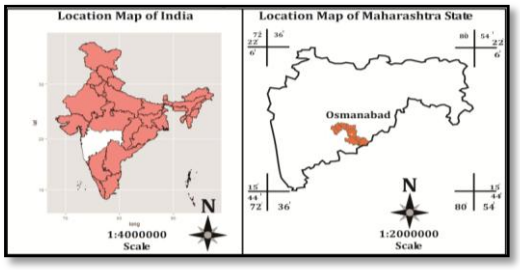
Abstract:
In the view of agriculture performance there are many components to clarify the status of performing agriculture. When all other sectors face a massive hit owing to the Covid-19 deadly disease and subsequent lockdown, earlier data of agriculture sector sees 11.7% growth, from 6.1% in 2019-20 agriculture sector is likely to report a whopping 11.7% growth in 2020-21. The three agriculture strategy of extensive farming, intensive agriculture and technical change it is technical change which is universally accepted as the best strategy (Desai 1997). The performance rate or ratio of state in not stable for long period, because it can be important to observed that, Deccan plateau constitutes 50 percent of the Drought-prone area, 12 percent of the population lives in drought prone area, deficient rainfall once in 5 years. The 1996 drought affected 7 districts 266.75 lakh people, 1997 affected 17 districts and in 2001 droughts affected over 23 districts includes 20,000 villages. Around 4.5 million hectares of crops was affected in the State. Rainfall is main source of water. Therefore, here an attempt has been made to examine the agriculture performance for the development of agriculture area.
Keywords: Spatial Variation, Agriculture Performance Index, Irrigation etc.

Introduction:

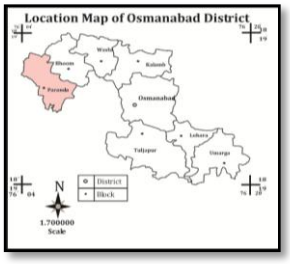
Agriculture is the major occupation of majority of the population in Osmanabad District. Economic, industrial, educational, social development of this area is dependent on agricultural production. Despite of higher promotions per capita availability of food over time did not increase significantly. At present the growth rate of agricultural production is less than 2%. The growth rate of production in agriculture must be more than the growth rate of population. Hence, there is an urgent need to accelerate agricultural growth or performance to address issues on food security, nutritional adequacy and income generation.

Study Area:



Osmanabad District is an administrative headquarter, situated on 17°35′ to 18°40′ North and 75°76′ to 75°46′ East of Marathwada region in Maharashtra. Osmanabad is a major drought prone district in Maharashtra. The average annual rainfall is 367mm and temperature is 27 ^{0}C. Due to irrigation facility and improved seeds as well as using agriculture technologies various. Osmanabad district includes eight taluka.

Objective: To identify the index of agriculture Performance in study area.



Data Base and Methodology:

The present paper is based on the secondary data. The following methodology has been implemented for the present paper.

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.

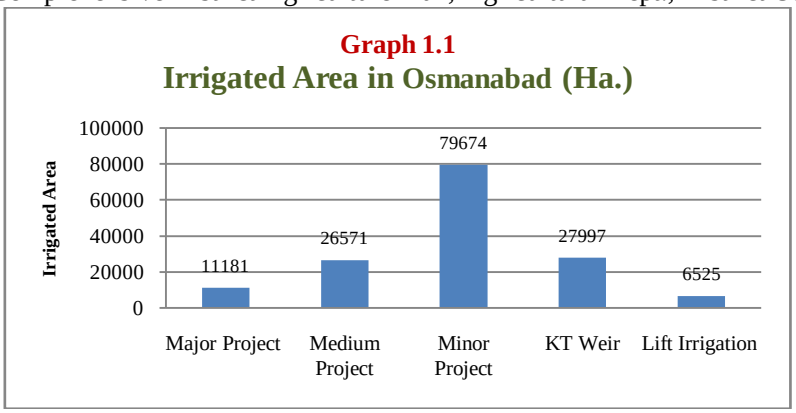
The summed up location quotients (LQS) were divided by the number of crops considered in the Revenue circle and multiplied by 100 to obtain the weighted composite index for the level of agricultural performance.

Thus, weighted composite level of agricultural performance $N = \frac{\Sigma LQS}{N} * 100$

Irrigation potential of Osmanabad District (in Ha.):

Block	Total cultivable Area	Total Irrigated Area	Surface Irrigation	Ground Water Irrigation
Osmanabad District	584480	149367	143631	5736

Source: Comprehensive District Agriculture Plan, Agricultural Dept., District Osmanabad.



Source: Water Resource Department, District Osmanabad.

As shown in graph no. 1.1 the distribution of irrigation in the district, reveals the status. It also elucidate that irrigation through Minor project is high and total irrigation covers 26 percent area in Osmanabad District.

Level of Agricultural Performance:

Planning for the development programmers of rural areas is it quite easy with Agricultural productivity data, is a measure of overall performance of region. The proportion of cultivable land per man has been reducing noticeably throughout the recent earlier period. 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 role of diverse factors like physical, socio-economic technical and organizational in rural area. 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:

I this module it is inspect with the composite index values. It is clarified that the composite index values and the level of agricultural performance is positively correlated.

>809	-	High
323 to 809	-	Moderate
< 323	-	Low

In composite index high level of Performance Region (above 809 index value), Moderate level of Performance Region (between 323 to 809 index value), Low level of Performance Region (below 323 index value). Vashi tahasil is included in the high Performance level region. It is noticed that the overall area of Vashi tahasil as well as its irrigated area and crop pattern behind the area under cultivation has a positive effect on efficiency/performance. Therefore, due to increase in irrigated area and the area under cultivation is more than other tahasil and due to the adoption and use of modern technology; productivity increases and is included in the high level of agriculture performance. Moderate level of Performance Region includes which are Umarga, Lohara, Bhum, Paranda and Kalamb tahasil. Out of total eight tahasils, five are founded in moderate region, mainly factors consists related are, Irrigation in this area is mainly done by wells and borewells. This means that individual irrigation facilities are being provided in this tahasil. Therefore, most of the tahasils come under this region. As well as Framers accepted new techniques and different crops in deferent session for irrigation and crop cultivation its impact of agriculture productivity. Osmanabad and Tuljapur tahasil are fall in to Low level of Performance Region (below 323 index value). This region is known as the region with low rainfall and adverse geographical

conditions. By seasonal wells, some of the rabbi season crops are harvested by bore wells. Due to the lack of perennial water supply and irrigation facilities, therefore gross cropped area and productivity less is found, the per capita income of farmers is low and they are economically reluctant to use modern agricultural technology. As a result of all this, the level of agricultural efficiency/performance in Osmanabad and Tuljapur tahasils are low.

Conclusion:

Achieve agricultural efficiency, focus on one multiple factors. Agriculture is the result of a combination of many activities. This means increasing irrigation efficiency productivity by implementing irrigation, modern technology, high yielding seeds, new crop models and change in cropping patterns like for ex. BBF Planter. It is also work primary stage on tahasil in low level of performance region to develop their soil potential as area treatments and drainage line treatment for increase in agriculture performance through soil fertility. The application methodology of agricultural performance reveals that substantial income from sugarcane, grapevine, green gram, bajra and soybean farming with forward looking attitude of farmers where less of important role of co-operative societies, factories etc.. It also proves that the levels of agricultural Performance is moderate in most of the tahasil. Dominance of all crops and specially pomegranate cultivation, having assured supply of water. Even so there is sufficient technology available for increasing productivity in study area.

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A Geographical Study of Land Use and Land Cover in Kolhapur District (M.S.)

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Abstract:
The Study has been conducted in Kolhapur district land use and land cover of study in geography is fruitful in many ways, to study of land use and land cover the present study based on secondary source. The published source is revenue record, census handbook, socio-economic abstract of Kolhapur district. Mango plantations were also found in the middle and lower piedmont area sugarcane is cultivated area. The sugarcane is also growth in kharif and Rabi Season.
Keywords: Agricultural, Physiographical, Land Use and Land cover.

Introduction:

Agricultural is one of the older and most important avocation of the word. human civilization and cultures evolved based on the natural resources available in a given environment. such as plants, animals, soil, water and air. The Human community is dependent on Agricultural for foods, clothing, and Shelters even today. Conservation and management of these natural resource in a sustainable way is the need of the day and is a pre-requisite to improve the life of the people.

Objectives:

The Main objectives of the present Paper are followings.

1) To Geographical study of land use land cover in Kolhapur district.
2) To analyze changing pattern of the land use land cover in Kolhapur district.

Data Collection and Methodology:

The present study is based on secondary sources, the secondary data is collected from Census handbooks, Agriculture department of Pune Maharashtra State. District gazetteers, district statistical department, socio economic review (2001-2011), and district statistical abstract of Study region.

Geographical Study:

Kolhapur district is situated in the Southern part of Maharashtra. It is located in between 150 42' 30" to 170 11' 25" North latitude and 730 43' 10" to 740 43' 45" East longitude. Kolhapur district is surrounded by Sangli district to the North, Karnataka State to the East and South, Ratnagiri and Sindhudurg districts to the West. The Sahyadri ranges to the West and Varna River to the North form the natural boundaries. For the administrative purpose, the district is divided into 12 tahsils i.e. Shahuwadi, Panhala, Hatkanangale, Shirol, Karvir, Bavda, Radhanagari, Kagal, Bhudargad, Ajra, Gadhinglaj and Chandgad. The total population of the district is 38, 76,001 persons, as per 2011 census, it constitutes 3.45 percent population to the state total. The geographical area of district is 7746.40 square

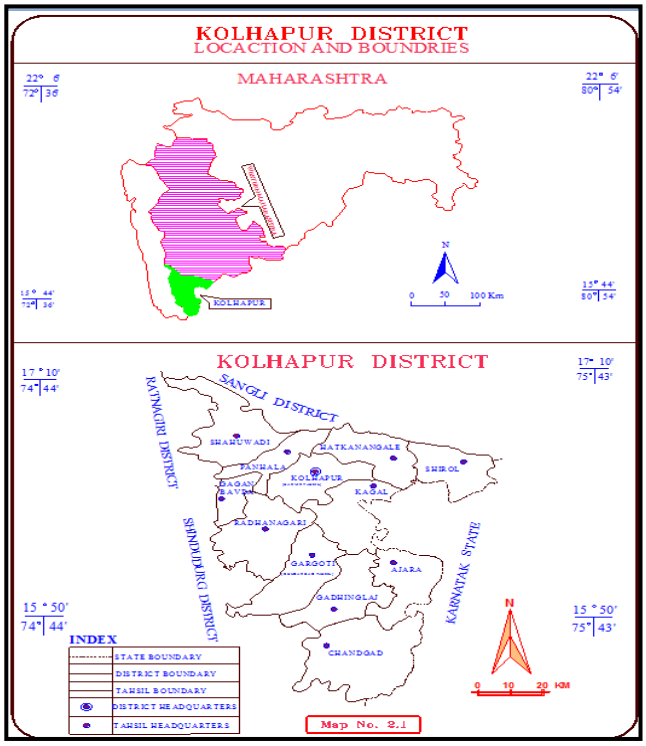

Fig. No. 1.

Land Use and Land Cover in Kolhapur:

Table No. 1. shows that land use pattern in Kolhapur district in 2001 and 2011. The total land cover categorized in net shown area, Cultivable waste, barren and uncultivated, Land not available for cultivation and forest.

Table No. 1. Land use Land cover in Kolhapur District: 2001-2011

Sr. No	Land use Category	Total Area (In Hectares)		Percentage		Changes
				2001	2011	
		2001	2011			
1	Net sown Area	417688	455085	53.81	58.62	**5**
2	Other Land	64542	26935	8.32	3.46	**-4.86**
3	Cultivable waste	76579	75981	9.87	9.78	**-0.09**
4	Barren and Uncultivated	34971	35921	4.51	6.62	**2.11**
5	Land not available for cultivated	42239	42239	5.44	5.44	**0**
6	Forest	140158	140100	18.05	18.05	**0**
Total Geographical Area		**776177**	**776261**	**100**	**100**	**12.07**

Source: Agriculture department of Pune Maharashtra State.

In 2001, the proportion of net shown area was about 53.81 percent to total geographical area it was increased for 5percent with 58.62 percent.Other lands account was 8.32 percent in 2001 and 3.46 percent it was declined with -4.86 percent. The next category Cultivable waste its proportion was 9.87 percent in 2001 and 9.78 in 2011, then barren and uncultivable land was 4.51 and 6.62, land not available for cultivation was 5.44 and forest cover was about 18.05 in both decades respectively. The above table clearly shows net shown area and barren land is increased compare to last decade while other land and cultivable waste land declined and Land not available for cultivation and Forest covered area was not changed from 2001 to 2011.

Conclusion:

The discussion in above mentioned text indicates spatial-temporal distribution of general land use for Kolhapur district the total area in study region has 53.81 and 58.62 percentage of net snow area during the study period, it was increased 5 percent. The maximum geograogical area of the district covered under the net shown area then forest covered area.Net shown area and Barren and uncultivated land is increased compare to last decade while other land and cultivable waste land declined and Land not available for cultivation but Forest covered area was not changed from 2001 to 2011.

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3. Socio-Economic Abstract in Kolhapur distract.

Basic Factors of Sustainable Agricultural Development

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Abstract :
In simplest terms, sustainable agriculture is the production of food, fiber, or other plant or animal products using farming techniques that protect the environment, public health, human communities and animal welfare. This form of agriculture enables us to produce healthful food without compromising future generation's ability to do the same. With reference to rural areas- sustainable development implies sustainable agriculture. Agriculture does not mean only production of crops, but includes live-stock, poultry, forestry, fishing and rural handicrafts and other occupation based on rural resources. Sustainable agriculture should be favorable to Individuals, society and environment. Sustainable agriculture is that which is healthy in eco-system, economically viable, socially equitable and charitable.
Keywords: Healthy Ecosystem, Economic feasibility, social Equitability, charitable Approach, urban Garbage, Cropping Pattern.

Introduction :

It has been observed that commercialization of agriculture is harmful in the long run for society and the environment. Modern technology has disturbed the total social and ecological pattern. The amount spent on commercial agriculture is spent on traditional agricultural technologies then the traditional agriculture will also give good harvest mostly modern agricultural techniques have been tried in rich agricultural areas. Also success stories about commercial agriculture have come from rich agricultural zones. If commercial agriculture can give increased yields then why these techniques cannot give increased yields in poor agricultural zone also. It is important to understand that Traditional Agricultural Area because of their poor physical environment, cannot compete with commercial Agricultural Area even if most expensive agricultural techniques are introduced there. Every area has its limitation in the use of its natural resources. If a production system is adopted according to the availability of natural resources, the area can become self-dependent. In order to make any area self-dependent, the process of sustainable development should be adopted. Sustainable development can be defined as "appropriate use of resources within the environmental and social limitations."

Objective :

This paper gives the information about the factors which responsible for sustainable agricultural development, who wants to find idea.

Data Base and Methodology :

This paper using published literature of known and unknown authors of sustainable agricultural development and its related websites, data is compiled for this purpose.

Basic Factors :

01) Healthy Ecosystem

A healthy eco-system can be achieved by controlling two components. One is self-regulation in the ecosystem and second is resource efficiency self-regulation can be achieved by introducing diversity in species. Each species fulfills certain role in regulations of the system and its cycling of energy and nutrients and soil health. In a resource efficiency system all resources, including green manure, perennial plants and compost, are used for fertilization of soil. Resource efficiency includes utilization of animal powered traction which will not only conserve fuel and minimize pollution but recycle animal feed into manure. Use of windmills and solar powered pumps and bio-gas would generate significant amount of energy and will save other resource. Plantation of useful trees and plants, which nourish humans in all respects is another requirement of a resource efficient system trees have multi-purpose uses, they provide food, fuel, building material, fertilizer and oxygen. They also protect soil form wind and water erosion.

02) Economic Feasibility:

Sustainable agriculture should be economically viable. There should be positive net return. It must produce sufficient food to meet the needs of the family farmer. It should also provide for the family well-being, health, satisfaction and security. In commercial agriculture, health care costs from exposure to chemical fertilizers, costs of cleaning up water and productivity losses due to soil erosion are not considered generally. It focuses only on market prices. Economic viability is based only short term benefits

to supply and demand. A holistic system of accounting is needed to ensure that agricultural systems are truly economically viable in the short and long runs.

03) Social Equitabilty :

Sustainable agriculture should be socially equitable. The system must ensure that resource and power are distributed equitably, so that basic needs of all are most and their rights are assured. Fanners need adequate resources.

04) Charitable Approach :

Sustainable agriculture should be human. Tender, merciful and sympathetic treatment should be given to animals. Animals are not imply objects to exploited. Development of human agriculture is based on respect for animals. Sustainable agriculture provides the possibility of a new common ground. It is a balance of traditional and commercial agriculture. It takes best aspects of both, traditional wisdom and lasted scientific advance. Different agricultural practices and systems have been introduced to achieve sustainable agriculture. Any one of these can be sustainable agricultural method provided it fulfills the criteria of a sustainable agricultural system which are given above.

05) Natural Factors :

Natural farming generally incorporate natural cropping, planting, least use of machinery and inter-planting for insect and weed control. No chemical fertilizer, pesticides, and High yielding varieties are used in natural farming. Natural and healthy seeds of local variety are use. Initially, tilling in necessary to remove medium and large size rocks, and facilitate spread of roots. Any tilling done after sowing, is harmful as it cuts off the roots. Initial tilling must be done by the traditional plough pulled by bullocks or any other light instrument, as use of tractor closes the natural holes in the soil making it less arable. Tilling is carried out by earth worms in natural farming. Earthworms eat soil continuously and then go on defeating at frequent intervals. For breathing they have to come above ground level, and to enable them to save from birds earthworms immediately get back into the soil. The excreta of earthworms is rich in nitrogen, phosphorus, potash and other vital substances, which make the soil much richer organic manure like dung, poultry waste, waste of bio-gas plant dry leaves etc. should be used for enrichment of soil through earthworms. In natural farming because chemical fertilize erase not used, plants do not become thirsty. So water requirement is about 30 percent less. In this situation even if rain gets delayed enough moisture is present in the soil to save the plant. Because healthy local seeds are selected in natural farming, plants develop very strong resistance to disease so the no chemical pesticide is used. It is not that pests do not attack plants they do but they are over powered biologically in the sense that every pest should be a prey to another and not all such pests would be harmful to the plants. Pest like spider, red ants, birds etc. do not harm the plants but they eat away harmful pests and rodents. Some types of plants like Tulsi and Neem help in controlling pests.

06) Use of Urban Garbage:

For achieving economic viability in sustainable agriculture, city garbage can be converted into rich organic fertilizers, with increase in urban population disposal of garbage is proving a great problem. Urban people should be educated for keeping their garbage separately; e.g. kitchen waste, papers, plastic items, industrial and other wastes. This will facilitate easy processing. After scientific processing urban garbage can be converted into rich fertilizer. This will keep the urban areas clean and will provide rich organic manure for agriculture.

07) Use of Livestock Energy :

For achieving resource efficiency in agriculture it is important to incorporate livestock in the agricultural system. In country Like India where enough human and livestock resources are available, there is no need to go for expensive machinery. Existing live-stock are needed to be fed whether they are used for work or not. If they have to be fed, then why not to use their energy, and save other expensive and scare resources. Use of livestock energy can employ more people than machines. Utilization of Livestock is more economic, because waste can be turned into farm manure, which can improve the nutrient cycle of soil. Animal products can be used for human consumption, which will improve their nutritional level. Livestock can make crop rotation economically viable through consumption of forage crops. Marginal crop lands can be converted into grazing lands. It will promote soil conservation and reduce water run-off.

08) Plantation :

Tree plantation are an important constituent of the sustainable agricultural system they make the agricultural system ecologically sound and economically feasible. Tress improve soil structure and reduce soil erosion. Trees also improve the nutritional level of local people by providing fruits, flowers, must, roots and timbers. Trees also provide medicinal herbs, which help to improve the health of local people. Trees provide fuel wood, which is an important source of energy for cooking in rural areas.

09) Land Management :

There is a need for proper and balanced land management, land should be provided for forest, grazing and cultivation. Traditional skills like blacksmith, carpentry, pottery and weaving etc. can be encouraged in the villages so that people do not depend only on land for their Livelihood. Therefore, land requirement for cultivation will be reduced. This way the best land can be indicated for cultivation and barren and fallow land can be developed as grazing and forest land. If grazing land, with enough fodder is available to animals, they will not go to die forest and agricultural areas. This way destruction of forests and cultivated land can be reduced. The yield of milk will increase as enough fodder will be available to animals without much waking.

10) Cropping pattern :

Multi cropping is appropriate as for as ecological soundness and social justification are concerned. If multi cropping is adopted systematically and scientifically, it will be able to increase yield very significantly. In traditional agriculture showing is usually done by broad casting method, if proper rows are made for each crop high yields can be obtained. Also Proper Corporation and crop sequencing can be adopted to save soil fertility and assure ecological balance. One crop should not be grown continuously. There should be always charges in the crop rotations is successive planting of different crops in the same field. Rotations are opposite of continuous cropping which involves successive planting of the same crop. Rotation may range from 2 to 6 years in length and generally involve a farmer planting a part of his or her land to each crop in rotation.

Social Aspects:

It is necessary to increases the purchasing power of the people in rural areas in order to achieve sustainability in agriculture. There is need to generate employment within the rural area. The main problem is not shortage of food, but unequal distribution of ford. The majority of people do not have purchasing power.

i) Distribution of food :

It is necessary to increase the purchasing power of the people in rural areas in order to achieve sustainability in agriculture. There is need to generate employment within the rural areas. The main problems is not shortage of food, but unequal distribution of food. The majority of people do not have purchasing power.

ii) Availability of Agricultural Tools :

In the traditional system of agriculture, fanners use old and depreciated tools. If traditional are improved and provided to farmers, it will help to increase crop yield to some extent. Further if every fanner has agricultural implements, both will be able to start all operations in time and may be able to increase crop yield, as all agricultural operations will be performed on time.

iii) Health and Nutrition :

In India output of agricultural laborers is very low. This is mainly because of under nutrition and poor health. If primary health facilities are improved people can be saved from dangerous diseases. It is also important to provide nutritious food to the people. Healthy workers can give higher output.

iv) Use of Organic fertilizers:

Farmers can been encouraged to prepare and use manure in a scientific manner. They can be given training to prepare farmyard manure, composite manure and green manure. Thus organic material can be used maximally. Besides proper fertilization farmers can be encouraged to keep the cultivated land fallow at least once in five to seven years to regenerate the fertility of soil.

v) Communication System :

The communication system should be strengthened, so that all information regarding agricultural technology reaches formers in time. Their problem such as disease or pest attack on the crop seed requirement etc. can be communicated to officials in time and controlled.

vi) Irrigation :

Irrigation is one of the important components of agriculture. There is no need to build hug dams, which will have their long term negative effects. Instead of one big dam, a number of small dams and check dams can be constructed. Ground water development should be encouraged. Development of catchment area through tree plantation is one of the most important tasks for prevention of water losses. This will increase water retention capacity and check the flow of silt into reservoir. Availability of irrigation in time will help to increase the yield rates of crops. There should be control over the supply of irrigation water, so that water may be drawn by farmers unnecessarily. In this way soil salinity can be avoided.

vii) Storage facility :

Warehouse should be constructed in the cluster of villages, which are within the reach of each fanner. Availability of warehouse facility immediately after harvesting can reduce the post-harvest losses, due to rodents or sudden changes in weather. Nature has provided enough to fulfill our needs, but not to fulfill our greed's. There is need to use all natural resources very wisely. Food, shelter and clothes are most important requirements of man. If an appropriate agricultural system is adopted according to land resource capability, any region will be able to fulfill these minimum needs.

Conclusion :

Every area has its limitation in the use of its natural resources. If a production system is adopted according to the availability of natural resources, the area can become self-dependent; the process of sustainable development should be adopted. Sustainable development can be defined as appropriate use of resources within the environmental and social limitations. With reference to rural areas sustainable development implies sustainable agriculture.Sustainable agriculture is that which is ecologically sound, economically viable, socially equitable, and humanitarian. In order to achieve sustainability in Agriculture in India situation, there are some physical and social remedies which need to be adopted. Natural farming systems, utilization of urban garbage, use of livestock energy, tree plantation, land management, appropriate cropping pattern are some of the physical aspects which need proper attention, actually on the field.

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Correlation Regression between Density and Rainfall of Latur and Osmanabad District: A Geographical Study

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Abstract:

The density of population is expressed in various ways to understand the relationship between population and resources. These ratios have been designated as arithmetic density, physiological density, agricultural density, geographical density and caloric density. Arithmetic density is a ratio between total area and total population. However, it cannot be used as a measure of population pressure on land because it merely gives a simple quantitative relationship between man and land.
According to 2011, census arithmetic density of the Latur and Osmanabad district was 343 and 221 persons per sq.km. This is significantly lower than that of Maharashtra in the same year which was 365 persons per sq.km or less than that of India, which was 382 persons per sq.km. The density of population for the study region has been lower than that for Maharashtra as well as for India since 1951. In the decade of 1951 density of the study area increases, it is mainly due to low mortality rates caused by plague epidemic.
Key words: Density, Distribution, Population, Rainfall, Regression, Correlation

Introduction:

Distributions of population in an area constitute an important segment of population studies. While distribution, the concepts are quite interrelated and used simultaneously. Distribution of population refers to the way people are spaced over the land; it emphasizes the pattern of actual place location of a population. Distribution of population measures the degree of population concentration or dispersion. On the other hand density of population is most revealing and is useful tool in the analysis of diversity of man's distribution in space. It is a simple concept of relating population size to the land area with a view to assessing the pressure of population upon the resource of area. It is generally expressed in terms of person per sq.km or per sq. mile of land area rather than of gross area. Density of population per unit of area represents the ratio of population to land (Desai, 1985).

Study Region:

Latur district is situated in the South-East part of the Maharashtra and it lies between 17^0 52' North latitude to 18^0 50' North latitudes and 76^0 12'East longitudes to 77^0 18' East longitudes. The district of Osmanabad is the southern most districts in Aurangabad division of Maharashtra state situated between 17°37' to 18°42' North latitudes and 75°17' to 76°47' East longitudes. The total geographical area of Latur district is 7157 sq.kms. Out of the total geographical area of Maharashtra it covers 2.39 per cent. The district has an area of 7484 square kilo-meters.

Objectives:

1. To correlate density of population
2. To correlate density and rainfall
3. To conclude with relationship of density and rainfall

Database and Methodology:

The attempts have been made by the researcher to examine population structure during the 30 years spreading between 1991 to 2011, for which uniform data at circle level is available. The main body of data used in this study was collected from two sources viz. primary and secondary.

The present paper includes distribution, density of population in the study region. It has been carried out over thirty years from 1991 to 2011. The processed data was presented in the form of maps, diagrams and tables.

Scattered diagram is prepared for X and Y. Regression equation for the line of Y on X is obtained. Regression of any straight line is in the form of -

$$YP = a + bx$$

Where as : a = intercept

b = slope

Once 'a' and 'b' is worked out a straight line could be drawn.

The regression equation is YP = a + bx . The 'a' and 'b' would be obtained with the following formula-

$$b = \frac{N \in xy - (\in x \in y)}{N \in x^2 - (\in x)^2}$$

$$a = \frac{\in y - b \in y}{N}$$

Correlation Regression between Density and Rainfall :

Therefore the equation of present regression of Latur district is Y on X (i.e. rainfall and density) is YP 824.94+(-0.28)X and Osmanabad district is Y on X is YP 768.53+(-0.005)X.

With reference this equation for any value of X the YP could be identified. Then by taking any three more points X and these corresponding YP values three more points are plotted on the scatter diagram and straight line is drawn to pass through the three points. This resultant straight line is regression line it shows that there is a positive relationship between these two variables more specifically it shows that with increasing rainfall there is increase in density of population.

Table No. 1.3: Rank Correlation between Density and Rainfall(2011)

Tahsils	Density	Rainfall	X2	XY	Yp	Tahsils	Density	Rainfall	X2	XY	Yp
Latur	684.31	634.9	468280.6	434468.62	633.14	Paranda	168	615.5	28109.88	103194.73	767.69
Udgir	257.7	761.2	66410.78	196163.45	713.22	Bhum	180	905.9	32504.48	163324.71	758.69
Ahmadpur	302.18	784.8	91312.03	237149.92	740.1	Washi	142	715.6	20192.41	101686.76	767.82
Nilanga	250.76	655.2	62878.09	164294.7	738.06	Kalamb	239	715.6	57230.99	171192.99	767.33
Ausa	266.6	728.7	71075.72	194271.64	756.06	Osmanabad	314	751.7	98621.12	236063.87	766.96
Renapur	253.08	634.9	64047.34	160677.8	752.42	Tuljapur	181	937.4	32728.43	169585.03	767.63
Chakur	245.33	830.8	60184.56	203816.36	749.9	Lohara	217	799	47097.68	173398.98	767.44
Jalkot	310.05	830.6	96130.71	257527.13	754.38	Omerga	276	799	76236.73	220611.89	766.95
Deoni	255.47	830.6	65262.86	212190.03	753.26	**Total**	∑x= 1717	∑y= 6239.7	$\sum x^2$= 392721.72	∑xy= 1339059	

Shirur A.	397.77	655.2	158224.11	260621.49	753.82	
Total	$\sum x$= 3223.24	$\sum y$= 7346.9	$\sum x^2$= 1203806.8	$\sum xy$= 2321181.1		

Source :*Compiled by the Researcher.*

Conclusions:

The points lie above the regression line indicates that rainfall in those places are more than what is expected the level of density. The places lie below the expected it indicates that the presence of density is not only dependent only the rainfalls but there are some other factors which affect the density distribution.

However, in the case of Latur and Osmanabad district since most of the points are away from the regression line. One may conclude that density is not so related with rainfall.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Propensity And Transformation Of Agricultural Land Use Efficiency Of Nashik District, (Ms)

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Abstract:
This is deliberate attempt to recognize the transformation and the restructuring in the general land use pattern of the district for the four decades we are focusing on the involving change in the form of distribution and the purpose of use the land and also discussed the factors affecting on the pattern of the distribution of the land use. Land is a specific part of the earth surface geographically; man is depending on the land for his surviving since the origin of the man's cultural life. Land use is the prime feature to recognize how the man was utilized the available resources and how he was developed his own economic living standard as well as automatically the country's economic development is depend upon the utilization of the land thus the general land use pattern is mostly effective concern with the development. Our district is mainly having agricultural activities and the economy ; the farmers life is depend upon the agriculture thus here try to examine the Spatio temporal trend and change in the general land use pattern and determinants of the land use of the district.
Key Words: Agriculture, Land Use, Trend, Cropped Area, LUEI, Spatial.

Introduction:

Agriculture practices in study area was influenced by the South-West Monsoon Season and followed by post monsoon season rainfall distribution is mainly from western parts having excess rainfall while middle part of the district having moderate rainfall and eastern and south eastern part having scarcity of rainfall. Nashik District is not regular, natural relief and other geographical features. Consideration of all these things Agricultural Land Use Efficiency varied spatially and temporally in the Nashik District M. G. Kendall was the first to develop a concept of agriculture land use efficiency followed by L. D. Stamp Shafi, Sapre and Deshpande, Bhatia, Gupta, M. Ali and Jasbir Singh etc.further modified and discovers new techniques to analyze LUEI (Land Use Efficiency Index) In this study an attempt should made to analyze the agricultural pattern and development through land use efficiency. Agricultural Land use efficiency index indicates the potential of the Crop yield. The variations in Spatial and Temporal pattern in land use efficiency examined for four decades the results will more clear and fruitful to planning of sustainable agricultural practices in study region.

Study Region:

Nasik district lying between 19°35'18" North latitude to 20°53'07" North latitude and 73°16'07" East longitude to 74°56'27" East longitude, with an area 15530 sq.km. and population of 6,109,052, as per the 2011 census. There are 15 Tahasil and 66 revenue circles are in the Nashik district. Nashik district is situated in the Deccan trap of Maharashtra which is partly in the Tapi Basin and partly in the upper odavari Basin. The main stream of hills in the Sahyadri which is runs North-South in the western proportion of the district. Ajanta range which runs right across the district. It acts as a watershed between the Girna and its tributaries which drain towards the Tapi to the north and the Godavari and its tributaries to the south. More area of this region is in the rain shadow zone which is called as rain fed area. Drought is the phenomenon which affects the cropping pattern and agricultural development. So we are interested to find out some concrete solution for the agricultural development of this region.

Objectives:

1. To find out tendency of the Agricultural Land Use effectiveness
2. To identify the pattern of Agricultural Land Use effectiveness

Methodology:

This study is depending upon four decades data of Cropping Pattern mainly Gross cropped area and net sown area the data is obtained from the Directorate of Agriculture, M.S. Pune and District Inspector Land Records, Nashik. We used Jasbir Singh's (1976) Method for Calculation of level of LUEI. The Index is calculated by using the following formula.

$$\text{Index of Land Use Efficiency (LUEI)} = \frac{\text{Gross Cropped Area}}{\text{Net Sown Area}} \times 100$$

The higher the index of the efficiency means higher the agriculture land use efficiency and the lower the index of the efficiency means the lower the agriculture land utilization.

Connotation: Agricultural Land Use Efficiency in study area categorized in three categories i.e. Low Agricultural Land Use Efficiency, Moderate Agricultural Land Use Efficiency and High Agricultural Land Use Efficiency. Land use efficiency represents the use of agricultural land hundred percent of the capacity of growing and yield of crops. Agricultural Land Use Efficiency Index Year: 1990-2021Table: 1. Pattern of Agricultural Land Use Efficiency Nashik District 1990-2021

Years		1990-1991			2000-2001			2010-2011			2020-2021		
Sr. No.	Tahsil	Gross Cropped Area	Net Sown Area	Land Efficiency Index	Gross Cropped Area	Net Sown Area	Land Efficiency Index	Gross Cropped Area	Net Sown Area	Land Efficiency Index	Gross Cropped Area	Net Sown Area	Land Efficiency Index
1	Nashik	61610	57312	107.49	59727	55800	107.03	40582	34042	119.21	38857	32794	118.48
2	Peth	31052	30914	100.44	34489	34137	101.03	35474	35013	101.31	21040	21040	100
3	Dindori	75715	72172	104.91	80681	76552	105.39	70299	66499	105.71	49459	41550	119.03
4	Surgana	30153	30060	100.3	32420	32310	100.34	34993	34993	100	30254	29974	100.93
5	Kalwan	48369	38749	124.82	61777	57141	108.11	40953	34699	118.02	47917	38966	122.97
6	Baglan	87296	80447	108.51	87163	81814	106.53	77586	71660	108.26	74801	68146	109.76
7	Malegaon	120038	112573	106.63	116775	112704	103.61	108735	103967	104.58	93191	88071	105.81
8	Chandwad	68220	64879	105.14	65003	63208	102.83	67521	62310	108.36	55160	53221	103.64
9	Nandgaon	61813	60104	102.84	63072	60418	104.39	67420	63000	107.01	13281	10781	123.18
10	Yeola	77463	72762	106.46	84245	77147	109.2	83163	73540	113.08	85607	85607	100
11	Niphad	92112	83172	110.74	84173	77561	108.52	81080	72729	111.48	75412	68741	109.7
12	Sinner	94528	90028	104.99	97727	90200	108.34	82027	78299	104.76	74786	67802	110.3
13	Igatpuri	55449	54683	101.4	57156	55288	103.37	51909	49388	105.1	14918	12475	119.58
14	Trimbak	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	27394	26892	101.86
15	Devala	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	35707	29470	121.16
Total		903818	847855	106.6	921408	874280	105.39	841742	780139	107.89	737784	675530	109.21

Source: 1. Directorate of Agriculture, M.S. Pune and District Inspector Land Records, Nashik. 2. Socio-Economic Abstract Nashik District 3. Land Efficiency Index Compiled by Research Scholar

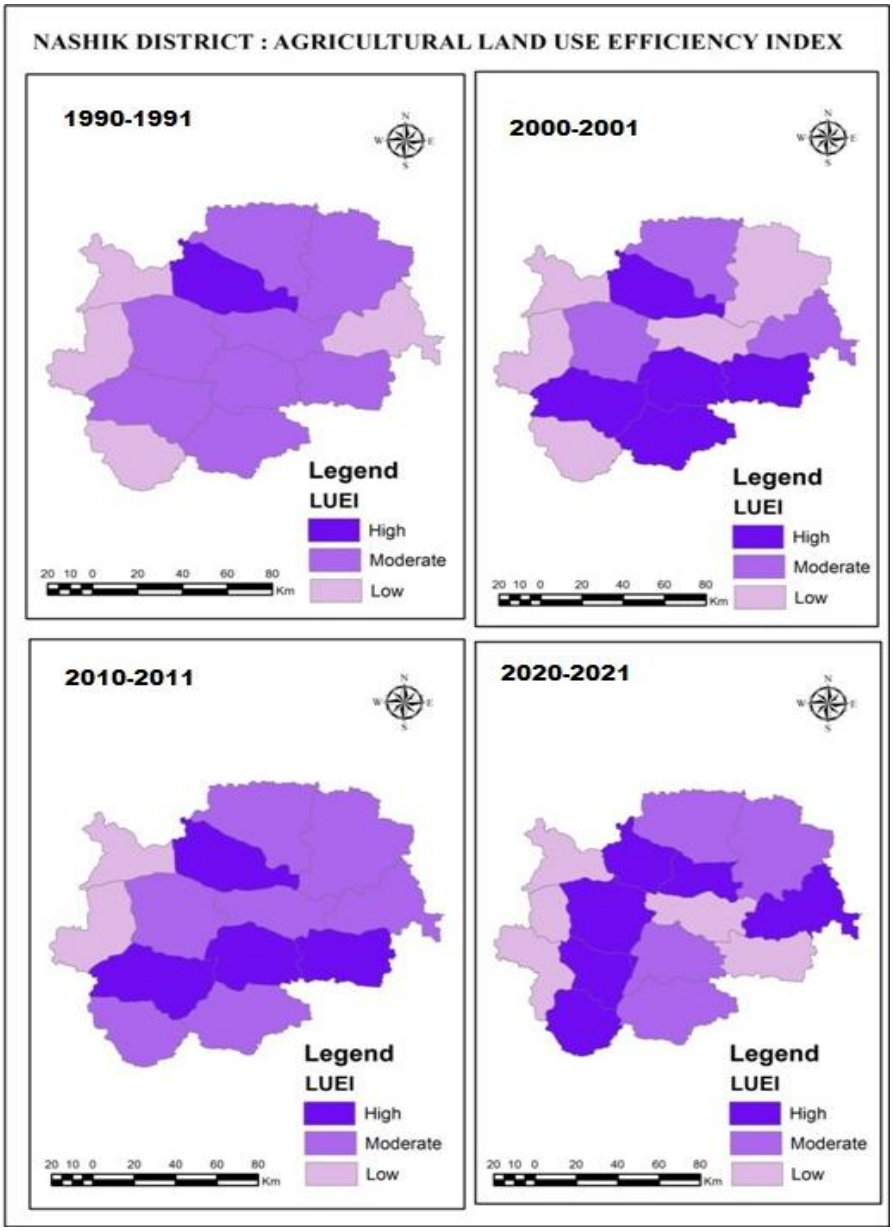

Fig.01 Agricultural Land Use Efficiency Index Year: 1990-2021

A. Pattern of Agricultural Land Use Efficiency

1. Low Agricultural Land Use Efficiency (100% to 110%)

More than 90% area is covered by the Low Agricultural Land Use Efficiency i.e. index in between 100% to 110% in all the decades mainly western and northern part of the district is having low agricultural land use efficiency the area is backward in terms of Education and Transport and communication accessibility. Farmers apply old agricultural techniques and mostly depend upon monsoon rainfall

2. Moderate Agricultural Land Use Efficiency (111% to 120%)

Moderate Agricultural Land Use Efficiency was not observed in the decades of 1991 And 2001 while in the year 2011 it is at Nashik 119.21% , Kalvan 118.02%, Yeola 113.08%,Niphad 111.48% in the year 2021 ,Nashik118.48%,Dindori 119.03% and Igatpuri 119.58%.

3. High Agricultural Land Use Efficiency (121% and Above)

High Agricultural Land Use Efficiency was occurred an insignificant time it is only covers four Tahsils while in 2000 and 2010 it was not observed. In 1991 Kalwan Tahsil was having 124.82%, In 2021 Kalwan, Nandgaon and Devala having respectively 122.97%, 123.18%, 121.16%.

B. Trend of Agricultural Land Use Efficiency Index

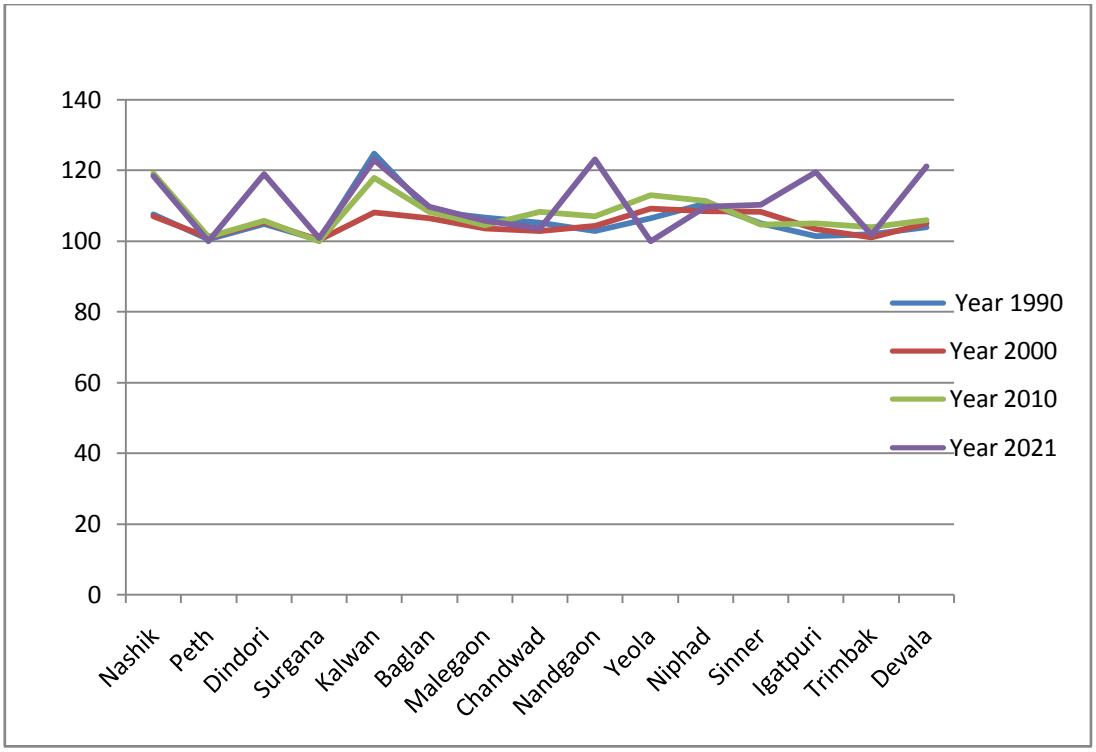

Fig: 2 Trend of Agricultural Land Use Efficiency Year 1990-2021

Above graph (Fig: 2) shows the trend of the Agricultural Land Use Efficiency for four decades there is no significant fluctuations in the years of 1990,2000,2010 .In the year of 2021 the graph shows more fluctuations otherwise trend is normal for the all decades.

Conclusion:

More area of this region is in the rain shadow zone which is called as rain fed area. Drought is the significant phenomenon which affects the cropping pattern and agricultural development. The present study will help to understand the relationship between Agricultural land Use Efficiency Index and the influences of other factors, like Soil, water supply and technology, represented by mechanization, pest and disease control, and the other agricultural management aspects. Although these factors are crucial in agriculture and crop yield. Scientific crop planning is possible through an understanding of Agroclimatic potential of the Study Region. The region having low agricultural efficiency index is facing problems of the Deforestation, wild life is becoming rare, soil erosion is common, water level is very deep, and soil fertility has been reduced in some of the Drought Prone areas. Most of the region having uneven Climatic and Physiographic Condition. There is regional imbalance in water resource and management. Some parts of Region having wrong Agricultural Practices. Lack of Awareness within the farmers and civilians is on climate change issues for further adaptation and mitigation. There is a Scope for Sustainable Agricultural Development of the Region.

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"Changing Trends in Agriculture and its Impact on Rural Development"

A Systematic Study Of Urban Sustainability in India

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Abstract:
Urbanization is not a new phenomenon; the ancient cities of the Indus Valley Civilization, Ancient Greece, Rome and Mesopotamia are strong evidences. However, with our entry to the era of the 'Anthropocene', rapid urbanization with its rate, scale and shifting geographies (with intense urbanization in the 'global south': Asia, Africa and Latin America) is upsetting the ecological balance complemented with rising inequity, displacement and loss of livelihoods affecting the urban poor.The URBAN-21 conference Berlin 2000 defines sustainable urban development as "improving the quality of life in a city, including ecological, cultural, political, institutional, social and economic components without leaving a burden on the future generations – a burden which is the result of a reduced natural capital and an excessive local debt."
Keywords: Urban Sustainability, Urbanization

Introduction: India's population stood at 1210 million in 2011, with an urbanisation level of **31.1%** (Census of India 2011)**.** The distribution of urban centres and the pace of urbanisationis not uniform across the country.Over 75% of the urban population of the country is in 10 States: Maharashtra, Uttar Pradesh, Tamil Nadu, West Bengal, Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Rajasthan, and Kerala. Goa, Tamil Nadu, Kerala, Maharashtra, and Gujarat have attained over 40% urbanisation. Bihar, Odisha, Assam, and Uttar Pradesh continue to be at a lower level of urbanisation than the national average of 31.1%.NCT of Delhi, Daman and Diu, Chandigarh, and Lakshadweep, show above 75% urbanisation. India's urban population is 11% of that of the world. However, in absolute numbers, the urban population in India is more than highly urbanised countries/regions like the United States, Japan, Western Europe, and South America.During 2011-36, urban growth will be responsible for 73% of the rise in total population in India.According to Oxford Economics report, Indian cities will make up most of the fastest growing cities in the world between 2019 and 2035, considering the year-on-year Gross Domestic Product growth. Over 17 of the 20 top cities on the list will be in India. The report said that Indian cities including Bengaluru, Hyderabad, and Chennai will be among the strongest performers across the globe. It must be noted that this quasi-urban transition has to be accompanied with green energy, clean water, mass mobility, nutrition, education, healthcare, waste management etc. to achieve a certain degree of sustainable living.

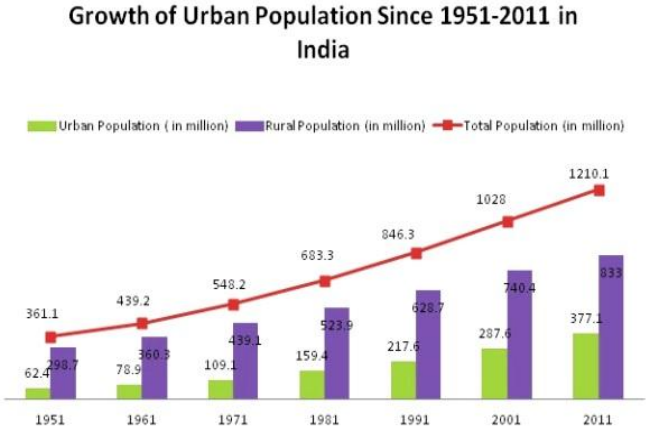


figure 1

Source: census of india.

Need for urban sustainability in india

1. According to the Census 2011, the census towns in India rose over 185% from 2001 to 2011 while only 0.36% increase was seen in villages.
2. The significant lateral growth in the city region is very slow as compared to the urban population. The population density of NCT is 11,297 people per sq. Km. (Census, 2011) which is much higher than the national average of 382 persons per sq. Km.

3. Lack of employment, health care, education and other facilities in the rural areas of the country has led to excessive migration towards the urban centres. This rapid migration has led to the problem of slums in the cities.
4. Due to the governmental policies and increasing population pressure on agriculture led to a sudden shift from agriculture to other economic activities which further led to a population explosion in the urban centres in search of employment opportunities.
5. The unequal distribution of natural and economic resources has created an economic development divide in the country where the colonial legacy and focus on a few economic centres has widened the gap.
6. The phenomenon of urbanization is concentrated in a few pockets in India which failed to laterally percolate the benefits of urbanization.
7. Global warming and increasing unpredictability of monsoon and other climatic phenomena have also increased the vulnerability of both rural and urban settlements.
8. Excessive population pressure on land use pattern and other resources, increasing energy demands and imbalance in production and consumption have further increased the need for sustainable urban planning.

What is sustainability?

Sustainability became a widely used term after United Nation's definition of 'sustainable development' in the Brundtland Report 1987; "A development that meets the needs of the present without compromising the ability of future generations to meet their needs". The definition of sustainable development contains two key points;

- "The concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given".
- "The idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs".

A sustainable city can be defined as one that is able to provide the basic needs of the population along with the necessary infrastructure of civic amenities, health, and medical care, housing, education, transportation, employment, good governance, etc. giving due importance to the environment, equity and futurity. It should take care of the population's needs and all sections of the society without discrimination.

Figure 2

Strategies to achieve sustainable urban success in India

- In order to take an initiative for urban renewal, the Indian government has announced JNNURM which is the largest mission for urban sustainability in India. The government has also taken a step towards urban sustainability by moving the responsibility of the decision making processes to local municipalities. These Local Bodies have thereby received more power over their own land. This is a step towards participatory planning which is a strategic management of sustainable urban planning. Another major planning strategy for urban sustainability is the spatial city forms since it regulates ways of transportation, public safety, social well-being and interaction as well as economic commerce. The compact city and mixed land use are two of these spatial city forms that are implemented in India
- Even though many strategies such as the planning for spatial forms are considered and implemented, urban sprawl will still happen but in a different manner. Along with a better economy as well as the increase in population, a demand for larger real estates will appear and the city will therefore spread. With a continuous increase of population follows the difficulty in keeping the cities' development sustainable.
- WSP India uses international resources as a strategy towards achieving sustainable urban success in their projects. The Green City is a clear example of how international expertise has developed a sustainability approach through a rating system called Citi Metrix, created specifically for the Green City

- Smart Cities: To promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of Smart Solutions.It is an innovative initiative under the Ministry of Housing and Urban Affairs, Government of India to drive economic growth and improve the quality of life of people by enabling local development and harnessing technology as a means to create smart outcomes for citizens.
- AMRUT Mission: To ensure that every household has access to a tap with the assured supply of water and a sewerage connection.
- Swachh Bharat Mission-Urban: Aims at making urban India free from open defecation and achieving 100% scientific management of municipal solid waste in 4,041 statutory towns in the country.
- HRIDAY: The National Heritage City Development and Augmentation Yojana (HRIDAY), aims to bring together urban planning, economic growth and heritage conservation in an inclusive manner & with the objective of preserving the heritage character of the City.
- PradhanMantriAwasYojana-Urban: Addresses Urban housing shortage among the Urban Poor including the Slum Dwellers by ensuring a pucca house to eligible urban poor.

India's Global Commitments:

SDGs (Goal 11): Promote urban planning as one of the recommended methods for achieving sustainable development.

UN-Habitat's New Urban Agenda: It was adopted at Habitat III in 2016. It puts forth principles for the planning, construction, development, management, and improvement of urban areas.

UN-Habitat (2020) mentions **spatial sustainability,** as a concept. It suggests that the spatial conditions of a city can enhance its power to generate social, economic and environmental value and well-being.

Paris Agreement: India's **National Determined Contributions (NDCs)** includes the goals to reduce the emission intensity of the country's GDP by 33 to 35% by 2030 from 2005 level.

Challenges associated with Sustainable Urban Planning in India

Economic Challenges

Rapid increase in urban population and increase in per capita income leads to the increased demand for luxury goods. To sustain the demand-supply balance along with sustainable utilization of resources is difficult to maintain.Major migration in the urban regions is in the form of labourers and daily wage earners thus, monitoring their working and living conditions and ensuring their welfare is a challenge.Lack of sophisticated, environment-friendly technology and sustainable infrastructure to support urbanization is a major concern.India being a developing nation where around 35% of the urban population is BPL lacks the necessary funds and investments to provide basic facilities at an affordable price.

Political problems

The fringing regions around the urban area lack clarity regarding governing bodies. The multiplicity of governing bodies creates ambiguity regarding delivery of services and the region lacks proper development.the Unplanned haphazard growth of urban regions along with rapid development creates law and order issues viz. increased crime rates, drug abuses and other illegal activities.Women and children are the most vulnerable sections of the society. With the changing societal norms and highly cosmopolitan society of urban centres has further increased concerns regarding their security. Indian cities still lack proper surveillance systems and adequate police force to ensure their security. Ensuring accountability and ethical practices by the governing bodies pose a great challenge to the sustainability of the urban centres.

Social problems

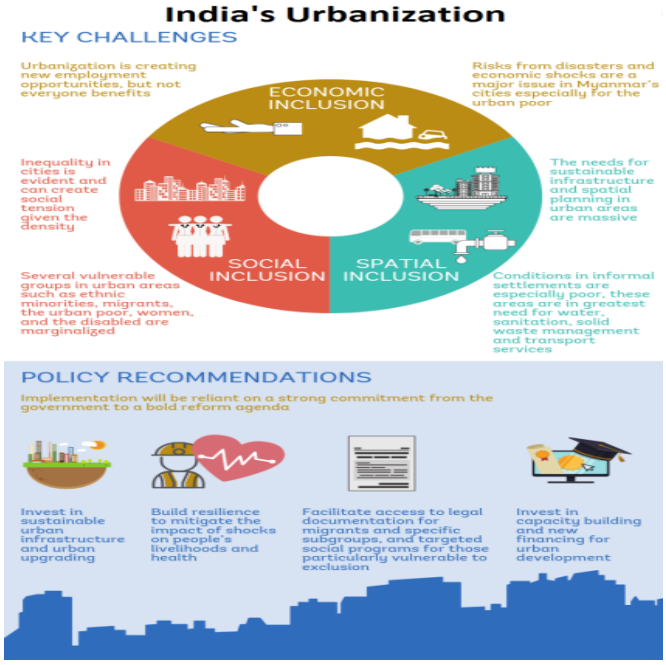
Rapid migration in the urban regions has led to the problem of illegal land encroachment and unplanned settlements in the form of slums. The slum dwellers are generally ill-represented and denied all the basic facilities which further aggravate the problem.Social pollution and degradation of societal norms due to highly cosmopolitan urban society is a common feature. These regions are highly prone to crimes and other illegal activitiy. The unplanned urbanization lacks basic infrastructural facilities especially with regards to sanitation and waste disposal and management which give rise to various health concerns. Pollution and adulterated food supply also lead to health issues in urban centres. Mental disorders are on the increasing trends in the region.Despite high literacy rate the gender ratio is poor in urban centres in India. As per the Census 2011 report, the gender ratio of Delhi is 832 while that for Mumbai is 852 females per 1000 males. Crime rate against women is also high in these centres which pose serious concerns about their security.

Environmental problems

The increased vertical extends along with excessive constructional activities and vehicular and industrial emissions have degraded the urban micro-climate which has increased the vulnerability of the region for climatic and environmental hazards.Improper waste management practices and landfills

negatively impact the urban climate and water bodies. The fringing regions of the urban areas have rapidly changing land use pattern from agriculture and forested land to concrete jungles. Unplanned extension of these urban centres further depletes the resources and degrades the environment. Increasing population and constructional activities lead to rapid deforestation and desertification in the R-U fringe.

Figure 3



Source: https://www.drishtiias.com/images/uploads/1587471528_image1.png

Conclusion and Recommendations

Urban reform process in India started in early 1990s with the enactment of the 74th Constitutional Amendment Act. Though progress has been made in developing the framework for reform linked investment in urban infrastructure, a lot needs to be done to make Indian cities more sustainable.In this context, India's future urban strategy should improve urban governance, delivery of public services, inter-government transfers and capacity building.There is a need for revision of the land use plan corresponding to the city characteristics to be made with the long-term perspectives.Urban centers should be made financial autonomous, so that they can take care of maintenance of basic civic amenities and cleanliness.In order to check blind migration towards cities, there is a need for providing employment opportunities in rural areas .AMRUT Mission along with Smart Cities Mission lays major emphasis on institutional reforms which aim to improve governance and institutional capacities of Urban local bodies..There is a need for national urbanisation policy, that should address the problems associated with slums.Mission Indradhanush 2.0 reiterates India's commitment to vaccines for all, as it aims to achieve 90% Full Immunisation Coverage with focus towards districts and urban areas with persistent low levels of immunization.Today's record is that India is succeeding brilliantly on some levels such as economic growth yet failing miserably when it comes to political sustainability. If India is sincere about a sustainable urban development, it is important for the Indian government to take a leadership position in using and promoting sustainability. Even though it takes hard work, urban sustainability will start with a sustainable government.

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Biodiversity and Ecosystems

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Abstract: -
The rapid anthropogenic climate change that is being experienced in the early twenty-first century is intimately entwined with the health and functioning of the biosphere. Climate change is impacting ecosystems through changes in mean conditions and in climate variability, coupled with other associated changes such as increased ocean acidification and atmospheric carbon dioxide concentrations. It also interacts with other pressures on ecosystems, including degradation, defaecation and fragmentation. There is a need to understand the ecological dynamics of these climate impacts, to identify hotspots of vulnerability and resilience and to identify management interventions that may assist biosphere resilience to climate change. At the same time, ecosystems can also assist in the mitigation of, and adaptation to, climate change. The mechanisms, potential and limits of such nature-based solutions to climate change need to be explored and quantified.

Introduction: -

The term 'diversity' is not new, rather has a long history, but 'biological diversity' came into use in scientific literature only in the 1980s. The term was first coined by Lovejoy who, however, did not provide any formal definition to it, but considered it as only the number of species. Rosen in 1985 used the term 'biodiversity' in the first planning conference of the 'National Forum on Biodiversity', Washington (D.C.), on Sept. 1986. Wilson (1988) edited the proceedings of the conference titled Biodiversity, and this popularized the concept. Convention on Biological Diversity in June 1992, constituted a historical commitment by all nations of the world. For the first time, biodiversity was comprehensively addresses in this global treaty. At the same time the genetic diversity was considered and conservation of biodiversity was accepted as the common concern for the cause of human welfare.

Since there are published records of all the species discovered and named, we know how many species in all have been recorded so far, but it is not easy to answer the question of how many species there are on earth. According to the International Union for Conservation of Nature (2004), the total number of plant and animal species described so far is slightly more than 1.5 million, but we have no clear idea of how many species are yet to be discovered and described. Some extreme estimates range from 20 to 50 million, but a more conservative and scientifically sound estimate made places the global species diversity at about 7 million.Although India has only 2.4 per cent of the world's land area, its share of the global species diversity is an impressive 8.1 per cent. That is what makes our country one of the 12 mega diversity countries of the world. Nearly 45,000 species of plants and twice as many of animals have been recorded from India. How many living species are actually there waiting to be discovered and named? If we accept Robert May's global estimates, only 22 per cent of the total species have been recorded so far. Applying this proportion to India's diversity figures, we estimate that there are probably more than 1,00,000 plant species and more than 3,00, 000 animal species yet to be discovered and described. Would we ever be able to complete the inventory of the biological wealth of our country? Consider the immense trained manpower and the time required to complete the job. The situation appears more hopeless when we realize that a large fraction of these species faces the threat of becoming extinct even before we discover them. Nature's biological library is burning even before we catalogued the titles of all the books stocked there. From a study of the history of life on earth through fossil records, we learn that large-scale loss of species like the one we are currently witnessing have also happened earlier, even before humans appeared on the scene. During the long period since the origin and diversification of life on earth there were five episodes of mass extinction of species. How is the 'Sixth Extinction' presently in progress different from the previous episodes? The difference is in the rates; the current species extinction rates are estimated to be 100 to 1,000 times faster than in the pre-human times and our activities are responsible for the faster rates. Ecologists warn that if the present trends continue, nearly half of all the species on earth might be wiped out within the next 100 years. Humans endanger the existence of species in three principal ways. The first is through direct exploitation, such as hunting. Second is the biological havoc that is occasionally wreaked following the introduction of alien species to new ecosystems, whether deliberately or accidentally. The third, and by far the most important, mode of human-driven extinction is the destruction and fragmentation of habitat, especially the inexorable cutting of tropical rainforests. The forests, which cover just 7 percent

of the world's land surface, are a cauldron of evolutionary innovation and are home to half of the world's species. The continued growth of human populations in all parts of the world daily encroaches on wild habitats, whether through the expansion of agricultural land, the building of towns and cities, or the transport infrastructure that joins them. As the habitats shrink, so too does the Earth's capacity to sustain its biological heritage.**Biodiversity is the foundation of ecosystem to which human** wellbeing **is intimately linked.** No feature of Earth is more complex, dynamic, and varied than the layer of living organisms that occupy its surfaces and its seas, and no feature is experiencing more dramatic change at the hands of humans than this extraordinary, singularly unique feature of Earth. This layer of living organisms the biosphere through the collective metabolic activities of its innumerable plants, animals, and microbes physically and chemically unites the atmosphere, geosphere, and hydrosphere into one environmental system within which millions of species, including humans, have thrived. Breathable air, potable water, fertile soils, productive lands, bountiful seas, the equitable climate of Earth's recent history, and other ecosystem services are manifestations of the workings of life. It follows that large-scale human influences over this biota have tremendous impacts on human well-being. It also follows that the nature of these impacts, good or bad, is within the power of humans to influence.An ecosystem can be visualised as a functional unit of nature, where living organisms interact among themselves and also with the surrounding physical environment. Ecosystem varies greatly in size from a small pond to a large forest or a sea. Many ecologists regard the entire biosphere as a global ecosystem, as a composite of all local ecosystems on Earth. Since this system is too much big and complex to be studied at one time, it is convenient to divide it into two basic categories, namely the terrestrial and the aquatic. Forest, grassland and desert are some examples of terrestrial ecosystems; pond, lake, wetland, river and estuary are some examples of aquatic ecosystems. Crop fields and an aquarium may also be considered as man-made ecosystems. We will first look at the structure of the ecosystem, in order to appreciate the input, transfer of energy and the output. We will also look at the relationships cycles, chains, webs that are created as a result of these energy flows within the system and their inter- relationship.

Ecology is the science that deals with the relationships between living organisms with their physical environment and with each other. Ecology can be approached from the viewpoints of the environment and the demands it places on the organisms in it or organisms and how they adapt to their environmental conditions. An ecosystem consists of an assembly of mutually interacting organisms and their environment in which materials are interchanged in a largely cyclical manner. An ecosystem has physical, chemical, and biological components along with energy sources and pathways of energy and materials interchange. The environment in which a particular organism lives is called its habitat. The role of an organism in a habitat is called its niche.Ecosystems are broadly divided into natural and artificial. Natural ecosystems are those that are existing in nature; they are further classified into terrestrial and aquatic. Terrestrial includes hot desert, grass land, tropical and temperate rainforest and aquatic includes ponds, river, streams, lakes, estuaries, oceans, mangroves, swamps and bays etc. However, these two ecosystems are self-regulating, open system with a free exchange of inputs and outputs with other systems. Artificial ecosystems are simple, human-made, unstable and subjected to human intervention and manipulation. Usually it is formed by clearing a part of the forest or grassland e.g. crop field, agricultural land.Ecosystems are parts of nature where living organisms interact amongst themselves and with their physical environment. The term ecosystem was coined by Sir Arthur Tensely in 1935. Ecosystems vary greatly in size, such as a small pond or a large forest. Ecosystems can be recognized as self-regulating and self-sustaining able to persist by itself units of landscape. In nature two major categories of ecosystems may be distinguished: terrestrial and aquatic. Forests, grasslands, deserts are examples of terrestrial ecosystems. The aquatic ecosystems can be either fresh water, or salt water type. Human activities may modify or convert natural ecosystems into anthropogenic or man-made ecosystems. For example, natural forests have been cut and the land converted to tree plantations or agricultural systems. Often dam construction involves submergence of forests and conversion to water reservoirs. Spacecraft's and aquariums may also be considered as manmade ecosystems. In this chapter, you will learn the basic concepts of ecosystem structure and function related to productivity, energy flow, decomposition and nutrient cycling. The general characteristics of major terrestrial ecosystems will also be described.Ecosystems can generally be physically delineated. But sometimes ecosystems intergrade with each other. At large spatial scale all ecosystems are interconnected by flow of energy and transfer of materials with the neighbouring ecosystems, or even with distant ecosystems. For example, leaves of riverbank trees dropping in river water represent transfer of energy and material from terrestrial to aquatic ecosystem. Terrestrial birds diving to catch fishes in water bodies make similar transfers from aquatic to terrestrial ecosystems. Soil material may be eroded from a forest ecosystem and washed into the adjoining

stream, or dust blown from a desert ecosystem may deposit over another ecosystem located miles away. Ecological systems both contribute to and are affected by the production of goods and services that are of value to people. We refer to the contribution of ecosystems to human wellbeing in short-hand notation as "ecosystem." Understanding how agriculture impacts ecosystem services, which in turn affect agricultural productivity, is of particular importance because of agriculture is a dominant form of land management. Globally, it is estimated that 38% of land is in agricultural uses, and excluding boreal lands, desert, rock and ice, this amount rises to 50% of "Agriculturalists are the de facto managers of the most productive lands on Earth.Sustainable agriculture will require that society appropriately rewards ranchers, farmers and other agriculturalists for the production of both food and ecosystem services." But appropriately rewarding ranchers, farmers and other agriculturalists will require the ability to accurately measure ecosystem services in a verifiable quantitative manner. Ecosystem indicators can be used for a variety of purposes. Indicators can help target key environmental problems and opportunities for improvement. Indicators can be helpful in designing effective farming systems and in monitoring them. They can also be used to predict efficiency of different farm practices and to evaluate the repercussions of site-specific conditions or place specific events. In a landscape context, indicators can be useful in evaluating the overall ecosystem services provided by agricultural lands in contrast to other land uses.

Conclusion: -

This emphasis has important implications for any consideration of the relationship between biodiversity and ecosystem in accounting of ecosystem. Such consideration needs to focus specifically on the potential values of, or roles played by, diversity itself at multiple levels of biological organisation, or at least of the components comprising this diversity. We therefore regard as 'out of scope' any assessment of services as a function of the overall amount of biological material within an ecosystem or the overall functioning of that system without explicitly considering the diversity of organisms underpinning these system-level attributes.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Agriculture Development and Soil problems in India

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Introduction

It is caused by the addition of Minerals to soils by man, from the employment of agriculture chemicals like herbicides, fungicides and pesticides, from mud fall and precipitation and use of fertilizers and contaminated water. whether or not material becomes a tangle or not, depends on the soil sort and also the levels. In several things the issues occur later, once the weather ar leached into waterways.Chemicals fertilizers ar a supply of trace materials in rock phosphate, also are in superphosphate. This supply of trace metals might not be a tangle nonetheless, however this might amendment as a lot of ar additional, with augmented use of fertilizers. Soil pollution is incredibly hurt full to the living organism. Soil pollution means that degradation or distraction of earth surface. Soil pollution, directly or indirectly result on human activities. conjointly it result on soil fertility and wearing. thanks to the soil pollution completely different variety of effects ar seen in surroundings. we tend to cannot stop soil pollution timely, and so we tend to collapse our diversity and face several essential issues. In this paper I tend to highlight the key issues associated with the soil pollution .this study supported secondary knowledge .we attempt to justify the notice of soil pollution, their causes and solutions. Data assortment and methodology: Present study supported secondary knowledge .some text books, article and journals .We refer several computing device.

Aims and Objective: Following aims and objectives of this study

1) To check soil pollution and its effects on surroundings and agriculture .
2) To grasp varied causes of soil pollution in Bharat.
3) Result of soil pollution on human life.
4) To check completely different approaches of management soil pollution.

Hypothesis:

1) Highlight to the result of soil pollution on agriculture.
2) Educate to the folks for the issues associated with the soil pollution.
3) Highlight to the disadvantages of soil pollution on living organism. 4) decide some conclusion and remedies.

Causes Of Soil Pollution

The soil pollution is caused on account of the subsequent wastes:

1. **Industrial waste: Industrial wastes have completely different quantity of noxious contents and dangerous chemicals specified once deposited in soil, they have an effect on the soil layer strength within the high soil, therefore reducing the soil fertility and biological activity of the soil.**

   Study of Lead and metal within the soil in fashionable economies, varied kinds of activity, together with agriculture, trade and transportation, manufacture an outsized quantity of wastes and new kinds of pollutants. Soil, air and water have historically been used as sites for the disposal of all th Pollution is many industries notably those producing paper, chemical, rubber, fossil fuel product, cement, sugar, fertilizer, textile, pesticides likewise as tanneries and oil refineries throw harmful waste inflicting soil however conjointly the air and water. The pollution of soil is especially thanks to excessive addition of carbonates, bicarbonates, sulphites, chlorides and fluorides of Na,Ca,K,Fe,Mn and Mg.Beside the suspended solids, the paper plant wastes is wealthy in chlorides whereas the factory waste contains cyanides and phenols.

   The distilleries add metal salts and chemical element wastes whereas the textile mill's waste is wealthy in chloride ions. The solid waste (sludge) from a manufacturing plant has been accumulated as a klick long hammock at Saharanpur. The waste from completely different industries conjointly deposits nickel, Cu,Ba,Mo,As And Hg in traces.

2. **Agricultural waste:** The agricultural waste includes fertilizers, pesticides, farm waste and fumigants. The fertilizers contain plant nutrients notably N, P and K, however the soil conjointly gets contaminated in the main thanks to organic pollutants presents as impurities. Besides, differing kinds of biocides like insecticide, aldrin, dieldrin, chordane etc. conjointly cause soil pollution. The waste additional thanks to domestic pets conjointly pollutes the soil. The ordure of pigs is wealthy in phosphates and people of different animals contain various morbific micro-organisms. pollution is another huge downside caused by agricultural pollution. Agricultural operations and practices like inappropriate water management and irrigation in the main result in pollution from surface runoff, each to surface and groundwater.

3. **Urban waste:** The urban waste includes sewerage and solid waste discarded as refuse. This refuse includes many billion tones of rubbish material like domestic waste , paper, plastic, argentiferous containers, waste garments ,shoes and written communication (news print, magazines, books etc) whereas a number of the wastes ar perishable, some ar non-degradable.
4. **Biological pathogens**: The soil contains reminiscences organisms like protoctist, fungi, bacteria, viruses, protozoan's nematodes, annelids, insects and rodents. These forms is also morbific or nonpathogenic. There ar several morbific forms gift within the human and animal waste product which can cause soil-borne diseases in plants and animals together with kinsmen. V. radioactive wastes: Thesear created due to radiations emitting from radioactive substances. management of soil pollution The soil pollution caused through completely different agencies will be reduced by varied ways. The soil pollution thanks to sewerage will be reduced by giving microorganism or chemical treatment. throughout chemical treatment, alkane gas is evolved that is employed in generating power. The sludge recovered when the separation of water is dried and used as manure. The land pollution caused thanks to oxen ordure in our country is employed to provide bio-gas or 'gobargas'. The 'gober gas 'is in the main a combination of alkane and greenhouse emission used for cookery and illumination. The solid waste is collected and befittingly recycled. a number of the waste is recycled into bio-gas. The gas is additionally a combination of alkane and greenhouse emission the previous is separated and used for heating functions. correct efforts ought to even be created to scale back the toxicity level of soil. it's necessary to utilize a lot of land for agriculture, pastures and forests. The soil pollution thanks to pesticides will be reduced by victimization perishable chemicals. rather than D.D.T. methoxychlor will be used that is perishable.

Effects of soil Pollution on Agriculture:

Effects of health of humans - Soil includes a profound result on the health and well-being of humans. relying upon the condition of the given soil and also the interactions of interest, this result will be either positive or negative and direct or indirect. Soils that have an effect on human health embody natural soil, that typically has very little anthropogenetic contamination, and soils in agro ecosystems, urban areas, mines, oil and gas extraction areas, lowland sites and different locations wherever anthropogenetic contamination is a lot of seemingly. Considering soil is that the reason we tend to ar ready to sustain ourselves, the contamination of it's major consequence on our health. Crops and plant grownup on contaminated soil absorb a lot of of the pollution and so pass these on to US. this might make a case for the abrupt surge in little and terminal diseases. Long term exposure to such soil will have an effect on the genetic make-up of the body inflicting inherent diseases and chronic health issues that con not be cured simply. In fact, it will sicken the eutherian mammal to a substantial extent and cause malady over a protracted time the soil pollution will even result in widespread famines if the plants ar unable to grow in it.

Result on Growth of plants:- The ecological balance by any system gets affected thanks to the widespread contamination of the soil. Most plant is sanctionative to adapt once the chemistry of the thereforeil changes so radically during a short amount of your time. Fungi and microorganism found within the soil that bind it along began to say no, that creates on further downside of wearing.

Decreased soil fertility :- The noxious chemical gift within the soil will decreases soil fertility and thus decrease within the soil yield. The contaminated soil is then wont to manufacture fruits and vegetables that lacks quality nutrients and will contain some toxic substances to cause serious health issues in folks overwhelming them.

Amendment within the Soil Structure:- The death of the many soil organisms within the soil structure a region from that, it may conjointly force different predators to maneuver to different places in search of food. Soil ecosystems ar today exposed to many physical, chemical, and biological stressors, that ar directly or indirectly associated with anthropogenetic activities.

Conclussion:

1) Deforestation and soil erosion is main problem of soil pollution
2) Soil pollution directly effect on agricultural activities
3) The effect of soil pollution is change in climate patterns
4) Make people understand about the harmful effects of soil pollution.

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Foodgrain Crop Combination Regions of Beed District: By Weaver's Method

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Abstract:
The investigation of crop combination regions is one of the important daimentation of agricultural geography as it provides a sound basis for agriculture regionalization. Generally the crops are grown in combination and is really that a particular crops occupies a positions of total isolation in a given area unit at a given point of time. The ecological or natural factors determine the shape and size of the areas of the crops, while the socio-economical determinants determine their extent. The government policies also played a important role to can decide to select the crops to grow. With the development of better irrigation facilities, new varieties of crops can be introduced in the place of traditional and unprofitable agricultural system[1].
Key Word: Foodgrain, Crop Combination, Weaver's method.

Introduction:

There were numerous studied carried out for understanding the crop-weather relationship over Indian regions[9] and also on the dependence of the country's economy on agriculture[10]. These studies were mainly focused on the seasonal rainfall, but not on the day-to-day variation of rainfall on which the growth of the crop mainly depends. Even though crop require water in all stages of the growth, the occurrence of extreme dry or wet rain spell events can cause damage to the crops and its yield[2]. A reduction in rainfall can cause drought while an increase in the intensity of rainfall and frequent occurrence of heavy rainfall days can lead to flood, but both the drought and flood can cause damage to crop. This makes it important to study the impact of dry and wet rainfall spells on the foodgrain yield. Beed district is one of the agriculture based district in the Maharashtra state. Agriculture is the backbone of study area economy and district agriculture is foodgrain oriented. Agriculturally district divided in two main growing seasons which is one of the Kharif (summer) and Rabi (winter). Foodgrains crops are grows above both seasons. Variation of monsoon rainfall is strictly affected in the area under total foodgrain in the study area.The pattern of crops distribution of in any region is outcome of predominance of combination of crops. This is the term resultant of crop scientific results than the quantitative techniques for the study of agricultural landuse of crop combination regions number of methods have been used by scholars, scientists, and agricultural scientists[3].

Study Area: Beed district is situated on the central part of the Maharashtra and lies between 18°27' and 19°27' north latitudes and 74°49' and 76°44' east longitudes[3]. The east west extension of Beed district is 268 kms. The shape of the Beed district is broadly that of a trapazed, the northern and southern sides of which are nearly parallel.The total geographical area of Beed district is 10615.3 sq.kms and its proportion as compared with Maharashtra state it is about 3.5 percent. The proportion of area of the Beed district in Marathwada division is 19.20 percent.

Objectives:

1. To study the crop combination of the region.
2. To find out foodgrain cropcombination pattern of the district.

Database and Methodology: The data collected and used for the period 1990-91, 1999-2000 to 2000-01, 2009-10, comes both from primary and secondary sources. The primary data is the raw data collected through different sources particularly questionnaires and personal interviews.Secondary data obtained from Socio-Economic Review, District census, Handbooks, Gazetteers, Agricultural, Epitomes, Periodicals, Season and Crop Report published by the different Agricultural Department. The data thus collected through primary and secondary sources were processed by statistical and cartographic techniques. On the basis of primary and secondary data with the help of various statistical and cartographical methods and techniques, researcher studied spatial as well as temporal changes in food grain cultivation in Beed district from 1990-91, 1999-2000 To 2000-01, 2009-10. For the present research work author has been used the following method to calculate different aspects.

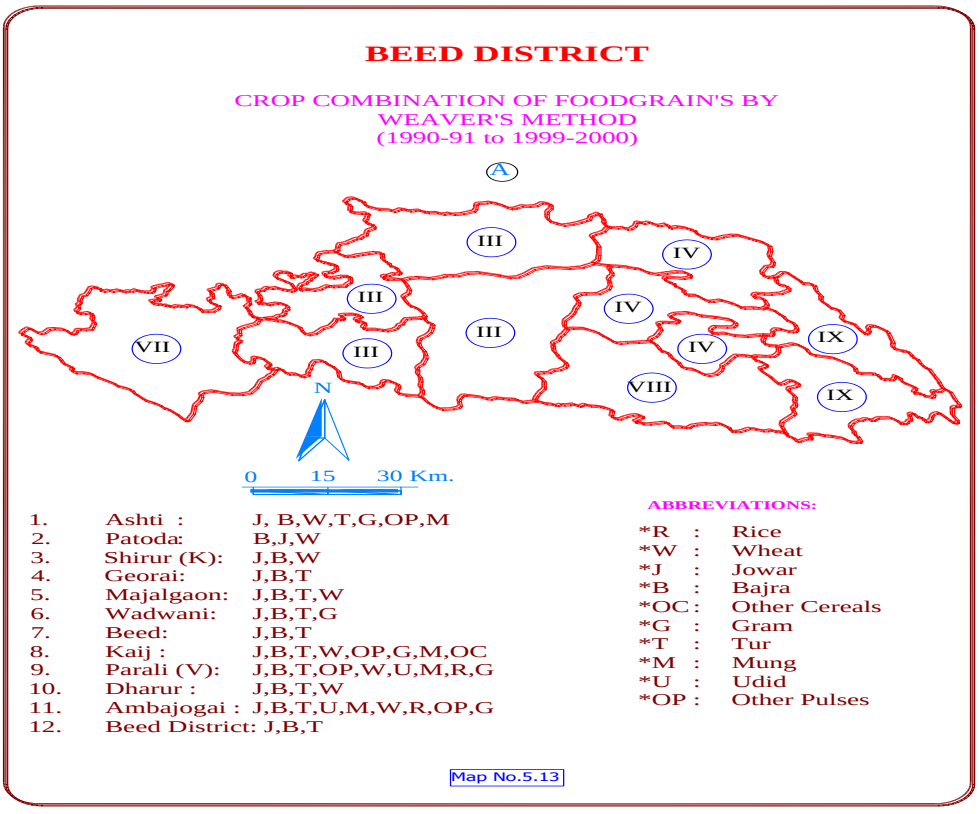
Changes in the Foodgrains Crop Combination Region:

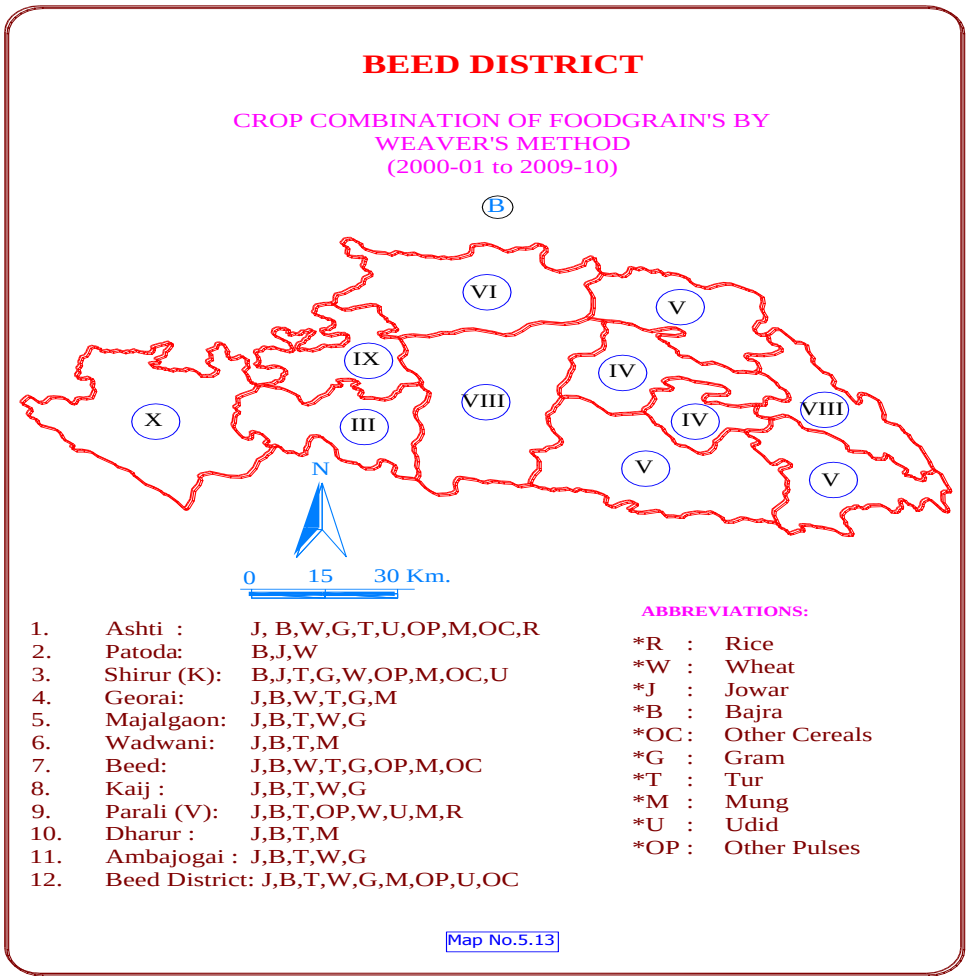
In the present study researcher an attempt to be made to delineate the foodgrains crop combination regions by applying crop combination method i.e. minimum standard deviation method is introduced by Weaver (1954).Table no. 1.1 reveals that the foodgrain crops combination pattern tahsilwise and district as a whole investigation period of 1990-91 to 1999-2000 and 2000-01 to 2010-11.

Table No. 1.1: Changes in Number of Foodgrains Crops in the Combination of Beed District

Sr. No.	Tahsils	Weavers Method No. of Foodgrain Crop Combination			
		1990-91 to 1999-2000		2000-01 to 2010-11	
		No. of Crops	Name of the Crops	No. of Crops	Name of the Crops
1	Ashti	07	Jowar, Bajra, Wheat, Tur, Gram, Other Pulses, Mung	10	Jowar, Bajra, Wheat, Tur, Gram, Udid, Other Pulses, Mung, Other Cereals, Rice
2	Patoda	03	Bajra, Jowar, Wheat	03	Bajra, Jowar, Wheat
3	Shirur (K)	03	Jowar, Bajra, Wheat	09	Bajra, Joar, Tur, Gram, What, Other Pulses, Mung, Other Cereals, Udid
4	Georai	03	Jowar, Bajra, Tur	06	Jowar, Bajra, Wheat, Tur, Gram, Mung
5	Majalgoan	04	Jowar, Bajra, Tur, Wheat	05	Jowar, Bajra, Tur, Wheat, Gram
6	Wadwani	04	Jowar, Bajra, Tur, Gram	04	Jowar, Bajra, Tur, Mung
7	Beed	07	Jowar, Bajra, Wheat, Tur, Gram, Other Pulses, Mung	08	Jowar, Bajra, Wheat, Tur, Gram, Other Pulses, Mung, Other Cereals
8	Kaij	08	Jowar, Bajra, Tur, Wheat, Other Pulses, Gram, Mung, Other Cereals	05	Jowar, Bajra, Wheat, Tur, Gram
9	Parali (V)	09	Jowar, Bajra, Tur, Other Pulses, Wheat, Udid, Mung, Rice, Gram	08	Jowar, Bajra, Tur, Other Pulses, Mung, Wheat, Udid, Rice
10	Dharur	04	Jowar, Bajra, Tur, Wheat	04	Jowar, Bajra, Tur, Mung
11	Ambajogai	09	Jowar, Bajra, Tur, Udid, Mung, Wheat, Rice, Other Pulses, Gram	05	Jowar, Tur, Bajra, Wheat, Mung
Total Beed District		**03**	**Jowar, Bajra, Tur**	**09**	**Jowar, Bajra, Tur, Wheat, Gram, Mung, Other Pulses, Udid, Other Cereals**

Source: Socio-Economic Abstract of Beed District, 1990 to 2011, Compiled by the Researcher.





In during the first half of the investigation period 09 crop combinations having observed in Parali (V) and Ambajogai tahsils while Kaij tahsil noticed 08 crop combination whereas Majalgaon, Wadwani and Dharur tahsils observed 04 crop combination while Patoda, Shirur (K), Georai and Beed tahsils experienced 03 crop combination and 07 crop combination was experienced in Ashti tahsil in the study region (Map No. 5.13A). In during the period under investigation 2000-01 to 2010-11, 10 crop combination was recorded in Ashti tahsil whereas 09 crop combination was registered in Shirur (K) tahsil while 08 crop combination was noticed in Beed and Parali (V) tahsils whereas 06 crop combination was found in Georai tahsil while 05 crop combination was observed in Majalgaon, Kaij and Ambajogai tahsils whereas 04 crop combination was experienced in Wadwani and Dharur tahsils while 03 crop combination was recorded in Patoda tahsils in the study region (Map No. 5.13B).

Conclusion:

In the 1990-91 to 1999-2000 as per Weaver's minimum standard deviation method 03 crop combination have been registered and in during 2000-01 to 2010-2011 there were 09 crop combinations have been found in Beed district.Out of total gross cropped area the area under total food crops was decreased by 3.03% in the study reigon in during the period of investigation. In during 2000-01 to 2009-10, below 65% area under total food crops was experienced in Kaij, Parali (V) and Ambajogai tahsils whereas 65% to 75% area under total food cropping was observed in Shirur (K), Georai, Majalgaon, Wadwani and Dharur tahsils while above 75% area under total food cropping was noticed in Ashti, Patoda and Beed tahsils in the study region.

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Geographical Analysis Of Levels Of Economic Development: A Case Study Of Western Satpura Region

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Abstract:
The present research work is based on both primary and secondary sources of data. Administrative circle is considered as the smallest unit of study. After the determination of various social, demographic and economic indicators of economic development four categories of level of economic development have been determined with the help of mean and standard deviation methods. These are high, medium and low. High level of economic development has been attained by four villages namely Khuntamodi, Umrani Bk., Jamothi and Satrasen. Satrasen is the most developed village in all the villages surveyed. Seven villages have attained medium level of economic development and located in central hilly zone of the study region and majority of villages are belonging to the category of low level of economic development. In nutshell level economic development is very uneven from village to village in the region under study.
Key words: Spatial, Disparity, Indicators, Weightage, Composite Index

Introduction:

The term 'economic development' was used as synonym as an 'economic growth'. Economic development is much more than just economic growth. Economic growth indicates the direction of development and essential for economic development. Economic development is a long process in which several forces or factors of production together to bring about an economic change for the betterment. The main objective of an economic development is to maximize the production of consumer's goods and service in the society, which would positively increase the economic welfare of the masses. But it is not even everywhere.The problem of regional disparities in development is common in all the countries of the world either developed or underdeveloped. At present the problem of regional inequalities in the level of development has become serious at national level. That's why it became necessary to narrowing or to eliminating the problem of regional imbalance in level of development. But this will be possible only when such types of study and planning will be done at micro level because this problem is also found at micro level and Western Satpuraregion is not exception for this. Hence, Western Satpura Region has been chosen to do such kind of study.

The Study Region:

The Western Satpura region is a peculiar region in respect of physiography and demography. It is inhabited by tribal people. This mountainous region is spread along the border of Maharashtra and Madhya Pradesh. It stretches from the Ashirgarh hills in the east to the boundary of Gujrath in the West and between Narmada valley in the north and Tapti valley in the south. It comprises part of Jalgaon, Dhule and Nandurbar districts of Maharashtra and Barwani and Khargone districts of Madhya Pradesh. It lies between 21^0 16' to 22^0 05' North latitudes and 73^0 45' to 76^0 10' East longitudes. As far as physiography is concerned it is a complex part which is characterized by the alternate arrangement of ridges and valleys from south to north. The part of Western Satpura, having an altitude more than 300 meters has been taken into consideration for this study. The total area of the region is 5044.30 Sq. Km. According to 2011 census, total population of this region was 17, 45,930. Out of the total population more than 78.30 per cent population belongs to Scheduled Tribe population. (Figure 1.1)

Objectives:

Following are main objectives of the present research:

1. To study the physio-socio-economic condition of the study region.
2. To find out the disparity in economic development in surveyed villages in the Western Satpura Region.
3. To find out the impact of different factors of economic development in the region under study.

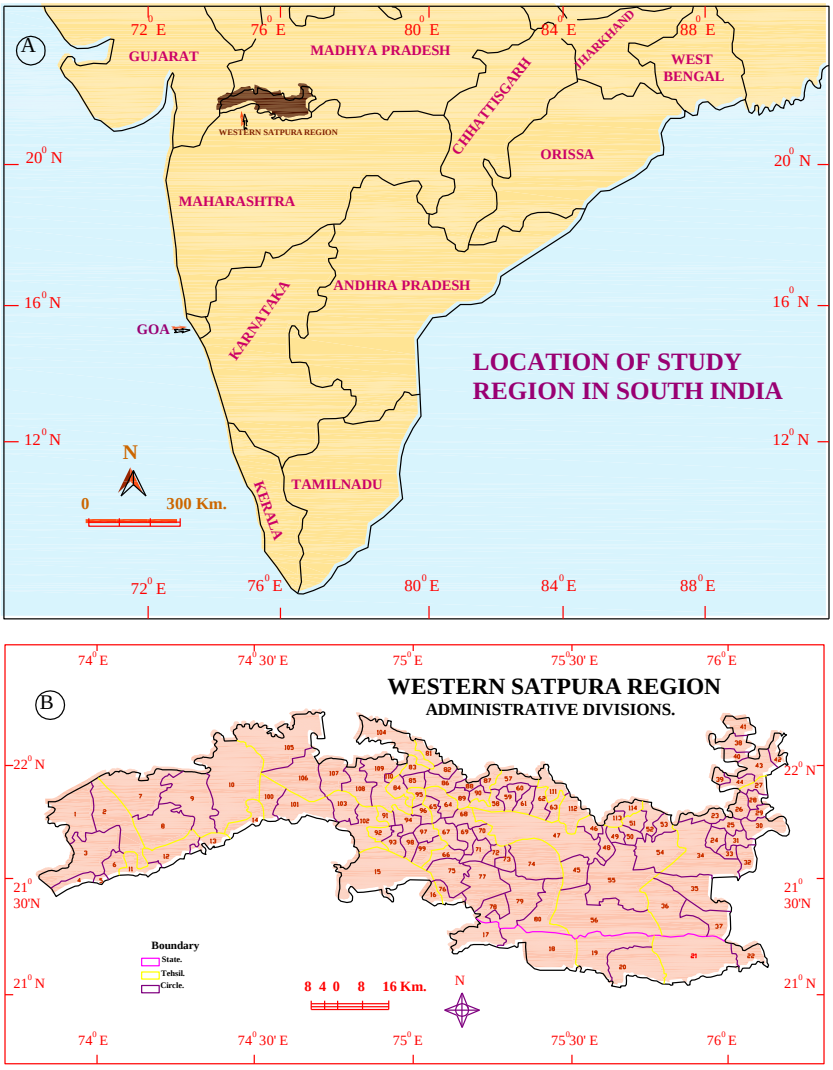

Figure: 1.

Data Collection And Methodology:

The present research work is based on both primary and secondary sources of data. The data regarding various social, demographic and economic variables such as Population density, educational attainment, age of marriage, sex-ration, net sown area, Net irrigated area, villages with educational, medical and drinking water amenities etc. have been collected from households by visiting to selected villages through questioner and village scheduled. Data pertaining to demographic aspects have been collected from the District Census Hand Books of Dhule, Nandurbar and Jalgaon districts of Maharashtra and Khargone and Barwani districts of Madhya Pradesh for the year 2011. After collecting data it was analyzed with the help of Excel 2007 and Weightages have been assigned to indicators as per their intensity. Finally, high, moderate and low levels of villages in respect of economic development have been determined with the help of composite weightage method and results have shown with the help of table and choropleth map.

Subject Explanation:

In the present research paper an attempt has been made to highlight various aspects of tribal economic condition as a sample study of selected villages. In order to understand the socio-economic condition of tribal people, 25 villages were studied during the field work. (Figure: 1.2) For selecting these villages, the study region was divided into three main physical divisions' namely Western mountainous region, Central and north-eastern hilly zone and Eastern and southern mountainous zone on the basis of variations in population density, amount of rainfall and net sown area. These three main physical divisions were subdivided. Map indicating these factors were prepared and superimposed which enabled divisions of the Western Satpura region into three subdivisions. During the field work selected villages were studied with the help of household questionnaire and village scheduled.

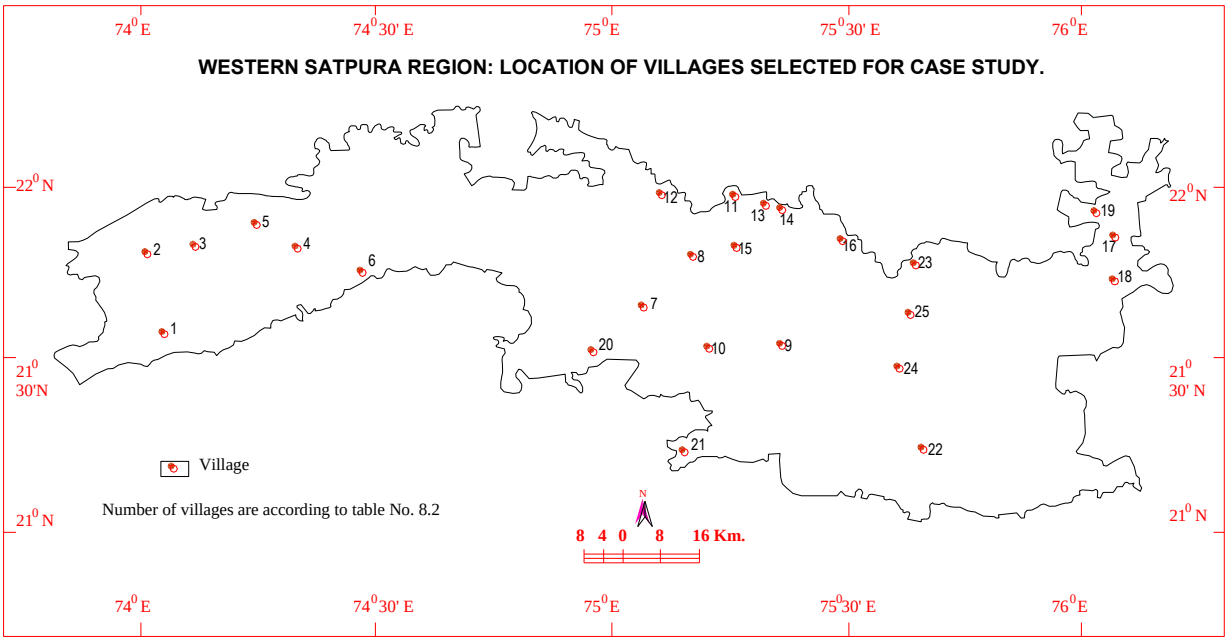

Figure: 1.2

Table: 1.1
Weightages used for finding the levels of development of villages surveyed and selected variables, 2018.

Subsets	Variables	Weightages			
		1	2	3	4
Social & Demographic Variables.	1. Proportion of Male literates. (%)	<50	50 - 60	60 - 70	70 <
	2. Proportion of Male literates. (%)	< 30	30 - 40	40 - 50	50 <
	3. Population Density	Very low	Low	Moderate	High
	4. Proportion of people with educational level beyond H.S.C. (%)	< 4.0	4.0 – 8.0	8.0 – 12.0	12.0 <
	5. Villages with Educational facilities.	P.	PM.	P.M.S.	P.M.S.J.
	6. Villages with Medical facilities.	PHC	PHC& PHSC	PHC,PHSC & D	PHC,PHSC, D & CHW
	7. Villages with Drinking facilities.	One source	Two sources	Three sources	Four sources
	8. Villages with Transport facilities.	Kuchha Road	Pucca Road	-----	-----
	9. Average Size of family.	> 7	5 - 7	< 5	-----
Economic Variables.	10.Average Size of land holding (Acares)	< 5.0	5.0 – 10.0	10.0 – 20.0	20.0 <
	11.Percapita Annual Income in Rs.	< 3000	3000 - 6000	6000 - 9000	9000 <
	12. Proportion of Net Sown Area.	Very low	Low	Medium	High
	13. Proportion of Workers to total Population. (%)	< 50.0	50.0 – 60.0	60.0 – 70.0	70.0 <
	14. Proportion of people engaged in secondary and tertiary occupations. (%)	< 5.0	5.0 – 10.0	10.0 – 15.0	15.0 <

	15. House Types	D	C	B	A
	16. Consumers Goods	T.V. & D.V.D.	Refrigerator	Telephone	Vehicle
	17. Insurance amount in Lac	< 0.5	0.5 – 1.0	1.0 – 2.0	2.0 <
	18. Bank Account	Cooperative Society	Nationalize Bank	Both	-----

Source: Computed by Researcher, 2018.

Levels Of Economic Development Of Villages Surveyed

For finding out the levels of economic development of villages surveyed weightages have been assigned to different variables according to the variation occurred there in. For this purpose eighteen variables are selected, nine variables are related to social and demographic condition and remaining are related to economic condition of the tribal. The weightages are given to such aspects are shown in table 1.1. After assigning the weightages, all the weightages are added up for each variable for twenty five villages. Finally with the help of mean and standard deviation methods villages are divided into three groups of level of economic development. These are developed, medium developed and low developed.

High Level Of Economic Development:

High level of economic development has been attained by four villages namely Khuntamodi, Umrani Bk., Jamothi and Satrasen. Satrasen is the most developed village in all the villages surveyed. It has 141 composite weightages. High proportion of male and female literacy, high educational attainment, availability of educational, medical, drinking water facilities, large size of landholding, and considerable proportion of people engaged in secondary and tertiary occupations etc are positive factors for the development of these villages. Along with this most of the households are having "A" type of houses with essential consumer goods and their per capita annual income is also seen more as compare with other surveyed villages. The composite weightage score of these villages is 115 and above. One noticeable thing is that out of four high developed villages three villages are located in the region of Maharashtra state.

Medium Level Of Economic Development:

Villages with composite weightage score ranging from 86 to 114 fall in this category. There are seven villages coming in this category of medium level. All the villages which belong to this category are located in central hilly zone of the study region.(Figure: 1.3) These villages witness medium level of development due to considerable proportion of large size landholding, per capita income, high proportion of working population and people in secondary and tertiary activities and density of population. Although these villages belong to this category still the condition in respect of male female literacy and facilities like educational, medical and transport are not sound. Especially such condition is occurred in Jalgone, Kolkheda and Ghatti villages.

Low Level Of Economic Development:

There are fourteen villages, which have been found in the category of low level of economic development. Out of which four villages are located in eastern mountainous zone and six and four villages locates in the central and north-eastern and western mountainous zones. Due to low proportion of net sown area, working population, low proportion of male female literacy, large size of family and low size of landholding, low per capita income these villages belong to this category. Most of the villages of this category are deprived from the essential amenities because of their inaccessible location consequently they remain backward.

Conclusion:

1. The level of economic development is not even in the study region. It differs from one village to another.
2. Only four villages namely Khuntamodi, Umrani Bk., Jamothi and Satrasen. Satrasen are highly developed villages. They have 141 composite weightages score.
3. Moderate level of economic development is seen in seven villages in the region under study and are located in central hilly zone of the study region..
4. Out of total surveyed villages fourteen villages have been found in the category of low level of economic development. Out of which four villages are located in eastern mountainous zone and six and four villages locates in the central and north-eastern and western mountainous zones.
5. Most of the villages which are having low level of economic development are deprived from the essential amenities because of their inaccessible location consequently they remain backward in compare with other villages of the study region.

Western Satpura Region: Levels of Economic Development of Villages Surveyed, 2018 (Based on Weightage Method)

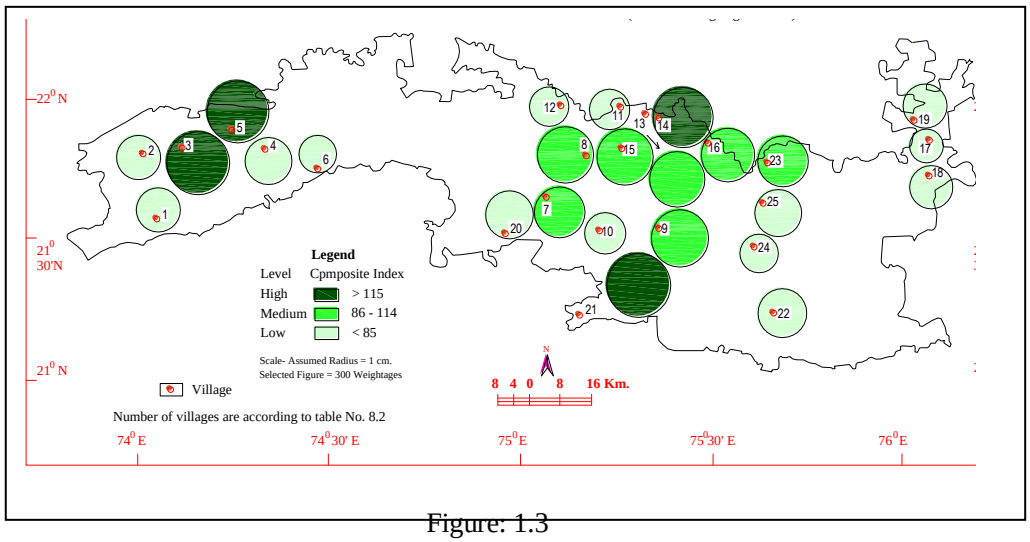

Figure: 1.3

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"Changing Trends in Agriculture and its Impact on Rural Development"

Growth of Population and Agricultural Land Use Change in Latur District of Maharashtra

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Abstract:
The growth of population, whatever its rate may be, gradually raises the man-land ratio and causes increase in the demand for food and other products. Consequently the same unit of land requires to accommodate more people and to meet the increased demand. In an agricultural area where there has been high growth of population but limited scope for further expansion of cropland, intensification of cropping is one of the possible ways for increasing output.Intensification of cropping is, in fact, a process by which the annual yield capacity of an unit-area can be enhanced. Normally the yield capacity of land is increased by raising more than one crop from the same land and thus, the intensity of cropping often refers to the number of crops raised in an area during an agricultural year.Cropping intensity and population density both are near about stable in the Latur district from 2001 to 2011.
Keywords: Population growth, growth rate of population, Population density, cropping intensity

Introduction:

Population growth and its increasing density exert pressure on cropping pattern. There are only two ways to satisfy the increasing food and other agricultural demands of the District rising population: either expanding the net area under cultivation or intensifying cropping over the existing area. Cropping intensity plays an important role in the agricultural development of any region. Higher cropping intensity shows intensive use of land for agricultural purpose. Its significance is further increased in view of the rising pressure of population on land.It may be seemed that areas of high population pressure have higher productive intensity and higher frequency of cropping. This lead to the conclusion that increases in population pressure may cause increase cropping intensity in the agricultural system.

Study Area:

Latur district is located on the map to the South-East of Maharashtra on the border of Maharashtra and Karnataka. The district of Latur lies between 17^0 52' north latitudes to 18^0 50' north latitudes and 76^0 18' east longitudes to 79^0 12' east longitudes. The maximum east-west length of Latur District is 106 km and north-south length is 109 km. It has a total area of 7157 sq.kms and proportion as compared with Maharashtra state is about 2.33 %. The proportion of area of the Latur district in Marathwada division is about 11.34 %.

Objectives:

The following objectives has been taken for achieve result of this research paper.

To know the changes in cropping intensity.

To examine the growth of population.

DataBase and Methodology:

The present study is entirely based on secondary data and study period for the year 2001 and 2011. The secondary data is collected from socio – economic review and District census hand book. For calculating cropping density formulae is used.

$$Index of Cropping Intensity = \frac{Gross Cropped Area}{Net Sown Area} \times 100$$

Tahsilwise Population Growth and Density:

There is decline in growth rate of population during the decade of 2001 to 2011 in Latur district.The total population growth of Latur district was increased by 17.97% during the decade of 2001-2011. Latur tahsil recorded highest growth rate of total population that is 26.04% whereas in other tahsil of the study region the growth rate of total population is observed between 10.45 to 26.02 % during the decade of 2001-2011.The total density of population in Latur district according to the population census of 2001 was 291 persons per sq.km. It was increased up to the 343 persons per sq.km. in 2011. It means growth of 52 persons per sq.km. in density of 2001.The density of population varies from tahsil to tahsil. The highest total density of population found in Latur tahsil is 684 persons per km^2 while the lowest total density of population recorded in Ausa tahsil is 245 persons per km^2 in 2011.Positive change in density of population was observed in all tahsils from 2001 to 2011.

Table No. 1: Tahsilwise Density of Populationin Latur District: 2001 to 2011.

Sr. No.	Tahsil	Density of Population (Per Km^2)		Change in Persons Per km2 (2001 to 2011)	Growth Rate in %
		2001	2011		2001 to 2011
1	Latur	543	684	141	26.04
2	Renapur	221	258	36	16.36
3	Ahmadpur	254	302	47	18.65
4	Chakur	235	266	31	13.25
5	Jalkot	199	251	52	26.02
6	Shirur- Anantpal	224	253	29	12.75
7	Ausa	222	245	23	10.47
8	Nilanga	272	310	37	13.69
9	Deoni	223	246	23	10.45
10	Udgir	340	405	64	18.94
Total District		291	343	52	17.97

Source: District Census Hand Book of Latur District, 1991.
(The figures of 2001 census are taken from the CD distributed by statistical Dept., Latur district).
http://www.censusindia.gov.in/DigitalLibrary/MFTableSeries.aspx

Analysis Of Cropping Intensity:

Cropping intensity refers to rising of a number of crops from the same field during one agriculture year.Thus, higher cropping intensity means that a higher portion of the net area is being cropped more than once during one agricultural year. This also implies higher productivity per unit of arable land during one agricultural year.For instance, suppose a farmer owns five hectares of land, and gets the crop from these five hectares during the kharif season and, again, during the rabi season he raises a crop from three hectares. He, thus, gets the effective produce from eight hectares, although he owns only five hectares physically. Had he raised crop from five hectares totally, his cropping intensity would have been 100 per cent, while now it is 160 per cent.

Cropping intensity of Latur district has been slightly decreased from 130.62 to 130.22 from 2001 to 2011. It means cropping intensity is slightly decreasedwith slightlyincreasing density of population in Latur district. In other words cropping intensity and population density both are near about stable in the study region.The highest positive change in cropping intensity has been found in Udgir tahsil (20.48) and the lowest positive change found in Chakur tahsil (5.05) during the period2001 to 2011.The highest negative change in cropping intensity has been found in Nilanga tahsil (-23.37) and the lowest negative change found in Renapur tahsil (-5.51) from 2001 to 2011.

Table No. 2: Tahsilwise Agricultural Cropping Intensity in Latur District: 2001 to 2011.

Sr. No.	Tahsil	Index of Cropping Intensity 2001	Index of ropping Intensity 2011	Vol. of Change 2001-2011
1	Latur	132.30	122.44	-9.86
2	Renapur	141.60	136.09	-5.51
3	Ahmadpur	114.12	132.79	18.67
4	Chakur	117.44	122.49	5.05
5	Jalkot	123.10	138.03	14.93
6	Shirur- Anantpal	142.04	132.83	-9.21
7	Ausa	138.84	130.70	-8.14
8	Nilanga	152.37	129.00	-23.37
9	Deoni	121.51	133.58	12.06
10	Udgir	121.51	141.99	20.48
Latur District		130.62	130.22	-0.40

Source:Compiled by Researcher

Cropping intensity is depend upon how many times same field has been cultivated in a year. It means, within a year more than twice the same area has been cultivated. Cropping intensity is nothing but it is the ratio between gross cropped area and net sown area. It shows the level of agricultural development.

Conclusions:

The study reveals that decline in growth rate of population during the decade of 2001 to 2011 in Latur district. Slightly increasing (52 persons per km^2)density of population in the study region from 2001 to 2011. Cropping intensity of Latur district has been slightly decreased from 130.62 to 130.22 from 2001 to 2011. It means cropping intensity is slightly decreased with slightly increasing density of population in Latur district. In other words cropping intensity and population density both are near about stable in the study region.

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The Interactions Between Prime Urban Agglomerations In India: A Gravity Model Approach

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Abstract

The research reported in this paper is an attempt to develop a technique for estimating composite interaction (migration) flows. The main objective is to find out the interaction between the top 10 prime urban agglomerations in India. The migration index (MI) technique was proposed to measure the interaction of selected urban agglomerations. The gravity model and Karl Pearson's correlation method were applied for this study. The study reveals the interaction of structural characteristics within the population size and distance square. Mumbai is the most interactive and Jaipur is the least interactive city in India among the top 10 agglomerations. To measure the interaction intensity forty-five (MI) composite values have been classified into three broad categories i.e. High, Medium, and Low interaction. Finally, the low interactive zone considers for immediate attention for urban and regional planning. This study helps to mitigate the regional imbalance and helps policymakers for urban planning.

Keywords: Agglomerations, Interaction, Gravity model, Migration Index, Population size, Correlation.

Introduction

The study of population and urban spatial interaction is important for the development of cities which is a greater part of the economic growth of any country. In addition to being hubs of innovation, commerce, and culture, cities are the centers of most economic activities within their respective countries. The interactions of the cities interpret the result in the form of growth and development.These interactions are motivating economic growth within citiesand subsequently in the countries. Globally, 80 percent of economic growth and 54 percent of the population can be attributed to cities. In the context of India, around 10 percent of the population is situated in the 50 most populous cities, and nearly 68 percent of the population lives in rural areas. The top 10 agglomerations in India account for 55 percent of GDP, with the top 4 agglomerations accounting for a quarter of the country's output.The gravity model has subsequent importance as it makes a clear idea of relative as opposed to absolute location. Isaac Newton (1687) has invented the law of gravity to emphasize that each particle attracts every other particle in the universe with a force. That force is directly proportional to the product of their masses and inversely proportional to the square of their distance. The role of population size and distance to determine spatial interaction is summarized in Newton's law of gravitation to find out population movement or interaction. Hence gravity model employed to find out the interaction (movement) of the person between two urban agglomerations. The literature related to the present analysis includes studies on the gravity model and interaction, the spatial configuration of urban agglomerations, and geospatial distance network analysis. Many researchers (Haynes Kingsley and Fotheringham A. 1984;Karemera, D. et al., 2000; Batra A. 2006; Liu, H. et al., 2008; Cheng et al., 2018) are reviewing in this field and various methods and techniques have been explored. Clark J. (1979) and Willekens, F. (1983) have been used as a gravity model analysis to clarify archeological data on the flow of products and social organization of exchange in his study and focused on the equivalences between the log-linear model and standard spatial interaction models. Au and Henderson (2006) argue that rural-urban intra-sector restrictions cause insufficient agglomeration of economic activity in both the agricultural, industrial and concrete sectors, with resulting first-order losses in GDP to migration restrictions limit for agglomeration

and productivity in China.Iyer etal.2007; Lewer and Van, 2008; Jung, W. et al. 2008 etc. verify the model's high explanatory power and have used examples to show its usefulness to work out immigration. They have shown an appraisal of physical gravity in their study. Goh et al. (2012) have applied the gravity model to seek out the passenger flows within the Seoul Metropolitan Subway system. They modified the gravity model by the Hill function and reveal the Yule kind nature present in Seoul. Pathare, A. (2014) has focused on tribal population migration (interaction) in Nashik district, Maharashtra, as well as applied Karl Pearson's correlation method and the flow diagram in his study. Backhaus et al. 2015; Poprawe, M. (2015; have applied the gravity model and explained the relationship between corruption and migration for 230 countries of the world. Bharath et al. (2018) have been studied the expansion of Indian megacities such as Delhi, Mumbai, Pune, Chennai and Coimbatore, through the Cellular Automata Markov Model (CAMM) considering the influence of agent(s) of urban growth through soft computing techniques. Yan and Zhou (2019) used a gravity model to convince the equilibrium solution of a degenerated DCG neglecting the crowding effects within the destinations. Its continued use by city planners, transportation analysts, retail location firms, shopping mall investors, land developers, and urban social theorists is without precedent. The gravity model is one of the earliest models to be applied within the social sciences and continues to be used and extended today. This research work isimportant to develop a strategy for estimating spatial interaction (migration) flows to mitigate regional imbalance.

The Research questions

In the light of above, the paper poses the following research questions for their answer with the help of analysis and mapping: -

1. What has been the level of interaction between the top 10 prime urban agglomerations in India?
2. How does the level of interaction differ between the cities and whether the population and distance variables are significant factors for an explanation of the interaction or migration flows?
3. Is it possible to decentralize share of GDP by systematic planning of towns of India? Are the research questions.

Objectives

The present study has the following objectives. It intends-

1. To find out the interaction between the top ten prime urban agglomerations in India.
2. To assess the power of any area to attract people (migrant) in urban agglomerations.
3. To examine the factors affecting on high or low interaction.

Material and Method

In the present work, the gravity model research approach was adopted to reveal the interaction and interaction levels among the top ten urban agglomerations in India. This approach forms an integrated framework to obtain a reliable result. The work is mainly based on secondary data. The population data was derived from the census of India 2011 and the distance data for cities from the website https://www.mapsofindia.com (Table 2).

Table 2: Population and distance ten prime urban agglomerations: India

Population in Million	Cities	Distance between Top Ten Prime Urban Agglomerations in India ('00 Km.)									
		Mumbai	New Delhi	Kolkata	Chennai	Bangalore	Hyderabad	Ahmedabad	Pune	Surat	Jaipur
18.4	**Mumbai**	0									
16.3	**New Delhi**	14.07	0								
14	**Kolkata**	19.87	14.61	0							
8.7	**Chennai**	13.29	20.95	16.76	0						
8.5	**Bangalore**	9.98	20.61	18.81	3.31	0					
7.75	**Hyderabad**	7.11	14.99	15.16	6.88	5.62	0				
6.3	**Ahmedabad**	5.45	9.15	19.24	18.26	14.95	12.08	0			
3.12	**Pune**	1.63	14.17	20.04	11.66	8.35	5.48	6.6	0		
4.5	**Surat**	2.63	11.7	20.35	16.05	12.76	9.1	2.55	3.62	0	
3.1	**Jaipur**	12.02	2.58	14.62	20.19	19.85	14.43	6.57	12.57	9.22	0

Source: (i) Source: Census of India, 2011, (ii) https://www.mapsofindia.com

The population data for the top ten agglomerations of India and the distance between the cities were used to perform the gravity model to find out the interaction (MI Index) between all top ten prime urban agglomerations (cities) in India.

Gravity Model

The gravity model emphasis the power of any area to attract people (migrant) depends on its size (population) and distance between urban agglomerations. The interaction between two cities (settlements) would be proportional to the product of their population and inversely proportional to the square of the distance between them. The statement is express with the following formula.

$$MI = K\frac{p1p2}{d^2} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where,

MI is the interaction between two cities (Migration Index), P1 is the population size of city 1, P2 is the population size of city 2, D is the distance between the two cities, and K is proportionality constant.

Correlation coefficient

The correlation between population size and distance square among cities (linear association) was calculated by Karl Pearson's method. To measure the degree of linear association between two-variable the correlation coefficient was denoted by the following formula.

$$r = \frac{n(\sum xy)-(\sum x)(\sum y)}{\sqrt{[n\sum x^2-(\sum x)^2][n\sum y^2-(\sum y)^2]}} \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

The MI index, the correlation coefficient for population and distance square between all top ten prime urban agglomerations were computed. The maximum and minimum interaction find out within all selected cities. The interaction intensity was classified into 3 broad categories i.e. high, medium and low interaction based on composite forty-five (MI) interaction values. The highly interactive, moderate interactive and less interactive classified cities were represented by flow diagrams using Arc GIS 10.2.2 software.

Study area

In the present research paper, the top ten urban agglomerations of India have been selected for the analysis. They are Mumbai, New Delhi, Kolkata, Chennai, Bangalore, Hyderabad, Ahmedabad, Pune, Surat, and Jaipur. All these cities are prime cities of India located in different directions of the country account for more than 50 percent of GDP. The latitudinal and longitudinal coordinates of these urban agglomerations are shown in Table 1.

Table 1: Location of the top ten urban agglomerations in India

Sr. No.	Name of City	Name of State/ UT	Latitude and Longitude Coordinates
1	Mumbai	Maharashtra	19°4'22.19" N, 72°52'57.4" E
2	New Delhi	New Delhi	28°38'8.74" N, 77°13'28.02"E
3	Kolkata	West Bengal	22°33'45.47" N, 88°21'46.94"E
4	Chennai	Tamil Nadu	13°5'16.22" N, 80°16'42.49"E
5	Bangalore	Karnataka	12°58'18.98" N, 77°35'37.28"E
6	Hyderabad	Telangana	17°23'2.58" N, 78°27'22.9" E
7	Ahmedabad	Gujarat	23°1'32.84" N, 72°35'14.17" E
8	Pune	Maharashtra	18°31'10.45" N, 73°51'19.26" E
9	Surat	Gujarat	21°11' 42" N, 72° 49' 9.99" E
10	Jaipur	Rajasthan	26°55'10.63"N, 75°47'16.12" E

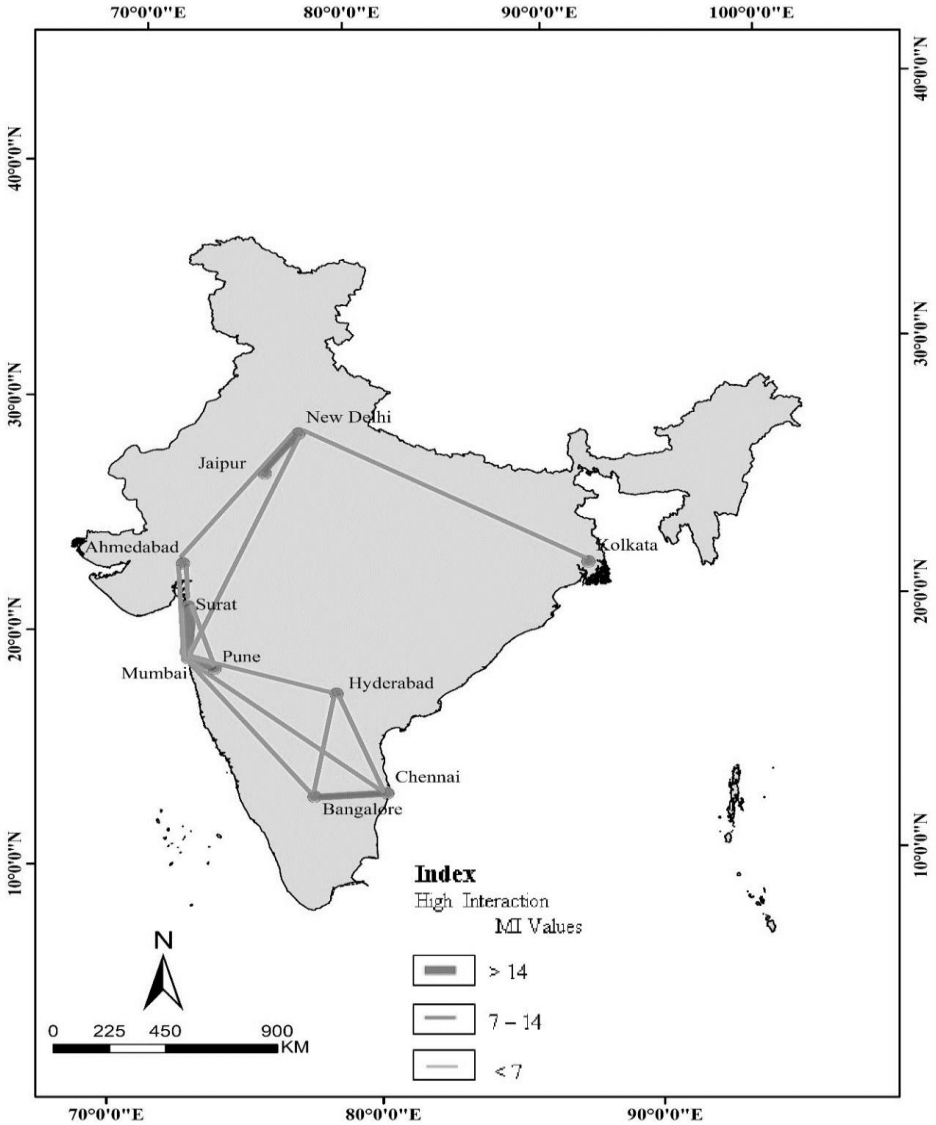
Source: https://latitudelongitude.org/in

Result and Discussion

The urban agglomerations are interacting with other urban agglomeration in space like the exchange of population, materials, capitals, and technical information. The interaction combines the cities with a special relationship and forming a certain structure and function of the organic whole. Bouchard and Pyers (1965) have provided appraisals of the gravity model as an analytical tool for stimulating present and forecasting future urban trip distribution patterns.The computed 45 MI values interpret the interaction between selected 10 urban agglomerations in India. These MI values reveal the interaction structural characteristics within the population size and distance square. It interprets that the highest interaction is found between Mumbai and Pune urban agglomeration in India followed by Mumbai – Surat, New Delhi – Jaipur, etc. (Fig. 1). The least (minimum) interaction is observed between Pune and Jaipur followed by Jaipur – Bangalore and Jaipur – Chennai among the all 10 prime urban agglomerations (Fig. 2). The study depicts that distance plays a more vital role as it inversely affects the MI value. The top 15 MI of the cities could take maximum advantage of the opportunities in urban interaction for the development. The

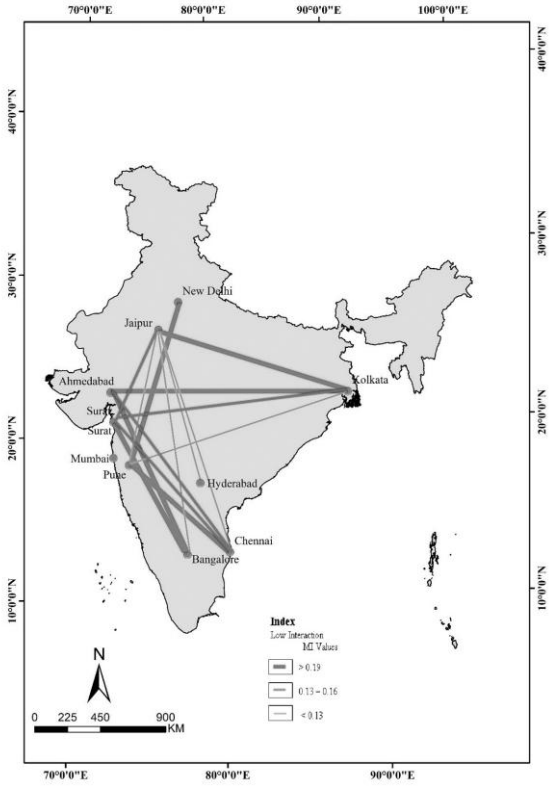
comparative study between the correlation calculation result and the gravity model has shown that conformity with reality. Thus, they can be used in the regional development link analysis in quantitative research as well.The population and distance square correlation results between all urban agglomerations interpret that Mumbai and New Delhi have the highest positive correlation (0.9945*) in terms of population size and less correlation in terms of distance square (0.0458). Mumbai – Pune has the highest positive correlation in terms of distance square (0.9886*) but less correlation in terms of population size (0.5464). The correlation among all urban agglomerations increases with population size and decreases with distance square. Fig. 3 reveals that there is a positive correlation between the migration index (MI) and distance square but a negative correlation is observed between the MI and population. Hence, it is determined that distance plays a vital role in the interaction. The spatial interaction model can be directly derived from the principle of entropy maximization, while the gravity model can be derived from the spatial interaction model by way of the algometric relations between population sizes and inflow/outflow quantities. The gravity

Fig. 1High Interaction between Urban Agglomerations: India



Note: Mumbai is the most highly interactive city.

Fig. 2 Low Interaction between Urban Agglomerations: India



Note: Jaipur is the most low interactive city.

Fig. 3: Correlation coefficient between population and distance square

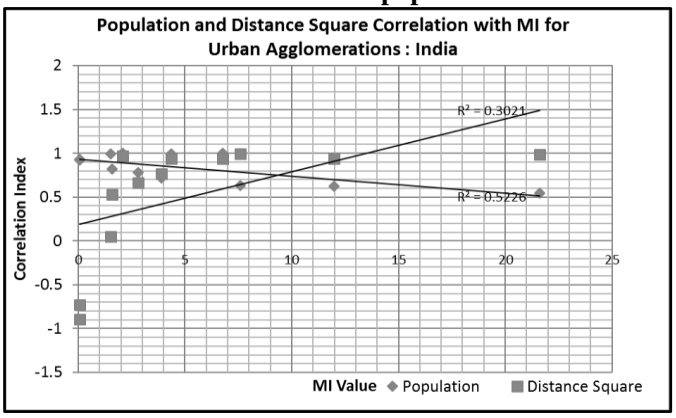
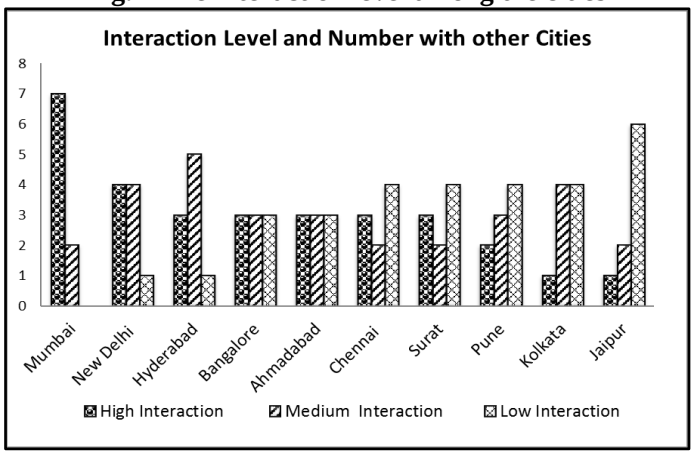


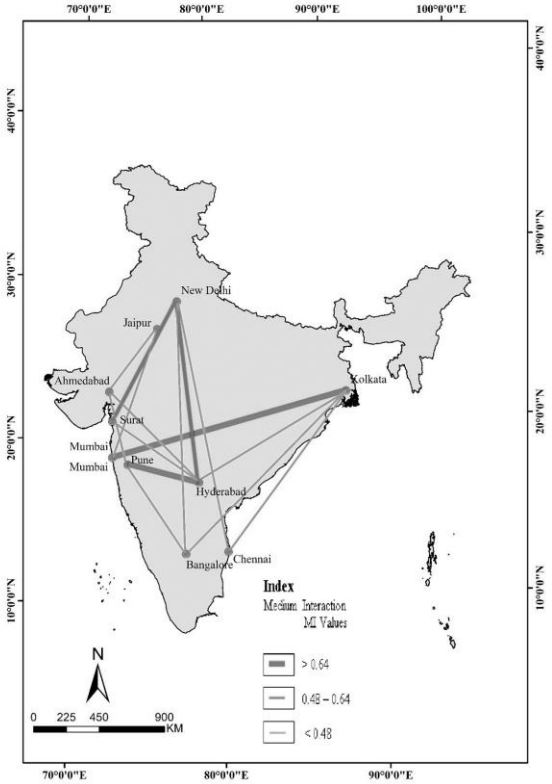
Fig. 4 The interaction level among the cities



model can be used to measure the strength of association of one place with another place, while the spatial interaction model can be used to predict the distribution of spatial flows in a transport network (Chen,

2015). Based on the composite score of 45 (MI) interaction values, all interactions are classified into three broad categories i.e. High, Medium, and Low interaction. The study reveals that the Mumbai city in India has the highest interaction with 7 other cities (Fig. 4). Hence, Mumbai is the most interactive and important city of India, which has the highest influence on other cities followed by Delhi. The high interactive zone of the country is observed in the west and central part of India. The Jaipur city has low interaction with the other 6 cities in the country. Jaipur is the least interactive city in India among the top ten cities. The low interactive zone is observed in the East part of the country. Though, Kolkata is 3rd largest city in the country has minimum interaction with other cities as it is located on the east coast with considerable distance. Hyderabad city has medium interaction with 5 cities and which is highest as compared to the other (Fig. 5). Though Kolkata, Chennai, Bangalore have more population sizes than Hyderabad, the city Hyderabad indicates a high level of interaction than these cities. The high level of interaction was noticed mainly due to the central geographical location of Hyderabad city. It indicates the result that the interaction increases with the population size and decreases with distance. It proves that the interaction is proportionate to the population size and inversely proportionate to the distance. However, human behavior and the natural barrier can interrupt this interaction. An urban agglomeration with strong interaction among cities can promote regional development. This study has important for regional and urban planning in India.

Fig.5Medium Interaction between Urban Agglomerations: India



Note: Hyderabad is the most moderate interactive city.

Conclusion

The applied gravity model emphasis the conventional structures of the gravity equation. The study devised that population and distance variables are significant factors for an explanation of the interaction or migration flows. The distance between the cities is found to be the single most important determinant in interaction, which can represent the practical network approximately. The interaction, such as high, moderate, and low are found similar in the gravity network and observed network. Finally, it shows resemblanceswith previous research. The present study illustrates that theoretical models can be computed and developed by relevant characteristics of variables to find out the interaction between the urban population. It is an addition to the literature of experiential models of interaction and migration.Thus, when the completion of interaction data of urban agglomerations is difficult and the methodical scope is limited, the gravity model can be used to integrate and it reflects the spatial organization of these agglomerations. This study may use to identify the weaker and stronger zone of interaction in city planning and it will help to mitigate the regional imbalance. A detailed investigation of the interaction between cities and their

correlation with each city is applicable in further research at a regional level too. This work is helpful for policymakers to form a concrete policy that enhances the strategy for urban development and regional planning.

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Agricultural Land Use Cropping Pattern In Delgoor Thasil

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Introduction:

In simple words cropping pattern means the proportion of area under various crops at a point of time. Each of the crops and an introduction of some new crops, leading to change in cropping patterns. "Cropping of Agricultural enterprises patterns are the intent to which the available land under different agricultural activities can be put use." (Jasbir Sing-1974) The chage in cropping pattern in a particular of time clearly indicates the changes that have taken place in the agricultural development. These changes are brought about by the socio- economic influences. "In most of the situations the physical environment reduces the choise of the enterprise, either by prophibition the growth of certain crops altogether or by reducing their level." (Morgan and Morgan-1971)

Study Area:

The present work an attempt has been made study the agriculture land use and cropping pattern in Degloor tahasil 199-2000 to 2007-08. Degloor taluka is one of the importance taluka in Nanded district of Marathwad region in Maharashtra State. At presently in Degloor taluka included four circles i.e. Degloor city, Shahapur, Markhel, and Hanegaon circle. Degloor city is the head quarter of the taluka. The taluka lies between 18 16 to 18 46 North latitude and 77 35 to 77 65 East Longitude. Taluka has an average elevation between 300 to 425 meter from above the sea level, the complete Degloor circle contain deep black soil of the taluka. The remaining part of Shahapur circle also contains black soil. The taluka is a surrounded by Lendi rever, the line of Lendi river running through South West. Most of the part become fertile due to Lendi river and almost part of taluka suppose as the fertile in the district. Similarly climate and vegetation have and investing regional variation which ultimately determined the variation in the characterize of agriculture in the taluka. Except duringthe Monsoon season the climate of taluka is dry, the maximum temperature recorded in the month of May 38.36 C. and minimum temperature was recorded in the month of January 12.59 C. and 825 mm average rainfall in the taluka. The taluka has total area of 687.12 sq.km. and proportion as compared with Nanded district is about 6.53 percent. The area of Degloor taluka has 68712 hectares as per the 2001 census, the population of Degloor taluka is 2,00,627.

Objectives:

The present study has creates specific research objectives:

1. To study the agricultural land use and cropping pattern of selected region of the area.
2. To study areal changes in area under crops and changes in cropping pattern in the study area.
3. The period selected for the study extends from 1999-2000 to 2007-08.

Database & Methoodology:

The entire data is used for the present study has been obtained from secondary source.

1.Socio-economic review and district statistical abstract of Nanded district.

2.District census & hand book , Gazetteer, Agricultural epitomes, Season and crops reports published by the department of agriculture.

3. Statistical abstract & Degloor tahasil.

The Formula used for study of cropping pattern.

CP = Ca/N X 100

Where.

CP-Cropping pattern

Ca- Area under crop 'a' is the component areal unit.

N- Total cropped area in the component areal uint.

Indian agriculture department studied cropping pattern positive or negative . (This shows the above formula used for cropping pattern in Indian agricultural sector)

$$\text{Relative Yield Index} = \frac{\text{Mean vield of crop 'a' in the component area unit}}{\text{Mean yield of crop 'a' in the enture region.}} \times 100$$

Cropping Pattern In Degloor Tahasil:

The figures for 1999-2000 and 2007-08 have been used to analysis the change that has taken place in seven years. In 1999-2000 out of the total gross cropped area nearly 44 percent under food grains and out of it 17.39 percent under cereals. In the cash crops cotton ranked first and covered 34.26 percent. While oil

seeds fallowed with 6.49 percent area. The double cropped area in this year was only 232 hectares . i.e. 0.85 percent of the total gross cropped area. This also reflects control of physical factors and at the same time lack of irrigation and adoption of modern techniques. In 2007-08 i.e. nearly after sever years the cropping pattern has changed. In the taluka the total gross cropped area has increased 2007-08. Similarly during this period the net sown area has also gone up 984 hectares, though the total area has increased. The share of different crops changed differently.

The following table no.1.1 shows the area under different crops in the taluka.

Table No 1.1, Area under different crops in Degloor tahasil (Area in hectares)

Name of crops	1999-2000	2007-1008	Percent incre./decre In area over 1999-2000
Rice	424(1.55)	298 (1.00)	-29.72
Jowar	4332(15.84)	42.91(14.36)	-0.95
Total cereals	4756(17.39)	4589(15.36)	-3.51
Total pulses	7139(26.10)	5465(18.29)	-23.45
Total food grains	11895(43.49)	10054(33.65)	-15.48
Cotton	9370(34.26)	10382(34.74)	+110.80
Groundnut	93(0.34)	143(0.48)	56.99
Oil seeds	1775(6.49)	4177(13.98)	35.32
Other crops	4217 (15.42)	5123(17.14)	+21.48
Total gross cropped once	27350 (100)	29882(100)	9.26
Area sown more Than once	232(0.85)	1780(5.96)	+667.24
Net sown area	27118(99.15)	1780(94.04)	+3.63

Source: Socio-economic review & district Statistical Abstract Of Nanded district & Tahasil office, Degloor (Note Fig. in points shows percentage)

Volume Of Change In The Taluka:

The area under food grains has gone down by 9.84 percent with similar increase in under non food crops. In a similar way area under cotton shows an increase of 0.48 percent or 1012 hectares. Area under oil seeds shows an increase of 7.39 percent or 2402 hectares.

Table No.1.2 (Area in hectares)

Name of crops	Degloor			Shahapur		
	1999-2000	2007-208	Incre/DecreIn over 1999-2000	1999-2000	2007-2008	Incre /DecreIn area over 1999-2000
Rice	200[1.46]	76[0.49]	-0.62	224[1.64]	222[1.53]	-0.89
Jowar	1727[12.60]	1556[10.10]	9.90	2605[19.09]	2735[18.90]	+4.99
Total	1927[14.06]	1632[10.29]	-15.31	2829[20.72]	2957[20.44]	+4.52
Cereals total pulses	3223[23.52]	2284[14.82]	-29.13	3916[28.69]	3181[21.98]	-18.77
Total food grains	5150[37.59]	3916[25.41]	-23.96	6745[49.42]	6138[42.42]	-9.00
Cotton	4625[33.76]	4581[29.72]	-0.95	4745[34.76]	5801[40.09]	+22.25
Groundnut	39[0.28]	46[0.30]	+17.95	54[0.40]	100[0.69]	+85.18
Oil seeds	875[6.39]	2551[16.65]	+191.54	900[6.59]	1626[11.24]	+80.66
Other	3012[[21.98]	4318[28.02]	+43.36	1205[8.83]	805[5.56]	-33.19
Grosse cropped area	1370[100]	15412[100]	+12.49	13649[100]	14470[100]	+6.01
Area sownmore than once	140[1.02]	1400[9.08]	+900	92[0.67]	380[2.63]	+331.04
Net sown area	13561[98.98]	14012[90.92]	+3.33	13557[99.33]	14090[97.37]	+3.93

Source:- Socio-economic reviews and district statistical abstract of Nanded district and Tahasil office. Degloor.

[Note: Fig. in points indicates percentage]

The above table no. 1.2 shows the cropping pattern that existed in 1999-2000 to 2007-08 in the Degloor taluka. Table shows that area under food grains occupies nearly 50 percent in each circle. In Degloor circle there is slight increase area under food grains.In non food crops cotton shows the dominance. Degloor shows 33.76 percent in 1999-2000 slightly decrease in 2007-08 to 29.72 percent in Shahapur circle. There is a slight increase of area under cotton. This variation has resulted due to the difference in physical condition. In both circles there is suitable soils and favorable rain fall amount for cotton.As compared to cotton the area under oil seeds show a different condition. In this respect Degloor circle 6.39 percent area under oil seeds. And in Shahapur circle 6.59 percent, The cultivation of lil seeds is in response to the soils and rainfall patterns, in the respective circle. The table indicates the increase in the gross cropped area in every circle. From 1999-2000 to 2007-08 i.e. in seven years the gross cropped area has increased but not uniformly throughout the taluka. In Degloor circle there is a increase of 1711 hectares (12.49 percent) In Shahapur circle increase is of 821 hectares (6.01 percent) The Net sown area has also increased in both the circle. In Degloor circle the increase is of 445 hectares(3.33%) and in Shahapur circle the increase is of 533 hectares (3.93%).The figures for gross cropped area which include the double cropped area present different pictures in different circle in the Degloor taluka.

Circle Wise Volume Of Change :

Regarding the area under food grains it is observed that Practically in both circle i.e. Degloor and Shahapur circle .In these circle area has decreased. The decrease ranges from 23.96 in Degloor, to 9.00 in Shahapur circle, comparing to this the area under non food crops show a slight change. In both the circle is general increase in the area under non food crops. It clearly indicates a conversion of traditional agriculture. Every additional piece of land is primarily used for non food crops production. In a way, it can be cincluded that the profit attraction of the non food crops production promotes. The farmers to bring more area under plough and practice double cropping for this they are ready to invest in inputs.The area under cotton shows spatial difference, in Degloor circle it has gone down, by 44 hectares (0.95) while in Shahapur circle there is an increase of (22.25) percent, i.se. about 1056 hectares. Recently tow forces are working upon the cotton production. The monopoly purchase system of cotton has discouraged many farmers from producing cotton while the new arieties of cotton which area raised with the help of irrigation some farmers to grow cotton. These conflicting circles and in different intensity. The farmers are responding to this situation according to the resources at their hand, it has resulted in varied change in the cotton area in different circle. The area under oil seeds has increased substantially in six year period. In Degloore circle this area has increased by 191.54 percent 1676 hectares and in Shahapur circle the increase is of 80.66 percent 726 hectares.

Priority Of Crops:

In order to assess the change and also the nature of change in the crops in the tahsil as well as at the circle level priority tables have been prepared for the years 1999-2000 to 2007-08.The table no. 1.3 for the taluka shows that the majority of crops have maintained their position in the cropping order. However there is no change in the position of total pulses. The area under it has decreased from 26.10 to 18.29 percent.

Table No. 1.3
Priority Of Crops In Degloor Tahasil

1999-200			2007-2008		
Sr.No.	Name of crops	Percentage[%]	Sr.No	Name of crops	Percentage[%]
1	Cotton	34.26	1	Cotton	34.74
2	Total pulses	26.10	2	Total pulses	18.29
3	Jowar	15.84	3	Jowar	17.14
4	Other crops	15.42	4	Other crops	14.36
5	Oil seeds	06.49	5	Oil seeds	13.98
6	Rice	01.55	6	Rice	01.00
7	Groundnut	00.34	7	Groundnut	00.49

Sources : Tahasil office, Degloor

The area and rank of cotton during the span of six years is almost the same. In the year 1999-2000 it is 34.26 percent and 34.74 percent in 2007-08. Jowar had 15.84 percent in 1999-2000 and there is a slight decrease in the area which is 14.36 percent in 2007-08. This change is due to agricultural conversations, which are very slow. Crops are given trials and only when they satisfy the farmers their area

increase other wise it decreases.Regarding other crops the area has increased in 2007 -08 from 15.42% to 17.14 % oil seeds also show a substantial change in area under oil seeds . Rank is same. The position of Rice and Groundnut is also the same.

Ranking Of Crops :

Different authors have used different simple descriptive as well as indicate statistical methods to describe the cropping pattern. The most simple method is to describe the crops according to their ranks. The first or first two crops or first three crops occupying the major area of gross cropped land are selected on the basis for ranking Majid Hussain (1982) has named this method as the **'Arbitiary choice methods'**. In this method the first rnaking crop i.e. the crop occupying the highest percentage of the total cropped area I each circle is selected with the help of this method the distributional pattern of firs ranking crops in 2007-08 . It is interesting that cotton was the first ranking crops in Degloor and Shahapur circle in 2007-08 and it has not lost its rank during senen years. It roughly indicates the control of physical and socio-economic determines.In 1999-2000 cotton was first ranking crop in Degloor and Shahapur circle and it maintained its first rank in 2007-08, If the first two corps are considered, then it shows some spatial variation. In the two circles Degloor circle. Cotton and total pulses are at the first and second rank in 1999-2000 while in Shahapur circle first and second passion of crops cotton of Degloor and Shahapur circle is crops ranking. Shahapur circle is first two crops one is cotton and second is total pulses crops ranking. (Show Table No. 1.4)

Table No. 1.4
First and Second Ranking Crops

Table No. 1.4
First and Second Ranking Crops

Name of the circle	1999-2000	Name of the circle	2007-08
Degloor	Cotton, Total pulses	Degloor	Cotton,Total pulses
Shahapur	Cotton, Other crops	Shahapur	Cotton,Total pulses
Markhel	Cotton, Other crops	Markhel	Cotton, Other crops
Hanegaon	Cotton, Other crops	Hanegaon	Cotton, Other crops

All the crops occupying more the 5% of the gross cropped area have been considered.

The results have been depicted in the table no 1.3 in Degloor tahasil 1999-2000 total four crop combination was there, which didn't change in 2007-08 except rank of the crops in this year, other crops moved to third rank. Degloor circle shows three crop combinations on in 1999-2000. Which change during the years 2007-08 four crop combinations hammered. Shahapur circle show three crop combination cotton ranking first, same is the case in 2007-08, except Jowar position in on third rank. Reasons for cotton as ranking first in the both the circles are the availability of deep black soil and moderate rainfall.

In the ranking of crops study it reveals certain rare differences. It is only in second ranking crops total pulses have gone undoubtedly the cash crop cotton has not changed the rank of first during the span of years.

Conclusion :

The foregoing discussion reveals certain facts about the change that has taken place in cropping pattern in the tahasil.

1. The net sown area as well as the gross cropped area has increased in every circle.
2. In every circle under non food crops shows an increasing trend in the taluka, as well as in thecircle separately.
3. In every circle under food crops has decreased.
4. Two circles show a mark difference in crop combination.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Literacy Pattern in Osmanabad District: A Geographical Study

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Abstract:
Literacy reflect the socio-economic and cultural setup of the nation. Literacy is a one of the important indicator of human development. According to Indian census operation 2011, a person aged seven and above, who can both read and write with understanding any language, is treated as literate. Literacy has traditionally defined as the ability to read and write. The main objective of the present paper is to study of literacy pattern in Osmanabad district. literacy rate in Osmanabad district ahead in 1961 to 2011. The present study is based on secondary data. The proportion of literate population in the Osmanabad district is about 76.30 in 2011.
Keywords: Literacy, Education, Development, Indicators.

Introduction:

Literacy and education attainment is one of the most important indicators of development without which no society can progress. It not only brings the development of agriculture and non- agriculture sectors of economy but also controls the growth of population (Ramotra, 2000). It is a one of the major demographic characteristics. Literacy has been important indicators and instrument of socio-economic development. The level of literacy, that different from country to county, generally in the developed countries literacy rate was high while in under developed countries literacy rate has very low. The various socio-economic aspects effects on literacy like a nature of economy, degree of urbanization, technological development and educational facilities. proportion of literates to total population has variously distributed through India. According to 2011 census data, literacy rate of India was about 72.98 percent, in which highest literacy has found in Kerala and lowest literacy found in Bihar district.

Objective of the study:

1. To study of spatial variation of literacy patternin Osmanabad district.
2. To study temporal change of literacy pattern in Osmanabad district.

Database and Methodology:

The present paper is based Secondary Source of data. The secondary data is collected from various sources which includes both published and unpublished books, government publication and private publications. District census handbook, district statistical department, socio economic review and district statistical abstract of Osmanabad district. Collected data is processed and presented in the form of tabular and graphical method.

Study Area:

Osmanabad district is situated in the southern part of the state it is extended between 17° 37’ to 18° 42’ north latitude and 75° 16’ to 76° 47’ east longitude. Osmanabad district bounded Beed district in the north side, Latur district in the East, Karnataka state in the South East, Solapur district in the south west and West and Ahmednagar district in the North West. The total geographical area of Osmanabad district has 7569 sq. km. According to 2011, census total population of district has 1657579 persons.

Trend of Literacy Since 1961 to 2011:

Table number 1. Shows that temporal variation of literacy rate in Osmanabad and Maharashtra state. According to 1961, the proportion of literate population to total population of Osmanabad district (17.10) than thewhich was lower than the state of Maharashtra with 35.08. In 1971, it was increased Osmanabad (27.88) and in state of Maharashtra (39.18).

Table No. 1. Trend of Literacy rate in Osmanabad district and Maharashtra: 1961 to 2011.

Temporal Change of Literacy		
Decade	**Osmanabad**	**Maharashtra**
1961	17.10	35.08
1971	27.88	39.18
1981	35.36	47.18
1991	54.27	64.87
2001	69.02	77.27
2011	76.23	82.33

Source: District census Handbook 2001 and 201

As per 1981, literacy rate Osmanabad district increased by 7.48 and Maharashtra was increased by 10 percent. After 1981 the literacy rate was increased rapidly in 1991, 2001 and 2011 due to increasing educational facilities and socio-economic development of the study region. In 1991, the

Trend of Literacy Rate in Osmanabad and Maharashtra State: 1961-2011

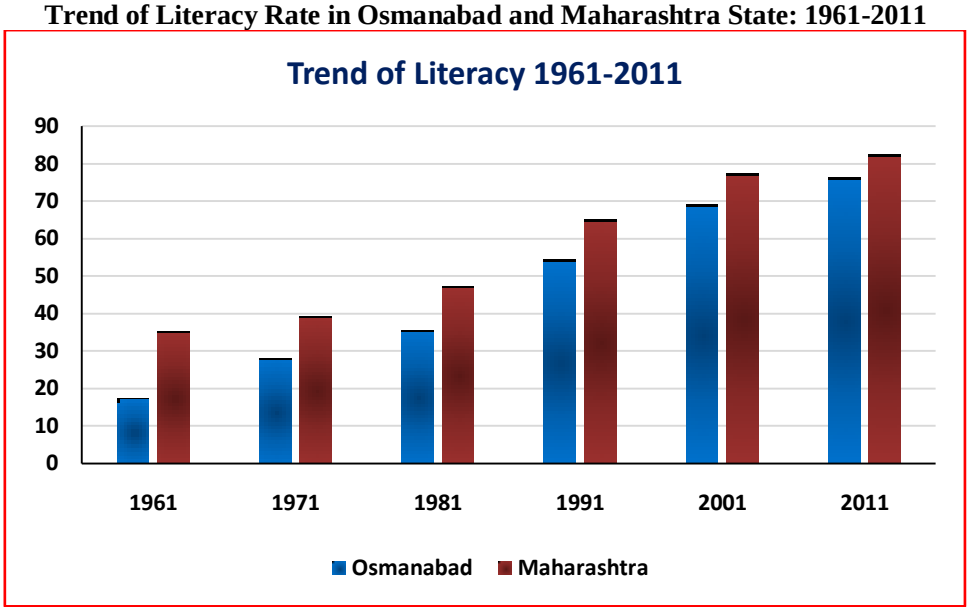

Fig. No. 1

proportion of literate population to total population is 54.27 percent witch was lower than the state literacy rate with 64.87 percent.In2011, the literacy in Osmanabad district was76.23 percent and 82.33 percent in Maharashtra. In all the investigation period literacy rate of Maharashtra state was higher than the Osmanabad district because of the district occurred in drought prone area hence it was more socio-economically backward than the other districts of the state.

Spatial Variation of Literacy: 2001 and 2011

Spatial pattern of literacy rate of Osmanabad district has variedly distributed in year 2001 and 2011. Table No. 2. Show the spatial variation of literacy pattern in Osmanabad district in 2001 and 2011.In 2001, the proportion of literate population to total population of Osmanabad district was about 69.02 percent, in which highest literacy was recorded in Osmanabad tahsil with 72.45 percent and lowest literacy was recorded in Paranda tahsil for 64.27 percent. Osmanabad and Kalamb tahsil literacy rate have more than district average literacy while remaining district have less than the district average literacy. It seems that where the urban area is higher literacy rate was also high due to high opportunity of education.

Table No. 2. Spatial Variation of Literacy rate in OsmanabadDistrict:2001 and 2011

Literacy Rate Osmanabad 2001-2011			
Sr. No.	**Tahsil**	**2001**	**2011**
1	Paranda	64.27	72.25
2	Bhum	66.46	73.08
3	Washi	68.1	75.09
4	Kalamb	70.81	78.34
5	Osmanabad	72.45	79.65
6	Tuljapur	67.82	75.66
7	Lohara	68.2	74.83
8	Omerga	68.19	75.28
District Total		**69.02**	**76.23**

Source: District census Handbook, 2001 and 2011

According to 2001, the proportion of literate population of Osmanabad district was 76.23 percent which was increased compare to 2001 with 7.21 percent. In the district the highest literacy rate was found in Osmanabad tahsil and lowest literacy found in Paranda tahsil for 72.25 percent. Osmanabad and Kalamb

tahsil recorded above the district average literacy while remaining tahsils are recorded below the district average.

Spatial Variation of Literacy rate in Osmanabad District: 2001 and 2011

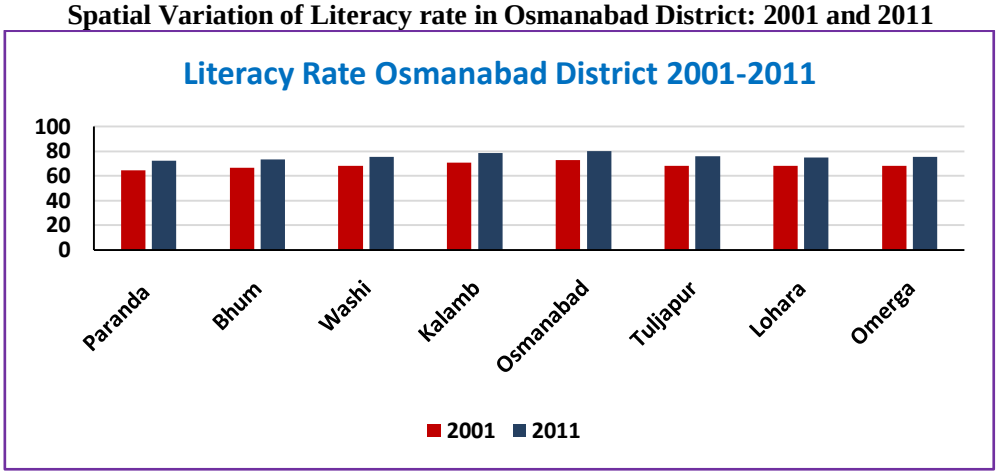

Fig. No. 2

Conclusion:

1. The proportion of literate population to total population of Osmanabad district increasing constantly since 1961 to 2011, due to increasing education facilities, degree of urbanization and changing the nature of economy.
2. In Osmanabad district Osmanabad and Kalamb tahsil have recorded high literacy, due to degree of urbanization and availability of education facilities.
3. The literacy rate of Osmanabad district has lower than the literacy rate of Maharashtra state.
4. Where the urban area is high the proportion of literate population is high in the study area district.

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Agricultural Productivity Calculated Based on Kendall's Method in Latur District (M.S.)

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Abstract:
Agriculture is a backbone of the Indian economy. Its play a vital role on the development of rural as well as whole India. As per 2018 more than 50 percent work force engaged in -agricultural sectors and contributed 17-18 Percent GDP of the Country. Many allied other activities depends on the agricultural sectors like a Trade, Transportation and Agricultural Industries. Agriculture productivity may be defining as it is a ratio of agricultural outputs to the input. The main objective of the present study is to find out and analysis agricultural productivityCalculated Based on Kendall's Method in Latur District. Latur district located in drought prone area, its agriculture is mainly depending on monsoon. Soybean, Gram, Tur, Jawar are the major crops of the district. According to Kendall's method of Agriculture productivity Nilanga is first rank tehsil of the study region followed by Latur and Ausa Tahsil.
Keywords: Agricultural, Production, Productivity, Crops, Irrigation.

Introduction:

Agriculture is a dominant economic activity of India, more than 50 percent people engaged in the agricultural activity in the country. The economy of the Latur district is also agrarian. Soybean, Tur, Maize and Jawar are the major crops in Kharip and Gram, Wheat is in the rabbi season. The sugarcane, sunflower, Rice and Groundnut are also other crops grown in the Latur district. in the study area about 715.7 thousand hector geographical area under the cultivation to the total geographical area. Net irrigated area of the district is 319 thousand hector and gross irrigated area is about 394 thousand hector. Annual rainfall of the district is 769.7 mm. The proportion working population of agriculture sectors to the total population is 31.69 percent cultivators and 39.79 percent are Agriculture labors means more than 70 percent people depend on Agriculture sectors.

Objective: The main objective of the present study is to find out and analysis agricultural productivityCalculated Based on Kendall's Method in Latur District.

Study Area:

Latur is a one of the important district of Marathwada region of Maharashtra state. It is situated on the south eastern part of Maharashtra. Latur district is extend between 17° 15' to 18° 40' North and 76°18' to 79'12' east longitude. Its geographical area is 7157sqkm and it is 2.32 percent Geographical area of the Maharashtra state. It is bounded by on the south Bidar district of Karnataka state and Osmanabad district. on the north by Nanded and Beed district. on the west and east side Nanded, Bidar and Osmanabad districts. The major part of the district is Maharashtra plateau the average height is about 609.6 meter above to sea level. Manjra is major river which flow on the Balaghat plateau with its tributaries' Terna, Tawarja and Gharni. Light black and deep black soils occurs in whole district.

Database and Methodology:

The present paper is based Secondary data. The secondary data is collected from various sources which includes both published and unpublished books, government publication and private publications. Agricultural Department Pune, Maharashtra. District statistical department, socio economic review and statistical abstract of the Latur district. Collected data is processed and presented in the form of tabular and graphical method.The M.G. Kendall's ranking coefficient method used to calculate and find out the agriculture productivity in the study region. The ten major crops selected for the study and following equation has been used to obtained productivity rank,

Formula of ranking coefficient Index: $= \frac{\sum R}{N}$

Where,

R - Ranking Yield of Individual Crop

N – Number of Crops

Agriculture Production:

Table No. 1. Agricultural Production in Latur District: 2012-13 (in MT)

Sr. No.	Tahsil	Jawar	Wheat	Rice	Maize	Soybean	Groundnut	Sunflower	Sugarcane	Tur	Gram
1	Latur	9668	2571	543	3447	104911	120	22	613	8537	9800
2	Renapur	6963	2758	164	1858	86529	57	28	343	6732	20963
3	Ahamadpur	201	508	759	4156	30615	172	42	333	10981	11446
4	Jalkot	13781	201	1014	0	30457	51	0	14	8030	3653
5	Chakur	8169	1761	294	3503	35247	258	182	160	45304	8798
6	Shirur Anantapal	2018	1766	371	0	28570	155	51	122	10221	11185
7	Ausa	14851	5902	560	1328	79960	467	302	383	25448	7615
8	Nilanga	13299	2153	908	1126	139207	416	338	361	28096	34902
9	Deoni	9503	792	226	0	55276	32	0	191	10027	7123
10	Udgir	15556	1715	326	2092	102481	137	210	125	17368	5854
District Total		94009	20127	5165	17510	693253	1865	1175	2645	170744	121339

Source: Department of Agriculture, Pune Maharashtra State.

The above table shows the Spatial variation of agricultural production of some selected major crops in the Latur district 2012-13. The selected major crops for the study region are Jawar, Wheat, Rice, Maize, Soybean, Groundnut, Sunflower, Sugarcane, Tur and Gram. The total agriculture crops production of the district was 1127832 MT in which soybean is largest productive crop which accounts 693253 followed by Tur, Gram and Jawar while lowest productive crop is Sunflower with 1175 MT followed by Sun flower, Sugarcane and Rice. The tahsil wise agriculture production of the district was distributed unevenly thought-out the district.Soybean is a major crops of the district Nilanga tahsil recorded highest production followed by Latur, Renapur and Ausa Tahsil and lowest production found in Shirur Anantapal followed by Jalkot tahsil, high Jawar, Wheat and Rice, Maize production recorded in Ausa and Jalkot tahsil. Highest sugarcane, Tur and Gram production observed in Latur, Chakur and Nilanga tahsil. Most of the crops growing depending on the Indian monsoon in the study region.

Agriculture Productivity:

Table No. 2. Ranking Coefficient of Agriculture Productivity in Latur District by Kendall's Method.

Sr. No.	Tahsil	Jawar	Wheat	Rice	Maize	Soybean	Groundnut	Sunflower	Sugarcane	Tur	Gram	Total Rank	Ranking Coefficient	Agriculture Productivity Rank
1	Latur	5	3	5	3	2	7	8	1	8	5	47	4.7	3
2	Renapur	8	2	10	5	4	8	7	4	10	2	60	6	6
3	Ahamadpur	10	9	3	1	7	4	6	5	6	4	55	5.5	5
4	Jalkot	3	10	1	8	9	9	9	10	9	10	78	7.8	9
5	Chakur	7	6	7	2	10	3	4	7	1	6	53	5.3	4
6	Shirur Anantpal	9	5	6	8	8	5	5	9	5	3	63	6.3	7
7	Ausa	2	1	4	6	5	1	2	2	3	7	33	3.3	2
8	Nilanga	4	4	2	7	1	2	1	3	2	1	27	2.7	1
9	Deoni	6	8	9	8	6	10	9	6	7	8	77	7.7	8
10	Udgir	1	7	8	4	3	6	3	8	4	9	53	5.3	4

Source: Computed by Researcher.

Agriculture productivity may be defining as it is a ratio of agricultural outputs to the input. Tahsilwise agricultural productivity calculated based on Kendall's coefficient method and classified high, medium and low category (table no. 1 and3).

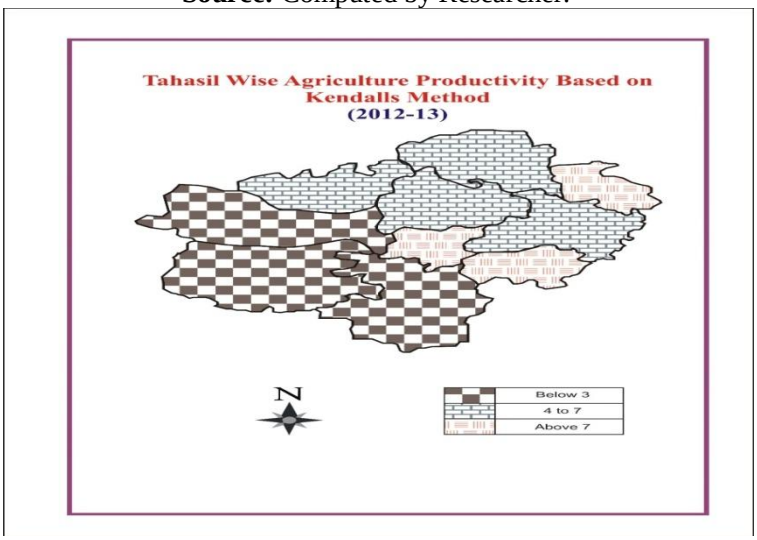
1. **High Agricultural Productivity:**

High agriculture productivity recorded in tahsils, namely Nilanga, Ausa and Latur tahsil in the Latur district. Nilanga is largest agriculture productivity tahsil followed by Latur and Ausa tahsil at second and third position. Use of High Verities Yields (HVY), fertilizers, new advance techniques and maintain the fertility, irrigation facilities etc. are the main causes to high agricultural productivity.Soybean, Tur, Gram and Jawar are the major crops of the Nilanga Latur and Ausa lahsil. Manjra River and its tributaries basin drain on the Nilanga, Latur and Ausa tahsil Tawarja, Masalga, lower Terna as well as Wells., Tube wells are main source of the irrigation of these three tahsils hence the agricultural production is high.

Table No. 3. Tahsilwise Agriculture Productivity Calculated based on Kendall's Method

Sr. No	Categories	Tahsil
1	High: below 3	Nilanga Ausa and Latur
2	Medium: 4 -6	Udgir, Chakur,Ahamadpur andRenapur
3	Low: above 7	Shirur Anantapal, Deoni and Jalkot

Source: Computed by Researcher.



2. **Medium Agriculture Productivity:**

Medium agriculture productivity has been found in four tahsils, namely Udgir, Chakur, Ahamdpur and Renapur tahsilin the study area.Udgir is forth number agriculture productivity tahsil followed by Chakur, Ahamadpur and Renapur tahsil. HVY, Fertilizers, mechanism, and irrigation facilities play a vital role of the agriculture production. Upper Manjra, Mahalingi, Gharni, Sakol, Devani are the major irrigation source of this region. Soybean, Tur, Gram and Jawar are the major crops in this four tahsil of the study area.

3. **Low Agriculture Productivity:**

Low agriculture productivity has been observed in three tahsils, namely Shirur Anantapal, Deoni and Jalkot tahsilin the study area. Jalkot tahsil is lowest rank tahsil of the study area. Soybean, Tur, Gram Jawar and Rice are the major cropsof these tahsils. Low irrigation facility, infertile land and high fallow land or uncultivable are the major cause of the low agriculture production in the Jalkot and Deoni tahsil in the study area.

Conclusion: The above study concludes that, high agriculture productivity recorded in tahsils, namely Nilanga, Ausa and Latur tahsil in the Latur district. Nilanga is largest agriculture productivity tahsil followed by Latur and Ausa tahsil at second and third position. Due to HVY, Fertilizers, mechanism, and irrigation facilities play a vital role of the agriculture production. Medium agriculture productivity has been found in four tahsils, namely Udgir, Chakur, Ahamdpur and Renapur tahsilin the study area. Upper Manjra, Mahalingi, Gharni, Sakol, Devani are the major are the major irrigation source of this region. Low agriculture productivity has been observed in three tahsils, namely Shirur Anantapal, Deoni and Jalkot tahsilin the study area. Low irrigation facility, infertile land and high fallow land or uncultivable are the major cause of the low agriculture production in the Jalkot and Deoni tahsil in the study area.

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Water Quality Index (WQI) and Ecosystem - A Case Study of Yamuna River NCR

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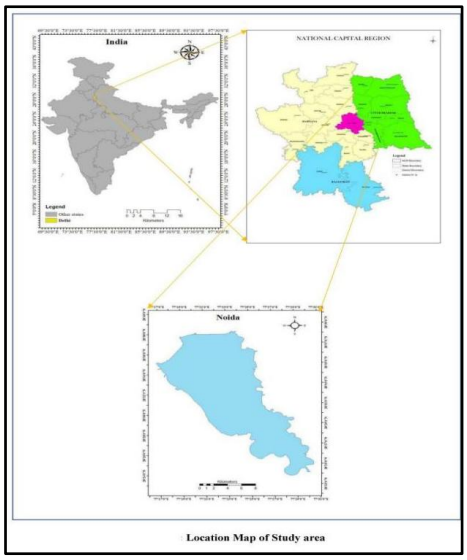
Abstract

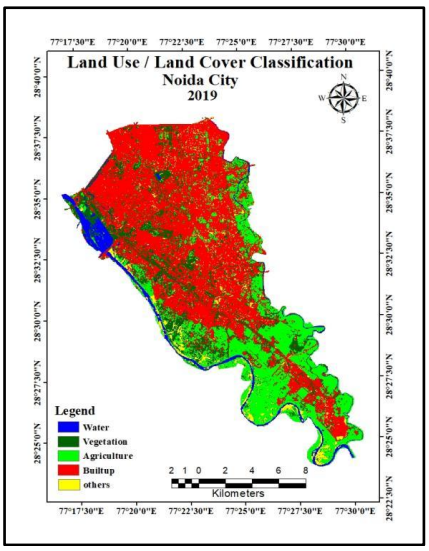
To assess twelve years of water pollution abatement efforts in Yamuna River. We studied how urban runoff affects the water quality of the Yamuna River in National Capital Region (NCR), which runs into the Agra canal and is utilized for public water supply and agriculture. Civilized land plays a primary role in influencing water quality within the watershed. Unspecified pollution of blue water, Streams, rivers, groundwater, lakes, wetlands, now associated with the management practices used in these ecosystem. In this article, we present an explanatory study of Yamuna River's water Quality of Delhi segment Wazirabad Barrage to Okhla Barrage in sustainable watershed management. Sustainable Watershed management will require monitoring of this valuable resource in terms of quantity and quality for various uses such as drinking, cleaning, agriculture, and industriesincreased pollution into the river system has resulted from population growth, urbanization, the introduction of sewage systems, intensive use of fertilizers, pesticides, and other chemicals in agriculture, and the growth of companies with contaminated effluents. Management strategies are used to reduce pollutant loads from watersheds should strive to improve water quality.Changes in user practices are required to implement new solutions to improve the quantity and quality of water resources.

Key Word- Water Quality, B.O.D. Level, Nitrate level, Water conductivity, NCR.

Introduction

The National Capital Region (NCR) is a Unique of inter-state regional Planning and Development for a region centred on the National Capital Territory of Delhi (NCT-Delhi). The Capital region defined by encompasses the whole NCT of Delhi, as well as select certain district in Haryana, Uttar Pradesh, and Rajasthan, covering total an area of 55088 Sq. Kilometres. In Constitutionally, NCR was established in 1985 after the Union parliament passed the National Capital Region planning board act, with the participation of participating states Haryana, Rajasthan, and Uttar Pradesh. My Study Based on near Noida region. Noida stands for New Okhla Industrial Development Authority (NOIDA) is extended from $28^0$18'12.54'' to$28^0$22'36.72'' North latitudes and $77^0$10'28.97'' to$77^0$15'19.83" East Longitudes, situated in Northern India in Gautam Buddha Nagar District of Uttar Pradesh. Noida was developed during the dispute crisis of urbanization in 1975-1977.The city has initiated by Sanjay Gandhi under the industrial area development act, 1976. Is a satellite city of Delhi.It is situated 5 kilometers away from Delhi India, in the trans-Yamuna area. Noida is situated on the west & South-west bank of river Yamuna Delhi from North&Ghaziabad from the Northwest side &the Hindon river flows from the east, southeast, and northeast side.





Water Pollution

Water pollution is defined as the contamination of water bodies, usually as a result of human activity, in such a way that their lawful uses are harmed. Pollution diminishes a body of water's ability to deliver ecosystem services that it might otherwise give.Water pollution is one of the serious problems of urbanized cities in India. It comes from various anthropogenic sources, including untreated water of sewage, chemical discharge from industries and agricultural land, dumping yard near to the river, silt from irrigation, and atmospheric pollutants dissolved in rainwater. It's one of the major pollutants in Delhi and Noida. The Yamuna flows along the boundary of Delhi and Uttar Pradesh.

3. Aim and Objective

The river is a prominent source of water in Delhi and Noida. Yamunariver flows on the back of both main industrial cities. Its main source of Drinking water supply is Delhi and Noida city. So, we preferred to know the quality of river water.

Main Objective of Study:

1. Check the level of water quality of rivers.
2. Identify main source of water pollution of the study area.

4. Data Base and Methodology

This study was carried out in the Yamuna River, which is a major river of Delhi and Noida. River flowing on this region 22 Kms along cities. The study is dependent upon secondary data collected by various sites. Water quality of Yamuna river, Industrial pollution data of various parameters collected by CPCB and UPPCB. Data has been Shown with the help of MS Excel. Map Prepared in ArcGIS Software. Water quality data was extracted from these four monitoring stations.

Table: 1 Water quality monitoring stations

Sr. No.	Water quality monitored locations	Coordinates
1.	Palla (U/s of Wazirabad barrage)	28°42'39.96"N -77°14' 3.84"E
2.	Nizamuddin Bridge	28°36′01.69″N - 77°15′44.03″E
3.	Okhala at Kalindi Kunj (Okhla U/s)	28°31' 31.35" N -77°16' 48.38" E
4.	Okhala D/s	28°32' 8.74"N - 77°16' 35.15"E

Source: ENVIS

5. Analysis and Discussion

Water quality of Yamuna River

Yamuna river rises from Yamunotri glacier of lower Himalaya in Uttarakhand, that flows from National Capital Region. Yamuna river is one of the most polluted rivers in India especially near Delhi and the Noida Region. Delhi and Noida both are producing a million liters of sewage per day but only a 42percent of sewage is managed & treated of the total sewage generated in the city this is also polluting the Yamuna River at a speedier pace than ever. The urban population is also faster increasing than the increasing pollution in the river and it has also affected the agricultural land in Delhi and Noida. The city along the Yamuna River is getting polluted due to water pollution. Commonly used parameters for the characterization of water quality are described by Davis and Cornwall. The important physical parameters suitable to the current class of studies are pH, electrical conductivity (EC), and turbidity whereas Dissolved Oxygen (DO), BOD, Nitrate are normal parameters.

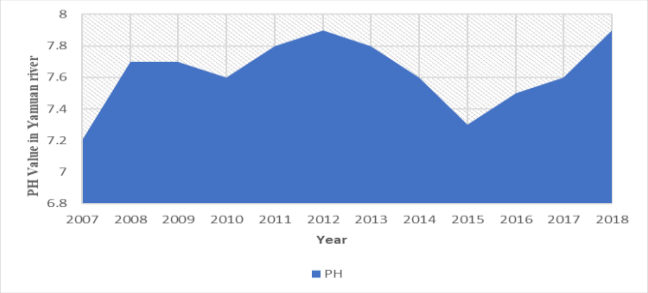
Table: 2Physico-Chemical indicatorof River Water in the Study Area

Year	pH (Mg/L)	Conductivity (Mg/L)	B.O.D. (Mg/L)	Nitrate (Mg/L)
2007	7.2	453	1.9	0.91
2008	7.7	679	12.8	0.90
2009	7.7	892	14.5	0.75
2010	7.6	781	13.5	0.89
2011	7.8	969	13	0.94
2012	7.9	906	22	0.85
2013	7.8	493	17	0.93
2014	7.6	588	17.3	1.2
2015	7.3	634	36	1.6
2016	7.5	610	49	0.93
2017	7.6	627	48	0.87
2018	7.9	670	52	0.91

Source: CPCB, ENVIS, UPPCB

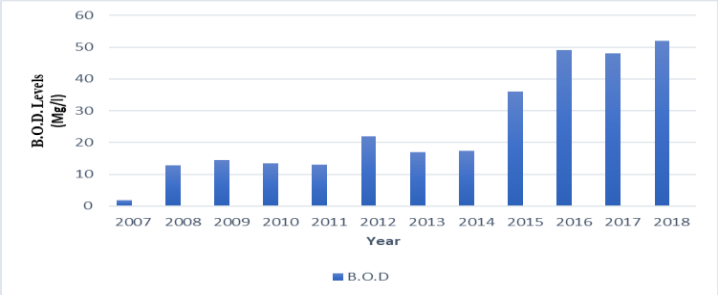
5.1 Potential of Hydrogen (pH) concentration in water explains from 2007 to 2018. In 2007 the pH found was 7.2 which has been also increased in 2012 which shows the highest concentration of 2.9 but from 2013 to 2015it has been decreased the rate of concentration from 7.8 to 7. 3. After 2015 to 2018 shows a rapidly increasing rate of pH. pH value reported as Balanced. But 2015 to 2018 displayed an increasing rate so it will affect the solubility and toxicity of chemicals and heavy metals in water. pH water lower or higher aquatic organisms living it will die. Humans facing Drinking water and skin problems.

Figure 1: Levels of pH value in River Yamuna



5.2 Biochemical Oxygen Demand (B.O.D. Level) Table has described the level of B.O.D. from 2007 to 2018 in 2007 has recorded 1.9 mg/l. but in 2018 shows 12.8 mg/l and 2009 14.5 mg/l. after 2009 to 2011 showing decreasing rate 2010, 13.5 mg/l ,2011, 13 mg/l. and 2012 shows 22 mg/l but in 2013 yet decrease 17 mg/l. From 2014 to 2015 take a high jump from 17.3 mg/l to 36 mg/l and in 2018, 52 mg/l then a continuous increase. Natural and man-made sources are responsible for increasing Biochemical Oxygen Demand.

Figure 2: Levels of B.O.D. Level in River Yamuna



Typical values of BOD and its indication:

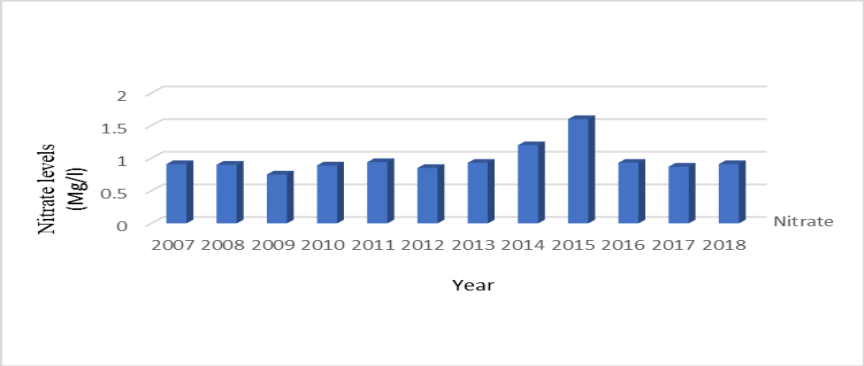
1. Below 1 mg/L- Pristine water quality.
2. 2-8 mg/L- Moderately polluted water.
3. Above 8mg/L- Severely polluted water.

The given indication graphs show the serious problem of Biochemical Oxygen Demand. Increasing BOD has effects of dissolved depleting oxygen. The aquatic ecosystem of the River is adversely affected. Fish

and aquatic plants die as a result, and the aquatic environment is completely disrupted.As a result of urbanization, substantially higher amounts of sewage are produced. The number of sewage treatment plants available was insufficient to handle the massive amounts of sewage. Untreated sewage was frequently released straight into bodies of water, resulting in significant contamination and an increase in the BOD of the bodies of water. This resulted in an upsurge in water-borne illnesses such as cholera, dysentery, and jaundice, among others.To safeguard these country's important rivers, the Ministry of Environment and Forests launched the Yamuna Action Plan in 1993. These plans prompted the construction of a huge number of sewage treatment plants to allow only treated sewage to be discharged into water ways.

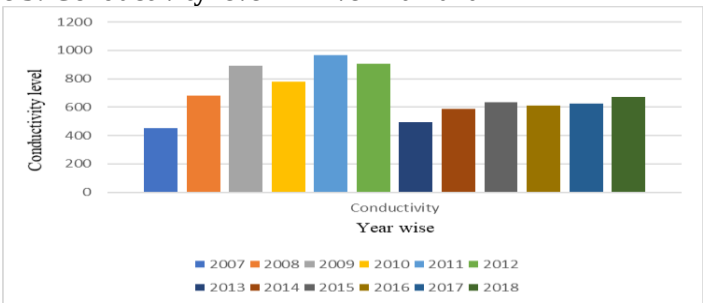
Nitrate level has been shown in table from 2007 to 2018. in 2007, nitrate level 0.91 mg/l. But in 2015 record highest level was 1.6 mg/l. also 2018 has record 0.91 mg/l. Nitrates have a wide range of detrimental effects on the environment, and they continue to cause problems today. When excessive concentrations of nitrate are found in water, it harms the quality of the water. When agricultural soil containing animal manures and nitrogen-rich fertilizer is exposed to heavy rainfall, it is susceptible to irrigation and leaching, causing the nitrate compounds to infiltrate through the soil and then be transferred into the groundwater (Power & Schepers, 1989). Because fertilizers from neighboring agricultural lands and industrial factories are washed away and brought into these bodies by rain, nitrates are frequently found in bigger water bodies, such as aquifers (Egboka, 1984).

Figure 3: Nitrate Level (Mg/L) in River Yamuna



Water conductivity in Yamuna River analyzed from 2007 to 2018. In 2007 conductivity level recorded 453. and in 2012 highest level recorded 969. and in 2018 recorded 670 conductivities in Yamuna River.

Figure 3: Conductivity level in River Yamuna



Conclusion

The analysis found that the river is highly polluted, have a high concentration of Biochemical Oxygen Demand, water conductivity, and have general water quality issue. This implies that water from the Yamuna River can also be used for water supply, after treatment. The extract and identify the factors/sources responsible for variations in river water quality of four different indicators. Temperature (naturally), Organic pollution (industrial and domestic wastewater), and Nutrients (agriculture and plantations) are the key factors influencing water quality in the Yamuna river. In agriculture, there should be minimum usage of fertilizers and pesticides, and drinking water should be well filtered. Future work, however, should include more monitoring and assessment of other water quality standards.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Monsoon Rainfall Instability And Drought Prone Zones In Nashik District (1980-2021)

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Abstract:
Indian climate primarily Monsoon Rainfall and temperature is speculate for the Indian cultivators and the strategy makers in terms of variability. Temperature and Rainfall is a key responsibility performer in the Indian financial system & agricultural output. Irregular unpredictability of rainfall and temperature is the major reason behind the deficient economical situation of Indian cultivators moreover that it is also the challenge prior to the leading power to plan for the provincial imbalance. In the present section the Temperature and Rainfall Trend of the Nashik District from 1980 to 2021 is identified from this research by examining the trend over district. The district controlled by the SW Monsoon Season meanwhile followed by post monsoon season rainfall circulation is generally from western regions had surplus rainfall while centre region of the district having modest rainfall and eastern and south eastern region having shortage of rainfall. Nashik District is having vibrant geographical characteristics. Famine is the occurrence which affects the cropping pattern and agricultural development in study region.Climate is a main role player in economic development of the country especially rainfall matters must in the Agricultural development and the rural and Urban areas basic water needs .Now a day's Earth is facing unevenness of the overall rainfall pattern due to some physical and human made interruptions and wrong agricultural and industrial practices. In Maharashtra most of the area having rainfall scarcity, most of the Tahsils are affecting badly in the vicious circle of the drought and its dangerously connected with the Crime,Enemployment,Low living of Standard ,Slums ,Migration, unhealthy environment etc.We are trying to identify the problem and try to give some suggestion for betterment of Societies Well Being.
Key Words: Drought, Susceptible, Rainfall Fluctuation, Well-Being, Monsoon, Variability.

Introduction:

Drought Susceptible areas in Nashik District are identified from this research paper by examining the rainfall trend over district about 37 years; we have got maximum temporal data to analyze the character of the rainfall. The district influenced by the South-West Monsoon Season meanwhile followed by post monsoon season rainfall distribution is mainly from western parts having excess rainfall while middle part of the district having moderate rainfall and eastern and south eastern part having scarcity of rainfall. Nashik District is not regular, consistent, or equal natural relief and other geographical features. As well as District is located on the Deccan trap of the Maharashtra, Godavari, Tapi, and Girna River Basins are part of the district. Having all the natural wealth over here but due to some manmade calamities District faced some Environmental Challenges like increasing drought Prone Areas.The indecisive climate low rainfall and the poor sources of the irrigation in those region farmers are grown more than a few crops. In the conventional hurdle of farming system farmers grown more crops for gathering their family need in such areas elevated scale of crop diversification was seen. Environmental loss of land, soil is also one of the causes of the high crop diversification.

Study Region: Nasik district lying between 19°35'18" North latitude to 20°53'07" North latitude and 73°16'07" East longitude to 74°56'27" East longitude, with an area 15530 sq.km. and population of 6,109,052, as per the 2011 census. There are 15 Tahasil and 66 revenue circles are in the Nashik district. Nashik district is situated in the Deccan trap of Maharashtra which is partly in the Tapi Basin and partly in the upper Godavari Basin. The main stream of hills in the Sahyadri which is runs North-South in the western proportion of the district. Ajanta range which runs right across the district. It acts as a watershed between the Girna and its tributaries which drain towards the Tapi to the north and the Godavari and its tributaries to the south. More area of this region is in the rain shadow zone which is called as rain fed area. Drought is the phenomenon which affects the cropping pattern and agricultural development. So we are interested to find out some concrete solution for the agricultural development of this region.

Objectives:

1) To find out South-West Monsoon Trend of the Nashik District from 1980 to 2021
2) To evaluate spatial and temporal change in Rainfall

3) To Identify Drought susceptible Tahsils in Nashik District

Methodology: This study is depending upon last 37 years data of rainfall which is obtained from 'India Meteorological Department, Pune and Hydrological Department, Nashik. We are using following Statistical methods for analysis of Drought prone areas of the District.

1. Mean is calculated by using the following formula.

$$\bar{x} = \frac{\sum x}{n}$$

Where, $\bar{x}$ = mean Σx = is the sum of the rainfall value
n = total number of values.

2. Trend Analysis by Statistical Technique
3. Geoinformatics (Arc-GIS) for Mapping Drought Susceptible Areas

Connotation: Drought is the result of Variability of Climate. Climatology is the scientific study of Spatio-temporal characteristics and variation of climatic elements like rainfall, temperature, evapotranspiration, humidity, pressure, winds and air masses. The climate is the average study of weather. The standard average periods for climatic analysis are 30 years defined by the World Meteorological organization (WMO). Here we are Concern with the Rainfall as a one major component of the Climate and directly connected with the droughts.

A.South-West Monsoon Rainfall Characteristics

Here we are discussing the South-West Rainfall Characteristics of Study Area Mainly for Monthly and seasonally for better understanding of Rainfall fluctuations during the 37 Years.

Sr. No.	Tahsil	Months											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	**Surgana**	5.14	3.14	15.34	35.68	57.36	678.14	800.74	832.14	512.36	166.32	89.12	6.32
2	**Peth**	4.25	3.25	20.14	41.23	62.35	704.15	936.14	879.41	402.36	145.32	78.1	7.14
3	**Trimbak**	6.32	4.25	29.36	52.31	57.64	806.25	1100.14	976.14	415.37	198.65	73.56	5.69
4	**Igatpuri**	9.32	5.69	21.03	78.36	64.25	945.17	1324.56	1000.23	391.25	276.35	92.36	12.36
5	**Nashik**	3.56	3.14	14.68	41.23	40.12	547.36	700.14	568.94	287.36	198.32	66.32	7.31
6	**Dindori**	3.01	2.14	15.36	34.12	41.25	541.02	600.25	501.23	275.63	178.24	54.36	6.32
7	**Satana**	3.14	2.36	17.36	24.31	32.14	438.12	546.23	500.69	300.1	145.36	56.17	2.36
8	**Kalvan**	2.14	2.47	17.69	20.14	25.1	406.58	547.90	481.23	278.36	166.33	42.37	3.01
9	**Niphad**	2.69	2.14	14.2	21.03	28.34	400.12	412.35	469.36	398.65	145.26	47.65	2.13
10	**Sinner**	2.00	1.56	9.36	15.36	25.36	356.12	314.17	457.16	298.21	110.02	43.27	3.01
11	**Yeola**	1.12	1.02	10.24	18.36	21.03	304.25	356.21	354.12	201.54	98.36	28.64	2
12	**Chandvad**	0.46	0.7	10.23	16.35	21.48	289.36	300.14	289.65	233.66	87.32	30.14	2.14
13	**Nandagaon**	0.78	0.8	11.25	17.25	18.23	450.17	278.65	247.36	146.35	84.21	28.36	1.24
14	**Malegaon**	0.49	0.45	6.35	17.36	17.12	301.47	307.69	268.14	200.01	79.36	22	0.98
15	**Deola**	0.14	0.36	7.32	12.14	14.23	248.32	294.15	276.35	188.66	66.32	17.24	0.76
Nashik District		**2.97**	**2.24**	**14.67**	**29.69**	**35.08**	**494.4**	**588**	**540.1**	**288.7**	**143.1**	**51.32**	**4.189**

Table: 1 Monthly Average Rainfall (in mm) Nashik District Year: 1980-2021

Above table (**Table: 1)** shows the monthly rainfall characteristics of the rainfall for the period from 1980 to 2021 .Mainly the distribution of rainfall is uneven in all the Tahsils in the month of December, January and February rainfall is very less for all the Tahsils During March, April and May having Moderate and During October and November it was normal. During June, July, August and September that is South West Monsoon Period Rainfall is Excess to Normal in The District.If we are considering rainfall During June, July, August and September that is South West Monsoon Period Surgana, Peth, Trimbak and Igatpuri Tahsils having more than average rainfall among them Igatpuri Tahsil having excess rainfall .While Nashik, Dindori, Satana, Kalvan and Niphad having normal rainfall but Sinner, Yeola, Chandwad, Nandgaon, Malegaon and Deola Tahsils are having Scarcity of Rainfall compare to others .That's why they are more susceptible for Drought in the Study region.

Sr.No.	Tahsil	South -West Monsoon Season Average Rainfall in MM (June-Sept.)
1	Surgana	705.849
2	Peth	640.8895
3	Trimbak	824.48025
4	Igatpuri	915.30925
5	Nashik	525.9555
6	Dindori	479.535
7	Satana	446.2935
8	Kalvan	428.52325
9	Niphad	420.12475
10	Sinner	356.4215
11	Yeola	304.0355
12	Chandvad	278.20775
13	Nandagaon	280.6395
14	Malegaon	269.330475
15	Deola	251.87325
Total Average		471.8311983

Table: 2 South -West Monsoon Season Average Rainfall Nashik District Years: 1980-2021

Above table(**Table: 2)** shows the South-West Monsoon rainfall characteristics for the period from 1980 to 2021 rainfall During June, July, August and September Surgana (705.849mm), Peth (640.8895mm), Trimbak (824.48025mm) and Igatpuri (915.30925mm)Tahsils having more than average rainfall among them Igatpuri Tahsil having excess rainfall .While Nashik, Dindori, Satana, Kalvan and Niphad having normal rainfall but Sinner (356.4215mm), Yeola (304.0355mm), Chandwad (278.20775mm), Nandgaon (280.6395mm), Malegaon (269.330475mm) and Deola (251.87325mm) Tahsils are having Scarcity of Rainfall compare to others .That's why they are more susceptible for Drought in the Study region.The trend of temperature and rainfall will be trending unfavorable direction in the future also; it portrayed the decreasing trend line. The fall in average rainfall and fall in the area under different crops and rise in the temperature and fall in the area under different crops is difficult for the forth coming years; it would be reflected in the agricultural outcomes and in the well beings of the farmers as well as it would be reflected in the scarcity of the water.Trend Graph **(Fig.: 1)** also shows the clear picture of the uneven distribution of the rainfall over the study region during whole period average. Igatpuri Tahsil SW region of Study area having high Rainfall while Deola Tahsil having low Rainfall which is situating North Eastern of study region. Following Malegaon NE region, while Nandgaon, Yeola and Sinner SE region of study region having low trend of rainfall.Remaing Tahsils namely Nashik, Dindori, Satana, Kalvan and Niphad having Moderate Trend of rainfall distribution over the study region during the Year 1980 to Year 2021.

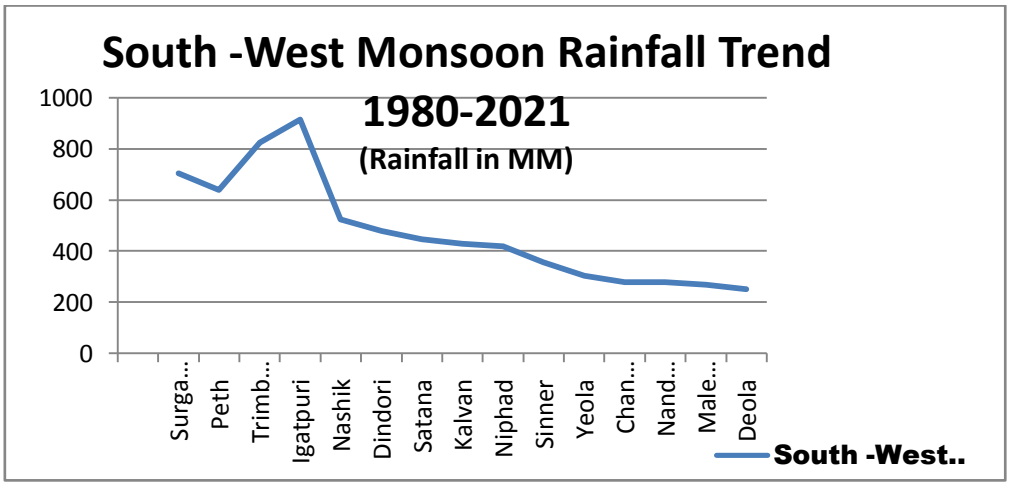

Fig.: 1 South -West Monsoon Season Rainfall Trend

Climate is constantly altering, and dynamic in temperament it is altering because of lot of factors included Physical, Chemical, Human made & Socio-Economic .Climate is a set of all weather elements and

represents the summation or performance of these element for long period of time that is more than three decades. Climate transformation is alteration in middling condition of the Weather essentials over a long period of time particularly the change in arithmetical allocation of the weather conditions. Climate alteration substantiations are seen in the study area in the form of change and deviation in the rainfall, intensifying temperature level, repeatedly incidence of famines, dryness or low down intensities of moisture had observed in the region.Trend of average mean temperature demonstrates the increasing trend for the district for computed period. The trend of the temperature shows the ever-increasing still from the beginning, the low average mean temperature was recorded in the year 1980 it was 23.64^0_C and the high average mean temperature was seen in the year 2013 it was 25.01^0_C and from the year 1980 to the year 1992 the temperature trend was had around the 23^0_C and change around the 0.64^0_C to the 0.99^0_C .the constant average temperature The trend of the average rainfall shows the decreasing still from the beginning, the low average rainfall was recorded in the year 1996 it was 245.79mm and the high average rainfall was seen in the year 1980 it was 941.22 mm and from the year 1980 to the year 2016 the rainfall trend was had the uneven trend. Sometimes it shows the drastic rise or some years it shows the drastic fall in the levels of average rainfall.

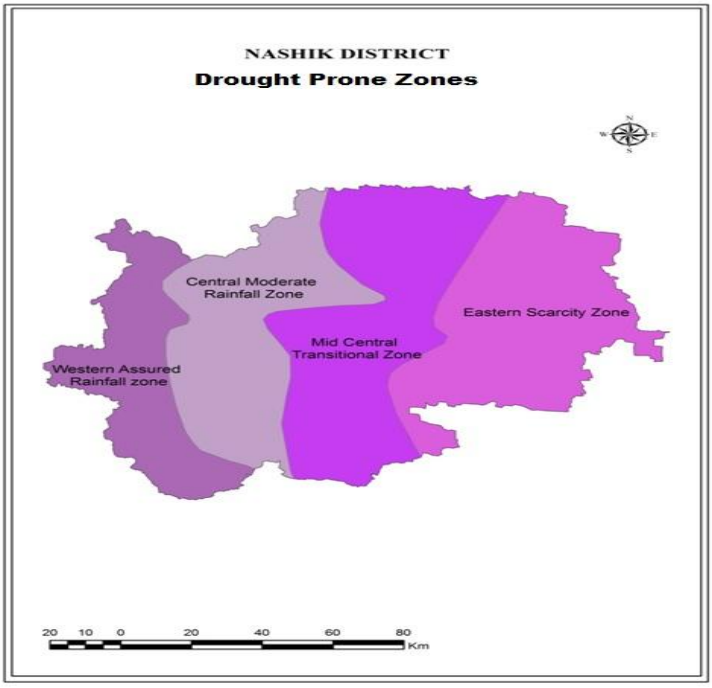

Fig-2 Drought Susceptible Tahsils in Nashik District

B. Drought Susceptible Tahsils in Nashik District

Map (**Fig.:2)** showes the drought prone/Susceptible Tahsils in Nashik District Mainly North East,South West and Eastern Part of the District having more valnurable to the drought because of unfavarable physical setting of the area and wrong industrial and agricultural practices .Also this part belongs to the Rainfed area .The main stream of hills in the Sahyadri which is runs North-South in the western proportion of the district. Ajanta range which runs right across the district. It acts as a watershed between the Girna and its tributaries which drain towards the Tapi to the north and the Godavari and its tributaries to the south.Mainly because of Ajanta and Sahyadri ranges Western part of district have more than avearage rainfall but apposit of the Sahyadri ranges and Monsoon wind the area not get proper condensed clouds that's why this area belongs to drought prone area.

Conclusion:

More area of this region is in the rain shadow zone which is called as rain fed area. Drought is the phenomenon which affects the cropping pattern and agricultural development. The present study will help to understand the relationship between Droughts and Rainfall Pattern, the influences of other factors, like Soil, water supply and technology, represented by mechanization, pest and disease control, and the other agricultural management aspects. Although these factors are crucial in agriculture and crop yield. Scientific crop planning is possible through an understanding of Agroclimatic potential of the Study Region. The region is facing problems of the Deforestation, wild life is becoming rare, soil erosion is common, water level is very deep, and soil fertility has been reduced in some of the Drought Prone Tahsils

in Nashik. Most of the region having uneven Climatic and Physiographic Condition. There is regional imbalance in water resource and management. Some parts of Region having wrong Agricultural Practices. Lack of Awareness within the farmers and civilians is on climate change issues for further adaptation and mitigation. There is a Scope for Sustainable Development of the Region.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Levels Of Regional Development Of Kolhapur District (2011)

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Abstract

Regional development is the result of interaction between various economic and social institutional factors. The task of regional planning is to prepare a comprehensive regional development plan, an integrated and coordinated plan between the physical and economic and social components, that is bet ween different levels of development in the region. The research paper deals with the measurement and analysis of levels of development on tehsil level, with a view to work out imbalances in the spatial distribution of social amenities in the region. For the purpose of inter-tehsil comparison, it would be desirable may absolutely essential to combine various individual indices into an overall measure to operationalize the concept of spatial distribution of social amenities. The composite index is obtained by aggregatory individual indicators of development. Following this approach, the indicators of social amenities are education facility, medical facility, drinking water facility, communication, road transportation, electricity facility, bank facility, mandis/regular market, sanitation facility, public library. Two indicators are calculated for each amenity, one relates to percentage of the population covered and other relates to percentages of the settlements covered.

Introduction

Regional development is the result of interaction between various economic and social institutional factors. The task of regional planning is to prepare a comprehensive regional development plan, an integrated and coordinated plan between the physical and economic and social components, that is bet ween different levels of development in the region. The existence of infrastructural facilities is primarily a function of interaction between men and men. It is frame of society which constrains the proper rate of development based on technology and consequently, the development of infrastructural facilities is also affected by it. Thus, the regional variation in the spatial distribution of development indicators mirrors the magnitude and the nature of interplay among these sets of indicators. The following seventeen indicators have been chosen to examine their relationship with the spatial distribution of development indicator. The development indicator has been categorized in to three categories viz. High (Above 20.01), Moderate (15.01-20.00) and Low (Below 15.00).

Study Area

Kolhapur district is situated in the extreme southern part of Maharashtra State. It lies between 15o 43' and 17o 17' north latitudes and 73o 40' and 74o 42' east longitudes. It is surrounded by Sangli district to the north, Karnataka State to the east and south and Ratnagiri and Sindhudurg districts to the west. The Sahyadri ranges to the west and Varna River to the north form the natural boundaries. The shape of district is triangular; base of triangular is west side and two edges from north-east and south-east direction. District north and south side are narrow but western side is so wide. The district has an area of 7,685.00 sq km and a population of 3876001 populations as per census 2011. While the geographical area of the district accounts for 2.5 percent of the total area out of the Maharashtra State. The density of population is 504 persons per sq km Among the 35 districts of the State, the district ranks 20th in terms of area as per 2011 census. The headquarters of the district is at Kolhapur, a city with a population of 549236 (2011) Census. Kolhapur was the capital of the former Kolhapur State, a premier State of the Deccan and was also the seat of the Residency for Deccan States. It derives its importance from its past political connections and its present position as a great commercial, religious, cultural and educational center. It is well linked both by road as well as by rail. The district has an area of 7,685.00 sq km and a population of 2989507 (1991), 3523162 (2001) and 3876001 population as per census 1991, 2001 and 2011. While the geographical area of the district accounts for 2.5 percent of the total area out of the Maharashtra State.

Objective

1. To examine levels of development at tehsil levels on the basis of the distribution of social amenities in rural settlements of the region.
2. To propose the priority order of tehsils to plan for locating social amenities in the rural settlements of the region.

Database And Methodology

In present research paper is based on secondary data which is collected from Socio Economic Abstract of Kolhapur District, Gazetteer of Kolhapur District and District census handbook 1991, 2001 and 2011. GIS mapping techniques is used for distribution of composite score of development.Following this approach, the indicators of social amenities are (1) educational (ii) medical (iii) drinking water (iv) communicational (a) postal and telegraphic (b) transport (v) power supply. Two indicators are calculated for each amenity, one relates to percentage of the population covered and other relates to percentages of the settlements covered.

Statistical methods have been used in working out a system of weightage, derived from the observed data matrix. Principal component analysis an objective method for summarizing the information of a large number of indicators in a fewer number of components, has been used for this purpose. The data matrix in the deviation form is obtained by subtracting column Mean (X) from observations in their corresponding columns. This method obviously, has a serious limitation as it begins by equalizing the variances, it seeks to explain. It has been observed that important developmental indicators tend to be mutually correlated and exhibit high degree of dispersion in their distribution.[1]The tehsil-wise spatial distribution of social amenities has been categorized at three levels viz., high, medium and low on the basis of availability of social amenities in the rural settlements.

Formula,

Composite Index of Development

$$CID = \frac{CDI_1 + CDI_2 + CDI_3 \ldots\ldots\ldots\ldots CDI_n}{N}$$

Were,

CID = Composite index of development

CDI1 = the Coefficient of development for variable 1

N = Number of variables

Result And Discussion

Levels of Regional Development

The regional developments have been determined on the basis of composite scores and the same have been depicted in map no. 1 and Table no. 1. In district to find that four out of the twelve tehsil of Kolhapur recorded high development. In the district average composite index of development is 20.01. The highest 25.44 composite index of development found in Shirol tehsil and lowest 13.83 found in Gaganbavda tehsil. It means that Kolhapur district except eastern region other tehsil is well developed in composite indexes of development because out of 12 tehsil 4 are high developed. The high composite indexes of development are recorded in eastern part of tehsil and low levels are recorded in western and south part of tehsil. It is clearly demarcated that physiographic played dominant role in transportation development.

Composite Index

As mentioned earlier, the composite index for all the amenities combined is obtained by aggregating (simple summation) the component indicators. These indicators of social amenities are Education Facility, Medical Facility,Drinking Water Facility, Communication,RoadTransportation, Electricity Facility, Bank Facility,Mandis/Regular Market, Sanitation Facility, Public Library.The levels of development have been calculated on the basis of composite score of social amenities of each tehsil. The levels of development have been categorized in tencategories viz.high, moderate, and low.

High Regional Development (Above 20.01)

In this category there are 4 tehsils viz. Shirol (25.44), Hatkanangale (25.12), Karvir (2.07) and Kagal (21.57). Karvir is well developed and it is district headquarters and other tehsil are located to near Karvir tehsil. Eastern tehsils are developed because Kolhapur is ‘Dakshin Kashi’ of India and Ichalkaranji is Manchester of Maharashtra. Kolhapur, Ichalkaranji class one and Kagal, Jayshingpur are class II urban center due to high rate of Urbanization and Industrialization Karvir, Hatkanangale, Kagal and Shirol tehsil are well developed in commercial sector. In Maharashtra, Kolhapur is famous for agricultural activity and it is rank first in agricultural development also physiographical eastern area is low land area. Karvir, Hatkanangale and Shirol tehsil are located in Bank of Panchaganga, Krishna River and Kagal tehsil is

Bank of Dudhaganga River; due to Irrigation facility these four tehsils are well developed in agricultural sector. These four tehsils are also dominated in Educational, Medical and other amenities.

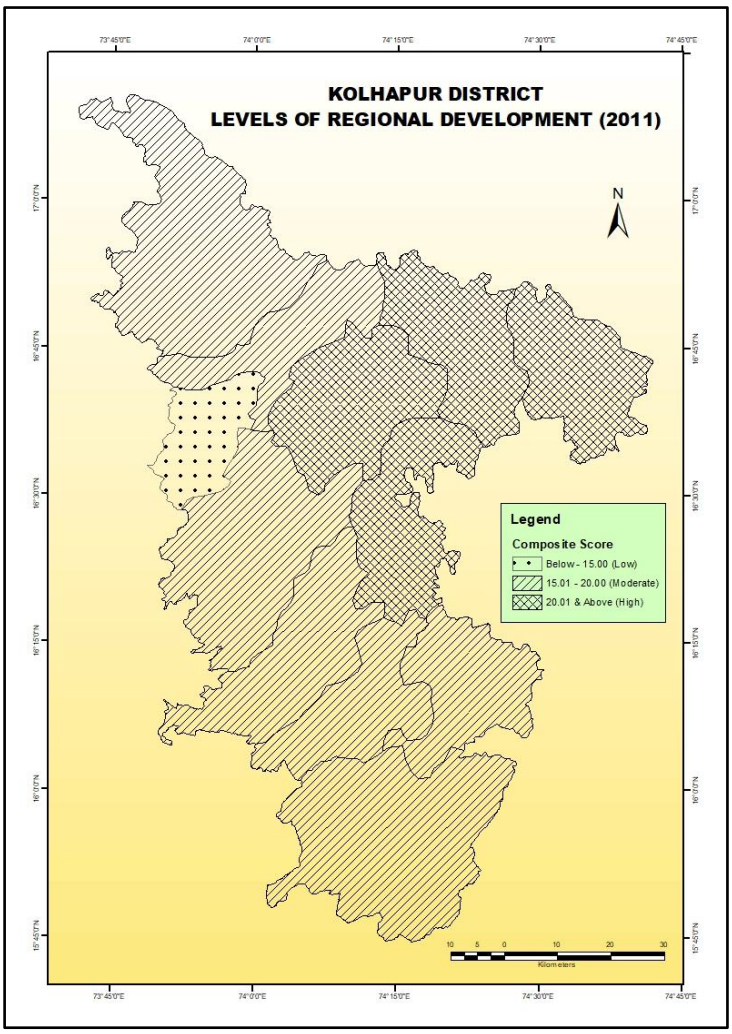
Moderate Regional Development (15.01- 20)

In the district there are seven tehsil recoded moderate level of regional development viz. Gadhinglaj (19.64), Panhala (19.06), Radhanagari (18.13), Bhudargad (16.50), Shahuwadi (16.25), Chandgad (15.91) and Ajra (15.48).Panhala is also one of tehsil is recorded in moderate level of regional development; the composite index of tehsil is 19.06. In Panhala tehsil is famous for historical place and hill station as well as Jotiba is famous for religious place. Warnanagar is famous for Milk industry and educational activity. Due to nearness of Kolhapur city as well as tourist attraction in Panhala, Jotiba and Warnangar this tehsil is recorded moderate level of regional development.

Table No: 1
Composite Score of Social Amenities of Kolhapur District: 2011

Tehsil	Education Facility	Medical Facility	Drinking Water Facility	Communication	Road Transportation	Electricity Facility	Bank Facility	Mandis/Regular Market	Sanitation Facility	Public Library	Composite Score
Ajra	1.92	1.52	1.94	1.94	1.96	1.97	1.72	0.45	1.72	0.33	15.48
Bavda	1.50	1.39	1.91	1.85	2.12	2.00	1.35	0.00	1.71	0.00	13.83
Bhudargad	1.81	1.60	2.02	1.96	1.98	1.99	1.65	0.90	1.97	0.63	16.50
Chandgad	1.86	1.49	1.96	2.02	1.90	2.00	1.73	0.73	1.72	0.51	15.91
Gadhinglaj	1.98	2.08	1.96	2.03	2.06	2.00	2.10	2.04	2.13	1.25	19.64
Hatkanangle	2.24	2.52	2.04	2.04	2.09	2.00	2.46	5.09	2.22	2.39	25.12
Kagal	2.18	2.48	2.02	2.04	1.97	2.00	2.41	2.79	2.21	1.46	21.57
Karvir	2.17	2.37	2.03	2.03	2.08	2.00	2.27	3.21	2.16	1.73	22.07
Panhala	2.11	2.04	2.03	1.99	1.94	2.00	2.13	1.69	2.02	1.11	19.06
Radhanagari	1.91	2.02	2.03	2.03	2.00	2.00	2.01	1.29	2.00	0.84	18.13
Shahuwadi	2.03	1.90	2.03	2.01	1.83	2.00	1.69	0.51	1.91	0.34	16.25
Shirol	2.29	2.58	2.04	2.04	2.09	2.00	2.46	5.30	2.22	2.40	25.44

Source: Source: Census of India, Maharashtra, Series-28, Part XII-A, District Census Handbook, Kolhapur, Village and Town Directory 2011



Map no. 1

The mountain ranges of Sahyadri spread west to east direction. The western part of Kolhapur district is covered by hilly area; at hence share of population, literacy rate, urban population, medical facility, net irrigated area and number of factories are recorded very less as compere to developed tehsils. If district is dived west and east part, we find out eastern part of district is well developed as compeer to west region. The physiographic is mostly determining factor on regional development.

Low level of Regional Development (Below 15.00)

The below 15.00 composite index of development recorded low level of regional development. Gaganbavda (13.83) tehsil is recorded lowest composite score; this tehsil is located in hilly region.The above analysis brings out the fact that those tehsils which are located very far from urban centers or are in remote areas of the region come under low levels category. The western part of the region, level of development in low level, where the hilly tracts effect the development of amenities.

Conclusion

Regional development is the result of interaction between various economic and social institutional factors. The task of regional planning is to prepare a comprehensive regional development plan, an integrated and coordinate plan between the physical, economic and social components that is between different levels of development in the region. The tehsil-wise spatial distribution of social amenities has been categorized at three level viz. High, Medium and low level on the basis of availability of social communities in the rural settlement.

1. High level (Above 20.01) of development is observed, in the eastern part of Kolhapur district viz. Shirol 25.44, Hatkanangale 25.12, Karvir 22.07 and Kagal 21.57 tehsil. These four tehsils are fall under plain of Panchaganga, Krushna and Vedganga River. The plain of the Panchaganga, Krushna and Vedganga River are more developed than the Western and the southern part of the region. These plains provide fertile land to grow food facility, providing drinking water and the wide space needed for large settlement. Topography facilitates development of transport network.

2. According to composite score of rural settlement those tehsils which are located very far from urban centers or are in remote areas of the region comes under low level category. Gaganbavda (13.83) tehsil is falls under low level categories. The western part of the region levels of development in very low level where the hilly tracks affect the development of amenities.
3. The most of tehsil comes under medium (15.01 – 20.00) level of development these are Gadhinglaj 19.64, Panhala 19.06, Radhanagari 18.13, Bhudargad 16.50, Shahuwadi 16.25, Chandgad 15.91 and Ajra 15.48. These seven tehsils are located in hilly and plateau region. Medium sizes of settlement are found in these tehsils seven tehsil.

Suggestion

1. The priority list is prepared tehsil wise. table 8.4 shows that in case of establishment of educational amenities. Shirol, Hatkanangale and Karvir tehsil in Kolhapur district has maximum number of settlements having amenities while Bavda and Bhudargad tahsil is the lowest in order therefore Bavda and Bhudargad tahsil has to be given the first priority in establishing more educational amenities in study area.
2. In Kolhapur district respectively Bavda, Chandgad, Ajra, Bhudargad and Shahuwadi tehsil have been observed in the lowest level of development particular in respect of medical facility at hence this tehsil has to be given the first priority in establishing more medical facility in study area.
3. AjraBavda, Bhudargad and Chandgad tehsil resaving more than 3000 mm rainfall but in these tehsils some villages are facing water scarcity problem. Dirking water is a need of human life, in **Ajra tehsil 6** settlement viz. Shringarwadi, Sule, Mumewadi, Kerakbol, Sawarwadi, Karpewadi Khalsa; in **Bavda tehsil 4** settlement viz. Narveli, Jambhulnewadi, TaliyeKh, Padawalwadi; in **Bhudargad tehsil 2** settlement viz. Manope, Chivale; in **Chandgad tehsil 8** settlement viz. Walkoli, Channehatti, Dhamapur, Amroli, Waghotre, Sulaye, Yaratanhatti, Savarde Khalsa; in **Gadhinglaj tehsil 5 settlement** viz. Chandankud, Yamehatti, Chinchewadi, Channekuppi, BasargeKh. These villages to be given the first priority in establishing drinking water amenities in study area.
4. In the case of establishment of electricity facility has to be given the first priority of Kerakbo, Sawarwadi, Karpewadi in Ajra tehsil and Manope, Chikkewadi in Bhudargad tehsil.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Application of Geo-Informatics Techniques In Urban Growth: A Case Study of Latur City

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Abstract:

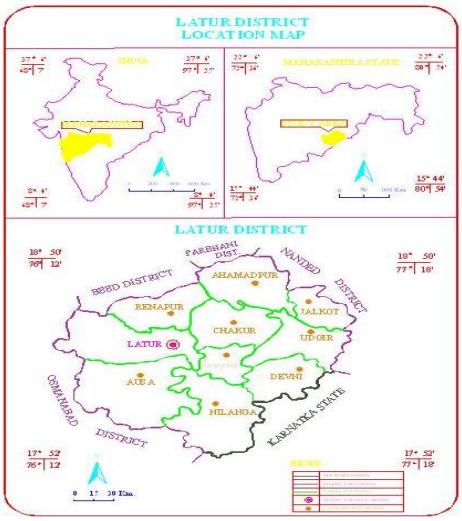
The peculiar province of the geographer is to interpret the relation between man and his environment. For a generation there has been debate as to the closeness of this relationship, geographers being divided into two schools on the question. The Possibilist stresses the human aspect of the relation, the Determinist the environmental factor. The present writer belongs to the latter school, and has devoted much research to an evaluation of the relation in regard to the three main types of human agglomeration. These essential types are Race, Nation and City. An urban area is characterized by higher population density and vast human activities in comparison to areas surrounding it. Urban areas may be cities, towns or conurbations. Urban areas are created and further developed by the process of urbanization. Cities are the engines of growth at both regional and national level. To facilitate and sustain this growth, cities have to provide both high quality of life and an efficient infrastructure for economic activities. Cities and towns are emerging as centers of domestic and international investments where most of the commercial activities take place. The present contribution of cities and towns in country's Gross Domestic Product (GDP) is 63% and it is estimated that cities and towns / urban areas will contribute to about 70% of GDP by 2031 (HPEC report, 2011). Study regarding the urban development of any region provides the information about the imbalances in the urban issues with their causes. Hence such type of study is helpful in the development planning process of the region.

Key Word: Geo-Informatics Techniques, Urban Growth.

Introduction:

The aim of this paper to analyse spatial, environmental and socio-economic consequences of the rapid expansion of Latur city into the surrounding rural areas primarily within the last few decades. Geo-informatics techniques like satellite remote sensing and GIS has been used to assess the rate of the spatial expansion, seen in the perspective of last four decades. The prime focuses are the following:The extension of new built up area is mapped from recent medium-scale satellite imagery using a classification algorithm based on visual and digital method. These areas constitute the rapidly expanding frontier of urban Latur into its rural surroundings. The updated land use map is compared with satellite-based maps to check their suitability for urban settlement analysis.The recent trends in urban spatial development are analysed with focus on the haphazard nature of the spatial development, e.g. road network and built up land (1982-2005) due to lack of planning and poor land management.

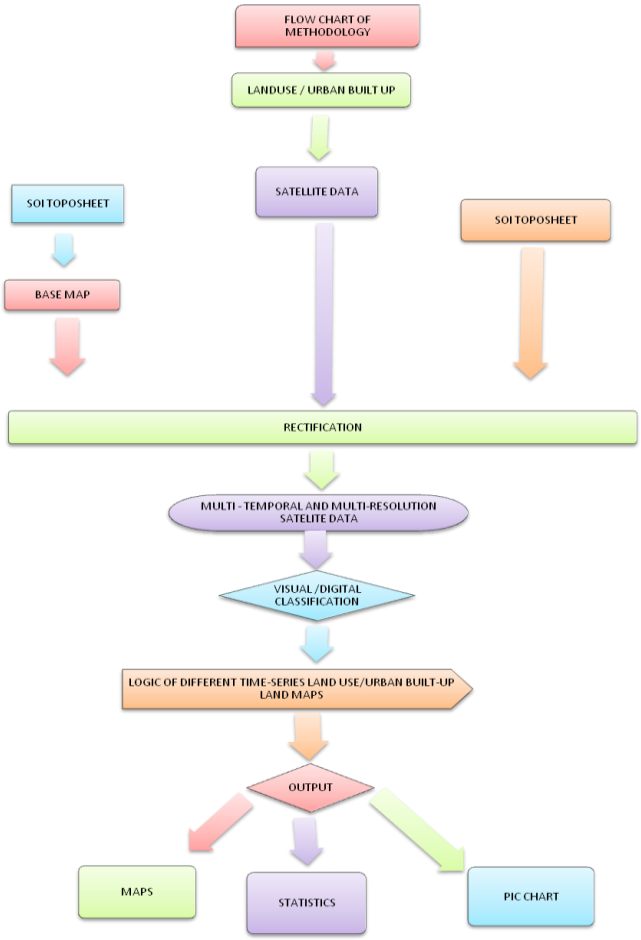
Study Area: This study was carried out in Latur city located within co-ordinates of latitudes $19^0 27'$ N to $18^0 27'$ N and Longitudes $74^0 44'$ E, to $76^0 57'$ E, Latur Comprises 62 wards and is connected by air, rail and road. The areal extent of the study area is 1443.59 Sq. km.



Objectives: To study the urban growth rate by Geo-informatics techniques.

Growth of Latur City:

The process of urbanization in India is not different form that of other countries in Asia and Africa. The proportion of the country's population living in towns has increased over the years – from 15.85% in 1901 to 20.30% in 1951, 33.80% in 2011. Latur is not only the district headquarters, but also the leading city in terms of population size and being the political, economic and cultural nerve centre in Marathwada region.



Rapid urbanization has resulted from several factors. Since the 1980s, however, the major factor has been the natural population growth. Latur is experiencing a high rate of growth and it is one of the fastest growing cities in Maharashtra. As per census from 1901 to 1941 the rate of growth was 3.46% per annum, whereas in 1951 to 2001 it was 14.96. After independence in 1951, the population of Latur was only about 35,374. It increased quite appreciably to 3,82,940 in 2011.

Satellite-Based Methods:

To find out the growth of city and its built up area, data were obtained from following source: IRS-1D (LISS-III) and IRS PAN sharpened LISS-III merged data with grown truth verification; Survey of India topographical sheets of 1928 (1:25000), 1980 (1:50000), 1982 (1:1000000), Census of India 1991, 2001 to 2011.

Thematic Layers:

The following thematic layers were created in the database for analysis. Administrative: it contains administrative boundary of Latur Municipal Corporation; Urban built-up boundary: it shows Latur Municipal Settlement area; Road Network: it contains state highways, other roads, rails and other layers. After digitization of the topographical sheets and imagery, the area under built-up land and road network of different years was added to the attribute database. It was also compared with master plan of road network. The road network map has been generated on 1:25000 scales as prepared by the municipality. This gives detailed information regarding the network of metalled, unmetalled and other roads. These roads are connected to every lane and major roads in city centre like Ganjgolai and other points. Planners call such type of maps as base map. The base map is a major asset for executing a plan. The present study is limited to preparation of urban land use, urban sprawl and road expansion maps for different time periods.

Results and Discussions:

There has been rapid growth of urban population in India over the last four decades. Over 27.78 percent of India's population lives in about 35,000 urban centers of varying sizes. Latur has been a small but important urban centre in the state of Maharashtra. Its importance lies in providing space for the political and commercial center during the Nizam Raj. Hence, different population communities played a vital role in its social and economic development. The past history of Latur shows that the city has a small population of 10,479 in 1901. The population grew slightly during 1901-1991. It faced a decline during 1911-1921 (-2905) along with the rest of India, a period when epidemics, took a heavy toll of India's population. In the subsequent decades of 1941 and 1951, its rate of growth had been higher that national average. In 2011 base year examine and another years from 2021 to 2051 has create a projected population

due some changes are possible for best of my knowledge (Table 01). Due to importance of the city and its environment, people are attracted towards the city and occupy the land for business and residential purpose.

Table 01 : Urbanization in Latur City 1901-2051

Census	Total Population	Increase in Population	Decadal Growth (Rate %)
1901	10479	0	0
1911	7574	-2905	-27.72
1921	16233	8659	-53.74
1931	30760	14527	-47.22
1941	24985	-5775	23.11
1951	35374	10389	-29.36
1961	43218	7844	-18.14
1971	73545	30327	-41.23
1981	111986	38441	-34.32
1991	197408	85422	-43.27
2001	299985	102577	-34.19
2011	349451	49466	-14.15
2021*	398917	49466	-12.4
2031*	448383	49466	-11.03
2041*	497849	49466	-9.93
2051*	547315	49466	-9.03

Sources: *District Census Handbook Abstract, 2011. * Projected Population.*

Levels of Development:

Analysis reveals that 53% of the total 35 wards in LMC are undeveloped and less developed, while 40 percent or 10 wards are developed and highly developed (Table 02). On the basis of secondary and primary data analysis, it is observed that only 5 wards are truly developed in terms of infrastructure, whereas rest of wards lack basic infrastructure and amenities.

Table 02 : Ward wise Levels of Development

Sr. No.	Levels of Development	No. of Wards	Percent
1	Highly Developed	10	40
2	Developed	05	10
3	Less Developed	05	10
4	Undeveloped	15	40

Source: *Primary Survey and Secondary Municipal Data.*

Table 02 is based on the primary and municipal level secondary data. Some wards are more developed and some are least. Around 40 percent wards are highly developed, 10 percent developed, 10 percent are less developed and 40 percent are undeveloped wards. Among the 35 wards comprising CBD part of LMC, i.e. The development has occurred in the areas with well-planned colonies, public facilities or educational institutes. The process of industrialization has put a significant footprint on the regional disparities within wards of Latur. The new industries set up like Harangul and Waswadi have added to the development of the wards. During survey it was noticed that the basic facilities are not available in many ghettos within Latur Municipal Corporation (LMC). Some of the pockets that are dominated by the people of Marata religion, have a higher level of development in terms of basic amenities like water and electricity in pockets in the peripheral areas reveal that about 60 percent of the respondents demand good street-lighting, drinking water and metalled roads. However, the public always demands the easier and safe mode of water supply.

Major Findings: The Geo-informatics techniques have proved its importance for urban landuse / urban sprawl and urban road network analysis. On the basis of survey and secondary data, the following observations are highlighted:

1. Latur city has expanded towards Northeast and Northwest directions. Comparatively SW & SE in uncontrolled manner, engulfing productive cropped areas.
2. Latur city is gradually encroaching into surrounding small villages.
3. Latur city is putting heavy pressure on the ecologically sensitive areas, due to deforestation and loss of agricultural area.

4. The agricultural land has been converted into commercial, residential and the other built-up land when compared in time perspective.
5. The increase in infrastructure (especially roads, water, electricity, etc.) has not kept pace with the growth of population. As a result, the city is experiencing disequilibrium in the level of development of different wards and is experiencing traffic chaos.

Conclusion:

The subject of this paper is the urban growth and its haphazard nature which is obvious to anybody travelling on the streets of Latur. Areas are being converted for urban use without any systematic development plan and without a corresponding investment in infrastructure. The results of poor land management are urban areas with inadequate service provision and infrastructure and with a corresponding lack of accessibility that may prove very costly to resolve. While it is not too difficult to pinpoint the magnitude of the problems and some of their causes, it is clearly more difficult to point out too fast the solutions that will create a more sustainable growth in the outskirts and fringe areas. Access to computers and e-based means of communication have increased significantly in India during the last few year. Also the tools for analyzing and handling digital spatial information have become potentially more accessible for people that are involved in the planning process. This increases the possibilities for assessing the magnitude of the problems in order to create public awareness as well as to handle issues related to land use pattern, infrastructure and environmental planning. This recent development will hopefully facilitate an effort to start addressing some of the problems in a serious manner.

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Spatio-Temporal Trend Analysis of Rainfall and Rainy Days in Marathwada

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Abstract:

The study of climatic parameters is the need of time, because it changing over a time and place. The climate is directly connected to primary activities and indirectly to secondary and other activities of society. The present research work focused on the rainfall trend over Marathwada region.The region has been located on the south eastern part of Maharashtra state. The rainfall data for 37 years have been grabbed from Indian Meterological Department, Pune and Hydrological Project Department, Nashik.Trend is one of the method to understand the changing nature of entity over the time. As concern to rainfall trend, there are 72 stations are recorded negative trend of average annual rainfall during 1980 to 2016. It means the average annual rainfall decreases and it ranges from 0.59 to 20.11mm. Whereas 24 stations recorded positive/ increasing trend, and ranges from 0.01 to 6.43mm.

Key Words: Climate, Rainfall, Seasonal, Trend.

Introduction:

Trend is one of the method to understand the changing nature of entity over the time. In the present study, while the studying the scenario of rainfall and temperature over Marathwada, trend analysis is carried out for the period of 37 years (1680 to 2016). The linear regression method is used and the rate of change is computed through the slope of regression line. The trends are variable depending on seasonal and annual pattern and are greatly modified by altitude and location in relation to the sea coast and other geographical features (Pal and Al-Tabbaa 2010). In the present evaluation the position of β represents an increasing trend over a time where as the negative value of β represents decreasing trend with time constraint.

Study Area:

The study region of the present research work is Marathwada region in Maharashtra state in India. The study region lies in upper Godavari basin which extends from 17^0 35' north to $20^0$40' north latitude and $74^0$40' east to $78^0$19' east Longitude. The study region covers 64434 sq. km. which is 20.95% of states area. Population of the region is 1.87 cores (2011). The study region has been divided in eight districts for administrative purpose with 76 tahsils. The region characterized by Deccan trap mostly found basalt rock. Major part of region covered by deep black soil, it formed from basalt rock. The climate of study region is typical hot and dries with high temperature. It ranges from 20^0 C to 40^0 C some time it goes more than 40^0 C in summer and also it falls down below 20^0C in winter season.

The study region receives 771.80mm. average annual rainfall. It receives from south western monsoon winds. Near about 70% rainfall receives during June to September i.e. monsoon season.

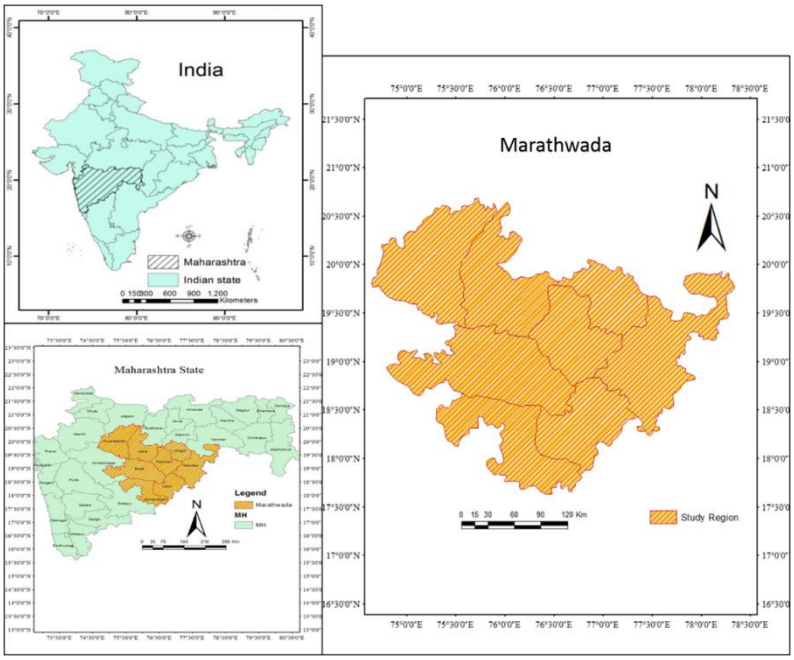


Fig. no. 01 Location of Study Region

Objectives: The main objective of the present study is to assess the Trend of Rainfall and Rainy days in Marathwada region.

Materials and Methods:

1. Trend Analysis Linear Regression

Correlation Regression line has an equation in the form

$$Y = a + bX,$$

Where, X = the explanatory variable and

Y = the dependent variable.

Result and Discussion

Annual trend of rainfall:

The below diagrams illustrates the trend of average annual rainfall of 96 stations in study region. There are 72 stations are recorded negative trend during 1680 to 2016. It means the average annual rainfall decreases and it ranges from 0.59 to 20.11mm/year. Whereas 24 stations recorded positive/ increasing trend, and ranges from 0.01 to 6.43mm/year. The increasing trend is much in less proportion in comparison to decreasing trend. The minimum decreases trend of rainfall is recorded at Majalgaon and maximum at Billoli of Beed and Nanded district accordingly. In concern to the increasing trend, the lowest at Alni and highest at Lohara stations of O'bad district. Overall the study region has found decreasing trend of rainfall by 3.32mm/year during study period.

Seasonal Trend of Rainfall:

The trend of mean seasonal rainfall is also evaluated and trend values are given in the below table During the winter season mean rainfall trend is observed as positive and negative. There are 91 stations are found as decreasing trend and it ranges from <0.001 to 0.82 mm/year. The lowest decreasing trend is observed at Khultabad and Ladsangvi and highest decreasing trend at Malegaon stations. The positive/ increasing trend observed over 5 stations namely Pishor (0.05), Beed (0.07), Ambad (0.07), Rohina (0.12) and Udgir (0.11). The lowest positive trend at Pishor and highest at Rohina stations of A'bad and Latur districts.The pre-monsoon season considered during March to May month. The average trend of pre-monsoon season also recorded positive and negative. During this season 84 stations are found with decreasing trend, ranges from 0.01mm/year to 1.87mm/year at Pishor and Aurad

Shahajani stations. During this season it is observed it decreases from northwest to southeast. The increasing trend is recorded at 12 stations, it varises from 0.02mm/year to 0.80mm/year at

Seasonal Trend of Rainfall 1980-2016

Stations	PM		M		PoSM		Wint		Stations	PM		M		PoSM		Wint	
	RF	RD	RF	RD	RF	RD	RF	RD		RF	RD	RF	RD	RF	RD	RF	RD
A'bad	-0.20	-0.04	6.50	0.20	0.94	0.01	-0.60	-0.08	Taka	-0.62	-0.10	0.50	0.06	0.04	0.01	0.33	0.01
Chikalthana	0.38	0.03	1.10	0.26	1.66	0.11	-0.14	-0.01	Takali	-1.41	-0.30	3.10	0.03	0.77	0.22	0.33	0.05
Dhorkin	-0.29	-0.02	8.60	0.83	2.20	0.28	-0.02	0.00	Udgir	-0.62	-0.10	1.10	0.14	1.11	0.09	0.11	0.01
Gangapur	0.34	0.03	3.19	0.18	1.26	0.00	-0.18	-0.02	Wadhona	-1.14	-0.10	1.84	0.20	0.73	0.01	0.03	0.00
Hiwarkheda	0.41	-0.04	1.07	0.25	0.82	0.07	-0.36	-0.02	Bhokar	-0.15	-0.01	8.43	0.07	1.35	0.06	0.25	0.00
Kannad	-0.20	-0.01	5.25	0.13	0.85	0.06	-0.19	-0.01	Billoli	-0.01	0.03	21.66	0.24	0.06	3.41	0.39	0.01
Khultabad	-0.07	-0.03	6.06	0.25	0.65	0.05	0.00	0.00	Degloor	0.15	-0.01	5.06	0.13	1.00	0.00	0.12	0.02
Ladsangvi	-0.10	-0.01	2.31	0.16	1.22	0.10	0.00	-0.01	Jamb bk	-1.23	-0.11	5.74	0.73	0.33	38.00	0.12	0.03
Loni kh	-0.21	-0.01	0.77	0.08	0.56	0.06	-0.12	-0.01	Kandhar	-0.05	0.01	4.94	0.05	1.34	0.02	0.20	0.01
Nagamthan	-0.92	-0.21	6.55	0.62	1.46	0.39	-0.68	-0.17	Kesrali	-0.67	-0.10	2.44	0.39	1.32	0.16	0.16	0.04
Palaswadi	-0.11	-0.02	3.38	0.30	0.43	0.01	-0.04	-0.01	Kinwat	0.71	0.10	3.03	0.11	0.37	0.00	0.32	0.03
Phulambri	-0.73	-0.04	0.11	0.22	2.53	0.08	-0.03	-0.21	Limboti	-1.10	-0.20	1.05	0.11	0.68	0.19	0.63	0.08
Pishor	-0.01	-0.01	1.06	0.18	1.89	0.07	0.05	0.00	Lohgaon	-0.52	-0.07	7.90	0.68	0.55	0.09	0.15	0.03
Shivna	-0.85	-0.05	8.64	0.19	2.09	0.10	-0.65	-0.04	Mahur	-0.70	-0.08	8.18	0.14	2.24	0.15	0.06	0.01
Sillod	0.56	0.07	3.88	0.46	0.99	0.02	-0.05	0.00	Malegaon	-1.19	-0.14	1.78	0.05	2.24	0.13	0.82	0.06
Soygaon	0.30	0.04	1.77	0.12	0.10	0.01	-0.30	-0.02	Mukhed	-0.03	0.01	3.14	0.07	1.53	0.07	0.08	0.01
Vaijapur	-0.07	0.01	0.48	0.30	0.36	0.04	-0.10	-0.01	Nanded	-0.25	-0.03	9.17	0.07	0.93	0.07	0.34	0.02
Ambejogai	-1.42	-0.15	1.89	0.13	1.07	0.08	-0.70	-0.04	Patoda N	-0.94	-0.11	12.72	0.16	1.59	0.13	0.26	0.01
Ashti	-0.37	-0.04	0.34	0.10	0.28	0.00	-0.05	-0.01	Sarkhani	-0.52	-0.10	17.03	0.46	2.39	0.14	0.09	0.01
Beed	0.02	0.01	2.94	0.03	0.04	0.02	0.07	0.00	Shivani	-0.59	-0.11	3.44	0.58	0.31	0.10	0.21	0.03
Georai	-0.07	-0.01	3.11	0.03	1.25	0.03	-0.17	0.00	Sundgi	-0.68	-0.10	4.57	0.04	0.88	0.11	0.17	0.03
Hirapur	-0.35	-0.08	4.15	1.01	1.06	0.23	-0.01	-0.01	Tamsa	-1.02	-0.08	10.36	0.39	1.88	0.10	0.68	0.05
Kuppa	-0.73	-0.08	0.96	0.36	0.03	0.01	-0.32	-0.01	Umri	-1.11	-0.17	6.66	0.03	1.01	0.06	0.79	0.06
LimbaGanesh	-0.71	-0.03	4.39	0.40	0.70	0.00	-0.01	0.00	Alni	-1.25	-0.11	2.04	0.23	0.54	0.10	0.22	0.01
Majalgaon	-0.61	-0.05	0.90	0.00	0.56	0.05	-0.31	-0.01	Awadshirpur	-0.64	-0.34	0.75	0.69	1.67	0.28	0.32	0.06
Murti	-0.59	-0.03	0.37	0.04	1.38	0.03	-0.01	0.00	Bembli	-1.46	-0.11	1.40	0.48	1.70	0.05	0.27	0.01
Patoda B	-0.85	-0.07	0.05	0.09	0.50	0.04	-0.10	0.00	Bhoom	0.28	-0.05	0.53	0.04	0.98	0.11	0.22	0.01
Vida	-1.30	-0.05	6.08	0.34	1.60	0.04	-0.12	-0.01	Chandani	-0.30	-0.03	1.36	0.19	0.66	0.01	0.22	0.00
Jawlabazar	-1.41	-0.10	3.01	0.07	1.90	0.12	-0.49	-0.04	Kalamb	-0.68	-0.09	5.10	0.07	0.59	0.06	0.30	0.01
Takalkhopa	-0.38	-0.02	4.23	0.53	0.62	0.07	-0.19	-0.01	Karajkheda O	-0.59	-0.07	3.74	0.09	0.26	0.09	0.33	0.02
Ambad	0.34	0.04	1.11	0.15	0.24	0.01	0.07	0.01	Lohara	-0.02	-0.20	7.50	0.30	0.69	0.07	0.19	0.01
Bhavnepangri	-0.36	-0.12	2.71	0.73	1.69	0.09	-0.19	0.07	O'bad	-0.76	-0.03	0.56	0.06	0.58	0.01	0.08	0.00
Bhokardan	0.17	0.01	0.16	2.31	1.30	0.04	0.01	0.01	Omerga	0.05	0.01	0.33	0.02	1.43	0.05	0.15	0.00
Golpangri	-0.45	-0.13	3.45	1.45	0.64	0.52	-0.13	0.08	Padoli	-1.34	-0.13	0.40	0.03	2.00	0.07	0.54	0.03
Jafrabad	-0.65	-0.12	4.13	0.23	1.61	0.19	0.31	0.07	Paranda	-0.08	-0.03	1.33	0.05	1.99	0.08	0.28	0.03
Partur	-0.14	-0.02	3.11	0.15	0.92	0.05	0.16	0.02	Sarola	-1.81	-0.10	4.49	0.24	2.11	0.04	0.32	0.02
Ranjni	-0.28	-0.06	4.80	0.06	0.43	0.10	0.03	0.02	Suratgaon	-0.05	-0.01	0.77	0.02	2.13	0.10	0.30	0.01
Salegaon	-0.17	-0.02	4.87	0.13	2.46	0.06	0.22	0.01	Surdi	-0.17	-0.03	3.44	0.06	1.42	0.04	0.27	0.02
Shahagad	0.05	0.00	5.72	0.36	1.29	0.03	0.01	0.27	Tawrajkheda	-1.07	-0.12	5.23	0.27	1.03	0.04	0.25	0.02
Shevali	-1.12	-0.05	6.90	0.10	2.24	0.04	0.45	0.03	Yermala	-0.77	-0.08	2.60	0.20	1.03	0.03	0.10	0.00
Ahemadpur	-1.19	-0.10	3.71	0.06	1.20	0.04	0.23	0.01	Gangakhed	-0.09	-0.01	0.44	0.11	1.90	0.03	-0.07	-0.01
Aurad Sha	-1.87	-0.21	2.85	0.41	1.34	0.07	0.24	0.01	Jintur	-0.79	-0.08	0.79	0.37	1.23	0.11	-0.80	-0.06
Ausa	-1.33	-0.10	0.46	0.63	0.06	0.07	0.08	0.00	Karajkhed	-0.64	-0.11	2.70	0.22	0.95	0.11	-0.40	-0.03
Jadhala	-0.71	-0.26	2.90	0.66	0.77	0.23	0.30	0.10	Palam	-0.72	-0.06	5.23	0.46	1.97	0.10	-0.32	-0.04
Jawala bk	-1.79	-0.08	7.27	0.52	2.77	0.01	0.34	0.00	Parbhani	0.80	0.04	5.53	0.22	0.90	0.03	-0.59	-0.03
Kasarshirshi	-0.76	-0.10	4.90	0.80	1.04	0.03	0.20	0.01	Pathri	-1.34	-0.14	0.08	0.40	0.97	0.11	-0.33	-0.04
Nitur	-0.73	-0.10	3.22	0.08	1.49	0.07	0.18	0.02	Supegaon	-0.39	-0.10	1.01	0.44	0.33	0.09	-0.27	-0.03
Rohina	-0.71	-0.10	0.77	0.56	0.78	0.04	0.12	0.01	Zari	-1.02	-0.10	5.15	0.30	1.92	0.06	-0.40	-0.02

Beed and Parbhani. During the monsoon season there are 60 stations have recorded decreasing trend from 1680 to 2016. The lowest decreasing trend is observed at Patoda station of Beed district by 0.05mm/year and highest decreasing trend is noted at Billoli of Nanded district by 21.66mm/year. On the other hand 36 stations are found with increasing trend. It ranges from 0.08mm/year to 12.72mm/year at Pathri of Parbhani district and Patoda of Nanded district. The post monsoon season has observed that 88 stations noticed decreasing trend and 8 stations increasing trend of average seasonal rainfall. The decreasing trend varies from 0.03mm/year to 2.77mm/year at Kuppa and Jawalabk station of Beed and Latur district. Whereas 8 stations observed increasing trend, ranges from 0.04 mm/year to 1.97mm/year at Taka and Palam stations of Latur and Parbhani district.

Annual Trend of Rainy days: As like rainfall trend, the trend of rainy days also significant for agriculture and other sectors which are directly or indirectly depends on climate of region. The trend of mean annual rainy days is evaluated and increasing and decreasing trend is observed. The entire Marathwada region has recorded decreasing (0.23days/year) trend during study period. As concern to station wise trend, 70 stations are recorded decreasing trend, it varies from 0.01 to 2.03 days/ year. The lowest trend is recorded at Lonikh. Station of A'bad district and highest decreasing trend is at Golpangri of Jalana stations. The increasing trend in rainy days also observed over 27 stations. It varies from 0.01 to 0.77 days/year over Beed and Kasarshirsi stations of Beed and Latur districts.

Seasonal Trend of Rainy Days:

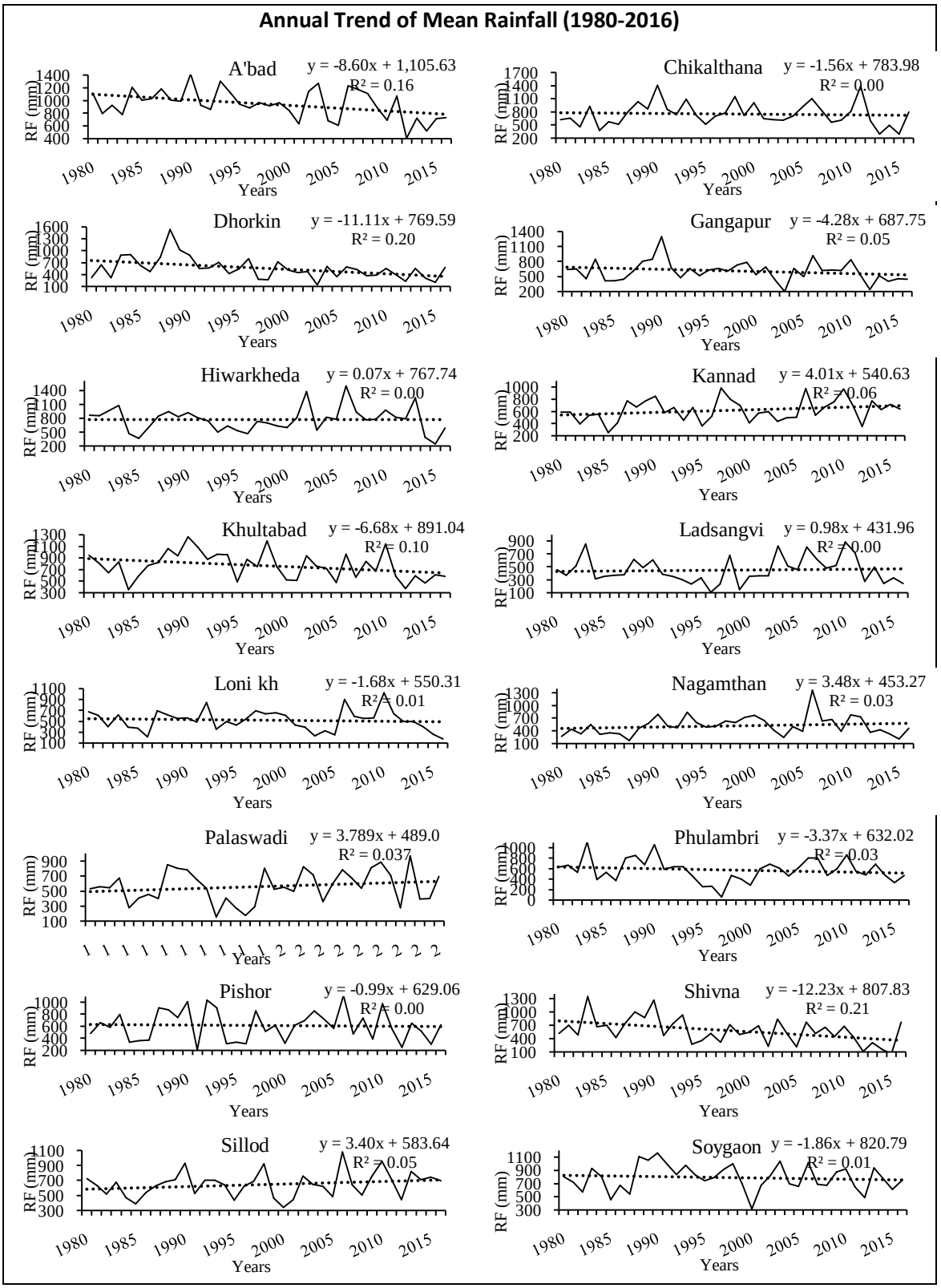
The mean seasonal trend of rainy days is computed and reported. The winter season is recorded decreasing trend at 89 stations and four stations namely Dhorkin, Khultabad, Sillod and Beed are recorded <0.001days/year and Parbhani has recorded by 0.21days/year. Whereas 7 station have observed increasing trend. Out of them Pishor, Golpangri and Patoda stations have noticed <0.001 day/year and Shahagad recorded 0.27days/year, it is highest positive trend during this season in Marathwada. During the pre-monsoon season, the increasing and decreasing trend is observed. The negative trend is varies from <0.001 to 0.34days/year at Shahagad and Awadshirpur stations of Jalna and O'bad districts. Whereas the increasing trend is found at14 stations. The 5 stations, vaijapur, Beed, Bhokardan, Mkhed and Omerga are recorded <0.01 days/year and Kinwat of Nanded district has found highest positive change by 0.10 days/year during this season.The monsoon season is also found with positive and negative trend. There are 55 stations have noticed decreasing trend, ranges from <0.001 to 1.45mm/year. On the other hand 41 stations are observed positive change with varies from 0.02 to 2.31 days/ year, recorded at Suratgaon and Bhokardan stations of O'bad and Jalana districts.

Post monsoon season is considered during October to December. The trend of rainy days is computed and observed as 86 stations with decreasing and 10 stations with increasing trend. The decreasing trend varies from <0.01 to 38.0 days/year. There are four stations, Gangapur, Ashti, Limbaganesh and Degloor are having <0.001 days/year and Jamb bk. of Nanded district recorded highest negative or decreasing trend of rainy days. Whereas the positive or increasing trend varies from 0.01 to 0.11 days/year during the season. The Palaswadi, Soygaon, Ambad, Taka and Kinwat stations are recorded lowest increasing trend and Pathri has recorded the highest positive trend.

Conclusion:

It is observed that as far as concern to rainfall trend, there are 72 stations are recorded negative trend of average annual rainfall during 1980 to 2016. It means the average annual rainfall decreases and it ranges from 0.59 to 20.11mm. The increasing trend is much in less proportion in comparison to decreasing trend. Overall the study region has found decreasing trend of rainfall by 3.32mm during study period. The seasonal trend of rainfall is during winter season 91 stations have decreasing and 5 stations namely Pishor, Beed, Ambad, Rohina and Udgir are increasing nature. The evaluation of trend of rainy days is also most significant. There are 70 stations have recorded decreasing trend of rainy days, ranges from 0.01 to 2.03 days/year. The 26 stations are found with increasing trend andvaries from 0.01 to 0.77days/ year in Marathwada region during study period. During winter season 89 stations are noticed as declined and 7 stations increased trend. In pre monsoon season it ranges from -0.34 days to 0.10 days. The monsoon season has observed 55 stations decreasing trend ranges from <0.001 to 1.45 days where as 41 stations observed positive trend. During the post monsoon 86 stations and 10 stations found negative and positive trend accordingly.

Fig. no.1.(I)


Annual Trend of Mean Rainfall (1980-2016)
A'bad
y = -8.60x + 1,105.63
R² = 0.16
Chikalthana
y = -1.56x + 783.98
R² = 0.00
Dhorkin
y = -11.11x + 769.59
R² = 0.20
Gangapur
y = -4.28x + 687.75
R² = 0.05
Hiwarkheda
y = 0.07x + 767.74
R² = 0.00
Kannad
y = 4.01x + 540.63
R² = 0.06
Khultabad
y = -6.68x + 891.04
R² = 0.10
Ladsangvi
y = 0.98x + 431.96
R² = 0.00
Loni kh
y = -1.68x + 550.31
R² = 0.01
Nagamthan
y = 3.48x + 453.27
R² = 0.03
Palaswadi
y = 3.789x + 489.0
R² = 0.037
Phulambri
y = -3.37x + 632.02
R² = 0.03
Pishor
y = -0.99x + 629.06
R² = 0.00
Shivna
y = -12.23x + 807.83
R² = 0.21
Sillod
y = 3.40x + 583.64
R² = 0.05
Soygaon
y = -1.86x + 820.79
R² = 0.01
RF (mm)
Years


of Annual mean Rainfall (1980-2016)
Vaijapur
y = -1.022x + 571.4
R² = 0.004
Ambejogai
y = -5.076x + 917.4
R² = 0.065
Ashti
y = -1.051x + 685.2
R² = 0.002
Beed
y = -2.885x + 771.0
R² = 0.018
Georai
y = -4.610x + 766.0
R² = 0.043
Hirapur
y = 2.737x + 571.1
R² = 0.018
Kuppa
y = -1.991x + 734.7
R² = 0.006
LimbaGanesh
y = 2.976x + 584.2
R² = 0.012
Majalgaon
y = -0.59x + 755.0
R² = 0.000
Murti
y = 0.527x + 638.6
R² = 0.000
Patoda B
y = -1.512x + 707.9
R² = 0.005
Vida
y = -9.359x + 932.6
R² = 0.112
Jawlabazar
y = -6.809x + 1096.
R² = 0.053
Takalkhopa
y = -5.438x + 973.5
R² = 0.028
Ambad
y = -0.931x + 704.9
R² = 0.001
Bhavnepangri
y = 0.467x + 585.6
R² = 0.000
RF (mm)
Years

Fig. no. 01 (II)

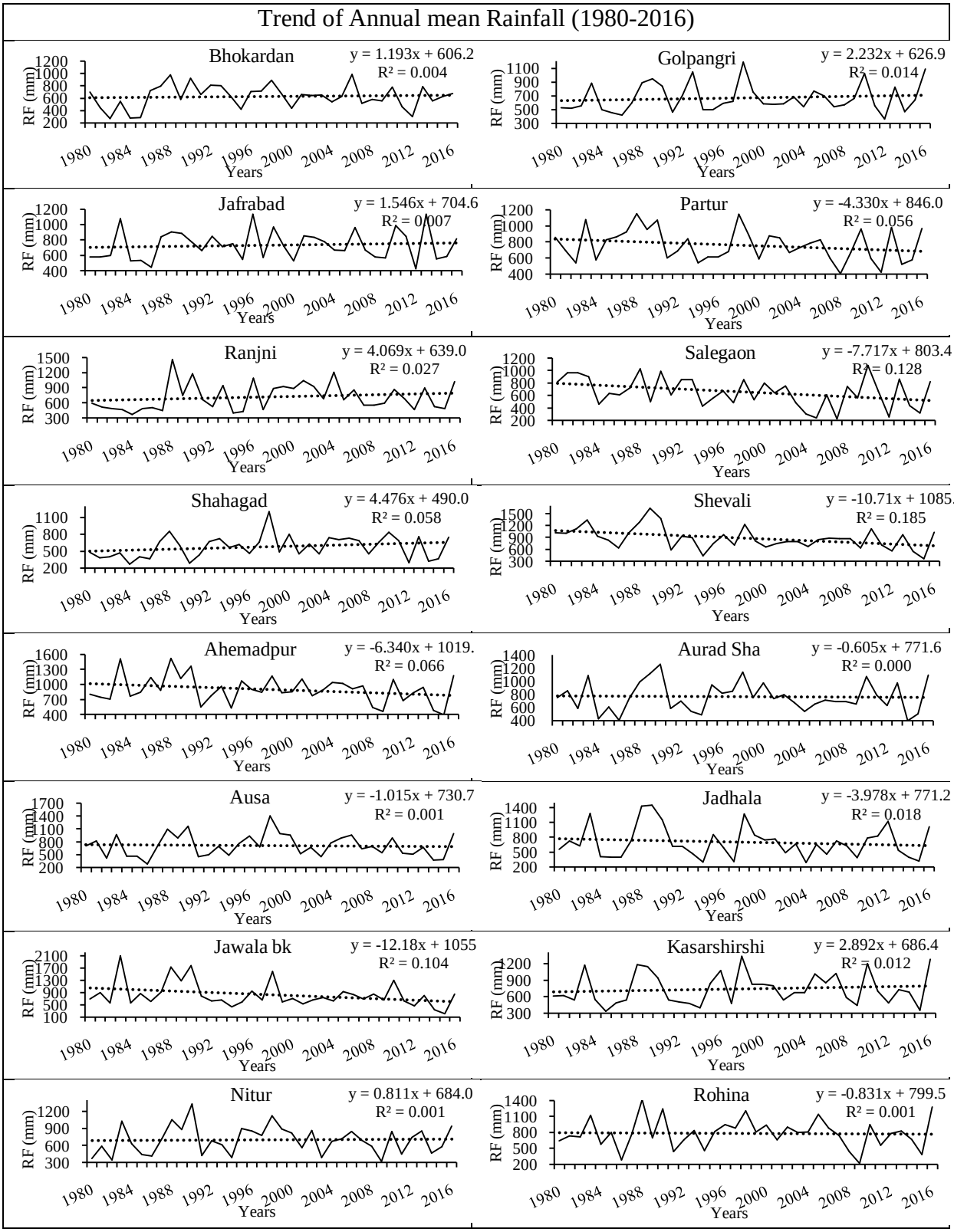

Trend of Annual mean Rainfall (1980-2016)
Bhokardan
y = 1.193x + 606.2
R² = 0.004
Golpangri
y = 2.232x + 626.9
R² = 0.014
Jafrabad
y = 1.546x + 704.6
R² = 0.007
Partur
y = -4.330x + 846.0
R² = 0.056
Ranjni
y = 4.069x + 639.0
R² = 0.027
Salegaon
y = -7.717x + 803.4
R² = 0.128
Shahagad
y = 4.476x + 490.0
R² = 0.058
Shevali
y = -10.71x + 1085.
R² = 0.185
Ahemadpur
y = -6.340x + 1019.
R² = 0.066
Aurad Sha
y = -0.605x + 771.6
R² = 0.000
Ausa
y = -1.015x + 730.7
R² = 0.001
Jadhala
y = -3.978x + 771.2
R² = 0.018
Jawala bk
y = -12.18x + 1055
R² = 0.104
Kasarshirshi
y = 2.892x + 686.4
R² = 0.012
Nitur
y = 0.811x + 684.0
R² = 0.001
Rohina
y = -0.831x + 799.5
R² = 0.001
RF (mm)
Years

Fig. no. 01 (III)

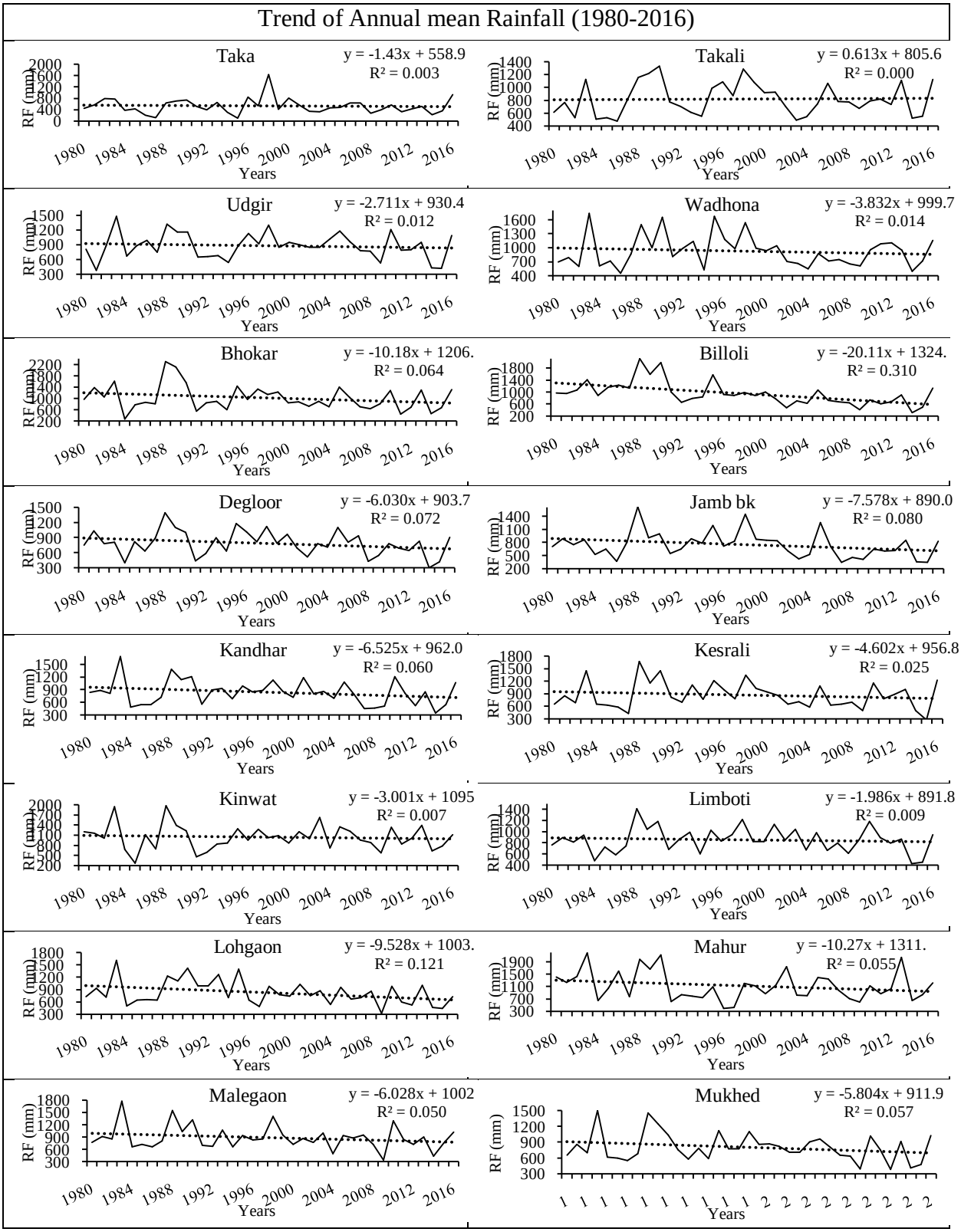

Trend of Annual mean Rainfall (1980-2016)
Taka
y = -1.43x + 558.9
R² = 0.003
Takali
y = 0.613x + 805.6
R² = 0.000
Udgir
y = -2.711x + 930.4
R² = 0.012
Wadhona
y = -3.832x + 999.7
R² = 0.014
Bhokar
y = -10.18x + 1206.
R² = 0.064
Billoli
y = -20.11x + 1324.
R² = 0.310
Degloor
y = -6.030x + 903.7
R² = 0.072
Jamb bk
y = -7.578x + 890.0
R² = 0.080
Kandhar
y = -6.525x + 962.0
R² = 0.060
Kesrali
y = -4.602x + 956.8
R² = 0.025
Kinwat
y = -3.001x + 1095
R² = 0.007
Limboti
y = -1.986x + 891.8
R² = 0.009
Lohgaon
y = -9.528x + 1003.
R² = 0.121
Mahur
y = -10.27x + 1311.
R² = 0.055
Malegaon
y = -6.028x + 1002
R² = 0.050
Mukhed
y = -5.804x + 911.9
R² = 0.057
RF (mm)
Years

Fig. no. 01.(IV)

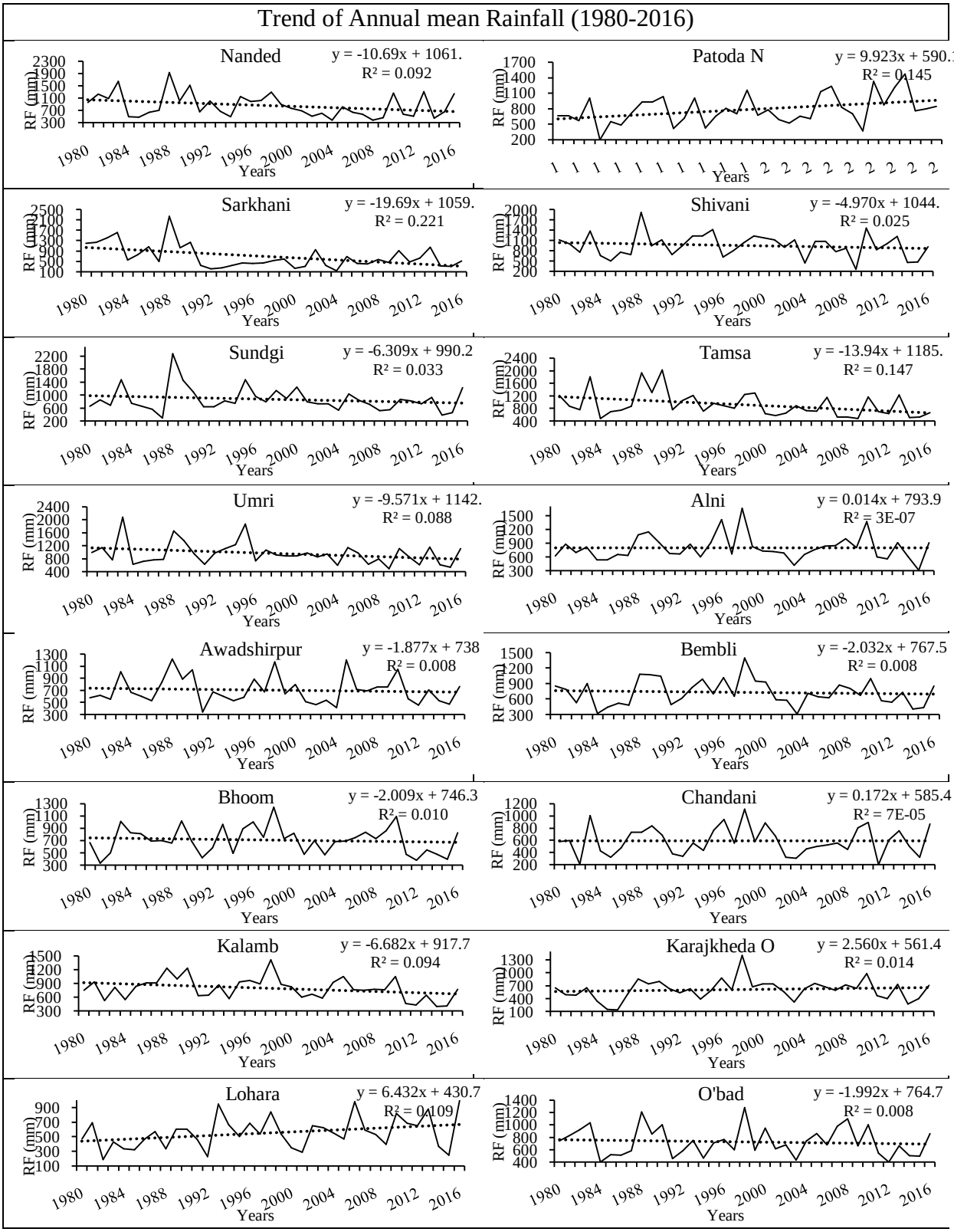

Trend of Annual mean Rainfall (1980-2016)
Nanded
y = -10.69x + 1061.
R² = 0.092
Patoda N
y = 9.923x + 590.1
R² = 0.145
Sarkhani
y = -19.69x + 1059.
R² = 0.221
Shivani
y = -4.970x + 1044.
R² = 0.025
Sundgi
y = -6.309x + 990.2
R² = 0.033
Tamsa
y = -13.94x + 1185.
R² = 0.147
Umri
y = -9.571x + 1142.
R² = 0.088
Alni
y = 0.014x + 793.9
R² = 3E-07
Awadshirpur
y = -1.877x + 738
R² = 0.008
Bembli
y = -2.032x + 767.5
R² = 0.008
Bhoom
y = -2.009x + 746.3
R²= 0.010
Chandani
y = 0.172x + 585.4
R² = 7E-05
Kalamb
y = -6.682x + 917.7
R² = 0.094
Karajkheda O
y = 2.560x + 561.4
R² = 0.014
Lohara
y = 6.432x + 430.7
R² = 0.109
O'bad
y = -1.992x + 764.7
R² = 0.008
RF (mm)
Years

Fig. no. 01.(V)

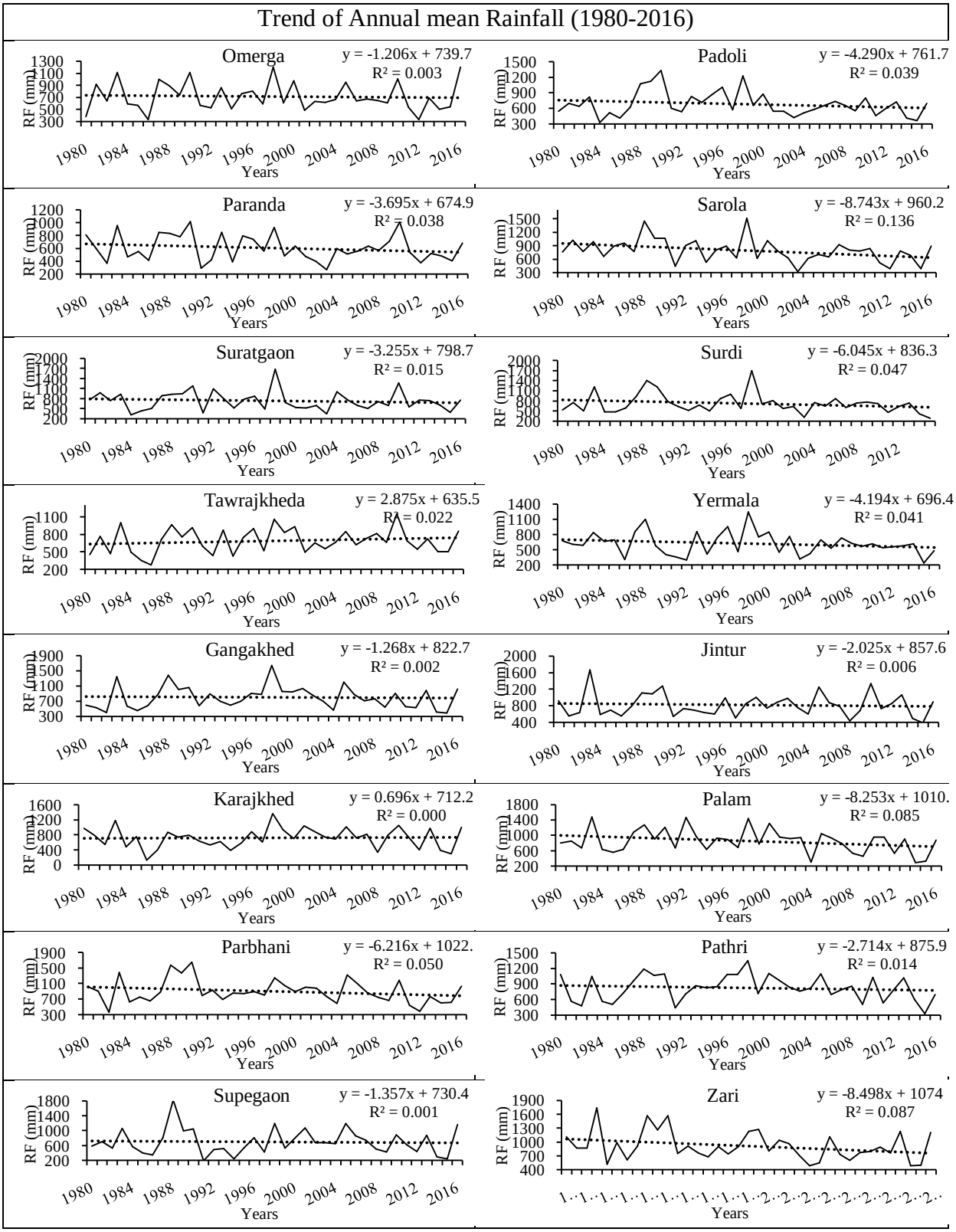


Fig. no. 01 (VI)

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Impact Of Irrigation Facilities On The Production Of Major Crops In Nashik District

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Abstract-
In the present paper an attempt has been made to study the impact of increased irrigation facilities on the crop production of the Nashik district based on the secondary data published by government departments. The irrigation facilities in the study region such as wells with the electric pumps and diesel pumps, area benefitted by dams, borewells with handpump and electric pumps are studied for the period of around 15 years. During the same time the production of major crop which are Wheat, Rice, Jowar, Bajra, Tur and Sugarcane are taken into consideration. The comparative study of availability of irrigation facilities and the production of the crops in hector is studied.The study reveals that the production of crop increases over the period of time due to improve irrigation in the region.
Keywords: Irrigation, Crop production, diesel pumps, electric pumps, borewells.

Introduction-

Agriculture is the major source of income, for roughly 58 percent of India's population. India is the world's second-largest producer of agricultural products. Agriculture employed more than half of the Indian workforce in 2018 and generated 17–18% of the country's GDP.Generally, in the maximum part of India, rainfall is limited to only four months every year, from June to September, when the monsoon arrives. In certain regions of the nation, rainfall occurs throughout the months of December and January. Rainfall is scarce and unreliable in many regions of the nation, even during the monsoon and in agriculture, insufficient, unpredictable, and irregular rain creates uncertainty which is the main cause for the low production,that'swhy the irrigation facility plays an important role in agriculture production.Irrigation is the science of applying water to land artificially in order to meet the water needs of crops throughout their life cycle in order to provide adequate nutrition. India's irrigation system consists of a network of big and small canals branching from Indian rivers, as well as groundwater well-based systems, tanks, and other rain-gathering facilities. The largest of these is the groundwater system.Agriculture in India, like that of many other developing nations, has grown dramatically in the last four decades as a result of the widespread adoption of high-yielding variety seeds, by the development of irrigation systems.

About Study Area-

Nasik district's location is from 19° 35'18" North latitude to 20° 53'07" North latitude and 73° 16'07'' East longitude to 74° 56 27" East longitudes with an area 15530 59.km,It is third largest in Maharashtra. There are 15 Tahsil in the district like Nashik, Paint, Surgana, Trimbakeshwar, Igatpuri, Sinnar, Niphad, Dindori, Kalwan, Satana, Malegaon, Chandwad, Nandgaon, Deolaand Yeola.

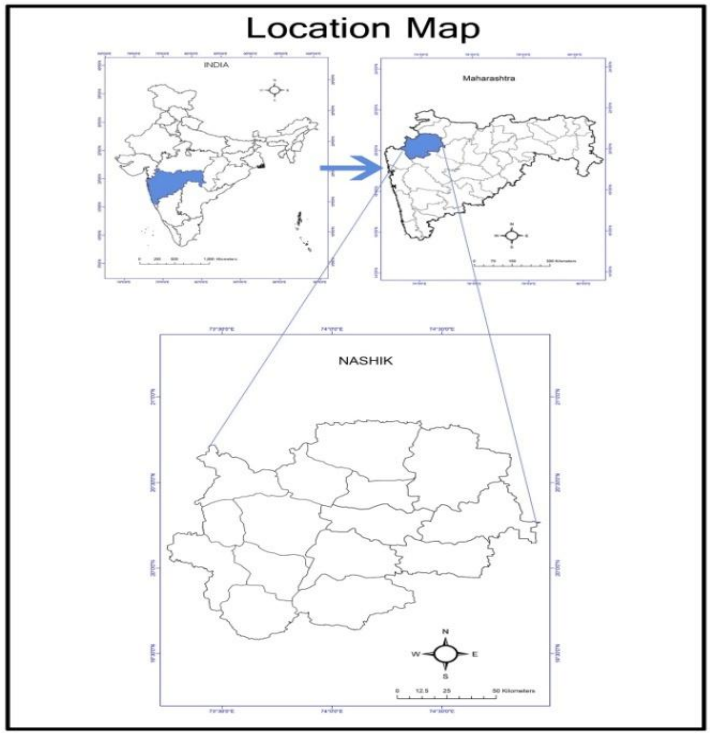


Fig.1 Location Map of the Study Area

Agriculture is the main economic activity of the district and about 70 per cent working population is depends upon it. Nashik district's agriculture related land area and it's classification are as follows:

Table: 1 Classification of Area under landuse

Area Type	**Area (Hectors)**
Geographical area	15,63,000
Cultivable area	8,64,000
Average kharif Crop area	6,63,200
Average Rabi Crap area	1,36,500
Actual sown area	6,58,763
Forest	3,40,000
Uncultivable area	23,000

Source: KrishiVigyan Kendra

dependent on agriculture occupation. Nasik district falls under medium rainfall area with normal annual rainfall of 1056 mm. The district has net irrigated area of 245471 ha. There are 13 major, 08 medium and 104 minor irrigation projects in the district. The irrigation potential for 1,03,098 ham is available for long term planning in the district. Since last 20 years the grape has acquired dominance on the agricultural economy of the district. Due to water shortage in kalwan, Deola, Baglan& Malegaon blocks, the farmers have shifted to pomegranate from sugarcane & grape crops. Some progressive farmers are cultivating flowers in green houses. These developments also indicates that the farmers in the district adopt new technologies & methods of cultivation very fast.

Methodology-

In the present paper the comparative studyof irrigation facilities and Crop production of fifteen years' time span i.e., from 2000-01 to 2015-16is studied as per available data. For irrigation facility data of Nashik district, we have used statistical department's annually online published data of wells with electric pump and diesel pump of years 1999-2000, 2008-09 and 2011-12, Borewells with Hand pump and Electric pump of years 2005-06, 2010-11 and 2015-16 andIrrigation Projects (Dams) years of 2005-06, 2010-11 and 2015-16. For crop production data of major crops i.e., Wheat, Rice, Jowar, Bajra, Tur, Sugarcane annual production of year

2001-2002 to 2015-2016 of Nashik district is consider as per availability. The study is based on the informationcollected fromthe website of Department of Agriculture, Government of Maharashtra.

Objectives-

1. To study the irrigation facility available in theNashik district
2. Comparative study of irrigation facilities and crop production in the Nashik district

Table:2 Irrigation Facilities: - Wells with diesel and electric pumps

Tehsil	Wells with Diesel Pump	Wells with Electric Pump	Wells with Diesel Pump	Wells with Electric Pump	Wells with Diesel Pump	Wells with Electric Pump
	1999-2000		2008-2009		2011-2012	
Surgana	30	71	0	0	0	0
Kalvan	380	6019	21	89271	145	8662
Devala	0	0	0	0	0	0
Baglan	156	7085	427	16625	310	17125
Malegaon	1700	6078	1918	6078	1618	6078
Nandgaon	560	4260	2237	1470	2237	1470
Chandvad	110	7750	92	8331	0	2314
Dindori	1179	2549	394	12981	0	19065
Peth	37	51	35	0	0	35
Trambak	0	0	65	315	82	350
Nashik	0	10087	5	10098	7	100115
Igatpuri	235	42	226	84	220	84
Sinnar	1908	9006	19	195	467	19509
Niphad	390	33442	220	27605	242	30365
Yevla	2174	4882	0	3500	0	3500
Total	**8859**	**91322**	**5359**	**96209**	**5328**	**230172**

Source: Directorate of Economics and Statistics, Government of Maharashtra

Irrigation is the agricultural process of applying controlled amounts of water to land to assist in the production of crops, as well as to grow landscape plants and lawns, where it may be known as watering. Agriculture that does not use irrigation but instead relies only on direct rainfall is referred to as rain-fed. Irrigation has been a central feature of agriculture for over 5,000 years and has been developed independently by many cultures across the globe.Irrigation facilities in the Nashik district consists of wells, canals, wells with electric pump, wells with diesel pump. As per the data collected from Department of Statistics for the year 1999-2000 it shows that there were 8859 wells with diesel pump and 91322 wells with electric pumps. After the period of about ten years i.e. in year 2008-09 wells with diesel pump reduces to 5359 and wells with electric pumps increases to 96209. The trend continues and the number of electric pumps increases tremendously to about 230172 in 2011-12. The growth in the number of wells indicates that the irrigation facilities enhanced such as Baglan, Dindori Sinnar, Niphad and Nashik has shown increase in irrigation leading to crop production throughout the district over the period. Above table representstehsilwise data of wells over the decade. Tehsils

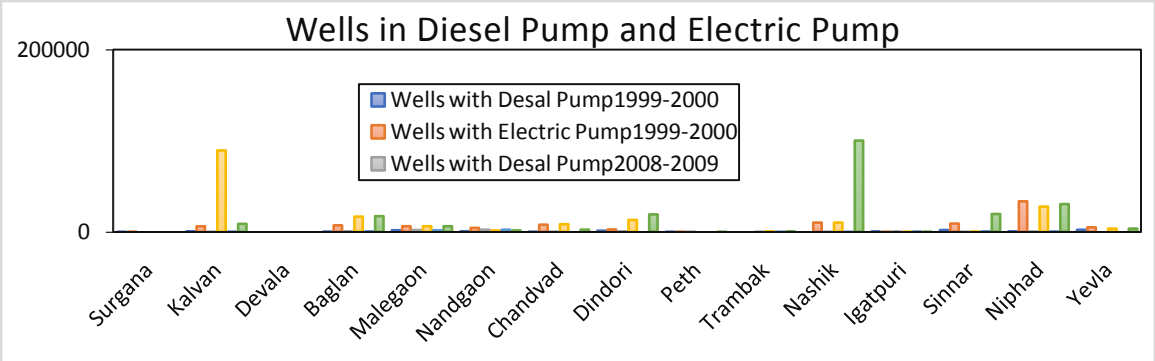


Fig:2 Wells in Diesel Pump and Electric Pump

Table: 3 Irrigation Facilities: - Borewells with Hand pump and Electric pump

Tehsil	Working Hand pump	Working Electric pump	Working Hand pump	Working Electric pump	Working Hand pump	Working Electric pump
	2005-2006		**2010-2011**		**2015-2016**	
Surgana	517	66	323	4	378	2
Kalvan	493	34	207	-	590	42
Devala	513	82	315	28	365	23
Baglan	280	46	513	48	746	68
Malegaon	146	9	594	23	767	21
Nandgaon	502	73	310	7	434	3
Chandvad	655	33	437	20	555	20
Dindori	181	23	470	64	640	63
Peth	245	26	111		142	2
Trambak	544	68	136	2	178	5
Nashik	94	2	212	29	278	29
Igatpuri	515	36	187	8	269	7
Sinnar	292	5	415	14	817	15
Niphad	119	5	541	41	665	79
Yevla	522	14	350	2	645	18
Total	**5618**	**522**	**5121**	**290**	**7469**	**402**

Source: Directorate of Economics and Statistics, Government of Maharashtra

The table No.3 represents borewellsavalibilty in the region. It shows that numbers of electric pumps has decreased from the 2005 to 2010 and again it increases in 2015. It also reveals that electric pumps numbers are noticeably increased over the period, leading to the improvement in facility of irrigation. Overall the trend of borewells are for the irrigation are becoming escalated.

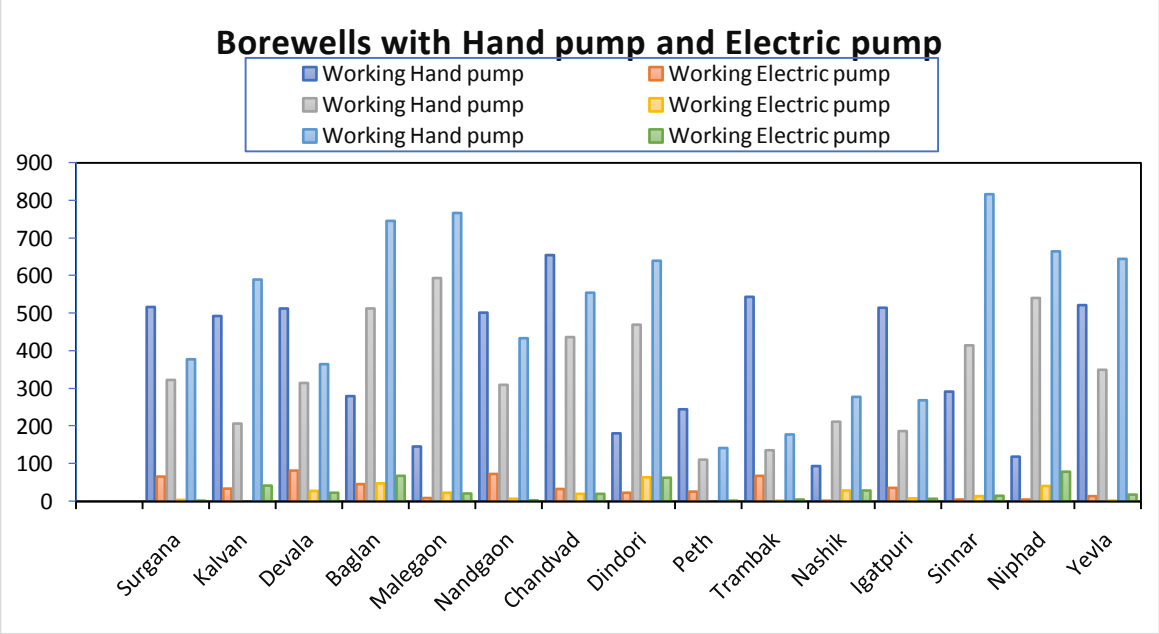


Fig: 3 Borewells with Hand pump and Electric pump

Table:4 Irrigation Projects (Dams) (Area in Hector)

Tehsil	**Minor Project**	**Medium Project**	**Major Project**	**Minor Project**	**Medium Project**	**Major Project**	**Minor Project**	**Medium Project**	**Major Project**
	Benefited area in 2005-2006			**Benefited area in 2011-2012**			**Benefited area in 2015-2016**		

Surgana	552	0	0	515	0	0	649	0	0
Kalvan	2093	0	52096	3346	0	36180	3346	0	53539
Devala	1068	0	0	1641	0	3794	1641	0	0
Baglan	2018	23534	0	2588	8885	2322	2588	23534	0
Malegaon	1976	0	0	3400	9529	14171	3400	0	0
Nandgaon	919	8139	26705	2497	1355	105688	2497	7673	106588
Chandvad	2959	0	864	1699	834	715	2655	0	715
Dindori	2951	9034	124057	3315	0	92286	4804	9034	101983
Peth	723	0	0	0	0	0	3149	0	0
Trambak	898	0	0	1808	0	0	2605	0	0
Nashik	1068	12725	38400	1409	12113	38400	2618	12728	30400
Igatpuri	1281	0	113450	1500	3573	113450	2044	0	113450
Sinnar	1953	5260	0	1955	3340	6211	3050	5260	0
Niphad	517	0	0	953	0	16260	1422	0	0
Yeola	914	0	0	827	0	0	953	0	0
Total	**21890**	**58692**	**355572**	**27453**	**39629**	**429477**	**37421**	**58226**	**406675**

Source: Directorate of Economics and Statistics, Government of Maharashtra

A majority of the dams built in the world are multipurpose in nature, but irrigation is the largest user of the waters withdrawn. due to a dam, reducing flood hazard due to inundation of land, crop and property which might result into economic upheavals. It also reduces congestion of runoff in plains and coastal lands. The table no. 4 reveals that the Nashik district has minor, medium and major dam project which leads to the beneficial of irrigation in the region.In the year 2005-2006 it shows that around 355572 hector of the agricultural land was benefitted by the major dams in the district. Kalwan, Nandgaon, Dindori, Nashik and Igatpuri are tehsils in which area under major dams is remarkable. Medium dam project benefited the areas in Baglan, Nandgaon, Dindori, Nashik and Sinnar. In the year 2011-12 the tehsils almost all the tehsils were benifitted by major dams except Surgana, Peth, Trimbakeshwar and Yeola. Nandgaon and Igatpuri is region which were mostly irrigated by major dams followed by Dindori, KalwananNiphad. All most each and every tehsils are irrigated by minor dams in region. In 2015 the area under dam irrigation is increased compared to previous data obtained in 2005 and 2011. It increases from 436154 hectors in the year 2005 to 496559 hectors in the year 2011 and 502322 hectors in the year 2015.

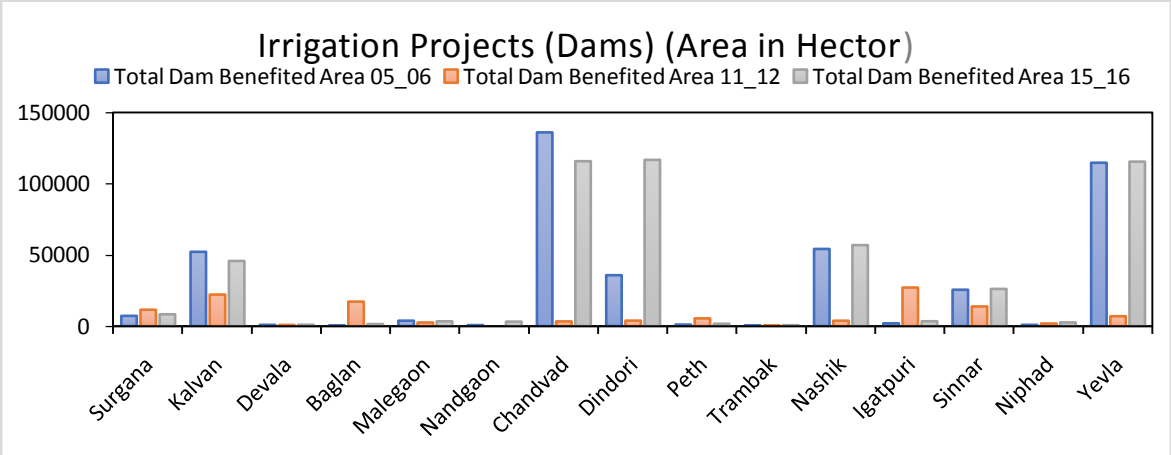


Fig: 4 Nashik District- Talukawise Average Yield Yield:- Kg/ha

Table: 5 Production of Wheat Kg/ha from (2001 -2015)

CROP- Wheat															
Sr.No	Dist /Taluka	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
	Sinnar	1365.1	750.5	1026.7	1190.0	1316.0	1646.0	2132.0	1930.0	2263.0	3066.2	1825.0	1693.0	2263.2	2073.6	1346.8

2	Nashik	1600.9	1570.7	1381.1	1898.0	1742.0	2130.0	1066.0	3247.0	2016.0	2216.8	2116.4	2775.0	2774.2	2668.9	2492.9
	Yeola	463.5	815.5	758.8	1351.0	1149.0	1503.0	1547.0	808.0	1977.0	1731.5	1423.8	1031.6	1590.3	1452.4	893.3
	Niphad	1745.7	2166.8	1667.1	1947.0	2109.0	1920.0	2127.0	1671.0	1932.0	1778.3	2227.3	1308.3	1455.0	1261.0	1474.4
	Chandwad	848.8	1052.3	805.8	1202.0	2596.0	2975.0	2205.0	2513.0	2215.0	2042.9	1753.6	1631.7	2055.1	1446.0	881.5
	Peint	0	0	0	0	1219.0	1734.0	514.0	1511.0	967.0	640.1	1857.7	2082.5	1708.6	465.0	1668.4
	Dindori	1227.0	992.1	886.8	1228.7	1377.0	1239.0	1424.0	1643.0	1076.0	1713.1	1683.8	2296.6	1753.1	1798.3	1431.1
	Nandgaon	686.1	1233.7	1493.2	1711.0	1203.0	1178.0	1045.0	1933.0	1684.0	1925.7	2430.7	1705.0	1731.6	1951.8	1335.5
9	Devala	810.6	1395.6	1446.7	1905.0	2128.0	1718.0	1317.0	1248.0	1838.0	1644.4	1251.1	1229.5	1286.4	1396.4	1830.2
	Surgana	338.1	506.4	893.2	556.2	1174.0	461.0	1131.0	1373.0	1412.0	1512.2	0	934.8	922.9	984.5	1555.7
	Kalwan	1314.6	1195.1	1171.7	1280.9	1561.0	1590.0	2337.0	1900.0	1739.0	2164.7	1640.9	1666.4	1566.6	1364.4	2120.8
	Malegaon	517.0	800.2	972.3	1227.0	1363.0	1466.0	1488.0	1371.6	1428.0	1607.3	1484.3	1395.3	1336.0	1569.3	1175.0
	Baglan	818.7	1162.3	1018.6	1242.0	1567.0	1970.0	1998.0	1441.0	1562.0	1995.3	1866.4	1337.7	1713.0	1662.7	1342.1
	Trymbak	0	650.8	766.4	977.0	867.0	844.0	1767.0	1495.0	1310.0	1061.9	1112.7	1542.2	1654.2	1010.7	1688.1
	Igatpuri	1264.6	1741.6	1149.7	1038.0	1312.0	1567.0	2000.0	1116.0	946.0	1272.7	3000.7	1286.4	1783.6	1338.0	1554.2

Source: Department of Agriculture Government of Maharashtra

Fig. 5

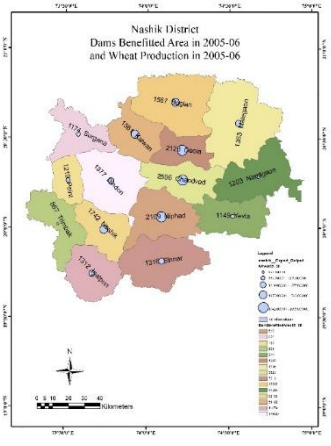


Fig. 6

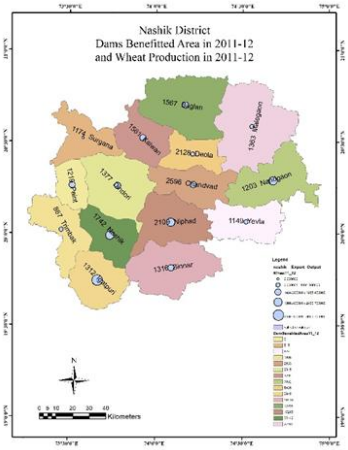
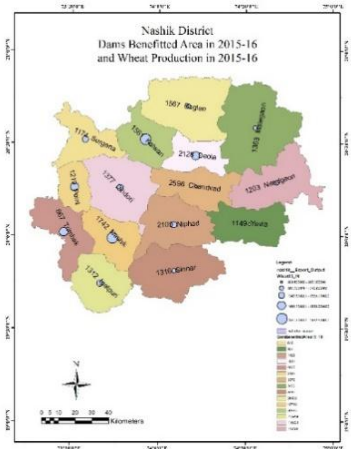


Fig. 7



The above fig.5 represents the production of wheat in the year 2005-06. The production of was 1316 kg/ha inSinnar, 1742 kg/ha in Nashik, 1149 kg/ha inYeola, 2109 in Niphad,, 2596 in Chandwad, 1219 kg/ha in Peth, 1377 kg/ha in Dindori, 1203 kg/ha in Nandgaon, 2128 kg/ha in Deola, 1174 kg/ha in Surgana, 1561 kg/ha in Kalwan, 1363 kg/ha in Malegaon, 1567 kg/ha in Baglan and 867 kg/ha in Trimbakeshwar tehsil. There is variation in the productions of wheat In the tehsils depending upon its irrigation facilities. Yeola, Niphad, Chandwad has comparatively more production then Trimbakeshwarthesil. From the fig.4 it is clear that the irrigation facility developed in Nandgaon, Chandwad and Yeola has benefitted the production of wheat in the

region. The similar result is observed in the 2011 and 2015, the tehsils with sufficient irrigation the production has increased per hector.

Table: 6 Production of Rice Kg/ha from (2001 -2015)

CROP- RICE																
Sr.No	Dist /Taluka	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Sinnar	944.0	643.1	1346.0	2328.0	1285.0	1082.2	1633.0	1691.0	519.3	487.3	299.1	835.8	2376.6	888.8	1413.6
2	Nashik	771.0	795.5	1001.7	1538.0	1340.0	944.3	1687.0	1960.0	870.3	814.0	1890.7	1420.5	2067.5	1836.6	1869.3
3	Yeola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Niphad	704.0	443.7	717.8	656.0	1293.0	1131.8	992.0	649.0	403.5	1144.7	564.3	1893.9	0	0	0
5	Chandwad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Peint	1186.0	0	1985.5	1238.0	1355.0	418.0	1533.0	1269.0	410.5	175.2	1052.0	1080.4	623.5	307.3	330.7
7	Dindori	1374.0	495.8	889.2	630.0	1161.0	569.4	1046.0	570.0	396.4	507.2	1366.7	928.1	1547.2	1181.0	1160.3
8	Nandgaon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Devala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Surgana	0	555.7	942.4	915.0	945.0	802.5	869.0		398.9	405.7	970.5	1360.4	1141.9	470.3	728.9
11	Kalwan	1049.0	387.5	1009.9	1115.0	804.0	645.2	1062.0	496.0	626.3	607.4	1353.4	996.0	1239.1	1469.8	1567.8
12	Malegaon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Baglan	1113.0	657.3	850.5	587.0	680.0	601.8	807.0	791.0	566.5	602.5	716.4	886.9	493.3	793.5	366.6
14	Trymbak	0	294.7	1156.3	812.0	1172.0	1166.7	2147.0	1125.0	297.9	361.9	1158.5	916.5	1376.5	1876.6	1813.3
15	Igatpuri	1299.0	446.7	1274.1	1205.0	1623.0	1223.6	1533.0	1391.0	206.4	333.8	1375.5	1349.7	1296.5	1499.5	1960.6

Source: Department of Agriculture Government of Maharashtra

Fig. 8

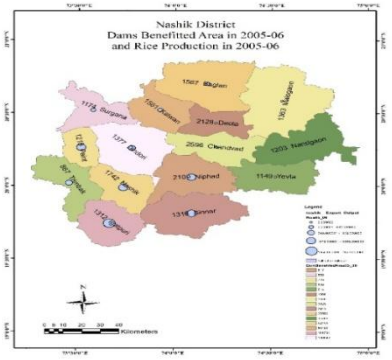


Fig. 9

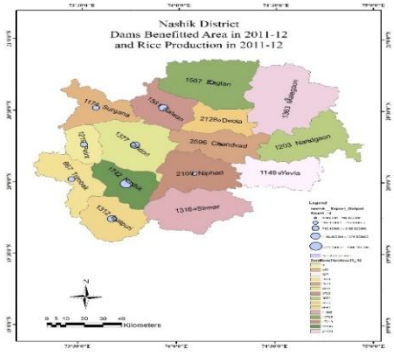
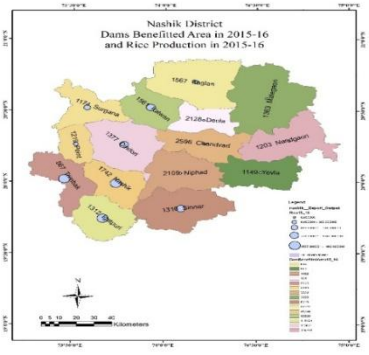


Fig. 10



Rice is not cultivated throughout the tehsils of Nashik district, as it require sufficient water to grow, it is mainly grown in western part of the district were the rainfall is high and some central part where the rainfall is moderate irrigation facilities are adequate.The above fig.8 represents the production of rice in the year 2005-06. The production of was 1285 kg/ha inSinnar, 1340 kg/ha in Nashik, 1293 in Niphad, 1355 kg/ha in Peth, 1161 kg/ha in Dindori, 945 kg/ha in Surgana, 804 kg/ha in Kalwan, 680 kg/ha in Baglan and 1172 kg/ha in Trimbakeshwar tehsil. The productions noticeably changed in the year 2015, it increases almost double than year 2005 mainly due to increase in the irrigation facilities such as wells with electric pumps and electric borewells.

Table: 7 Production of Jowar Kg/ha from (2001 -2015)

CROP- Kh. Jowar																
Sr. No	Dist /Taluka	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Sinnar	0	532.4	538.3	0	799.2	517.0	315.0	0	0	1022.5	1417.4	0	0	0	0
2	Nashik	0	2985.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Yeola	647.3	2095.5	470.5	1347.0	676.2	774.0	1403.0	678.0	742.7	880.7	0	0	0	0	0
4	Niphad	1260.5	1424.7	218.6	1303.0	0	0	0	0	479.5	0	0	0	0	0	0
5	Chandwad	654.9	1178.2	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Peint	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Dindori	0	689.0	0	0	1109.4	0	0	0	0	0	0	0	0	0	0
8	Nandgaon	844.7	2082.5	0	1633.6	916.7	1206.0	0	2209.0	0	1217.6	1328.0	0	0	0	0
9	Devala	0	758.0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Surgana	1402.1	669.5	0	0	0	0	0	0	0	0	0	0	0	0	925.3
11	Kalwan	819.6	1428.6	589.2	794.5	798.0	0	0	921.0	726.5	0	0	0	0	0	0
12	Malegaon	296.8	703.6	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Baglan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Trymbak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Igatpuri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Department of Agriculture Government of Maharashtra

Fig. 11

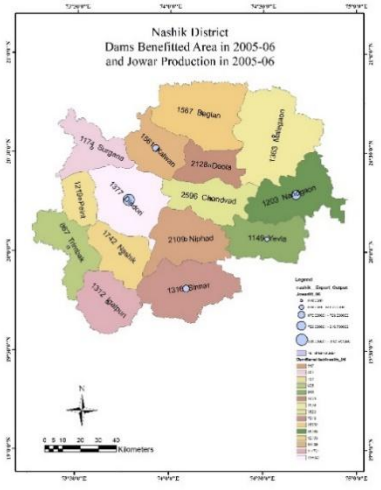


Fig. 12

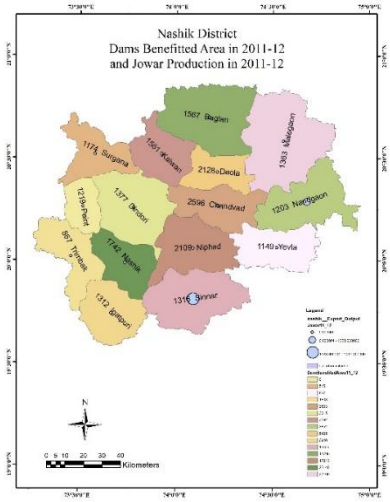
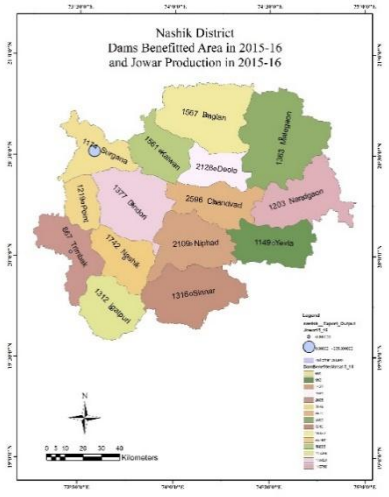


Fig. 13



The Jowar is not sown throughout the district, it is only limited to the area where the rainfall is comparatively low. As it is difficult to practice other crops due to water scarcity. The crop like Jowar which required less amount of water are sown here. Due to low rainfall and low groundwater level the Jowar is preferred in tehsils of Sinnar, Yeola, Nandgaon and kalwan.

Table: 8 Production of Bajra Kg/ha from (2001 -2015)

CROP- Bajra																
Sr. No	Dist /Taluka	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Sinnar	964.0	577.0	891.8	894.0	800.0	682.8	1028.0	622.0	655.8	1415.3	798.4	488.3	706.5	735.3	647.6
2	Nashik	957.0	869.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Yeola	483.0	935.9	659.2	968.0	718.0	552.0	1482.0	749.0	791.3	1628.9	1753.3	1230.0	1570.3	1173.7	253.0
4	Niphad	891.0	1092.7	1055.5	1103.0	821.0	779.0	1001.0	809.0	543.5	954.1	784.1	714.6	598.1	977.3	482.2
5	Chandwad	652.0	941.2	620.3	828.0	1032.0	819.6	2267.0	1925.0	1204.2	1906.5	2137.5	1916.7	1943.8	765.7	764.4
6	Peint	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Dindori	881.0	718.2	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Nandgaon	565.0	632.6	415.0	622.0	817.0	864.4	846.0	811.0	936.0	1634.7	1501.1	639.1	1014.2	549.4	320.1
9	Devala	0	970.5	655.6	1165.0	1142.0	953.5	1701.0	829.0	717.8	1031.3	558.8	1098.4	1171.4	751.4	483.0
10	Surgana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Kalwan	675.0	959.5	1156.8	693.0	945.0	360.5	868.0	676.0	825.1	1100.6	931.4	976.1	988.8	1406.7	398.8
12	Malegaon	342.0	1194.1	670.8	767.0	746.0	911.3	882.0	1353.0	759.2	972.9	650.2	815.3	1097.9	425.7	493.4
13	Baglan	385.0	529.6	456.0	820.0	688.0	702.0	932.0	1174.0	656.1	930.9	722.1	602.8	1500.0	1039.2	884.6
14	Trymbak	0	677.2	0	0	0	0	0	0	0	0	0	0	0	0	0

15	Igatpuri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Department of Agriculture Government of Maharashtra

Fig. 14

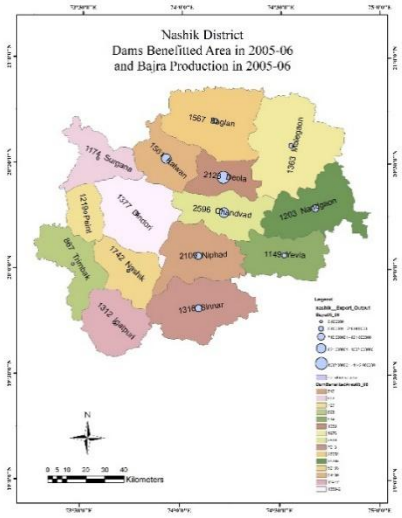


Fig. 15

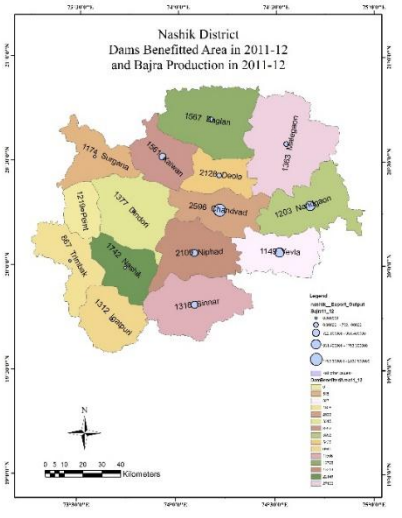
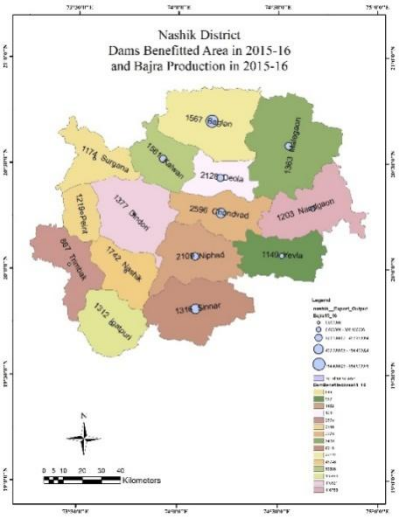


Fig. 16



As per the table no.8 bajra crop is mainly grown in the district in compared to jawar. It is observed that it is nor sown in the tribal region of Nashik district. It includes the Surgana, Trimbakeshwar and Igatpuri district. The production of Bajra is high in Baglan, Niphad and Chandwad tehsils of Nashik district. Due to the development of irrigation facilities is major part the cash crops as well as crops with high market potential is grown in the district.

Table: 9 Production of Tur Kg/ha from (2001 -2015)

CROP- Tur																
Sr. No	Dist /Taluka	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Sinnar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Nashik	0	1014.4	0	1106.0	0	0	0	0	0	0	0	0	0	0	0
3	Yeola	0	1577.5	473.1	293.0	656.2	0	649.0	266.0	328.1	1017.5	835.0	797.5	1143.8	527.5	258.8
4	Niphad	0	1135.0	158.6	474.0	951.2	985.0	1179.0	832.0	537.5	852.5	1275.0	753.8	791.3	680.0	907.5
5	Chandwad	416.3	281.3	248.7	571.0	0	0	0	401.0	425.0	451.9	545.0	457.5	516.3	289.0	378.8
6	Peint	0	191.9	0	1363.0	607.5	300.0	486.0	515.0	327.1	139.4	431.3	735.0	407.5	70.0	96.4
7	Dindori	0	1275.0	0	0	0	0	0	599.0	186.2	582.5	921.3	533.1	460.0	691.3	0
8	Nandgaon	0	792.5	211.3	818.0	663.7	0	0	695.0	628.1	728.8	1221.3	225.6	836.3	511.3	87.5
9	Deval a	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Surgana	425.0	381.9	262.5	675.0	370.0	634.0	308.0	301.0	148.4	588.8	209.0	351.3	296.3	78.8	275.0
11	Kalw	0	856	0	0	0	0	0	0	0	0	0	0	0	0	0

	an		.9													
12	Malegaon	403.1	847.5	607.5	750.0	1475.0	1333.0	1268.0	1321.0	1355.0	1247.5	1062.5	1056.3	1756.3	368.8	526.3
13	Baglan	441.3	958.8	762.5	284.0	708.7	663.1	738.0	162.0	501.9	462.5	830.0	548.8	412.5	659.4	0
14	Trymbak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Igatpuri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Department of Agriculture Government of Maharashtra

Fig. 17

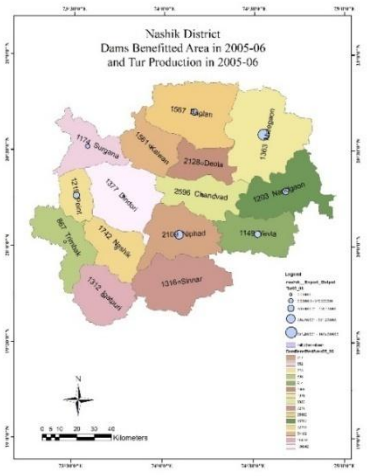


Fig. 18

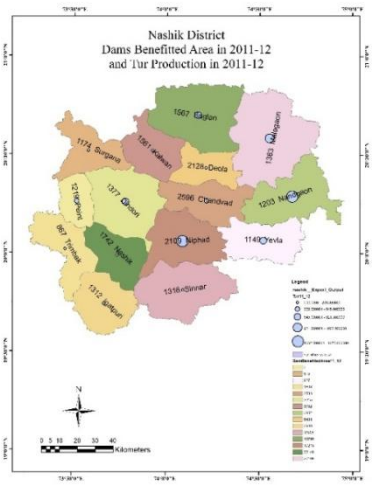
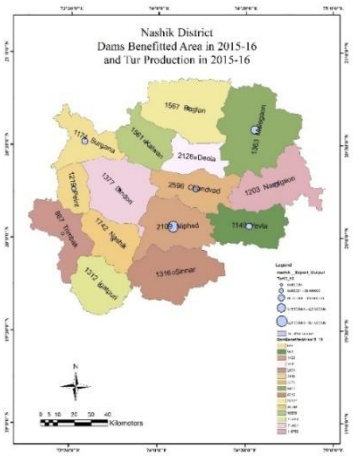


Fig. 19



From the above table it is seen that Sinnar, Nashik, Kalwan, Igatpuri and Trimakeshwar tehsils are not involved in the production of tur. It is mainly sown in the remaining part of the district. Yeola and Malegaon tehsils gives more production of tur, other tehsils are producing it in moderate quantity. Due to irrigation and changing crop pattern there is a shift in cropping pattern in the region. The cultivated area is decreasing for the tur crop and practicing of cash crops is increasing.

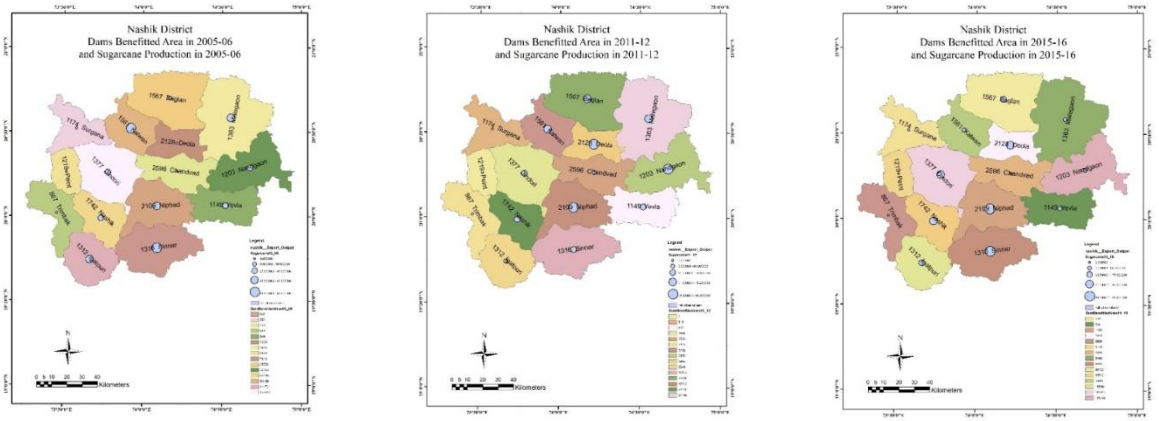
Table: 10 Production of Sugarcane tones/ha from (2001 -2015)

CROP- Sugarcane																
Sr. No	Dist /Taluka	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Sinnar	64.3	129.3	97.9	60.3	80.0	63.0	88.0	66.0	63.9	79.7	70.3	71.3	88.0	73.5	96.4
2	Nashik	101.3	111.7	52.8	48.0	49.0	55.0	87.0	52.0	73.1	77.3	71.0	80.5	83.7	84.6	88.2
3	Yeola	46.9	70.1	52.9	53.3	43.0	61.0	58.0	56.0	77.9	80.5	68.8	78.6	71.8	73.0	63.2
4	Niphad	104.9	74.6	49.4	56.3	53.0	72.0	94.0	70.0	69.2	77.7	85.7	83.9	85.2	83.7	94.2
5	Chandwad	59.3	40.8	63.0	0	0	71.0	80.0	65.0	60.0	70.2	61.0	64.6	63.0	0	0
6	Peint	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Dindori	69.2	27.8	42.2	54.9	44.1	52.0	73.0	64.0	63.8	61.1	67.3	80.2	81.5	83.8	89.1
8	Nandgaon	89.5	68.7	25.5	62.8	40.0	83.0	73.0	69.0	84.3	91.7	91.5	59.7	79.4	126.3	58.8
9	Devala	0	69.	54.	0	0	57.	65.	58.	74.	93.	95.	84.	69.	78.	81.

			1	7			0	0	0	7	4	4	0	7	6	1
10	Surgana	0	73.5	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Kalwan	90.9	83.0	88.2	62.6	71.0	80.0	78.0	78.0	73.9	77.0	75.5	85.7	74.6	69.0	63.1
12	Malegaon	58.3	60.2	61.6	54.2	59.0	60.0	68.0	63.0	68.3	74.6	76.2	70.5	78.7	53.3	63.7
13	Baglan	51.2	77.5	60.7	49.1	29.5	66.0	88.0	81.0	78.7	75.6	73.0	62.4	97.4	70.2	66.4
14	Trymbakeshwar	0	73.5	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Igatpuri	155.0	88.3	39.5	62.5	57.0	52.0	66.0	68.0	84.7	69.4	55.7	87.5	62.3	66.6	71.1

Source: Department of Agriculture Government of Maharashtra

Fig. 20 Fig. 21 Fig. 22



Sugarcane is planted in the major part of the tehsil except the tribal belt i.e. Surgana, Peth, Trimbakeshwar tehsils of the district. Compared with production in the 2001 to 2015 it is observed that the production has increased. This is only possible due to the availability of water in the region. As sugarcane required huge amount of water, improved irrigation system, increased in the numbers of electric pumps, dam projects has contributed in the production of sugarcane in the region.

Conclusion From the present study it can be concluded that there is remarkable increase in the numbers of irrigation facilities such as wells with electric and diesel pumps, borewells and area under dam irrigation over the period of fifteen years. This has lead in the remarkable growth in the production of crops in the region. Apart from this improved irrigation facilities have created the option for cash crops and commercial farming in the region. The production per hector of the sown crops has also increased in the region.

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"Changing Trends in Agriculture and its Impact on Rural Development"

Spatial Diffusion of Agricultural Technologies in the Fringe of Nagpur City

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Introduction

There is no doubt that agriculture has been the backbone of the Indian economy and it will continue to remain so for a long time. Moreover, this sector has been the biggest employer in the Indian economy and its growth basically controls the sustenance of the economic activities across sectors. It is known that the economic reforms, initiated in the country during the early 1990s, have put the economy on a higher growth trajectory. Moreover, this opening of the economy has led to import of many technologies in India that helped the local industries to grow exponentially. However, comparatively the import of technology in agriculture has been quite slow and whatever technology has arrived in India it's adoption by the Indian farmers has been very slow. In addition to above, the lack of awareness about good agricultural practices and ignoring value addition opportunities has made the agriculture business very challenging. In most of the states the agriculture sector is only alive and not growing. In addition to that the present cropping intensity has declined in the fringe areas of large cities (like Nagpur City of central India). The net irrigated area has also not increased significantly that presents a new challenge. The degradation of land and surface as well as ground water resources results in fast deterioration of soil health and all this demands integration of technologies in the agriculture sector. In view of the above, this study has been carried out to know the adoption of latest agriculture related technologies by the farmers of fringe areas of a large city, which is Nagpur City in the state of Maharashtra. The distance was limited to 20 kilometers from the Nagpur city limits and within this area the farmers who are 10, 15 and 20 kilometers away were selected for determination of spatial distribution of agriculture technology adoption by the farmers

Research Methodology

The present study was carried out in three steps involving reconnaissance, data collection and analysis, followed by interpretation of statistics. First the researcher visited the
fringe areas of Nagpur city and collected data about the farming practices followed by the farmers of the study area.

Research design and population

In this study a descriptive research design was used for present study. All the farmers residing the fringe area of Nagpur up to the 20 kms distance from the city limits were considered as population of the study.

Sample Size and Sampling Method

In view of the objectives of the study a total sample size of 450 was considered as an appropriate sample size for present study. Out of this 450 samples, 150 each were selected from the each fringe areas, which was identified as 10, 15 and 20 kms away from the city limits. The farmers were selected from all the directions i.e. east, west, north and south directions of Nagpur city. The selection of samples was carried out randomly.

Primary Data Collection

The primary data was collected using a structured research instrument and using survey method. The process of developing the research instrument for this study was based on generally accepted principles of instrument design, and was carried out according to the standard methodology.

Statistical Analysis of Data

The data generated during the study was processed using various statistical tests with the aid of Statistical Package for Social Sciences (SPSS) 18.0 software. The descriptive statistics, such as frequency, percentage, mode etc. were determined from the collected data.

Results and Discussion

Weather forecast technology for decision making

Table 1: Use of weather forecasting technology by farmers residing in a fringe of Nagpur City

Distance of Farms from Nagpur City	Yes		No		Total	
	Nos.	Per	Nos.	Per	Nos.	Per
10 Km away	116	77.3	34	22.7	150	100.0
15 Km away	86	57.3	114	76.0	200	133.3
20Km away	52	34.7	98	65.3	150	100.0

Table 1 shows information pertaining to use of weather forecasting technology by farmers residing in a fringe of Nagpur City. It was observed that 77.3% farmers residing 10 kms away from Nagpur city use weather forecasting technology while 22.7% farmers do not use it. However 57.3% farmers residing 15 kms away from Nagpur city use weather forecasting technology while 76.0% farmers do not use it. Furthermore 34.7% farmers residing 20 kms away from Nagpur city use weather forecasting technology while 65.3% farmers do not use it.

Automated Irrigation technology

Table 2: Use of automated irrigation technology by farmers residing in a fringe of Nagpur City

Distance of Farms from Nagpur City	Yes		No		Total	
	Nos.	Per	Nos.	Per	Nos.	Per
10 Km away	87	58.0	63	42.0	150	100.0
15 Km away	121	80.7	29	19.3	150	100.0
20Km away	109	72.7	41	27.3	150	100.0

Table 2 shows information pertaining to use of automated irrigation technology by farmers residing in a fringe of Nagpur City. It was observed that 58.0% farmers residing 10 kms away from Nagpur city use automated irrigation technology while 42.0% farmers do not use it. However 80.7% farmers residing 15 kms away from Nagpur city use automated irrigation technology while 19.3% farmers do not use it. Furthermore 72.7% farmers residing 20 kms away from Nagpur city use automated irrigation technology while 27.3% farmers do not use it.

Phase tracking technology

Table 3: Use of phase tracking (monitoring and analyzing farming activities such as crop rotation, pest control, fertilizer/water saturation, seeding/harvesting, etc.) technology by farmers residing in a fringe of Nagpur City

Distance of Farms from Nagpur City	Yes		No		Total	
	Nos.	Per	Nos.	Per	Nos.	Per
10 Km away	67	44.7	83	55.3	150	100.0
15 Km away	24	16.0	126	84.0	150	100.0
20Km away	19	12.7	131	87.3	150	100.0

Table 3 shows information pertaining to use of phase tracking (monitoring and analyzing farming activities such as crop rotation, pest control, fertilizer/water saturation, seeding/harvesting, etc.) technology by farmers residing in a fringe of Nagpur City. It was observed that 44.7% farmers residing 10 kms away from Nagpur city use phase tracking technology while 55.3% farmers do not use it. However, 16.0% farmers residing 15 kms away from Nagpur city use phase tracking technology while 84.0% farmers do not use it. Furthermore 12.7% farmers residing 20 kms away from Nagpur city use phase tracking technology while 87.3% farmers do not use it.

Light and heat control technology

Table 4: Use of light and heat control technology by farmers residing in a fringe of Nagpur City

Distance of Farms from Nagpur City	Yes		No		Total	
	Nos.	Per	Nos.	Per	Nos.	Per
10 Km away	99	66.0	51	34.0	150	100.0
15 Km away	106	70.7	44	29.3	150	100.0
20Km away	102	68.0	48	32.0	150	100.0

Table 4 shows information pertaining to use of light and heat control technology by farmers residing in a fringe of Nagpur City. It was observed that 66.0% farmers residing 10 kms away from Nagpur city use light and heat control technology while 34.0% farmers do not use it. However 70.7% farmers residing 15 kms away from Nagpur city use light and heat control technology while 29.3% farmers do not use it. Furthermore 68.0% farmers residing 20 kms away from Nagpur city use light and heat control technology while 32.0% farmers do not use it.

Soil Management using data analysis

Table 5: Use of soil management technology by farmers residing in a fringe of Nagpur City

Distance of Farms from Nagpur City	Yes		No		Total	
	Nos.	Per	Nos.	Per	Nos.	Per
10 Km away	89	59.3	61	40.7	150	100.0
15 Km away	97	64.7	53	35.3	150	100.0
20Km away	107	71.3	43	28.7	150	100.0

Table 5 shows information pertaining to use of soil management technology by farmers residing in a fringe of Nagpur City. It was observed that 59.3% farmers residing 10 kms away from Nagpur city use soil management technology while 40.7% farmers do not use it. However 64.7% farmers residing 15 kms away from Nagpur city use soil management technology while 35.3% farmers do not use it. Furthermore 71.3% farmers residing 20 kms away from Nagpur city use soil management technology while 28.7% farmers do not use it.

Intelligent software analysis for disease prediction

Table 6: Use of intelligent software analysis for disease prediction by farmers residing in a fringe of Nagpur City

Distance of Farms from Nagpur City	Yes		No		Total	
	Nos.	Per	Nos.	Per	Nos.	Per
10 Km away	9	6.0	140	93.3	149	99.3
15 Km away	0	0.0	150	100.0	150	100.0
20Km away	0	0.0	150	100.0	150	100.0

Table 6 shows information pertaining to use of intelligent software analysis for disease prediction by farmers residing in a fringe of Nagpur City. It was observed that 6.0% farmers residing 10 kms away from Nagpur city use intelligent software analysis for disease prediction while 93.3% farmers do not use it. Furthermore 100.0% farmers residing 15 and 20 kms away from Nagpur city use do not intelligent software analysis for disease prediction respectively.

Conclusions

Weather forecast technology for decision making

- In view of the study results it is evident that most of the farmers residing 10 kms away from Nagpur city

use weather forecasting technology while farmers residing 15 and 20 kms away from the city do not use it.

Automated Irrigation technology

- In view of the study results it is evident that most of the farmers residing 15 kms and 20 kms away from Nagpur city use automated irrigation technology while farmers residing 10 kms away from the city do not use it.

Phase tracking technology

- In view of the study results it is evident that most of the farmers residing 10, 15 and 20 kms away from Nagpur city do not use phase tracking (monitoring and analyzing farming activities such as crop rotation, pest control, fertilizer/water saturation, seeding/harvesting, etc.) technology.

Light and heat control technology

- In view of the study results it is evident that most of the farmers residing 10, 15 and 20 kms away from Nagpur city use light and heat control technology.

Soil Management using data analysis

- In view of the study results it is evident that most of the farmers residing 10, 15 and 20 kms away from Nagpur city use soil management technology.

Intelligent software analysis for disease prediction

- In view of the study results it is evident that most of the farmers residing 10, 15 and 20 kms away from Nagpur city do not use intelligent software analysis for disease prediction.

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Physiographic Site and Distribution of Rural Settlements in Latur District

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Abstract:
Physiographic constitutes the physical environment, which determines to a large extent to our agricultural activities. The physical aspects particularly, the relief climate drainage and soil plays a vital role in shaping the Rural Settlement. The marked differences in these factors help to explain the pattern of landuse. The people adjust further agricultural activities to the changing physical variables. Therefore, agricultural activities are governed largely by the physical controls.
Key Word: Physiography, Settlement, Landuse, ETC

Introduction:

Shelter is one of the most significant basic necessaries of human being. Even the naked saints or pygmies need sound sleep, the physiological necessity of living being at some place. Man also needs some sort of shelter for safe rest for shelter he selects tree branches, caves or pits or rock-cut
hiding places. These shelter places become the most concrete expression of human cultural activity and assume various forms as well as names. Houses, dwelling group of houses, abodes, habit action all from human habitat more specifically settlements with the establishment of any sort of dwelling the
foundation of a civilization is laid which grows flourishes and spreads like petals of blossoming flowers in all directions in varied tint and colour and temporal variation in the form of habitations these become the concrete expressions of anthropogenic and later on technogenic adaption of human being. Although all living organisms build for themselves nests dwelling like bees, beavers ants etc. An animal only Produces what it immediately needs for itself or it's young. It produces one sidely whilst man produces
universally1. This universality of houses and their grouping in the form of Settlements exhibit variations in size shape pattern and types as well as multi-distributional aspects. All being the subject matter of systematic study.

OBJECTIVES:

To study the morphology of villages and the building materials used for the construction of houses.

HYPOTHESIS:

There is an impact of physical and human factors on the development of rural settlements.

DATABASE AND METHODOLOGY:

This study has emphasized mainly spatial analysis of settlements. For this purpose, data obtained from the primary and secondary sources supplemented in making general observations. Most of the secondary data obtained from district census hand book, socio-economics review and statistical abstracts, Gazetteers of Latur District and other government and private institutes. Primary data collected at the village level with the help of questionnaires, interviews of farmers and residences of villagers. The primary and secondary data thus collected will be processed. The processed data will be presented in the form of table, graphs, diagrams and maps. The suitable statistical techniques will be used in the analysis of various attributes of rural settlement. The data will be mapped using various cartographic techniques to enhance the quality of the work.

Following methods have been used for the analysis of rural settlements

PHYSIOGRAPHY SITE AND DISTRIBUTION OF RURAL SETTLEMENTS:

According to the height the study region is broadly and conveniently divided into the following three physiographic divisions.

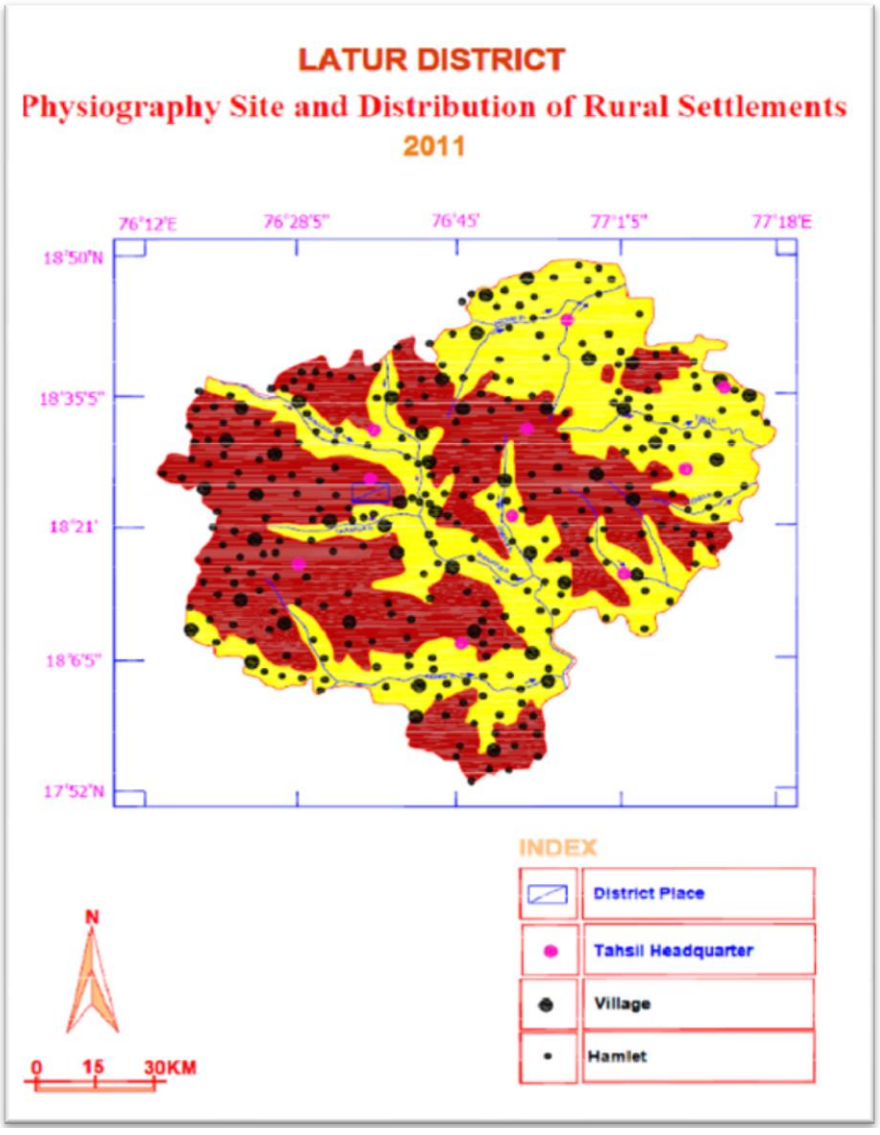
1.The plateau region
2. The River Basin region

1. The Plateau Region :

This region covers 410.09 km2 area in 502 rural settlement of the region. The average height of this region is found between 600 to 700

Physiographic Divisions and Geographical Area

Sr. No.	Physiographic Division	Area in Km^2	Percentage to total geographical area of the region	No. of Settlements
1	The Balaghat plateau	410.09	57.71	502
2	The River Basin	300.48	42.29	446
		710.57	100	948



meters above mean sea level And extends throughout the study region except hilly and lowland area. 50% of part is covered by Balaghat pleateau. It is above 600 to 900 meters from sea level but maximum part of Balaghat plateau is flat. Some hillocks found on the balaghat plateau which is known as local names.

Near wadwal a one ridge locally known as Sanjivani Bet, anyother one conical shaped hillocks near chakur which is famous for Hakkani Bet. In Udgir taluka near Deverjan found hillock named Hatti bet. These are several hillocks on Balaghat plateau in Latur district. This dissected many water streams and rivers.

2. The River Basin:

This region covers 300.48 km2 area in 446 rural settlement of the region. The average height of this region is found between 580 to 600 meters above mean sea level And extends throughout the study region except River Basin and lowland area. This is Manjra and Tawarja river Basin area near about 42.29 % of area occupied from this area. Height of this region is in between 580 to 600 meter from sea level. This division located North-East, central part and in the southern part of latur district. This is a plateau area but soil of this area is very deep and fertile. Southern part of this divison lies in the Terna river basin. Some hills and hillocks of the region is low land region and height of this hillock is about 300 to 600 meters. This region includes the plane parts formed by the river. This region is covered by the parts of the taluka of Ahmedpur, Renapur, Udgir, Shirur Anantpal, Deoni and Jalkot Region Inner Rural Settlement.

CONCULSION:

1. This region covers 410.09 km2 area in 502 rural settlement of the region. The average height of this region is found between 600 to 700 meters above mean sea level And extends throughout the study region except hilly and lowland area.
2. 50% of part is covered by Balaghat pleateau. It is above 600 to 900 meters from sea level but maximum part of Balaghat plateau is flat. Some hillocks found on the balaghat plateau which is known as local names.
3. This region covers 300.48 km2 area in 446 rural settlement of the region. The average height of this region is found between 580 to 600 meters above mean sea level And extends throughout the study region except River Basin and lowland area. This is Manjra and Tawarja river Basin area near about 42.29 % of area occupied from this area. Height of this region is in between 580 to 600 meter from sea level. This division located North-East, central part and in the southern part of latur district.
4. This is a plateau area but soil of this area is very deep and fertile. Southern part of this divison lies in the Terna river basin. Some hills and hillocks of the region is low land region and height of this hillock is about 300 to 600 meters. This region includes the plane parts formed by the river. This region is covered by the parts of the taluka of Ahmedpur, Renapur, Udgir, Shirur Anantpal, Deoni and Jalkot region inner Rural settlement.

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Diagnosis and Forecast of Global Climate Change

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Abstract

Climate change refers to changes beyond the average atmospheric condition that are caused both by natural factors such as the orbit of earth's revolution, volcanic activities and crustal movements and by artificial factors such as the increase in the concentration of greenhouse gases and aerosol. Climate change by global warming, which refers to the average increase in global temperature, has become a megatrend that will lead to significant global changes in the future. Concerning its impacts, the UN Intergovernmental Panel on Climate Change (IPCC) presented considerable scientific evidences in its fourth report on climate change (2007) and they have become clearly recognized worldwide. In addition, people have become more aware of the fact that global warming cannot be avoided due to the continued increase in greenhouse gas emissions and the changes in the climate system. The Club of Rome Report 1972 officially raised global warming as an international issue and, in 1985, World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) officially declared carbon dioxide as the principal cause of global warming. In order to effectively cope with the global warming issue, Intergovernmental Panel on Climate Change (IPCC) was organized in 1988 and has carried out systematic research and in-depth studies on climate change.

Keyword: global warming, Climate Change, Meteorology

Introduction

Earth has risen 0.74℃ over the past 100 years (1906~2005) (Korea Meteorological Agency, 2008). Global warming not only causes a change in average temperature and precipitation but also increases the frequency of floods, droughts, heat waves, and the intensity of typhoons and hurricanes following the change in temperature and precipitation patterns. The impacts of climate change are also shown in various other forms throughout the world, including the rise of sea level, decrease in glaciers, northward movement of plant habitats, changes in animal habitats, rise of ocean temperature,

As the acceleration of global warming affects not only ecological systems but also human life, it has become an important issue both nationally and internationally. Approaches to deal with the issue of global warming are divided largely into mitigation measures, focusing on reduction and absorption of greenhouse gases, the causative factors, and adaptation measures to minimize the damages by climate change. So far, the global warming issue has focused on the mitigation of greenhouse gases based on international environmental conventions such as IPCC and Kyoto Protocol. For agriculture,

however, the focus has been shifted to adaptation and adaptability based on the assessment of the impacts of climate change and vulnerability to it. IPCC emphasizes that it is very important for the agricultural sector to adapt to climate change. This is because even if greenhouse gas emissions decrease, global warming will still continue for the next several decades due to its previously emitted greenhouse gases.

It takes at least 5 to 10 years to assess the impacts of climate change and the vulnerability to it and prepare proper countermeasures against it. Especially, as agriculture is climate-dependent and thus susceptible to climate change, it is very urgent to prepare adaptation measures against climate change. Proper countermeasures drawn based on scientific diagnosis and assessment of the impacts of climate change on East Asian countries' agriculture are essential in establishing the vision and administrative policies of future agriculture. This will also provide valuable information for local governments in establishing mid to long-term agricultural development plans and for farming households to prepare their production plans.

Diagnosis and Forecast of Global Climate Change

Current Conditions of Global Warming

Climate refers to a long-term variation in the atmospheric condition of a specific region or regions, and climate change means a gradual change in the climate system both by natural and artificial causes. Climate change is caused by the change in each component of the climate system such as atmosphere, hydrosphere, biosphere, cryosphere and lithosphere or by complicated interactions among

those components. The causes of climate change are largely divided into natural causes and artificial causes. Natural causes include the change in solar activity, volcanic eruption, sea water temperature, ice cap distribution, westerly waves and atmospheric waves. On the other hand, artificial causes include carbon dioxide emission from industry and agricultural production activities, deforestation, acid rain and the destruction of the ozone layer by Freon gas, with global warming by the increase of greenhouse gases as the representative (Presidential Advisory Council on Education, Science & Technology: PACEST, 2007).

Global warming refers to the average increase of the Earth's temperature due to the greenhouseeffect caused by carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydro fluorocarbon (HFCs), perfluorocarbon (PFCs) and sulfur hexafluoride (SF_6). [1] Global warming, meaning a continuous increase of the Earth's temperature due to the greenhouse effect, started from the time of the Industrial Revolution which was accompanied by a rapid increase of fossil fuel consumption. This issue has attracted international interests as the scientific knowledge of climate has accumulated since the 1970s and it has been widely accepted by scientists that the anthropogenic greenhouse gas emissions are the cause of global warming.

The global greenhouse gas concentration based on carbon dioxide is estimated to have increased from 280ppm before the Industrial Revolution (1750) to 379ppm in 2005. According to an analysis of the average temperatures of the Earth (Climate Research Unit, 2009), the increase of the Earth's average temperature so far, since the Industrial Revolution, appears to be much higher than the increase before the Industrial Revolution. Specifically, global warming has significantly accelerated since 1980 and the average temperature of 1998 was shown to be 0.58℃ higher than the average temperatures of 1960~1990. As shown in the Figure 1, 11 out of 12 hottest years since 1850 were recorded to be in the last 12 years.

To make a systematic and reliable diagnosis of global warming, scientific analysis of climate change has been periodically made by IPCC since 1990. So far, IPCC has published its First (1990), Second (1995) and Third (2001) Assessment Report and its Fourth Assessment Report was being prepared as its Working Group I (Physical Science of Climate Change), Working Group II (Impacts, Adaptation, Vulnerability) and Working Group III (Mitigation of Climate Change) announced their reports in April 2007 (IPCC, 2007).[2] IPPC WGI Report, which was prepared based on physical science, suggests that the atmosphere's carbon dioxide concentration has increased by about 1.4 times (379ppm in 2005) over the past 100 years, in comparison to the pre-industrialization concentration (280ppm). Accordingly, it is estimated that the average global temperature has risen 0.74℃ (0.56~0.92℃) over the past 100 years (1906~2005) Especially, the average temperature of the Northern hemisphere in the late 20th century, which appears to be the highest temperatures recorded since 1850 and the temperature rise during the last 20 years is shown to be more than twice that of the past 100 years. This report states that there is no doubt that global warming is occurring in the climate system and affirms that greenhouse gases are an artificial cause of global warming.[3]

As global warming continues, the temperature of the North Pole and the South Pole have risen, accelerating the rate of ice cap melting, shortening the ice-breaking period in the polar lakes and thus causing a significant rise in sea level. Furthermore, global warming causes extreme climatic phenomena such as flood, drought and heat waves, increasing the occurrence of natural disasters worldwide (Korea Meteorological Agency, 2008).[4]

- **Current Conditions and Forecasts of Global Climate Change**

As global climate change is affected by various factors such as regional characteristics, socioeconomic variables and meteorological variables, it is forecasted by making several feasible scenarios.

The IPCC Assessment Report provides greenhouse gas emission scenarios by forecasting the change in greenhouse gas concentration according to demographics and socioeconomic development. The Special Report on Emission Scenario (SRES) presents four main scenarios (A1, A2, B1, and B2) and three other scenarios (A1F, A1T, A1B) modified according to their technological emphasis in the A1 scenar

The A1 scenario assumes a very-rapid economic growth, in which the rapid growth of the global economy and population peaks in 2050 and declines thereafter, in which then new efficient technologies are introduced. It is divided into three groups according to the alternative development of energy technology. The three scenarios are the fossil intensive scenario (A1F1), non-fossil energy scenario (A1T), and balanced-energy source scenario (A1B) A2 is the scenario for a heterogeneous world

with a high population growth rate, a low economic growth rate, and the most diversified but slowly developing technologies.

The B1 scenario assumes the same population growth rate as that of the A1 scenario but at a lower economic growth rate. In this scenario, the economic structure changes toward a service and information economy and the sustainable development is pursued with an emphasis on clean and resource-efficient technologies.

B2 is a scenario for a world where regions coexist with each other in harmony. This scenario assumes the intermediate level of population and economic growth between A1 and B1, and focuses on regional solutions for economic, social and environmental sustainability.

The average global temperature by the end of the 21st century is estimated to rise by 1.1~6.4℃ from the period of 1980~1999, and the sea level is forecasted to rise by 18~59cm due to heat expansion and the loss of land glaciers

- Estimated temperature rise in 2100 under each scenario

Scenario	Temperature Change (℃)		Sea Level Rise (cm)
	Optimal Estimation	Expected Range	
Very rapid economic growth (A1FI)	4.0	2.4~6.4	26~59
Non-fossil intensive energy (A1T)	2.4	1.4~3.8	20~45
Balanced-energy source (A1B)	2.8	1.7~4.4	21~48
Heterogeneous world (A2)	3.4	2.0~5.4	23~51
Continuous development (B1)	1.8	1.1~2.9	18~38
Coexistence of regions (B2)	2.4	1.4~3.8	20~43

Estimates of future climate change vary greatly from scenario to scenario. In the continuous development scenario (B1), in which environmental conservation and economic development are compatible with each other, temperature change is estimated to be about 1.8℃ (1.1~2.9℃), while the rise of about 4.0℃ (2.4~6.4℃) is expected under the very rapid economic growth scenario (A1) based on fossil-intensive energy sources. By 2030, however, it is estimated in all scenarios that the temperature will rise at the rate of 0.2℃ for every 10 year According to the fourth IPCC Assessment Report, it is anticipated that the impacts of climate change will vary greatly with the degree of temperature rise and the latitudinal locations. When the temperature rise is less than 1℃, damages by natural disasters such as water shortage and floods are foreseen in some areas. However, the report warns that if the temperature rises by 2~3℃, most areas will be subject to damages by natural disasters and about 20~30% of animals and plants will be subject to endangerment. Furthermore, if the temperature rises by more than 3℃, substantial economic and environmental damages are expected, including chronic water shortages, ecosystem destruction, reduced food production, and increased occurrences of diseases

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"Changing Trends in Agriculture and its Impact on Rural Development"

Sustainable Agricultural Development in India: A Study

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Abstract:

Due to many decades of agricultural experience and science, various sustainable farming practices have emerged in the field of agriculture. For example: adoption of rotational crops and crop diversification method. Crop diversification methods include intercropping (increasing cultivation of different crops in the same area) and complex annual crop rotations. In general, agriculture has a significant impact on natural resources and the environment. Sustainable farming practices are useful for protecting the environment, expanding the earth's natural resources, increasing soil fertility and conserving it. In addition, sustainable agriculture helps achieve the three main objectives of environmental health, economic benefits and social equity. In addition, goals such as different policies, philosophies and different agricultural practices can be achieved, but some common themes and principles are woven through most definitions of sustainable agriculture. By adopting sustainable practices, farmers will reduce their non-renewable energy, reduce chemical use and save resources, reduce soil erosion by improving land health in response to growing populations and food demand, and again It will help in increasing its fertility to ensure high yield.

Key words: Sustainable, Environment, Biodiversity, Agriculture etc.

Objective:

1) To study the solution to the food problem of the nation
2) To study sustainable agricultural production

Research Methodology:

The present study relies entirely on secondary literature with information obtained from various sources. The information is collected from various literacy and philosophy articles and is the main source of this article. It includes research reference books of research literature.

Introduction:

The role of agriculture in the Indian economy is reflected in its contribution to GDP and employment. This sector contributes significantly to the sustainable economic development of any country. Depend on their judicious mix of available natural resources. In fact, agriculture determines the fare of a country like India, where nearly two-thirds of the population still lives in rural India, with agriculture as subsistence, despite increasing urbanization, mistaken for agriculture for decades. This will be really bad for the economy as slowdown in agricultural growth affects not only employment but also GDP. The larger objective of the reform of the agricultural sector can be achieved through the rapid development of agriculture, which for a country likes India, increased crop intensity and productivity but more than the other two countries in terms of increase in productivity. Is important, this has been made easier by increasing urbanization, industrialization and the limited land size of the country.

Sustainable agricultural development is the idea that human society should live and meet the needs of future generations without compromising on their ability to meet their own needs. The official definition of sustainable agricultural development was given by the

Australian agronomist Gordon McLemond. The term sustainable agriculture became popular in the 1980s. The movement for sustainable agricultural development began between 1950 and 1960. At a time when the Green Revolution modem was exporting high-tech agriculture around the world, a counter-movement in the sustainable agriculture movement had begun. The sustainable agriculture movement is at the heart of the 2030 agenda, and is the first step towards achieving zero, while many SDGs address issues related to agriculture, as agriculture contributes to development – as an economic activity, as a source of livelihood and a provider of environmental services. Suggests that all sectors, including agriculture, should be considered in three dimensions of sustainability: economic, social and environmental.

Sustainable Agricultural Development:

The concept of sustainable development was first introduced to the United Nations in 1972 at the Human Development Conference in Stockholm with a global focus on the environment, environment and poverty. Conceptual progress on sustainable development gained importance after the publication of the book "Our Common Future for the Conservation of Natural Resources and Energy" in 1987 at the World Conference on Environment and Development held in Rio de Janeiro. The report, known as the Brandtland Report, named after Gro Harlem Brundtland, the farmer prime minister of Norway, drew attention to the development of the country as a whole. Sustainable development means achieving economic development without duplicating or exploiting natural resources. It is a principle of meeting human needs while maintaining natural order. Sustainable development is a way to meet human needs and livelihoods without harming natural resources. Now this concept is focused on social development and protection of environment.

The Brundtland Report defines "sustainable development" as one that meets current needs without compromising the ability of future generations to meet their own needs. Sustainable development aims to end hunger, achieve food security and better nutrition and promote sustainable agricultural empowerment of small farmers, gender equality, eradication of rural wealth, and the health problem of sustainable development under three broad types of farming methods. is to promote. : 2) Modern farming system and 3) Sustainable farming system.

Next, we can compare them in three dimensions: environmental, economic and social sustainability. Environmental Sustainability Most traditional and non-traditional methods are not environmentally sustainable. They abuse natural resources that reduce soil fertility and reduce soil erosion and contribute to global climate change. But sustainable farming has some advantages over traditional methods.

Soil Fertility: Continuous decline in soil fertility is a major problem in many parts of India. Sustainable agriculture improves fertility and soil texture.

Water: Irrigation is the largest consumer of fresh water, with fertilizers and pesticides contaminating both surface and groundwater. Sustainable agriculture increases the amount of organic matter in the top soil, thus increasing the ability to retain and store rain-soaked walls.

Biodiversity: Sustainable farming practices include mixed crops, thus increasing the yield of diversified crops and increasing the diversity of insects and other animals and plants in and around the farm.

Health and Pollution: Health and pollution, chemical pesticides, fertilizers adversely affect the local environment as well as improper use of pesticides by the population can cause health problems. Sustainable agriculture reduces the use of hazardous chemicals and controls pests.

Land Use Patterns: On Land Exploitation; Sunshine, landslides and floods cause traffic

jams. Irrigation reduces the capacity of canals and soil. Sustainable agriculture avoids these problems by increasing productivity, soil conservation, etc.

Climate: Conventional agriculture contributes to the production of greenhouse gases in various ways such as production of methane in irrigated areas and reduction of carbon stored in soil and plants through production of synthetic fertilizers. One can easily overcome this problem by adopting sustainable farming methods.

Social Sustainability:

Social sustainability means that agricultural techniques are related to the ideas of social acceptance and justice. Development cannot be sustainable without reducing poverty. The government must find ways to benefit the rural poor from agricultural development, there is social injustice where some sections of the society neglect the opportunities for development. But having a strong system of social stability can bridge the gap between "disturbed and not". Many new technologies could not be implemented in the agricultural sector due to lack of acceptance by the local community. Sustainable farming practices are based on traditional knowledge and local innovations; The local people are aware of the crops and animals in their environment. Traditional agriculture is mostly gender absent, where women bear the heaviest burden in terms of labor. Sustainable farming ensures that burdens and benefits are shared equally between men and women, whereas traditional farming focuses on a few commodities, sustainable agreed time quality, nutritional value of food and mass production throughout the year. Improves the quality of food by improving Traditional farming was also carried on by caste and money-intensive people. The rich and upper castes benefited more, while the poor and lower castes were excluded. Sustainable Agriculture strives to ensure equal participation for every individual by organizing voice and speech.

Economic Sustainability:

For agriculture to be sustainable, it must be economically viable in the long run. Conventional farming carries greater economic risk than long-term sustainable farming. Sometimes governments consider export-oriented production systems more important than meeting domestic demand. This is not true, focusing only on exports involves hidden costs in transportation, local food security promises, etc. Policies must consider domestic demand and specific food security as equally important as the balance of trade, a popular misconception that some goods promise high economic returns. . But the market is at risk of being veiled because the market is volatile and changes rapidly. Cheap foreign food can enter the national market. As a signatory to the WTO, the Indian government is pushing for control and the global economy to open up its economy so that it cannot protect its farmers behind walls. Agriculture is the main source of employment for the rural people. Specialization and mechanization tendencies can increase the measured efficiency to some extent but it also reduces on-the-ground employment. The welfare value of unemployment must be taken into account when designing national agriculture with an emphasis on small-scale, labor-intensive initiatives to help address these problems.

Objectives of Indian Agriculture for Sustainable Development:

The Sustainable Development Goals are outlined in a document titled Future Wanted to Be Presented at the United Nations Conference on Sustainable Development ---

1) poverty alleviation 2) zero hunger 3) good health and welfare 4) quality education 5) gender equality, clean water and sanitation 6) good work and economic development 7) innovation and reduction of infrastructure inequality 8) sustainable cities and communities 9) Responsible Use and Production 10) Climate Action 11) Underwater Life 12) Earth Life 13) Peace, Justice and Organization 14) Partnerships to Achieve Objectives.

The world of globalization brought modern technology which led to the

development of industries but still agriculture plays a major role in the process of economic development of India. The development of agricultural sectors is an integral part of the development of other sectors. Agriculture provides food to the people, employs labor, promotes rural savings and investment, the cost of agro-based industries plays a measurable role in India's population, more efforts to meet the growing demand for food and Innovations are needed and this should increase agricultural production, reduce wastage and loss of food and ensure the availability of food for the whole country. Thus the role of agriculture is indispensable for the development of the economy and nature is an important factor for its development. Sustainable agriculture is farming without compromising on nature, without duplicating or exploiting natural resources; Hence, the orientation of technological and organizational changes in this way. Which meets the human needs of present and future generations and ensures continuous satisfaction? Is that sustainable agriculture is a path of agricultural development that is non-degrading to the environment, technically feasible and socially acceptable (FAO-1991).

Factors of Sustainable Agricultural Development:

The key components of both sustainable production and traditional agriculture are equitable soil management, crop management, water management, disease/pest management and waste management. It is the method used that is often radically different. We will discuss them in the course of soil management. On a conventional farm, maintaining and maintaining soil fertility is as easy as monitoring the soil and applying recommended doses of nitrogen, phosphorus, potassium and other nutrients to meet the needs of the crop. In sustainable agriculture, soil fertility is maintained and crops are carefully rotated and improved liberally by compost and green manure, which are cover crops that are taken back into the soil to enrich the manure.

-Ensuring the supply of nutritious food and the health of the people

- Reduce food wastage and achieve food security

-To help and support small and marginal farmers and women, develop new farming models that increase rural income and lead to rural development.

-Protecting and nurturing the environment through the principles of efficient use of resources and reducing carbon emissions that are harmful to the environment and human health.

-Long-term investment in agricultural resources.

Conclusion:

However it is much more than a collection of sustainable farming methods. It is a process of dialogue as well as engaging the interests of individual farmers in the community, as they work or solve complex problems with how we grow our food and fiber.

There are several methods commonly used by people working in sustainable agriculture and food systems. Growers can use methods to promote soil health, reduce water use, and reduce agricultural pollution levels. Consumers and retailers are concerned with foods grown using methods that are "value-based", eco-friendly, or that promote the health of structures that strengthen the local economy. And researchers in sustainable agriculture often cross disciplinary lines with their work, mixing neology, economics, engineering, chemistry, community development and many others.

Sustainable agricultural practitioners seek to integrate three main objectives into their work; Healthy environment, economic benefits, social and economic equality. Food system manufacturers, food processors, distributors, retailers and everyone involved in waste management can play a role in ensuring sustainable systems.

Sustainable agriculture aims to meet the community's current food and clothing needs

without compromising the ability of future generations to meet their own needs - Brandland Report

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"Changing Trends in Agriculture and its Impact on Rural Development"

Agriculture Activities and its Impact on Rural Settlements

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Abstract

Agricultural and Rural Development Policies are necessary to improve the efficiency in supplementing the efforts of states to enhance agriculture production and productivity. To motivate the farmers for more food grain production, union government has launched policy of Minimum Support Price since 1966-67. This policy ensures minimum price to farmers for each crop. On the other hand, this policy saved the interests of rural poor. Important policy measures introduced in the rural sector in India during the period of planning are as follows Technological Measures

Introduction –

Initiation of measures to substantially increase agricultural production to meet the growing needs of the population and also to provide a base for industrial development. It includes steps to increase both extensive and intensive cultivation. For the former, irrigation facilities were provided to a large area on an increasing basis and areas hitherto unfit for cultivation were made fit for cultivation. For the latter, new agricultural strategy was introduced in the form of a package programme in selected regions of the country in 1966. To sustain and extend this programme to larger and larger areas of the country, steps were taken to increase the production of high-yielding varieties of seeds, fertilisers and pesticides within the economy and supplement domestic production by imports whenever necessary.Food grain production which was merely 50.8 million tonnes in 1950-51, rose to record level of 252.6 million tonnes in 2011-12

Land Reforms

Land reform measures were introduced to abolish intermediary interests in land. Measures taken under this head included: (i) Abolition of intermediaries; (ii) Tenancy reforms to (a) regulate rents paid by tenants to landlords, (b) provide security of tenure to tenants, and (c) confer ownership rights on tenants; and (iii) Imposition of ceilings on holdings in a bid to procure land for distribution among landless labourers and marginal farmers

Cooperation and Consolidation of Holdings

In a bid to reorganise agriculture and prevent subdivision and fragmentation of holdings, the Indian agricultural policy introduced the programmes of co-operation and consolidation of holdings. The latter programme aimed at consolidating all plots of land owned by a particular farmer in different places of the village by sanctioning him land at one place equal in area (or value) to his plots of land

Institutions Involving People Participation in Planning

Bringing small and marginal farmers together to cultivate jointly is only half of the story. It was precisely with this end in view that the Programme of Community Development was initiated in 1952 in the

country. Another programme designed to encourage the participation of masses in the planning process (and political decision-making) was the programme of democratic decentralisation, often known as Panchayati Raj.

Institutional Credit: National Bank for Agriculture and Rural Development

(NABARD) was also set up. As a result of the expansion of institutional credit facilities to farmers, the importance of moneylenders has declined steeply and so has the exploitation of farmers at the hands of moneylenders. Currently agricultural credit limit has reached at 8.5 lac cr for 2015-16.

Procurement and Support Prices: To provide remunerative prices to the farmers so that they feel motivated to show more crops.

Input Subsidies to Agriculture**:** The government has provided massive subsidies to farmers on agricultural inputs like irrigation, fertilisers and power.

Food Security System

In a bid to provide food grains and other essential goods to consumers at cheap and subsidised 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.

Rural Employment Programmes

The government introduced various poverty alleviation programmes particularly from Fourth Plan onwards like Small Farmers Development Agency (SFDA), Marginal Farmers and Agricultural Labour Development Agency (MFAL),National Rural Employment Programme (NREP), Rural Landless Employment Guarantee Programme (RLEGP), JawaharRozgarYojana (JRY) , Jawahar Gram SamridhiYojana (JGSY),SampoornaGrameenRozgarYojana (SGRY), National Food for Work Programme (NFFWP),Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), etc.

RashtriyaKrishiVikasYojana (RKVY)

The RKVY was launched in 2007-08 with an outlay of Rs. 25,000 crore in the Eleventh Plan for incentivising States to enhance public investment to achieve 4 per cent growth rate in agriculture and allied sectors during the Eleventh FiveYear Plan period. The RKVY format permits taking up national priorities as sub-schemes, allowing the States flexibility in project selection and implementation. The sub-schemes include, Bringing Green Revolution to Eastern India (BGREI); Integrated Development of pulses villages (60,000) in Rain fed areas; Promotion of Oil Palm; Initiative on Vegetable Clusters, Nutri-cereals; National Mission for Protein Supplements; Accelerated Fodder Development Programme and Saffron Mission

National Food Security Mission (NFSM)

The NFSM is a crop development scheme of the Government of India that aims at restoring soil health and achieving additional production of 10, 8 and 2 million tons of rice wheat and pulses respectively by the end of 2011-12. It was launched in August 2007 with an approved outlay of Rs. 4,883 crore for the period 2007-08 to 2011-12. The Mission has focused on the Districts with productivity of wheat/rice below the State average

Economic sustainability

Agricultural policy measures that support commodity prices are poor instruments for improving the rural economy. Measures that target economic sustainability in rural areas are better - for example, encouraging the development of new or diversified economic activities for farm households, or ensuring the supply of rural amenities.However, the greatest benefits to rural areas are likely to be generated by a shift away from an agricultural sectorial emphasis towards place-based policies that address the overall economic performance of rural areas.

Rural areas are home to one-quarter of the population of OECD countries. They provide vital food, energy, and environmental resources that are crucial to the prosperity of urban and rural dwellers alike. They are a growing source of manufacturing and service-sector production. They provide employment and have quality of life attributes that are increasingly valued by citizens. We need to adopt a rural focus because these areas also face specific challenges. Rural regions are consistently over-represented among the best-performing regions in the OECD on a range of socio-economic indicators, but they are also over-represented among the worst-performing.

Macro Management of Agriculture

Macro Management of Agriculture (MMA) is one of the centrally sponsored schemes formulated in 2000-01 with the objective to ensure that Central assistance is spent through focused and specific interventions for development of agriculture in States. To begin with, the scheme initially consisted of 27 Centrally sponsored schemes relating to Cooperative Crop Production Programmes (for rice, wheat, coarse cereals, jute, and sugarcane), Watershed Development Programme (National Watershed Development Project for Rain fed Areas, River Valley Projects/Flood Prone Rivers), Horticulture Fertiliser, Mechanisation and Seed Production Programmes. With the launching of National Horticulture Mission (NHM) in 2005-06, 10 schemes pertaining to horticulture development were taken out of purview of this scheme. In the year 2008-09, Macro Management of Agriculture Scheme was revised to improve its efficacy in supplementing/complementing efforts of States towards enhancement of agricultural production and productivity

In an effort to extend Green Revolution to the Eastern Region of the country and develop dry land areas, the Seventh Five Year Plan introduced two specific programmes

1. Special Rice Production Programme
2. National Watershed Development Programme for Rain fed Agriculture

To increase the production of oil seeds to reduce imports and achieve self-sufficiency in edible oils, the Technology Mission on oilseeds was launched by the Central government in 1986. Subsequently, pulses, oil palm and maize were brought within purview of the Mission in 1990- 91, 1992 and 1995-96, respectively

An Accelerated Irrigation Benefit Programme (AIBP) was launched during 1996-97 to give loan assistance to the States to help them complete some of the incomplete projects. Rs. 50,381 crore was released under AIBP as Central Loan Assistance/grant from 1996-97 to November 31, 2011

To meet the demand for bringing in more crops into the purview of crop insurance, extending its scope to

cover all farmers (both loanee and non-loanee) and lowering the unit area of insurance, the government introduced 'National Agriculture Insurance Scheme (NAIS), in the country from Rabi 1999-2000. The scheme envisages coverage of all the food crops (cereals and pulses), oilseeds and annual horticultural/commercial crops, in respect of which yield data are available for adequate number of years. With the aim of further improving crop insurance schemes, themodified NAIS (MNAIS) is under implementation on pilot basis in 50 districts in the country from Rabi 2010-11 seasons

To facilitate access to short-term credit by farmers, a Kisan Credit Card (KCC) scheme was introduced in 1998-99. The scheme has gained popularity and its implementation has been taken up by 27 commercial banks, 378 District Central Cooperative Banks/State Cooperative Banks and 196 Regional Rural Banks throughout the country

In addition to RIDF, another important initiative for building up rural infrastructure was the announcement of the Bharat NirmanProgramme in 2005. This programme covers six components of infrastructure: Irrigation, rural roads, rural housing, rural water supply, rural electrification and rural telephony. The targets are as under: (a) irrigation - to create 10 million hectares of additional irrigation capacity; (b) rural roads - to connect all 'habitations (66,802) with population above 1,000 (500 in hilly/tribal areas) with all weather roads; (c) rural housing - to construct 60 lakh houses for rural poor; (d) rural water supply - to provide potable water to all uncovered habitations (55,067) and also address slipped back and water quality affected habitations; (e) rural electrification - to provide electricity to all un-electrified villages (1,25,000) and to connect 23 million households below the poverty line; and (f) rural telephones - to connect all remaining villages (66,822) with public telephones.

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भारतीय अर्थव्यवस्थेत पशुधनाची भूमिका व योगदान

भंडारे माधव मारोतीरेड्डी[1] प्राचार्य डॉ.एस.एच. गोने[2]
संशोधक , श्री हावगीस्वामी महाविद्यालय, उदगीर जि.लातूर
मार्गदर्शक , उज्वल ग्रामीण महाविद्यालय घोणसी ता.जळकोट जि.लातूर

प्रस्तावना

भारत हा कृषीप्रधान देश आहे. ग्रामीण भारतातील सामाजिक व आर्थिक स्तरावर ग्रामीण लोकांचा उपजीविकेसाठी कृषी व्यवसायासोबतच पशुपालन हा एक अविभाज्य घटक समजला जातो. बऱ्याच भागामध्ये कृषी उत्पन्नापेक्षाही अधिक पशुधनापासून मिळणारे उत्पन्न शेतक-यांसाठी वरदान ठरत असल्याचे दिसून येत आहे. मागील तीन दशकांपासून पिक उत्पादन क्षेत्रापेक्षाही पशुधन उत्पादन जास्त असल्याचे दिसून येत आहे व कृषी विकासासाठी पशुधन हे महत्त्वाची भूमिका बजावत आहे. भारतासारख्या विकसनशील राष्ट्रामध्ये विशेषतः ग्रामीण भागामध्ये दारिद्र्याचे समूळ उच्चाटन करण्यासाठी पशुधनाकडे एक महत्त्वाचे साधन म्हणून पाहिले जाते. भारतामध्ये शेतकरी फक्त कृषी उत्पन्नावरच अवलंबून नसून पशुधन सांभाळणेही महत्त्वाचे मानतात. शेतक-यांचे उत्पन्न कृषी विकास व ग्रामीण अर्थकारण हे खूप मोठ्या प्रमाणावर पशुधनावर अवलंबून आहे. लहान शेतकरी समूहांना तर पशुधन हे एक महत्त्वाचा उत्पन्नाचा स्रोत आहे.

उद्दिष्टे

1. भारतीय अर्थव्यवस्थेत पशुधनाची भूमिका अभ्यासणे.
2. भारतीय अर्थव्यवस्थेत पशुधनाचे योगदान अभ्यासणे.

संशोधन पद्धती

प्रस्तुत शोधनिबंधासाठी विविध संदर्भ ग्रंथ, शासकीय अहवाल, भारतीय जनगणना अहवाल, राष्ट्रीय सांख्यिकीय विभागाची आकडेवारी तसेच इंटरनेटवरील विविध संकेतस्थळावरील माहितीसाठी आधार घेण्यात आलेला आहे. प्रस्तुत शोधनिबंधात सन 2004-05 ते 2013-14 या दहा वर्षांच्या कालावधीचा अभ्यास केलेला आहे.

विषय विवेचन

भारतीय अर्थव्यवस्थेत पशुधनाची भूमिका अत्यंत महत्त्वाची आहे. कोणत्याही देशाच्या अर्थव्यवस्थेत पशुधनाला अनन्यासाधारण असे महत्त्व आहे. म्हणूनच भारतीय आर्थिक विकासात पशुधनाची भूमिका काय आहे हे पाहणे अत्यंत महत्त्वाचे आहे.

स्थुल एतद्देशीय उत्पादनामध्ये कृषी उत्पादनामध्ये पशुधनाचा हिस्सा

सन 2012-13 च्या आकडेवारीनुसार पशुधन व मत्स्यव्यवसाय क्षेत्रातील स्थूल एतद्देशीय उत्पादनात पशुधनाचा वाटा 4.1 टक्के तर मस्त्य उत्पादनाचा वाटा 0.8 टक्के एवढा होता. पुढे हाच वाटा

2013-14 मध्ये 3.9 टक्के नि खाली आला. सन 2012-13 साली कृषी व कृषीपूरक क्षेत्राचे सकल एतद्देशीय उत्पादन (जीडीपी) योगदान 15.1 टक्के एवढे होते. पुढे सन 2013-14 मध्ये कमी होवून 11.8 टक्के यावर आले. एकूण कृषी उत्पादनापैकी पशुधनापासून मिळणा-या उत्पादनाचा वाटा सन 2012-13 मध्ये 27.3 टक्के एवढा होता व तसेच सन 2013-14 मध्ये 32.9 टक्के एवढा होता.

तक्ता क्र.1

भारताच्या स्थूल एतद्देशीय उत्पादनात कृषी व पशुधन क्षेत्राचा हिस्सा

वर्ष	जी.डी.पी. एकूण उत्पन्न	जी.डी.पी. कृषीक्षेत्र		जी.डी.पी. पशुधन क्षेत्र		
		रूपणे एकूण कोटीमध्ये	एकूण जी.डी.पी. मधील टक्केवारी	रूपये एकूण कोटीमध्ये	एकूण जी.डी.पी. मधील टक्केवारी	कृषी उत्पादनातील पशुधनाची टक्केवारी
2004-05	2971464	476634	16.04	119333	4.02	25.03
2005-06	3390503	536822	15.83	127518	3.76	23.8
2006-07	3953276	604672	15.30	142695	3.61	23.6
2007-08	7582086	716276	16.63	169256	3.69	23.6
2008-09	5303567	806646	15.21	200440	3.78	24.8
2009-10	6108903	928586	15.20	237059	3.88	25.6
2010-11	7266966	1132038	15.58	276105	3.80	24.4
2011-12	8353495	1268081	15.18	327838	3.92	25.9
2012-13	9388876	1417468	15.10	386246	4.11	27.3
2013-14	10477140	1233595	11.8	406035	3.9	32.9

स्त्रोतः राष्ट्रीय सांख्यिकीय विभाग, केंद्रीय सांख्यिकीय कार्यालय भारत सरकार, 2014-15

वरील तक्त्यावरून सन 2004-05 ते 2013-14 या दहा वर्षांच्या कालावधीचा अभ्यास करता असे दिसून येते की, सन 2012-13 मध्ये कृषी उत्पादन असलेल्या पशुधनाच्या 27.3 टक्के वाटयावरून सन 2013-14 मध्ये हाच वाटा 32.9 टक्के वर पोहोचला. म्हणजेच कृषी उत्पादन वाढवण्यासाठी पशुधनाचा वाटा सातत्याने वाढत असलेला दिसून येतो.सन 2013-14 मध्ये देशाच्या स्थूल एतद्देशीय उत्पादनामध्ये जवळपास 3.9 टक्के वाटा हा पशुधन क्षेत्राचा असल्याचे दिसून येते. तसे पाहिले तर सन 2012-13 च्या असलेल्या 4.11 टक्के असलेल्या उत्पादनापैकी सन 2012-13 मध्ये 3.9 टक्के वर घसरून कमी झाल्याचे दिसून येते. कृषी उत्पादनाचा जेव्हा आपण विचार करतो तेव्हा त्या कृषी उत्पादनामध्ये सन 2012-13 मध्ये पशुधन क्षेत्राचा हिस्सा 27.03 टक्के एवढा होता. पुढे तोच वाटून सन 2013-14 मध्ये 32.9 टक्के एवढा झाला. यावरून असे दिसून येते की, सन 2004-05 पासून पशुधन क्षेत्राचे कृषी उत्पादनातील योगदान सातत्याने वाढत असल्याचे दिसून येते.

पशुधन हे भारतीय कृषी क्षेत्राचा व भारतीय कृषी उत्पादन वाढविण्यासाठी अविभाज्य भाग बनला आहे. कृषी क्षेत्राच्या वाढ व विकासासाठी पशुधनास अनन्यसाधारण असे महत्त्व आहे. दुस-या बाजूने

पशुधनाचा विचार केला असता मानवाच्या खाद्यान्न गरजा भागविण्यासाठी व पौष्टिक खाद्य पुरवठयासाठी तसेच स्वयंरोजगाराच्या संधी उपलब्ध करून देण्यासाठी पशुधन उपयुक्त असल्याचे दिसून येते. भारतीय शेती ही निसर्गावर अवलंबून असल्यामुळे कधी-कधी उत्पादन नाही झाले तर पशुधन निश्चितच येथील शेतक-यांना उत्पन्नाचा एक पर्याय म्हणून उपयुक्त ठरते.

निष्कर्ष

भारताच्या राष्ट्रीय उत्पन्नात पशुधनाचे योगदान अत्यंत महत्त्वपूर्ण असलेले दिसून येते. सन 2013-14 मध्ये कृषी जी.डी.पी. मध्ये 32.9 टक्के आणि एकूण जी.डी.पी. मध्ये 3.9 टक्के योगदान दिले आहे. हे जगातील विविध देशांना त्यांच्या उपउत्पादकांची निर्यात करून परकीय चलन देखील मिळविते. गेल्या काही दशकापासून पशुधन क्षेत्राचा विकास कमी होत चालला आहे. सर्वात महत्त्वाचे म्हणजे पशुधन क्षेत्राची वाढ कृषी क्षेत्रावर अवलंबून आहे. देशात गेल्या दोन ते तीन दशकांमध्ये कृषी वाढीचा नकारात्मक कल दिसून आला. जागतिकीकरणाचा परिणाम, जागतिक तापमान वाढ, वाढते नागरीकरण, शेतीचे बदलते स्वरूप, शाश्वत धोरणाचा अभाव, नैसर्गिक आपत्ती यामुळे पशुधन क्षेत्रापुढे नवीन आव्हाने निर्माण झालेली आहेत.

संदर्भ

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परभणी जिल्ह्यातील जलसिंचन तीव्रतेच्या बदलाचा भौगोलिक अभ्यास

सन 2000-01 ते 2014-15

दयानंद शिवाजीराव धावणे[1] प्रा.डॉ.ए.ए. काळगापुरे[2]

[1]भूगोल विभाग श्री हावगीस्वामी महाविद्यालय, उदगीर जि.लातूर

[2]उपप्राचार्य व भूगोल विभागप्रमुख श्री हावगीस्वामी महाविद्यालय, उदगीर जि.लातूर

प्रस्तावना

भारतातील लोकांचा कृषी हा प्रमुख व्यवसाय आहे. देशातील 2011 च्या जनगणनेनुसार 60 टक्के एवढे लोक या प्राथमिक व्यवसायात गुंतलेले आहेत. कृषी हा भारतीय अर्थव्यवस्थेचा कणा आहे. कृषीतून देशातील वाढत्या लोकसंख्येची अन्नधान्याची गरज पूर्ण होते. एवढेच नव्हे तर देशातील लोकांना रोजगार उपलब्धतेचे कृषी एक प्रमुख साधन आहे. कृषीवर आधारित उद्योगधंद्यांना कच्चा माल कृषीच्या माध्यमातून पुरविला जातो. यामुळे औद्योगिक विकासाला चालना मिळालेली आहे. देशाला प्राप्त होणा-या राष्ट्रीय उत्पन्नात 18 टक्के वाटा कृषीचा आहे. भारतातून होणारी निर्यात ही सुद्धा कृषी मालाची आहे. म्हणून कृषीचे महत्त्व अनन्यसाधारण असे आहे. कृषीवर अनेक घटक परिणाम करतात. त्यात रासायनिक खते, बि-बियाणे, जलसिंचन इत्यादी घटकांचा समावेश होतो. यात जलसिंचन हा घटक कृषीवर परिणाम करणारा महत्त्वपूर्ण घटक आहे. म्हणून परभणी जिल्ह्यातील जलसिंचन तीव्रतेच्या बदलाचा भौगोलिक अभ्यास करण्यासाठी प्रस्तुत विषयाची निवड करण्यात आलेली आहे.''एकूण जलसिंचनाखालील क्षेत्र व एकूण लागवडीखालील क्षेत्र याच्या गुणोत्तरास जलसिंचन तीव्रता असे म्हणतात.''परभणी जिल्ह्यातील 2000-01 ते 2014-15 या कालावधीतील जलसिंचन तीव्रता एवढ्यापुरता हा अभ्यास मर्यादित आहे.

अभ्यासक्षेत्र

परभणी जिल्हा हा महाराष्ट्राच्या मध्यभागी वसलेला आहे. परभणी जिल्ह्याचा अक्षवृत्तीय विस्तार $18^0$45' उत्तर ते $20^0$01' उत्तर अक्षांश आणि $76^0$13' पूर्व ते $77^0$39' पूर्व रेखांश या भौगोलिक पट्ट्यामध्ये वसलेला आहे. जिल्ह्याच्या उत्तरेस बुलढाणा व हिंगोली, पश्चिमेस बीड आणि जालना, दक्षिणेस लातूर व पूर्वेस नांदेड व हिंगोली हे जिल्हे आहेत. जिल्ह्याचे भौगोलिक क्षेत्रफळ 6511.58 चौ.कि.मी. आहे.

उद्दिष्टे

परभणी जिल्ह्यातील जलसिंचन तीव्रतेच्या बदलाचा भौगोलिक अभ्यास करणे हे प्रमुख उद्दिष्ट समोर ठेवून प्रस्तुत शोधनिबंध तयार करण्यात आलेला आहे.

अभ्यास पद्धती

प्रस्तुत शोधनिबंध हा दुय्यम स्त्रोतांवर आधारित असून यासाठी विविध संदर्भ ग्रंथ, शासकीय अहवाल, जिल्हा सामाजिक व आर्थिक समालोचन, वर्तमानपत्रे व संकेतस्थळावरील माहितीचा उपयोग

करण्यात आलेला आहे. जलसिंचन तीव्रतेचा अभ्यास करण्यासाठी खालील सूत्राचा वापर करण्यात आलेला आहे.

$$\text{जलसिंचन तीव्रता} = \frac{\text{एकूण जलसिंचनाखालील क्षेत्र}}{\text{एकूण लागवडीखालील क्षेत्र}} \times 100$$

विषय विश्लेषण

परभणी जिल्ह्यातील सन 2000-01 ते 2014-15 या कालावधीतील जलसिंचन तीव्रता अभ्यासण्याकरिता त्याचे तीन गटात विभाजन केलेले असून त्यात जास्त तीव्रतेचा विभाग (10 पेक्षा जास्त), मध्यम तीव्रतेचा विभाग (5 ते 10) आणि कमी तीव्रतेचा विभाग (5 पेक्षा कमी) यांचा समावेश होतो.

तक्ता क्र.1

परभणी जिल्ह्यातील जलसिंचन तीव्रता (सन 2000-01 ते 2014-15)

(क्षेत्र हेक्टरमध्ये)

अ.क्र.	तालुके	सन 2000-01			सन 2014-15		
		लागवडी खालील क्षेत्र (हे.)	जलसिंचना खालील क्षेत्र (हे.)	जलसिंचन तीव्रता (%)	लागवडी खालील क्षेत्र (हे.)	जलसिंचना खालील क्षेत्र (हे.)	जलसिंचन तीव्रता (%)
1	**सेलू**	53079	3545	6.70	60089	4594	7.64
2	**जिंतूर**	73401	5369	7.31	74681	4760	6.37
3	**परभणी**	93466	11141	11.91	91784	9458	9.32
4	**मानवत**	19947	3186	15.90	42117	6411	15.22
5	**पाथरी**	38752	5445	14.05	45884	4785	10.43
6	**सोनपेठ**	14228	619	4.35	35854	4381	12.21
7	**गंगाखेड**	43940	3519	8.00	53133	4379	8.24
8	**पालम**	25898	3549	13.70	47773	7023	14.70
9	**पूर्णा**	36283	3760	10.36	65624	12292	18.73
		398994	**40133**	**10.05**	**516911**	**58083**	**11.03**

स्त्रोत: संशोधकाने संकलित केलेल्या माहितीवर आधारित

परभणी जिल्ह्यातील सन 2000-01 या कालावधीतील जलसिंचन तीव्रता अभ्यासल्यास असे दिसून येते की, जास्त तीव्रतेचा विभाग (10 पेक्षा जास्त) या गटात परभणी (11.91 टक्के), पाथरी (14.05 टक्के), पालम (13.70 टक्के), पूर्णा (10.36 टक्के) या चार तालुक्यांचा समावेश होतो. मध्यम तीव्रतेचा विभाग (5 ते 10) या गटात जिंतूर (7.31 टक्के), गंगाखेड (8 टक्के) या दोन तालुक्यांचा समावेश होतो. तर कमी तीव्रतेचा विभाग (5 पेक्षा कमी) या गटात सोनपेठ (4.35 टक्के) या एकाच तालुक्याचा समावेश होत असलेला दिसून येतो.परभणी जिल्ह्यातील सन 2014-15 या कालावधीतील जलसिंचन तीव्रता

अभ्यासल्यास असे दिसून येते की, जास्त तीव्रतेचा विभाग (10 पेक्षा जास्त) या गटात पाथरी (10.43 टक्के), सोनखेड (12.21 टक्के), पालम (14.70 टक्के), पूर्णा (18.73 टक्के) या चार तालुक्यांचा समावेश होतो. मध्यम तीव्रतेचा विभाग (5 ते 10) या गटात जिंतूर (6.37 टक्के), परभणी (9.32 टक्के), गंगाखेड (8.24 टक्के) या तीन तालुक्यांचा समावेश होतो. तर कमी तीव्रतेचा विभाग (5 पेक्षा कमी) या गटात एकाही तालुक्याचा समावेश असलेला दिसून येत नाही.

निष्कर्ष

1. परभणी जिल्ह्यातील सन 2000-01 या कालावधीतील जलसिंचन तीव्रता अभ्यासल्यास असे दिसून येते की, जास्त जलसिंचन तीव्रता मानवत तालुक्यात (15.9 टक्के) असून सर्वात कमी घनता ही सोनपेठ तालुक्यात (4.35 टक्के) एवढी असलेली दिसून येते.
2. परभणी जिल्ह्यातील सन 2014-05 या कालावधीतील जलसिंचन तीव्रता अभ्यासल्यास असे दिसून येते की, सर्वात जास्त जलसिंचन तीव्रता पूर्णा तालुक्यात (18.73 टक्के) असून सर्वात कमी घनता ही जिंतूर तालुक्यात (6.57 टक्के) एवढी असलेली दिसून येते.

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5. www.parbhani.nic.in

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ओमप्रकाश सुभाषराव पाटील[1] प्रा.डॉ.ए.ए. काळगापुरे[2]

[1]संशोधक ,श्री हावगीस्वामी महाविद्यालय, उदगीर जि.लातूर

[2]मार्गदर्शक उपप्राचार्य व भूगोल विभागप्रमुख श्री हावगीस्वामी महाविद्यालय उदगीर जि.लातूर

प्रस्तावना

अन्नाइतकीच मानवास निवासाची गरज आहे. लहरी हवामानापासून स्वतःचे संरक्षण करण्यासाठी आणि सामाजिक जीवन उपभोगण्यासाठी मानव घरे बांधतो आणि वसाहती वसवितो. मानवी संस्कृतीचे वैशिष्ट्यपूर्ण प्रतीक म्हणून वस्तीकडे पाहिले जाते. मानवाच्या समूहप्रियतेच्या जाणिवेतून वस्त्यांचा उदय झाला आहे. मानवाच्या लाखो वर्ष आदिम अवस्थेनंतर आजपासून सुमारे दहा हजार वर्षांपूर्वी शेती व्यवसायाला सुरूवात झाली. मानवाला शेती योग्य सुपीक जमिनीचा भाग नद्यांच्या काठावर अधिक असल्यामुळे त्याच प्रदेशातील मानवी वस्त्यांचा प्राचीन संस्कृतीचा उदय झालेला दिसून येतो. टैग्रीस-युफ्राटिस खो-यात बॉबिलोनियन सिंधू खो-यात आर्य संस्कृती, व्हॉगहो खो-यात मंगोल संस्कृतीचा उदय झालेला आहे. ''ज्या वस्तीमध्ये लोक शेती, पशुपालन, लाकूडतोड, खाणकाम व मासेमारी यासारखे प्राथमिक व्यवसाय करतात त्या वस्तीला 'ग्रामीण वस्ती' असे म्हणतात.'' भारतात जवळजवळ 72 टक्के लोक ग्रामीण वस्तीत वास्तव्य करतात. कोणत्याही प्रदेशाचा विकास मोजण्यासाठी लोकसंख्या हा घटक अत्यंत महत्त्वपूर्ण असतो. लोकसंख्येचे असमान वितरण विकासावर परिणाम करत असते. त्यामुळे ग्रामीण लोकसंख्येच्या घनतेच्या वितरणाचा अभ्यास करणे आवश्यक ठरते.

अभ्यासक्षेत्र

लातूर जिल्हा हा महाराष्ट्रातील सुसंस्कृत व उपक्रमशील जिल्हा म्हणून ओळखला जातो. लातूर जिल्ह्याचा रेखावृत्तीय विस्तार 73025' पूर्व ते 7525' पूर्व रेखांशादरम्यान आहे. अक्षांशीय विस्तार $18^0$05' उत्तर ते $18^0$07' उत्तर अक्षांश असा आहे. लातूर जिल्ह्याचे क्षेत्रफळ 7157 चौ.कि.मी. आहे. पूर्व-पश्चिम लांबी 112 कि.मी. आहे. उत्तर-दक्षिण रूंदी सुमारे 113 कि.मी. आहे. महाराष्ट्राच्या एकूण क्षेत्रफळाच्या 2.32 प्रतिशत भाग लातूर जिल्ह्याने व्यापला आहे. लातूर जिल्ह्यात एकूण 10 तालुक्यांचा समावेश होत असून यापैकी प्रस्तुत अभ्यासासाठी देवणी व शिरुर अनंतपाळ या दोन तालुक्यांची निवड करण्यात आलेली आहे.देवणी व शिरुर अनंतपाळ तालुक्याची निर्मिती 23 जून 1999 ला करण्यात आलेली असून लातूर या मुख्यालयापासून देवणीचे अंतर 70 कि.मी. असून शिरुर अनंतपाळ तालुक्याचे 40 कि.मी. आहे. देवणी तालुक्याचे भौगोलिक स्थान अक्षवृत्तीय विस्तार $18^0$15'50'' उत्तर ते $18^0$26'38'' उत्तर अक्षवृत्तादरम्यान तर रेखावृत्तीय विस्तार $77^0$04'56'' पूर्व ते $70^0$82'22'' पूर्व रेखावृत्त दरम्यान आहे. सन 2011 च्या जनगणनेनुसार या तालुक्याचे क्षेत्रफळ 403.24 कि.मी. आहे व लोकसंख्या 97598 इतकी

आहे.शिरुर अनंतपाळ तालुक्याचे भौगोलिक स्थान अक्षवृत्तीय विस्तार 18⁰20'99'' उत्तर ते 18⁰33'86'' उत्तर अक्षवृत्तादरम्यान तर रेखावृत्तीय विस्तार 76⁰54'24'' पूर्व ते 76⁰84'00'' पूर्व रेखावृत्त दरम्यान आहे. सन 2011 च्या जनगणनेनुसार या तालुक्याचे क्षेत्रफळ 358.61 चौ.कि.मी. असून लोकसंख्या 83568 इतकी आहे.

उद्दिष्टे

1. देवणी व शिरुर अनंतपाळ तालुक्यातील ग्रामीण लोकसंख्येच्या घनतेच्या वितरणाचा मंडळनिहाय अभ्यास करणे.
2. देवणी व शिरुर अनंतपाळ तालुक्यातील ग्रामीण वस्तीचा तुलनात्मक अभ्यास करणे.

अभ्यास पद्धती

प्रस्तुत शोधनिबंध हा दुय्यम स्त्रोतांवर आधारित असून यासाठी विविध संदर्भ ग्रंथ, शासकीय अहवाल, जिल्हा सामाजिक व आर्थिक समालोचन, वर्तमानपत्रे व संकेतस्थळावरील माहितीचा उपयोग करण्यात आलेला आहे. ग्रामीण लोकसंख्येच्या घनतेचा अभ्यास करण्यासाठी खालील सुत्राचा वापर करण्यात आलेला आहे.

$$\text{ग्रामीण लोकसंख्येची घनता} = \frac{\text{एकूण ग्रामीण लोकसंख्या}}{\text{एकूण ग्रामीण क्षेत्र (चौ.कि.मी.)}} \times 100$$

देवणी व शिरुर अनंतपाळ तालुक्यातील ग्रामीण लोकसंख्येच्या घनतेच्या वितरणाचा मंडळनिहाय अभ्यास करण्यासाठी त्याचे तीन गटात विभाजन करण्यात आलेले असून त्यात देवणी तालुक्यातील जास्त घनता विभाग (250 पेक्षा जास्त), मध्यम घनता विभाग (225-250) आणि कमी घनता विभाग (225 पेक्षा कमी) यांचा समावेश आहे. मंडळनिहाय ग्रामीण लोकसंख्येची घनता अभ्यासली असता असे दिसून येते की, देवणी तालुक्यातील मंडळनिहाय एकूण लोकसंख्या घनता (प्रति चौ.कि.मी.) ला 242 एवढी आहे. तर मंडळनिहाय लोकसंख्येच्या घनतेचे वितरण अभ्यासले असता 250 पेक्षा जास्त लोकसंख्या घनता देवणी मंडळात 264 चौ.कि.मी. इतकी आहे. तर 225-250 या मध्यम लोकसंख्येच्या गटात बोरोळ 240 चौ.कि.मी. एवढी घनता दिसून येते.

सारणी क्र.1

देवणी व शिरुर अनंतपाळ तालुक्यातील ग्रामीण लोकसंख्येच्या घनतेचे मंडळनिहाय वितरण

देवणी तालुका					शिरुर अनंतपाळ तालुका				
अ.क्र.	महसूल मंडळ	क्षेत्रफळ (चौ.कि.मी.)	ग्रामीण लोकसंख्या	ग्रामीण लोकसंख्येची घनता (प्रति चौ.कि.मी.)	अ.क्र.	महसूल मंडळ	क्षेत्रफळ (चौ.कि.मी.)	ग्रामीण लोकसंख्या	ग्रामीण लोकसंख्येची घनता (प्रति चौ.कि.मी.)
1	देवणी	157.44	41599	264	1	शिरुर अनंतपाळ	113.25	28325	250

2	वलांडी	153.95	34003	221	2	हिसामाबाद	101.43	23714	234
3	बोरोळ	91.85	21996	240	3	साकोळ	143.93	31529	219
	सरासरी	403.24	97593	242		सरासरी	358.61	83568	233

स्त्रोत: संशोधकाने संकलित केलेल्या माहितीवर आधारित

तर 225 पेक्षा कमी ग्रामीण लोकसंख्येच्या घनतेचे वितरण वलांडी 221 चौ.कि.मी. इतकी असलेली पहावयास मिळते. कारण कृषीचा विकास कमी प्रमाणात झाल्यामुळे ग्रामीण लोकसंख्येचे रोजगारासाठी झालेले स्थलांतर झालेले दिसून येते.शिरुर अनंतपाळ तालुक्यातील ग्रामीण लोकसंख्येचे वितरण मंडळनिहाय अभ्यासल्यास असे दिसून येते की, 240 चौ.कि.मी. पेक्षा जास्त गटात शिरुर अनंतपाळ 250 चौ.कि.मी. या एकमेव मंडळाचा समावेश झालेला दिसून येतो. कारण कारण हे तालुक्याचे ठिकाण व बाजारपेठ आहे. तसेच शैक्षणिक सुविधा व रोजगारासाठी काही लोक इतर भागातून येथे येतात. त्यामुळे लोकसंख्येची घनता जास्त असलेली दिसून येते. 220 ते 240 चौ.कि.मी. या मध्यम घनता विभागात 220 ते 240 चौ.कि.मी. लोकसंख्या गटात हिसामाबाद 234 चौ.कि.मी. या मंडळाचा समावेश झालेला दिसून येतो. तर 220 पेक्षा कमी गटात साकोळ या मंडळात आढळून येते. कारण साकोळ मंडळातील प्रतिकूल भौगोलिक परिस्थितीमुळे या महसूल मंडळाचा या गटात समावेश असलेला दिसून येतो.

निष्कर्ष

1. देवणी तालुक्यातील ग्रामीण लोकसंख्येच्या घनतेचे वितरण अभ्यासले असता सर्वात जास्त ग्रामीण लोकसंख्येची घनता ही देवणी 264 चौ.कि.मी. या महसूल मंडळात असून सर्वात कमी लोकसंख्येची घनता ही वलांडी महसूल मंडळात 221 एवढी असलेली दिसून येते.
2. शिरुर अनंतपाळ तालुक्यातील मंडळनिहाय ग्रामीण लोकसंख्येच्या घनतेचा अभ्यास केला असता असे दिसून येते की, सर्वात जास्त ग्रामीण लोकसंख्येची घनता ही शिरुर अनंतपाळ या महसूल मंडळात 250 चौ.कि.मी. एवढी असून सर्वात कमी घनता ही साकोळ महसूल मंडळात 219 चौ.कि.मी. एवढी असलेली दिसून येते.
3. ग्रामीण लोकसंख्येच्या वितरणातील असमानता कमी करण्यासाठी मंडळनिहाय पायाभूत सुविधांचा विकास आणि उद्योगधंद्याची निर्मिती केली गेली पाहिजे.
4. लोकसंख्येच्या घनतेच्या वितरणातील तफावत दूर करण्यासाठी वाहतूक मार्गाचे जाळे निर्माण होणे गरजेचे आहे.

संदर्भ

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6. www.latur.gov.in

नांदेड जिल्ह्यातील रासायनिक खतांचा वापर

प्रा. डॉ. पुरी एन. एन[1] प्रा. डॉ. कोरे जी. एम[2]

[1]संशोधक सहाय्यक प्राध्यापक भूगोल विभाग स्वामी विवेकानंद महा. शिरुर ताजबंद अहमद्पूर,जि.लातूर

[2]संशोधक सहाय्यक प्राध्यापक भूगोल विभाग स्वामी विवेकानंद महा. शिरुर ताजबंद अहमद्पूर, जि.लातूर

प्रस्तावना:

रासायनिक खतांचा वापर करणे म्हणजे कृषी उत्पन्नातील मोठ्या प्रमाणावर वाढ करणारे, ही शेती विकास करणारे, मजूरांची बचत तसेच मृदेचे संवर्धन करणारे महत्वपूर्ण असे साध्यच आहे. कारण त्यामूळे कृषी उत्पादकतेमध्ये वाढ होवून उत्पादन हे विक्रमी स्वरूपाचे घेतले जात आहे. त्यामुळे आर्थिक विकास होत आहे. नांदेड जिल्ह्यातील शेती विकासामध्ये व आर्थिक समृध्दीसाठी रासायनिक खतांच्या वापराचे प्रमाण मोठ्या प्रमाणावर वाढलेले पहावयास मिळत आहे. विसाव्या शतकापूर्वी रासायनिक खतांचा वापर जगात कोठेही केला जात नव्हता. तोपर्यंत म्हणजेच १९०० सालापर्यंत अन्नधान्याची गरज ही पिकावू पडीक जमीन विविध पिकाखाली आणून भागविली जाते असे. परंतू पूढे नवीन जमिन पिकाखाली आणण्यावर मर्यादा आल्या. अमेरिकेत चुनायूक्त मृदा पिक योग्य जमिनीत रुपांतरीत करून उत्पादन वाढविणे असे प्रयोग चालू होते. त्यातूनच रासायनिक खताची कल्पना पुढे आली. लाबीग (१९७०) या शास्त्रज्ञांने पिकांच्या वाढीसाठी अन्नद्रव्यांची गरज असते असे सिध्द केले होते. अरनॉन या शास्त्रज्ञाने नत्र, स्फुरद, पालाश, सल्फर, मॅग्नेशियम, कॅल्शियम आयर्न, झिंक, मॉलिब्डेनियम, बोरॉन, मॅगनिज, कॉपर, कार्बन, हैड्राजन, ऑक्सिजन या अन्न द्रव्यांची नितांत गरज असते असे सिध्द केले.

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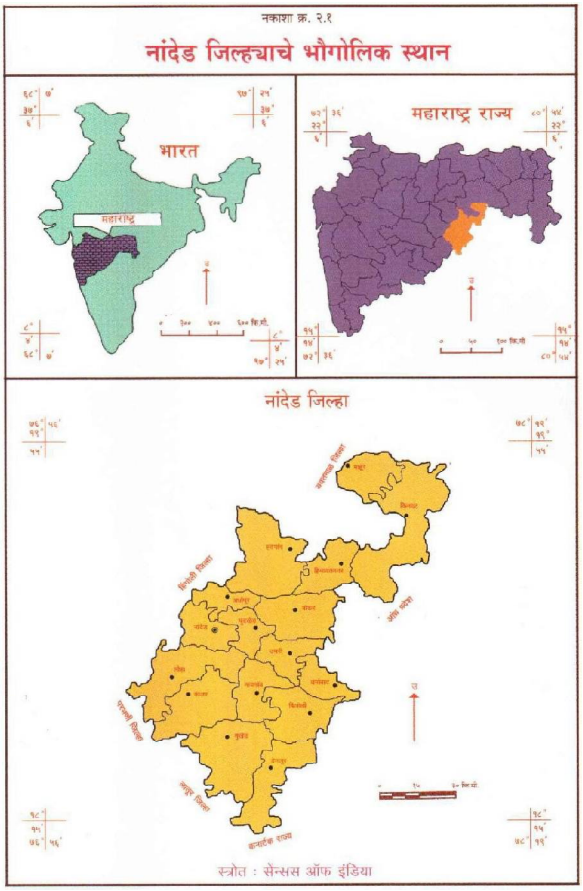
अभ्यासक्षेत्र (Study Area):

मराठवाड्याच्या पूर्वेकडील नांदेड जिल्ह्याचा अक्षवृत्तीय विस्तार १८°१६ ते १९°५५' उत्तर अक्षवृत्त व ७६°५६ ते ७८°१९ पूर्व रेखावृत्त यांच्या दरम्यान आहे. नांदेड जिल्ह्याचे एकूण क्षेत्रफळ १०,५२८ चौ. कि.मी. आहे. सन २०११च्या जनगणनेनुसार जिल्ह्याची लोकसंख्या ३३,५६,५६६ एवढी आहे. राज्याच्या तुलनेत नांदेड जिल्ह्याचे लोकसंख्या प्रमाण २.९६ टक्के आहे. तर जिल्ह्याचे क्षेत्रफळ महाराष्ट्राच्या एकूण क्षेत्रफळाच्या ३.४२ टक्के एवढे आहे.



जिल्ह्याच्या क्षेत्रापैकी २११.१ चौ.कि.मी. (२.०१ टक्के) क्षेत्र नागरी भागाचे असून १०२९८.९ चौ.कि.मी. (९७.९९ टक्के) ग्रामीण भागाचे आहे. महाराष्ट्रात क्षेत्रफळाच्या बाबतीत जिल्ह्याचा १४ वा क्रमांक लागतो तर लोकसंख्येच्या बाबतीत १२ वा क्रमांक लागतो.

उद्दिष्ट्ये (Objectives):

१. नांदेड जिल्ह्यातील नांदेड जिल्ह्यातील रासायनिक खतांच्या वापरातील बदल अभ्यासणे.

२. अभ्यासक्षेत्रातील तहसीलनिहाय उत्पादनातील मोठ्याप्रमाणावर होणा-या वाढीमध्ये रासायनिक खताची भूमिका अभ्यासणे.

३. रासायनिक खतांच्या वापरामुळे कृषी कार्यक्षमतेच्या स्तरामध्ये आणि कृषी विकासाच्या स्तरातील झालेला बदल अभ्यासणे.

माहिती संकलनाचे स्त्रोत व अभ्यास पद्धती (Data Collection):

'नांदेड जिल्ह्यातील रासायनिक खतांच्या वापराचा कल' अभ्यासण्यासाठी १९९० ते २०१० या कालावधीतील माहितीचा आधार घेतला आहे. प्रस्तूत संशोधनासाठी प्राथमिक व दुय्यम आकडेवारीचा आधार घेतला आहे. प्राथमिक माहिती ही सर्वेक्षण, प्रश्नावलीच्या माध्यमातून शेतकरी, तलाठी व मंडळ अधिकारी, कृषीशी संबंधीत व्यक्ती आणि अधिकारी यांच्याशी वैयक्तिक चर्चा आणि कृषी तज्ञासोबत चर्चा करुन त्यांच्या कडून मुलाखती घेऊन आकडेवारी संकलित केली आहे. दुय्यम स्वरूपाची माहिती ही जिल्हा आर्थिक व सामाजिक समालोचन १९९०-९१ ते २००९-१०, नांदेड जिल्हा जनगणना पुस्तिका १९९१

आणि २०१०, नांदेड जिल्हा गॅझेटियर २०११, जिल्हा कृषी विभाग, कृषी उत्पन्न बाजार समिती, जिल्हा परिषद, कृषी अधिक्षक कार्यालय, नांदेड. कृषी विभाग वार्षिक अहवाल,शासकीय व निमशासकीय कार्यालयातील अहवाल, मासिके व इंटरनेट इत्यादी मधून घेतलेली आहे.

विषय विवेचन:

कृषी उत्पादनातील मोठ्याप्रमाणावर होणा-या वाढीमध्ये खतांचा वापर हा घटक महत्वाची भूमिका बजावतो. २० व्या शतकाच्या मध्यात जलसिंचन सूविधांचा अभाव, खतांच्या विविध प्रकारच्या जातीचा अभाव, शेतक-यांचे अज्ञान या सर्व बाबीमूळे नांदेड जिल्ह्यात खतांच्या वापराचे प्रमाण अतिशय कमी होते. जमिनीची सूपीकता ही प्रामुख्याने जमिनीतील सेंद्रीय घटकद्रव्य आणि जमिनीचा कस, सामू यावर अवलंबून असते. उच्च उत्पादन देणारी पिके त्यांच्या विविध जाती आणि जलसिंचन सूविधेतील वाढीबरोबर खतांच्या वापरात सूध्दा आपणास वाढ करावी लागते.जिल्ह्यातील सन २०००-०१ ते २०१०-११ या वर्षातील रासायनिक खताच्या वापरातील प्रति हेक्टरी बदल तहसीलनिहाय प्रमूख तिन गटामध्ये विभाजीत केलेला आहे. तो पुढीलप्रमाणे

खताच्या उच्य वापराचे प्रदेश :

रासायनिक खताच्या उच्य वापर सन २०००-०१ ते २०१०-११ या १० वर्षात प्रति हेक्टरी २० कि.ग्रॅ. पेक्षा जास्त खताच्या वापरामध्ये वाढ प्रामुख्याने नांदेड जिल्ह्यामध्ये धर्माबाद ३२ कि.ग्रॅ., मुदखेड २४ कि.ग्रॅ, नायगाव २१ कि.ग्रॅ, अर्धापूर २० कि.ग्रॅ, प्रति हेक्टरी या तालुक्यामध्ये खताच्या वापरामध्ये वाढ झालेली दिसून येते.

नांदेड जिल्ह्यातील रासायनिक खतांचा वापर २०००-०१ ते २०१०-११

(खतांचा वापर मे.टन)

अ. क्र.	तालूके	युरिया	डीएपी	एमओपी	एमपीके	एसएसपी	एकून	क्षेत्र	प्रति.हे	वापर
1	माहूर	२०००-०१	१६४१	८९४	२७४	९११	५७०	४२९०	१५२०१	२८.२२
		२०१०-११	४७६४	२१५६	७१८	४३८१	१६०२	१३६२१	५१७७०	२६.३१
		बदल	३१२३	१२६२	४४४	३४७०	१०३२	९३३१	३६५६९	-२
2	किनवट	२०००-०१	१६४१	१४९०	४५७	१५१८	९५१	७१५१	१०७४२७	६.६६
		२०१०-११	४७६४	३७४०	१४७७	४७८३	२२२०	१९७१८	१४७६३०	१३.३६
		बदल	३१२३	२२५०	१०२०	३२६५	१२६९	१२५६७	४०२०३	७
3	ही.नगर	२०००-०१	१६४१	८९४	२७४	९११	५७०	४२९०	३७५९१	११.४१
		२०१०-११	४२६२	२१३३	७५१	४२०९	१२९६	१२६५१	५०५४३	२५.०३
		बदल	२६२१	१२३९	४७७	३२९८	७२६	८३६१	१२९५२	१४
4	हदगाव	२०००-०१	४९२४	२६८२	८२२	२७३२	१७११	१२८७१	८२३३१	१५.६३
		२०१०-११	९५६४	४८६१	१८२२	८०२८	२९६७	२७२४२	१०८५४०	२५.१
		बदल	४६४०	२१७९	१०००	५२९६	१२५६	१४३७१	२६२०९	९
5	अर्धापूर	२०००-०१	५४७१	२९८०	९१३	३०३६	१९०२	१४३०२	२२९६६	६२.२७
		२०१०-११	८७३३	४३०१	१५७७	६८८७	२९५७	२४४५५	२९७६०	८२.१७
		बदल	३२६२	१३२१	६६४	३८५१	१०५५	१०१५३	६७९४	२०
6	नांदेड	२०००-०१	८७५४	४७६९	१४६०	४८५७	३०४१	२२८८१	२६१२९	८७.५७
		२०१०-११	१३१०१	६४८९	२३९८	११८३९	३८४२	३७६६९	३७५७०	१००.२६
		बदल	४३४७	१७२०	९३८	६९८२	८०१	१४७८८	११४४१	१२.६९

7	मुदखेड	२०००-०१	५४७१	२९८०	९१३	३०३६	१९०२	१४३०२	२५३९५	५६.३२
		२०१०-११	८८५५	४४२१	१५६७	६८९५	३०३८	२४७७६	३०७६६	८०.५३
		बदल	३३८४	१४४१	६५४	३८५९	११३६	१०४७४	५३७१	२४.२१
8	भोकर	२०००-०१	३२८३	१७८८	५४८	१८२१	११४१	८५८१	५०२०८	१७.०९
		२०१०-११	७०३१	३३४४	११४१	६०५७	२३६८	१९९४१	६२१३५	३२.०९
		बदल	३७४८	१५५६	५९३	४२३६	१२२७	११३६०	११९२७	१५
9	उमरी	२०००-०१	२७३५	१४९०	४५७	१५१८	९५१	७१५१	२९५९३	२४.१६
		२०१०-११	५२८६	२७११	८०२	४७२८	१८०१	१५३२८	४१६२६	३६.८२
		बदल	२५५१	१२२१	३४५	३२१०	८५०	८१७७	१२०३३	१२.६६
10	धर्माबाद	२०००-०१	२१८८	११९२	३६५	१२१४	७६१	८	२३२९८	२४.५५
		२०१०-११	४९१९	२६६१	८५७	४६३४	१६२४	१४६९५	२६५२४	
		बदल	२७३१	१४६९	४९२	३४२०	८६३	८९७५	३२२६	३०.८५
11	बिलोली	२०००-०१	२१८८	११९२	१२१४	७६१	५७२०	४६१९९	१२.३८	११
		२०१०-११	५६३८	२६७६	९७०	५०७६	१९२१	१६२८१	६५८७४	२४.७२
		बदल	३४५०	१४८४	६०५	३८६२	११६०	१०५६१	१९६७५	१२.३४
12	नायगाव	२०००-०१	२७३६	१४९०	४५७	१५१८	९५१	७१५१	४३८८०	१६.३
		२०१०-११	७०२१	४४८३	१२९२	५७६९	२७१९	२१२८४	५६६५२	३७.५७
		बदल	४२८५	२९९३	८३५	४२५१	१७६८	१४१३३	१२७७२	२१.२७
13	लोहा	२०००-०१	२७३३	१४९०	४५७	१५१८	९५१	७१५१	५६६६५	१२.६२
		२०१०-११	७४९८	३७४०	१४७७	४७८३	२२२०	१९७१८	१४७६३०	१३.३६
		बदल	४७६५	२२५०	१०२०	३२६५	१२६९	१२५६७	९०९६५	०.७४
14	कंधार	२०००-०१	२७३५	१४९०	४५७	१५१८	५९५१	१२१५१	६५४४१	१८.५७
		२०१०-११	७३१२	३५८१	१०९९	६७७९	७५१२	२६२८३	८२४२७	३१.८९
		बदल	४५७७	२०९१	६४२	५२६१	१५६१	१४१३२	१६९८६	१३.३२
15	मुखेड	२०००-०१	२७३४	१४९०	४५७	१५१८	७१५१	७६४२५	९.३६	१५
		२०१०-११	७५७३	३८०२	१२५३	७२०७	२४७३	२२३०८	९३४००	२३.८८
		बदल	४८३९	२३१२	७९६	५६८९	१५२२	१५१५७	१६९७५	१४.५२
16	देगलूर	२०००-०१	२७३२	१४९०	४५७	१५१८	९५१	७१५१	५६२२९	१२.७२
		२०१०-११	६२५०	३२४९	१०५५	५४८२	२१६७	१८२०३	६९१५९	२६.३२
		बदल	३५१८	१७५९	५९८	३९६४	१२१६	११०५२	१२९३०	१३.६

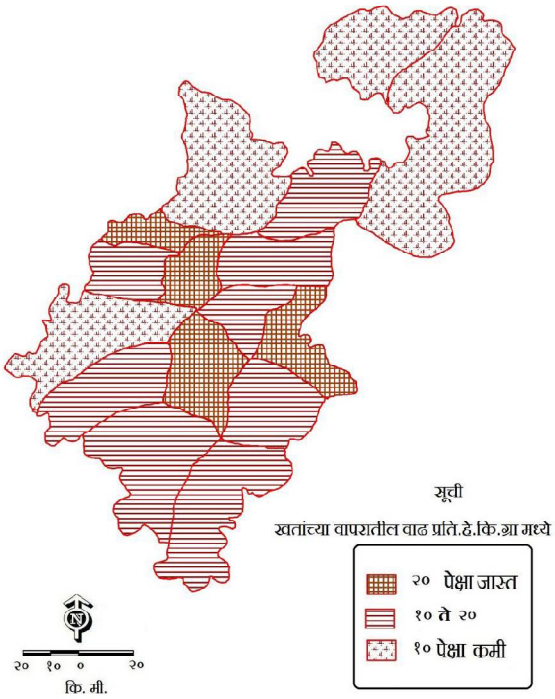
स्रोत : जिल्हा सामाजिक व आर्थिक समालोचन २०००-०१ ते २०१०-११

या तालुक्यामध्ये खतांचा वापर जास्त असण्याचे कारण म्हणजे जलसिंचन सूविधांची उपलब्धता त्याचबरोबर जलसिंचन प्रकल्पामुळे पाण्याचा पूरवठा मोठ्याप्रमाणावर होत आहे. तसेच ऊस क्षेत्राचे प्रमाण ही जास्त असून येथील शेतकरी नवनवीन कृषि तंत्रज्ञानाचा अवलंब करण्यासाठी सक्षम, जागृत असलेले दिसून येतात.

नांदेड जिल्हा

रासायनिक खताच्या वापरातील बदल

२०००-०१ ते २०१०-११



वरील सर्व कारणामुळे हा विभाग खतांच्या उच्च वापराचा विभाग म्हणून ओळखला जातो.

खतांच्या मध्यम वापराचे प्रदेशः

या विभागामध्ये १० ते २० कि.ग्रॅं. प्रतिहेक्टर खताच्या वापरामध्ये वाढ झालेली दिसून येते. यामध्ये प्रामुख्याने प्रति हेक्टरी मुखेड, भोकर प्रत्येकी (१५), हिमायतनगर (१४), बिलोली (१२), नांदेड, देगलूर, कंधार, उमरी या तालुक्यामध्ये प्रत्येकी (१३) कि.ग्रॅं. प्रतिहेक्टर खताच्या वापरामध्ये वाढ झालेली दिसून येते. या तहसिलमध्ये जलसिंचना खालील क्षेत्रात वाढ होत असून विहीरीद्वारे व कूपनलिकेद्वारे जलसिंचन होत आहे. परंतू उपजावू जमिनीचे प्रमाण कमी असल्यामूळे खतांचा मध्यम वापर होत असलेला दिसून येतो.

खतांच्या कमी वापराचा विभाग :

या विभागात प्रति हेक्टरी १० कि.ग्रॅं. खताच्या वापरामध्ये वाढ झालेली दिसून येते. त्यामध्ये अनुक्रमे हदगाव (९), किनवट (७), लोहा (०.१४) आणि माहूर (-२), कि.ग्रॅम आहे. वरील प्रमाणे या तालुक्यात खताच्या वापरामध्ये वाढ प्रति हेक्टरी कमी झालेली पहावयास मिळते. तक्ता क्र. ६.३ व आकृती क्र.६.३ नांदेड जिल्ह्यातील २०००-०१ ते २०१०-११ या कालावधीतील रासायनिक खताच्या वापरातील बदल पाहता माहूर या तालुक्यात रासायनिक खताचा वापर २०००-०१ पेक्षा प्रतिहेक्टरी (२) कि.ग्रॅं कमी झालेला आहे. कारण प्रतिकूल भौगोलिक परिस्थिती बरोबर पवित्र असे रेणुकामातेचे आणि दत्तात्रयाचे

देवस्थान असल्यामुळे तीर्थक्षत्राचा विकास होत आहे. त्यामुळे शेतक-यांचा कल धार्मिकतेकडे झुकलेला आहे. त्यामुळे शेतीकडे दुर्लक्ष होत असलेले दिसून येते.

निष्कर्ष

जलसिंचन सुविधांचा विकास, सक्षम जागृत शेतक-याकडून सुधारित कृषी तंत्रज्ञानाचा अवलंब केला जात आहे. यामुळे खतांच्या उच्च वापराचे प्रदेश प्रति हेक्टरी ७५ कि.ग्रॅ. पेक्षा जास्त रासायनिक खतांचा वापर करणा-या प्रदेशात प्रामुख्याने नांदेड (प्रति हे. १०६ कि.ग्रॅ.), अर्धापूर, धर्माबाद व मुदखेड, या तीन तालुक्याचा प्रत्येकी (प्रति हे. ९१ कि.ग्रॅ.) एवढा होतो. खताच्या मध्यम वापराचे प्रदेश हा विभाग ५० ते ७५ कि.ग्रॅ.प्रति हेक्टर खतांच्या वापराचा विभाग आहे. यामध्ये नायगाव (प्रति हे.६७ कि.ग्रॅ.), हदगाव (प्रति हे. ५४ कि.ग्रॅ.) आणि उमरी (प्रति ५२ कि.ग्रॅ) हे तीन तालूके समाविष्ट होतात कारण या तालुक्यात विहीरी व कूपनलिकांद्वारे सिंचन क्षेत्रात वाढ होत आहे. त्यामुळे या तालुक्याच्या खताच्या वापराचे प्रमाण मध्यम स्वरुपाचे असलेले दिसून येते. खतांच्या कमी वापराचा प्रदेश या विभागात प्रति हेक्टरी ५० कि.ग्रॅ. पेक्षा कमि खतांचा वापर करत असलेला आढळतो. यामध्ये अनुक्रमे भोकर (प्रति हे.४९ कि.ग्रॅ.), माहुर (प्रति हे.४८), लोहा (प्रति हे.४७), कंधार (प्रति हे.४५), हिमायतनगर व मुखेड (प्रति हे.४४), बिलोली व देगलुर (प्रति हे.४२) आणि किनवट (प्रति हे.२२) या आठ तालूक्यांचा समावेश होतो. कारण हे तालुके प्राकृतिक दृष्टया डोंगराळ प्रदेशात येतात. तसेच जलसिंचन सुविधांची कमतरता या प्रदेशात असलेली दिसून येते. त्यामुळे या विभागात खतांचा वापर प्रति हेक्टर कमी होत असल्याचे आढळून येते.

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"Changing Trends in Agriculture and its Impact on Rural Development"

सांगली जिल्ह्यातील कृषी पर्यटन विकासाची क्षमता: एक भौगोलिकअभ्यास

पाटील संदीप अर्जुन[1] डॉ. देशमुख विकास . ए [2]

[1]संशोधक विद्यार्थी, डॉ. बाबासाहेब आंबेडकर मराठवाडा विद्यापीठ, औरंगाबाद.

[2]भूगोल विभाग प्रमुख राजर्षी शाहू आर्टस अॅण्ड सायन्स कॉलेज वाळूज, औरंगाबाद.

सारांश/ गोषवारा:

पर्यटनास प्राचीन काळापासून अनन्यसाधारण महत्त्व असून तोअनेक उद्योग -धंद्या पैकीएक प्रमुख उद्योग आहे. त्याचा ग्रामीण ते देशाची अर्थव्यवस्था त्याचबरोबर इतर क्षेत्राच्या विकासास मदत होते. मागास प्रदेशाचा विकास करण्याचा पर्यटन हा योग्य मार्ग आहे. एखाद्या पर्यटन स्थळांचा विकास होण्यासाठी त्या पर्यटन स्थळाच्या अंगी पर्यटकांना आपल्याकडे आकर्षित करण्याचे गुणधर्म त्या बरोबर नाविन्य असणे अत्यंत आवश्यक आहे. सध्या पर्यटनाच्या संकल्पना बदलल्या आहेत. पारंपारिक पर्यटनामध्ये बदल होऊन पर्यटनाच्या काही नवीन संकल्पना, क्षेत्र उदयास आली आहेत; त्यापैकी एक आहे "कृषिपर्यटन" ग्रामीण जीवनाची रचना, कृषी क्षेत्रातील पीक पेरणीपासून ते पीक काढणी, त्याचे उत्पादन यामध्ये समाविष्ट सर्व क्रियांचा पर्यटकांना प्रत्यक्ष अनुभव देण्याच्या क्रियेस कृषी पर्यटन म्हणतात. सांगली जिल्ह्यात कृषी पर्यटनाच्या विकासात मोठी क्षमता आहे. कारण प्राकृतिक रचना, हवामानातील विविधतेमुळे कृषी पिकांमध्ये असणारी विविध त्यामध्ये फळबागा, नगदी पिके, पालेभाज्या, इ. चे मोठ्या प्रमाणात घेतले जाणारे उत्पादन.

प्रस्तावना :

विश्वामध्ये अनेक देशांच्या अर्थव्यवस्थेमध्ये पर्यटनाच्या माध्यमातून आमूलाग्र बदल घडून आलेला आहे. जगातील विविध अर्थव्यवस्थेमध्ये मोठ्या प्रमाणावर वाढ करणारा पर्यटन हा मुख्य व्यवसाय आहे. उदा - सिंगापूर, इटली, मलेशिया, युरोपियन देश, स्विझर्लांड, दुबई इ.पर्यटनाच्या पारंपरिक संकल्पनात बदल होत असून सध्या नवीन संकल्पना उदयास आलेले आहेत त्यापैकीच एक कृषी पर्यटन आहे. पर्यटन व्यवसायापासून लोकांना प्रत्यक्ष व अप्रत्यक्ष अनेक आर्थिक लाभ होतात तसेच समाज जीवनावर त्याचा परिणाम होतो व रोजगाराची उपलब्धता होते. पर्यटन क्षेत्रातील कृषी पर्यटन ही नावीन्यपूर्ण संकल्पना असून कृषी क्षेत्रातील वेगळ्या शेत्राशी निगडित आहे. पर्यटन क्षेत्रातून रोजगार उपलब्ध होतोच त्याचप्रमाणे कुशल व अकुशल लोकांसाठी उत्पन्नाचे अनेक मार्ग निर्माण होतात. कृषी पर्यटनाच्या माध्यमातून शेतकऱ्याला अधीकचे उत्पादन व रोजगार संधी निर्माण होऊ शकतात. महाराष्ट्रातील सांगली जिल्ह्यामध्ये कृषी पर्यटन संकल्पनेचा विकास होण्यासाठी मोठी क्षमता आहे.

कृषी पर्यटन संकल्पना:

कृषी पर्यटन ही पर्यटन क्षेत्रातील नावीन्यपूर्ण संकल्पना आहे. ही संकल्पना शेतीवर आधारित असून ही मूळची पाश्चात्य देशातील आहे. त्यामध्ये ब्राझील, ऑस्ट्रेलिया, न्यूझीलंड यासारख्या देशांमध्ये प्रचलीत असलेल्या "ब्रेड अॅण्डब्रेकफास्ट" या धर्तीवर आधारलेले आहे. पर्यटक हा एखाद्या शेतकऱ्याच्या शेतात ठराविक रक्कम देऊन जातात. थोडक्यात तेथे त्या शेतकऱ्याचे पाहुणे होऊन राहतात. शेतातच पर्यटकांच्या राहण्याची व्यवस्था केलेली असते. त्यांच्या सकाळच्या न्याहरीची ही व्यवस्था केलेली असते. हवे ते अन्न शिजवण्यासाठी पर्यटकांना मुभा दिली जाते."या आणि मनसोक्त रहा आणि आवडेल ते खाप-या" या धर्तीवर कृषी पर्यटन संकल्पना आधारलेली आहे. त्यामध्ये कृषीतील पीक उत्पादन घेत असताना पूर्वमशागत पासून पेरणी, आंतरमशागत, पिक संरक्षण, कापणी अशा अनेक कृषी प्रक्रियांचा समावेश होतो. जे पर्यटक शहरांमध्ये कृषी क्षेत्र व नैसर्गिक पर्यावरणाचा अनुभव घेऊ शकत नाहीत, त्यांना प्रत्यक्ष कृषीकार्याचा

अनुभव घेता येतो. त्यामध्ये वेगळ्या पिकांचा समावेश होतो.उदा- फळबाग, नगदी पिके, मळयाची शेती, मसाला शेती तसेच आधुनिक शेती (ग्रीन हाउस, पोली हाउस) इ. कृषी पर्यटन आणि नैसर्गिक पर्यावरणाचा जवळचा संबंध आहे.

उद्दिष्टे:

1. सांगली जिल्ह्याचे कृषी पर्यटन संकल्पनेच्या दृष्टीकोनातून महत्त्व पाहणेव कृषी उद्यैगाना प्रोत्साहन देणे.
2. कृषी पर्यटन केंद्रांचा योग्य आराखडा तयार करणे.
3. शेतकर्यांना आर्थिक उत्पन्नाचा नाविन्यपूर्ण मार्ग उपलब्ध करून देणे.
4. कृषी पर्यटन क्षेत्रातील समस्या जाणून उपाय सुचवणे व कृषी पर्यटन क्षेत्र निर्मितीस आवश्यक घटक पाहणे.

कृषी पर्यटन क्षेत्र निर्मितीस आवशक घटक:

कृषी पर्यटनासाठी योग्य स्थान हा अत्यंत महत्त्वाचा घटक आहे. निवडलेल्या स्थानाला नैसर्गिक पार्श्वभूमी तसेच त्या ठिकाणी पोहचण्यासाठी सुलभयोग्य मार्ग: सहज उपलब्ध होणाऱ्या दळून - वळण सुविधा असावी. त्याच्याशेजारीच एखादी ऐतिहासिक पर्यटन स्थळ असावे तसेच तेथिल नैसर्गिक व ग्रामीण जीवनाचा आनंद घेता यावा. शेतकऱ्यांनी शेती अशा पद्धतीने विकसित करावी की;शहरातील लोक त्याच्या शेतीवरती कृषी पर्यटनासाठी आकर्षित होतील.

1. दळणवळणाचे सहज उपलब्धता.
2. शहरापासून दूर असावे.
3. धरण / बंधारा यांच्या जवळ असावे.
4. नैसर्गिक व ऐतिहासिक पार्श्वभूमी असणारी पर्यटन केंद्र त्याच्या जवळ असावीत.
5. कृषी पर्यटन केंद्रात नावीन्यपूर्णता असावी.
6. पर्यटकास आवश्यक असणारया पायाभूत सुविधा उपलब्ध असाव्यात. उदा- फोन, जेवणाची सोय इत्यादी.

कृषी पर्यटन केंद्राचे फायदे:

पारंपरिक शेती प्रकारचा, अर्थकारणाचा चेहरा बदलण्याची क्षमता कृषी पर्यटनामध्ये आहे. कृषी पर्यटनाच्या माध्यमातून शेतकरी व ग्रामीण जनतेला प्रत्यक्ष व अप्रत्यक्ष फायदा मिळतो.एकूणच कृषी पर्यटन हा ग्रामीण भागाचा विकास होण्यासाठी अत्यंत आवश्यक घटक आहे.

1. ग्रामीण भागातील जनतेला रोजगार संधी निर्माण होतील.
2. स्वतःच्या शेतीच्या उत्पन्नाबरोबर कृषी पर्यटनातून अधिकच्या उत्पन्नाचे मार्ग शेतकऱ्यांनी निर्माण होतील.
3. शेतकऱ्यांचे जीवनमान उंचावेल एकूणच ग्रामीण जीवन सुधारण्यास मदत होईल.
4. शहरी लोकांचा संपर्क ग्रामीण जीवनाशी होऊन त्यांना ग्रामीण जीवन समजावून घेता येईल.

कृषी पर्यटन केंद्रावर आवश्यक असणाऱ्या पायाभूत सुविधा:

कोणत्याही क्षेत्राचा विकास होण्यासाठी त्या शेत्राशी निगडित असणाऱ्या सुविधा उपलब्ध असणे आवश्यक आहे. त्याचप्रमाणे कृषी पर्यटन केंद्राचा विकास करण्यासाठी खालील सुविधा आवश्यक आहेत.

1. निवासाची सुविधा (फार्म हाऊस) याला प्रामुख्याने ग्रामीण स्वरूप असावे. त्यामध्ये कमी - अधिक आवश्यक सुविधा असाव्यात.उदा - टेलिफोन सुविधा
2. स्वच्छ पिण्याचे पाण्याची सुविधा, स्वयंपाकासाठी आवश्यक उपकरणे व पर्यटकांना आवडणारे अन्नपदार्थ.
3. पोहण्यासाठी आवश्यक विहिर, तळे, नदी त्याचप्रमाणे मासेमारी करण्यासाठी आवश्यक साहित्य,.
4. बैलगाडी,वेगवेगळी पारंपरिक अवजारे, जनावरांचा गोठा.

5. भारतीय, महाराष्ट्रीयन जेवण न्याहारीची सुविधा.
6. शेतकऱ्याने शेती मध्ये वेग - वेगळी केली जाणारी कार्य या संदर्भात माहिती उपलब्ध करून द्यावी. तसेच ती कार्य सुद्धा शेतकऱ्याने करून दाखवणे व पर्यटकास प्रत्यक्ष अनुभव घेण्याची संधी द्यावी.
7. पर्यटकांना ग्रामीण प्रदेशात खेळले जाणारे सर्व ग्रामीण खेळ उदा - भोवरा फिरवणे, विटी-दांडू, गोट्यांचा खेळ ,लपंडाव,लगोरी, गोपन चालवणे,रवणी काठी,सुरु पाटी, चिखलातील खेळ इ. खेळत पर्यटकांना भाग घेण्यासाठी संधी उपलब्ध करून द्यावी.
8. होळीचा खेळ, बैलगाडी चालवणे, म्हैशीची धार काढणे त्याच बरोबर शेतीमध्ये बैला मार्फत केले जाणारे वेगळी मशागत प्रत्यक्ष पर्यटकास अनुभव देणे.
9. पिकांची काढणी करण्यामध्ये पर्यटकांचा सहभाग घेण्यास द्यावे. उदा - फळे, मका, भुईमूग, ऊस भात,आले ,हळद त्याच पद्धतीने फळबागांमध्ये द्राक्ष, डाळिंब, बोर, सीताफळ इ.
10. ग्रामीण स्तरावरील गुऱ्हाळघर,तेल घाणे, विहिरी वरती जुन्या पद्धतीने (मोठ) पाणी ओढण्याची पद्धत, सूतकताई, जात्यावरील दळण, ताक - लोणी बनवणे, सुतार, लोहार, चांभार या ग्रामीण जीवनाचा अनुभव पर्यटकांना द्यावा.
11. ग्रामीण जीवनातील उपलब्ध नैसर्गिक सौंदर्य, प्राणी-पक्षी, नदी-नाले, संस्कृती व इतिहास दर्शन पर्यटकांना व्हावे म्हणून लोक नृत्य, शेकोटी गीते, भजन-कीर्तन, लेझीम, धनगर गीते, वाजंत्री, लोकगीते, यात्रा, उत्सव इ. अशा सर्व ग्रामीण जीवनाचा अनुभव पर्यटकांना द्यावा.

सांगली जिल्ह्यातील कृषी पर्यटन क्षमता:

सांगली जिल्ह्याचे स्थान महाराष्ट्र राज्याच्या दक्षिण - पश्चिमेस असून त्याने महाराष्ट्र राज्याचे इतके ३.०५ %क्षेत्र व्यापलेले आहे. त्याची समुद्रसपाटीपासूनची उंची ५५३मीटर आहे. सांगली जिल्ह्याचे एकूण क्षेत्रफळ ८५७२चौ. कि.मी.आहे. जिल्ह्याचा विस्तार १६.४५° ते १७.२२° उत्तर अक्षांश व ७३.४२° ते ७५.४२° पूर्व रेखांश आहे. भूपृष्ठ, हवामान व पर्जन्यमान यानुसार जिल्ह्याचे तीन स्वाभाविक विभाग पडतात.

1. पश्चिमेकडील डोंगराळ व जास्त पावसाचा प्रदेश
2. नद्यांच्या सानिद्यातील पावसाचा सपाट मैदानी प्रदेश.
3. पूर्वेकडील पठाराचा व भरड मातीचा कमी पावसाचा दुष्काळी प्रदेश.

पश्चिमेकडील सह्यद्रीच्या पूर्व उतारेच्या डोंगररांगा व त्यातून निघणा-या भैरवगड उप डोंगररांगा याठिकाणी वारणा, येरळा नद्यांचा उगम झालेला आहे.वारणा नदीवर असणारे चांदोली धरण जलाशयाचे ठिकाणी आहे. सांगली जिल्हयाच्या पश्चिमेस सदाहरित वने आढळतात तर पूर्वीस काटेरी वने आढळतात. या जिल्ह्यामध्ये प्राचीन मंदिरे, किल्ले, प्राचीन वास्तू, सागरेश्वर, चांदोली अभयारण्य इ. येथील वन्यजीवन अशी अनेक पर्यटनस्थळे आहेत. ही सर्व पर्यटन स्थळे कृषी पर्यटनास मदत करतात. तर प्रामुख्याने कृषी पर्यटनासाठी आकर्षित करणारे मुख्य पिके द्राक्षबागा, डाळिंबाच्या बागा, हळदीची लागवड, पश्चीमेस भात पिकाची लागवड तसेच वाळवा क्षेत्रामध्ये ऊस त्याच पद्धतीने पूर्वीस बोर, सीता फळांच्या बागा, ज्वारी, बाजरी तसेच वेगळया प्रकारची कडधान्य पिके सोयाबीन, सूर्यफूल इ. क्षेत्रात कृषी पर्यटनास मोठ्या प्रमाणात वाव आहे. तसेच द्राक्षापासून मनुके व वाईन्स (पलूस) बनवणारे कारखाने, हळद व हळद प्रक्रिया उद्योग त्यांचा कृषी पर्यटनास आधार पोहोचेल.तसेच सांगली जिल्हा इतर कृषी उत्पादनामध्ये विकसित जिल्हा आहे. सांगली जिल्ह्यात अनेक सण - उत्सव साजरे केले जातात. त्यामध्ये दिवाळी, गणेशचतुर्थी, दसरा, नागपंचमी (बत्तीशिराळा), बैल पोळा, संक्रांत, होळी इ.व अनेक सांस्कृतिक व पर्यटन स्थळे सांगली जिल्ह्यात कृषी पर्यटनास चालना देऊ शकतात.

कृषी पर्यटन समस्या:

सांगली जिल्ह्यामध्ये कृषी पर्यटन केंद्राच्या विकासाच्या दृष्टिकोनातून खूप अधिक क्षमता आहे. कारण नैसर्गिक व हवामानातील विविधतेमुळे कृषी पीक पद्धतीमध्ये मोठ्या प्रमाणात विविधता आढळून येते. परंतु कृषी पर्यटन विकासाच्या प्रक्रियेत काही समस्या आहेतच.

1. समाजजीवनात कृषी पर्यटन संबंधी कमी जाणीव व जागृती आहे.
2. शेतकऱ्यांमध्ये व्यावसायिक दृष्टिकोनाचा अभाव.
3. शेतकऱ्यांमध्ये संप्रेक्षण कौशल्याचा अभाव.
4. भारतीय समाज जीवनात कृषी पर्यटन ही संकल्पना म्हणावी तेवढी अजून रुजलेली नाही.
5. कृषी पर्यटनासाठी आवश्यक असणाऱ्या पायाभूत सुविधांचा अभाव, निधीचा अभाव.
6. कृषी पर्यटन हा अजून असंघटित उद्योग आहे.

निष्कर्ष:

सांगली जिल्ह्यामध्ये कृषी पर्यटनाच्या दृष्टिकोनातून कृषी पर्यटन केंद्राच्या विकासाची अधिक क्षमता आहे. कारण जिल्ह्याची प्राकृतिक रचना, नैसर्गिक परिस्थितीत, जलप्रणाली, कृषी उत्पादने यामध्ये असणारी विविधता व विविध प्रकारचे ग्रामीण जीवन त्यांची संस्कृती, जिल्ह्यातील जिल्हा कृषी विभागातून कृषी पर्यटन या संदर्भात नवीन व नाविन्य पूर्ण कल्पना, शेतकऱ्यांना दिल्या जातात. परंतु अजूनही कृषी पर्यटन या संकल्पनेचा विकास झालेला नाही. शहरातील वाढलेले हवा, जल प्रदूषण, झालेली दाटीवाटी, वाढलेला ताण - तणाव यातून थोडी विश्रांती मिळावी; त्याच पद्धतीने नैसर्गिक प्रदेशावर किंवा नैसर्गिक प्रदेश पाहण्याची आवड असणाऱ्या शहरी लोकांना ग्रामीण जीवनाचा आनंद घेता यावा ग्रामीण जीवन समजून घेता यावे. या दृष्टिकोनातून कृषी पर्यटन हा अनोखा आविष्कार आहे. त्यामुळे अतिशय चांगली संधी कृषी पर्यटन उद्योगास आहे. पाश्चात्य देशात कृषी पर्यटनाकडे ओघ वाढत आहे. निसर्गाचा खराखुरा आनंद कृत्रिम शाळांपेक्षा शेती आणि ग्रामीण जीवनाशी समरस होण्यातच आहे. हे सत्य जगाला सध्या पटत चालले आहे. गेल्या काही वर्षात पर्यटकांनचा कल शाश्वत व वास्तववादी पर्यटनाकडे झुकत आहे. सध्या जागतील तापमान वाढीवर जी चर्चा सुरू आहे:त्याच्या मुळाशी गेलो तर निसर्गाची झालेली हेळसांड हे मुख्य कारण आहे. कृषी पर्यटनाचा मूलाधार पर्यावरणाचे रक्षन, पृथ्वीचे संरक्षण हाच आहे. ग्रामीण जीवनामध्ये होणारी प्रत्येक घडामोडी आपली संस्कृती अधोरेखित करीत असतात. सण - उत्सव, रितीरिवाज, यात्रा-जत्रा, मिळे यातून संस्कृती व्यक्त होत असते: हे सारे अनुभवण्याची मजा काही औरच आहे. शहरी लोकांनी फुरसतीचे चार क्षण शेतावर जाऊन घालवले. तर कृषीवर घोगावणारे संकट दूर होण्यास मदत होऊ शकेल. पण कृषी पर्यटन उद्योग क्षेत्राविषयी कमी जागृकता, सरकारने बँकांनी कृषी पर्यटन उद्योगाला अनुदान, कर्ज अशा सुविधा द्याव्यात. कृषी पर्यटन उद्योग क्षेत्र हे संघटित उद्योग असावा जेणेकरून या क्षेत्रातील शेतकऱ्यांच्या समस्यांना संघटितपणे सोडवता येतील किंवा संघटितपणे त्या समस्यांना तोंड देता येईल.

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भारत में छोटे व सीमांत किसानो की वर्तमान स्तिथि

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शोध पत्र का सार-:
इस शोध पत्र में मैंने भारत के छोटे एवं सीमांत किसानों द्वारा सामना की जा रही उन विभिन्न बाधाओं व समस्याओ का वर्णन किया है जो उनकी भूमि की उत्पादकता और उनकी आय दोनों को भी बुरी तरह प्रभावित कर रही हैं। खेती–बाड़ी से जुड़े सभी छोटे किसानो को काफी समस्याओ का सामना करना पड़ रहा है। जिनमें उत्पादन से लेकर भंडारण एवं बाजारों तक पहुंच सभी शामिल हैं। हाल ही में कराए गए एक सरकारी सर्वेक्षण से यह निष्कर्ष उभर कर सामने आया है कि देश के हर दस किसानों में से चार किसान खेती को नापसंद करते हैं और यदि उन्हें कोई विकल्प दे दिया जाए तो वे इसे छोड़कर किसी और पेशे को अपनाना पसंद करेंगे। वैसे तो सरकार ने कृषि क्षेत्र में सुधारों की एक श्रृंखला जैसे कि 'ई–नाम' और 'कृषि यंत्रीकरण योजना' शुरू की है। लेकिन इन कार्यक्रमों का लाभ ज्यादातर बड़े किसानों के ही खातो में चला गया हैं। इस शोध पत्र में मैंने उन विकट समस्याओं को खत्म करने के लिए विशिष्ट सुझाव भी दिए है। जिस कारण से आने वाले समय के अंदर छोटे व सीमांत किसानो की दशा के अंदर सुधार किया जा सके।
कुंजी शब्द-: छोटे किसान, ऋण व बीमा व्यवस्था, सरकार की योजनाए, छोटे किसानो के समक्ष चुनौतिया, वर्तमान छोटे किसान का स्तर

परिचय-:

भारत में ज्यादातर किसान छोटे और सीमांत हैं। जिन्हें अक्सर एक हेक्टेयर से भी कम अथवा महज एक से लेकर दो हेक्टेयर तक की कृषि जमीन पर ही अपना पसीना बहाने पर विवश होना पड़ता है। भारत में जितने भी ग्रामीण परिवार हैं उनका लगभग 57.8 प्रतिशत कृषि क्षेत्र के भरोसे ही अपना जीवन यापन कर रहा है। इनमें से 69 प्रतिशत से भी अधिक परिवारों के पास मामूली कृषि योग्य जमीन हैं जिस कारण से उन्हें इसी जमीन पर अपना सारा पसीना बहाकर अपने परिवारों का जीवन यापन करना पड़ता है। वहीं, दूसरी ओर 17.1 प्रतिशत परिवारों को बिल्कुल थोड़ी कृषि योग्य जमीन के भरोसे ही अपना काम चलाना पड़ रहा है। वर्ष 2011 की नवीनतम जनगणना से यह निष्कर्ष उभर कर सामने आया है कि भारत के लगभग 72.3 प्रतिशत ग्रामीण परिवार कृषि क्षेत्र में या तो किसान या कृषि मजदूरों के रूप में काम करते हैं। हालांकि, कृषि क्षेत्र में कार्यरत किसानों का अनुपात वर्ष 1951 के 71.9 प्रतिशत से घटकर वर्ष 2011 में 45.1 प्रतिशत के स्तर पर आ गया है वर्ष 2011 की नवीनतम जनगणना से यह निष्कर्ष उभर कर सामने आया है। जो कम उत्पादकता की वजह से इस हद तक घट गया। जहां तक कम उत्पादकता का सवाल है, यह प्रतिकूल मौसम सहित विभिन्न कारकों का नतीजा है। कृषि क्षेत्र में विकास के अभाव ने ग्रामीण आबादी को गैर-कृषि क्षेत्र की ओर अग्रसर होने पर विवश कर दिया है जिसके परिणामस्वररूप वर्ष 1999-2000 और वर्ष 2011-2012 के बीच गैर-कृषि ग्रामीण रोजगार लगभग 12 प्रतिशत बढ़ गया है वर्ष 2011 की नवीनतम जनगणना से यह निष्कर्ष उभर कर सामने आया है। वर्ष 2003 में सरकार द्वारा किए गए 'किसानों के हालात आकलन सर्वेक्षण' के मुताबिक, हर दस किसानों में से

चार किसान खेती को नापसंद करते हैं और यदि उन्हें कोई विकल्प दे दिया जाए तो वे इसे छोड़कर किसी और पेशे को अपनाना पसंद करेंगे। इनमें से 27 प्रतिशत किसानों का यह मानना था कि खेती लाभदायक नहीं है और आठ प्रतिशत किसानों का यह मानना था कि यह जोखिम भरा है। ये निष्कर्ष बेशक अनपेक्षित हो सकते हैं, लेकिन इससे यह तो अवश्य ही पता चल जाता है कि देश के किसानों के बीच किस हद तक असंतोष फैला हुआ है। इस असंतोष के जो भी कारण हैं उनका तत्काल निपटारा करने की जरूरत है।

छोटे किसान: बाधाएं और सरकार की प्रतिक्रिया-:

भारत में छोटे किसानों को तकनीकी, वित्तीय और संस्थागत सहायता हासिल करने के मार्ग में विभिन्न बाधाओं का सामना करना पड़ता है। इन बाधाओं में निम्नलिखित शामिल हैं: औपचारिक ऋण एवं बीमा तक सीमित पहुंच, उन्हें आधुनिक कृषि उपकरणों एवं तौर-तरीकों का समुचित प्रशिक्षण देने वाले क्षमता निर्माण कार्यक्रमों का अभाव, सिंचाई के लिए अपर्याप्त पानी की आपूर्ति, फसल विविधीकरण के लिए बेहद कम या कोई गुंजाइश नहीं और विपणन सुविधाओं का अभाव। वैसे तो छोटे और बड़े दोनों ही किसानों को इनमें से ज्यादातर चुनौतियों का सामना करना पड़ता है, लेकिन कृषि से जुड़े कच्चे माल तक पहुंच के मामले में दोनों की स्थितियां अक्सर एक जैसी नहीं होती हैं। इस मामले में बड़े किसानों को कुछ बढ़त हासिल है। उदाहरण के लिए, छोटे किसानों की तुलना में बड़े किसान सिंचाई के सार्वजनिक (नहर) और निजी (ट्यूबवेल) स्रोतों तक अपनी पहुंच आसानी से सुनिश्चित कर लेते हैं। वहीं, छोटे किसान अक्सर भू-जल पर निर्भर रहते हैं जो पहले ही बहुत कम स्तर पर आ चुका है। इस कारण से यह असमानता छोटे एवं सीमांत किसानों को उत्पादकता से जुड़े जोखिमों के मामले में और ज्यादा असुरक्षित बना देती है।

भारत में छोटे किसानों द्वारा सामना की जाने वाली विभिन्न बाधाए इस तरह से है-:

पैदावार बेचने के लिए बाजार-:

बाजारों तक छोटे किसानों की पहुंच बढ़ाने के लिए सरकार ने हाल ही में एक नया कार्यक्रम 'ई-नाम' शुरू किया है। यह कृषि पैदावार में कारोबार के लिए एक वर्चुअल साझा बाजार है। जिससे खरीदारों एवं विक्रेताओं के बीच सूचना संबंधी विषमता समाप्त हो जाने की उम्मीद है। अत: इससे समूची कारोबारी प्रक्रिया और अधिक पारदर्शी बन जाएगी। इस तरह की प्रणालियों की सफलता इस बात पर निर्भर करेगी कि किसानों की शिक्षा का स्तर क्या है और खरीदारों के साथ बातचीत के वैकल्पिक तरीकों को जानने के मामले में किस हद तक खुलापन दिया गया है। असंगठित क्षेत्र के उद्यमों के लिए राष्ट्रीय आयोग की एक रिपोर्ट से पता चला है कि छोटे एवं सीमांत किसानों के बीच साक्षरता दर क्रमश: 55 प्रतिशत और 48 प्रतिशत है जो 72.98 प्रतिशत की राष्ट्रीय औसत साक्षरता दर से कम है। अत: ऐसे में ग्रामीण आबादी को कृषि क्षेत्र में सरकार की डिजिटल पहलों से लाभ उठाने में बेहद मुश्किलों का सामना करना पड़ेगा।

पानी, उर्वरकों, कीटनाशकों, बीजों और अन्य सामग्री तक पहुंच-:

भारत में पानी की कम उपलब्धता वाले क्षेत्रों जिनमें महाराष्ट्र, पंजाब, हरियाणा व कर्नाटक शामिल हैं इनमे जल तक पहुंच सुनिश्चित करना एक बड़ी समस्या है। 10 हेक्टेयर और उससे ज्यादा के बड़े भूखंडों वाले किसान जिनकी पहुंच आधुनिक मशीनों और पंपों तक होती है वे बड़ी मात्रा में पानी की खपत करते हैं। ऐसे में छोटे किसानों को बेहद कम पानी मिल पाता है क्योंकि वे इस तरह के पंप लगाने में असमर्थ होते हैं। इस स्थिति में फसलें उगाने के लिए उन्हें काफी हद तक बारिश पर ही निर्भर रहना पड़ता है अथवा निकटवर्ती ट्यूबवेल से पानी खरीदने पर विवश होना पड़ता है। जहां तक उर्वरकों और कीटनाशकों व बीज का सवाल है तो सीमित आपूर्ति के कारण इनकी लगातार बढ़ती कीमतों की वजह से बुनियादी कच्चे माल तक छोटे किसानों की पहुंच संभव नहीं हो पाती है। जिस कारण से छोटे व सीमांत किसानो को काफी समस्याओ का सामना करना पड़ सकता है।

ऋण और बीमा की सुविधाओं तक पहुंच-:

छोटे एवं सीमांत किसानों द्वारा ज्यादा उत्पाददन करने (वर्ष 2002-03 में देश के कुल उत्पादन में लगभग 51.2 फीसदी हिस्सेदारी) के बावजूद उनकी अर्जित आमदनी कम रहने और औपचारिक ऋण संस्थानों में जटिल परिचालन प्रक्रियाएं अपनाए जाने के कारण इन किसानों को अपनी निवेश एवं खपत जरूरतों के वित्तपोषण के लिए ऋण के भरोसे रहने पर विवश होना पड़ता है। वर्ष 2012 में यह पाया गया कि लगभग 85 फीसदी सीमांत किसान गैर-संस्थागत ऋण बाजारों जैसे कि गांव के जमींदारों, व्यापारियों, दोस्तों और अन्य लोगों पर निर्भर थे, जो औपचारिक ऋण बाजार दर का 100 गुना वसूला करते है। वर्ष 2011-12 में भारत में छोटे और सीमांत किसानों के बीच लगभग 82 फीसदी ऋणग्रस्तता थी जो विश्लेषकों के मुताबिक, किसानों के बीच व्यापक निराशा का संभवत: सबसे गंभीर कारण था और यहां तक कि इसी वजह से विभिन्न राज्यों में किसान आत्महत्या करने पर विवश हो गए। सरकार ने किसानों को आसान और अधिक विश्वसनीय ऋण चैनल मुहैया कराने के उद्देश्य से कृषि यंत्रीकरण योजना और मूल्य समर्थन योजना जैसी अनेक योजनाएं शुरू की हैं। हालांकि, यह माना जाता है कि इन कार्यक्रमों से अक्सर बड़े जमींदार ही लाभ उठाने में कामयाब हो जाते है। जबकि छोटे और सीमांत किसानों के लिए संकट का दौर बदस्तूर जारी ही रहता है। इसके अलावा, कृषि यंत्रीकरण योजना के तहत ब्याज में छूट के तौर पर मिलने वाली सब्सिडी की आलोचना इस बात को लेकर होती रही है कि इससे किसानों को संबंधित धनराशि को कृषि के बजाय ज्यादा मुनाफे वाले विकल्पों में लगाने का मौका मिल जाता है। इस योजना का दुरुपयोग बड़े किसानों द्वारा किया जाता रहा है, जो औपचारिक ऋण व्यवस्थाओं के दायरे से बाहर रहने वाले छोटे किसानों को ऊंची ब्याज दरों पर पैसा उधार दे देते हैं। इस बीच, फसल बीमा योजना एक ऐसा कार्यक्रम है जिससे आधे से भी अधिक किसान परिवार अनजान है। 24 फीसदी किसान परिवारों की पहुंच इस सुविधा तक नहीं थी। इस सुविधा तक कोई भी पहुंच न रखने वाले परिवारों की सर्वाधिक संख्या जिन-जिन राज्यों में थी उनमें जम्मू-कश्मीर (72 प्रतिशत), पंजाब (67 प्रतिशत), हरियाणा (42 प्रतिशत), बिहार (49 प्रतिशत) और राजस्थान (37 प्रतिशत) शामिल थे।

फसल विविधीकरण (बदलाव) में सीमित गुंजाइश-:

भारत में छोटे और सीमांत किसान दो हेक्टेयर से भी कम की कृषि जमीन के मालिक होते हैं व उस पर खेती करते हैं, जो अक्सर टुकड़ों में होती हैं और इनमें से केवल कुछ को ही पर्याप्त सिंचाई सुविधाएं मिल पाती हैं। इन छोटी-छोटी जमीनों के टुकडो के लगातार सिकुड़ते औसत आकार के कारण फसल विविधीकरण के लिए गुंजाइश बेहद सीमित हो गई है। इसके अलावा, सरकार की पहल मुख्य रूप से चावल और गेहूं के उत्पादन पर ही ध्यान केंद्रित करती है। चावल, गेहूं, मोटे अनाज और कुछ दालों के उत्पादन के लिए न्यूनतम समर्थन मूल्य के प्रावधान के कारण उपज के लिए दी जाने वाली मूल्य की गारंटी भी इसमें शामिल है। ये पहल केवल कुछ राज्यों तक ही सीमित हैं। इस वजह से किसान, विशेष रूप से छोटे और सीमांत किसान वाणिज्यिक फसलों का उत्पादन शुरू करने को लेकर हतोत्साहित हो जाते हैं। ऐसे में किसान जोखिम उठाने से और ज्यादा बचना शुरू कर देते हैं। जिससे भविष्य में फसल विविधीकरण के लिए प्रयास करने की संभावना कम हो जाती है। विशेष रूप से ऐसे राज्यों में फसल विविधीकरण से काफी लाभ होने की संभावना है जो खराब मिट्टी की समस्याओं से जूझ रहे हैं अथवा जहां पानी की उपलब्धधता अपेक्षाकृत कम है। उदाहरण के लिए, पांच एकड़ जमीन पर अनाज लगाने से जितनी आमदनी होगी उससे भी कहीं ज्यादा आय महज एक एकड़ भूमि पर उच्च मूल्य वाली फसलें लगाने से अर्जित की जा सकती है। अत: ऐसे व्यक्तियों को प्रशिक्षित करने के लिए कारगर सरकारी व्यवस्था कायम

करने की जरूरत है जो फसल विविधीकरण के संभावित लाभों को ध्यान में रखते हुए किसानों को खाद्यान्न के साथ-साथ वाणिज्यिक फसलों का भी उत्पादन शुरू करने के लिए प्रोत्साहित करेंगे।

फसल कटाई के बाद जरूरी समझे जाने वाले बुनियादी ढांचे का अभाव-:

किसानों को अपनी उपज के लिए पर्याप्त भंडारण और मालगोदाम संबंधी सुविधाएं न मिल पाने के कारण उन्हें अक्सर भारी नुकसान उठाना पड़ता है। इस वजह से वे अकसर उन्हें बहुत कम दामों पर अपनी उपज बेचने पर विवश हो जाते हैं। यह समस्या पूरे देश में देखी जा रही है जिससे सभी कृषि उत्पाद प्रभावित होते हैं। उदाहरण के लिए, वर्ष 2016 के आरंभ में ओडिशा में आलू की खेती करने वाले किसानों को भारी नुकसान उठाना पड़ा था। क्योंकि शीत भंडारण सुविधाओं के अभाव में उनकी लगभग 20 प्रतिशत उपज बर्बाद हो गई थी। इसी तरह, महाराष्ट्र में प्याज की खेती करने वाले किसानों को भारी नुकसान का सामना करना पड़ा था। क्योंकि कृषि उपज मंडी समिति में 35 दिनों तक चली हड़ताल के कारण वे अपने घरों में ही अपनी उपज का भंडारण करने पर विवश हो गए थे जिसके परिणामस्वरूप बड़ी मात्रा में उनका माल बर्बाद हो गया था। इस कारण से हर राज्य में भंडारण की सुविधाओं का होना काफी ज्यादा जरूरी है। इसके अलावा, ये सुविधाएं सभी किसानों, विशेष रूप से छोटे और सीमांत किसानों को उपलब्ध होनी चाहिए। ताकि उनकी फसल सुरक्षित रह सके।

छोटे व सीमांत किसानो की दशा में सुधार हेतु सुझाव-:

आज भारत में छोटे और सीमांत किसानों को कर्ज पर ऊंची ब्याज दरों का बोझ भी उठाना पड़ता है क्योंकि कुछ किसानों की ही पहुंच औपचारिक वित्तीय संस्थानों से मिलने वाले ऋणों तक है। औपचारिक ऋण संस्थानों की कवरेज अवश्य ही बढ़ाकर छोटे किसानों को भी इसमें शामिल किया जाना चाहिए। इसके लिए सरकार को एक ऐसी एजेंसी बनाने की जरूरत है जो सभी राज्यों के छोटे किसानों को सभी स्तरों पर ऋण संस्थानों से कनेक्ट करेगी। ब्याज छूट योजना में लीकेज की रोकथाम के लिए बैंकों में आय का सीधा हस्तांतरण करने की योजना को व्यापक रूप से लागू किया जाना चाहिए। इसके लिए भी बैंकिंग क्षेत्र में छोटे किसानों के एकीकरण की आवश्यकता होगी। कृषि भारत में राज्य का विषय है और यह राज्यों की भी जिम्मेदारी है कि वे अपने-अपने क्षेत्रों में रहने वाले किसानों की पहुंच आवश्यक सुविधाओं तक बढ़ाएं। कृषि क्षेत्र में उत्पादकता बढ़ाने के उद्देश्य से इस क्षेत्र में कई कार्यक्रमों को केंद्र सरकार द्वारा प्रायोजित किया गया है, लेकिन वे सभी किसानों की आमदनी बढ़ाने के लिहाज से कोई खास सफल नहीं हो पाए हैं। यह अत्यंत आवश्यक है कि केंद्र सरकार एक पर्यवेक्षक की भूमिका निभाए ताकि राज्य सरकारों को मुहैया कराई गई धनराशि का समुचित उपयोग सुनिश्चित किया जा सके। विभिन्न योजनाओं की ताजा स्थिति और प्रगति पर नियमित रूप से नजर रखने का काम अवश्य ही समयबद्ध ढंग से किया जाना चाहिए। देश में किसी तरह से अपना जीवन यापन कर रहे किसानों की लंबे समय से चली आ रही चिंताओं को दूर करने के लिए योजनाओं का प्रभावी कार्यान्वयन और निष्पादन अति आवश्यक है।

निष्कर्ष-:

अंत में निष्कर्ष के रूप में यह कहा जा सकता है कि भारत नि:संदेह पूरी दुनिया के लिए अनाज के एक प्रमुख स्रोत के रूप में उभर कर सामने आया है क्योंकि विगत दशकों में इसका कृषि उत्पादन और यहां से अनाज की फसलों का निर्यात कई गुना बढ़ गया है। हरित क्रांति के बाद किसानों की समृद्धि और आमदनी काफी बढ़ गई। हालांकि, ये लाभ सभी किसान परिवारों के बीच समान रूप से नहीं बंट पाए। छोटे एवं सीमांत और किसी तरह से अपना जीवन यापन करने वाले किसानों के समक्ष मौजूद कई बाधाओं पर गौर करने से यह साफ पता चल जाता है कि उनके संघर्ष का दौर अब भी जारी है। किसानों के हालात आकलन सर्वेक्षण (2003) के निष्कर्षों से यह तथ्य उभर कर सामने आया है कि किसान अपने पेशे के प्रति उदासीन हो गए हैं। किसी तरह से जीवन निर्वाह कर रहे लगभग 40 फीसदी ग्रामीण किसान परिवार खेती को नापसंद करते हैं और किसी अन्य व्यवसाय को अपनाने की बात करते है। उन्होंने यह भी कहा कि

वे नहीं चाहते हैं कि उनके बच्चे अपने परिवार की भूमि पर खेती-बाड़ी को आगे भी जारी रखें। इसलिए आज सरकार को इन छोटे व सीमांत किसानो के बारे में गहनता से सोचना होगा। ताकि आने वाले समय के अंदर छोटे व सीमांत किसानो की दशा में सुधार किया जा सके।

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सारांश :

काही प्रश्न व्यक्ती समाज, राज्य व राष्ट्रापुरते मर्यादित असतात, तर काही प्रश्न संपूर्ण विश्वासाठी महत्त्वाचे असतात. काही प्रश्न मानवी जीवनाच्या एका विशिष्ट अंगाला प्रभावित करतात, तर काही प्रश्न संपूर्ण मानवी जीवनाला प्रभावित करतात, काही प्रश्न माणसासोबतच वनस्पती, प्राणी, कृषी, उद्योग, व्यापार, हवा, पाणी, जमीन अशा सर्वच घटकाला प्रभावीत करतात. म्हणून संपूर्ण मानवी जीवनाला, वनस्पती जीवनाला, प्राणी जीवनाला व संपूर्ण विश्वाला प्रभावित करणाऱ्या घटकांपैकी एक महत्त्वाचा घटक म्हणजे जागतिक हवामान बदल होय. जगातील हवामान बदलाचा प्रभाव जसा संपूर्ण विश्वाला प्रभावित करतो तसाच तो सर्वाधिक स्वरूपात कृषीला प्रभावित करतो. या हवामान बदलामुळे संपूर्ण जगाच्या शेतीसोबतच भारताची शेती मोठ्या प्रमाणात प्रभावित झालेली आहे. हवामान बदलामुळे अनेक गंभीर पर्यावरणीय समस्या निर्माण होऊन, एकाच वेळी अतिवृष्टी, अनावृष्टी, चक्रावात, ढगफुटी, ओला दुष्काळ कोरडा दुष्काळ, महापूर, पर्जन्य असमतोल, जमिनीची धूप, साथीचे रोग, जमिनीची झीज, जीवितहानी, वित्तहानी, बर्फ वितळून येणारा महापूर, उष्णतेच्या लहरी, शित लहरी, कृषी उत्पादनात झालेली घट, कृषीमालाच्या किमतीत होणारा प्रचंड चढ-उतार, अतिनील किरणांचा प्रभाव, निसर्गचक्रात झालेली बिघाड, कार्बनचक्र, ऑक्सीजनचक्र, जलचक्र, नायट्रोजनचक्रात झालेली बिघाड, पर्यावरण संतुलनात झालेली बिघाड, जमिनीचे झालेले प्रदूषण, जमिनीचे झालेले क्षारीकरण, कृषी उत्पादनात झालेले चढ-उतार, शेतकरी आत्महत्येचे समाजकारण, अर्थकारण, राजकारण, स्थलांतरावर झालेले परिणाम या सर्वांचा एकूणच भारतीय शेतीवर झालेला नैसर्गिक, सामाजिक, आर्थिक परिणाम, कृषी उत्पादनामुळे व्यापारावर झालेला परिणाम, अतिरिक्त कार्बनच्या उत्सर्जनाने निर्माण झालेला परिणाम, जल, जमीन, जंगल यावर झालेला परिणाम हे जागतिक हवामान बदल किंवा ग्लोबल वार्मिंगच्या प्रभावामुळे संपूर्ण भारतीय शेतीवर झालेला दूरगामी परिणाम आपण या संशोधन पेपरच्या अनुषंगाने माहिती घेणार आहोत

बीज संज्ञा :"जागतिक हवामान बदलाचा भारतीय शेतीवर प्रभाव अभ्यासणे"

प्रस्तावना :

जागतिक हवामान बदलामुळे अर्थात ग्लोबल वॉर्मिंगमुळे वातावरणाच्या सरासरी तापमानात वाढ होत आहे. विशेषता: १९८० नंतर जागतिक तापमानात वेगाने बदल होत आहे. वाढलेले औद्योगिकीकरण, नागरीकरण, काँक्रिटीकरण, प्रदुषण, जंगलतो,ड वाळवंटीकरण, निर्वणीकरण, युद्ध, अनुस्फोट, ग्रीन हाऊस गॅसेस, कार्बनच्या प्रमाणात झालेली वाढ, मिथेनच्या प्रमाणात झालेली वाढ इ.मुळे वातावरणाच्या सरासरी तापमानात ०.२° सेल्सिअसने वाढ होऊन जागतिक तापमान वाढीला चालना मिळाली. याच गतीने तापमानवृद्धी होत राहिल्यास IPCC च्या अहवालानुसार २१ व्या शतकाच्या मध्यापर्यंत पृथ्वीचे सरासरी तापमान १.५° सेल्सिअस ते २.०° सेल्सिअसने वाढ होऊ शकते. १९८६ मध्ये CFC १२ पटीने वाढली PPT 230 पटीने वाढली. त्यामुळे बर्फ वितळून महापूर येणे सुरू झाले. CFC च्या प्रमाणात प्रतिवर्षी ५ टक्के वाढ होत आहे. या सर्वांचा परिणाम म्हणून ओझोनावर कमकुवत होऊन, अतिनील किरणे पृथ्वीपृष्ठावर येऊन पृथ्वीवर उष्णतेच्या लहरी निर्माण होऊ लागल्या, पर्जन्यातघट, अतिवृष्टी, अनावृष्टी, चक्रवात, वनवा, महापूर, ढगफुटी, जीवित व वित्त आणि जैविक विविधतेची हानी, साथीचे रोग निर्माण होऊन

भारतीय शेतीवर या हवामान बदलाचा दूरगामी परिणाम झाला. नैसर्गिक आपत्तीचे प्रमाण वाढले. जलचक्रात, कार्बनचक्रात नायट्रोजन चक्र व एकूण पर्यावरण चक्रात बिघाड निर्माण झाला. शेतीवर दुरगामी परिणाम होऊन शेती व शेतकरी नामशेष होण्याची भीती निर्माण झाली. एकूणच काय तर जागतीक तापमान वाढीचा शेतीवर व शेतीशी संबंधित सर्वच घटकांवर परिणाम होऊन शेतीसोबतच येथील समाजकारण अर्थकारण जीवनमान अशा सर्वच घटकांवर प्रभाव पडला. शेतीचे उत्पन्न घटले शेतीचे उत्पादन मूल्य वाढले, बाजार भाव गडगडले, शेती उत्पादनात प्रचंड चढ-उतार निर्माण झाले, शेतकरी कर्जबाजारी झाला, शेतक-यांच्या आत्महत्या वाढल्या, शेती व शेतीशी संबंधित समाजजीवनावर व्यापक परिणाम झाला.

क्षेत्र निवड : हवामान बदलाच्या संदर्भात भारतीय शेतीवरील प्रभावाचा अभ्यास प्रस्तुत संशोधन पेपरमध्ये करण्यात येणार आहे म्हणजे संशोधनाचे अभ्यासक्षेत्र संपूर्ण भारताच्या शेतीवर हवामान बदलाचा झालेला प्रभाव अभ्यासणे आहे.

उद्देश : जागतिक हवामान बदलाचा अभ्यास करणे, हवामान बदलाचा भारतीय शेतीवरील प्रभाव अभ्यासणे, हवामान बदलाची कारणे व शेतीच्या दृष्टीने परिणाम जाणून घेणे.

गृहितके : जागतिक हवामान बदला पूर्वीची शेती व नंतरची शेती यात मुलभूत फरक आहे. जागतिक हवामान बदलामुळे केवळ शेती क्षेत्र प्रभावित झाले नाही, तर संपूर्ण जगावर या हवामान बदलाचा दूरगामी परिणाम झाला आहे.

अभ्यास पद्धती : प्रस्तुत संशोधन पेपर तयार करण्यासाठी द्वितीय साधनसामग्रीचा उपयोग करण्यात आला शिवाय जागतिक पर्यावरण परिषदेचे अहवाल तसेच संकेतस्थळावरून माहिती संकलित करण्यात आली.

विषय विवेचन :

१९८० च्या दशकानंतर वैश्विक पातळीवर अनेक कारणामुळे पृथ्वीच्या तापमानात वाढ होत आहे या तापमान वाढीचा जागतिक तापमान वाढ किंवा जागतिक हवामान बदल किंवा ग्लोबल वार्मिंग असे म्हणतात. या जागतिक तापमानवाढीच्या एका घटकाला जबाबदार धरता येणार नाही तर अनेक घटकांच्या एकत्रित प्रभावातून ही जागतिक तापमानवाढ किंवा जागतिक हवामान बदल घडून आला, ही जागतिक तापमान वाढ अनेक कारणांमुळे घडून आली जसे विविध उद्योधंद्यातून होणारे कार्बन उत्सर्जन वाढलेले प्रदूषण वाढले औद्योगिकीकरण, नागरीकरण, वाळवंटीकरण, वृक्षतोड, अमर्याद वाळू उपसा, ग्रीन हाऊस गॅसेसची निर्मिती अणुस्फोट, वाढता प्लास्टिक कचरा, युद्ध वाहतुकीमुळे जीवाश्म इंधनाचा वाढता वापर, नवीन उद्योगातून होणारे प्रदूषण, अमर्याद खाणकाम इत्यादी कारणांमुळे पृथ्वीवरील वातावरणात अनेक अनावश्यक घटक मिसळून पृथ्वीचे तापसंतुलन बिघडले, त्याचा परिणाम म्हणून सूर्याकडून येणारे अतिनील किरणे लघु लहरी च्या स्वरूपात पृथ्वीवर येऊन दीर्घ लहरींच्या स्वरूपात उत्सर्जित होऊ लागले. परिणामी पृथ्वीवरील तापमान वाढ होऊन ग्लोबल वॉर्मिंग किंवा जागतिक तापमान वाढ किंवा जागतिक हवामान बदलाची क्रिया घडून आली. या तापमानवाढीस कारणीभूत ग्रीनहाऊस गॅसेस उत्सर्जन करणारे प्रमुख घटक पुढीलप्रमाणे.

ग्रीन हाऊस गॅसेस उत्सर्जन करणारे घटक		
अ.क्र.	कार्बन उत्सर्जित करणारे घटक	कार्बन उत्सर्जित करणारे घटक % मध्ये
०१	वीज उद्योग	२१.३
०२	इतर उद्योग धंदे	१६.१८
०३	वाहतूक साधने	१४
०४	कृषिक्षेत्र	१२.५
०५	जीवाष्म इंधन ज्वलन	११.३
०६	नागरीकरण	१०.३३
०७	बायोमास ज्वलन	१०

अशाप्रकारे वरील विविध घटकांतून मोठ्या प्रमाणात कार्बन उत्सर्जित होऊन जागतिक तापमान वाढीला गती मिळाली. या तापमान बदलाचे भारतीय शेतीक्षेत्रावर पुढील प्रमाणे परिणाम दिसू लागले. उदाहरणार्थ जीवावरण, जलावरण, वातावरणात बदल घडून आला. प्रदूषणात प्रचंड वाढ झाली, वातावरणातील वायूचे संतुलन बिघडले, पृथ्वीच्या सरासरी तापमानात वाढ झाली, पर्जन्यात अनिश्चितता निर्माण झाली. अतिवृष्टी, अनावृष्टी, दुष्काळाचे प्रमाण वाढले, महापुराचे प्रमाण वाढले, ढगफुटी चे प्रमाण वाढले, ओझोनावरणात घट झाली, उष्णतेचा लहरी निर्माण होऊ लागल्या, चक्रवताचे प्रमाण वाढले, जंगलांना वनवा पेटण्याचे प्रमाण वाढले, बर्फ वितळून महापूर येऊ लागले, अनेक नैसर्गिक आपत्ती वारंवार येऊ लागल्या. जैविक विविधतेचा ऱ्हास झाला, अनेक पशुपक्षी व प्राण्यांच्या आणि वनस्पतींच्या प्रजाती कायमच्या नष्ट झाल्या, साथीचे रोग विस्तारले कार्बनचक्र, जलचक्र, नायट्रोजन चक्रात बिघाड निर्माण झाला, गारपीटीचे प्रमाण वाढले, आम्लपर्जन्याचे प्रमाण वाढले, कृषी उत्पादनात घट झाली, सागर जलाची पातळी वाढवून समुद्रकिनारे जलमग्न झाले, मानवी आरोग्य धोक्यात आले. कॅन्सरचे प्रमाण वाढले, श्वसनाचे रोग वाढले एकूणच काय तर या सर्व वातावरण बदलाचा भारतीय शेतीवर दूरगामी परिणाम होऊन, कृषी उत्पादन घटले कृषी योग्य जमिनीचे प्रमाण कमी झाले. मृदा धूप होऊन शेती नाहीशी झाली. शेतीत अनावश्यक क्षाराचे प्रमाण वाढले, शेतीचा उत्पादन मूल्य खर्च वाढला, शेती तोट्यात आली, शेती नामशेष झाली, शेतकऱ्यांच्या आत्महत्या वाढल्या, शेतीमुळे संपूर्ण समाज जीवन प्रभावित झाले, शेतीमुळे पूरक उद्योग बंद पडले, शेतीचा अर्थकारणावर, व्यापारावर परिणाम होऊन अर्थव्यवस्था ढासळली. शेतीच्या ऱ्हासा बरोबर कृषी संस्कृती व सभ्यता मोडीत निघाली. शेतकरी देशोधडीला लागला. स्थलांतरितांचे प्रश्न निर्माण झाले तर नगरात अतिरिक्त लोकसंख्याचे प्रश्न निर्माण झाले. हवामान बदलामुळे अन्नधान्य उत्पादनात प्रचंड चढ-उतार झाले. हवामान बदलामुळे पिकावरील रोगाचे प्रमाण वाढले हवामान बदलामुळे अतिवृष्टी होऊन जमिनीची प्रचंड प्रमाणात धूप झाली. या सगळ्याचा परिपाक म्हणून शेतीवर नकारात्मक परिणाम होऊन शेती संकटात आली. हजारो लाखो शेतकऱ्यांनी आत्महत्या केल्या देशातील प्रमुख पाच राज्यांत झालेल्या शेतकरी आत्महत्या वरून हवामान बदलाचा भारतीय शेतीवर किती भयानक परिणाम झाला याची कल्पना येते.

भारतातील सर्वाधिक शेतकरी आत्महत्या झालेले राज्य व आत्महत्या केलेल्या शेतकऱ्यांची आकडेवारी

वर्ष	महाराष्ट्र	आंध्र प्रदेश	कर्नाटक	मध्य प्रदेश	भारत एकूण	केवळ ५ राज्यांत झालेल्या आत्महत्या
१९९५	१०८३	११९६	२४९०	१२३९	१०७२०	५६.०४ %
२०००	३०२२	१५२५	२६३०	२६५४	१६६०३	५९.२५ %
२००५	३९२६	२४९०	१८८३	२६९०	१८२४१	६३.९७ %
२०१०	३१४१	२५२५	२५८५	२३६३	१७३६८	६६.४१ %
२०११	३३३७	२२०६	२१००	१३२६	१५९६४	६३.९४ %

वरील आकडेवारीवरून हे स्पष्ट होते की भारतातील प्रमुख ५ राज्यात देशातील शेतकरी आत्महत्येच्या ६० टक्के पेक्षा जास्त आत्महत्या झालेल्या आहेत. यावरून जागतिक हवामान बदलाचा भारतीय शेतीवर किती गंभीर व दूरगामी परिणाम झाला आहे. पहायला मिळते. एकट्या महाराष्ट्रात २००१ ते २०२० या काळात विविध विभागात पुढील प्रमाणे शेतकरी आत्महत्या झाल्याची नोंद आहे. कोकण विभागात १३०, पुणे विभागात ११४५ ,नाशिक विभागात ४०५९, अमरावती विभागात १५२२१, नागपूर विभागात ४२९० तर औरंगाबाद विभागात ७७९५ शेतकऱ्यांनी आत्महत्या केल्याची नोंद पाहायला मिळते. एकूणच भारताचा विचार केला तर मागील २० वर्षात भारतात हवामान बदलामुळे शेती संकटात येऊन लाखो शेतकऱ्यांनी आत्महत्या केल्याचे पहावयास मिळते.

निष्कर्ष :

1. हवामान बदलामुळे भारतीय शेती संकटात आली.
2. हवामान बदलामुळे पर्जन्यात अनिश्चितता निर्माण झाली.

3. हवामान बदलामुळे शेती उत्पादनात प्रचंड चढ-उतार निर्माण झाला.
4. हवामान बदलानंतर नैसर्गिक आपत्तीचे प्रमाण वाढले,
5. हवामान बदलामुळे महापूर, ढगफुटी, बर्फवृष्टीचे, गारपीटीचे प्रमाण वाढले
6. हवामान बदलामुळे साथीचे रोग वाढले.
7. हवामान बदलामुळे शेती संकटात येऊन शेतकरी आत्महत्या वाढल्या.
8. हवामान बदलामुळे शेती संकटात येऊन शेतकरी स्थलांतराचे प्रमाण वाढले.
9. हवामान बदलामुळे कृषी संस्कृती व कृषी सभ्यता धोक्यात आली.

उपाय :

1. प्रदूषणावर आळा घालणे.
2. जल, जमीन, जंगल याचे नियोजन करणे.
3. पारंपारिक पद्धतीने शेती करणे किंवा शाश्वत शेतीचा विकास करणे.
4. जलनियोजन व जल व्यवस्थापन करणे.
5. वृक्षलागवड करणे, अमर्याद वाळू उपसा थांबवणे, पर्यावरण संरक्षण कायदे करून अंमलबजावणी करणे.
6. हरितगृह वायू उत्सर्जित उत्सर्जन कमी करणे.
7. लोकसंख्येची वाढ, नागरीकरण, वाढते औद्योगिकीकरण यावर नियंत्रण ठेवणे.

अशाप्रकारे जागतिक हवामान बदलाच्या भारतीय शेतीवर व्यापक परिणाम होऊन शेती संकटात सापडली आहे. शेतीमुळे शेतकरी संकटात सापडला आहे. परिणामी शेतकरी आत्महत्येचे प्रमाण वाढले आहे. शेती क्षेत्र नामशेष होत आहे शेतीचे वसाहतीमध्ये रूपांतर होत आहे. शेतकरी देशोधडीला लागत आहे स्थलांतरितांचे लोंढे शहरात येऊन शहरी भागात दारिद्र्य बेकारी गुन्हेगारी वाढत आहे. यातून अनेक सामाजिक, आर्थिक, धार्मिक समस्या निर्माण होत आहेत. हे सर्व रोखण्यासाठी पर्यावरण संतुलन होऊन पृथ्वीचे तापसंतुलन ठेवणे गरजेचे आहे. यातच व्यक्ती समाज देश व विश्वासाचे हित आहे.

संदर्भ ग्रंथ :

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2. en.m.wikipedia.org
3. कृषी अर्थशास्त्र, डॉ. विजय कविमंडल
4. जागतिक तापमान वाढ अटळ सत्य, राजेंद्र पचोळी.

महाराष्ट्रातील सामाजिक वनीकरण
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प्रस्तावना (Introduction) :

सामाजिक वनीकरण विभाग निर्माण करण्याचा निर्णय शासनाने सन 1981 साली घेतला आणि सन 1982 साली सामाजिक वनीकरण संचनालय स्थापन केले. सन 1982 ते 1987 या काळात सामाजिक वनीकरण व फलोत्पादन विभागाचे कामकाज सन 1992 पर्यंत महाराष्ट्र राज्याचे महसूल व वन विभागाअंतर्गत चालविले गेले.महाराष्ट्रातील मानवी हस्तक्षेपामुळे जो मोठ्या प्रमाणावर वृक्षसंहार झालेला आहे. ही वनांची पोकळी भरून काढण्यासाठी वृक्षाची पुर्नलागवड करून वनांचे प्रमाण संतुलित ठेवून पर्यावरणाच्या समतोल कायम ठेवणे हे शासनाचे या पाठीमागचे मुख्य उद्दिष्ट आहे. याशिवाय, इंधन व इमारतीसाठी लाकूड पुरविणे, जनावरांना चारा उपलब्ध करून देणे, शेत-जमिनीचे संरक्षण, लोकांना करमणुकीसाठी उद्याने तयार करणे इत्यादी सामाजिक वनीकरणाची उद्दिष्टे आहेत. "खेड्यामधील सामाईक भूमी रस्त्यालगत आणि कालव्याच्या काठावर रेल्वेमार्गाच्याडेला वृक्ष आणि कुरणांची लागवड याला सामाजिक वनीकरण असे म्हणतात." रस्ते लोहमार्ग, कालवे नद्याचे प्रवाह, शाळा-महाविद्यालये, शासकीय मालकीच्या मोकळ्या जागा, नीपीक क्षेत्र इत्यादी ठिकाणी वृक्षारोपण केले जाते. हा कार्यक्रम सामाजिक वनीकरण यामध्ये समाविष्ट होतो.

उद्देश (Objective):महाराष्ट्रातील सामाजिक वनीकरणाचा अभ्यास करणे.

अभ्यास क्षेत्र (Study Area) :भारतामधील सध्याच्या 28 घटक राज्यापैकी महाराष्ट्र हे एक राज्य आहे.

अक्षवृत्तीय व रेखावृत्तीय विस्तार : महाराष्ट्राचा अक्षांस विस्तार 15º44' उत्तर अक्षवृत्त ते 22º6' उत्तर अक्षवृत्त असून रेखांश विस्तार 72º36' पूर्व रेखावृत्त ते 80º 54' पूर्व रेखावृत्त आहे.

लांबी, रूंदी व क्षेत्रफळ : पश्चिमेस अरबी समुद्रापासून पूर्वेस साधारणपणे पूर्व घाटापर्यंत महाराष्ट्रात पसरलेला आहे. महाराष्ट्राची पश्चिम – पूर्व लांबी सुमारे 800 कि.मी. असून महाराष्ट्राची समुद्रकिनाऱ्याची उत्तर –दक्षिण एकूण लांबी 720 कि.मी. आहे. महाराष्ट्राचे क्षेत्रफळ 3,07 713 चौ. कि.मी. आहे.

सामुदायिक विकासासाठी सामाजिक वनीकरण :

सामाजिक वनीकरण लोकाभिमुख आहे. वनांचे संयुक्त व्यवस्थापन मुल्याधारित आहे. याचे मुख्य उद्दिष्ट लोक आणि शासनाच्या गरजा व आकांशा यांचे समाधान करते सामाजिक वनीकरण पडीक जमिनीवरील क्रियांच्या अमर्यादित कक्षांना समाविष्ट करते. यामुळे राष्ट्राच्या वनसाधन-संपत्तीवरील दबाव कमी करण्याचा प्रयत्न करते. सामाजिक वनीकरणास विस्तारित वनीकरण, खान वनीकरण, नागरी वनीकरण, वृक्षशेती, वन महोत्सव, मनोरंजन वनीकरण, पशुधन वनीकरणइत्यादी नावानेही संबोधले जाते. बरीचशी नावे सामाजिक वनीकरणाच्या वनांची उपयोगिता दर्शविते.

सामाजिक वनीकरणाची उध्दिष्टे :

राष्ट्रीय कृषी आयोगाने निर्देशित केलेली सामाजिक वनीकरणाची प्रमुख उद्दिष्टे पुढील प्रमाणे आहेत.

1. जळाऊ लाकूड, गुरांना चारा आणि ग्रामीण लोकांना टिंबर वनामधील किरकोळ उत्पादनाचा पुरवठा करणे.
2. उपलब्ध भूमीचा उत्पादन क्षमतेनुसार उपयोग करून घेणे.
3. कच्चा मालाचा पुरवठा करून स्थानिक कुटीर उद्योगाचा विकास करणे.
4. मृदा आणि जलाचे सक्षम संवर्धन करणे
5. स्थानिक लोकांना रोजगारांची संधी प्राप्त करून देणे.
6. शेणखताचा वापर करून कृषी उत्पादनात वाढ करणे.
7. लोकांच्या मनोरंजनाच्या गरजेची पूर्तता करणे.
8. क्षेत्राच्या दृश्यामधील सौदर्य अभिरूचीमध्ये सुधारणा करणे.
9. एकात्मिक ग्रामीण विकास कार्यक्रमांतर्गत ग्रामीण भागाचा सर्वांगीन विकास करण्याचा प्रयत्न करणे.

सामाजिक वनीकरणाची प्रमुख वैशिष्टये :

1. स्थानिक लोकांच्या सहभागाने वृक्षाची लागवड करणे.
2. वनांवरील दबाव कमी सर्व निरूपयोगी आणि पडीक जमिनीचा वापर करावा.
3. स्थानिक, सामाजिक-आर्थिक परिस्थितीचाविचार करून वनीकरणाची संरचना आणि कार्याचे स्वरूप निर्धारित करणे.
4. छोट्या कालखंडाची पीक फेरपालट करताना शाश्वत वनीकरण करून जलद फायद्याच्या आश्वासनाची पूर्तताकरणे.
5. सोप्या रीतीने अंमलबजावणी होणाऱ्या तंत्रज्ञानाच्या वापर करणे.
6. सामाजिक वनीकरणामधून प्राप्त होणाऱ्या नफ्याचेवाटप लोकांना आणि सामाजिक व आर्थिकदृष्ट्या मागास लोकामध्ये सारख्या प्रमाणात करणे.

सामाजिक वनीकरण :

महाराष्ट्र – प्रमुख योजनांखालील वर्षनिहाय वृक्ष लागवड (क्षेत्र : हेक्टर)

योजना	2014-15	2015-16	2016-17
महात्मा गांधी ग्रामीण रोजगार हमी योजना – गट लागवड	234	211	110
महात्मा गांधी ग्रामीण रोजगार हमी योजना : रस्त्यांच्या बाजूला वृक्ष लागवड (कि. मी.)	1,672	928	1,132
राष्ट्रीय बांबू अभियान	39	30	65
निवडलेल्या पाणलोट क्षेत्रातील वनेतर सामूहिक जमिनीवर वृक्ष लागवड कार्यक्रम	125	147	105

संदर्भ : प्रधान मुख्य वनसंरक्षक कार्यालय, सामाजिक वनीकरण, महाराष्ट्र शासन, महाराष्ट्राची आर्थिक पाहणी, 2016 – 17

वनशेती : शेतीबरोबरच वनांचीही लागवड म्हणजे वनशेती होय. उपलब्ध असलेल्या शेतजमिनीचा कमाल वापर अधिक काळ शेती किंवा वनाखाली जमी असणे हाच प्रमुख वनशेतीचा आहे. यामध्ये वन उत्पादने, फळे व चारा यांचे उत्पनन घेतले जाते. यामुळे वेगाने वाढणाऱ्या वनस्पती मोठ्या प्रमाणात लागवड करण्याचे कार्यक्रम तज्ज्ञांच्या मार्गदर्शनाखाली हाती घेण्यात आलेले आहेत. सुरूवातीच्या काळात वृक्ष लागवडीच्या क्षेत्रात पीक पट्टे घेतात. अलीकडे सर्वत्र निलगिरी व सुबाभूळ यांची स्वतंत्र लागवड अनेक ठिकाणी आढळते.

वृक्ष लागवड : वृक्ष लागवड कार्यक्रमाची अंमलबजावणी मुख्यत: वन विभाग, म. वि. म. व सामाजिक वनीकरण संचालनालय यांच्यामार्फत करण्यात येते. राज्यशासनाने सन 2012 पासून दरवर्षी वृक्ष लागवड करण्याचा निर्णय घेतलेला आहे.

वनसंरक्षण : महाराष्ट्रात उपलब्ध असलेल्या वनस्पतींच्या प्रकारांचे संरक्षण करणे आवश्यक आहे. कारण राज्यामध्ये एकूण भौगोलिक क्षेत्रफळांपैकी फक्त 17 टक्के क्षेत्र अरण्याखाली आहे. राष्ट्रीय वनधोरणानुसार राज्यामध्ये एकूण जमिनीच्या 33.33 टक्के अरण्ये असावयास पाहिजे, यासाठीच उपलब्ध असलेल्या वनस्पतींचे संरक्षण करणे आणि नवीन वनस्पतीचे संवर्धन करणे जरूरीचे आहे.

वन उत्पादने : वनांद्वारे इमारती लाकूड, जळाऊ लाकूड ही प्रमुख व बांबू, तेंदू, पत्ता, डिंक, गवतइत्यादी गौण वन उत्पादने मिळतात. या सर्व वन उत्पादन राज्याचा महसूल वाढविण्यासाठी व स्थानिकांना उपजिविका पुरविण्यासाठी महत्वपूर्ण आहेत.

महाराष्ट्र – वनोत्पादने व त्याचे मूल्य (रू कोटी)

वनोत्पादने	उत्पादनाचे प्रमाण	2014 - 15		2015 - 16		2016 - 17	
		उत्पादन	मूल्य	उत्पादन	मूल्य	उत्पादन	मूल्य
अ) मुख्य उत्पादने							
इमारती लाकूड	लाख घट मीटर	1.11	213.25	1.82	120.67	1.81	234.42
जळाऊ लाकूड	लाख घट मीटर	1.89	20.57	2.26	19.87	2.36	32.78
एकूण (अ)		3.00	233.82	4.08	140.54	4.17	267.20
ब) गौण वनोत्पादने							
बांबू	लाख मेट्रिक टन	0.23	30.26	0.33	12.20	0.38	
तेंदू	लाख स्टँडर्ड बॅग्ज	4.62	55.21	2.13	30.68	2.76	
गवत	मेट्रिक टन	483	0.13	116	0.02	उ.ना.	उ.ना.
डिंक	क्विंटल	5,391	0.56	4,530	3.41	उ.ना.	उ.ना.
इतर(लाख, हिरडा, शिकेकाई)		उ.ना.	9.56	उ.ना.	13.63	उ.ना.	उ.ना.
एकूण (ब)			95.72		59.94		65.23
एकूण (अ + ब)			329.54		200.48		332.43

* अस्थायी * अपेक्षित उपलब्ध नाही.

संदर्भ : 1) प्रधान मुख्य वनसंरक्षक व महासंचालक, सामाजिक वनीकरण यांचे कार्यालय, महाराष्ट्र शासन

2) महाराष्ट्राची आर्थिक पाहणी, 2016-17, पान क्र. 111

वृक्षारोपणाच्या महत्वाच्या योजना :

1. निवडलेल्या पाणलोट क्षेत्रातील वनेत्तर सामूहिक जमिनीवर वृक्ष लागवड कार्यक्रम व पश्चिम घाट विकास कार्यक्रम,

2. रोजगार हमी योजनेतर्गत खासगी पडीक जमिनीवर वृक्ष लागवड
3. कुरण विकास व महात्मा गांधी ग्रामीण रोजगार हमी योजना – महाराष्ट्र
4. एकात्मिक पाणलोट व्यवसाय कार्यक्रम
5. राष्ट्रीय बांबू मिशन
6. संत तुकाराम वनग्राम योजना.

सामाजिक वनीकरणाच्या यशस्वीतेसाठी आवश्यक घटक :

1. भूमीची क्षमता.
2. गावकऱ्यांची भूमिउपयोजनाची निवड.
3. पुरविल्या जाणाऱ्या संघटनात्मक संरचनेच्या आधाराचे स्वरूप.
4. स्थानिक परिसंस्था, लोकांच्या वर्तणुकीचे स्वरूप, नेतृत्वाची पद्धत, जमिनीची मालकी आणि सध्या अस्तित्वात असलेल्या आर्थिक पायाभूत सुविधा यांचा अभ्यास करून सामाजिक कार्यक्रम हाती घेणे.
5. सध्या अस्तित्वात असलेल्या सुविधांपेक्षा वापरले जाणारे तंत्रज्ञान अधिक सोईस्कर, उपलब्ध, अधिक उपयुक्त व उत्पादन देणारे असले पाहिजे. शिवाय सध्या वापरात असलेल्या तंत्रज्ञानापेक्षा परिस्थितीनुसार शाश्वत असले पाहिजे.
6. गावकऱ्यांच्या दृष्टीकोनामधून नवीन भूमिउपयोजन निश्चितपणे फायदेशीर असले पाहिजे.
7. स्थानिक लोकांना खात्री वाटली पाहिजे की, होणारी लागवड आपल्या फायद्यासाठी आहे आणि ती मोठ्या प्रमाणात असली पाहिजे.

सामाजिक वनीकरणाच्या मर्यादा :

1. **फक्त श्रीमंत शेतकऱ्यांना फायदेशीर :** सामाजिक वनीकरण कार्यक्रमाचा फायदा फक्त श्रीमंत शेतकऱ्यांना होत आहे की, जे थोड्या कालावधीसाठी वन पिकाची फेरपालट करतात आणि ताबडतोब बाजारपेठ प्राप्त होते.
2. **निलगिरी वृक्षाचे परिणाम :** या कार्यक्रमांतर्गत निलगिरी वृक्षांची लागवड मोठ्या प्रमाणात करण्यात आली. कारण ते एक नगदी पीक आहे आणि जळावू लाकूड म्हणून उपयुक्त आहे. परंतु आता असे सिद्ध झाले आहे की, परिस्थितिकीदृष्ट्या ही एक आपत्ती आहे. कारण निलगिरी वृक्षांच्या जवळपास दुसऱ्या कोणत्याही वृक्षाची लागवड होऊ शकत नाही. निलगिरी वृक्ष मोठ्या प्रमाणात भूमिगत पाणी घेते की, ज्यामुळे भूमिगत पाण्याची पातळी खालावते. जमिनीच्या पोषणमूल्यांचा अवक्षय होतो आणि काळाच्या ओघात मृदेची अवनती होते.

3. **सामुदायिक जागेवर असमाधानकारक कार्य** : सामुदायिक जागेवर समाधानकारक कार्य होत नाही, कारण लोक त्याच्या जमिनीत न उगवणाऱ्या वृक्षांच्या लागवडीची काळजी घेत नाहीत.

निष्कर्ष (Conclusion):

1. सामुदायिक विकासासाठी सामाजिक वनीकरण हा उपक्रम पर्यावरणाचा समतोल राखण्याच्या दृष्टीने अत्यंत महत्त्वाचा आहे.
2. इंधन, इमारतीसाठी लाकूड, जनावरांना चारा, शेतजमिनीचे संरक्षण, करमणुकीसाठी उद्याने इ. च्या संदर्भाने सामाजिक वनीकरणाची भूमिका अत्यंत महत्त्वाची आहे.
3. सामाजिक वनीकरणाची उद्दिष्ट्ये आणि वैशिष्ट्यांची प्रत्यक्षात अंमलबजावणी करणे अत्यावश्यक आहे.
4. सन 2016-17 मध्ये सर्व प्रकारच्या योजनांच्या माध्यमातून 1412 हेक्टर क्षेत्रामध्ये वृक्ष लागवड करण्यात आली होती.
5. सन 2016-17 मध्ये एकूण वनोत्पादन मूल्य 332.43 कोटी रू. आहे.
6. सामाजिक वनीकरणाच्या यशस्वीतेसाठी महाराष्ट्रातील लोकांनी आवश्यक घटकांची प्रत्यक्षात अंमलबजावणी करणे आवश्यक आहे.
7. महाराष्ट्रातील सामाजिक वनीकरणाचे प्रामुख्याने ग्रामपातळीवर व शासन स्तरावर संवर्धन व विकास होणे गरजेचे आहे.

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2. महाराष्ट्राचा भूगोल : ए. बी. सवदी
3. संपूर्ण भूगोल (जग + भारत) : राहूल पाटील, प्रशांत अहिरे, विकास गिरासे
4. संकेत स्थळावरील माहिती

कृषी रसायने आणि औद्योगिक भागातील रसायने व इतर रसायनांमुळे ठाणे जिल्ह्यातील खाडी प्रदेशाच्या जलगुणवत्तेवर होणारे परिणाम

डॉ . सुरेश जे . फुले[1] श्री . नंदकुमार म . गोसावी[2]

[1]संशोधन मार्गदर्शक, भूगोल विभाग, राजर्षी शाहू महाविद्यालय (स्वायत्त), लातूर, लातूर जिल्हा.

[2]संशोधन विद्यार्थी , भूगोल विभाग, राजर्षी शाहू महाविद्यालय (स्वायत्त), लातूर, लातूर जिल्हा.

सारांश:

खाडी प्रदेशातील जलप्रदूषण हा सभोवतालच्या प्रदेशातील मानवी जीवन आणि खाडी प्रदेशातील पर्यावरणाच्या दृष्टीने अत्यंत महत्त्वाचा विषय आहे. उद्दिष्टे : प्रस्तुत लघुशोधनिबंधद्वारे जलप्रदूषके त्यांचे परिणाम आणि ठाणे जिल्ह्यातील खाडी प्रदेशातील जलप्रदूषणाचा अभ्यास करणार आहे. पद्धती : केंद्रीय प्रदूषण नियंत्रण मंडळ आणि महाराष्ट्र प्रदूषण नियंत्रण मंडळ याद्वारे स्थापित जलगुणवत्ता सनियंत्रण केंद्रांनी संकलित केलेल्या आकडेवारीच्या आधारे विश्लेषण करण्याचा प्रयत्न केला आहे .

बीज शब्द : पाणी , गुणवत्ता निर्देशांक , जलप्रदूषके , पर्यावरणीय परिणाम.

प्रस्तावना :

जगात सर्वत्र औद्योगीकरण वाढत आहे मानव आपल्या स्वार्थासाठी विविध संसाधनांचा वापर करत असतो अधिकाधिक आरामदायक जीवनशैलीसाठी मोठ्या प्रमाणावर संसाधनांचा अनावश्यक वापर केला जातो . त्यातूनच मोठ्या प्रमाणात उद्योगधंदे उभारले जात असतात . वाढत्या औद्योगिकरणामुळे अनेक समस्या उद्भवत आहेत . त्यात प्रमुख समस्या म्हणजे विविध प्रकार प्रदूषण औद्योगिकरणामुळे शहरीकरण वाढत आहे . उद्योगधंद्यांमध्ये नोकरीच्या संधी उपलब्ध झाल्याने मोठ्या प्रमाणावर शहरी भागाकडे किंवा औद्योगिक केंद्राकडे लोकांचे स्थलांतर होते. त्यातून शहरी लोकसंख्या ही मोठ्या प्रमाणावर वाढत जाते . त्यातून जागेचे प्रश्न निर्माण होऊन झोपडपट्ट्या व गलिच्छ वस्त्या ही वाढत जातात आणि शहरी भागातून कचरा प्रदूषण , सांडपाणी प्रदूषण अशा प्रकारची प्रदूषणे वाढत जातात.

काही उद्योगधंद्यांना पाण्याची जास्त आवश्यकता असल्याने असे उद्योगधंदे नद्यांच्या काठावर उभारले जात असतात . नद्यांच्या काठावर उद्योगधंदे वाढल्याने तेथे उद्योगधंद्यातील सांडपाणी , टाकाऊ पदार्थ , रसायने , प्लास्टिक , तसेच जवळच्या नागरी भागातून येणारे सांडपाणी , टाकाऊ पदार्थ हे घटक पाण्यात मिसळल्याने जलप्रदूषण घडून येत असते . येथे आपण

ठाणे जिल्ह्यातील समुद्र खाड्यांच्या जल प्रदूषणाचा अभ्यास करणार आहोत . ठाणे खाडी हा अरबी समुद्राचा भाग आहे . ठाणे खाडी भारताच्या मुख्य भूमीपासून मुंबई शहराला वेगळी करते . ठाणे खाडी ही आशिया खंडातील सर्वात मोठी खाडी आहे . तिची लांबी २६ किलोमीटर एवढी आहे . या खाडी प्रदेशाचे मुख्यत्वे दोन भाग पडतात . पहिला भाग हा घोडबंदर रोड आणि ठाणे दरम्यान आहे . तो मुंबईच्या उत्तरेकडील उल्हास नदीच्या मुखापासून सुरू होतो आणि दुसरा भाग ठाणे शहरापासून सुरू होतो आणि अरबी समुद्रातील जवळ घारापुरीच्या अलीकडे संपतो . पर्यावरणीय दृष्टिकोनातून त्याला अनन्यसाधारण महत्त्व आहे . ऑगस्ट २०१५ मध्ये महाराष्ट्र शासनाने खाडी प्रदेशाला फ्लेमिंगो पक्षी अभयारण्य म्हणून घोषित केले आहे . खाडी प्रदेशाचे क्षेत्रफळ १६ ९ ० हेक्टर इतके असून त्यातील ८ ९ ६ हेक्टर प्रदेशात खारफुटीची जंगले आहेत आणि ७ ९ ४ जलमग्न प्रदेश आहे . या खाडीच्या एका बाजूला मुंबई क्षेत्र तर दुसऱ्या बाजूला ठाणे , नवी मुंबई आहे . ठाणे तसेच मुंबई आणि नवी मुंबई या प्रदेशातील मोठ्या प्रमाणावर सांडपाणी तसेच टाकाऊ पदार्थ हे खाडी प्रदेशात येऊन मिसळतात . या पदार्थांमध्ये रसायनमिश्रित पाणी टाकाऊ पदार्थ , घनकचरा , प्लास्टिक , कॉपर , शीसे , पारा यासारखे जड धातू यासारखी प्रदूषके खाडीच्या पाण्यात मिसळतात . त्यामुळे पाण्याचे प्रदूषण होत आहे . असे प्रदूषित पाणी तेथील झाडामार्फत शोषले जाते , तेथील सजीव ह्या पाण्यात राहतात . त्यांच्या आरोग्यावर गंभीर परिणाम होत असतो . तसेच ह्या खाडी प्रदेशाच्या जवळपासच्या प्रदेशात राहणाऱ्या लोकांच्या आरोग्यावरही या घटकांचा परिणाम होत असतो.

निष्कर्ष : विविध प्रकारच्या प्रदूषकामुळे सजीव पर्यावरण व त्यांच्या आरोग्यावर विपरीत परिणाम होत असतात आणि पर्यावरणाचा ऱ्हास होत असतो.

उद्दिष्टे : प्रस्तुत शोधनिबंधाची उद्दिष्टे खालीलप्रमाणे आहेत.

१. जल गुणवत्ता प्रक्रियेची माहिती घेणे .

२. जलप्रदूषकाच्या मापणाची माहिती घेणे .

३ . खाडी क्षेत्रातील प्रदूषकाचा आढावा घेणे .

संशोधन पद्धती: प्रस्तुत शोधनिबंधसाठी संशोधन पद्धतीतील द्वितीयक साधनसामग्रीचा वापर करण्यात आला आहे . ही माहिती संशोधकाने वार्षिक अहवाल , नियतकालिके , पुस्तके , वर्तमानपत्रे तसेच इंटरनेटच्या माध्यमातून संकलित केली आहे.

साधने व पद्धती : सतत वाढत असलेले जलप्रदूषण हे मानव इतर सजीव तसेच वनस्पती या सर्व पर्यावरणीय घटकासाठी भेडसावणारी समस्या बनली आहे . विविध पदार्थ हे पाण्यात विरघळू शकतात . पाण्याच्या या गुणधर्मामुळे काही पदार्थ , काही वायू पाण्यात विरघळत असतात . असे दूषित घटक विरघळलेले असलेले पाणी सजीव आणि पर्यावरणासाठी घातक असते .

केंद्रीय प्रदूषण नियंत्रण मंडळ आणि महाराष्ट्र प्रदूषण नियंत्रण मंडळ प्रदूषणाच्या प्रतिबंधासाठी कार्यरत आहेत . महाराष्ट्र प्रदूषण नियंत्रण मंडळ ७ सप्टेंबर १ ९ ७० रोजी महाराष्ट्र प्रदूषण प्रतिबंधक अधिनियम , १ ९ ६ ९ च्या तरतुदीनुसार स्थापन करण्यात आली , जल प्रदूषण प्रतिबंध व नियंत्रण अधिनियम , १ ९ ७४ च्या कलम ४ च्या तरतुदीनूसार तयार करण्यात आला . प्रदूषण प्रतिबंध अधिनियम १ ९ ८१ च्या कलम ५ अंतर्गत राज्य मंडळ म्हणून देखील कार्यरत आहे . महाराष्ट्र प्रदूषण नियंत्रण मंडळाने विविध ठिकाणी पाणी गुणवत्ता संनियंत्रण केंद्रे स्थापन केलेले आहेत. प्रत्येक महिन्याला खाडी परिसरातील पाण्याच्या गुणवत्तेच्या नोंदी घेतल्या जातात . खाडी प्रदेशातील खारफुटीच्या जंगलामध्ये अनेक जीव जोपासले जात असतात . मोठ्या प्रमाणावर अन्न उपलब्ध असल्यामुळे विविध पक्षी हे त्या जंगलामध्ये वास्तव्य करून असतात . खाडी प्रदेशाची जैवविविधता मोठया प्रमाणावर आढळत असते . फ्लेमिंगो सारखे पक्षी हे हजारोंच्या संख्येने ठाणे खाडी येथे येत असतात . त्यामुळे तेथील पर्यावरण हे चांगले राहणे खूप महत्वाचे आहे . १ ९ ७० या वर्षी राष्ट्रीय स्वच्छता संस्था , यू.एस.ए. येथे जल गुणवत्ता निर्देशांक (एन . एस . एफ . डब्ल्यू . कयू.आय.) विकसित करण्यात आला . विविध जलाशयांच्या जल गुणवत्तेची तुलना करण्यासाठी ही प्रमाणित पद्धत आहे . युनायटेड स्टेट्स मध्ये एन . एस . एफ . डब्ल्यू . क्यू . आय सर्वाधिक वापरला जाणाऱ्या जल गुणवत्ता निर्देशांकापैकी एक आहे . निर्देशांक निश्चित करण्यासाठी वापरण्यात येणाऱ्या नऊ मापदंडामध्ये डी.ओ.सी. , पी.एच. , बी.ओ.डी . , तापमान बदल , एकूण फॉस्पेट , नायट्रेट , गढूळता आणि एकूण सोलिड्स यांचा समावेश होतो .

खाडी प्रदेशाजवळील शहरी भाग , उद्योगधंदे आणि प्रदूषणाचा आढावा :

ठाणे खाडी प्रदेशाजवळ असलेल्या शहरी भागांमध्ये मुंबई बेटाच्या उत्तर आणि पूर्व किनारपट्टीला लागून असलेल्या शहरी भागाचा समावेश होतो . या भागांमधून वाहत येणारे प्रदूषित पाणी , पाण्यातील कचरा , प्लास्टिक , डिटर्जंट , रसायनमिश्रित पाणी , खाडी भागात वाहून आणत असतात . देवनार डम्पिंग ग्राउंड हेसुद्धा खाडी प्रदेशाला लागून आहे . येथूनही मोठ्या प्रमाणावर खाडीचे प्रदूषण होत असते . पावसाळयात मुंबईत मोठ्या प्रमाणात पाऊस पडतो . तेव्हा ह्या डम्पिंग ग्राउंड मधून मोठ्या प्रमाणावर कचरा , प्लास्टिक आणि पाण्यात विरघळणारी प्रदूषके खाडी प्रदेशात येऊन मिसळत असतात.

खाडी प्रदेशाच्या उत्तर आणि पूर्वेकडे ठाणे जिल्हा आणि नवी मुंबई भागाचा समावेश होतो . ठाणे जिल्ह्यात एकूण १४ औद्योगिक क्षेत्र आहे . हा महाराष्ट्रातील तिसऱ्या क्रमांकाचा औद्योगिक जिल्हा आहे . त्या जिल्ह्यात एकूण १५४८ मोठे आणि मध्यम उद्योग आणि १८४८० लघुउद्योग आहेत . त्या उद्योगातील प्रमुख उद्योगधंद्यांमध्ये औषधे , कापड , डिंक , रबर , लोखंड , अभियांत्रिकी , खते इलेक्ट्रॉनिक्स , रसायने , लोहपोलाद उद्योग यांचा समावेश होतो.

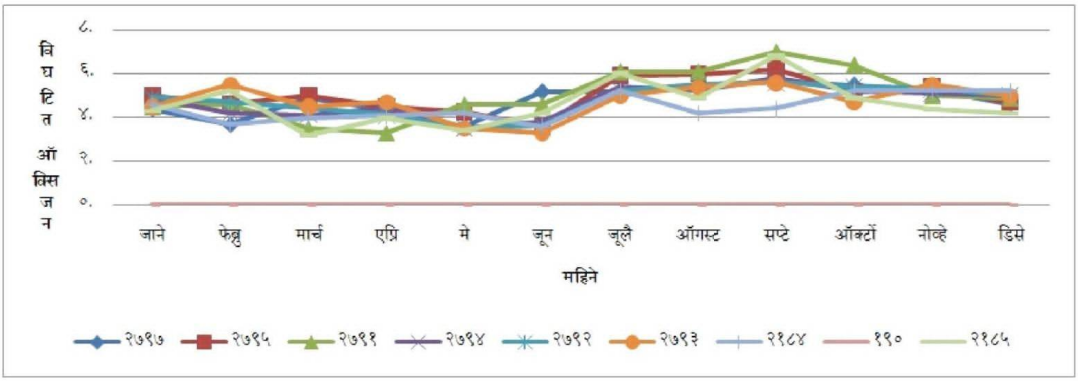
ठाणे - बेलापूर कल्याण औद्योगिक पट्टा हा सुधारित आधुनिक उद्योगधंद्याचे केंद्र आहे. यंत्रसामग्री , वस्तू निर्माण , धातू उत्पादने अशा मोठ्या उद्योग धंदा व्यतिरिक्त रेफ्रीजिरेटर , अन्नप्रक्रिया , पेपर आणि सिमेंट उद्योग , वनस्पती आणि प्राणीज तेल , रंग , वॉर्निश , लाख आणि इतर रासायनिक उत्पादने तसेच इतर महत्त्वाचे उद्योगधंदे ठाणे जिल्ह्यात आढळून येतात . महाराष्ट्र प्रदूषण नियंत्रण मंडळाच्या माहितीनुसार राज्यात जास्त प्रदूषण करणाऱ्या उद्योगधंद्यांची संख्या ठाणे जिल्ह्यात सर्वाधिक आहे . या उद्योगधंद्या मधून आणि ठाणे , नवी मुंबई शहरी भागातून मोठ्या प्रमाणावर प्रदूषित पाणी आणि प्रदूषके खाडी प्रदेशात येऊन मिसळतात.

१६ डिसेंबर २०१८ च्या लोकवृत्तानुसार ठाण्यातील खाडीच्या पाण्याची गुणवत्ता सुधारली असल्याचा दावा जरी महापालिकेने केला असला तरी खाडीची सद्यस्थिती पाहता हा अहवाल समाधानकारक नसल्याचे दिसून येत आहे . पाण्यातील ऑक्सिजनची क्षमता प्रचंड प्रमाणावर घसरली असून त्याचा परिणाम जलचरांवर होत आहे . ठाणे खाडी पात्रात गायमुख , कळवा , कोळशेत , साकेत , रेतीबंदर , मुंब्रा , विरावा , कोपरी हा भाग येत असून तेव्हा ह्या या भागातील चाचणी आणि गुणवत्ता तपासली असता ऑक्सिजन ६.४ टक्के ते ४.१२ टक्के एवढा घसरलेला आढळून आला . पाण्यात आढळणाऱ्या विविध घटकांमध्ये घट झाल्याने खाडीची पर्यावरणीय स्थिती दिवसेंदिवस बिकट होत चालली आहे . रासायनिक प्रदूषित पाण्यामुळे मोठ्या प्रमाणात माशांचे मृत्यू झाल्याचे चित्र अनेकदा पुढे आले आहे

ठाणे जिल्ह्यातील खाड्यांच्या पाण्यातील विघटित ऑक्सिजनचे प्रमाण (मि.ग्रा ./ ली . वर्ष २०१९

अ.क्रं.	स्टेशन आय . डी	जाने	फेब्रु	मार्च	एप्रि	में	जून	जूलै	ऑगस्ट	सप्टे	ऑक्टों	नोव्हे	डिसे
१	२७ ९ ७	४.४	३.७	४.९	४.४	३.६	५.२	५.२	५.४	५.७	५.५	५.३	४.६
२	२७ ९ ५	५	४.६	५	४.५	४.३	३.६	५.९	६	६ .२	५.२	५.४	४.७
३	२७ ९१	४.५	४.६	३.५	३.३	४.६	४.६	६.१	६.१	७	६.४	५	४.९
४	२७ ९ ४	४.९	४.२	४.१	४ .४	३.५	३.८	५.४	५.२	५.८	५.२	५.१	५
५	२७९२	४. ९	४.७	४.४.	४.१	३.५	३.६	५.२	५.५	५ .६	५ .४	५.३	५
६	२७ ९३	४. ५	५.५	४ .५	४. ७	३. ५	३.३	५	५.४	५. ६	४.७	५.५	५
७	२१८४	४.६	३.७	४	४.१	४.२	३.६	५.२	४.२	४.४	५.२	५.२	५.२
८	१ ९ ०	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
९	२१८५	४.३	५.२	३.२	४	३. ४	४.२	६	४.९	६.८	४.९	४.४	४.२

ठाणे जिल्ह्या खाडी प्रदेशातील विघटित ऑक्सिजन



वरील आलेखाचा अभ्यास केल्यावर असे दिसून येते की ठाणे जिल्ह्यातील खाडी प्रदेशातील पाणी गुणवत्ता संनियंत्रण केंद्राद्वारे नोंदवण्यात आलेल्या आकडेवारी वरून खाडी प्रदेशातील पाण्यातील विघटित ऑक्सिजनचे प्रमाण हे मार्च ते जुलै या महिन्यांमध्ये बऱ्याच ठिकाणी ४ च्या खाली आले आहे खूप कमी आहे ज्यामुळेच खाडीतील जीवितास धोका उत्पन्न होत आहे .

निष्कर्ष : वाढत्या नागरीकरणामुळे आणि औद्योगिकीकरणामुळे नैसर्गिक संसाधनाचा अनिर्बंध वापर होत आहे व या प्रक्रिया मधून मोठ्या प्रमाणात प्रदूषके निर्माण होऊन विविध प्रकारचे प्रदूषण घेऊन येत आहे.खाडी प्रदेशात प्रदूषण वाढून तेथील खारफुटीची जंगले , जलचर व खारफुटीच्या झाडावर घरटी बांधून राहणारे पक्षी यांच्या अस्तित्वावर प्रश्नचिन्ह लागले आहेत . पर्यावरणीयदृष्ट्या खारफुटीच्या जंगलांचे आणि तेथील सजीव सृष्टीचे खूप महत्त्वपूर्ण स्थान आहे . खाडी सभोवतालच्या परिसरात खाडीतील मासे कोळंबी , चिंबोरी यांचा समावेश मानवी आहारामध्ये केला जात असतो . प्रदूषित क्षेत्रातील माशांमध्ये पारा , कॅन्डमियम शीसे , यासारखे घटक आढळून आल्याने मानवी आरोग्यासाठी धोका निर्माण होत आहे . त्यामुळे प्रदूषणाकडे सातत्याने लक्ष देऊन जलप्रदूषणावर आळा घालणे अत्यंत महत्त्वाचे आहे . घनकचरा टाकाऊ पदार्थ खाडीत न जाऊ देणे , सांडपाणी प्रक्रिया करून नंतरच खाडीत सोडणे याबाबत जनजागृती करणे यासारख्या उपाययोजना करता येणे शक्य आहे .

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ठाणे जिल्ह्यातील कृषी रसायने आणि खतांच्या कारखान्यांमुळे होणाऱ्या हवा प्रदूषणाचा भौगोलिक अभ्यास

डॉ. सुरेश जे. फुले[1], श्री. दिपक हि. महाजन[2]

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सारांश:

ठाणे जिल्हा महाराष्ट्रातील दुसऱ्या क्रमांकाचा औद्योगिक जिल्हा म्हणून ओळखला जातो. ठाणे जिल्ह्यातील औद्योगिक क्षेत्रामध्ये अनेक उद्योगधंदे स्थापन झालेले आहेत. त्यात अनेक कृषी रसायने व खतांच्या कारखान्यांचा देखील समावेश होतो. इतर कारखान्यांत सोबतच कृषी रसायने व खतांच्या कारखान्यांमुळे देखील वातावरणात अनेक प्रकारची हवा प्रदूषके सोडली जातात. वातावरणात होणाऱ्या प्रदूषनामुळे जगातील सजीवांचे आरोग्य धोक्यात आले आहे. हवा प्रदूषनामुळे वेगवेगळ्या प्रकारचे आजार बळावत आहेत. आणि त्यामुळे अनपेक्षित मृत्युचे प्रमाणही वाढलेले आढळते. 2.5 µm पेक्षा कमी आकाराच्या विभाजित पदार्थामुळे (कणांमुळे) अनपेक्षित मृत्युत वाढ होत आहे. या कणांमुळे श्वसनाचे आजार आणि फुफ्फुसांबद्दलच्या तक्रारी जाणवत आहेत. जागतिक आरोग्य संघटनेने (WHO) भारतातील हवा प्रदूषनामुळे होणारे मृत्यू आणि अपंगत्वाचे प्रमाण कमी करण्यासाठी हवेची गुणवत्ता अबाधित ठेवण्यासाठी मानके निश्चित केली आहेत. सध्या भारतात हवा प्रदूषणाचे प्रमाण वाढलेले आहे. भारतात हवा प्रदूषनामुळे श्वसनाचे रोग अपंगत्व, अनपेक्षित मृत्यू होत आहेत. हवा प्रदूषण कमी करण्यासाठी न्यायिक, प्रशासकीय, तसेच सामाजिक पातळीवर प्रयत्न करण्याची गरज आहे. हवेची गुणवत्ता ठरविलेल्या मांनाकांपर्यंत आणण्यासाठी वर्तमान स्थिति बदलण्याची गरज आहे. सदर शोधनिबंधातून हवा प्रदूषके आणि त्यामुळे होणारे परिणाम व उपाय योजना याविषयी चर्चा केलेली आहे.

महत्वाचे शब्द: कृषी रसायने, हवा प्रदूषण, हवेची गुणवत्ता, श्वसनाचे रोग

उद्दिष्टे :

1) कृषी रसायने आणि खतांच्या कारखान्यांमुळे होणाऱ्या हवा प्रदूषणाबद्दल जाणून घेणे.

2) हवा प्रदूषनामुळे आरोग्यावर होणाऱ्या परिणामांचा अभ्यास करणे.

3) हवा प्रदूषण कमी करण्यासाठी उपाय योजना सुचविणे.

प्रस्तावना :

महाराष्ट्र राज्यातील काही मोजक्या औद्योगिक दृष्ट्या प्रगत जिल्ह्यांपैकी ठाणे हा एक कोकण विभागातील उत्तरेकडचा जिल्हा असून जनगणना 2011 नुसार लोकसंख्या दृष्टीने त्याचा राज्यात

तिसरा क्रमांक आहे. औद्योगिक विकासाच्या दृष्टीने ठाणे जिल्ह्याचा राज्यांमध्ये तिसरा क्रमांक असून जिल्ह्याच्या निम्म्यापेक्षा जास्त भागाचा आर्थिक व सामाजिक विकास हा औद्योगिकरणामुळे झाला आहे. महाराष्ट्र औद्योगिक विकास महामंडळाने 8 औद्योगिक वसाहती विकसित केल्या आहेत. शासना मार्फत पुरविल्या जाणाऱ्या सुविधांमुळे जिल्ह्यामध्ये उद्योगधंद्यांची भरभराट झालेली आहे. शासनामार्फत पुरविल्या जाणाऱ्या सुविधांमुळे जिल्ह्यामध्ये उद्योगधंद्यांची भरभराट झालेली आहे. जिल्ह्यामध्ये नोंदणी झालेल्या उद्योगात प्रामुख्याने रसायने व औषधे त्याबरोबरच कृषी रसायने-कीटकनाशके व खते यांचे मोठ्या प्रमाणावर उत्पादन केले जाते.

ठाणे जिल्ह्यातील कृषी रसायने व खतांचे उत्पादन करणाऱ्या काही कंपन्यांचे यादी खालील प्रमाणे:

१. डीबी केमिकल्स, नेतीवली, कल्याण, ठाणे.

२. डीव्हीएस केमिकल्स अँड इंजिनिअरिंग इंडस्ट्रीज, ठाणे

३. घारडा केमिकल्स लिमिटेड, डोंबिवली, ठाणे

४. गॅलक्सी बायोकेअर, वसई, ठाणे

५. इंडियन ग्रो केमिकल इंडस्ट्रीज प्रायव्हेट लिमिटेड, बेलापुर, कल्याण, ठाणे

६. पेस्ट कंट्रोल (इंडिया) प्रायव्हेट लिमिटेड, ठाणे

७. पंजाब केमिकल अँड क्रॉप प्रोटेक्शन लिमिटेड, ठाणे

८. रुद्रा इनसेक्टीसाईड प्रायव्हेट लिमिटेड ठाणे

९, सल्फर मिल्स लिमिटेड, ठाणे

१०. साई फर्टिलायझर्स, अंबरनाथ, ठाणे

११. आर्या कृषी उद्योग, अंबरनाथ, ठाणे

ठाणे जिल्ह्यातील इतर उद्योगाप्रमाणेच हे कृषी रसायने-कीटकनाशके व खतांचे कारखाने हवा प्रदूषण घडवून आणण्यामागे कारणीभूत आहेत. विविध प्रकारचे घातक वायू वातावरणात सोडण्या मध्ये या कृषी रसायने व खतांच्या कारखान्यांचा मोठा वाटा आहे. त्यामुळे आपल्याला हवा प्रदूषणा सारख्या मोठ्या संकटाला सामोरे जावे लागत आहे.

आजच्या काळातील सर्वात मोठे संकट म्हणजे हवा प्रदूषण, कारण हवा प्रदूषणाचा परिणाम केवळ हवामान बादलावरच होत नाही तर वाढत्या विकृती आणि मृत्युच्या रूपात सार्वजनिक आणि वैयक्तिक आरोग्यावर देखील होतो. हवा प्रदूषकांमध्ये अनेक प्रादुशके आहेत जी मानवामध्ये रोगांचे प्रमुख कारण आहेत. त्यापैकी विभाजित पदार्थ (PM), श्वसनयोग्य कण श्वसनाद्वारे श्वसन प्रणालीमध्ये प्रवेश करतात, ज्यामुळे श्वसन आणि हृदय व रक्तवाहिन्यांसंबंधी रोग, प्रजनन आणि मध्यवर्ती मज्जासंस्था बिघडते. स्तितांबर / स्ट्रटोस्फिअर मधील ओझोन हा अल्ट्राव्हायोलेट / अतिनील किरणांपासून आपला बचाव करण्याची भूमिका पार पाडत असला तरी टोपोस्पीयर / तपांबरात त्याचे वाढणाऱ्या केंद्रीकरणामुळे श्वसन, हृदय आणि रक्त वाहिन्यांसंबंधी प्रणालीवर हानिकारक परिणाम

करत आहे. याशिवाय, नायट्रोजन ऑक्साइड्स, सल्फर डायऑक्साइड, अस्थिर केंद्रीय संयुगे हे सर्व हवा प्रदूषके मानवासाठी हानिकारक आहेत.

पर्यावरण प्रदूषनामुळे होणारे हवामानबदल नैसर्गिक संकटाप्रमाणे अनेक संसर्गजन्य रोगांचा प्रसार घडवून आणतात. या समस्येचा सामना करण्याचा एकमेव मार्ग म्हणजे वैज्ञानिक तज्ञांच्या मार्गदर्शक तत्वांनुसार जनजागृती करणे. राष्ट्रीय आणि आंतरराष्ट्रीय संस्थांनी प्रदूषणाच्या या धोक्याच्या उद्रेकाकडे लक्ष दिले पाहिजे आणि ते निवरण्यासाठी शाश्वत उपाय सुचविले पाहिजेत.

अनेक मानवी क्रिया पर्यावरणावर प्रभाव टाकत असतात. म्हणून पर्यावरण विषयात मानव आणि त्यांच्या सभोवतालच्या भौगोलिक पर्यावरणाच्या सहसंबंधाचा अभ्यास केला जातो. पर्यावरण हे जैविक (सजीव आणि सूक्ष्मजीव) आणि अजैविक (जलावरण, वातावरण, भू-आवरण) यांनी मिळून बनलेले आहे. पर्यावरणात जीवावरण, वातावरण, जलावरण, शीलावरण या वेगवेगळ्या आवरणांचा समावेश होतो. यांना आपण निसर्गदत्त देणग्या म्हणू शकतो. मानव आपल्या दिंनचर्येसाठी आणि विकासासाठी यांचा वापर करून घेत आहे. या नैसर्गिक देनग्यांचा वापर करण्यासाठी मानवाने आधुनिक तंत्रज्ञान विकसित केले आहे. नैसर्गिक संसाधंनांचा वापर करून घेत असतांना मानवी आर्थिक क्रियांचा विकास होत गेला. भटके जीवन जगणारा मनुष्य स्थिर होऊन शेती करू लागला आणि बुद्धीच्या जोरावर हळूहळू औद्योगिक विकासाकडे वळाला.

बुद्धीच्या जोरावर विकास करून घेत असतांना मानवाने पर्यावरणाकडे दुर्लक्ष केलेले आढळते. स्वतःचा आर्थिक विकासाचा समतोल करत असतांना निसर्गाचा समतोल बिघडवत आहे. याकडे मानवाने जाणीवपूर्वक दुर्लक्ष केलेले आढळते आणि त्यामुळेच आज प्रदूषनासारख्या समस्येचा उद्रेक झालेला आहे. जलावरण, वातावरण, भू-आवरण हे निसर्गत: काही घटकांनी बनलेले आहेत. मानवी कृतींमुळे त्यातील घटकांच्या प्रमाणात वाढ होते किंवा इतर हानिकारक पदार्थ त्यात मिसळतात याला प्रदूषण असे म्हणतात. थोडक्यात, मानव आणि इतर सजीवांना अनुकूल असलेले पर्यावरण प्रतिकूल होणे म्हणजे पर्यावणीय प्रदूषण होय. हानिकारक घटक घन, द्रव किंवा वायुरूप असू शकतात, जे सामान्य वातावरणापेक्षा जास्त प्रमाणात वातावरणात मिसळून जे आपल्या पर्यावरणाची गुणवत्ता कमी करतात.

आपण पित असलेले पाणी, आपण श्वास घेत असलेली हवा आणि ज्या जमिनीत झाडे, पिके वाढतात ती जमीन मानवी क्रियांमुळे प्रदूषित होत आहे. औद्योगिक क्रांति हे तंत्रज्ञान, समाज आणि अनेक सेवांच्या निर्मितीच्या दृष्टीने एक मोठे यश असले तरी, त्यामुळे मानवी आरोग्यासाठी हानिकारक असलेल्या प्रदूषकांचे मोठ्याप्रमाणावर उत्सर्जन केले आहे. जागतिक स्तरावर पर्यावरण प्रदूषण ही आंतरराष्ट्रीय सार्वजनिक आरोग्य समस्या मानली जाते, यात काही शंका नाही. वाढते शहरीकरण औद्योगिकीकरण यामुळे पर्यावरण प्रदूषण त्रासदायक होत आहे.

हवा प्रदूषके :

जागतिक आरोग्य संघटनेच्या (WHO) अहवालनुसार कणीय प्रदूषण (PM), भुस्तरीय ओझोन, कार्बन मोनाक्साइड, सल्फर ऑक्साइड्स, नायट्रोजन ऑक्साइड्स आणि शिसे या सहा प्रमुख वायू प्रदूषकांमुळे होणाऱ्या हवा प्रदूषणाचा भूजल, माती आणि हवेसह पर्यावरणाच्या सर्व घटकांवर विनाशकारी परिणाम होऊ शकतो . आपण प्रामुख्याने या प्रदूषकांवर लक्षं केंद्रीत करणे गरजेचे आहे. कारण मानवी आरोग्य आणि पर्यावरणावर या प्रदूषकांमुळे गंभीर परिणाम होत आहेत. आम्ल पर्जन्य, जागतिक तापमान वाढ, हरितगृह परिणाम आणि हवामान बदलांचा हवा प्रदूषणावर मोठ्या प्रमाणात प्रभाव पडतो.

***विभाजित पदार्थ (PM) आणि आरोग्य :**

विभाजित पदार्थ हे लहान कणांचे बनलेले असतात. हे लहान कण घन किंवा द्रवीभूत आम्लाचे (नायट्रेट्स आणि सल्फेट्स), हायड्रोकार्बन्स, जड धातू, माती किंवा धुळीचे कण यांचे पासून तयार झालेले असतात. विभाजित पदार्थांच्या रसायनिक संरचना आणि आकार याबाबतीत विविधता आढळते. विभाजित पदार्थांमधील अतिशय लहान कण 2.5 मायक्रोग्रॅम पेक्षा लहान आकाराच्या कणांमुळे श्वसनाशी संबंधित आरोग्याच्या समस्या निर्माण होतात. वेगवेगळ्या प्रकारच्या औद्योगिक प्रक्रियांमधून विभाजित पदार्थ वातावरणात सोडले जातात. त्यामुळे डोळ्यांची जळजळ होणे, नाक आणि घसा खवखवणे, खोकला, श्वास घेण्यास त्रास होणे, अनपेक्षित मृत्यू, दमा आणि फुफ्फुसाचे आजार यासारखे मानवी आरोग्यावर परिणाम होतात.

***नायट्रोजन ऑक्साइड्स (NO_x):**

नायट्रोजन ऑक्साइड्समध्ये नायट्रोजन आणि ऑक्सीजन या प्रमुख वायूंच्या संयोगाने तयार होणाऱ्या वायूंचा समावेश होतो. नायट्रोजन ऑक्साइड्समुळे नाक आणि डोळे चुरचुरणे, घसा खवखवणे, डोके दुखी, फुफ्फुसाचे कार्य मंदावणे शरीरातील पेशींमध्ये ऑक्सीजनची कमतरता जाणवते. या सारख्या आरोग्य विषयक तक्रारी निर्माण होतात. वनस्पतींमध्ये पाने गळणे, खुरटे होणे, वनस्पतींची संवेदनशिलता वाढते त्यामुळे नुकसान होते. या व्यतिरिक्त आम्ल पर्जन्य आणि धुके यासारख्या समस्या निर्माण होतात.

सल्फर डायऑक्साइड (SO_2):

वेगवेगळ्या प्रकारच्या उद्योगांमधून सल्फर डायऑक्साइड उत्सर्जित केला जातो. तसेच ज्वालामुखी, वन वनवे पेटणे आणि इंधन ज्वलनातून सल्फर डायऑक्साइड वायू वातावरणात सोडला जातो. सल्फर डायऑक्साइडमुळे त्वचा आणि डोळे चुरचुरणे, खोकला, दमा, फुफ्फुसे कमजोर होणे अशा आरोग्य विषयक समस्या निर्माण होतात.

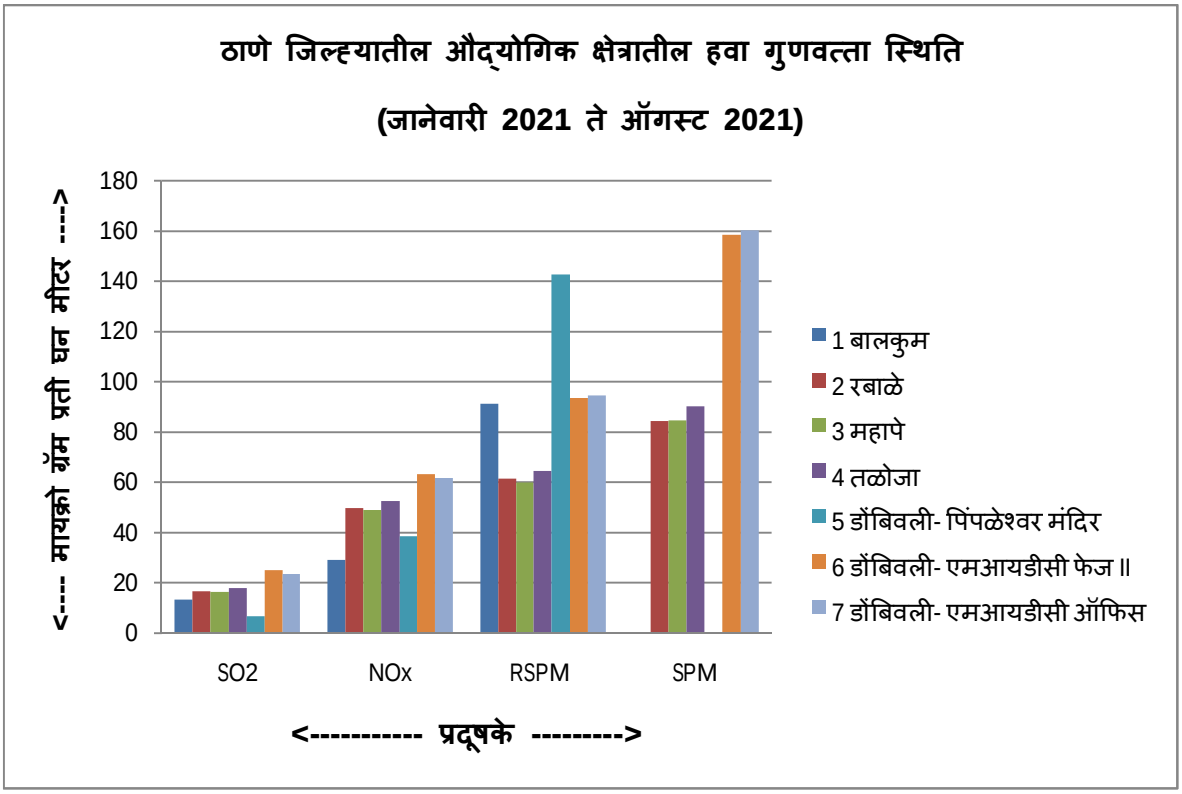
अ.क्र.	हवा गुणवत्ता स्थानक	प्रदूषके			
		SO_2 ($\mu m/m^3$)	NO_x ($\mu m/m^3$)	RSPM ($\mu m/m^3$)	SPM ($\mu m/m^3$)
मानके (मायक्रो ग्रॅम प्रती घन मीटर) -->		80	80	100	--
1	बालकुम	13.67	29.10	91.35	00
2	रबाळे	16.85	49.95	61.73	84.45
3	महापे	16.46	49.12	60.19	84.81
4	तळोजा	18.10	52.69	64.73	90.53
5	डोंबिवली- पिंपळेश्वर मंदिर	6.84	38.86	142.85	--
6	डोंबिवली- एमआयडीसी फेज II	25.14	63.46	93.90	158.76
7	डोंबिवली- एमआयडीसी ऑफिस	23.80	62.05	94.88	160.27

कोष्टक क्र. 1 : ठाणे जिल्ह्यातील औद्योगिक क्षेत्रातील हवा गुणवत्ता स्थिति

(जानेवारी 2021 ते ऑगस्ट 2021)

कोष्टक क्रमांक 1 मधून असे स्पष्ट होते की 6.84 $\mu m/m^3$ एवढी सल्फर डायऑक्साइड (SO_2) ची सरासरी किमान पातळी डोंबिवली- पिंपळेश्वर मंदिर परिसर येथे आढळली. 29.10 $\mu m/m^3$ एवढी नायट्रोजन ऑक्साइड्सची(NO_x) सरासरी किमान पातळी बालकुम परिसर येथे आढळली. 60.19 $\mu m/m^3$ एवढी श्वसनयोग्य निलंबित विभाजित पदार्थ (RSPM) ची सरासरी किमान पातळी महापे परिसर येथे आढळली. 84.45 $\mu m/m^3$ एवढी निलंबित विभाजित पदार्थ (SPM) ची किमान सरासरी पातळी रबाळे परिसरात आढळली.

जागतिक आरोग्य संघटनेने निश्चित केलेल्या मनाकांपेक्षा जास्त प्रमाणात उत्सर्जित झालेल्या प्रदूषकांमध्ये श्वसनयोग्य निलंबित विभाजित पदार्थ (RSPM) चा समावेश होतो. 142.85 $\mu m/m^3$ एवढी श्वसनयोग्य निलंबित विभाजित पदार्थ (RSPM)ची कमाल सरासरी पातळी डोंबिवली-पिंपळेश्वर मंदिर या परिसरातून आढळून आली. ठाणे जिल्ह्यातील इतर औद्योगिक विभागांच्या मानाने डोंबिवली परिसरातील औद्योगिक क्षेत्रांमध्ये श्वसनयोग्य निलंबित विभाजित पदार्थ (RSPM) आणि निलंबित विभाजित पदार्थ (SPM) यांचे प्रदूषण जास्त प्रमाणात होतांना आढळते.



आलेख क्र. 1: ठाणे जिल्ह्यातील औद्योगिक क्षेत्रातील हवा गुणवत्ता स्थिति
(जानेवारी 2021 ते ऑगस्ट 2021)

आलेख क्रमांक 1 वरुन असे निदर्शनास येते की ठाणे जिल्ह्यातील हवा प्रदूषणाचे केंद्रीकरण डोंबिवली परिसरात झालेले आहे. डोंबिवली-पिंपळेश्वर मंदिर, डोंबिवली-एमआयडीसी फेज II, डोंबिवली-एमआयडीसी ऑफिस या तीनही ठिकाणी प्रदूषकांचे उत्सर्जनाचे प्रमाण जास्त आहे. ठाणे जिल्ह्यातील इतर औद्योगिक विभागांच्या मानाने डोंबिवली परिसरातील औद्योगिक क्षेत्रांमध्ये श्वसनयोग्य निलंबित विभाजित पदार्थ (RSPM) आणि निलंबित विभाजित पदार्थ (SPM) या प्रदूषकांनी मानक मर्यादा ओलांडली आहे. याचा परिणाम तेथील रहिवास्यांच्या आरोग्यावर होतांना दिसत आहे. याचे कारण म्हणजे या भागात 450 पेक्षा जास्त उद्योगधंदे आहेत, त्यापैकि 250 रसायन उद्योग आहेत. बऱ्याच उद्योगांमध्ये धोकादायक पदार्थांचा वापर केला जातो.

हवा प्रदूषण कमी करण्यासाठी उपाय योजना:

औद्योगिक प्रदूषकांमुळे निर्माण झालेल्या पर्यावरण व प्रदूषण विषयक समस्यांबाबत आज जागतिक पातळीवर गांभीर्याने विचार केला जात आहे. उद्योगांचे स्थान निश्चित करतांना स्थानिकीकरणाच्या परंपरागत घटकांबरोबरच परिस्थितिकीय घटकांचाही विचार केला जात आहे.

1. कारखान्यांमुळे होणारे प्रदूषण कमी करण्यासाठी व्यवस्थापनाने आपल्या कारखान्यातील वाहितमल, अपायकारक अपशिष्टे व प्रदूषकांची योग्य प्रकारे विल्हेवाट लावली पाहिजे.

2. इंधनाची बचत करणाऱ्या वाहनांची व यंत्रासामग्रीची निर्मिती केली पाहिजे.
3. प्रदूषण नियंत्रण, नैसर्गिक संसाधनांचे संधारण, पर्यावरणीय व्यवस्थापन योजना इ. घटक विचारात घेणे आवश्यक आहे.
4. सीमेन्स मोबिलिटी ही गतीशीलता व्यवस्थापन कंपनी आणि हवेच्या गुणवत्तेसंबंधी तज्ञ मानल्या जाणाऱ्या अर्थसेन्स यांनी 'झेफायर' हा हवेची गुणवत्ता मोजणारा सेन्सर विकसित केला आहे. हा सेन्सर विविध प्रदूषकांची वास्तव मोजणी करू शकतो. या सेन्सर द्वारे मिळणाऱ्या प्रदूषण विषयीच्या विश्वासार्ह माहितीद्वारे स्थानिक प्राधिकरणांना हवेची सद्य गुणवत्ता पातळी लक्षात घेऊन वेळेत आणि अर्थपूर्ण हस्तक्षेप करता येईल.
5. शैक्षणिक भागीदारी आणि आंतर्विद्याशाखांमधील संशोधन यांकरता खासगी क्षेत्र वित्तपुरवठाही करू शकते; याद्वारे हवेतील प्रदूषणाच्या स्त्रोतांविषयी सखोल वैज्ञानिक समाज प्राप्त होऊ शकेल तसेच पुराव्यावर आधारित कृतीला मजबूत आधार मिळेल व प्रदूषण कमी करण्यासाठी नवनवी तांत्रिक प्रगति शक्य होईल.
6. भारतात औद्योगिक प्रदूषण रोखण्याच्या दृष्टीने राष्ट्रीय तसेच राज्य पातळीवर काही कायदे व नियम केले आहेत. उदा. जल व वायु प्रदूषण नियंत्रण कायदा, पर्यावरण संरक्षण व संधारण कायदा. या कायद्यांची कडक अंमलबजावणी करणे आवश्यक आहे.
7. भारत शासनाचे केंद्रीय प्रदूषण नियंत्रण मंडळ प्रदूषण विषयक कामकाज पाहते. या संदर्भातील कायद्यांचे उल्लंघन करणाऱ्या उद्योगधंद्यांच्या व्यवस्थापनास जबाबदार व शिक्षेस पात्र ठरवले जाते.

समारोप/ निष्कर्ष:

भारताच्या वाढत्या लोकसंख्येच्या गरजा पूर्ण करण्यासाठी आपण नव नवीन साधनांचा शोध घेत गेलो. मुख्यत्वे अन्नाची गरज पूर्ण करण्यासाठी आपण कृषी तंत्र मध्ये बदल केले. जास्त उत्पादन देणाऱ्या बी-बियाणांचा वापर आणि रासायनिक खते तसेच कीटकनाशके यांचा वापर सुरू केला. रासायनिक खते आणि कीटकनाशके तयार करण्यासाठी उद्योगधंदे स्थापन केले. मात्र याच उद्योगधंद्यांमुळे वातावरण प्रदूषित झाले. अनेक प्रकारचे विषारी वायू वातावरणात सोडले गेले. त्यामुळे मानवी आरोग्यावर तसेच सजीव सृष्टी वर विपरीत परिणाम झाले. ते दूर करण्यासाठी वेगवेगळ्या उपाय योजना तयार केल्या गेल्या. हवा प्रदूषण दूर करण्याकरिता शासनामार्फत कायदे तयार केले गेले. या कायद्यांची अंमलबजावणी जाणीवपूर्वक करणे गरजेचे आहे. उद्योगधंद्यांना देखील प्रामाणिकपणे उत्सर्जित होणाऱ्या वायूंचे नियोजन केले पाहिजे. आधुनिक तंत्रज्ञानाचा वापर करून विषारी वायूंचे कमी प्रमाणात उत्सर्जन करणे शक्य आहे. त्या तंत्रज्ञानाचा वापर उद्योजकांनी करणे गरजेचे आहे. त्यामुळे वातावरणातील प्रदूषकांचे प्रमाण कमी होईल आणि जनतेला शुद्ध हवा उपलब्ध करून देता येईल.

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सारांश

भारतात २००१ मध्ये झालेल्या जनगणनेनुसार दर हजार पुरुषांमागे ९३३ स्त्रिया असे प्रमाण होते.०-६ वयोगटासाठी हेच प्रमाण दर हजार मुलींमागे ९२७ मुली असे आहे. महाराष्ट्रात तर हे प्रमाण ९१३ इतके कमी आहे. देशातील आर्थिकदृष्ट्या विकसित मानल्या जाणाऱ्या पंजाब, हरियाणा, दिल्ली, गुजरात आणि महाराष्ट्रासारख्या राज्यांमध्ये मुलींची संख्या झपाट्याने कमी होत आहे. त्यातही आर्थिक सुबत्ता असणाऱ्या शहरी भागांमधून मुला-मुलींचे लिंग गुणोत्तर जास्तच विषम होत चालले आहे. पूर्वी गर्भजलपरीक्षा आणि आता अल्ट्रासाउंड सोनोग्राफीच्या तंत्रज्ञानाचा गर्भाचे लिंग जाणून घेण्यासाठी मोठ्या प्रमाणावर होणारा गैरवापर आणि त्यानंतर मुलीचा गर्भ असल्यास गर्भपात, तसेच एकूणच मुलगी म्हणून केले जाणारे दुर्लक्ष या सर्व कारणांमुळे मुलींची संख्या वेगाने कमी होत चालली आहे. महाराष्ट्रात विकसित समजल्या जाणाऱ्या जिल्ह्यांमध्येच मुलींची संख्या कमी होत आहे. ज्या भागात आर्थिक विकास झाला, कारखानदारी आली आणि लोकांच्या हातात थोडा फार पैसा आला, तेथेच सोनोग्राफीचे तंत्रज्ञान घेऊन डॉक्टर पोचले आहेत आणि परिणामी लिंग निदान आणि मुलीचे गर्भपात मोठ्या प्रमाणावर होत आहे. कोल्हापूर जिल्ह्याचे लिंग गुणोत्तर प्रमाण सन १९५१ साली १००० पुरुषांमागे ९७० स्त्रिया इतके होते तर २०११ साली १००० पुरुषांमागे ९५३ स्त्रिया आहे. म्हणजे हे प्रमाण १७ ने कमी झाले आहे (कोल्हापूर जिल्हा सामाजिक व आर्थिक समालोचन २०१२). पन्हाळा तालुक्यातील सन १९९१ साली १००० पुरुषांमागे ९४९ स्त्रियांचे प्रमाण होते, तर सन २०११ साली १००० पुरुषांमागे ९१५ स्त्रियांचे प्रमाण असल्याचे दिसून आले. म्हणजे तीस वर्षाच्या कालावधीत १००० पुरुषांमागे असलेल्या स्त्रियांच्या प्रमाणात ३४ ने घट घडून

आली आहे.

कोल्हापूर जिल्ह्यातील ० ते ६ वयोगटातील मुली-मुलांचे प्रमाण ९३१ वरून ८३९ एवढं कमी झालं आहे म्हणजे तब्बल ९२ ची घट झाली आहे. राज्यात १९९१ च्या तुलनेत २००१ मध्ये १०० अंकांहून घट झालेले नऊ तालुके होते. कोल्हापूर जिल्ह्यातील यामध्ये पन्हाळा, कागल, राधानगरी व करवीर या प्रमुख तालुक्यांचा समावेश होता. पन्हाळा (७९५) तालुक्याची २००१ मध्ये देशांच्या ९२७ च्या तुलनेत अतिशय चिंताजनक स्थिती होती तर महाराष्ट्र राज्यामध्ये तालुका निहाय पन्हाळा तालुक्याचा क्रमांक अग्रस्थानी होता. यावरून असे निदर्शनास येते की पन्हाळा तालुक्यामध्ये स्त्री पुरुष प्रमाण हा सामाजिकदृष्ट्या गंभीर विषय बनला आहे. म्हणून सदर संशोधनामध्ये पन्हाळा तालुक्यातील बालगुणोत्तराचा स्थल-कालीय बदलाचा मंडल विभाग तसेच ग्रामपंचायतनिहाय अभ्यास केला आहे.

प्रस्तावना

"स्त्री-पुरुष यांच्यातील प्रमाणाला लिंग रचना असे म्हंटले जाते". सामाजिक रचनेत स्त्री-पुरुष हे दोन घटक मुख्य आहेत. कोणत्याही प्रदेशातील लोकसंख्या रचनेत लिंग गुणोत्तरामध्ये संतुलन असणे गरजेचे आहे. लिंग गुणोत्तरामुळे कार्यशील व्यक्ती आणि निर्भर व्यक्ती यांच्यातील प्रमाण निश्चित होते. तसेच लिंग रचना हि एखाद्या प्रदेशातील प्रगतीचे सूचक असते. संशोधन क्षेत्रातील लिंग गुणोत्तराच्या आकडेवारीचा अभ्यास केला असता १९९१ मध्ये ०-६ वयोगटातील १००० मुलांमागे ९३१ मुली आहेत तर; हेच प्रमाण कमी होत सन २००१ मध्ये ७९५ पर्यंत येऊन पोहोचले आहे. मुलींच्या प्रमाणामध्ये घट होण्याचे कारण येथील पुरुषप्रधान संस्कृती असल्याचे दिसून येते. विवाहानंतर वंशाला दिवा म्हणून मुलापेक्षा मुलीचा कमी विचार केला जातो. मुलगा हा उतार वयातील आधार असल्याने मुलीकडे जाणीवपूर्वक दुर्लक्ष केले जात आहे. स्त्रियांच्या शारीरिक वाढीकडे जाणीवपूर्वक लक्ष न दिल्याने त्यांना अकालीच मृत्यूला सामोरे जावे लागते. त्यांचे योग्य पालन पोषणही केले जात नाही. कमालीचे शारीरिक श्रम, छळ आणि मानसिक त्रास यामुळे स्त्रियांना अकाली वृधत्त्व येत असते. शिवाय जास्त मुलाच्या हव्यासामुळे त्यांच्यावर अनेक बाळंतपणे लादली जात असल्याने असंख्य स्त्रिया बाळंतपनातच मृत्यूमुखी पडतात. एकंदरीत स्त्रियांची होणारी चौफेर हेळसांड ही त्यांची संख्या कमी होण्यास कारणीभूत आहे. त्यामुळे अशा परिस्थितीत पुरुषांच्या संख्येत वाढ होऊ लागली आहे.

अभ्यास क्षेत्र

प्रस्तुत लिंग-गुणोत्तराच्या स्थल-कालीय बदलाच्या अभ्यासासाठी लिंग गुणोत्तराच्या दृष्टीने संवेदनशील असलेल्या कोल्हापूर जिल्ह्यातील पन्हाळा तालुक्याची निवड करण्यात आली आहे. पन्हाळा तालुका कोल्हापूर जिल्ह्याच्या वायव्य भागात स्थित आहे. पन्हाळा तालुक्याचा अक्षवृत्तीय विस्तार १६० ३५' ते १६० ५४' उत्तर ते ७३० ४८' ते ७४० १३' पूर्व रेखावृत्त इतका आहे. पन्हाळा तालुक्याचे क्षेत्रफळ ५७३.९२ चौ.कि.मी असून ते कोल्हापूर जिल्ह्याच्या (७६८५ चौ.कि.मी) ७.४६ टक्के इतके आहे (कोल्हापूर जिल्हा जनगणना अहवाल २०११). पन्हाळा तालुक्याच्या उत्तरेस सांगली जिल्हा, पश्चिमेस रत्नागिरी जिल्हा, पूर्वेस हातकणंगले तालुका, तर दक्षिणेस राधानगरी तालुका आहे. मसाई पठार आणि पन्हाळा डोंगर रांगा या सह्याद्री पर्वत रांगांचा अविभाज्य भाग असून त्या पन्हाळा तालुक्याच्या मध्यातून पसरल्या आहेत. जनगणना अहवाला नुसार पन्हाळा तालुक्याची लोकसंख्या २०६८७२ (१९९१), २३८३८३ (२००१) व २५९४१७ (२०११) इतकी आहे. तसेच जनगणना अहवालानुसार लोकसंख्येची घनता दर चौ.कि.मी ला अनुक्रमे ३६९, ४२६ आणि ४६३, इतकी आहे. पन्हाळा हे तालुक्याचे प्रशासकीय ठिकाण असून ते कोडोली, कोतोली, कळे, बाजारभोगाव आणि पन्हाळा या ५ मंडल विभागात विभागले आहे. पन्हाळा तालुक्यामध्ये १३१ गावांचा समावेश असून २०११ च्या जनगणनेनुसार १ जनगणना शहर व १ नगरपरिषद आहे.

उद्दिष्टये

सदर संशोधनाकरिता संशोधकाने खालील उद्दिष्टे निश्चित केली आहेत.

1. पन्हाळा तालुक्यातील बाल लिंग गुणोत्तराच्या स्थल-कालीय बदलाचा मंडल विभागनिहाय अभ्यास करणे.
2. पन्हाळा तालुक्यातील बाल लिंग गुणोत्तराच्या स्थल-कालीय बदलाचा ग्रामपंचायत निहाय अभ्यास करणे.
3. पन्हाळा तालुक्यातील बाल लिंग गुणोत्तराच्या वाढीसाठी उपाययोजना सुचवणे.

सांख्यिकी माहितीचे संकलन आणि तथ्य विश्लेषण

सदर संशोधनाकरिता प्राथमिक व दुय्यम स्वरुपाच्या सांख्यिकी सामग्रीचा वापर करण्यात आला आहे. प्राथमिक स्वरूपाची सांख्यिकी माहिती प्रश्नावली व क्षेत्रभेट यांच्या माध्यमातून संकलीत करणेत आली आहे. तसेच दुय्यम स्वरूपाची सांख्यिकी माहिती

कोल्हापूर जिल्हा जनगणना अहवाल सन १९९१, २००१ व २०११, कोल्हापूर जिल्हा सामाजिक व आर्थिक समालोचन सन २००३, २०१२ व २०१६, कोल्हापूर जिल्हापरिषद आरोग्य विभाग अहवाल, कोल्हापूर गॅझेट शासकीय अहवाल, संदर्भ ग्रंथ, विविध संशोधनपत्रिका, इंटरनेट सांकेतिक स्थळे, दैनिक वृत्तपत्रे, मासिके तसेच साप्ताहिके यांच्या मधून संकलीत करणेत आली आहे. संकलित केलेल्या सांख्यिकी सामग्रीचे व्यवस्थित स्वरुपात मांडणी करून नकाशांच्या सहाय्याने माहितीचे पृथःकरण करण्यात आले आहे. भौगोलिक माहिती प्रणाली (GIS) या नकाशाशास्त्रीय तंत्राचा उपयोग सदरच्या संशोधनातील नकाशे तयार करण्यासाठी केला आहे. नकाशे तयार करण्यासाठी QGIS, Arc view या साँफ्टवेअरचा ही उपयोग करण्यात आला आहे.

बाल लिंग गुणोत्तर सूत्र

$$\text{लिंग गुणोत्तर} = \frac{\text{०-६ वयोगटातील मुलींची संख्या}}{\text{०-६ वयोगटातील मुलांची संख्या}} * १०००$$

लिंग गुणोत्तराच्या स्थल-कालीय बदलाचा अभ्यास करण्यासाठी सन १९९१, २००१ व २०११ च्या सांख्यिकी सामग्रीचे विश्लेषण गावनिहाय तसेच मंडल विभागनिहाय वर्गीकरण

पन्हाळा	वर्ष			लिंग गुणोत्तरातील बदल	
	१९९१	२००१	२०११	१९९१ - २००१	२००१ – २०११
एकूण	९३१	७९५	८४३	-१३६	४८
ग्रामीण	९३१	७९४	८४५	-१३७	५१
नागरी	९०२	८४३	७६९	-५८	-७४

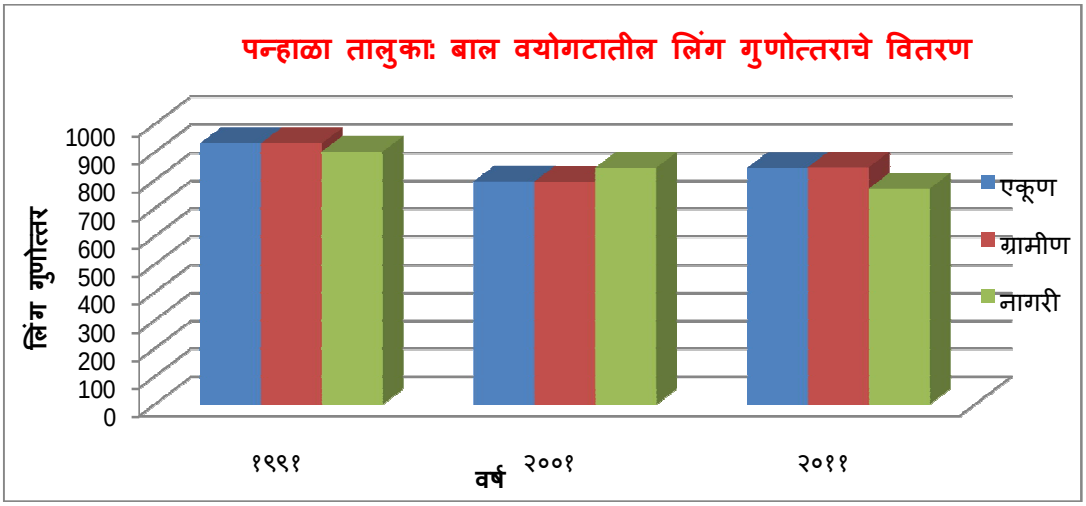
पुढील चार गटामध्ये करण्यात आले आहे. लिंग गुणोत्तराच्या विभागणीसाठी कमी (९५० पेक्षा कमी), मध्यम (९५१ ते १०००) आणि जास्त (१००० पेक्षा अधिक) असे असे ३ विभाग केले आहेत. पन्हाळा तालुक्यातील ० ते ६ वयोगटातील लिंग गुणोत्तराच्या स्थल-कालीय बदलाचा अभ्यास (१९९१-२०११)लोकसंख्येच्या वयोरचनेच्या अभ्यासाबाबत संयुक्त राष्ट्रसंघाने वय या शब्दाची पुढीलप्रमाणे व्याख्या केली आहे. "जन्मतारखेपासून जनगणना काळातील मोजणीच्या दिवसापर्यंतचा मोजलेला किंवा अंदाजित केलेला कालावधी म्हणजेच व्यक्तीचे वय होय''. बाल वयोगटातील लिंग गुणोत्तराचे प्रमाण मोजत

असताना एकूण लोकसंख्येमध्ये ० ते ६ वयोगटामध्ये दर १००० मुलांनमागे मुलींचे असलेले प्रमाण मोजले जाते.

तक्ता क्र. १

पन्हाळा तालुका: ० ते ६ वयोगटातील लिंग गुणोत्तराचे वितरण

माहितीचा स्त्रोत्र: कोल्हापूर जनगणना अहवाल १९९१, २००१ व २०११



समाजामध्ये होत असलेली स्त्रीभृणहत्या मोजण्यासाठी ० ते ६ वयोगटाचा उपयोग होतो. एकूण लिंग गुणोत्तरामध्ये जर दर १००० पुरुषांमागे स्त्रियांचे प्रमाण कमी असेल तर स्त्रियांचे लग्नानंतर होत असलेले विशेषता ग्रामीण भागामध्ये स्थलांतर तसेच नोकरीच्या निमित्ताने प्रामुख्याने नागरी भागामध्ये पुरुषांचे होत असलेले स्थलांतर कारणीभूत असते. परंतु ० ते ६ वयोगटामध्ये लिंग गुणोत्तर कमी असण्यामागे स्त्रीभृणहत्या हे प्रमुख कारण असू शकते किंवा पहिला मुलगा झाला की एक मुलावरच कुटुंब नियोजन केले जाते. म्हणजेच अशा समाजामध्ये स्त्रीयांना असलेले दुय्यम स्थान अधोरेखित होते. २००१ च्या जणगणने नुसार असे दिसून येते की, कोल्हापूर जिल्ह्यातील ० ते ६ वयोगटातील मुली-मुलांचे प्रमाण ९३१ वरून ८३९ एवढं कमी झालं आहे म्हणजे तब्बल ९२ ची घट झाली आहे. राज्यात १९९१ च्या तुलनेत २००१ मध्ये १०० अंकांहून घट झालेले नऊ तालुके होते. कोल्हापूर जिल्ह्यातील यामध्ये पन्हाळा, कागल, राधानगरी व करवीर या प्रमुख तालुक्यांचा समावेश होता. पन्हाळा (७९५) तालुक्याची २००१ मध्ये देशांच्या ९२७ च्या तुलनेत अतिशय चिंताजनक स्थिती होती तर महाराष्ट्र राज्यामध्ये तालुका निहाय पन्हाळा तालुक्याचा क्रमांक अग्रस्थानी होता.पन्हाळा तालुक्यातील ० ते ६ वयोगटातील लिंग गुणोत्तराचे एकूण, ग्रामीण व नागरी विभागा नुसार झालेला बदल दर्शवण्यात आला आहे. पन्हाळा

तालुक्यामध्ये ० ते ६ बाल वयोगटातील एकूण लिंग गुणोत्तरामध्ये १९९१ मध्ये दर १००० मुलांनमागे ९३१ इतके मुलींचे प्रमाण होते. बाल लिंग गुणोत्तर २००१ मध्ये ७९५ व २०११ मध्ये ८४३ इतके होते. म्हणजेच १९९१ ते २००१ या कालावधी मध्ये बाल लिंग गुणोत्तरामध्ये दर १००० मुलांन मागे १३६ इतक्या मुलींचे प्रमाण कमी झाल्याचे दिसून येते. बाल लिंग गुणोत्तर दर २०११ मध्ये दर १००० मुलांन मागे १९९१ च्या तुलनेत कमी असला तरी २००१ ते २०११ या कालावधी मध्ये ४८ मुली इतकी वाढ झाल्याचे दिसून येते. २००१ ते २०११ या कालावधी मध्ये शासनाने हेतू पुरस्कर राबवलेल्या विशेष योजनांमुळे हे शक्य झाले आहे परंतु अपेक्षित ध्येय गाठता आलेले नाही.मंडल विभागनिहाय ० ते ६ वयोगटातील लिंग गुणोत्तराच्या स्थल कालीय बदलाचा अभ्यासदेशातील, राज्यातील तसेच जिल्हातील ० ते ६ बाल वयोगटातील दर १००० मुलांन मागे कमी होत असलेल्या मुलींच्या प्रमाणामध्ये पन्हाळा तालुका सुद्धा अपवाद नाही. पन्हाळा तालुक्यामध्ये जनगणना अहवाल १९९१, २००१ व २०११ मध्ये मुलींच्या प्रमाणामध्ये १९९१ ते २००१ या कालावधी मध्ये मोठ्या प्रमाणात घट झाल्याचे दिसून येते. तक्ता क्र. २ व नकाशा मध्ये ० ते ६ बाल वयोगटातील लिंग गुणोत्तराचे स्थल कालीय वितरण दर्शवण्यात आले आहे. पन्हाळा तालुक्याचे सन १९९१ मध्ये बाल लिंग गुणोत्तर ९३१ होते तर २००१ मध्ये हे प्रमाण कमी होऊन ७९५ इतके झाले आहे. परंतु २०११ मध्ये २००१ च्या तुलनेत वाढ होऊन ते ८४३ इतके झाले असून सन १९९१ च्या तुलनेत मात्र ते कमीच आहे. सन १९९१ ते २००१ या कालावधी मध्ये -१३६ इतक्या मोठ्या प्रमाणात मुलींची संख्या कमी झाल्याचे दिसून येते. ० ते ६ बाल वयोगटातील दर १००० मुलांच्या मागे मुलींचे प्रमाण कमी होण्याचे प्रमुख कारण म्हणजे स्त्रीभ्रूणहत्या हत्या होय. बाल लिंग गुणोत्तर २०११ मध्ये दर १००० मुलांन मागे १९९१ च्या तुलनेत कमी असला तरी २००१ ते २०११ या कालावधी मध्ये ४८ इतकी वाढ झाल्याचे दिसून येते. नकाशा क्र. १ मध्ये पन्हाळा तालुक्यातील मंडल निहाय १९९१, २००१ व २०११ या कालावधी मधील ० ते ६ बालवयोगटातील स्त्री पुरुष लिंग गुणोत्तराच्या स्थल कलीय बदलाचे वितरण दर्शवण्यात आले आहे.

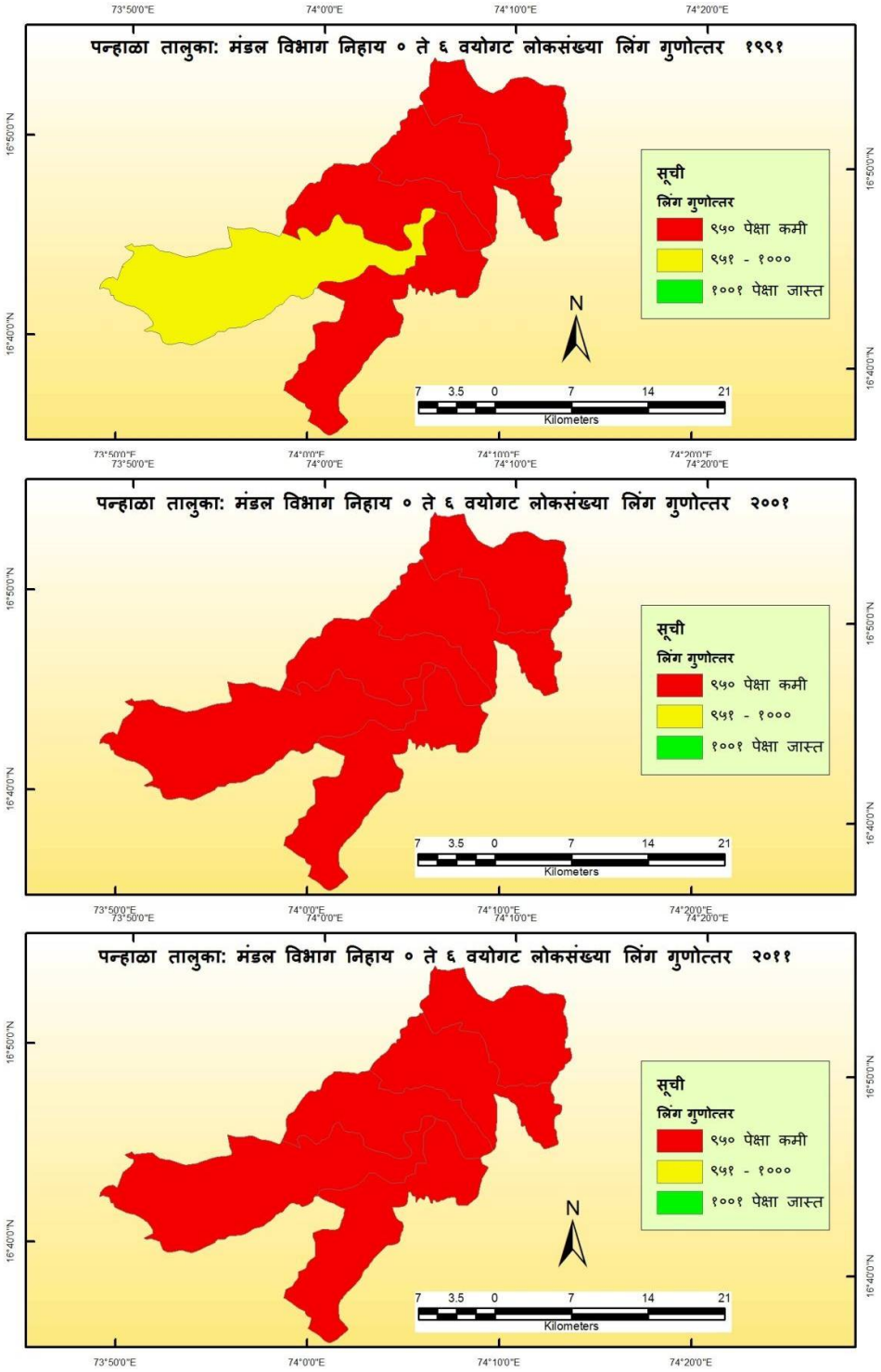
तक्ता क्र. २ पन्हाळा तालुका: मंडल विभाग निहाय ० ते ६ वयोगटातील लिंग गुणोत्तराचा स्थल कालीय बदल

अ.न	मंडल विभाग	वर्ष	बदल

		१९९१	२००१	२०११	१९९१-२००१	२००१-२०११
१	कोडोली	८९४	७४६	८२३	-१४८	७७
२	पन्हाळा	९४४	८१८	८१०	-१२६	-८
३	कोतोली	९२२	८०६	८६९	-११५	६३
४	बाजारभोगाव	९७७	८२६	९०२	-१५२	७७
५	कळे	९४६	८१०	८३१	-१३६	२१
६	तालुका	९३१	७९५	८४३	-१३६	४८

माहितीचा स्त्रोत्र: कोल्हापूर जिल्हा जनगणना अहवाल १९९१, २००१ व २०११

कमी लिंग गुणोत्तर गटामध्ये (९५० पेक्षा कमी) १९९१, २००१ व २०११ मध्ये केवळ बाजारभोगाव मंडल विभाग वगळता सर्व मंडल विभागामध्ये ९५० पेक्षा कमी बाल वयोगटातील लिंग गुणोत्तर दिसून येते. सन १९९१ व २००१ मध्ये सर्वात कमी बाल लिंग गुणोत्तराची नोंद कोडोली (८९४ व ७४६) तर २०११ मध्ये पन्हाळा (८१०) मंडल विभागा मध्ये झाली आहे.



नकाशा क्र. १

मध्यम लिंग गुणोत्तर गटामध्ये (९५१ ते १०००) मध्ये केवळ १९९१ मध्ये बाजारभोगाव (९७७) मंडल विभागाचा समावेश झाला असून २००१ ते २०११ या कालावधी मध्ये मात्र बाल वयोगटातील लिंग गुनोत्तारामध्ये घट झाली आहे. जास्त लिंग गुणोत्तर गटामध्ये

(१००१ पेक्षा जास्त) मध्ये १९९१ ते २०११ या कालावधी मध्ये तालुक्यातील एकाही मंडल विभागाचा समावेश झालेला नाही.

लिंग गुणोत्तरातील बदल

बाल वयोगटातील लिंग गुणोत्तरा मध्ये दर १००० मुलांन मागे १९९१ ते २००१ या कालावधी मध्ये सर्वच मंडल विभागामध्ये लक्षणीय रीत्या घट झाल्याचे दिसून येते. यामध्ये सर्वाधिक घट ही बाजारभोगाव (-१५१) या मंडल विभागामध्ये तर त्याखालोखाल कोडोली (-१४८), कळे (-१३६), पन्हाळा (-१२६) व कोतोली (-११६) या मंडल विभागामध्ये झाली आहे. या सर्वच मंडल विभागामध्ये १०० पेक्षा जास्त मुलींचे प्रमाण १९९१ च्या तुलनेत कमी झाले आहे. परंतु कोल्हापूर जिल्ह्यामध्ये सोनोग्राफी मशीनला बसवलेल्या सायलेंट ऑब्झार्वेर सारख्या यंत्राने मुळे २००१ ते २०११ या कालावधी मध्ये १९९१ पेक्षा जास्त वाढ झाली नसली तरी २००१ च्या तुलनेत काही प्रमाणामध्ये २०११ मध्ये वाढ झाली आहे. यामध्ये कोडोली व बाजारभोगाव या मंडल विभागामध्ये अनुक्रमे ७७ व ७६ इतक्या मुलींच्या प्रमाणा मध्ये वाढ झाली आहे. परंतु पन्हाळा मंडल विभागामध्ये मात्र अपेक्षित वाढ झाली नाही.

ग्रामपंचायत निहाय ० ते ६ बालवयोगटातील लिंग गुणोत्तराच्या स्थल कालीय बदलाचा अभ्यास

निसर्गतः स्त्री- पुरुष प्रमाण समसमान ठेवण्यासाठी जन्म प्रक्रियापासूनच सुरवात होते; परंतु जगातील कोणत्याही देशात स्त्री-पुरुष जन्म प्रमाण सारखे नाही. साधारणपणे १००० मुलींच्या मागे १०५० ते १०५५ मुले जन्माला येतात. मुलीच्या जन्म प्रमाणापेक्षा मुलांचे जन्म प्रमाण जास्त असण्यामागे जीवशास्त्रीय कारण असून मुलींचा गर्भ हा मुलांच्या गर्भाच्या तुलनेत सशक्त व रोगप्रतिकारक शक्ती अधिक असणारा असतो तर मुलाचा गर्भ हा नाजूक व दुर्बल असतो. म्हणून मुलींच्या गर्भमृत्यू प्रमाण साधारणत: वयाच्या ४ वर्षापर्यंत जास्त राहतो. जीवशास्त्रीय कारणामुळे जन्मापासून ते ४ वर्षापर्यंत मुलांचे जन्म प्रमाण जास्त राहूनही मुलींच्या प्रमाणाइतके राहते. परिणामी या वयातील स्त्री पुरुष प्रमाण समान होते; मात्र वाढत्या वयानुसार लिंग प्रमाणातील समानता कमी होत जाते. कारण निसर्गत: स्त्री-पुरुष प्रमाणात समतोल ठेवण्याची प्रक्रिया असली तरी मानवी हस्तक्षेपामुळे स्त्री पुरुष प्रमाणातील असमानता निर्माण होत जाते (मोहन गुळवे). तक्ता क्र. ३ मध्ये पन्हाळा तालुक्यातील मंडळ विभाग निहाय तसेच ग्रामपंचायत निहाय सन १९९१ ते २०११ या

कालावधी बाल वयोगटातील मुला-मुलीन मध्ये निर्माण झालेली असमानता दर्शवण्यात आली आहे. जनगणना अहवाल १९९१ नुसार पन्हाळा तालुक्यामध्ये जास्त लिंग गुणोत्तर (१००१ पेक्षा जास्त) गटामध्ये ४३ तर २००१ व २०११ मध्ये अनुक्रमे १५ व १६ ग्रामपंचायतीनचा समावेश झाला आहे. तसेच कमी लिंग गुणोत्तर (९५० पेक्षा कमी) गटामध्ये १९९१ , २००१ व २०११ मध्ये अनुक्रमे ६८, ११२ व १०४ ग्रामपंचायतीनचा समावेश झाला आहे. सदर ग्रामपंचायत निहाय आकडेवारीवरून स्पष्ट होते की १९९१ ते २०११ या कालावधी मध्ये बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तरामध्ये कमालीची घट होत आहे.

तक्ता क्र. ३

पन्हाळा तालुका: ग्रामपंचायत निहाय ० ते ६ बाल वयोगटातील लिंग गुणोत्तराचा स्थल कालीय बदल

गावे	१९९१	२००१	२०११	गावे	१९९१	२००१	२०११
कोडोली मंडल विभाग				बाजारभोगाव मंडल विभाग			
सावर्डे तर्फ सातवे	९५६	७०६	७१८	पाटपन्हाळा	१०३४	८१४	७०४
सातवे	८७४	८२७	८०१	पोर्ले तर्फ बोरगाव	१२३२	७७१	१२२५
आमतेवाडी	७७४	७६७	४७४	बाजारभोगाव	१२२३	७७०	८४४
शिंदेवाडी	७७८	८३३	८९५	पोहाळे तर्फ बोरगाव	७७८	६८४	९०४
आरळे	७६०	८९४	८१०	साळवाडी	९२६	७८४	८५२
मोहरे	९८५	८०४	७३१	वालोली	८०७	८२४	८३६
काखे	७८३	६३५	७४५	वरनुळ	९७३	९२३	९२४
कोडोली	८८८	७३०	८४५	कुंभारवाडी	७३२	१०३४	६५५
बहिरेवाडी	९२१	६७७	९२७	वाळवेकरवाडी	६८२	८८१	५६९

पोखले	७७०	६७१	६८५	मोताईवाडी	२०००	६४९	८००
माले	१००३	७१६	१०५१	काऊरवाडी	९५७	६६७	९७१
शाहपूर	९९०	९६७	८२७	किसरूळ	१०००	८९०	९०९
जाखले	८५१	७४२	६८८	मुगडेवाडी	७३९	१४३८	१३६४
केखले	८१६	६३५	८९६	पिसात्री	११५०	६९०	६३१
जाफळे	१०८७	९२८	९१८	मानववड	९४२	१०१०	११२८
पन्हाळा मंडल विभाग				वाशी	१०८३	९००	६५७
आवळी	८४७	८०५	८७०	पडसाळी	९२०	१९१७	१३०८
देवाळे	१०२८	७११	११६२	कोलीक	७०९	६८८	८१८
पैजारवाडी	९२९	८१५	८८१	गोठणे	११५४	१२३१	१०००
बोरपाडळे	९२४	७८८	७०६	पोम्बरे	१२६७	७९७	८६३
मिठारवाडी	१०९५	८४८	७६५	काळजवडे	१२८२	९११	११०७
आंबवडे	१०१७	८३२	६८९	पोहाळवाडी	९५६	७८७	१०७१
नेबापूर	९५९	८३३	६३६	काटेभोगाव	९१८	८८४	६९३
आपटी	८०२	८७८	७८३	तळेवाडी	३२५	७५०	२१०

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पन्हाळा ग्रा.	८५३	७३३	९११	माजनाळ	९६०	६८१	८५७
नावली	६९८	७८०	५४८	पुणाळ	७९९	७२९	८९२
जेऊर	१६०७	८३५	८५४	पुशिरे तर्फ बोरगाव	१३९५	८६३	८२७
वेखंडवाडी	८५४	१०००	११११	म्हाळुंगे तर्फ बोरगाव	९८६	७३२	८६४
बोरीवडे	९७८	८८६	८७२	महाडिकवाडी	१०४३	११७२	८८९
बोंगेवाडी	७७८	७४५	१०००	कसबा ठाणे	१००७	७९९	१०३५
बादेवाडी	११५६	७३२	७०५	देवठाणे	९७१	८७७	८९२
बांदीवडे	८८८	९५८	७९६	कळे मंडल विभाग			
इंजोळ	१०००	१०५६	६८५	खेरीवडे	८२६	७८१	९६३
म्हाळुंगे	८५०	९५५	७२०	आसगाव	१४२९	६९०	८५७
गुडे	१०७७	५६०	९५०	कळे	९०४	७५२	८८६
धबधबेवाडी	११०९	७९२	९०९	मरळी	१०४०	७०३	७९८
आसुर्ले	८८५	७६५	७२९	सातर्डे	७९८	७६०	९७४
राक्षी	१०२३	८१७	७७४	पडळ	७८५	६५८	८०६
पिंपळे तर्फ सातवे	७५६	१२०८	९११	माळवाडी	१०७१	१०४१	८३०
दानेवाडी	१०५	८२४	८३८	शिंदेवाडी	८३०	६०८	८६०

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वाडी रत्नागिरी	८७०	८०५		खोतवाडी	८४१	७५६	८१८
गिरोली	११८८	८०५	१०००	माजगाव	१०३२	८४२	६८४
पोहाळे तर्फ आळते	१०४१	७११	८०३	येवलुज	९६५	८१२	७३५
कुशिरे	९२७	८४३	९०९	सावर्डे तर्फ असंडोली	९५८	७९०	६६७
दरेवाडी	११८८	९२६	७८१	मल्हारपेठ	८३८	७३९	९३७
कोतोली मंडल विभाग				घरपण	१०००	९०५	८००
निवडे	७९७	११४३	७८८	परखंदळे	९१४	६०८	८०२
देसाईवाडी	९६९	८३०	८९४	अतकीरवाडी	८७८	१०५८	१२३२
बोरगाव	८३७	९७६	७६०	मेंगानेवाडी	७६९	१५७१	१०९१
चव्हाणवाडी	११३८	८७३	६९२	गोठे	१०००	७५४	७६३
उंड्री	१०२९	९३५	८२२	तांदुळवाडी	१२७३	८४३	८२४
गोठवडे	८५९	६३१	९०१	आकुर्डे	१०३६	९३२	७१४
नणुद्रे	९१३	७६९	१०७५	वाघुर्डे	१०९९	८०४	७६८
करंजफेन	१३१४	७६५	७२४	मोरेवाडी	९२६	७९५	७९२

कणेरी	७३७	८५५	८१०	नवलेवाडी	५७९	७०८	६६७
तेलवे	८१४	१११ १	५२३	सुळे	९५१	८८४	९१८
कोलोली	१०३ ८	६८७	६२७	कोदवडे	७७५	८६६	८३०
कोतोली	९४९	८२१	१०३ ०	गोघवे	५६७	१४५ ०	८९२
माळवाडी	७५०	८६३	८८७	वेतवडे	१२८ २	७९६	८८६
तीरपण	८८८	८१३	७७१	पणुत्रे	१०७ ८	११६ ३	८७३
दिगवडे	९०१	७९६	६७८	आंबर्डे	८७८	९०२	८५४
आळवे	११८ ७	८००	८४७	हरपवडे	७८९	८९०	८५५
मानेवाडी	९४६	७९२	८४६	निवाचीवाडी	१०० ०	६८४	८१०
गोलीवडे	१०१ ८	५८३	८११	पनोरे	८८८	९०९	९५६
पिंपळे तर्फ ठाणे	९३९	७७४	१०० ०				
वाघवे	९१५	८७३	९०६				
निकमवाडी	७५०	६२५	८५७				
उत्रे	११३ ९	७६५	१०३ १				
पोर्ले तर्फ ठाणे	८६३	७७१	९७७				

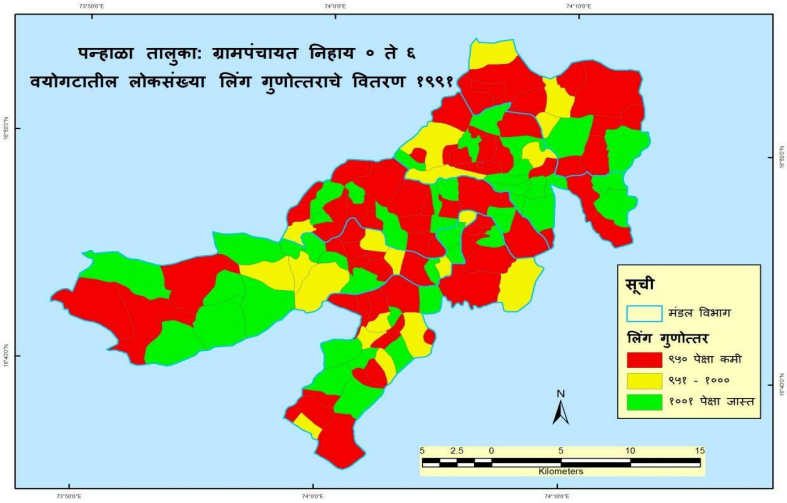
तक्ता क्र. ४

पन्हाळा तालुका: मंडल विभाग निहाय ० ते ६ बालवयोगटातील लिंग गुणोत्तरातील गावांची वर्गवारी

वर्ष	वर्ग	कोडोली	पन्हाळा	कोतोली	बाजारभोगाव	कळे	एकूण
१९९१	कमी	१०	१५	१५	११	१७	६८
	मध्यम	३	३	१	०७	०६	२०
	जास्त	२	१२	७	१३	०९	४३
२००१	कमी	१५	२५	२०	२५	२७	११२
	मध्यम	०	३	१	०	०	०४
	जास्त	०	२	२	६	५	१५
२०११	कमी	१४	२६	१६	२१	२७	१०४
	मध्यम	०	२	४	२	०३	११
	जास्त	१	२	३	८	०२	१६

माहितीचा स्त्रोत्र: कोल्हापूर जिल्हा जनगणना अहवाल १९९१, २००१ व २०११

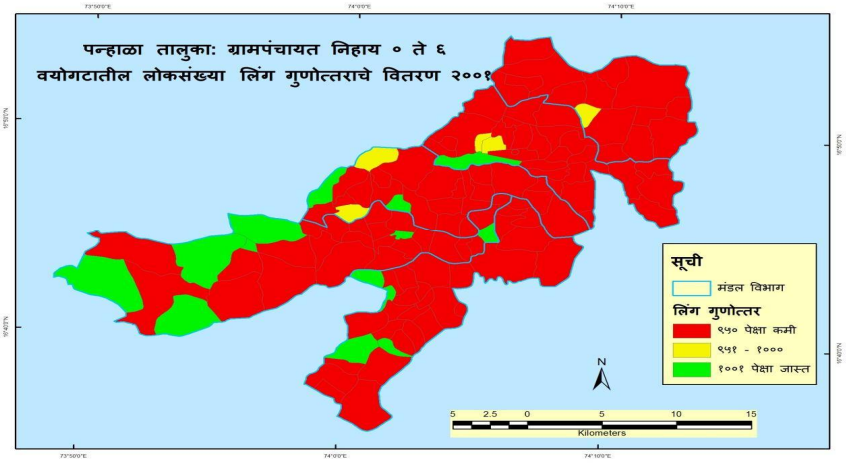
१९९१ जनगणना अहवाल १९९१ नुसार पन्हाळा तालुक्यातील १३१ ग्रामपंचायती पैकी ४३ ग्रामपंचायती मध्ये बाल वयोगटातील (० ते ६) दर १००० मुलांच्यामागे १००१ पेक्षा जास्त मुलींची संख्या नोंदवली गेली आहे. तसेच ९५० ते १००० मध्यम स्त्री पुरुष लिंग गुणोत्तर गटामध्ये २० तर कमी स्त्री पुरुष लिंग गुणोत्तर गटामध्ये सर्वाधिक ६८ ग्रामपंचायतीनची नोंद झाली आहे. पन्हाळा तालुक्यातील सर्वाधिक बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद तळेवाडी ३२५० या बाजारभोगाव मंडल विभागातील तर सर्वात कमी गोघवे ५६७ कळे मंडल विभागामध्ये नोंद झाली आहे. तक्ता क्र. ३ व ४ तसेच नकाशा क्र. २ मध्ये ग्रामपंचायत निहाय बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराचे वितरण दर्शवण्यात आले आहे.



नकाशा क्र. २

कमी (९५० पेक्षा कमी) बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तर गटामध्ये सन १९९१ मध्ये पन्हाळा तालुक्यातील एकूण १३१ पैकी ६८ गावांचा समावेश झाला आहे. यामध्ये सर्वाधिक कळे मंडल विभागामध्ये १७ तर सर्वात कमी कोडोली मंडल विभागामध्ये १० गावांचा समावेश होतो. सर्वात कमी बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद झालेल्या शेवटच्या ५ गावांनमध्ये प्रामुख्याने गोघवे (५६७), नवलेवाडी (५७९), वाळवेकरवाडी (६८२), नावली (६९८) तर कोलीक (७०९) यांचा समावेश होतो. सर्वात कमी लिंग गुणोत्तर असलेल्या शेवटच्या ५ गावांनपैकी कळे मंडल विभागातील नवलेवाडी व गोघवे तसेच बाजार भोगाव मंडल विभागातील वाळवेकरवाडी व कोलीक या गावांचा समावेश झाला आहे. मध्यम (९५१-१०००) बाललिंग गुणोत्तर गटामध्ये एकून १३१ पैकी २० गावांचा समावेश झाला आहे. यामध्ये बाजारभोगाव मंडल विभागातील ०७ तर त्यानंतर अनुक्रमे कळे ६, कोडोली पन्हाळा प्रत्येकी ३ व कोतोली मंडल विभागामध्ये १ गावांचा समावेश झाला आहे. जास्त (१०००) पन्हाळा तालुक्यातील ५ मंडल विभागातील १३१ गावांपैकी ४३ (३२.८२%) गावांमध्ये दर १००० मुलांन पेक्षा मुलींचे प्रमाण अधिक असल्याचे नोंदले आहे. डोंगराळ भागामध्ये समाविष्ट असलेल्या बाजारभोगाव या मंडल विभागामध्ये सर्वाधिक १३ तर त्याखालोखाल पन्हाळा मंडल विभागामध्ये १२ गावांमध्ये १००० पेक्षा जास्त बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद झाली आहे. कळे, कोतोली व कोडोली या मंडल विभागातील अनुक्रमे ९, ७ व २ गावांमध्ये १००० पेक्षा जास्त बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद झाली आहे. दर १००० मुलांच्या मागे सर्वाधिक मुलींची ३२५० इतकी संख्या बाजारभोगाव या मंडल विभागातील तळेवाडी

(३२५०) या ग्रामपंचायती मध्ये झाली आहे. त्याखालोखाल सर्वाधिक बाललिंग गुणोत्तराची नोंद मोताईवाडी (२०००), जेऊर (१६०७), आसगाव (१४२९) व पुशिरे तर्फ बोरगाव (१३९५) या ग्रामपंचायती मध्ये झाली आहे. २००१ जनगणना अहवाल २००१ नुसार पन्हाळा तालुक्यातील १३१ ग्रामपंचायती पैकी १५ ग्रामपंचायती मध्ये बाल वयोगटातील (० ते ६) दर १००० मुलांच्यामागे १००१ पेक्षा जास्त मुलींची संख्या नोंदवली गेली आहे. तसेच ९५० ते १००० मध्यम स्त्री पुरुष लिंग गुणोत्तर गटामध्ये ०४ तर कमी स्त्री पुरुष लिंग गुणोत्तर गटामध्ये सर्वाधिक ११२ ग्रामपंचायतीनची नोंद झाली आहे. यावरून स्पष्ट होते की १९९१ ते २००१ या १० वर्षाच्या कालावधी मध्ये बाल वयोगटातील लिंग गुणोत्तरामध्ये कमालीची घट झाली आहे. पन्हाळा तालुक्यातील सर्वाधिक बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद पडसाळी १९९७ या बाजारभोगाव मंडल विभागातील तर सर्वात कमी गुडे ५६० पन्हाळा मंडल विभागामध्ये नोंद झाली आहे. तक्ता क्र. ३ व ४ तसेच नकाशा क्र. ३ मध्ये ग्रामपंचायत निहाय बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराचे वितरण दर्शवण्यात आले आहे.कमी (९५० पेक्षा कमी) बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तर गटामध्ये सन २००१ मध्ये पन्हाळा तालुक्यातील एकूण १३१ पैकी ११२ गावांचा समावेश झाला आहे. यामध्ये सर्वाधिक कळे मंडल विभागामध्ये २७ तर सर्वात कमी कोडोली मंडल विभागामध्ये १५ गावांचा समावेश झाला आहे. कळे मंडल विभागा नंतर अनुक्रमे पन्हाळा व बाजारभोगव मंडल विभागामध्ये २५ तर कोतोली मंडल विभागामध्ये २० ग्रामपंचायतींनचा समावेश झाला आहे. सर्वात कमी बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद झालेल्या शेवटच्या ५ गावांनमध्ये प्रामुख्याने गुडे (५६०), गोलीवडे (५८३), परखंडळे (६०८), शिंदेवाडी (६०८) तर निकामवाडी (६२५) यांचा समावेश झाला आहे. सर्वात कमी लिंग गुणोत्तर असलेल्या शेवटच्या ५ गावांनपैकी कळे मंडल विभागातील शिंदेवाडी, परखंडळे, गुडे तसेच कोतोली मंडल विभागातील गोठवडे, निकमवाडी व गोलीवडे या गावांचा समावेश झाला आहे. मध्यम (९५१-१०००) बाललिंग गुणोत्तर गटामध्ये एकूण १३१ पैकी केवळ ०४ गावांचा समावेश झाला आहे. यामध्ये पन्हाळा मंडल विभागातील ०३ तर कोतोली मंडल विभागातील केवळ १ गावांचा समावेश झाला असून उर्वरीत कोडोली, कळे व बाजारभोगाव या मंडल विभागामध्येएकही गावाचा समावेश झाला नाही.



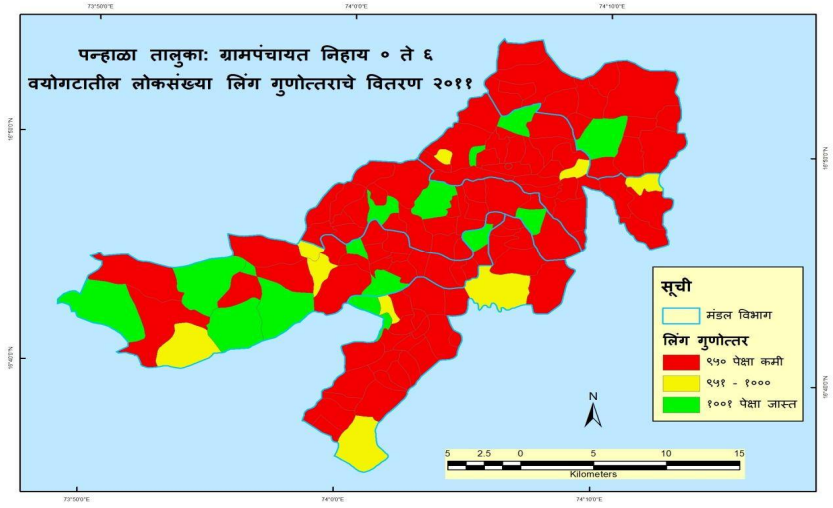
नकाशा क्र. ३

जास्त (१००१ पेक्षा जास्त) बाललिंग गुणोत्तर गटामध्ये प्रामुख्याने डोंगराळ भागामध्ये समाविष्ट असलेल्या बाजारभोगाव या मंडल विभागामध्ये सर्वाधिक ०६ तर त्याखालोखाल कळे मंडल विभागामध्ये ०५ गावांमध्ये १००१ पेक्षा जास्त बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद झाली आहे. पन्हाळा तालुक्यातील ५ मंडल विभागातील १३१ गावांपैकी १५ (११.४५%) गावांमध्ये दर १००० मुलांन पेक्षा मुलींचे प्रमाण अधिक असल्याचे नोंदले आहे. कोतोली व पन्हाळा या मंडल विभागातील अनुक्रमे २ गावांमध्ये १००१ पेक्षा जास्त बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद झाली आहे. दर १००० मुलांच्या मागे सर्वाधिक मुलींची १९१७ इतकी संख्या बाजारभोगाव या मंडल विभागातील पडसाळी (१९१७) या ग्रामपंचायती मध्ये झाली आहे. त्याखालोखाल सर्वाधिक बाललिंग गुणोत्तराची नोंद मेंगाणेवाडी (१५७१), गोघवे (१४५०), मुगडेवाडी (१४३८) व गोठणे (१२३१) या ग्रामपंचायती मध्ये झाली आहे.

२०११

जनगणना अहवाल २०११ नुसार पन्हाळा तालुक्यातील १३१ ग्रामपंचायती पैकी १६ ग्रामपंचायती मध्ये बाल वयोगटातील (० ते ६) दर १००० मुलांच्यामागे १००१ पेक्षा जास्त मुलींची संख्या नोंदवली गेली आहे. तसेच ९५० ते १००० मध्यम स्त्री पुरुष लिंग गुणोत्तर गटामध्ये ११ तर कमी (९५० पेक्षा कमी) स्त्री पुरुष लिंग गुणोत्तर गटामध्ये सर्वाधिक ६८ ग्रामपंचायतीनची नोंद झाली आहे. पन्हाळा तालुक्यातील सर्वाधिक बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद तळेवाडी २१०० या बाजारभोगाव मंडल विभागातील तर सर्वात कमी आमतेवाडी ४७४ कोडोली मंडल विभागामध्ये नोंद झाली

आहे. याच ग्रामपंचायती अंतर्गत एकूण स्त्री पुरुष लिंग गुणोत्तरामध्ये १९९१ (१०९४) ते २००१ (१०००) या कालावधी मध्ये दर १००० पुरुषांनपेक्षा जास्त स्त्रियांची संख्या जास्त होती. तक्ता क्र. ३ व ४ तसेच नकाशा क्र. ४ मध्ये ग्रामपंचायत निहाय बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराचे वितरण दर्शवण्यात आले आहे.



नकाशा क्र. ४

कमी (९५० पेक्षा कमी) बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तर गटामध्ये सन २०११ मध्ये पन्हाळा तालुक्यातील एकूण १३१ पैकी १०४ गावांचा समावेश झाला आहे. यामध्ये सर्वाधिक कळे मंडल विभागामध्ये २७ तर सर्वात कमी कोडोली मंडल विभागामध्ये १४ गावांचा समावेश होतो. सर्वात कमी बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद झालेल्या शेवटच्या ५ गावांनमध्ये प्रामुख्याने आम्तेवाडी (४७४), तेलवे (५२३), नावली (५४८), वाळवेकरवाडी (५६९) तर कोलोली (६२७) यांचा समावेश होतो. जनगणना अहवाल २००१ च्या तुलनेत २०११ मध्ये काही प्रमाणामध्ये बाल लिंग गुणोत्तरामध्ये वाढ झाल्याचे दिसून येते कारण २००१ मध्ये कमी बाल लिंग गुणोत्तर गटामध्ये ११२ गावे होती तर २०११ मध्ये ती १०४ इतकी झाली आहेत.मध्यम (९५१-१०००) बाललिंग गुणोत्तर गटामध्ये एकून १३१ पैकी ११ गावांचा समावेश झाला आहे. यामध्ये कोतोली मंडल विभागातील ०४ तर त्यानंतर अनुक्रमे कळे ०३, पन्हाळा व बाजारभोगव प्रत्येकी २ गावांचा समावेश झाला आहे.जास्त (१००१ पेक्षा जास्त) बाललिंग गुणोत्तर गटामध्ये प्रामुख्याने डोंगराळ भागामध्ये समाविष्ट असलेल्या बाजारभोगाव या मंडल विभागामध्ये सर्वाधिक ८ गावांचा तर त्याखालोखाल कोतोली मंडल विभागामध्ये ०३ गावांमध्ये १००० पेक्षा जास्त बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद झाली आहे. पन्हाळा

तालुक्यातील ५ मंडल विभागातील १३१ गावांपैकी केवळ १६ (१९.८४%) गावांमध्ये दर १००० मुलांन पेक्षा मुलींचे प्रमाण अधिक असल्याचे नोंदले आहे. कळे, पन्हाळा मंडल विभागामध्ये प्रत्येकी २ तर कोडोली या मंडल विभागामध्ये १ गावांमध्ये १००१ पेक्षा जास्त बाल वयोगटातील स्त्री पुरुष लिंग गुणोत्तराची नोंद झाली आहे. दर १००० मुलांच्या मागे सर्वाधिक मुलींची २१०० इतकी संख्या बाजारभोगाव या मंडल विभागातील तळेवाडी (२१००) या ग्रामपंचायती मध्ये झाली आहे. त्याखालोखाल सर्वाधिक बाललिंग गुणोत्तराची नोंद मुगडेवाडी (१३६४), पडसाळी (१३०८), आतकीरवाडी (१२३२) व पोर्ले तर्फ बोरगाव (१२२५) या ग्रामपंचायती मध्ये झाली आहे.

सारांश

२२ जानेवारी २०१५ रोजी हरियाणा मधील पानिपत तेथे पंतप्रधान नरेंद्र मोदी यांनी 'बेटी बचाओ, बेटी पढाओ' या योजनेचे लोकार्पण केले. या योजनेमध्ये राष्ट्रीय सरासरीपेक्षा कमी लिंग गुणोत्तर व राष्ट्रीय सरासरी बरोबर असलेले जिल्हे यांची निवड केली यामध्ये महाराष्ट्रातील हिंगोली, सोलापूर, नाशिक, पुणे कोल्हापूर व परभणी या जिल्ह्यांचा समावेश केला.

1. कोल्हापूर जिल्ह्यातील (८६३) बाल लिंग गुणोत्तर दर १००० बालकांनमागे राष्ट्रीय सरासरी (९१९) पेक्षा कमी आहे. तसेच पन्हाळा तालुक्याचे बाल लिंग गुणोत्तर प्रमाण दर १००० मुलांनमागे ८४३ ही राष्ट्रीय सरासरी पेक्षा खूपच कमी असल्याचे दिसून येते.
2. महाराष्ट्रातील बाल लिंग गुणोत्तरामध्ये बीड जिल्हामध्ये सर्वात कमी लिंग गुणोत्तराची तर तालुक्यानमध्ये पन्हाळा तालुक्याचा समावेश झाला आहे. बाल लिंग गुणोत्तरामध्ये पन्हाळा तालुक्यातील ५ ही मंडळ विभागातील सरासरी राष्ट्रीय सरासरी पेक्षा कमी आहे.
3. ग्रामपंचायतनिहाय अभ्यास केला असता १३० पैकी २९ गावातील बाल लिंग गुणोत्तर राष्ट्रीय सरासरी पेक्षा जास्त आहे तर १०१ गावातील सरासरी पेक्षा कमी आहे. त्यामुळे 'बेटी बचाओ, बेटी पढाओ' यासारखी योजना सक्षमपणे राबवायची असेल तर बाल लिंग गुणोत्तराचा सूक्ष्म पातळीवर अभ्यास करणे गरजेचे आहे.
4. प्राधान्य क्रमाने तालुक्यातील राष्ट्रीय सरासरी पेक्षा कमी बाल लिंग गुणोत्तर असलेल्या १०१ गावमध्ये 'बेटी बचाओ, बेटी पढाओ' योजना प्रभावीपणे राबवणे गरजेचे आहे. तसेच प्रामुख्याने दर १००० मुलांनमागे ८०० पेक्षा कमी मुलींचे प्रमाण असलेल्या ४३

गावांनवर उदा. आम्तेवाडी (४७४), तेलवे (५२३), नावली (५४८), वाळवेकरवाडी (५६९), कोलोली (६२७) तालुक्यातील आरोग्य विभागा मार्फत विशेष लक्ष केंद्रित केले पाहिजे.

5. तसेच तालुक्यातील १००० पेक्षा जास्त बाल वयोगटातील लिंग गुणोत्तर असलेल्या ग्रामपंचायतीना बाल लिंग गुणोत्तरामध्ये सातत्य राखून ठेवण्यासाठी विशेष प्रोत्साहन देणे गरजेचे आहे कारण जनगणना अहवाल १९९१ नुसार १००० पेक्षा जास्त बाल लिंग गुणोत्तर असलेल्या १४ ग्रामपंचायती मध्ये २०११ च्या जनगणना अहवाला नुसार झपाट्याने घट होऊन सदर गावामध्ये ८०० पेक्षा कमी बाल लिंग गुणोत्तराची नोंद झाली आहे. यामध्ये कोलोली, माजगाव, चव्हाणवाडी, पाटपन्हाळा, बादेवाडी, आकुर्डी, करंजफेन, मिठारवाडी, वाघुर्डी, राक्षी,दरेवाडी, मरळी या गावांचा समावेश होतो. मोतावाडी या गावामध्ये तर १९९१ मध्ये दर १००० मुलांमागे २००० इतकी मुलींची संख्या होती यामध्ये २०११ मध्ये घट होऊन ती ८०० इतकी झाली आहे.

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लातूर तालुक्यातील फळबाग शेती क्षेत्र : एक भौगोलिक विश्लेषण

शिंदे नरसिंग जयसिंग[1] डॉ.ओमप्रकाश व्ही. शहापूरकर[2]

[1]एम. फिल. संशोधक विद्यार्थी भूगोल संशोधन केंद्र, राजर्षीशाहू महाविद्य(स्वायत्त) लातूर.

[2]भूगोल विभाग प्रमुख, भूगोल संशोधन केंद्रराजर्षीशाहू महाविद्यालय,(स्वायत्त) लातूर.

शोधसारांश:

प्रस्तुत शोध निबंधामध्ये लातूर तालुक्यातील फळबागपिक क्षेत्राचाअभ्यास करताना आंबा,डाळिंब,द्राक्षआणि बोर या चार फाळपिकांचा आढावा घेतला आहे . त्या मध्ये लातूर तालुक्यातील कृषी अधिकारी कार्यालयातील प्राप्त माहितीच्या आधारे वर्ष २००३ ते २००८ पासून २००८ ते २०१२ पर्यंतचा कालावधी निश्चित केला आहे. तसेच उद्देशाला अनुसरून निष्कर्ष काढण्याचा प्रयत्न केलेला आहे. त्यामध्ये प्रामुख्याने लातूर तालुक्यातील फळबाग शेती क्षेत्राचा विचार करता असे दिसून आले आहे कि आंबा या फळ पिकाचे क्षेत्र सर्वाधिक आहे तर त्या पाठोपाठ डाळिंब,त्यानंतर द्राक्ष व बोर या पिकाचे क्षेत्र आहे .

बीज संज्ञा : - कृषी क्षेत्र,फळबाग

उद्दिष्टे

1) लातूर तालुक्यातील फळबागांचा अभ्यास
2) लातूर तालुक्यातील फळबाग क्षेत्राच्या वितरणाचा अभ्यास

प्रस्तावना

कृषीचा विचार करता उत्पादन वाढीसाठी फळबाग शेतीला अनन्यसाधारण महत्व आहे. लातूर तालुक्यातील फळबाग क्षेत्राचा अभ्यास करताना काही मंडळांचा विचार व प्रत्येक फळाची विस्तृत माहिती आणि फळबागांच्या विकास याचा विस्तृत विचार केला गेला आहे. तसेच त्यासाठी लातूर तालुक्यातील फळबाग क्षेत्राखालील फळबागांचा अभ्यास केला आहे तसेच यातील प्रमुख फळबाग पिक क्षेत्र आंबा,बोर,आवळा,सीताफळ,द्राक्ष यांचा अभ्यास क्षेत्रात समावेश करण्यात आला आहे.

संशोधन पद्धती

विविध प्रकारच्या माहिती स्त्रोतांच्या आधारे मिळालेल्या आकडेवारीचे सांख्यिकीय पद्धतीने पृथक्करण करून त्याचे व्यवस्थित रीत्या विश्लेषण करण्यात आले आहे. यामध्ये द्वितीयक माहिती स्त्रोतांचा उपयोग करण्यात आला आहे. ही माहिती जिल्हा जनगणना पुस्तिका जिल्हा सामाजिक व आर्थिक समालोचन लातूर जिल्हा राजपत्र प्रकाशित व अप्रकाशित माहिती स्त्रोत नकाशे आणि शासकीय प्रकाशनानं मधून घेतलेली आहे तसेच शोधनिबंध तसेच पीएचडी अहवाल व मासिके, विविध सांख्यिकीय कार्यालय वर्तमानपत्रे इंटरनेट या माध्यमातून माहिती संकलित करण्यात आली आहे.

अभ्यास क्षेत्र

लातूर जिल्हा दहा तालुक्यांनी बनलेला असून त्यापैकी लातूर तालुका एक महत्त्वपूर्ण तालुका आहे. त्याचे कारण म्हणजे लातूर जिल्ह्याचे ठिकाण महत्त्वपूर्ण अशी बाजारपेठ आहे लातूर जिल्ह्याच्या पश्चिम भागात लातूर तालुका वसलेला आहे. याचा अक्षवृत्तीय व रेखावृत्तीय विस्तार 18 अंश 17 अंश ते 18 अंश 45 अंश उत्तर अक्षांश ते 76 अंश 12 अंश ते 76 अंश 45 अंश पूर्व रेखांश आहे लातूर तालुक्याचे क्षेत्रफळ 630 चौरस किलोमीटर असून क्षेत्रफळाच्या दृष्टीने जिल्हा तिसऱ्या क्रमांकाचा तालुका आहे तर लोकसंख्येच्या बाबतीत जिल्ह्यात प्रथम क्रमांक आहे लातूर तालुक्याच्या वायव्येस बीड जिल्हातील अंबाजोगाई तालुका उत्तरेस रेनापुर तालुका ईशान्य रेनापुर व चाकुर तालुका व पूर्वेस चाकुर व शिरूर आनंतपाळ तसेच अग्नेश शिरूर आनंतपाळ निलंगा व पश्चिम भागात उस्मानाबाद जिल्ह्याची सीमा आहे.

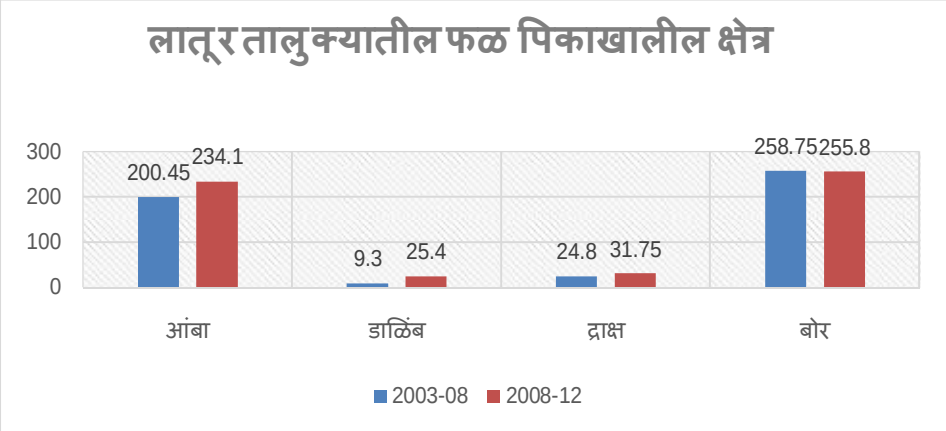
विषय विवेचन

तक्ता. क्र. १

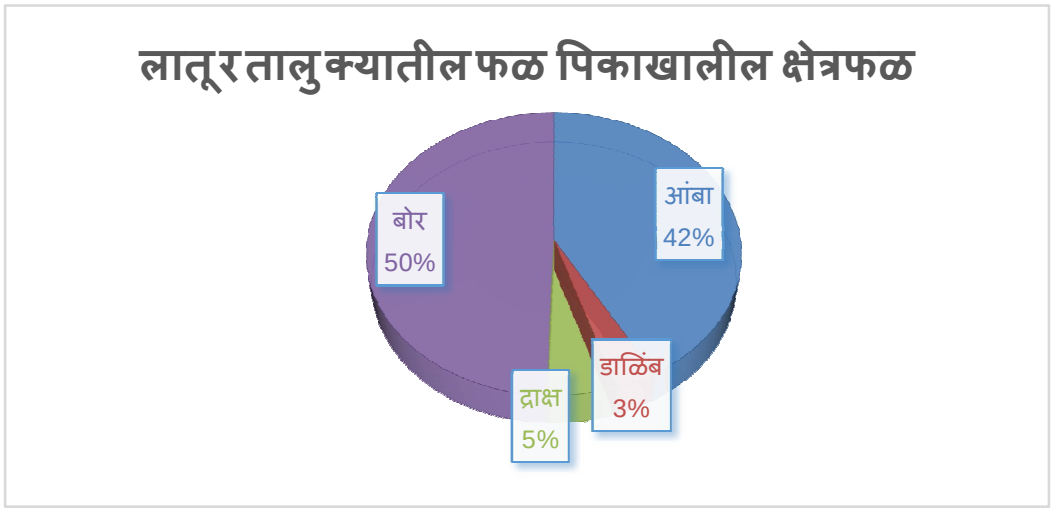
अ. क्र.	फळपीक	2003-08	2008-12	एकूण	टक्केवारी
1	आंबा	200.45	234.10	434.55	41.78
2	डाळिंब	9.30	25.40	34.7	3.27
3	द्राक्ष	24.80	31.75	76.55	5.43
4	बोर	258.75	255.80	514.55	49.45
एकूण फळबाग खालील क्षेत्र		493.30	547.05	1040.45	100%

स्त्रोत:तालुका कृषी अधिकारी

आलेख क्रं . १



आलेख क्रं . २



वरील फळबाग पीक व क्षेत्रांमध्ये सर्वाधिक क्षेत्र हे आंबा या फळपिकाचे वाढलेली दिसून येते. त्याच बरोबर त्यापाठोपाठ डाळिंब,द्राक्ष, बोर व या पिकांचा क्रमांक लागतो. लातूर तालुक्यातील फळबाग क्षेत्राचा अभ्यास करताना असे आढळून आले की, फळबाग क्षेत्रांमध्ये काही प्रमाणात बदल झालेला आहे. त्यामध्ये आंबा यापिकाचे क्षेत्र २००३ ते २००८ च्या तुलनेत २००८ ते २०१२ या वर्षात 200.45 वरून वाढ होऊन 234.10 इतके झाले आहे तर डाळिंब या पिकाचे क्षेत्र २००३ ते २००८ च्या तुलनेत २००८ ते २०१२ या वर्षात 9.30 वरून वाढ होऊन 25.40 इतके झाले आहे तसेच द्राक्ष या पिकाचे क्षेत्र २००३ ते २००८ च्या तुलनेत २००८ ते २०१२ या वर्षात 24.80 वरून वाढ होऊन 31.75 इतके

झाले आहे. परंतु बोर या फळ पिकाचे क्षेत्र २००३ ते २००८ च्या तुलनेत २००८ ते २०१२ या वर्षात 258.75 वरून कमी होऊन ते 255.80 इतके झाले आहे.

निष्कर्ष

लातूर तालुक्यातील फळबाग शेती क्षेत्राचा विचार करता असे दिसून आले आहे कि आंबा यापिकाचे क्षेत्र २००३ ते २००८ च्या तुलनेत २००८ ते २०१२ या वर्षात 200.45 वरून वाढ होऊन 234.10 इतके झाले आहे तर डाळिंब या पिकाचे क्षेत्र २००३ ते २००८ च्या तुलनेत २००८ ते २०१२ या वर्षात 9.30 वरून वाढ होऊन 25.40 इतके झाले आहे तसेच द्राक्ष या पिकाचे क्षेत्र २००३ ते २००८ च्या तुलनेत २००८ ते २०१२ या वर्षात 24.80 वरून वाढ होऊन 31.75 इतके झाले आहे. परंतु बोर या फळ पिकाचे क्षेत्र २००३ ते २००८ च्या तुलनेत २००८ ते २०१२ या वर्षात 258.75 वरून कमी होऊन ते 255.80 बोर फळ पिकाचे क्षेत्र अधिक असून त्याच्या इतके झाले आहे.

शिफारशी

१) लातूर तालुक्यातील शेतकऱ्यांना फळबाग शेती विषयाचे महत्त्व समजावून सांगून त्या विषयीचे प्रशिक्षण देणे आवश्यक आहे

२) बोर फळपिकाखालील क्षेत्र वाढवणे

संदर्भग्रंथ सूची :

1. नाडे योगेश्वरी रमेश,(२०१६) तुळजापूर तालुक्यातील फळबाग शेती:एक भोगोलिक विश्लेषण
2. भूगोल इयत्ता तिसरी (बालभारती २०२१) लातूर जिल्हा
3. सुरेश फुले,(२००२) कृषी भूगोल विद्याभारती प्रकाशन
4. लातूर तालुका कृषी अधिकारी फळबाग शेती अहवाल
5. जिल्हा अर्थ व सांखिकी कार्यालय लातूर
6. सामाजिक व आर्थिक समालोचन २००१ व २०११

पन्हाळा तालुक्यातील सामाजिक व आर्थिक सोई सुविधा वप्रादेशिक विकास (२०११)

प्रा. अश्विनी खंडेराव मुरावणे[1] डॉ. ओमप्रकाश शहापूरकर[2] प्रा. संजयकुमार मेंन्शी[3]

[1]संशोधक विद्यार्थिनी, राजर्षीशाहू महाविद्यालय (स्वायत्त), लातूर

[2]भूगोल विभाग प्रमुख, राजर्षीशाहू महाविद्यालय (स्वायत्त), लातूर

[3]भूगोल विभाग प्रमुख, गोपालकृष्ण गोखले कॉलेज, कोल्हापूर

सारांश

मानवी विकासाचा संबंध मानवी कल्याणाशी जोडण्यात आला आहे. मानवी जीवनाचं कल्याण साधणाऱ्या बाबींमध्ये जीवनातील मुलभूत गरजा, शिक्षण, आरोग्य, रोजगार, उत्पन्न आणि संपत्तीचं समान वितरण इ. चा अंतर्भाव होतो. मानवी जीवनाचे कल्याण साधणाऱ्या या निर्देशांकाचे मापन करणाच्या वेगवेगळ्या पद्धती आहेत. अर्थशात्रज्ञाच्या मते, सामाजिक व आर्थिक निर्देशांकाच्या आधारे तयार करण्यात आलेला विकास निर्देशांक (Development Index)हा सामाजिक आणि वैयक्तिक कल्याणाचं मापन करण्यासाठी दरडोई उत्पन्नापेक्षा जास्त अचूक साधन आहे. सदर प्रकरणामध्ये पन्हाळा तालुक्यातील मंडल विभागांचा संयुक्त विकास निर्देशांक पी.आर. व्यास यांनी त्यांच्या "Social Amenities and Regional Development"या पुस्तकामध्येवापरलेल्या सूत्रानुसार काढण्यात आला आहे. पी.आर. व्यास यांच्या सूत्रानुसार विशीष्ट प्रदेशातील लोकसंख्येला व वसाहतीनां उपलब्ध असलेल्या सामाजिक व आर्थिक सोई सुविधांच्या विचार करून संयुक्त विकास निर्देशांक काढला जातो.

प्रस्तावना

पन्हाळा तालुक्यातील मंडल विभागानुसार हवामान, प्राकृतिक रचना, वनस्पती इत्यादी बाबतीत मोठ्या प्रमाणात विविधता आढळून येते. तालुक्यातील बाजारभोगाव व कळे मंडल विभागाच्या सीमावर्ती भागामध्ये मध्ये उंच डोंगराळ प्रदेश आहेत तर कोतोली व कोडोली मंडल विभागामध्ये सखल मैदानी प्रदेश पसरला आहे.पन्हाळा तालुक्यातील बाजारभोगाव व कळे मंडल विभागामध्ये अतिवृष्टी होते तर पन्हाळा मंडळ विभागाच्या मध्यातून पसरलेल्या मसाई पठाराच्या वातविन्मुख बाजूस बाजूस असलेल्या पैजारवाडी,बोरपाडळे, आवळी यासारख्या भागामध्ये पाण्याचे दुर्भिक्ष्य आहे. तालुक्यातील या भौगोलिक परिस्थितीचा मानवाच्या आर्थिक व सामाजिक परिस्थितीवर परिणाम झाला आहे. सदर प्रकरणामध्ये आर्थिक व सामाजिक सोई सुविधांचा स्त्री-पुरुष लिंग गुणोत्तरावर कशा प्रकारे परिणाम झाला आहे याचा अभ्यास करण्यात आला आहे. प्रामुख्याने आर्थिक व सामाजिक सोई सुविधा मधील शैक्षणिक सुविधा, वैद्यकीय सुविधा, स्वच्छता विषयक सुविधा, मार्केट सुविधा, बँक सुविधा, वाहतुकीच्या सोई, संदेशवहन सुविधा, दै.वृत्तपत्र सुविधाव नळ पाणीपुरवठा यांचा अभ्यास करण्यात आला आहे.

उद्दिष्टये

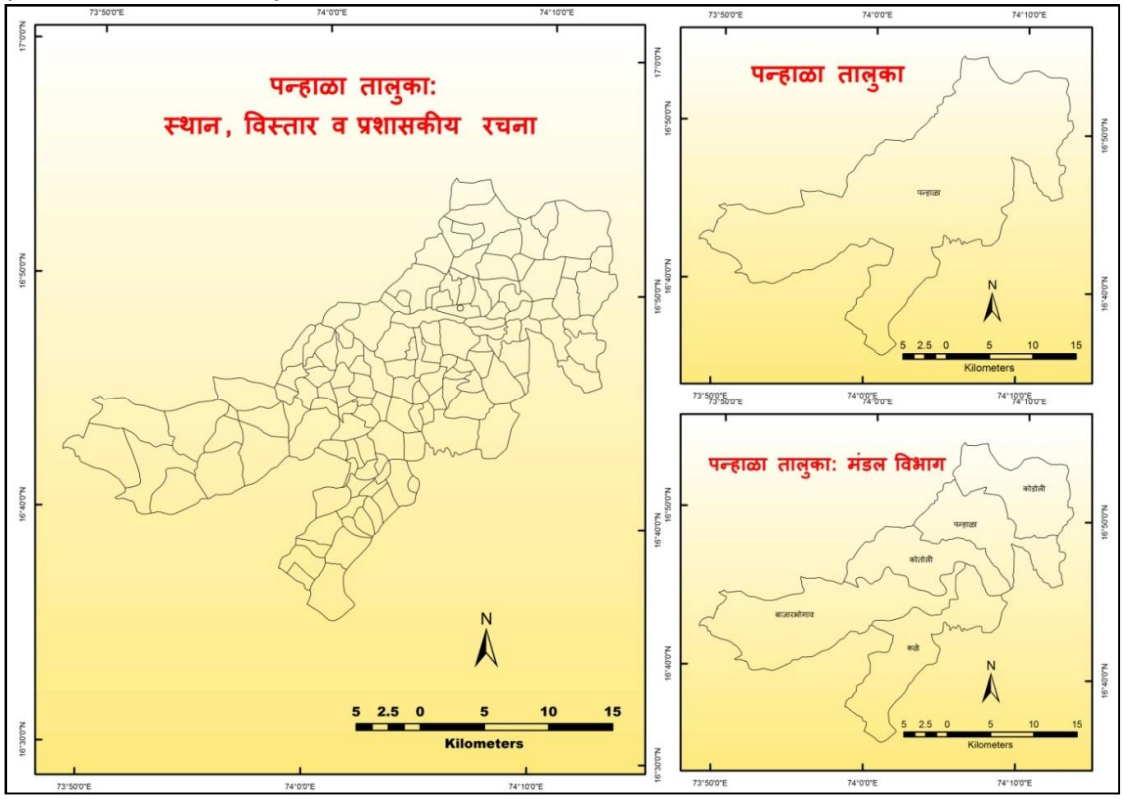
सदर संशोधनाकरिता संशोधकाने खालील उद्दिष्टे निश्चित केली आहेत.

1. पन्हाळा तालुक्यातील प्राकृतिक रचनेचा अभ्यास करणे
2. पन्हाळा तालुक्यातील भौतिक सोई सुविधांच्या वितरणाचा अभ्यास करणे.

अभ्यास क्षेत्र

ऐतिहासिक व भौगोलिक दृष्ट्या पन्हाळा हे छत्रपती शिवरायांच्या स्वराज्यातील तळकोकण, दक्षिणेकडील आदिलशाही व निजामशाही यांच्यावर वचक ठेवण्याच्या दृष्टीने असलेले महत्वाचे ठाणे होय.

महाराष्ट्र राज्याच्या दक्षिणेकडील कोल्हापूर जिल्ह्यामध्ये कोल्हापूर शहराच्या वायव्येस सुमारे १८ कि.मी वर कोल्हापूर-रत्नागिरी हमरस्त्याच्या दक्षिणेस सह्याद्रीच्या कुशीत एका छोट्याशा पठारावरती पन्हाळा तालुका वसलेला आहे. पन्हाळा हे लोकांचे आवडते पर्यटन स्थळ असून थंड आणि आरोग्यवर्धक हवामानासाठी प्रसिद्ध आहे.



नकाशा क्र.१

पन्हाळा तालुक्याचा अक्षवृत्तीय विस्तार १६० ३५' ते १६० ५४' उत्तर ते ७३० ४८' ते ७४० १३' पूर्व रेखावृत्तीय विस्तार आहे. पन्हाळा तालुक्याचे क्षेत्रफळ ५७३.९२ चौ. कि.मी असून तालुक्याची समुद्र सपाटीपासूनची उंची सुमारे १००० मी इतकी आहे. प्रशासकीय सोयीनुसार कोल्हापूर जिल्ह्यातील बारा तालुके करवीर, इचलकरंजी, गडहिंग्लज व राधानगरी या चार महसुली उपविभागामध्ये विभागले आहेत. करवीर या महसुली उपविभागामध्ये पन्हाळा तालुक्याचा समावेश होतो. २०११ च्या जनगणना अहवालानुसार पन्हाळा तालुक्यात एकूण १३१ ग्रामपंचायती, १ नगरपरिषद व १ जनगणना नगर इत्यादीचा समावेश होतो. ग्रामपंचायतीच्या प्रशासकीय सोयीसाठी तालुक्याचे कोडोली, पन्हाळा, कोतोली, बाजारभोगाव व कळे असे एकूण ५ मंडल विभाग करण्यात आले आहेत. मंडल विभागातील कोडोली या विभागामध्ये १५, पन्हाळा २९, कोतोली २३, बाजारभोगाव ३१ व कळे या मंडल विभागामध्ये ३२ गावांचा समावेश होतो (कोल्हापूर जिल्हा सामाजिक आर्थिक समालोचन अहवाल). तालुक्यातील ५ मंडल विभागामध्ये बाजारभोगाव हे मंडल क्षेत्र आकाराने मोठे असून त्याचे एकूण क्षेत्रफळ तालुक्याच्या ३०.२१ टक्के इतके आहे तर कोतोली हा (१४.६८ टक्के) मंडल विभाग आकाराने लहान आहे. मंडल विभागातील ग्रामीण व नागरी भागाचाही लोकसंख्या लिंग-गुणोत्तरावर परिणाम झाल्याचे दिसून येते. कारण ग्रामीण भागामध्ये शहरी भागाच्या तुलनेने कमी वैद्यकीय सोई सुविधा उपलब्ध असतात.

अभ्यास पद्धती

सदर संशोधनाकरिता प्राथमिक व दुय्यम स्वरुपाच्या सांख्यिकी सामग्रीचा वापर करण्यात आला आहे. प्राथमिक स्वरूपाची सांख्यिकी माहिती प्रश्नावली व क्षेत्रभेट यांच्या माध्यमातून संकलीत करणेत आली आहे. तसेच दुय्यम स्वरूपाची सांख्यिकी माहिती कोल्हापूर जिल्हा जनगणना अहवाल सन १९९१,

२००१ व २०११, कोल्हापूर जिल्हा सामाजिक व आर्थिक समालोचन सन २००३, २०१२ व २०१६, कोल्हापूर जिल्हापरिषद आरोग्य विभाग अहवाल, कोल्हापूर गॅझेट शासकीय अहवाल, संदर्भ ग्रंथ, विविध संशोधनपत्रिका, इंटरनेट सांकेतिक स्थळे, दैनिक वृत्तपत्रे, मासिके तसेच साप्ताहिके यांच्या मधून संकलीत करणेत आली आहे. प्रामुख्याने आर्थिक व सामाजिक सोई सुविधा मधील शैक्षणिक सुविधा, वैद्यकीय सुविधा, स्वच्छता विषयक सुविधा, मार्केट सुविधा, बँक सुविधा, वाहतुकीच्या सोई, संदेशवहन सुविधा, दै.वृत्तपत्र सुविधाव नळ पाणीपुरवठा यांचा अभ्यास करण्यात आला आहे. तक्ता क्र. १ मध्ये पन्हाळा तालुक्यातील मंडल विभाग निहाय आर्थिक व सामाजिक सोई सुविधांचा विकास निर्देशांक दर्शवण्यात आला आहे. पी.आर. व्यास यांच्या"Social Amenities and Regional Development"या पुस्तकातील सूत्रानुसार विशीष्ट प्रदेशातील लोकसंख्येला व वसाहतीनां उपलब्ध असलेल्या सामाजिक व आर्थिक सोई सुविधांच्या विचार करून संयुक्त विकास निर्देशांक खालील दिलेल्या सूत्रानुसार काढण्यात आलेला आहे.

जसे,

CDI = विकास निर्देशांक सहसंबधीत चल, i

Pi = विशिष्ठ क्षेत्रातील चलाचे शेकडा प्रमाणi, (मंडल विभाग)

PI = विशिष्ठ क्षेत्रातील चलांच्या शेकडेवारीची सरासरी I, अभ्यास क्षेत्र (तालुका).

$$CDI = \frac{Pi}{PI} X\ 100$$

संयुक्त विकास निर्देशांक

जसे,

CID = संयुक्त विकास निर्देशांक

CDI1 = विकास निर्देशांक सहसंबधीत चल, i

N = एकूण चल

$$CID = \frac{CDI_1 + CDI_2 + CDI_3 \ldots\ldots\ldots\ldots CDI_n}{N}$$

पन्हाळा तालुक्याची प्राकृतिक रचनेचा अभ्यास

भूपृष्ठरचना

कोल्हापूर जिल्ह्याचे भूस्तरीय संरचनेनुसार तीन भाग पडतात. अतिप्राचीन केब्रीयन पूर्व काळातील खडक, मध्यजीव महाकल्प ते तृतीयक या कालखंडातील खडक व अलीकडील खडक हे चतुर्थ काळातील खडक असे तीन भाग आढळतात. पश्चिम भागामध्ये डोंगराळ भाग हा तांबड्या मुरमाड खडकांचा तर पूर्वेकडील भूभाग कठीण काळया खडकाचा आहे (कोल्हापूर जिल्हा सामाजिक व आर्थिक समालोचन). कोल्हापूर जिल्ह्यातील पन्हाळा तालुक्याचे स्थान पश्चिम डोंगराळ भागामध्ये येत असून बहुतांश भूभाग तांबड्या मुरमाड खडकांचा आहे. पन्हाळा तालुक्याच्या पश्चिमेकडील बाजारभोगाव मंडल, दक्षिणेकडील कळे मंडल तसेच मध्य भागातील पन्हाळा मंडलचा भूभाग हा सर्वसाधारण डोंगराळ १००० मी उंची पर्यंतचा आहे. बाजारभोगाव, कळे व पन्हाळा मंडल विभागातून सह्याद्री डोंगर रांगा पसरलेल्या असून यामध्ये दक्षिण व पश्चिम भाग हे अनियमित डोंगराळ आहे.पन्हाळा मंडल विभागातील सह्याद्री डोंगररांग विस्तृत सपाट माथ्याची असून स्थानिक लोक या रांगेस **मसाई डोंगर रांग** म्हणून ओळखतात. मसाई डोंगर रांगेच्या कड्या लगत काही ठिकाणी बेसाल्ट खडकाचे उंचच्या उंच डाईक्स आढळून येतात.

मसाई डोंगररांगेमध्ये ऐतिहासिक पन्हाळा किल्ला स्थित असून पठारावर पांडवकालीन गुहा असल्याचे आढळून येते. मसाई डोंगर रांगेच्या उत्तरेस वारणा नदी तर पन्हाळा तालुक्याच्या मध्यातून कासारी नदीने डोंगराळ भागातून वाहून आणलेल्या गाळामुळे सखल मैदानी प्रदेश तयार झाला आहे.तालुक्याच्या पश्चिम भागातील डोंगर रांगेच्या दरम्यान जांभळी नदी तर दक्षिणेकडील भागातून कुंभी, धामणी या नद्यांनी चिंचोळे सपाट मैदानी प्रदेश निर्माण केले आहेत. भूपृष्ठरचना व लोकसंख्या लिंग गुणोत्तर यांचा प्रत्यक्ष संबंध येत नसला तरी भूपृष्ठ रचनेवर प्रदेशाचा आर्थिक विकास व विकासावर अप्रत्यक्षरित्या लोकसंख्या लिंग-गुणोत्तर अवलंबून असते (**पी.ए.खडके**).

जलप्रणाली

पन्हाळा तालुक्यातून प्रामुख्याने **वारणा, कुंभी, धामणी, कासारी व जांभळी** या नदया वाहतात. वारणा नदी तालुक्याच्या उत्तरेकडील सिमेवरून तर कासारी नदी शाहुवाडी तालुक्यातून वाहत येऊन पन्हाळा तालुक्याच्या मध्यातून पश्चिम-पूर्व दिशेमध्ये वाहते. कुंभी नदी पन्हाळा तालुक्यातून डोंगर रांगेच्या दरम्यान दक्षिण-उत्तर दिशेमध्ये वाहते. कुंभी व कासारी या नदया कोल्हापूर जिल्ह्यातील प्रयाग चिखली याठिकाणी येऊन मिळतात. प्रयाग या ठिकाणी कुंभी, कासारी, तुळशी, भोगावती व गुप्त सरस्वती या नद्या एकत्र येऊन मिळतात या एकत्र प्रवाहास पंचगंगा नदी या नावाने संबोधले जाते. कुंभी नदी प्रयाग या ठिकाणापासून पन्हाळयाच्या पायथ्यालगतच्या भागातून घरपण या गावातून पश्चिमेकडे वाहत जाते. घरपण या ठिकाणी कुंभीची वितरिका तयार होते तिला धामणी या नावाने ओळखले जाते. तर रत्नागिरी जिल्ह्याच्या वायव्य भागात असलेल्या चांदोली धरणातून वारणा नदी ही पुढे वाहत येऊन ती पन्हाळयाच्या उत्तरे कडील भागातून वाहत जाऊन सांगली जिल्ह्यातील पूर्वेकडील भागात असलेल्या कृष्णा नदीस जाऊन मिळते.कोल्हापूर जिल्ह्यामध्ये असलेल्या लघु व मध्यम पाटबंधारे प्रकल्पामुळे व नद्यांवर बांधलेल्या कोल्हापूर पद्धतीच्या बंधाऱ्यामुळे तालुक्यातील चारही नदया बारमाही वाहतात परंतू केवळ उन्हाळयामध्येच नदी पात्रातील पाणी कमी होते. नद्यानां असलेल्या मुबलक पाण्यामुळे नदीकाठी असलेल्या गावांमध्ये आर्थिकदृष्ट्या समृद्धता आढळून येते. आर्थिक व सामाजिक दृष्ट्या विकासाचा लोकसंख्या लिंग गुणोत्तरावर परिणाम झाल्याचे दिसून येते.

हवामान

पन्हाळा तालुक्यामध्ये पसरलेल्या सह्याद्री पर्वतरांगामध्ये दाट झाडी असून तेथे पर्जन्याचे प्रमाण अधिक असल्यामुळे येथील हवामान उष्ण व दमट स्वरूपाचे असून डोंगराळ भागामध्ये हवामान थंड आहे. कोल्हापूर जिल्ह्याचे पर्जन्यमान पश्चिमेकडून पूर्व भागामध्ये कमी कमी होत जाते. पन्हाळा तालुक्यातील पर्जन्य वितरणावर तेथील भूपृष्ठ रचनेचा प्रभाव असल्याचे दिसून येते. तालुक्याचा दक्षिण भाग डोंगराळ असल्यामुळे दक्षिण भागातील बाजारभोगाव व कळे मंडल विभागामध्ये ६२५० मि.मी ते १८७५ मि.मी दरम्यान पाऊस पडतो. कोतोली, पन्हाळा व कोडोली हे मंडल विभाग सह्याद्री डोंगर रांगेच्या वातविन्मुख बाजूस असल्यामुळे या प्रदेशात १५०० मि.मी ते ७५० मि.मी दरम्यान पाऊस पडतो. पन्हाळा मंडल विभागामध्ये मसाई डोंगर रांगेच्या विस्तृत भागामध्ये पन्हाळा हे थंड हवेचे ठिकाण म्हणून प्रसिद्ध आहे.

मृदा

मृदा म्हणजे खडकांपासून वेगळया असलेल्या जमिनीचा असा भूभाग, कि जो वनस्पतींना आधार देतो. मृदेची निर्मिती व दर्जा नैसर्गिक पर्यावरणावर अवलंबून असतो. साधारण मृदा ही खडकांच्या विदारण प्रक्रियेमुळे तयार होत असते. विदारण क्रियेमुळे तयार झालेल्या मृदेमध्ये मूळ खडकाचे गुणधर्म आढळून येतात. कोल्हापूर जिल्हाचे प्रामुख्याने तीन भूभाग पडतात. पश्चिम भागामध्ये डोंगराळ तांबड्या मातीचा भूप्रदेश, मध्य भागात गाळाच्या जमिनीचा प्रदेश व पूर्व भागात मध्यम व काळया मातीचा भूप्रदेश येतो. प्रामुख्याने पन्हाळा तालुक्याच्या पश्चिम भागात जांभी मृदा तर पूर्वे भागात काळी मृदा आढळून येते.

वनसंपदा

निसर्गतः ज्या वनस्पती वाढतात, त्यांनाच नैसर्गिक वनस्पती असे म्हणतात. नैसर्गिक वनस्पती पर्जन्य आणि तापमानाशी निगडीत असतात, म्हणजे त्यांचा हवामानाशी प्रत्यक्ष संबंध आहे. पन्हाळा तालुक्यात पश्चिम व दक्षिण भागातील डोंगराळ भागामध्ये अधिक पर्जन्य व थंड हवामानामुळे कळे व

बाजारभोगाव मंडल विभागामध्ये निम सदाहरित पानझडी वने आढळून येतात. जिल्ह्यात मुख्यत: पश्चिमेकडील जास्त पावसाच्या भागात हिरडा, एन, जांभूळ, दालचिनी व साग इ. कमी उंचीवरील परंतु जास्त पावसाच्या प्रदेशात पाणबाभूल, बांबू, इ. व पूर्वेकडील कमी पावसाच्या प्रदेशात कारवी, बोरीव, तडवळ सारखी खुरटी व काटेरी झुडपी व गवत आढळते. त्याच प्रमाणे तालुक्यात नरक्या, कुडा, भरंग, बावडिंग, सातवी, धावरी, बिंबा, भुइकोल्हा इ औषधी वनस्पती आढळतात. पन्हाळा तालुक्याच्या एकूण क्षेत्रफळाच्या १९.०७टक्के इतके क्षेत्र वनाखाली आहे.

पन्हाळा तालुक्यातील भौतिक सोई सुविधांचे वितरण व प्रादेशिक विकास

कोल्हापूर जिल्ह्यामध्ये एकूण १२ तालुके असून यामध्ये प्राकृतिक, आर्थिक व सामाजिक दृष्टीकोनातून विविधता आढळते. सामाजिक व आर्थिक सोई सुविधांच्या संयुक्त निर्देशांकानुसार शिरोळ (२५.४४), हातकणंगले (२५.१२), करवीर (२२.०७), कागल (२१.५७), गडहिंग्लज (१९.६४) या तालुक्य नंतर पन्हाळा (१९.०६) तालुक्याचा क्रमांक लागतो (एस.जी.भोसले). यावरून स्पष्ट होते की, पन्हाळा तालुका हा मध्यम विकसित गटामध्ये समाविष्ट होतो. तक्ता क्र. १ मध्ये शैक्षणिक सुविधा, वैद्यकीय सुविधा, स्वच्छता विषयक सुविधा, मार्केट सुविधा, बँक सुविधा, वाहतुकीच्या सोई, संदेशवहन सुविधा, दै.वृत्तपत्र सुविधाव नळ पाणीपुरवठा सुविधा या निर्देशाकांची बेरीज करून संयुक्त विकास निर्देशांक काढला आहे. पन्हाळा तालुक्यातील सर्वाधिक संयुक्त विकास निर्देशांक हा कोडोली (२२.६९) मंडल विभागाचा असून त्याखालोखाल कोतोली (१८.५७) व कळे (१७.२२) या मंडल विभागांचा क्रमांक लागतो. तालुक्यातील सर्वात कमी संयुक्त विकास निर्देशांकाची नोंद बाजारभोगव (१५.१३) या मंडल विभागात झाली आहे. पन्हाळा हे ऐतिहासिक पर्यटन स्थळ तसेच तालुक्याचे ठिकाण असून या मंडल विभागाचा संयुक्त विकास निर्देशांक (१६.४०) इतका आहे.

जास्त संयुक्त विकास निर्देशांक (१८.५८ – २२.६९)

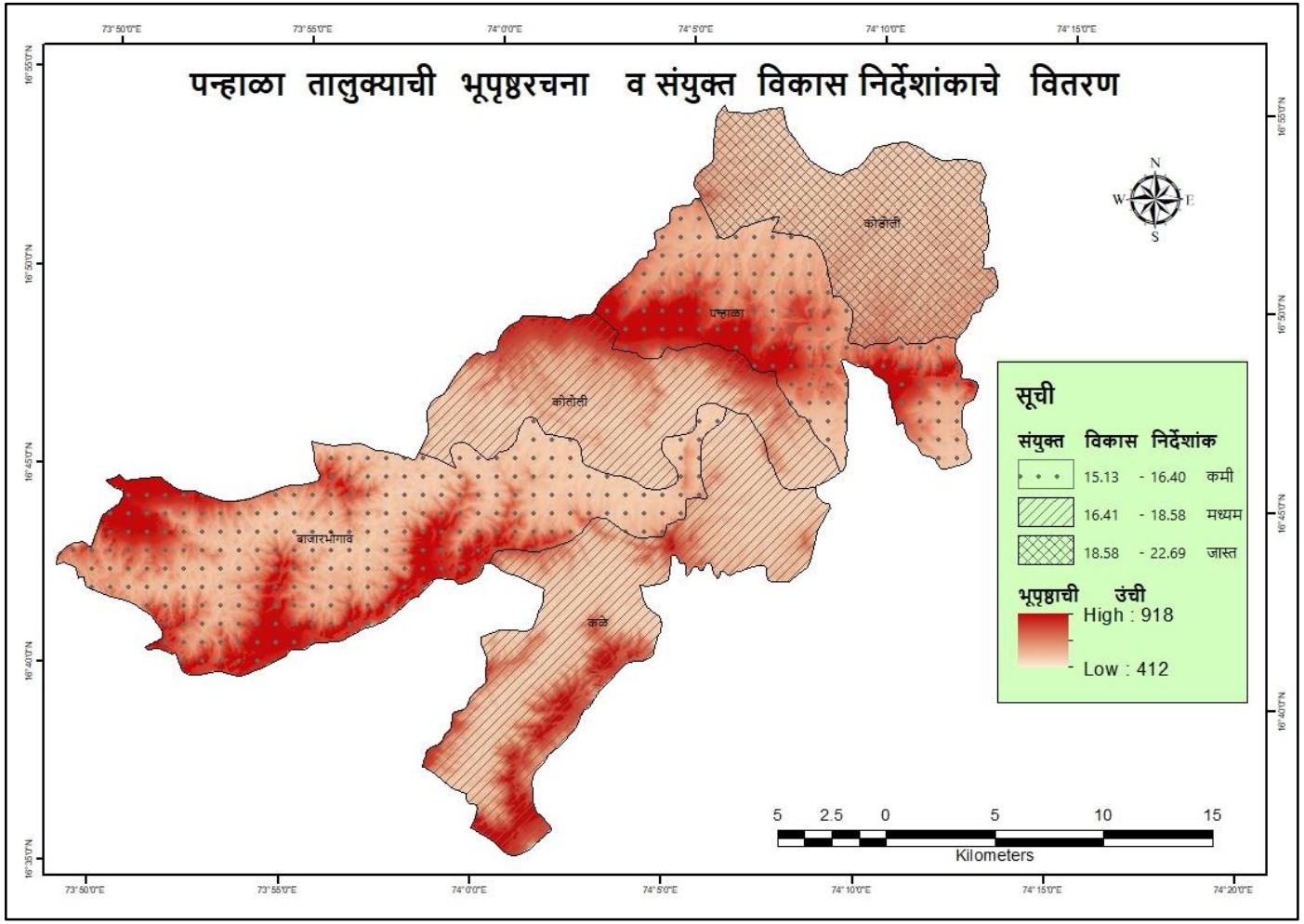
संयुक्त विकास निर्देशांका नुसार पन्हाळा तालुक्यातील **कोडोली** (२२.६९) विभाग हा इतर मंडल विभागांच्या तुलनेत जास्त विकसित आहे. कारण या मंडल विभागामध्ये वारणानगर तसेच कोडोली या ठिकाणी सहकार महर्षी तात्यासाहेब कोरे यांच्या वारणा उद्योग समूहाच्या माध्यमातून औद्योगिक व शैक्षणिक प्रगती झाली आहे. तसेच प्राकृतिक भूरचनेच्या दृष्टीकोनातून वारणा नदीच्या खो-यामध्ये कोडोली मंडल विभाग वसलेला असून त्यामुळे सुपीक मृदा व बारमाही जलसिंचन सुविधा मुळे या मंडल विभागाचा विकास घडून आला आहे. ग्रामीण वसाहतीच्या दृष्टीने कोडोली मंडल विभागामध्ये मोठी १५ गावे समाविष्ट असून पन्हाळा तालुक्याच्या २८.६५% इतकी सर्वाधिक लोकसंख्या या प्रदेशमध्ये स्थित आहे.

तक्ता क्र. १

पन्हाळा तालुका: भौतिक सोई सुविधांचे निर्देशांक व संयुक्त विकास निर्देशांक

अं. न	मंडल विभाग	X_1शैक्षणिक सुविधा	X_2 वैद्यकीय सुविधा	X_3 स्वच्छता विषयक सुविधा	X_4 मार्केट सुविधा	X_5 बँक सुविधा	X_6 वाहतुकीच्या सोई	X_7 संदेशवहन सुविधा	X_8 दै.वृत्तपत्र सुविधा	X_9 नळ पाणीपुरवठा सुविधा	संयुक्त विकास निर्देशांक
१	कोडोली	२.१०	२.३३	२.१२	५.६१	२.१४	१.९४	२.०६	२.४०	१.९९	२२.६९
२	पन्हाळा	१.८७	१.९०	१.९५	०.७५	१.८८	२.११	२.०२	१.८८	२.०४	१६.४०
३	कोतोली	२.१८	२.१४	२.०७	१.९८	२.१९	२.१२	२.०६	२.११	१.७२	१८.५७
४	बाजारभोगाव	१.८३	१.८४	१.९३	०.३८	१.८५	१.७६	१.८९	१.७७	१.८८	१५.१३
५	कळे	२.०४	१.७९	१.९३	१.२८	१.९३	२.०८	१.९८	१.८४	२.३५	१७.२२

माहितीचा स्त्रोत: संशोधकाने केलेली सांख्यिकी आकडेमोड.


पन्हाळा तालुक्याची भूपृष्ठरचना व संयुक्त विकास निर्देशांकाचे वितरण
कोतोली
पन्हाळा
कोतोली
बाजारभोगावं
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N
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सूची
संयुक्त विकास निर्देशांक
15.13 - 16.40 कमी
16.41 - 18.58 मध्यम
18.58 - 22.69 जास्त
भूपृष्ठाची उंची
High : 918
Low : 412
5 2.5 0 5 10 15
Kilometers
73°50'0"E
73°55'0"E
74°0'0"E
74°5'0"E
74°10'0"E
74°15'0"E
74°20'0"E
16°55'0"N
16°50'0"N
16°45'0"N
16°40'0"N
16°35'0"N

मध्यम संयुक्त विकास निर्देशांक (१६.४१ – १८.५८)

कोतोली मंडल विभागाचा संयुक्त विकास निर्देशांक १८.५७ तर कळे मंडल विभागाचा १७.२२ इतका आहे. कोतोली मंडल विभागातून कासारी तर कळे मंडल विभागातून धामणी व कुंभी नदी गेली आहे. कासारी, धामणी व कुंभी नदीच्या खोऱ्यामुळे या मंडळ विभागामध्ये जलसिंचनाच्या सोई उपलब्ध झाल्या आहेत तसेच कोतोली व कळे या मध्यवर्ती मार्केट सेंटर मुळे या मंडळ विभागातील गावांच्या विकासास चालना मिळाली आहे.

कमी संयुक्त विकास निर्देशांक (१५.१३ – १६.४०)

पन्हाळा तालुक्यातील सर्वात अल्प विकसित भाग म्हणून **बाजारभोगाव** या मंडल विभागाचा समावेश होतो. या मंडल विभागाचा संयुक्त विकास निर्देशांक १५.१३ इतका अत्यल्प आहे. बाजारभोगाव हे मंडल विभाग पन्हाळा तालुक्याच्या नैऋत्य दिशेला असून हा मंडल विभाग सह्याद्रीच्या सुमारे १००० मी उंचीच्या डोंगररांगांनी वेढला आहे. बाजारभोगाव या मंडळ विभागामध्ये तालुक्यातील १३१ पैकी सर्वाधिक ३१ गावे असून तालुक्याच्या केवळ १३.६८% इतकी लोकसंख्या या मंडल विभागामध्ये आहे. ग्रामीण वसाहतीच्या दृष्टीने लहान वसाहती या मंडल विभागाध्ये स्थित आहेत. जांभळी ही नदी या मंडल विभागाच्या मध्यातून वाहत असली तरी डोंगराळ जंगलव्याप्त भागामुळे इतर विभागांच्या तुलनेत या मंडल विभागाचा खूपच कमी विकास झाला आहे. **पन्हाळा** मंडल विभागाचा संयुक्त विकास निर्देशांक १६.४० इतका आहे. तालुक्यातील एकूण ५ मंडल विभागा पैकी या मंडल विभागाचा चौथा क्रमांक लागतो. पन्हाळा मंडल विभागाच्या मध्यातून मसाई पठाराचा विस्तृत प्रदेश पसरला आहे. तसेच या विभागातील २९ ग्रामीण वसाहती या पठाराच्या पायथ्याशी वसल्या आहेत. पन्हाळा हे ऐतिहासिक पर्यटन स्थळ तसेच तालुक्याचे ठिकाण असले तरी पठारी प्रदेशांमुळे या मंडळ विभागाच्या विकासावर मर्यादा आल्या आहेत.

सारांश:

1. पन्हाळा तालुक्यामध्ये एकूण ५ मंडल विभागामध्ये विभागाला असून या ५ मंडल विभागामध्ये एकूण १३१ गावे, १ नगर परिषद तसेच १ जनगणना नगर आहे. प्राकृतिक दृष्ट्या कोडोली व कोतोली मंडल विभाग पन्हाळा तालुक्याच्या मैदानी, पन्हाळा मंडल विभाग पठारी तर बाजारभोगाव व कळे मंडल विभाग डोंगराळ प्रदेशामध्ये वसले आहेत.
2. प्राकृतिकदृष्ट्या पन्हाळा तालुक्यातील उत्तर सीमेवरून वारणा नदी पश्चिमेस व दक्षिण पूर्व बाजूस सह्याद्री डोंगर रांगा तसेच मसाई डोंगर रांग तालुक्याच्या मध्यातून गेली आहे. तालुक्याचा सर्वसाधारण उतार पश्चिम पूर्व दिशेस असून वारणा नदी कोडोली मंडल विभागाच्या उत्तरेकडून, कासारी नदी कोतोली मंडल विभागातून पश्चिम-पूर्व तसेच जांभळी नदी बाजारभोगाव विभागाच्या मध्यातून दक्षिण उत्तर वाहत येऊन कासारी नदीस मिळते. कुंभी नदी सुद्धा कळे विभागातून दक्षिण उत्तर वाहत जाऊन करवीर तालुक्यातील प्रयाग चिखली येथे पंचगंगा नदीस मिळते.
3. वारणा नदीच्या खोऱ्यामध्ये मध्यम प्रतीची काळी मृदा व जांभळी, कुंभी व कासारी नदीच्या खोऱ्यामध्ये तांबडी व जांभी मृदा आढळून येते.
4. पन्हाळा तालुक्यातील या प्राकृतिक रचणेमुळे तालुक्यातील मंडलनिहाय सामाजिक, आर्थिक संरचनेवर परिणाम झाल्याचे दिसून येतो. कोडोलीमंडल विभाग मैदानी प्रदेशामध्ये वसल्यामुळे तालुक्यातील इतर मंडल विभागाच्या तुलनेत भौतिक सोई सुविधांच्या बाबतीत जास्त विकास झालेला आहे. या मंडल विभागाचा संयुक्त निर्देशांक २२.६९ इतका आहे.
5. कोतोलीमंडल विभागाच्या मध्यातून कासारी नदी व कळे मंडल विभागाच्या मध्यातून कुंभी नदी गेल्यामुळे जलसिंचनाच्या सोई सुविधा उपलब्ध झाल्या आहेत. कोतोली (१८.५८), व कळे (१७.२२) मंडल विभागाचा विकास मध्यम स्वरूपाचा झालेला आहे.
6. पन्हाळा (१६.४०) व बाजारभोगाव (१५.१३)हे मंडल विभाग डोंगराळ प्रदेशामध्ये वसल्यामुळे या विभागांचा संयुक्त विकास निर्देशांक कमी आहे.

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7. जोग. सु. रा (१९८०): सांख्यिकी भूगोल, नरेंद्र प्रकाशन, पुणे.
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9. कोल्हापूर जिल्हा सामाजिक आर्थिक समालोचन अहवाल २०१८.
10. कोल्हापूर जिल्हा जनगणना अहवाल १९९१, २००१ व २०११ .

परळी तालुक्यातील मृदा संरचनेचा भौगोलिक अभ्यास

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सारांश:-

एखाद्या प्रदेशाच्या विकासात कृषी क्षेत्र व लोकसंख्या यांचे योगदान सर्वात मोठ्या प्रमाणात असते. जर प्रदेशाचा विकास करावयाचा असेल तर त्या प्रदेशातील भूपृष्ठ रचना कशी आहे यावर सर्वात जास्त भर दिला जातो. त्यामुळे यातील महत्त्वपूर्ण भाग म्हणजे त्या प्रदेशातील मृदा कशा प्रकारची आहे हे पाहणे महत्त्वाचे ठरते.म्हणूनच शोधनिबंधात मृदा संरचनेचा अभ्यास केला आहे.

प्रस्तावना:-

मृदा म्हणजे खडकापासून वेगळया असलेल्या जमिनीचा असा भूभाग, की जो वनस्पतींना आधार देतो तसेच पोषक अन्नद्रव्ये पुरवितो. अभ्यास क्षेत्रातील कृषी विकास, पोषण घनता, रोजगार यांचे योग्य प्रकारे विश्लेषण करण्यासाठी मृदा संरचनेचा अभ्यास करणे गरजेचे असते. अभ्यास क्षेत्रात कोणत्या प्रकारची मृदा आढळते त्यावर त्या प्रदेशातील कृषी विकास अवलंबून असतो.

उद्दिष्टे:-

१) अभ्यास क्षेत्रातील मृदेचा अभ्यास करणे.

२) अभ्यास क्षेत्रातील मंडळनिहाय संरचना अभ्यासणे.

अभ्यास क्षेत्र:

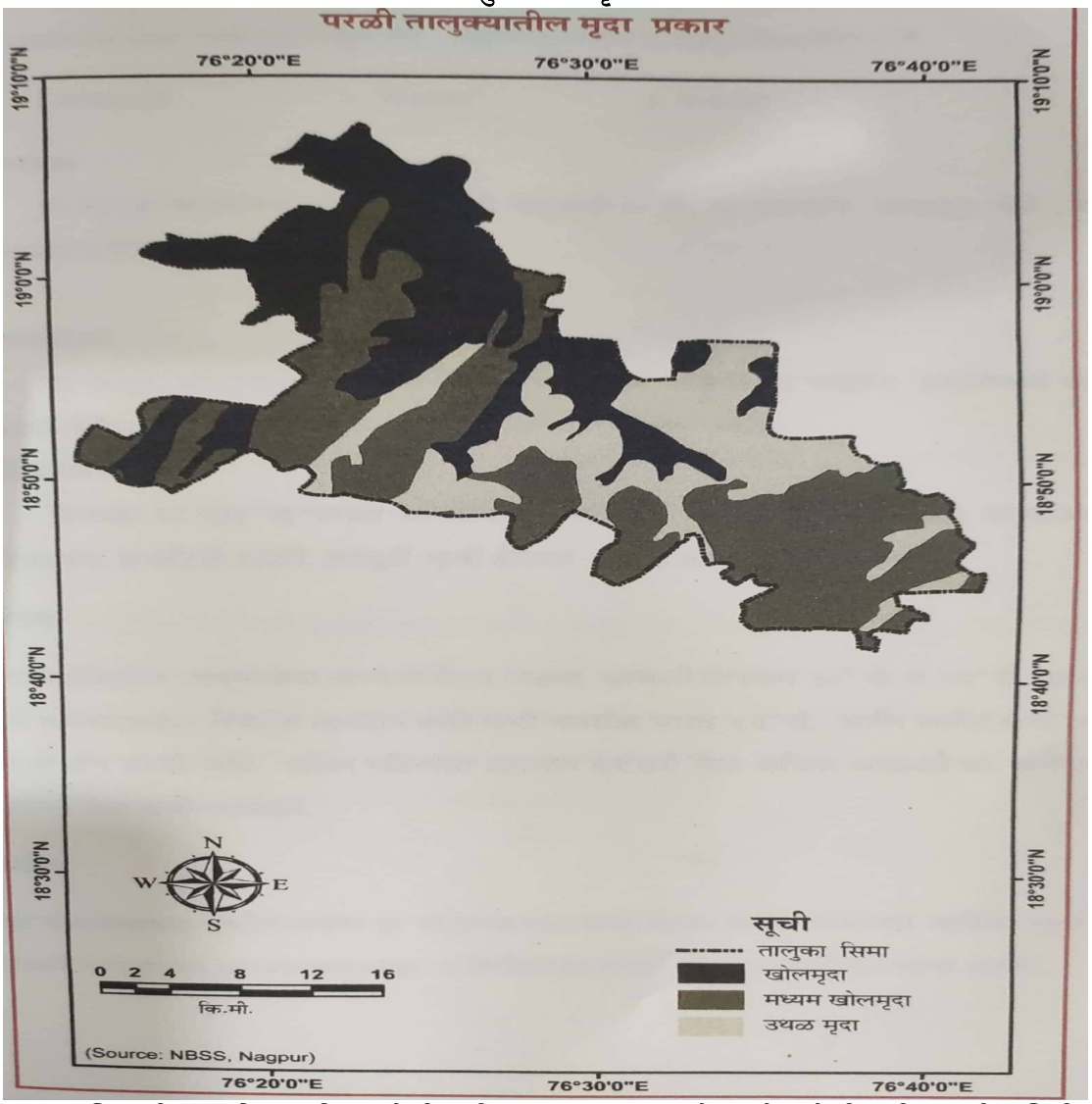
परळी तालुका मध्य-पूर्व महाराष्ट्रात आणि बीड जिल्ह्याच्या पूर्वेस आहे.परळी तालुका १८ ४१'33" उत्तर अक्षांश ते १९ ७'४६" उत्तर अक्षांश आणि ७६ १४'२७" पूर्व रेखांश ते ७६ ४१'४४" पूर्व रेखावृत्त दरम्यान विस्तारलेला आहे. परळी तालुक्याच्या दक्षिणपूर्व गंगाखेड तालुका तसेच पूर्वेस सोनपेठ व पाथरी तालुक्याच्या सीमा आहेत. तर परळी तालुक्याच्या दक्षिण पश्चिमेस अंबाजोगाई तर उत्तर दिशेस माजलगाव आणि पश्चिमेला धारुर तालुक्याचा सीमा आहेत. परळी तालुक्याचे एकूण क्षेत्रफळ ७३७.९९ चौ.की.मी.आहे. त्यामध्ये १०५ ग्रामीण वस्ती १ नागरी केंद्र व ५ मंडळाचा समावेश आहे.

संशोधन पद्धती व आधार सामग्री संकलन:-

परळी तालुक्यातील कृषी घनतेचा अभ्यास करण्यासाठी दुय्यम स्वरूपाच्या आधार सामग्रीचा वापर केला आहे.दुय्यम स्वरूपाच्या आकडेवारीसाठी बीड जिल्ह्याचा कृषी अहवाल व बीड जिल्हा आर्थिक सामाजिक समालोचन सन २००१ व २०११ यातून माहिती संकलित केली आहे.

विषय विवेचन:-

तक्ता.क्र.1.परळी तालुक्यातील मृदा संरचना



पिकांची वाढ होण्याकरिता मृदेची सुपीकता अत्यंत महत्त्वाचे असते. मृदेची सुपीकता ही जमिनीचा सामू काढून मोजली जाते. सामू हे मातीचे तुलनात्मक आम्ल, विम्लता दर्शविणारे परिणाम आहे. जर जमिनीचा सामू ७ असेल तर ती जमीन/मृदा उदासीन असते. जमिनीचा सामू ७ पेक्षा अधिक असल्यास मृदा ही विम्ल असते. व जमिनीचा सामू ७ पेक्षा कमी असेल, तर ती जमीन आम्लधर्मीय असते. जमिनीचा सामू ६.५ ते ७.५ च्या दरम्यान असल्यास पिकांच्या वाढीसाठी आवश्यक असणारी सर्व अन्नद्रव्ये जमिनीत उपलब्ध असतात. ती जमीन पिकांच्या वाढीसाठी उपयुक्त आहे असे म्हटले जाते.

भूरचना:-

दख्खन पठारावर असलेल्या परळी तालुक्याची सरासरी समुद्रसपाटीपासूनची उंची 450 मी. आहे. परळी तालुक्याच्या भूरचना यासंबंधी एकंदरीत अभ्यास केला असता या अभ्यास क्षेत्राला दोन भागात विभाजित करता येते. १) अभ्यास क्षेत्रातील दक्षिणेकडील बालाघाट टेकड्यांचा प्रदेश.२) अभ्यास क्षेत्रातील उत्तर पूर्वेकडील गाळाचा प्रदेश.

मृदा:-

कोणत्याही प्रदेशातील प्राकृतिक भूदृश्य मध्ये मृदा हे महत्त्वाचे अंग आहे. म्हणून अभ्यास क्षेत्रातील मृदा कशा प्रकारची आहे.जाणून घेण्यासाठी मृदा या घटकांचा अभ्यास करण्यात आला. अभ्यास क्षेत्रातील मृदेचे दोन भागात वर्गीकरण करता येते. १) उथळ व मध्यम मृदा २) सुपीक गाळाची मृदा.

१) उथळ व मध्यम मृदा:- अभ्यास क्षेत्रातील दक्षिण-पश्चिम आणि पूर्वेस यामध्ये चा रंग फिकट तपकिरी प्रकारचा आहे.ही मृदा अल्कधर्मी प्रकारात मोडते.या मृदेत नायट्रोजन फॉस्फरस कॅल्शियम मॅग्नेशियम हे घटक प्रामुख्याने आढळतात.या मृदेमध्ये कापूस तूर ज्वारी ऊस सोयाबीन हरभरा ही पिके घेतली जातात.

२) सुपीक गाळाची मृदा:- सुपीक गाळाची मृदा अभ्यास क्षेत्रातील गोदावरी,वाण,पद्मावती, गुणवरा, भावपरे,नदीच्या खोऱ्यात आढळते या मृदेचा जाडी थर १.५०-९.२५ मी.खोलीपर्यंत आढळतो अभ्यास क्षेत्रातील सिरसाळा व पिंपळगाव (गाढे) या मंडळात सर्वात जास्त या मृदेच विस्थापन झालेले आहे.या मृदे मध्ये मोठ्या प्रमाणात कापूस ऊस ज्वारी भुईमूग गहू हरभरा भाजीपाला पिके घेतली जातात.

निष्कर्ष:-

१) अभ्यास क्षेत्रात मोठ्या प्रमाणात कृषी विकास झालेला आहे.
२) अभ्यास क्षेत्रात सुपीक मृदा आढळते.
३) अभ्यास क्षेत्रातील मृदेचा सामू ६.५ ते८ पर्यंत आढळतो.

संदर्भ:-

१) जसबीर सिंग, १९९४
२)कृषी भूगोल, दिल्ली
३) कृषी अहवाल, कृषी कार्यालय परळी
४) सामाजिक व आर्थिक समालोचन बीड जिल्हा
५) बीड जिल्हा गॅझेटीयर

उस्मानाबाद जिल्ह्यातील सोयाबीन कृषी कार्यक्षमतेचा भौगोलिक अभ्यास (इ.स.1991 ते 2011)

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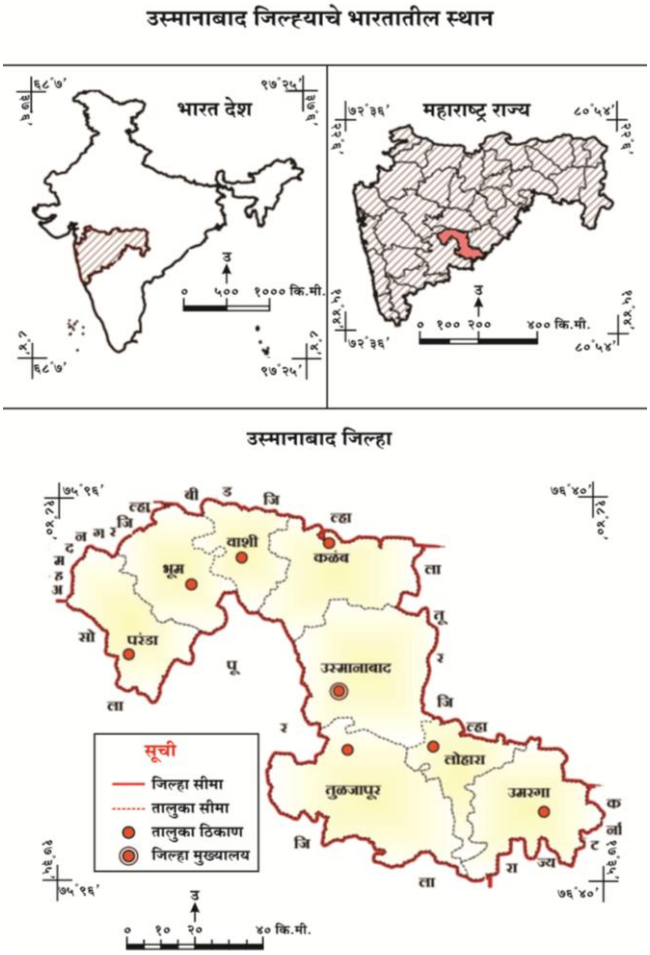
प्रस्तावना

भूगोलामध्ये भौगोलिक घटकांचे अभिक्षेत्रीय व कालानुसार विश्लेषण या दोन गोष्टी अतिशय महत्त्वाच्या असतात व अशा प्रकारचे विश्लेषण करण्यासाठी अनेक प्रकारच्या साधनांचा वापर केला जातो आणि या अनेक साधनांपैकी विभाग हे साधन आहे की, ज्या साधनाद्वारे आपण भौगोलिक घटकांचे काळानुसार व अभिक्षेत्रानुसार विश्लेषण करू शकतो. भूगोल अभ्यासात अनेक भूगोल तज्ञांनी कृषी प्रदेश निश्चित करून प्रदेश सीमांकीत करण्याचा प्रयत्न केला आहे. यापैकी अनेक कृषी तज्ञांनी खंड किंवा देश असे मोठे भाग घेऊन प्रादेशिकीकरण केले आहे. ज्यावेळेस लहान प्रदेश विचारात घेतला जातो. त्यावेळेस त्या प्रदेशात कृषीमध्ये भिन्नता असण्याची शक्यता कमी असते. जर अशा लहान प्रदेशात भूपृष्ठीय किंवा मातीच्या संदर्भात भिन्नता असेल तर कृषीमध्ये भिन्नता आढळते. अशा विभागात पिकांच्या निवडीला व कृषी पद्धतीला अधिक शक्यता असते व अशा परिस्थितीत कृषी विभाग किंवा प्रदेश ठरविणे किंवा ते प्रदेश सीमांकीत करणे शक्य असते.

बीज**संज्ञा:** सोयाबीन कृषी कार्यक्षमता, स्थल व कालपरत्वे बदल.

अभ्यासक्षेत्र

सोयाबीन कृषी कार्यक्षमतेचा अभ्यास करण्यासाठी उस्मानाबाद जिल्ह्याची निवड केलेली आहे. उस्मानाबाद मराठवाड्यातील नैऋत्येकडील जिल्हा असून त्याचा अक्षवृत्तीय विस्तार 17°35' ते 18°40’ उत्तर अक्षवृत्त, रेखावृत्तीय विस्तार 75⁰16’ ते 76°40' पूर्व रेखावृत्ताच्या दरम्यान आहे. हा जिल्हा महाराष्ट्र व कर्नाटक सीमेवरील असून त्याच्या दक्षिणेस-पश्चिमेस सोलापूर, उत्तर-पश्चिम दिशेस अहमदनगर, उत्तरेस बीड, पूर्वेस लातूर आणि दक्षिणेस कर्नाटक राज्यातील बिदर आणि गुलबर्गा हे जिल्हे आहेत. उस्मानाबाद जिल्ह्याचे क्षेत्रफळ 7512.4 चौ.कि.मी. असून त्यापैकी 7271 चौ.कि.मी. क्षेत्र ग्रामीण भागाचे आहे. महाराष्ट्र राज्याच्या 3.21 टक्के क्षेत्र या जिल्ह्याचे आहे. जिल्ह्यात उस्मानाबाद, कळंब, उमरगा, तुळजापूर, परांडा, भूम, लोहारा व वाशी या आठ तालुक्यांचा समावेश होतो.



स्त्रोत: भारतीय सर्वेक्षण विभाग, भूस्थलदर्शक नकाशा, उस्मानाबाद जिल्हा

गृहितके

1) सोयाबीन कृषी कार्यक्षमतेत वाढ होत आहे.

2) सोयाबीन कृषी कार्यक्षमता ही प्रामुख्याने तेथील कृषी प्रकारावर अवलंबून असते.

उद्दिष्ट

1) उस्मानाबाद जिल्ह्यातील सोयाबीन कृषी कार्यक्षमतेचा स्थल-कालपरत्वे अभ्यास करणे.

माहिती स्त्रोत

सदरील शोधनिबंध प्राथमिक व द्वितीयक स्वरूपाच्या आकडेवारीवर आधारलेला आहे. उस्मानाबाद जिल्ह्यातील सोयाबीन कृषी कार्यक्षमतेचा अभ्यास करताना इ.स.1991-92 ते 2010-11 या कालावधीचा विचार करून सदर अभ्यासासाठी जिल्हा सामाजिक व आर्थिक समालोचन, उस्मानाबाद जिल्हा, कृषी अधिकारी अहवाल, कृषी सहसंचालक कार्यालयातील अहवाल, जिल्हा सांख्यिकीय विभाग, मुलाखत, प्रश्नावली तंत्राचा उपयोग करून माहिती संकलीत केली आहे.

अभ्यास पद्धती

प्रस्तुत अभ्यासासाठी सांख्यिकीय व नकाशाशास्त्रीय पद्धतीचा वापर केला आहे. उस्मानाबाद जिल्ह्यातील सोयाबीन कृषी कार्यक्षमता काढण्यासाठी गांगुली (1938) यांनी मांडलेल्या कृषी कार्यक्षमता पद्धतीचा अवलंब करण्यात आलेला आहे.

सूत्र

$$En = \left[\frac{lyn - cn}{10} \right]$$

$$lyn = \frac{yi}{yr} \times 100$$

$$yi = \frac{\text{Pr}oduction}{Area}$$

$$yr = \frac{Total\ \text{Pr}oduction}{Total\ area}$$

$$Cn = \frac{Area \times 100}{Total\ Area}$$

विषय विवेचन

उस्मानाबाद जिल्ह्यातील सोयाबीन कृषी कार्यक्षमता अभ्यासण्यासाठी 1991 ते 2011 या वीस वर्षांचा विचार करण्यात आलेला आहे. उत्पादनाप्रमाणे उस्मानाबाद जिल्ह्यातील तालुकानिहाय सोयाबीन कृषी कार्यक्षमता काढण्यासाठी तीन गटांचा विचार केला आहे.Jasbir Singh, "Agricultural efficiency, as a concept means the degree to which the economic, cultural and organizational variation (i.e the man-made framework of farming) are able to exploit the resources of the area for agricultural production." ''प्रत्यक्ष जमिनीमधून मिळणारे उत्पादन व त्याच जमिनीची असलेली सुप्त शक्ती यांच्यातील गुणोत्तरास कृषी कार्यक्षमता असे म्हणतात.''

उस्मानाबाद जिल्ह्यातील तालुकानिहाय सोयाबीन कृषी कार्यक्षमता

सन 1991-92 ते 1995-96 या कालावधीत उस्मानाबाद जिल्ह्यातील तालुकानिहाय सोयाबीन कृषी कार्यक्षमतेमध्ये 0.78 टक्के पेक्षा जास्त मध्ये कळंब तालुक्याचा समावेश होतो. तर 0.73 ते 0.78 टक्केमध्ये उमरगा व भूम तालुक्याचा समावेश होतो तर 0.73 टक्के पेक्षा कमीमध्ये तुळजापूर तालुक्याचा समावेश होतो. उस्मानाबाद व परांडा तालुक्यात आकडेवारी उपलब्ध नसल्यामुळे कृषी कार्यक्षमता आढळत नाही. याच कालावधीत सर्वात जास्त कृषी कार्यक्षमता कळंब तालुक्यात 0.83 टक्के एवढी तर सर्वात कमी तुळजापूर तालुक्यात 0.68 टक्के सोयाबीन कृषी कार्यक्षमता आढळते. (सारणी क्र.1.1अ)

उस्मानाबाद जिल्ह्यातील एकूण सोयाबीन कृषी कार्यक्षमतेमध्ये सन 1996-97 ते 2000-01 या कालावधीत 0.91 टक्के पेक्षा जास्त मध्ये उस्मानाबाद व परांडा तालुक्याचा समावेश होतो. 0.52 ते 0.91 टक्के मध्ये उमरगा, लोहारा, तुळजापूर, वाशी व कळंब तालुक्यांचा समावेश होतो. तर 0.52 टक्के पेक्षा कमी मध्ये भूम तालुक्याचा समावेश होतो. या कालावधीत सर्वात जास्त 1.31 टक्के एवढी सोयाबीन कृषी कार्यक्षमता उस्मानाबाद तालुक्यात तर सर्वात कमी भूम तालुक्यात 0.13 टक्के सोयाबीन कृषी कार्यक्षमता असल्याचे दिसून येते. (नकाशा क्र.1.1 अ)

सन 2001-02 ते 2005-06 या कालावधीत उस्मानाबाद जिल्ह्यातील एकूण सोयाबीन कृषी कार्यक्षमतेमध्ये 1.58 टक्के पेक्षा जास्त मध्ये भूम व परांडा तालुक्यांचा समावेश होतो. तर 1.05 ते 1.58 टक्के मध्ये फक्त वाशी तालुक्याचा समावेश होतो आणि 1.05 टक्के पेक्षा कमी मध्ये लोहारा, उस्मानाबाद, कळंब, तुळजापूर व उमरगा तालुक्यांचा समावेश होतो. या कालावधीत सोयाबीन कृषी कार्यक्षमता सर्वात जास्त भूम तालुक्यात 2.12 टक्के आढळते. तर सर्वात कमी उमरगा तालुक्यात 0.52 टक्के एवढी सोयाबीन कृषी कार्यक्षमता आढळून येते. (सारणी क्र.1.1 ब)

उस्मानाबाद जिल्ह्यातील तालुकानिहाय एकूण सोयाबीन कृषी कार्यक्षमतेमध्ये सन 2006-07 ते 2010-11 या कालावधीत2.55 टक्के पेक्षा जास्त मध्ये परांडा व वाशी या दोन तालुक्यांचा समावेश होतो तर 1.38 ते 2.55 टक्के मध्ये फक्त लोहारा याएकाच तालुक्याचा समावेश होतो तर 1.38 टक्के पेक्षा कमी मध्ये भूम, उमरगा,उस्मानाबाद, कळम व तुळजापूर तालुक्यांचा समावेश सोयाबीन कृषी कार्यक्षमतेमध्ये होतो . या कालावधीत सर्वात जास्त सोयाबीन कृषी कार्यक्षमता परंडा तालुक्यात 3.72 टक्के तर सर्वात कमी तुळजापूर तालुक्यात 0.21 टक्के एवढी सोयाबीन कृषी कार्यक्षमता उस्मानाबाद जिल्ह्यात असल्याचे आढळते . (नकाशा क्र. 1.1 ब)

सारणी क्र.1.1 अ
उस्मानाबाद जिल्ह्यातील तालुकानिहाय सोयाबीन कृषी कार्यक्षमता

अ. क्र.	तालूके	सन 1991-92 ते 1995-96							सन 1996-97 ते 2000-01						
		उत्पादन	क्षेत्रफळ	Yi	Yi	Iyn	Cn	En	उत्पादन	क्षेत्रफळ	Yi	Yi	Iyn	Cn	En
1	उस्मानाबाद	00	00	-	-	-	-	-	214	60	3.56	2.59	137.45	6.52	1.31
2	कळंब	144	40	3.6	3.42	105.26	22.22	0.83	424	200	2.12	2.59	81.85	21.74	0.60
3	उमरगा	133	40	3.33	3.33	97.36	22.22	0.75	716	240	2.98	2.59	115.06	26.09	0.89
4	तूळजापूर	208	60	3.47	3.47	101.46	33.33	0.68	717	260	2.76	2.59	106.18	28.26	0.78
5	परांडा	00	00	-	-	-	-	-	118	40	2.95	2.59	113.90	4.35	1.09
6	भूम	132	40	3.3	3.3	96.49	22.22	0.74	18	40	0.45	2.59	17.37	4.35	0.13
7	लोहारा	-	-	-	-	-	-	-	93	40	2.33	2.59	89.96	4.35	0.86
8	वाशी	-	-	-	-	-	-	-	84	40	2.1	2.59	81.08	4.35	0.77
		617	**180**						**2384**	**920**					

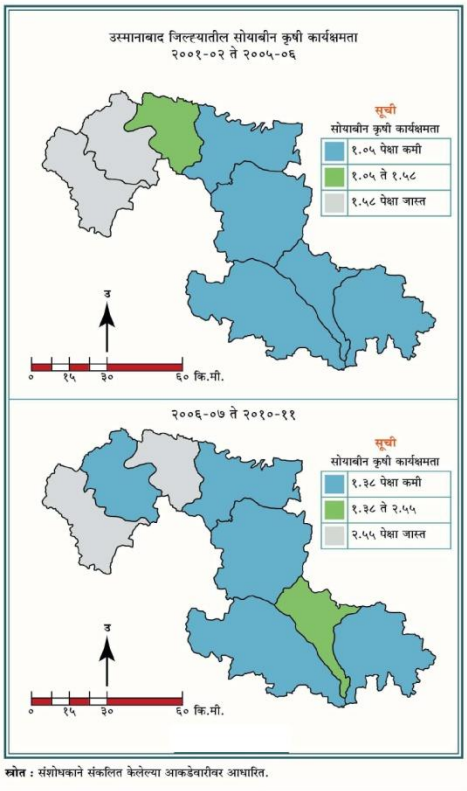
स्त्रोत: जिल्हा सामाजिक व आर्थिक समालोचन, उस्मानाबाद सन 1991-92 ते 2000-01

सारणी क्र.1.1 ब

उस्मानाबाद जिल्ह्यातील तालुकानिहाय सोयाबीन कृषी कार्यक्षमता

अ.क्र.	तालुके	सन 2001-02 ते 2005-06							सन 2006-07 ते 2010-11						
		उत्पादन	क्षेत्रफळ	Yi	Yi	Iyn	Cn	En	उत्पादन	क्षेत्रफळ	Yi	Yi	Iyn	Cn	En
1	उस्मानाबाद	1048	420	2.49	2.47	100.31	17.80	0.83	956	2620	0.36	0.51	70.59	18.69	0.52
2	कळंब	788	400	1.97	2.47	79.76	16.95	0.63	850	3200	0.27	0.51	52.94	22.82	0.30
3	उमरगा	639	380	1.68	2.47	68.01	16.10	0.52	1102	1960	0.56	0.51	109.80	13.98	0.96
4	तुळजापूर	590	340	1.74	2.47	70.45	14.41	0.56	682	3160	0.22	0.51	43.14	22.54	0.21
5	परांडा	346	80	4.33	2.47	175.30	3.39	1.72	1149	600	1.92	0.51	376.47	4.28	3.72
6	भूम	642	120	5.35	2.47	216.59	5.08	2.12	685	940	0.73	0.51	143.14	6.70	1.36
7	लोहारा	751	280	2.68	2.47	108.50	11.86	0.97	896	1040	0.86	0.51	168.63	7.42	1.61
8	वाशी	1036	340	3.05	2.47	123.48	14.41	1.09	819	500	1.64	0.51	321.57	3.57	3.18
		5840	**2360**						**7139**	**14020**					

स्त्रोत: जिल्हा सामाजिक व आर्थिक समालोचन, उस्मानाबाद सन 2001-02 ते 2010-11



स्त्रोत : संशोधकाने संकलित केलेल्या आकडेवारीवर आधारित.

निष्कर्ष

सारणी क्र.1.1 अ आणि ब वरून उस्मानाबाद जिल्ह्यातील सोयाबीन कृषी कार्यक्षमतेच्या अभ्यासावरून असे स्पष्ट होते की, सन 1991-92 पासून 2010-11 पर्यंत सोयाबीन कृषी कार्यक्षमतेत वाढ होत असल्याचे दिसून येते.

कृषी कार्यक्षमता ही प्रामुख्याने तेथील कृषी प्रकारावर अवलंबून असते. त्याचबरोबर तेथील निव्वळ पिकाखालील क्षेत्र, दुबार पिकाखालील क्षेत्र, लागवडीस अयोग्य क्षेत्र, पडीत जमीन, जलसिंचनाच्या सुविधा, दुबार जलसिंचनाखालील क्षेत्र, जादा उत्पादन देणा-या पिकाखालील क्षेत्र इत्यादी घटकांचा परिणाम कृषी कार्यक्षमतेवर होत असतो.

संदर्भ

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6. कृषी अधिकारी अहवाल, कृषी विभाग, उस्मानाबाद.

नंदूरबार जिल्हयातील लोकसंख्येचा भौगोलिक अभ्यास

प्रा.डॉ.राजेष्वर कोटलवार[1] प्रा.डॉ.बालाजी आव्हाड[2]

[1]भूगोल विभागप्रमुख, शंकरराव चव्हाण महाविद्यालय, अर्धापूर

[2]भूगोल विभाग, शंकरराव चव्हाण महाविद्यालय, अर्धापूर

सारांश

कोणत्याही ठिकाणी उपलब्ध असणारी शहरीकरणाची स्थितीही तेथील विविध भौगोलिक व संस्कृती घटकावर अवलंबून असते त्याचबरोबर ग्रामीण व नागरी लोकसंख्येचे स्वरूपही बदलत जाते या घटकात नेहमी भौगोलिक सामाजिक आर्थिक राजकीय व धार्मिक घटकांचा समावेश होतो नागरीकरणाच्या बाबतीत लोकसंख्येचा अभ्यास केला असता नागरीकरण प्रक्रिया अतिशय संथगतीने होताना आढळते.

बीज संज्ञा: लोकसंख्या घनता वाहाड वरास ग्रामीण व नागरी लोकसंख्या

उद्दिष्टे: नंदुरबार जिल्ह्यातील 1961 2011 या कालखंडातील लोकसंख्या वाढीचा अभ्यास करणे

प्रस्तावनाः

नंदुरबार जिल्ह्याच्या भौगोलिक विविधतेमुळे येथील लोकसंख्येमध्ये असमान असे वितरण झालेले आढळते. 2011 च्या जनगणनेच्या अहवालानुसार नंदुरबार जिल्ह्याची एकूण लोकसंख्या 1677177 असून त्यापैकी 1370995 इतकी लोकसंख्या ग्रामीण भागात वास्तव्यास आहे व ती एकूण लोकसंख्येच्या 81 टक्के इतकी आहे. तर शहरी भागात 306182 इतकी लोकसंख्या स्थित असुन ती एकूण लोकसंख्येच्या 19 टक्के पेक्षा जास्त आहे. नंदुरबार जिल्ह्याच्या असमान भौगोलिक रचनेमुळे त्याचा प्रभाव लोकसंख्येच्या घनतेवर झालेला आहे. जिल्ह्याच्या मध्य भागातील जमीन सुपीक असल्याने तेथे लोकसंख्येची अधिक प्रमाणात आढळते. शहरी भागात देखील अधिक लोकसंख्येचे प्रमाण आढळते.

सारणी क्र. 1: नंदुरबार जिल्हयातील तालुकानिहाय लोकसंख्यानिहाय वितरण (2011)

अ.क्र.	तालुके	लोकसंख्या	टक्केवारी
1	अक्कलकुवा	245961	14.66
2	धडगाव	195343	11.66
3	तळोदा	190069	11.34
4	षहादा	407968	24.32
5	नंदुरबार	361385	21.9
6	नवापूर	270461	16.12
	जिल्हा	1677187	100

Source: Socio-Economic Abstract Nandurbar District, 2012

वरील तक्त्यामध्ये नंदुरबार जिल्ह्यातील लोकसंख्येचे वितरण दाखवले आहे. लोकसंख्या वितरणाच्या बाबतीमध्ये तालुकानिहाय भिन्नता दिसून येते. सर्वात जास्त लोकसंख्या शहादा 407968 (24.32 टक्के) तालुक्यामध्ये आहे. तर सर्वात कमी तळोदा 190069 (11.34 टक्के) तालुक्यामध्ये लोकसंख्या दिसून येते.

लोकसंख्येची घनता

नंदुरबार जिल्ह्याची लोकसंख्येची घनता महाराष्ट्रातील इतर जिल्ह्याच्या तुलनेने अतिशय कमी असून ती 333 चौ.कि.मी. आहे. नंदुरबार जिल्ह्याची न्यूनतम घनता 70 चौ.कि.मी. असून ती कमाल 600 चौ.कि.मी. इतकी आहे. लोकसंख्येची घनता सर्वाधिक तळोदा तालुक्यात असून ती 554 चौ.कि.मी तर सर्वाधिक कमी घनता धडगाव तालुक्यात आढळते व ती 253 चौ.कि.मी. इतकी कमी प्रमाणात आहे. लोकसंख्येचे असमान वितरण घनतेवर परिणाम करणारे असून त्यासाठी तेथील प्राकृतिक व सांस्कृतिक घटक कारणीभूत आहे. सातपुडा पर्वतरांगेमुळे तेथे एकसारखी सपाट भूप्रदेश शेतीयोग्य अतिशय कमी प्रमाणात आहे. त्यामुळे लोकांच्या स्थायी होण्यासाठी आवश्यक असण्यासाठी शेती हे मुलभूत कारण आहे परंतु असमतोल शेतीमुळे या ठिकाणी ते स्थायिक होऊ शकत नसल्याने लोकसंख्येच्या घनतेवर त्याचा परिणामझाला आहे. त्यामध्ये अक्कलकुवा, धडगाव व तळोदा तालुक्याचा उत्तर भाग प्रामुख्याने कमी घनतेचा आढळतो. नंदुरबार जिल्ह्याच्या मध्य व दक्षिण भागात लोकसंख्येची घनता 200 ते 300 चौ.कि.मी. इतकी आढळते. तर सर्वाधिक कमी लोकसंख्येची घनता जिल्ह्याच्या उत्तर भागात असून ती 177 ते 205 चौ. कि.मी. इतकी आहे.

सारणी क्र. 2: नंदुरबार जिल्हयातील तालुकानिहाय घनता (2011)

अ.क्र.	तालुके	घनता
1	अक्कलकुवा	283
2	धडगाव	253
3	तळोदा	554
4	षहादा	412
5	नंदुरबार	339
6	नवापूर	277
	जिल्हा	**333**

Source: Socio-Economic Abstract Nandurbar District, 2012

वरील कोष्टकात तालुकानिहाय लोकसंख्या घनता दाखवण्यात आली आहे. लोकसंख्या घनतेच्या बाबतीत नंदुरबार जिल्ह्यात भिन्नता आढळून येते. सर्वात जास्त लोकसंख्येची घनता 554 इतकी तळोदा

तालुक्यात आहे. ती एकूण जिल्ह्याच्या घनतेपेक्षा जास्त आहे. तर सर्वात कमी लोकसंख्येची घनता 253 इतकी धडगाव तालुक्यात आहे.

स्त्री व पुरुष लोकसंख्याः

2011च्या जणगणना अहवालानुसार महाराष्ट्रातील आदिवासी जिल्ह्याच्या तुलनेने नंदुरबार जिल्ह्यामध्ये स्त्री व पुरुष लोकसंख्येचे प्रमाण अतिशय चांगले असून येथील लिंग गुणोत्तर 972 इतके आहे. ते ग्रामीण भागात 986 असून शहरी भागात ते 930 इतके आहे. भारतामध्ये लिंग गुणोत्तर प्रमाण ढासळत असताना नंदुरबार जिल्ह्यामध्ये ते अतिशय चांगले आहे.

सारणी क्र.3: नंदुरबार जिल्हयाचा लोकसंख्या वृध्दी दर

अ.क्र.	वर्श	वृध्दी दर
1	1961	25.31
2	1971	21.50
3	1981	22.41
4	1991	25.30
5	2001	23.45
6	2011	25.50

Source: Socio-Economic Abstract Nandurbar District, 2011-12

वरील कोष्टकात नंदुरबार जिल्ह्यातील जनगणना वर्षनिहाय लोकसंख्या वृद्धीदर दर्शवला आहे. नंदूरबार जिल्हयाचा लोकसंख्या वृध्दीदर 1961 ते 2011 या 6 वर्शात सरासरी 23.91 टक्के राहिला आहे.

सारणी क्र.4: नंदुरबार जिल्हयाचा लिंग गुणोत्तर

अ.क्र.	वर्श	लिंग गुणोत्तर
1	1961	976
2	1971	968
3	1981	982
4	1991	974
5	2001	977
6	2011	972

Source: Socio-Economic Abstract Nandurbar District, 2011-12

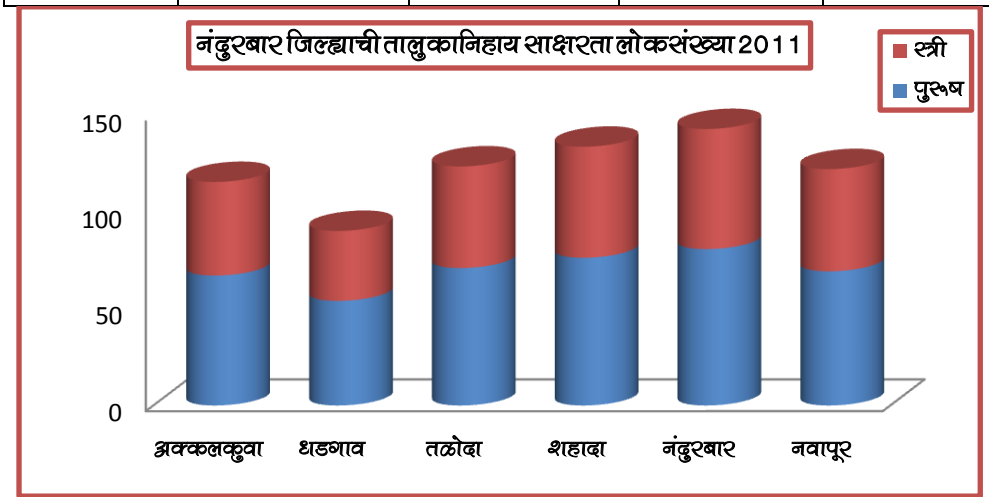
नंदुरबार जिल्ह्याचा वृद्धी दर हा इतर जिल्ह्याच्या तुलनेने महाराष्ट्र राज्यामध्ये अधिक आहे व प्रत्येक जनगणनेचा विचार केला असता तो सतत 30000 पेक्षा अधिक आहे. 2011 च्या जनगणनेनुसार नंदुरबार जिल्ह्यामध्ये 0 ते 6 वर्षे वयोगटातील एकूण लोकसंख्या 240222 इतकी असून त्यापैकी मुलीची 123582 तर मुलांची 116540 इतकी आहे. बाल लिंग गुणोत्तराचे प्रमाण 2011 च्या जनगणनेनुसार 944 असून 2001 मध्ये 961 इतकी होती. त्यामध्ये घट झालेली आढळून येते.

साक्षरता

2011 मध्ये नंदुरबार जिल्ह्याचा साक्षरतेचे प्रमाण 60.82 टक्के इतकी होते. जे 2001 मध्ये केवळ 55.80 टक्के इतकेच होते. पुरुष साक्षरतेचे प्रमाण 72.17 टक्के तर स्त्री साक्षरतेचे प्रमाण 56.47 टक्के इतके होते. 2001 नुसार ग्रामीण साक्षरता दर 51.10टक्के तर शहरी साक्षरतेचे प्रमाण 80.30 टक्के इतके होते. त्यामध्ये पुरुष साक्षरतेचे प्रमाण 69.90 टक्के तर स्त्री साक्षरतेचे प्रमाण 51.75 टक्के इतके होते. नंदुरबार जिल्ह्याच्या संबधित भागातील साक्षरतेचे प्रमाण अभ्यासले असता नंदुरबार तालुका अधिक साक्षर असून त्याचे प्रमाण 71.93 टक्के इतके आहे. तर सर्वाधिक कमी साक्षरता धडगाव तालुक्यात आढळते. सातपुडा पर्वतरांगांनी व्याप्त भूप्रदेश धडगाव व अक्कलकुवा भागात अतिशय कमी साक्षरता दर असून त्यासाठी तेथील आर्थिक स्थिती, शिक्षण विषयक जागरूकतेचा अभाव, अल्प शिक्षण विषयक सुविधा, ऋतूमानानुसार होणारे स्थलांतर, कुंटुब व्यवस्था व भौगोलिक संरचना इत्यादी कारणे कारणीभूत आहेत.

सारणी क्र. 5: नंदुरबार जिल्ह्याची तालुकानिहाय साक्षरता लोकसंख्या 2011

अ.क्र.	तालुके	पुरूश	स्त्री	एकूण
1	अक्कलकुवा	67.25	48.43	57.84
2	धडगाव	54.14	36.19	45.16
3	तळोदा	71.13	52.58	61.85
4	षहादा	76.47	57.44	66.95
5	नंदुरबार	80.94	62.13	71.93
6	नवापूर	69.43	52.89	61.06
	जिल्हा	69.90	51.75	60.82



वरील लोकसंख्येच्या तक्त्यावरून स्पष्ट होते की, पुरुष साक्षरता दर 69.90 टक्के तर स्त्री साक्षरतेचे प्रमाण 51.75 टक्के इतके आढळून येते. सर्वाधिक साक्षर लोकसंख्या नंदुरबार तालुक्यात 71.93 टक्के असून सर्वाधिक कमी धडगाव तालुक्यात 45.16 टक्के इतकी आहे. येथील भौगोलिक परिस्थितीचा फार मोठा परिणाम तेथील साक्षरतेवर पडलेला आहे.

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तहसील सिकन्दपुर (जनपद बलिया) उत्तर प्रदेष में कृशि उद्योगो के विकास की सम्भावनायें

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सारांष—

गाँवो में और उनके आस—पास कृशि पर निर्भर उद्योगों का विकास कृशि को स्वीकार्य और आकर्शक बनाने तथा स्थिरता प्रदान करने की क्षमता रखता है। कृशि उद्योग एक सर्वव्यापी अभिव्यक्ति है जिसमें विभिन्न औद्योगिक, प्रसंस्करण और विनिर्माण गतिविधियो का समावेष कृशि आधारित कच्चे माल पर होता है और उन गतिविधियों और सेवाओं को भी समाहित करता है जो आगत के रूप में कृशि से प्राप्त होती है। कृशि उद्योग किसी भी विकासषील राश्ट्र की विकास प्रक्रिया में एक तकनिकी के रूप में कार्य करेगा, कृशि—आधारित उद्योग देष के भीतर और बाहर प्रतिस्पर्धात्मक लाभ की धारणा के अनुरूप है। वे गाँवो के श्रमिको को रोजगार प्रदान करने के लिए एक सुरक्षा कवच की भूमिका निभा सकते है और ग्रामीण क्षेत्रो में बड़े पैमाने पर बेरोगारी की समस्या का समाधान कर सकते है। यहॉ चुनौती इस बात की है कि सरकार अपनी कृशि उद्योग के विकास की नीतिगत योजनाओं को क्षेत्रीय विभिन्नता के अनुरूप, कृशि उत्पादन प्रणाली को बिना प्रभावित किये कृशि उद्योगों के विकास का सुनिष्चित किया जा सके। विकासषील देषो की आर्थिक नीतियों ने हमेषा न केवल उत्पाद और उत्पादकता वृद्वि के माध्यम से प्रसंस्करण और विनिर्माण के माध्यम से कृशि उत्पादो में प्रणालीगत मूल्य—संवर्धन द्वारा किसानो की आय बढ़ाने की बकालत की है। इस षोध पत्र का उद्देष्य ग्रामीण क्षेत्रो में कृशि उद्योगों के विकास की सम्भावनाओ को तलासना है।

मुख्य षब्द— तकनीकी, प्रतिस्पर्धात्मक लाभ, प्रसंस्करण, विनिर्माण, मूल्य संवर्धन

भूगोल विभाग, श्री गाँधी स्नातकोत्तर महाविद्यालय, मालटारी, आजमगढ़, उ०प्र०

अध्ययन की कल्पना— भारतीय अर्थव्यस्था की रीढ़ में कृशि समाहित है, कृशि को लघुत्तम स्तर पर औद्योगिकरण की आवष्यकता है, जो मध्यम और लघु किसानो के द्वारा कृशक अनुरूप सरकार की नीतिगत योजनाओ को समाहित करते हुए, खाद्यय प्रसंस्करण के लिए छोटे—२ स्तर पर प्रयोगषाला का निर्माण कर सके। जिससे कृशक प्रषिक्षित होकर कृशि उद्योग में अपनी भागीदारी सुनिष्चित कर सके।

अध्ययन क्षेत्र में कृशि उद्योग से सम्बन्धित अनेक सम्भावनाये है जो अध्ययन की कल्पना के रूप परिलक्षित है।

— राइस मील की स्थापना (चावल प्रसंस्करण से बनने वाल सभी खाद्य पदार्थ)
— फ्लोर मील की स्थापना (ऑटा प्रसंस्करण से बनने वाले सभी खाद्य पदार्थ)
— चीनी मील (गन्ना प्रसंस्करण से बनने वाले सभी खाद्य पदार्थ)
— दूध प्रसंसकरण से बनने वाले खाद्य पदार्थ

— बागानी कृशि से उत्पादित फसल
— कृशि में उपयोग होने वाले आवष्यक छोटे—२ उपकरणों का निर्माण
— खाद्य प्रसंस्करण उद्योग की स्थापना
— वनस्पति तेल उद्योग
— वांस उद्योग

कृशि आधारित उद्योग में इन सभी का छोटे—छोटे स्तर पर स्थापना करके कृशि पर आधारित उद्योगो के विकास की कल्पना को साकार करना है जिससे अध्ययन क्षेत्र का विकास हो सके।

अध्ययन का उद्देष्य— प्रस्तुत अध्ययन का उद्देष्य तहसील सिकन्दरपुर जनपद—बलिया में कृशि में उद्योग की सम्भावनाओं को ढूढ़ना है। जिसके माध्यम से अध्ययन क्षेत्र में विभिन्न कृशि उद्योगो को प्रकाष में लाकर औद्योगिक विकास किया जा सके।

विधि तंत्र— प्रस्तुत अध्ययन प्राथमिक एंव द्वितीयक के आधार पर है। अध्ययन के निश्कर्श हेतु गुणात्मक और मात्रात्मक एंव विष्लेशणात्मक विधि तंत्रो का प्रयोग करते हुए निश्कर्श को प्राप्त किया गया है।

अध्ययन क्षेत्र— प्रस्तुत अध्ययन क्षेत्र तहसील सिकन्दरपुर जनपद की उत्तरी सीमा का निर्धारण करती है। इसका अक्षांषीय विस्तार २५° ५५¹ उत्तरी अक्षांष से २६° ८¹ उत्तरी अक्षांष एंव ८३° ५५¹ पूर्वी देषान्तर से ८४° ७¹ पूर्वी देषान्तर के मध्य है। सिकन्दरपुर तहसील के पूरब में बांसडीह तहसील, दक्षिण में बलिया तहसील एंव पष्चिमी सीमा पर रसड़ा तहसील तथा उत्तरी पष्चिमी सीमा पर बेल्थरा रोड़ तहसील स्थित है। अध्ययन क्षेत्र तीन विकास खण्डों नवानगर, पन्दह एंव मनियर (अंषिक) में विभक्त है। इसमें न्याय पंचायतो की संख्या २४ एंव गांवो की संख्या २४२ है।

अध्ययन क्षेत्र एक कृशि प्रधान क्षेत्र है, जहाँ की अधिकांष जनसंख्या कृशि पर आक्षित है।

सारणी संख्या १— विकास खण्डवार तहसील सिकन्दरपुर में औद्योगिक स्थिति

कृशि प्रसंस्करण उद्योग कृशि उत्पाद निर्माण उद्योग विनिर्माण उद्योग कृशि सेवा उद्योग

क्रमसंख्या	उद्योग	उद्योगो की संख्या	
		लघु	वृहत
१—	राइस मील	५०	३
२—	फ्लावर मील	३००	०
३—	चीनी मील	०	०
४—	डेयरी	२००	२०
५—	प्रसंस्करण	१०	०
६—	बांस उद्योग	१००	०
७—	वनस्पति तेल	२५०	०

स्रोत— व्यक्तिगत सर्वेक्षण द्वारा

सामान्य रूप से अध्ययन क्षेत्र मे सारणी संख्या १ से स्पश्ट है कि अव्यवस्थित लघु उद्योगो की संख्या लगभग १५०० सौ के करीब है जिसका प्रोसेसिग न होने से किसानो की आय में कोई अन्तर दिखाई नही पड़ता, सरकारी तंत्र के सहयोग से इन उद्योगो में संलग्न ग्रामीण क्षेत्रो के लघु उद्यमियो को प्रषिक्षित कर छोटे—छोटे ब्रॉण्ड का रूप देकर ग्रामीण उद्यमियो के साथ—साथ किसानो की आय में वृद्वि किया जा सकती है।

वृहत् उद्योगो की संख्या न के बराबर है इनकी संख्या में वृद्वि करके अध्ययन क्षेत्र के कृशि उद्योग में अमूलचूल परिर्वतन किया जा सकता है। जिससे ग्रामीण अर्थव्यवस्था को बल मिल सके और ग्रामीण क्षेत्रो से रोजगार के लिए षहरी क्षेत्रो में प्रवास को रोका जा सके।

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"Changing Trends in Agriculture and its Impact on Rural Development"

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प्रा. डॉ. एन. के. वाघमारे[1] श्री बी.ए. मोठेराव

सहयोगी प्राध्यापक व संशोधक मार्गदर्शक तथा भूगोल विभाग प्रमुख इंदिरा गांधी महाविद्यालय सिडको, नांदेड.

संशोधक विदयार्थी भूशास्त्र संकुल स्वा.रा.ती.म. विद्यापीठ, नांदेड

सारांश:

सदरील शोधनिबंधामध्ये अहमदपूर तालुक्यातील ग्रामीण वसाहतींची वाढ एक भूगोल खुश लेसन सन 1991 ते 2011 या तीन दशकांच्या कालावधीमध्ये अभ्यास करण्यात आला आहे या जनादना वर्षांमध्ये अमदपुर तालुक्यातील मंडळ निहाय ग्रामीण वसाहतीमध्ये कशा प्रकारच्या वाढ होऊन बदल आहे याचा अभ्यास सदरील शोधनिबंधामध्ये करण्यात आला आहे ग्रामीण वसाहतीच्या वाडी वरती व वितरण आवर्ती कोणकोणत्या घटकांचा परिणाम झाला आहे याचेही विश्लेषण करण्याचा प्रयत्न करण्यात आला आहे अमदपुर तालुक्यातील ग्रामीण वसाहतींच्या अभ्यास करण्यासाठी जनगणना वर्ष 1991 नुसार ग्रामीण वसाहतींची संख्या 216 एवढी होती तर जनगणना वर्ष 2001 नुसार अमदपुर तालुक्यातील ग्रामीण वसाहतींची संख्या 123 एवढी होती व 2011 नुसार ग्रामीण वसाहतींची संख्या 123 एवढी होती.

प्रस्तावना:

मानवाचा उदय झाल्यानंतर मानवाने आपल्या अन्न वस्त्र निवारा या मूलभूत गरजा भागवण्यासाठी मानव निसर्गाशी एकरूप झाला प्राचीन काळी मानवाने संपूर्ण जीवन निसर्गावर अवलंबून होते कालांतराने नैसर्गिक पर्यावरणात बरोबरच सांस्कृतिक पर्यावरणाचा प्रभाव मानवी जीवनावर बदल घडवता हे मानवाच्या मूलभूत गरजा पूर्ण करण्याची पद्धती व स्वरूप कालांतराने बदललेले दिसते अतिप्राचीन काळात मानव कंदमुळे फळे शिकार मासेमारी पशुपालन स्थलांतरित शेती स्थानिक शेती करून आपल्या गरजा भागवण्याचा प्रयत्न करत होता कालांतराने मानवाचे अनुभव ज्ञान संशोधनातून मानवाचे सांस्कृतिक व आर्थिक जीवनात अमुलाग्र बदल झालेला आहे पूर्वीच्या काळी मानव झाडाच्या आडोशाला जवळ गुहेमध्ये राहत होता कालांतराने झोपडी कच्ची घरे पक्की घरे असं करत वसाहतीचा उगम झाला अतिप्राचीन काळातील घरात असतो म्हणजे मानवी संस्कृतीचा एक अविष्कार मानला जातो मानव जातीची व्याख्या अनेक तज्ञांनी केलेल्या आहेत प्रसिद्ध भूगोलतज्ञ डिकन्स यांच्या मते शेतीतील घरे वाड्या ग्रह समूह नगरे आधी मानवी समाजास गरज असलेल्या भौगोलिक घटकांचा व्यवस्था म्हणजे वस्ती होय पर्यावरण नुसार मानव व सत्तेचा उदय विकास उत्क्रांती यात कालपरत्वे व स्थानपरत्वे भिन्नता आढळते.

बीज संज्ञा : ग्रामीण वसाहतीची वाढ व वितरण

अभ्यास क्षेत्र

लातूर जिल्हयाचे स्थान महाराष्ट्र राज्याच्या आग्नेय दिषेत आहे. अहमदपूर तालुक्याचे स्थान लातूर जिल्हयाच्या उत्तरेस आहे. लातूर जिल्हयाचा अक्षावृत्तीय विस्तार १७° ५२' उत्तर ते १८°५०' उत्तर व रेखावृत्तीय विस्तार ७६° २८'

पूर्व ते ७९° १२' पूर्व रेखावृत्तादरम्यान आहे. या जिल्हयामध्ये एकूण १० तालुके आहेत. पैकी अहमदपूर तालुका या षोध निबंधासाठी निवडला आहे.

अहमदपूर तालुक्याचा अक्षावृत्तीय विस्तार १८° १७' उत्तर ते १८° ७०' उत्तर व रेखावृत्तीय विस्तार ७६° २८' पूर्व ते ७६° ६६'पूर्व आहे. अहमदपूर तालुक्याच्या पूर्वेस जळकोट व नांदेड जिल्हयातील कंधार तालुक्याच्या सिमा आहेत. पष्चिमेस बिड जिल्हयातील अंबाजोगाई व परभणी जिल्हयातील गंगाखेड तालुक्याच्या सिमा आहेत. दक्षिणेस चाकूर तर उत्तरेस नांदेड जिल्हयातील लोहा तालुक्याची सिमा आहे. अहमदपूर तालुक्याचे एकूण भौगालिक क्षेत्रफळ ७८३.२६ चौ.कि.मी असून अभ्यास क्षेत्रामध्ये ०६ महसूल मंडळ आहेत. किनगाव, खंडाळी, अंधोरी, षिरूर ताजबंद, हाडोळती, व अहमदपूर अषी मंडळ आहेत. अहमदपूर तालुका हा बालाघाट डोंगर रांगेतील पठारावर स्थिरावलेला आहे. अहमदपूर तालुक्याची समुद्रसपाटीपासूनची उंची ५४५ ते ६४० मिटर आहे. अहमदपूर तालुक्यामध्ये मन्याड ही महत्त्वाची प्रमुख नदी असून वाकी, तिरू, या तिच्या उपनद्या आहेत. अहमदपूर तालुक्याचे हवामान उश्ण व कोरडया स्वरूपाचे असून कमीत कमी तापमान १०° से. ते जास्तीत जास्त तापमान ४०° से. पर्यंत आहे.२०११ च्या जनगणना अहवालानुसार तालुक्याची लोकसंख्या २३६१६८ एवढी आहे. तर लोकसंख्येची घनता ३०९ इतकी आहे. तालुक्याची साक्षरता ७८.३३ टक्के आहे.

उद्दिष्टे :

1. ग्रामीण वसाहतीची वाढ व झालेला बदल अभ्यास करणे
2. ग्रामीण वसाहतीच्या वितरणाचा अभ्यास करणे

संशोधनपद्धती :

सदरील शोधनिबंध हा द्वितीय माहिती यावर आधारित आहे माहिती संकलन करण्यासाठी ड्युटी एक स्त्रोतांचा वापर करण्यात आला आहे ही माहिती लातूर जिल्हा जनगणना पुस्तिका 1991, 2001 व 2011 लातूर जिल्हा गॅझेटिअर भारत व महाराष्ट्र सरकारचा जनगणना अहवाल इंटरनेटवरील माहिती तसेच विविध आकडेवारीचे सादरीकरण करण्यासाठी नकाशा शास्त्रीय पद्धतीचा अवलंब करण्यात आला आहे.

मंडळ निहाय ग्रामीण वसाहतीची वाढ 1991 ते 2011

अ क्र	मंडळ	ग्रामीण वसाहतींची संख्या			अ क्र	मंडळ	ग्रामीण वसाहतींची संख्या		टक्केवारी	
		1991	2001	2001			2001	2011	2001	2011
1.	अहमदपूर	27	29	02	1	अहमदपूर	18	-11	6.89	-61.1
2.	किनगाव	27	27	0	2	किनगाव	22	-5	0	-22.7
3.	खंडाळी	25	26	1	3	खंडाळी	21	-5	3.84	-23.8
4.	शिरूर ताजबंद	32	30	2	4	शिरूर ताजबंद	22	-8	6.66	-36.4
5.	हडोळती	23	11	-12	5	हडोळती	19	+8	91.7	-
6.	चाकूर	21	-	-	6	अंधोरी	21	21	-	-
7.	कारेपूर	24	-	-					-	-
8.	वडवळ नागनाथ	21	-	-					-	-
9.	नळेगाव	16	-	-					-	-
एकूण तालुका		216	123	93					5.69	0

सारणी क्रमांक 1 मध्ये अहमदपूर तालुक्यातील मंडळ निहाय ग्रामीण वसाहतीची वाढ जनगणना वर्ष 1991 ते 2011 तीन दशकातील कालावधीमध्ये झालेला बदल यामध्ये दर्शन यात आला आहे वरील साधनेचे अवलोकन केले असता असे निदर्शनास येते की 1991 ते 2011 या जनगणना च्या आकडेवारीनुसार अहमदपूर तालुक्यातील ग्रामीण वसाहती संख्या 1991 मध्ये 216 एवढी होती यावर्षी 2001 मध्ये ग्रामीण मासाची संख्या 123 एवढी झाल्याचे आढळून येतात 1991 ते 2001 या दहा वर्षाच्या कालावधीमध्ये अमदपुर तालुक्यातील ग्रामीण वसाहतीमध्ये वाढ न होता त्यामध्ये त्यांनी ग्रामीण वसाहतीची गट झालेली आढळून येते धनगरा वर्षे 1991 ते 2001 या दहा वर्षांमध्ये अहमदपूर मंडळामध्ये दोन खंडाळी मंडळांमध्ये एक शिरूर ताजबंद मंडळांमध्ये दोन ग्रामीण वसाहतींची वाढ झालेली आहे तर हाडोती मंडळांमध्ये 1991 मध्ये 23 ग्रामीण ग्रामीण वसाहती होत्या तर 2001 मध्ये त्यामध्ये घट होऊन अकरा ओ साथी कमी झाल्या जनगणना वर्ष 1991 च्या आकडेवारीनुसार या क्षेत्रामध्ये ग्रामीण वसाहतींची संख्या 216 इतकी असून जनधारणा वर्ष 2001 मध्ये ग्रामीण वसाहती संख्या 123 एवढी असल्याचे आढळून येते जनार्दना वर्षे 1991 ते 2001 या दहा वर्ष दशकांमध्ये त्यांनी ग्रामीण वसाहतींची संख्या कमी झाल्याचे आढळून येते दिनांक 15 ऑगस्ट 1992 रोजी अमदपुर तालुक्याचे विभाजन होऊन चाकूर तालुक्यातील चिवरी नापुर तालुक्याची निर्मिती करण्यात आली या नवीन तालुका मध्ये अहमदपूरकर त्यातील तीन मंडळ आणि 83 ग्रामीण वसाहती व रेनापुर या नवीन तालुका मध्ये एक महसूल मंडळ आणि दहा ग्रामीण वस्त्या समावेश करण्यात आला त्यामुळे अमदपुर तालुक्यातील एकूण ग्रामीण वस्ती संख्या कमी झाल्याची आपल्याला या ठिकाणी आढळून येते जनगणना वर्षे 1991 ते 2001 या दशकामध्ये तालुकानिहाय ग्रामीण असे असंख्य मध्ये खालील प्रमाणे बदल झालेला दिसून येतो 1991 मध्ये अहमदपूर तालुक्यांमध्ये 216 ग्रामीण व साध्या असून त्यापैकी दोन ग्रामीण व साथी उसळ आहेत जनधारणा वर्षे 1991 ते 2001 मध्ये त्यांना ग्रामीण साठी कमी झाल्याचे आपल्याला दिसून येते जनगणना वर्ष 2001 च्या आकडेवारीनुसार अमदपुर मंडळांमध्ये 29 ग्रामपंचायती असून यापैकी दोन नवीन ग्रामीण साथी उत्क्रांती झालेले आहेत खंडाळी आणि शिरूर ताजबंद मंडळांमध्ये 26 ग्रामपंचायती असून यापैकी एक ग्रामीण वसाहत उत्क्रांत झालेले आहे किनगाव मंडळामध्ये हाडोती मंडळांमध्ये एकीकरणासाठी उत्क्रांती झालेली नाही जनगणना 2011 नु सार चाकूर मंडळात चाकूर तालुक्याचा दर्जा देण्यात आला पंधरा ऑगस्ट एकोणीसशे ब्याण्णव त्यामुळे अहमदपूर तालुक्यातील ग्रामीण उसाची संख्या कमी झाल्याचे आढळते हाडोती मंडळामध्ये आठ नवीन ग्रामीण व जातीचा समावेश करण्यात आला जनगणना वर्षे 1991 मध्ये 2011 या दशकामध्ये मंडळ नुसार ग्रामीण वसाहतीची कमी झालेली संख्या अमदपुर मंडळामध्ये अकरा वाजून मंडळामध्ये आठ तर किनगाव आणि खंडाळी मंडळामध्ये प्रत्येकी पाच ग्राम वसाहती कमी झालेल्या दिसून येतात तर अहमदपूर किनगाव आणि खंडाळी मंडळात ची पुनर्रचना होऊन आंधोरी या नवीन मंडळाची निर्मिती करण्यात आली व या मंडळामध्ये 21 ग्रामीण वसाहतीचा समावेश करण्यात आला.

अमदपुर तालुक्यातील ग्रामीण वसाहतीच्या वाढीवर व वितारणावर भौगोलिक व सामाजिक घटकांचा परिणाम कशा प्रकारे झाला हे या शोध निबंधावरुन स्पष्ट होते.

निष्कर्ष:

अमदपुर तालुक्यातील मंडळांमध्ये ग्रामीण वसाहतींची वाढ व वितरण असमान स्वरूपाचे आढळते तालुका मध्ये सर्वाधिक ग्रामीण वसाहती संख्या शिरूर ताजबंद व किनगाव मंडळांमध्ये आढळते त्यासोबतच सर्वात कमी ग्रामीण असती संख्या अमदपुर मंडळांमध्ये आढळते त्यानंतर खंडाळी मंडळांमध्ये 21 हाडोळती मंडळामध्ये 19 व अंधोरी मंडळांमध्ये 21 ग्रामीण वर्षातील संख्या आपल्याला पाहावयास मिळतील या मंडळामध्ये वाहतूक व दळणवळणाच्या सुविधांचा अभाव आहे तसेच काही ग्रामीण वसाहतीमध्ये स्वातंत्र्याच्या 75 वर्षांनंतर ही बससेवा उपलब्ध नाही त्याचबरोबर या परिसरामध्ये उदंचन केंद्र करणे अत्यंत महत्त्वाचे आहे तरच लोकांना रोजगार उपलब्ध व लोकांचे स्थलांतर थांबेल ग्रामीण वसाहतीतील मंडळाचा विकास होण्यास व तिथल्या असणाऱ्या लोकसंख्येचा विकास होण्यास व वितरणातील असमतोल दूर होण्यास मदत होईल.

संदर्भ ग्रंथ:

1. गॅझेटिअर भाग 1 व भाग 2
2. जनगणना पुस्तिका 1991, 2001 व 2011
3. वस्ती भूगोल : डॉ. भोळे ए. एस.
4. वस्ती भूगोल : घारपुरे विठ्ठल
5. आदिवास भूगोल : शिरसागर, देशमुख, देशपांडे
6. लातूर जिल्हा सामाजिक व आर्थिक समालोचन 1991, 2001 , 2007, 2011 2017

चाकूर तालुक्यातील लिंग गुणोत्तराचे भौगोलिक विश्लेषण

प्रा. डॉ. के.बी. शिंदे बी. ए. मोठेराव

सहाय्यक प्राध्यापक, भूगोल विभाग, राजर्षी शाहू महाविद्यालय, लातूर.संशोधक विद्यार्थी, भूशास्त्र संकुल, स्वा.रा.ती.म.विद्यापीठ, नांदेड.

सारांश:

सदरील शोधनिबंधामध्ये चाकूर तालुक्यातील लोकसंख्येच्या लिंग गुणोत्तराचा अभ्यास सन 2011 या जनगणना वर्षामध्ये करण्यात आला आहे या जनगणना वर्षांमध्ये चाकूर तालुक्यातील मंडळ निहाय लोकसंख्येच्या लिंग गुणोत्तर मध्ये कशाप्रकारे बदल झाला आहे याचा अभ्यास सदरील शोधनिबंधामध्ये करण्यात आला आहे लोकसंख्येच्या लिंग गुणोत्तराचे कोणकोणत्या घटकाचा परिणाम झालेला आहे याचेही विश्लेषण करण्याचा प्रयत्न या मध्ये करण्यात आला आहे चाकूर तालुक्यातील एकूण लोकसंख्या जनगणना वर्ष 2001 नुसार 157135 एवढी होती तर लोकसंख्या घनता 254 व लिंग गुणोत्तर 916 होते. जनगणना वर्ष 2011 नुसार चाकूर तालुक्याची एकूण लोकसंख्या 178089 एवढी असून या लोकसंख्येचे लिंग गुणोत्तर 926 एवढे आहे

बीज संज्ञा : लोकसंख्येचे लिंग गुणोत्तर

प्रस्तावना

देशाच्या लोकसंख्येच्या विकासामध्ये सामाजिक आर्थिक सांस्कृतिक आणि राजकीय घटक महत्त्वाची भूमिका बजावतात एखाद्या प्रदेशाची परिस्थितीही तेथील लोकसंख्येच्या प्रमाणावर अवलंबून असते ज्यामध्ये लोकसंख्येची घनता लिंग गुणोत्तर साक्षरता जन्मदर आणि मृत्यू दर या सर्व घटकांचा अभ्यास केल्यास असे लक्षात येते की सर्वच दृष्टीकोनातून लोकसंख्येच्या अभ्यासाला महत्त्वाचे स्थान आहे लोकसंख्या घटकातील वाढती संख्या ही लोकसंख्या समस्या कारणीभूत ठरत असते तेव्हा उद्भवणाऱ्या समस्या लक्षात घेता देशातील लोकसंख्येची लोकसभा अध्यक्ष माहिती घेणे क्रमप्राप्त ठरते. अध्यावत सांख्यिकीच्या माहितीच्या आधारे लोकसंख्येच्या समस्येचा आढावा व भविष्यातील लोकसंख्येचे अचूक नियोजन करणे शक्य होते लोकसंख्येचे लिंगगुणोत्तर हा घटक लोकसंख्या अभ्यासा मध्ये अत्यंत महत्त्वाचा आहे लोकसंख्येचे लिंग गुणोत्तर म्हणजे दर हजारी पुरुषामागे असणारी स्त्रियांची संख्या यास लिंगगुणोत्तर असे म्हणतात. लोकसंख्येच्या लिंग गुणोत्तर यामुळे अहमदपूर तालुक्यांमध्ये लोकसंख्येचे गुणोत्तर कशा प्रकारचा आहे याचा अभ्यास या शोधनिबंध द्वारे करण्यात आला आहे भारतामध्ये लोकसंख्येचे लिंग गुणोत्तर विषम प्रमाणामध्ये पाहावयास मिळते त्याचप्रमाणे अमदपुर तालुका सारख्या ग्रामीण भागांमध्ये लोकसंख्येच्या लिंग गुणोत्तरा मध्ये खूप मोठ्या प्रमाणावर विषमता पाहवयास मिळते आणि याचा परिणाम समाज व एकंदर पर्यावरणावर होताना दिसून येतो.

अभ्यास क्षेत्र:

लातूर जिल्ह्याचे स्थान महाराष्ट्र राज्याच्या आग्नेय दिशेत आहे चाकुर तालुक्याचे स्थान लातूर तालुक्याच्या पूर्वेस आहे लातूर जिल्ह्याचा अक्षवृत्तीय विस्तार 17^0 52' उतर ते 18^{0}50' उत्तर व रेखावृत्ते विस्तार 76^0 28' पूर्व ते 79^0 12' पूर्व रेखावृत्त दरम्यान आहे या जिल्ह्यामध्ये एकूण 10 तालुके आहेत पैकी चाकुर तालुका या शोधनिबंधात साठी निवडला आहे चाकूर तालुक्याचे अक्षवृत्तीय विस्तार तालुक्याचे 17^0 58' * उत्तर ते 18^0 30' उत्तर व रेखावृत्तीय विस्तार 76^0 40' पूर्व ते 76^0 53' पूर्व आहे . चाकुर तालुक्याच्या पूर्वेस उदगीर दक्षिणेस शिरूअनंतपाळ , पश्चिमेस लातूर, रेनापुर व उत्तरेस अहमदपूर तालुका आहे चाकुर तालुक्याचे भौगोलिक क्षेत्रफळ 683 चौरस किलोमीटर असून चाकुर तालुका मध्ये 2011 च्या जनगणनेनुसार 83 ग्रामीण वसाहती आहेत. चाकुर तालुक्याचे लोकसंख्या 2001 नुसार 157 135 तर 2011 च्या जनगणनेनुसार 178089 एवढी आहे. चाकूर तालुक्यामध्ये 05 महसूल मंडळ आहेत चाकूर, वडवळ, नळेगाव, शेळगाव, झरी बु चाकुर तालुका हा बालाघाट डोंगररांगेतील पठारावर स्थिरावलेला आहे चाकुर तालुक्याचे सरासरी समुद्रसपाटीपासून उंची 538 मीटर एवढी आहे . 2011 च्या लोकसंख्या जनगणना नुसार तालुक्याची लोकसंख्या ची घनता 309 एवढी आहे तर साक्षरतेचे प्रमाण 78.33 टक्के आहे.

उद्दिष्टे: १. चाकूर तालुक्यातील लोकसंख्येच्या लिंग गुणोत्तरातील बदल अभ्यासणे. २. लोकसंख्या लिंग गुणोत्तरातील वितरण अभ्यासणे.

संशोधनपद्धती :

सदरील शोधनिबंध हा द्वितीय माहिती यावर आधारित आहे माहिती संकलन करण्यासाठी ड्युटी एक स्त्रोतांचा वापर करण्यात आला आहे ही माहिती लातूर जिल्हा जनगणना पुस्तिका 2001 व 2011 लातूर जिल्हा गॅझेटिअर भारत व महाराष्ट्र सरकारचा जनगणना अहवाल इंटरनेटवरील माहिती तसेच विविध आकडेवारीचे सादरीकरण करण्यासाठी नकाशा शास्त्रीय पद्धतीचा अवलंब करण्यात आला आहे.

सूत्र :

$$\text{लिंग गुणोत्तर} = \frac{\text{स्त्रियांची संख्या}}{\text{पुरुषांची संख्या}} \times 1000$$

चाकुर तालुका मंडळ निहाय लोकसंख्येची निवडक माहिती 2011

मंडळ	क्षेत्रफळ (चौकिमी)	लोकसंख्या	लोकसंख्येची घनता	स्त्री-पुरुष प्रमाण	साक्षरता
चाकुर	127.39	42171	331	899	61.6
नळेगाव	128.67	46194	359	889	40.36
वडवळ (ना)	184.77	337941	183	841	42.37
झरी (बु)	106.75	34540	229	951	28.80
शेळगाव	139.17	31390	225	1049	43.39
तालुका एकुण	683	178089	260	926	77.84

संशोधकाने अधिकृत माहितीच्या आधारे संकलित केली आहे.

सारणी क्र 1 मध्ये चाकूर तालुक्यातील मंडळ निहाय लोकसंख्येची निवडक माहिती जनगणना वर्ष 2011 या वर्षातील दाखवण्यात आली आहे वरील सारणीचे अवलोकन केले असता असे निदर्शनास येते की 2011 या दोन वर्षांमध्ये चाकूर तालुक्यातील सर्वाधिक लोकसंख्येची लिंग गुणोत्तर शेळगाव मंडळामध्ये 1049 एवढे आहे तर सर्वात जास्त लोकसंख्येची घनता नळेगाव मंडळांमध्ये 359 एवढी आहे. 2011 च्या जनगणनेनुसार चाकूर तालुक्याची लोकसंख्या ची घनता दर चौरस किलोमीटर ला 260 एवढी आहे. सर्वात जास्त लोकसंख्येची घनता नळेगाव मंडळामध्ये 359 त्यानंतर चाकूर मंडळांमध्ये 331 जरी बुद्रुक मंडळांमध्ये 229 शेळगाव मंडळांमध्ये 225 आणि सर्वात कमी लोकसंख्येची घनता मंडळांमध्ये 183 इतकी आहे.

म्हणून या साक्षरता प्रमाणाचा विचार केला असता सर्वाधिक साक्षरता प्रमाण चाकूर मंडळांमध्ये 61.6 त्यानंतर शेळगाव मंडळात 43.39 नळेगाव मंडळांमध्ये 40.36 वडवळ (ना)मंडळात 42.36 आणि सर्वात कमी साक्षरता प्रमाण झरी बु मंडळात 28.8 एवढे आहे. दर एक हजार पुरुषांमागे स्त्रियांचे प्रमाण किती आहे याला अनुसरून मंडळनिहाय लिंग गुणोत्तर याचा अभ्यास केला असता असे लक्षात येते की, सर्वात जास्त लिंग गुणोत्तर शेळगाव मंडळात 1049 त्यानंतर झरी मंडळात 951 वडवळ (ना) मंडळात 841, चाकूर मंडळात 899 तर सर्वात कमी नळेगाव मंडळांमध्ये 889 एवढे लिंग गुणोत्तराचे प्रमाण दिसून येते.

निष्कर्ष :

चाकूर तालुक्यातील मंडळ निहाय लोकसंख्यची निवडक माहिती चा अभ्यास केला असता असे लक्षात येते की चाकूर तालुक्यातील लोकसंख्येतील साक्षरता प्रमाण लिंग गुणोत्तर स्त्री-पुरुषांचे प्रमाण क्षेत्रफळ यामध्ये विषमता आढळून येते. साक्षरतेच्या प्रमाणाचा अभ्यास केला असता असे निष्कर्ष काढता येईल की चाकूर मंडळांमध्ये सर्वात जास्त साक्षरता प्रमाण पाहावयास मिळते तर इतर मंडळांमध्ये साक्षरतेचे प्रमाण अत्यंत अल्प प्रमाणात प्रमाणामध्ये दिसून येते यावरून असा निष्कर्ष काढता येईल की ग्रामीण भागामध्ये शिक्षणाच्या सोयी सुविधांमध्ये वाढ करावे लागेल व तेथील साक्षरता प्रमाण लिंग गुणोत्तर यामधील विषमता दूर करता येईल.

संदर्भ ग्रंथ:

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2. जनगणना पुस्तिका 2011
3. लोकसंख्या भूगोल : डॉ. सुरेश फुले
4. वस्ती भूगोल : डॉ. भोळे ए. एस.
5. लातूर जिल्हा सामाजिक व आर्थिक समालोचन 2011, 2015, 2017
6. www.Latur.nic.in

शेतीचा बदलता प्रवाह आणि त्याचा ग्रामीण विकासावर होणारा परिणाम

कसबे प्रार्थना गुलाबराव[1] प्रा.डॉ. बी. पी. गाडेकर[2]

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प्रस्तावना :

भारत हा मुख्यत्वे कृषीप्रधान देश आहे. आजही भारतातील ग्रामीण भागातील जनता ही प्रामुख्याने शेतीवर अवलंबून आहे. स्वातंत्र्यपूर्व काळापासून ते आजतागायत भारतीय कृषी व्यवस्थेमध्ये अमूलाग्र बदल झालेले आपण पाहिले आहेत. पूर्वी भारतीय कृषी प्रणालीमध्ये यांत्रिकीकरण, नव नवीन पध्दती, रसायने, खते इत्यादींचा वापर नगण्य होता. जुनाट पध्दतीने शेती केल्या जात असे. इस. 1960 च्या मध्यापर्यंत शेतीच्या अनेक मर्यादामुळें अल्प मुल्यांच्या पिकांचे लागवडीचे प्रमाण अधिक होते. शिवाय पिकांचे उत्पादन व उत्पादकता ही अतिशय अल्प होती. 1960 च्या दशकांच्या मध्यावरील अवर्षण आणि पुढे 1972-73 च्या दुष्काळाच्या विदीर्ण अनुभवाने धोरणकर्त्यांना अनेक धडे मिळाले. हरीतक्रांतीमुळे भारतीय शेतीची परिस्थिती बदलली गेली. भारतीय अर्थव्यवस्थेचा बारकाईने अभ्यास केल्यास कृषी क्षेत्र हे अत्यंत महत्वाचे क्षेत्र असल्याचे दिसून येते. जेव्हा आपण कृषी व संलग्न क्षेत्र असा उल्लेख करतो तेव्हा कृषी, वने, व मत्स्य या तिघांचा अंतर्भाव करतो. कृषी क्षेत्र म्हणजे भारतातील एक सर्वात मोठं मुक्त खाजगी क्षेत्र आहे. तसेच सर्वात मोठं असंघटित क्षेत्र असल्याचे दिसून येते. कृषी व्यवसाय हा एकच असा प्रमुख व्यवसाय आहे की ज्यावर आयकर आकारला जात नाही.

ज्यावेळी आपण भारतातील कृषी हंगामांचा विचार करतो त्यावेळी जुलै ते ऑक्टोबर दरम्यान खरीप हंगाम असतो आणि ऑक्टोबर ते मार्च दरम्यान रब्बी हंगाम असतो. एकंदरीत विचार करता भारतीय शेती ही प्रामुख्याने मोसमी पावसावर अवलंबून असल्याचे दिसून येते.

लोकसंख्या विस्फोटाच्या तुलनेत लागवड क्षेत्र मर्यादित असल्यामुळे अलिकडे आधुनिक तंत्रज्ञानाचा वापर करून उत्पादनात वाढ करण्याचे उपाय योजिले आहेत. ग्रामीण भागात रोजगार देणारा कृषी हा प्रमुख उद्योग असल्यामुळे कृषी क्षेत्रातच रोजगार वृध्दी करण्याचे लक्ष ठेवण्यात आले. इस. 1952 चा समुदाय विकास कार्यक्रम आणि 1953 ची राष्ट्रीय विस्तार योजना यांचा भारतीय शेती व्यवसायास विशेष हातभार लागला.

संशोधनाची उद्दिष्टे

1. भारतीय अर्थव्यवस्थेत कृषीची भूमिका सांगणे.
2. नियोजन काळातील कृषी विकासाची उद्दिष्टे स्पष्ट करणे.
3. कृषी विकासासाठी उपयुक्त असलेले घटक अभ्यासणे.
4. शेती क्षेत्रातील बदलाची निरीक्षणे समजून घेणे.
5. ग्रामीण विकासावर शेतीच्या बदलत्या प्रवाहाचा परिणाम काय होतो हे अभ्यासणे.

सांशोधनाची गृहितकेः

1. भारतीय शेती ही प्रामुख्याने पावसाच्या पाण्यावर अलंबून असल्याचे स्पष्ट होते.

2. स्वातंत्र्यपूर्व काळापासून भारत हा कृषीप्रधान देश असल्याची माहिती मिळते.
3. हरीतक्रांतीनंतर भारतीय शेतीच्या परिस्थितीमध्ये बदल झाल्याचे चित्र दिसून येते.
4. पूर्वी शेती ही प्रामुख्याने पारंपारिक पध्दतीने केली जात होती.
5. भारतीय शेतीमध्ये आधुनिक संसाधनांचा अभाव होता.

उद्दिष्टाचे स्पष्टीकरण :

भारतीय अर्थव्यवस्थेत कृषीची भूमिका

अंतर्भुत घटक	टक्केवारी
ग्रामीण भागातील शेतीवर अवलंबून असणारी कुटुंबे	70 %
एकुण जीडीपीमध्ये कृषीचे योगदान	17 %
कृषी क्षेत्रातून मिळणारी रोजगार प्रदानता	58 %
अन्नधान्य उत्पादन	1950-51 - 51 दशलक्ष टन 2011-12 - 250 दशलक्ष टन
कृषीमधील जीडीपीचा वाटा	2002-03 - 20 % 2019-20 - 17.8 % 2020-21 - 19.9 %

Data Source : Ministry of Agriculture and Farmers Welfare releases Third Advance Estimates of Principal Crops for 2020-21

भारतीय अर्थव्यवस्थेत कृषीची भूमिका अनन्य साधारण आहे. ग्रामीण भागातील शेतीवर अवलंबून असणाऱ्या कुटुबांची संख्यांची टक्केवारी ही 70 टक्के इतकी आहे. एकूण स्थूल देशांतर्गत उत्पादनात कृषीचे 17 टक्के योगदान आहे. कृषी क्षेत्रातून लोकसंख्येला मिळणारी रोजगार प्रदानता 58 टक्के इतकी आहे. अन्नधान्याच्या उत्पादनाचा विचार करता 1950 ते 51 मध्ये 51 दशलक्ष टन आणि 2011 ते 12 मध्ये 250 दशलक्ष टन एवढ्या मोठ्या प्रमाणात वाढ झाल्याचे दिसून येते. कृषीमधील स्थूल देशांतर्गत उत्पादनाचा वाटा 2003 - 03 मध्ये 20 %, 2019 - 20 मध्ये 17.8 % आणि 2020 - 21 मध्ये 19.9 % इतका आहे. त्यामानाने सद्याच्या घडीला कृषीक्षेत्रामध्ये अमूलाग्र बदल झाल्यामुळे प्रगती मोठ्या प्रमाणावर झाल्याचे दिसून येते.

कृषी क्षेत्राचा विकास करण्यासाठी नियोजन काळातील उद्दिष्टे

1. कृषी उत्पादनात वाढ करणे.
2. कृषी क्षेत्रात रोजगार वृध्दी करणे.
3. कृषीवर अवलंबून असणाऱ्यांची संख्या कमी करणे.
4. ग्रामीण क्षेत्रात आर्थिक समानता प्रस्थापित करणे.

भारतात कमी अधिक फरकाने जमिनदारी पध्दत अस्तित्वात होती. या पध्दतीने कृषी क्षेत्रात मालक, मजुर यांच्यात प्रचंड तफावत निर्माण केली होती. असंघटित शेतकरी वर्ग, शेतावर राबणारी कुळे, भूमिहीन मजूर या प्रत्येकाचे प्रश्न वेगळे होते. या प्रश्नांची उकल करणे. ग्रामीण क्षेत्रात आर्थिक समानता प्रस्थापित करण्यासाठी जमिन सुधारणा कार्यक्रम शासनाला हाती घ्यावा लागला.

कृषीच्या विकासासाठी उपयुक्त घटक

सिंचन सुविधा, खते, बियाणे, मृदा संवर्धन, जल संवर्धन, यांत्रिकीकरण, पणन व बाजार, किंमत धोरण, पतपुरवठा , हरित क्रांती, विविध कृषी योजना

जगात सर्वाधिक सिंचन क्षेत्र चीन खालोखाल भारतात आहे. सिंचन क्षेत्राचे प्रमाण टक्केवारीमध्ये सांगायचे असेल तर 1950 - 51 मध्ये 17.1 % होते तर 2014 - 15 मध्ये ते 48.6 % झाले. त्यामानाने हरित क्रांतीनंतर भारतातील सिंचन क्षेत्रात झपाट्याने विकास झाल्याचे दिसून येते. खताच्या वापरामध्ये सुमारे 400 पट वाढ झाली असून दर हेक्टरी खताचा वापर विचारात घेतल्यास भारतात 1950 - 51 मध्ये 1 किलोग्राम खत वापरले जात होते तर 2016 - 17 मध्ये हे प्रमाण दर हेक्टरी 130.8 किलोग्राम वर गेले. खत उद्योगांना प्रोत्साहन देण्यासाठी केंद्र सरकार खतांवर सबसिडी देते. 2015 मध्ये भारत सरकारने सिक्कीम राज्याला पहिले सेंद्रिय राज्य म्हणून घोषित केले.

सन 2002 मध्ये केंद्र सरकारने राष्ट्रीय बियाणे धोरण जाहीर केले. कमी मुल्याच्या व जास्त उत्पादन देणाऱ्या बियाणांची मागणी जास्त असते. त्या तुलनेने उत्पादन अपुरे पडते. भारत शासनाने आकस्मित गरजेवेळी बियाणे उपलब्ध होण्यासाठी तसेच बियाणांच्या उत्पादन व वितरणाच्या पायाभूत सुविधा उभारण्यासाठी 1999 - 2000 मध्ये (सिड बँक) निर्माण केल्या. राहीबाई पोपरे या महाराष्ट्रातील अहमदनगर जिल्ह्यातील कोंभाळणे या गावातील महिला शेतकरी आणि पारंपारिक बियाणांच्या वाणांच्या संरक्षक संवर्धक आहेत. देशी वाणांच्या बियाणांची जपवणुक केल्याबद्दल राहीबाई यांना भारत सरकारने 2020 साली पद्श्री पुरस्काराने सन्मानित करण्यात आले.

मृदा संवर्धनाच्या उद्देशाने पहिल्या पंचवार्षिक योजना काळात 1953 मध्ये केंद्रीय मृदा संवर्धन मंडळाची स्थापना करण्यात आली. मृदेची धूप होणे, खते वाहून जाणे, आम्लीकरण, वाळवंटीकरण, कार्बनी पदार्थांचा नाश, अतिक्षार संचयन, विषारी द्रव्ये या घटकांमुळे मृदेची उत्पादकता कमी होत असते, यासाठी मृदेचे संवर्धन करणे आवश्यक असते.

केंद्र सरकारने 2008 मध्ये राष्ट्रीय शाश्वत कृषी अभियान सुरू केले. सूक्ष्म सिंचन ते प्रत्येक थेंबामागे अधिक पीक या अंतर्गत दामोदर खोरे ते तुंगभद्रा प्रकल्पापर्यंत अनेक कालवे नियोजन काळात उभे राहिले. 1191 नेतर बृहत् सिंचनाबरोबर सूक्ष्म सिंचनावर अधिक लक्ष केंद्रित केले जावू लागले.

यांत्रिकीकरणामध्ये भारताने अलिकडच्या काळात खूप मोठ्या प्रमाणावर प्रगती केली असून जगामध्ये ट्रॅक्टर उत्पादनात भारताचा प्रथम क्रमांक आहे. शेतमालाच्या उत्पादनासाठी जेवढी मेहनत करावी लागते त्यादृष्टीने उत्पादित शेतमालाला बाजारपेठ मिळणे महत्वाचे असते. भारतामध्ये सद्याच्या घडीला केंद्र सरकारच्या आखत्यारित्या राष्ट्रीय कृषी बाजार अंतर्गत 1000 मोठ्या बाजारपेठा (कृषी उत्पन्न बाजार समिती) शेतमाल विक्रीसाठी उपलब्ध असून गावपातळीपासून ते जिल्ह्यापर्यंत खरेदी विक्री केंद्र प्रत्येक राज्याने उपलब्ध केले आहेत. केंद्र सरकार 23 वस्तूंसाठी किमान आधारभूत किमती जाहीर करते. पीकांच्या पेरणीच्या अगोदर केंद्र सरकार किमान आधारभूत किंमत जाहीर करते.

आधुनिक शेतीला प्रोत्साहन देण्यासाठी शासन वेगवेगळ्या स्वरूपामध्ये आर्थिक मदत जाहीर करते. या अनुषंगाने अतिवृष्टी, दुष्काळसदृश्य परिस्थिती निर्माण झाल्यास शासन पीकविमा योजनेसारख्या योजनेतंर्गत शासन

लाभार्थ्यांना मदत जाहीर करते. याचा उद्देश शेतीची उत्पादकता व शेतकरी वर्गास आधुनिक शेती करण्यास प्रोत्साहन मिळावे हे असते.

भारतात सन 1966 ते 67 मध्ये हरीत क्रांतीचा उदय झाला. प्रामुख्याने हरीत क्रांतीचा उद्देष हा कृषी उत्पादन वाढवून अन्नसंकट व दुष्काळ दूर करणे, वाढत्या लोकसंख्येची अन्नगरज भागवणे आणि उद्योगांना लागणारा कच्चा माल अधिकाधिक उत्पादित करणे हा होता. त्याच्या परिणामाचा विचार करता अन्नधान्य उत्पादनात लक्षणीयरित्या वाढ होत गेली. गहू व तांदूळ उत्पादनात हे यश खूप जास्त होते. भारत अन्नधान्य उत्पादनात स्वयंपूर्ण बनला. पीक पध्दतीत बदल झाला.

भारतातील कृषी उत्पादनात वाढ करण्यासाठी शासनाने विविध योजन अंमलात आणल्या आहेत. त्यामध्ये उच्चतम उत्पादनाचे वाण कार्यक्रम (1966), राष्ट्रीय सेंद्रिय उत्पादन कार्यक्रम (2001), राष्ट्रीय कृषी विकास योजना 2007, इंद्रधनुशी क्रांती (2015), राष्ट्रीय अन्नसुरक्षा अभियान (ऑक्टोबर 2007), मृदा आरोग्य कार्ड (फेब्रुवारी 2015), ऑपरेशन ग्रीन (5 नोव्हेंबर 2018) इत्यादी योजनांची अंमलबजावणी करण्यात आली आहे.

शेती क्षेत्रातील बदलांविषयी पाच महत्वाची निरीक्षणे नोंदविता येतील:

1. लोकसंख्येतील बदलांच्या प्रमाणापेक्षा अधिक वेगाने अल्प व सिमांत भूधारकांचे प्रमाण वाढते आहे.
2. किफायतशीर न ठरणाऱ्या सिमांत धारणा क्षेत्राच्या आकरांमुळे शेतकऱ्यांना व्यापारी पीकांकडे वळावे लागले आहे.
3. जमिनीच्या बाजारपेठेचे स्वरूप मोठ्या शेतकऱ्यांना अधिक अनुकूल आहे व त्यामुळे दुर्बल गटातील सिमांत शेतकऱ्यांचे प्रमाण वाढले आहे.
4. कुळ कायद्याच्या निर्बंधामुळे छुपी कुळ पध्दती निर्माण झाली आहे. आणि त्यातून होणारे कुळांचे शोषण कायद्या अगोदरच्या कुळांच्या शोषणापेक्षा अधिक आहे. लहान कुळांना जमिनीवर मालकी अधिकारही सांगता येत नाही. आणि पर्यायी रोजगाराअभावी शेती कसने सोडूनही देता येत नाही अशी अवस्था झाली आहे.
5. या सर्व परिस्थितीमुळे मोठ्या शेतकऱ्यांनी व कार्पोरेट क्षेत्राने शेतकऱ्यांच्या जमिनींना आकर्षक किमतींचे आमिष देवून आपला स्वार्थ साधला आहे. शेती कसण्यातून किमान उदरनिर्वाहही शक्य नसल्याने शेतकऱ्यांना जमिन विकण्याशिवाय पर्याय उरलेला नाही. भारताच्या जनगणनेतून शेतमजूरांचे प्रमाण लोकसंख्येच्या वाजवी प्रवृत्तीपेक्षा अधिक प्रमाणात वाढलेले दिसून येते. विषेशतः याचा सर्वाधिक परिणाम हा ग्रामीण विकासावर झालेला दिसून येतो.

निष्कर्ष व शिफारशी :

शासनाचे किमतीचे धोरण पूर्णपणे फसल्याचे दिसून येते. पीकविमा देण्यापेक्षा शेती मालाला बाजार भावानुसार वाजवी मूल्य दिले तर शेती उत्पादन वृध्दींगत होण्यास मदत होईल तसेच विषेशतः ग्रामीण शेतकऱ्यांना प्रवाहात येण्यास मदत होईल. जलसंधारणाची कामे योग्य रितीने न केल्यामुळे शेतीवर विपरीत परिणाम झाला असल्याचे दिसून येते. शहरी भागातील वाढत्या प्रदूषणाचा परिणाम शेतीवर होत असून त्याचा ग्रामीण विकास खुंटण्यावर परिणाम झाल्याचे निदर्शनास येते. कारखान्यांच्या सांडपाण्याची योग्य विल्हेवाट न लावण्याने शेतीपूरक मृदेची प्रत खालावत चाललेली दिसून येते. बेरोजगारीचा सर्वाधिक परिणाम हा ग्रामीण विकासावर होताना दिसून येतो. प्रामुख्याने शेतीतील हंगामी बेरोजगारी हे उदाहरण सांगता येईल. शेतीविशयक योजनांची सरकारने योग्यरित्या अंमलबजावणी करणे महत्वाचे असून गावपातळीवर विशेषतः शिबिरे, विविध शेतीविषयक मार्गदर्शनपर कार्यक्रम यांचे आयोजन करून शेतकऱ्यांना सखोल माहिती देणे गरजेचे आहे. तरच या आधुनिक शेतीच्या प्रवाहात ग्रामीण शेतकरी तग धरून वाटचाल करू शकेल.

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शेती विकासावर परिणाम करणाऱ्या घटकांचा अभ्यास

|ÉÉ.bÉ. xÉÉ¨Énú´É ºÉ{ÉiÉ®É´É MÉÉb

ºÉ½ÉªÉaÉEò |ÉÉvªÉÉ{ÉEò, ¦ÉMÉÉ±É Ê´É¦ÉMÉ, ¦ÉÉ< ÊEò¶ÉxÉ®É´É n¶É¨ÉJÉ ¨É½ÉÉ´É tÉ±ÉªÉ, SÉÉEò®ú

|É°ïÉÉ´ÉxÉÉ :

+ÉÌlÉEò Ê´ÉEòÉºÉÉºÉÉ`ú +É tÉÊMÉEò®úhÉ +É´É¶ªÉEò +ºÉ±É iÉ®ú +xÉEò Ê´ÉEòºÉxÉÉ¶É±É n¶É ½ ¨ÉÉ`ú¬É |É¨ÉÉhÉÉ´É®ú EòªÉÒ lÉjÉÉ´É®ú +´É±ÉªÉxÉ +É½iÉ. =nÉ. ¦ÉÉ®iÉÉ¨ÉvªÉ ÉxÉªÉÉvÉxÉÉSÉÒ {ÉÉSÉ n¶ÉEò ±ÉÉ]ú±ªÉÉxÉiÉ®ú½ 1996-97 ¨ÉvªÉ ºÉEò³ú ®É¹]úªÉ =i{ÉÉnxÉÉSªÉÉ (GDP) 26.1]úCEò B´Éfú EòªÉÒ lÉjÉÉSÉ ªÉÉMÉnÉxÉ +É½. 2001-02 ±ÉÉ 24.3]úCEò {ÉªÉiÉ Eò¨ÉÒ ZÉÉ±É. 2001-02 SªÉÉ VÉxÉMÉhÉxÉºÉÉ®ú BEòhÉ EòÉªÉEò®úÒ ±ÉÉEòºÉJªÉ{ÉEòÒ, VÉ´É³ú VÉ´É³ú 69.00]úCEò ±ÉÉEòºÉJªÉÉ ®ÉVÉMÉÉ®ÉSªÉÉ ¤ÉÉ¤ÉiÉÒúiÉ EòªÉÒ´É®ú +´É±É¤ÉxÉ +É½. +¨ÉÊ®úEò ºÉÉ®úJªÉÉ Ê´ÉEòÉºÉiÉ n¶ÉÉiÉ ½ |É¨ÉÉhÉ EòÉ³ú 2.00]úCEò <iÉEò +É½. n¶ÉÉSªÉÉ +¦ªÉÉ´É°üxÉ ´É +xÉ¦É´ÉÉ´É°üxÉ +ºÉ ÉxÉn¶ÉxÉÉºÉ aÉiÉ Eòà, EòªÉÒ lÉjÉÉSªÉÉ Ê´ÉEòÉºÉÉ Ê¶É´ÉÉªÉ +É tÉÊMÉEò®úhÉ ¶ÉCªÉ xÉÉ½Ò +ÉÊhÉ +É tÉÊMÉEò Ê´ÉEòÉºÉÉÉ¶É´ÉÉªÉ ®ÉVªÉ ÊEò´ÉÉ n¶ÉÉSÉÉ Ê´ÉEòÉºÉ ºÉÉvÉhÉ ¶ÉCªÉ xÉÉ½Ò.

2)=Êq¹]¬ :

1)शेती विकासावर परिणाम करणाऱ्या घटकांचा शोध घेणे.

2)¶ÉiÉÒ / EòªÉÒ aÉÉ ºÉEò±{ÉxÉSÉÉ +¦ªÉÉºÉ Eò®úhÉ.

3)¶ÉiÉÒ Ê´ÉEòÉºÉÉºÉÉ`ú EòÉ½Ò ¨É½k´É{ÉhÉ ={ÉÉªÉ ºÉSÉÉ´ÉhÉ.

3)ºÉ¶ÉÉvÉxÉ {É r iÉÒ :

|É°ïÉiÉ ¶ÉÉvÉ ÊxÉ¤ÉvÉÉSÉÉ +¦ªÉÉºÉ Eò®úhªÉÉºÉÉ`ú nªªÉ´É °jÉÉiÉÉSÉÉ +ÉvÉÉ®ú PÉhªÉÉiÉ +É±ÉÉ +É½, aÉÉiÉ Ê´É¹ÉªÉÉ¶ÉÒ ºÉ¤ÉvÉÒúiÉ +xÉEò {É°ïÉEò, ºÉn¦É OÉlÉ, ¨ÉÉÉºÉEò, ´ÉiÉ¨ÉxÉ{ÉjÉ, ºÉ¶ÉÉvÉxÉ {É{É®ú, ®É¹]úªÉ ´É +ÉiÉ®úÉ¹]úªÉ »ÉÉ´É°üxÉ |ÉEòÉÉ¶ÉiÉ ½ÉhÉÉ®úÒ ¨ÉÉÉ½iÉÒ ºÉEò±ÉÒúiÉ Eò°üxÉ ¶ÉÉvÉ ÊxÉ¤ÉvÉ ºÉÉn®ú Eò®úhªÉÉiÉ +É±ÉÉ +É½.

4)Ê´É¹ÉªÉ Ê´É´ÉSÉxÉ :

Eò¹É ¨½hÉVÉ xÉÉMÉ®úhÉ aÉÉ {ÉÉºÉxÉ EòªÉÒ ½É ¶É¤n ÊxÉ¨ÉÉhÉ ZÉÉ±ÉÉ. EòªÉÒ aÉÉSÉÉ +lÉ VÉÊ¨ÉxÉ xÉÉMÉ®úhÉ +ÉÊhÉ iªÉÉiÉ É{ÉEò PÉhÉ B´ÉfÉSÉ ¨ÉªÉÉÉnúiÉ xÉºÉxÉ iÉÉ Ê´É°ïÉiÉ ´É ´aÉÉ{ÉEò +ºÉÉ +É½. ºÉÉ¨ÉÉxªÉ{ÉhÉ ¶ÉiÉÒ ¨½hÉVÉ ={É±É¤vÉ VÉÊ¨ÉxÉÒSÉÉ ¨ÉxÉ¹ªÉ¤É³ú, ªÉjÉ, iÉjÉ, aÉÉSªÉÉ ºÉÉÁÉxÉ ¶ÉCªÉ iÉ´ÉfÉ aÉÉMªÉ ={ÉªÉÉMÉ Eò°üxÉ É{ÉEòÉSÉ =i{ÉÉnxÉ EòÉfhÉ ½ÉªÉ. É{ÉEòÉSÉ =i{ÉÉnxÉ EòÉfhÉ ½Ò Eò±ÉÉ ´É ¶ÉÉºÉjÉ +É½.

¶ÉiÉÒSÉÉ =MÉ¨É EòÓ½É EòvÉÒ ´É EòÉÊ`ú ZÉÉ±ÉÉ aÉÉ ¤ÉÉ¤ÉiÉ ¨ÉiÉ¦Énú +ºÉ±É iÉ®ú ÊºÉ¨ÉÉxºÉ SªÉÉ ¨ÉiÉ, +ÉÊhÉ ={É±É¤vÉ {É®É´ªÉÉ{É°üxÉ सुमारे आठ ते दहा हजार वर्षापूर्वी शेतीला सुरूवात झाली असावी व ती नद्यांच्या खोऱ्यात आणि महिला Eòbxú ¶ÉiÉÒ Eò±ÉÒ MÉ±ÉÒ

+ºÉÉ´ÉÒ +ºÉÉ½Ò ¨ÉiÉ|É´ÉÉ½ +É½. ¶ÉiÉÒ¨É³ ¨ÉÉxÉ´ÉÒ VÉÒ´ÉxÉÉSªÉÉ BEòÉ xÉ´ªÉÉ ÎºlÉ®ì VÉÒ´ÉxÉÉºÉ |ÉÉ®¦É ZÉÉ±ÉÉ. ªÉlÉxÉSÉ ¨ÉÉxÉ´ÉÒ ºÉºEòiÉÒSÉÉ Ê´ÉEòÉºÉ ½É>ðxÉ EòªÉÒSÉÉ |ÉSÉÉ®ì +ÉÊhÉ |ÉºÉÉ®ì ZÉÉ±ÉÉ. ¨½hÉxÉ ¨ÉÉxÉ´ÉÒ Ê´ÉEòÉºÉÉiÉ ¶ÉiÉÒ±ÉÉ +hÉhªÉ ºÉÉvÉÉ®ìhÉ ¨É½k´É +É½.

¦É]ÌCªÉÉ +´ÉºlÉiÉxÉ ¨ÉÉxÉ´ÉÒ VÉÒ´ÉxÉÉ±ÉÉ ÎºlÉ®iÉÉ |ÉÉ{iÉ ZÉÉ±ªÉÉ´É®ì VÉÉ¨ÉxÉ xÉÉMÉ°üxÉ, JÉiÉ PÉÉ±ÉxÉ ®É{ÉÉSÉÒ ±ÉÉ´Éb Eò±ªÉÉºÉ É{ÉEò VÉÉºiÉ ªÉiÉ +ºÉÉ ¶ÉÉvÉ ±ÉÉMÉ±ÉÉ +ºÉÉ´ÉÉ Eò¹ÉÒ =i{ÉÉnxÉ ´ÉÉf±ªÉÉ´É®ì ´ÉºÉÉ½iÉÒ ¨ÉÉ`ì¬É ½É>ðxÉ xÉÉMÉ®ì0 ºÉºEòìÉÒ +ÎºiÉì´ÉÉiÉ +É±ÉÒ +ºÉÉ´ÉÒ. <ÊiÉ½ÉºÉÉ±ÉÉ ¨ÉÉÉ½iÉÒ +ºÉ±É±ÉÒ {ÉÉ½±ÉÒ ¶ÉiÉÒ ÊLÉ.{É. ºÉ¨ÉÉ®ì 5000 ´É¹ÉÉ{É´ÉÒ <ÊVÉ{iÉ +ÉÊhÉ ¤ÉÉ¤É±ÉÉÉxÉªÉÉ ªÉlÉ Eò±ÉÒ VÉÉiÉ ½ÉiÉÒ. ®É¨ÉxÉ EòÉ³ÉiÉ MÉ´½, VÉ´É, +É]¡, pÉlÉ ªÉÉSÉ =i{ÉÉnxÉ ½ÉiÉ ½ÉiÉ. ¨ÉvªÉªÉMÉÒxÉ EòÉ³ÉiÉ ªÉ®É{ÉÉiÉ BEòÉ ¦ÉÉMÉÉ´É® ¶ÉiÉÒ i®ì nºÉ®É ¦ÉÉMÉ {ÉÉbÉò `ì´É±ÉÉ VÉÉiÉ ½ÉiÉÉ. ºÉÉ³É´ªÉÉ ¶ÉiÉÉEòÉiÉ <M±Éb¨ÉvªÉ EòÒ{ÉhÉ ¶ÉiÉÒ ¨½hÉVÉ +±ÉMÉ ´ÉªÉÎCiÉEò, ¦ÉÉb´É±É, MÉiÉ´ÉhÉEò Eò°üxÉ, ¨É¶ÉÉMÉiÉ, ºÉvÉÉ®ì0iÉ ÊªÉªÉÉhÉ ªÉÉSÉÉ ´ÉÉ{É®ì Eò°üxÉ ¶ÉiÉÒ Eò±ÉÒ MÉ±ÉÒ. 1725 {ÉÉºÉxÉ {Éfì iÉ®ì Eò¹ÉÒ {ÉbÒìÉÉxÉÒ ¶ÉiÉÒìÉ +¨É±ÉÉOÉ ¤Én±É Eò®ìiÉ EòÉ¹É +´ÉVÉÉ®ì ªÉjÉ ´É iÉjÉYÉÉxÉÉSÉÒ ¦É®ì PÉÉ±ÉiÉ ¶ÉiÉÒ Ê´ÉEòÉºÉÉiÉ ¨É½kÉ´É{ÉhÉ ªÉÉMÉnÉxÉ Ên±É. {Éb <M±Éb¨ÉvÉªÉ Agricultural Research Council SÉÒ (1931) ºlÉÉ{ÉxÉÉ ZÉÉ±ªÉÉ´É®ì+ÉÊhÉ +MÉÉn®SÉ PÉbxÉ +É+É±É±ÉÒ +ÉÉtMÉEò GòÉiÉÒ (1850) ªÉÉ¨É³ iÉ®ì Eò¹ÉÒ Ê´ÉEòÉºÉÉiÉ ¨ÉÉ±ÉÉSÉÒ ¦É®ì {Éb±É0. +ÉVÉ VÉMÉÉiÉÒ±É VÉ´É³É{ÉÉºÉ ºÉ´ÉSÉ ®É¹]ì Eò¨ÉÒ +ÉvÉEò ¡ò®ìEòÉxÉ +zÉvÉÉxªÉÉSªÉÉ ¤ÉÉ¤ÉiÉÒiÉ º´É¤É{ÉhÉ ZÉÉ±É±ÉÒ ÊnºÉxÉ ªÉiÉÉiÉ.

5)¶ÉiÉÒ Ê´ÉEòÉºÉÉ´É® {ÉÉ®hÉÉ¨É Eò®hÉÉ®ì PÉ]ÌEò :

¨ÉÉxÉ´ÉÉxÉ +É{É±ªÉÉ ¤ÉrÒEòÉ¶É±ªÉÉSÉÉ ÊEòiÉÒ½Ò ={ÉªÉÉMÉ Eò°üxÉ ¶ÉiÉÒ ´ªÉ´ÉºÉÉªÉÉ´É®ì +É{É±É |É¦Éi´É Ê¨É³É´ÉhªÉÉSÉÉ |ÉªÉixÉ Eò±ÉÉ +ºÉ±ÉÉ iÉ®ì0 xÉºÉÌMÉEò PÉ]ÌEò ½É Eò¹ÉÒSÉÉ BEò¨É´É ´É |É¨ÉJÉ +ÉvÉÉ®ì +É½. ºÉ´É ºÉÉvÉÉ®ìh{ÉhÉ BEòhÉ +¦ªÉºÉÉiÉÒ ¶ÉiÉÒ´É® JÉÉÉ±É±É PÉ]ÌEò {ÉÊ®ìhÉÉ¨É Eò®ìiÉÉxÉÉ ÊnºÉxÉ ªÉiÉÉiÉ.

1. ½´ÉÉ¨ÉÉxÉ :

शेतीवर परिणाम करणाऱ्या प्रमुख घटकात हवामान सर्वाधिक प्रभावी आहे. हवामाXÉÉiÉ iÉÉ{É¨ÉÉxÉ, {ÉVÉxªÉ, +ÉpiÉÉ, +ÉEòÉ¶ÉÉSÉÒ ÎºlÉiÉÒ, {ÉÉ®É, ºÉªÉ|ÉEòÉ¶É <. PÉ]ÌEò ºÉ¨ÉÉÉ´É¹`ì ½ÉiÉÉiÉ. iÉÉ{É¨ÉÉxÉ +ÉÊhÉ {ÉVÉxªÉÉ´É®ì ¶ÉiÉÒ =i{ÉÉnxÉ ÊxÉÎ¶SÉiÉ ½ÉiÉÉiÉ. =nÉ. Eò³ì0 ½ {ÉÒEò =¹hÉ EòÊ]ì¤ÉvÉÉiÉ ªÉiÉ EòÉ®hÉ Ê{ÉEòÉºÉ +ÊvÉEò iÉÉ{É¨ÉÉxÉÉSÉÒ +É´É¶ªÉEòiÉÉ +ºÉiÉ. MÉ´½ ½ {ÉÒEò Ê½´ÉÉ²ªÉÉiÉ ®¤¤ÉÒ ½MÉÉ¨ÉÉiÉ PÉiÉ±É VÉÉiÉ. iÉÉn³¡, SÉ½É, EòÉ¡ò0, >ðºÉ ªÉÉ Ê{ÉEòÉxÉÉ VÉÉºiÉ iÉ{É¨ÉÉxÉ ´É +ÊvÉEò {ÉVÉxªÉÉSÉÒ MÉ®ìVÉ +ºÉiÉ. ½Ò Ê{ÉEò ¨ÉÉºÉ¨ÉÒ ½´ÉÉ¨ÉÉxÉÉiÉ PÉiÉ±ÉÒ VÉÉiÉ. EòÉÎ¶¨É®ì ¨ÉvªÉ ºÉ¡ò®ìSÉnÉSÉ Ê{ÉEò Ê¶ÉiÉ ½´ÉÉ¨ÉÉxÉÉiÉ Ê¨É³¡iÉ. ªÉÉ ´É°üxÉ Ê´ÉÉ´ÉvÉ ½´ÉÉ¨ÉÉxÉÉSªÉÉ |Én¶ÉÉiÉ Ê´ÉÉ´ÉvÉ ½´ÉÉ¨ÉÉxÉÉiÉ PÉiÉ±ÉÒ VÉÉiÉÉiÉ. EòÉÎ¶¨É®ì ¨ÉvªÉ ºÉ¡ò®ìSÉnÉSÉ Ê{ÉEò Ê¶ÉiÉ ½´ÉÉ¨ÉÉxÉÉiÉ Ê¨É³¡iÉ. ªÉÉ´É°üxÉ Ê´ÉÉ´ÉvÉ ½´ÉÉ¨ÉÉxÉÉSªÉÉ |Én¶ÉÉiÉ Ê´ÉÉ´ÉvÉ |ÉEòÉ®ìSÉÒ Ê{ÉEò =i{ÉÉnÒìÉ ½ÉiÉÉiÉ ½ ÊnºÉxÉ ªÉiÉ. ªÉÉ=±É]¡ Ê´É¹É´É´ÉiÉÒªÉ, =¹hÉ ´ÉÉ³´É]ì0 bbÉ ½´ÉÉ¨ÉÉSÉ |Én¶É Ê{ÉEòÉSªÉÉ =i{ÉÉnxÉÉºÉ ¡ÉÉ®ìºÉ +Eò±É xÉÉ½ìÉ ªÉÉ´É°üxÉ ½SÉ ±É lÉÉiÉ ªÉiÉ Eòì, ½´ÉÉ¨ÉÉxÉÉSÉÉ ¶ÉiÉÒSªÉÉ Ê´ÉEòÉºÉÉ´É®SÉ {ÉÉ®hÉÉ¨É ½ÉiÉÉ +ºÉ xÉÉ½Ò iÉ®ì Ê{ÉEòÉSªÉÉ |ÉEòÉ®ìÉ´É®ì ´É iªÉÉSªÉÉ =i{ÉÉnxÉÉ´É®ì ½Ò |É¦ÉÉ´É {ÉbiÉÉ.

2)|ÉÉEòÉiÉEò ®SÉxÉÉ :

|ÉÉEòÉiÉEò ®SÉxÉSÉÉ ¶ÉiÉÒ ´ªÉ´ÉºÉÉªÉ´É®ì {ÉÉ®hÉÉ¨É ½ÉiÉÉ. {É´ÉiÉ, {É`ìÉ®ì, ¨ÉnÉxÉ ªÉÉiÉ {ÉlÉ´ÉÒSÉ |ÉÉEòÉiÉEò ®SÉxÉÉ Ê´É¦ÉÉMÉ±ÉÒ MÉ±ÉÒ +É½. ºÉ{ÉÉ]ì +ÉÊhÉ ¨ÉnÌ =iÉÉ®ÉSÉ |Én¶É, xÉtÉSÉÒ JÉÉ®ì0, ÉjÉ¦ÉvÉ |Én¶É ¶ÉiÉÒºÉÉ`ì0 ={ÉªÉCiÉ `®ìiÉÉiÉ, +¶ÉÉ VÉÉ¨ÉxÉÒSÉÒ ¨É¶ÉÉMÉiÉ Eò®hÉ ºÉÉ{É

VÉÉiÉ. {ÉÉhªÉÉSÉÉ ÊxÉSÉ®ÉÉ SÉÉगला होतो. जमिनीची धुप होत नाही. या उलट पर्वताच्या उतारावर पायऱ्यापायऱ्याची शेती केली जाते. ¦ÉÉ®ÉiÉÉiÉ ºÉÁÉpÀ {É´ÉiÉÉSªÉÉ =iÉ®ÉhÉÒ´É®É SÉ½É, EòÉ¡ÒÀ ®¤É®É ªÉÉSÉ =i{ÉÉnxÉ PÉiÉ±É VÉÉiÉ. ªÉlÉ iÉÉ{É¨ÉÉxÉ Eò¨ÉÒ +ºÉiÉ. {É`É®ÉÀ |Én¶É ¶ÉiÉÒºÉÉ`ÉÀ ={ÉªÉCiÉ `ÉºÜ ±ÉÉMÉ±É +É½iÉ. ªÉlÉ VÉ±ÉÉºÉSÉxÉÉSªÉÉ ºÉÉ´ÉvÉÉ ÊxÉ¨ÉÉhÉ Eò°üxÉ ¶ÉiÉÒ Ê´ÉEòÉºÉ ºÉÉvÉhÉÉªÉÉEòÉb ±ÉÉEòÉSÉÉ ´ÉÉfiÉÉ Eò±É ÊnºÉxÉ ªÉiÉ +É½. ªÉlÉ >ðºÉ, EòÉ{É ºÉ, MÉ´½, V´É®ÒÀ, ¤ÉÉVÉ®ÒÀ ªÉSÉ =i{ÉÉnxÉ ½iÉ. ¨ÉnÉxÉÒ |Én¶ÉÉSªÉÉ 80 iÉ 90 ]CEò ¦ÉÉMÉÉ´É® ¶ÉiÉÒ Eò±ÉÒ VÉÉiÉ. iªÉÉ JÉÉ±ÉÉJÉÉ±É {É`É®ÒÀ |Én¶É ´É {É´ÉiÉÒªÉ |Én¶ÉÉSÉÉ Gò¨É ±ÉÉMÉiÉÉ +ÊvÉEò =iÉÉ®ÉSªÉÉ |Én¶É´É® +ºÉ]Ê±ÉªÉÉ, n-+ÉÉ£ÒEòÉ, ª.BºÉ.B., ¦ÉÉ®iÉ, SÉÒxÉ <. n¶ÉÉiÉ bÉMÉ® =iÉ®ÉhÉÒ´É® {É¶É{ÉÉ±ÉxÉ ´ªÉ´ÉºÉÉªÉ ±ÉÉEòÉ|ÉªÉ ZÉÉ±ÉÉ +É½.

3)VÉÉ¨ÉxÉ :

VÉÉ¨ÉxÉÒSªÉÉ |ÉÉEòÉiÉEò +ÉÉhÉ ®ÉºÉÉªÉÉxÉEò MÉhÉvÉ¨ÉÉ´É® Ê{ÉEòÉSÉÉ |ÉEòÉ® ´É n® BEò®ÒÀ =i{ÉÉnxÉ +´É±É¤ÉxÉ +ºÉiÉÉiÉ. VÉÉ¨ÉxÉÒSªÉÉ |ÉEòÉiÉEò MÉhÉvÉ¨ÉÉiÉ VÉÉ¨ÉxÉÒSÉÉ ®MÉ, {ÉÉiÉ, JÉÉ±ÉÒ, VÉÉbÒ iÉ® ®ÉºÉÉªÉÉxÉEò MÉhÉvÉ¨ÉÉiÉ VÉÉ¨ÉxÉÒiÉÒ±É JÉÊxÉVÉ p´ªÉ, ¨ÉnÉVÉ±É, Ê´ÉPÉ]xÉ¶ÉÒ±É p´ªÉ, ªÉÉSÉÉ ºÉ¨ÉÉ´É¶É ½iÉÉ. VÉÉ¨ÉxÉÒiÉ JÉÊxÉVÉ +ÉÉhÉ lÉÉ® +ºÉiÉÉiÉ. ºÉb±É±ªÉÉ, EòVÉ±É±ªÉÉ ´ÉxÉº{ÉiÉÒ +ÉÉhÉ iªÉÉSÉÉ {ÉÉ±ÉÉ{ÉÉSÉÉ³É, |ÉÉhªÉÉSÉ ¨ÉiÉÉ´É¶É¹É ªÉÉ¨É³ VÉÉ¨ÉxÉÒiÉ ºÉÉpªÉ p´ªÉÉSÉ |É¨ÉÉhÉ ´ÉÉfxÉ iÉÉ ºÉ{ÉÒEò ½iÉ. iÉÒSÉÒ =i{ÉÉnxÉ lÉ¨ÉiÉÉ ´ÉÉfiÉ. ¨ÉnSªÉÉ EòhÉÉSÉÉ +ÉEòÉ®É ¤ÉÉ®ÒEò, ºÉl¨É +ºÉ±ªÉÉºÉ iÉÒ +ÊvÉEò ºÉ{ÉÒEò +ºÉiÉ. =nÉ. MÉÉ³ÉSªÉÉ VÉÉ¨ÉxÉÒ, EòÉ³Ò EòºÉnÉ® VÉÉ¨ÉxÉ, SÉhÉÉZÉ¨É VÉÉ¨ÉxÉÒ ¶ÉiÉÒ =i{ÉÉnxÉÉºÉÉ`ÉÀ ={ÉªÉCiÉ `É®iÉÉiÉ. Ê{ÉEòÉSªÉÉ +ÊvÉEò =i{ÉÉnxÉÉºÉÉ`ÉÀ VÉÉ¨ÉxÉÒSÉÒ xÉÉMÉ®hÉÒ, Ê{ÉEòÉSªÉÉ ¨É³ÉSÉ JÉÉ±É´É® VÉÉhÉ, ¨ÉniÉ ½´ÉSÉ ºÉSÉÉ±ÉxÉ, {ÉÉhÉÒ +É±ÉÉ´ÉÉ `Ó´ÉhªÉÉSÉÒ lÉ¨ÉiÉÉ, ¤ÉÉ¹{ÉÒ¦É´ÉxÉ ½ÉhÉ <. PÉ]ÉEò½ÒÀ ¨É½k´ÉÉSÉ `É®iÉÉiÉ.

4)VÉÒ´É PÉ]Eò :

¶ÉiÉÒ Ê{ÉEòÉSªÉÉ =i{ÉÉnxÉ lÉ¨ÉiÉÉiÉ VÉÒ´É PÉ]ÉEò ¨É½k´ÉÉSÉ +É½iÉ. VÉÉ¨ÉxÉÒiÉÒ±É EòÉ½Ò ¤ÉC]É®ªÉÉ, VÉÒ´ÉÉhÉ MÉÉb³¦ aÉÉ ºÉÉ®JÉ PÉ]ÉEò VÉÉ¨ÉxÉÒ ¦É¤É¦É¤ÒiÉ Eò®iÉÉiÉ iÉ® EòÉ½Ò VÒ´ÉÉhÉ, Ê´É¹ÉÉhÉ, Eò¨ÉÒ, ÊEò]ÉEò, ¤ÉÉbMÉ³, ®ÉMÉVÉn, ¨ÉMªÉÉ, ´ÉÉ³´ÉÒ]É³¦VÉÉb Ê{ÉEòÉSÉÒ ¡ò³, ¡ò±É, {ÉÉxÉ, ¨É³ JÉ>ð ¡ò¤iÉ Eò®iÉÉiÉ. =nÒ® PÉ¶ÉÒ ={Ép´ÉÒ `É®iÉÉiÉ. MÉÉVÉ®MÉ´ÉiÉ, EòÉ®b, MÉ´ÉiÉ <. ºÉÉ®JÉ iÉhÉ Ê{ÉEòÉ±ÉÉ ¨ÉÉ®ÉEò `É®iÉ.

VÉiÉxÉÉ¶ÉEò ´É ÊEò]ÉEòxÉÉ¶ÉEò ªÉÉSÉÉ ªÉÉMªÉ |É¨ÉÉhÉÉiÉ ´ÉÉ{É®É Eò°üxÉ iªÉÉ´É® ÊxÉªÉjÉhÉ `Ó´ÉiÉÉ ªÉiÉ. {É®iÉ ºÉvªÉÉ ªÉÉSªÉÉ +ÊiÉ®EòÒ ´ÉÉ{É®É¨É³ |Én¹ÉhÉÉiÉ ¦É®É {ÉbxÉ {ÉªÉÉ´É®hÉÉ±ÉÉ vÉÉEòÉ ÊxÉ¨ÉÉhÉ ZÉÉ±ÉÉ +É½.

5)+ÉÌlÉEò PÉ]Eò :

¶ÉiÉÒ Ê´ÉEòÉºÉÉ´É®É |ÉÉEòÉiÉEò ËEò´ÉÉ xÉºÉÉÌMÉEò PÉ]ÉEò VÉºÉ {ÉÉ®hÉÉ¨É Eò®iÉÉiÉ iÉºÉSÉ +ÉÌlÉEò PÉ]ÉEò½Ò {ÉÉ®hÉÉ¨É Eò®iÉÉiÉ. =i{ÉÉnxÉ JÉSÉ, |ÉÉGòªÉÉ JÉSÉ, ´ÉÉ½iÉEò, ¨ÉVÉ®, ¤ÉÉVÉÉ®{É`É, ¦ÉÉb´É±É, ºÉ®EòÉ®SÉ +ÉÌlÉEò vÉÉ®hÉ, ´ªÉÉ{ÉÉ®, +ÉÌlÉEò ºÉPÉ]xÉÉ <. PÉ]ÉEò ªÉÉiÉ ¨É½k´É{ÉhÉ `É®iÉÉiÉ. ¦ÉÉb´É±ÉÉJÉ®ÒVÉ ¶ÉiÉÒ Ê´ÉEòÉºÉ ºÉÉvÉhÉ ¶ÉCªÉ xÉÉ½Ò. Ê´ÉÉ´ÉvÉ +iªÉÉvÉÉxÉEò ¤ÉÒ-Ê¤ªÉÉÉhÉ, JÉiÉ, VÉiÉxÉÉ¶ÉEò, ÊEò]ÉEòxÉÉ¶ÉEò, Eò¹ÉÒ +´ÉVÉÉ®, +ÉiÉ®É ¨É¶ÉÉMÉiÉÒSÉÒ EòÉ¨É, ¨ÉVÉ® JÉSÉ, VÉ±ÉÉºÉSÉxÉ JÉSÉ, ªÉjÉºÉÉ¨ÉÒEò, EòÉ{ÉhÉÒ, iÉÉbhÉÒ, ¨É³hÉÒ, ¦É®hÉÒ, ´ÉÉ½iÉEò, ½¨ÉÉ±É, n±ÉÉ±É, VÉEòÉiÉ, Ê´É¨ÉÉ <. ºÉÉ`Ó ¦ÉÉb´É±É ¨É½k´ÉÉSÉ +ºÉiÉ.

VÉ±ÉÉºÉSÉxÉ PÉ]ÉEò½Ò ¶ÉiÉÒ Ê´ÉEòÉºÉÉ´É® |É¦ÉÉ´É]ÉEòiÉ +ºÉ±ªÉÉxÉ {ÉÉ´É ºÉÉSªÉÉ {ÉÉhªÉÉSªÉÉ |ÉiªÉEò lÉ¤É ºÉÉ`Ó´ÉhÉ +É´É¶ªÉEò `É®iÉ. EòÉjÉ¨É {ÉÉÉhÉ {É®´É`Ó¡É ¤ÉÉ¤ÉiÉ iÉ³, Ê´É½ÒÀ®, ¤ÉÉ+®´É±É, vÉ®hÉ, xÉtÉ xÉÉ±É, EòÉ±É´É ªÉÉSªÉÉ {ÉÉhªÉÉSÉ ÊxÉªÉÉxÉ Eò°üxÉ ¶ÉiÉÒ±ÉÉ {ÉÉÉhÉ {É®´É`É Eò±ªÉÉºÉ Eò¹ÉÒ =i{ÉÉnxÉ ´ÉÉfhªÉÉºÉ SÉÉ±ÉxÉÉ Ê¨É³¡iÉ.

¨ÉVÉ® {É®´É`É :

½É E¤¹É¤ Ê´ÉE¤É°¤É¡É¤±É ¨É½k´ÉÉSÉÉ PÉ]ɤ¤ aÉÉSªÉÉ È¶É´ÉÉªÉ E¤¹É¤ Ê´ÉE¤É°¤É °ÉÉvÉhÉ ¶ÉCªÉ xÉÉ½¤. ¶É¡É¤SªÉÉ +É¡É®¦ ¨É¶ÉÉMÉ¡É¤{ÉÉ°ÉxÉ ¡É ¤ÉÉVÉÉ®{É`¡É ¨ÉÉ±É {ÉÉ½SÉ {ÉªÉ¡É ¶É¡É¤SªÉÉ Ê´ÉÉ´ÉvÉ ÊG¤ªÉÉ°ÉÉ`¤ ¦É®{É® - ¨É¤É±ÉE¤ ´É º´É°¤¡É n®É¡É ¨ÉVÉ® {É®´É`¡É ½ÉhÉ +É´É¶ªÉE¤ +°É¡É. °ÉvªÉÉ +¨ÉÉ®ɤÉ, +É°]ÉÉ±ÉªÉÉ °ÉÉ®JªÉÉ E¤¨É¤ ±ÉÉE¤°ÉJªÉSªÉÉ n¶ÉÉ¡É ¶É¡É¤ ªÉÉÉjÉE¤ {ÉrɡÉ¤xÉ E¤±É¤ VÉÉ¡É.

´ÉÉ½¡ÉÉE¤¤SªÉÉ °ÉÉvÉxÉÉxÉÉ½¤ ¶É¡É¤ Ê´ÉE¤É°¤ÉÉ¡É ¨É½k´ÉÉSÉ °ÉÉxÉ +É½. =¡{ÉÉn¤¡É ¶É¡É¨ÉÉ±É ¤ÉÉVÉÉ®{É`¡É {ÉÉ`¡É´ÉhªÉÉ°ÉÉ`¤ ¤É±ÉMÉÉb¤, ]ɪC]®, ¨ÉÉ±É]ɤ, ®±´É ´ÉÉPÉ¤hÉ¤, +ÉMÉ¤ÉÉ]ɤ, VÉ½ÉVÉ ½¤ °ÉÉvÉxÉ ¨É½k´ÉÉSÉ¤ +É½¡É. ¡É® xÉÉ¶É´É¡É EºSªÉÉ¨ÉÉ±É nvÉ, n¤MvÉVÉxªÉ {ÉnÉ¤É, ¦É+ÉVÉ¤{ÉÉ±É, xÉÉ¶É´É¡É ¨ÉÉ±É ¶ÉCªÉ¡ÉÉ ±É´ÉE¤®¤ ¤ÉÉVÉÉ®{É`¡É {ÉÉ`¡É´ÉhªÉ°ÉÉ`¤ ´ÉÉ¡ÉÉxÉE¤É¤±É¡É ´ÉÉ½¡ÉE¤ ªÉj¡ÉhÉÉ, +¡ªÉÉvÉÉxÉE¤ ªÉj¡ÉhÉ °É°ÉVªÉ +°ÉhÉ +É´É¶ªÉE¤ É½. =nÉ. E¤É¶¨É®¤ ¨ÉvÉ¤±É °É¡¤®¤SÉn¤ ´É ¨É½É®É¹]ɡÉ¤±É E¤³¤, pÉ¤É ´ÉÉ½¡ÉE¤ °ÉÉvÉxÉÉ¨É³¤SÉ n¶É¦É®¤ ={É±É¤vÉ ZÉÉ±É¤ +É½¡É.

¤ÉÉVÉÉ®{É`¡É Á¤É =¡{ÉÉn¤¡É ¨ÉÉ±É¡ÉSªÉÉ Ê´É¡É®¤hÉÉ¡É ¨É½k´ÉÉSÉ¤ ¦ÉÉ¨ÉE¤É ¤ÉVÉÉ´É¡É ¨ÉÉ`¡¬É ¶É½®É¡É ¦ÉÉVÉ¤{ÉÉ±ÉÉ, ¡¤³¤¡¤³É´É³¤, ¡¤±É ªÉÉxÉÉ ¨ÉÉ`¤ ¨ÉÉMÉhÉ¤ +°É¡É. ¶É¡É¨ÉÉ±É¡ÉÉ ªÉÉMªÉ ¦ÉÉ´É Ê¨É³¤hªÉÉ°ÉÉ`¤ ¤ÉÉVÉÉ®{É`¡É Á¤É °É¨É¨Érɤ +°É±ªÉÉ {ÉÉÉ½VÉ¡É.

6)°É®E¤É®SÉ ¶É¡É¤ Ê´É¹É¶ªÉE¤ vÉÉ®hÉ :

E¤¹É¤ Ê´ÉE¤É°É´É® ¶ÉÉ°É¤xÉÉSªÉÉ ¶É¡É¤ Ê´É¹É¶ªÉE¤ vÉÉ®¤hÉÉSÉÉ {ÉÉ®¤hÉÉ¨É ½É¡É¡ÉÉ. +zÉvÉÉxªÉÉSÉ¤ ¡É]ɤ +°É±É±ªÉÉ n¶ÉÉ¡É ¶É¡É°ÉÉ®É ¨ÉÉ¡¤ करणे, कमाल उत्पादन करणाऱ्या शेतकऱ्याचा गौरव करणे, कृषी पंडित ही पदवी देणे, शेतमालाला ह¨É¤ ¦ÉÉ´É nhÉ. ¶ÉÉ°¡ÉªÉ {ÉrɡÉ¤xÉ ¶É¡É¦ करण्याचा प्रचार आणि प्रसार करणे, नवनवीन तंत्रज्ञान उपलब्ध करून त्याची माहिती शेतकऱ्याला देणे. ¶É¡É¤ °É¶ÉÉvÉxÉ E¤ªÉªÉÉ±ÉÉ |ÉÉ¡i°ÉÉ½xÉ nhÉ, °ÉÉ`¤ÉÉVÉ¤ , §É¹]ɤSÉÉ®¤, E¤É³ɤ°ÉÉVÉÉ®¤ ®ÉJÉhÉ, ¦ÉÉb´É±É =¦É±É¤vÉ E¤°üxÉ nhÉ ÊxÉªÉÉVÉxÉ ´É ´ªÉÉ´É°¤ɦÉÉ{ÉxÉÉ¡É °½E¤ÉªÉ E¤®¤hÉ <. PÉ]ɤ ¶ÉÉ°ÉxÉ {ÉÉ¡É³¤´É°üxÉ ½É¡É +°É±ªÉÉxÉ ¡ªÉ°É°ÉvÉÉxÉ °É¤É®¤É¡¨ÉE¤ ¦ÉÉ¨ÉE¤É `¡É±ªÉÉ°É E¤¹É¤ Ê´ÉE¤É°É °ÉÉvÉhÉ ¶ÉCªÉ +É½.

7)°ÉÉ¨ÉÉÉVÉE¤ PÉ]E¤ :

¦É®¤¡ÉÉ¡É ¦ÉÉÎ¶¨É¨ÉÉ¡ªÉ n¶ÉÉ¦É¨ÉÉhÉ ¶É¡É¤¡É¤ ¨ÉÉ`¤¬É |É¨ÉÉhÉÉ´É®¤ ªÉj¡ÉÉSÉÉ ´ÉÉ{É®¤ E¤±ÉÉ VÉÉ¡É xÉÉ½¤ ¶É¡É¤SÉ¤ ¤É®¤SÉ¶É¤ E¤É¨É ¨ÉVÉ®É¡E¤bxÉ E¤±É¤ VÉÉ¡É¡É¡É. ¦ÉÉ¡É, SÉ½É, E¤É{É°¤É, >ðº¤ ªÉÉ È{É¡E¤É¤SªÉÉ =¡{ÉÉnxÉÉ°ÉÉ`¤ ¨ÉVÉ®¤ ±ÉÉMÉ¡É¡É¡É. ¦É®¤¡É¡É¡É {É´É¤ VÉÉ¨ÉxÉnÉ®¤{ÉrɡÉ ½É¡É¤ ½ VÉÉ¨ÉxÉnÉ®¤ <¡É®¤É¡E¤bxÉ ¶É¡É¤ E¤°üxÉ PÉ¡É. ¨ÉÉ±É¡E¤¤ ½CE¤nÉ®¤ ¶É¡É¤ E¤®¤¡É +°É±ªÉÉ°É ¡ªÉ¡SªÉÉ¡E¤bxÉ +ÊvÉ¡E¤ =¡{ÉÉnxÉ ½É¡É¡ÉÉxÉÉ ÊnºÉxÉ ªÉ¡É. ¶É¡É¤¡É¤±É °üf¤, |É¤É, {É®{É®É °ÉÉbxÉ +ÉvÉÉxÉ¡E¤ ¶É¡É¤ E¤±ªÉÉ°É =¡{ÉÉnxÉ ´ÉÉfi¡É.

E¤¹É¤ Ê´ÉE¤É°É°ÉÉ`¤ E¤É½¤ ¨É½k´É{ÉhÉ Ê¶É¡É¤É®°É¤/={ÉÉªÉ :

E¤¹É¤SªÉÉ Ê{ÉE¤É°É°ÉÉ`¤ E¤¹É¤ ¤ÉjÉÉ¡É ´ÉÉf¤ E¤®¤hÉ +É´É¶ªÉE¤ +°É±É ¡É®¤, ¶É¡É¤¡É¤É¡xÉ n®¤ BE¤®¤ =¡{ÉÉnxÉ ´ÉÉf¤É´ÉhÉ ¨É½k´ÉÉSÉ +É½. ¡ªÉÉ¨É³¤ {É¤f¤±É EºÉ½¤ ¨É½k´É{ÉhÉ ={ÉÉªÉ ªÉÉVÉÉ´É ±ÉÉMÉ¡É¤±É.

1.हवामन बदलानुसार कृषी उत्पादाने घेण्यास शेतकऱ्यांना तयार करणे.

2.¶É¡É¤ VÉÉ¨ÉxÉ¤SÉÉ {ÉÉ¡É, °ÉvÉÉ°üxÉ VÉÉ¨ÉxÉ¤SÉ¤ °É{É¤E¤¡É¤ ´ÉÉfÉ´ÉhÉ.

3.ÊE¤]ɤ ´É ¡ÉhÉ xÉÉ¶ÉE¤ ¨ÉªÉÉÉn¡É |É¨ÉÉhÉÉ´É®¤ ´ÉÉ{É®¤hªÉÉ°É |ÉÉ¡i°ÉÉ½xÉ n>ðxÉ °ÉÉpªÉ ¶É¡É¤°É |É´ÉkÉ E¤®¤hÉ.

4.शेतकऱ्यांना भांडवलाची उभारणी करण्यास मदत करणे.

5.उत्तम दर्जाचे, कमी पर्जन्यावर, कमी कालावधीत भरपुर उत्पन देणाऱ्या बी-Ê¤Ê¤ÊxÊÊSÊÊ |ÉSÊÊ®\ +ÊÊhÉ |ÉºÊÊ®\ Eò®\hÉ.

6.VÉ±ÊÊºÉSÉxÊÊSªÉÊ ºÊÊ´ÉvÊÊ =Ê{É±É¤vÉ Eò°üxÉ nhÉ, ¶ÉiÉiÉ³\ªÊÊºÉ MÉiÉÒ n¨É, {ÊÊ´ÉºÊÊSªÊÊ {ÊÊhªÊÊSÉÊ |ÉiªÉEò IÉ¤É ºÊÊ`¡Ê´ÉhÉ.

7.+iªÊÊvÊÊxÉEò, ´ÊÊiÊÊxÉEò£±ÉiÉ, VÉ±ÉnÌ ´ÊÊ½iÉEò ºÊÊvÉhÉ ={É±É¤vÉ Eò°üxÉ iÉÒ Eò¹ÉÒ ¨ÊÊ±É =i{ÊÊnEò |Énq¶ÊÊ {Ê´ÉiÉ {ÊÊ`¡´ÉhÉ, {ÉCEò, =kÉ¨É ®ºiÉ iÉªÊÊ®\ Eò®\hÉ.

8.º´ÉºiÉ ´ÉÒVÉ ={É±É¤vÉ Eò°üxÉ nhÉ. ºÉ¨ÉrÌ ¤ÊÊVÊÊ®\{Ê`¡ÉiÉxÉ ªÊÊMªÉ ¦ÊÊ´É nhÉ.

9.¶ÉiÉÒ ¨ÊÊ±ÊÊ±ÊÊ ½¨ÉÒ¦ÊÊ´ÊÊ¤É®É¤É®\ iÊÊÊjÉEò YÊÊxÉ, ¶ÊÊºjÉÒªÉ ¶ÉiÉÒ, xÉ´É ºÉ¶ÊÊvÉxÉ ªÊÊºÉ SÊÊ±ÉxÊÊ nhÉ.

10.ºÊÊ`¡¤ÊÊVÉÒ, EòÉ³|É¤ÊÊVÊÊ®\, §É¹]ÉSÊÊ®\ ¤Énq Eò°üxÉ ´É®\Ò±É ºÉ´É ={ÊÊªÊÊSÉÒ |É¦ÊÊ´ÉÒ +¨É±É¤ÉVÊÊ´ÉhÉÒ Eò®\hÉ ¨É½k´ÊÊSÉ +É½.

ºÉnq¦É :

1) Eò¹ÉÒ ¦ÊÊMÉ- bÉ. Ê´Éa¡±É PÊÊ®\{É®\

2) Eò¹ÉÒ Ê´ÉEòÉºÊÊSÉ +lÉ¶ÊÊºjÉ- bÉ. {ÊÊ´É³|

3) +ÉÌlÉEò ¦ÉMÊÊ±É- bÉ. Ê´É`¡±É PÊÊ®\{É®\

4) Eò¹ÉÒ ¦ÉMÊÊ±É-bÉ. +°ühÉ Eò¦ÊÊ®\

5) Eò¹ÉÒ ¦ÉMÊÊ±É - ®ÉVÉ¶ÉÌ ¶ÉC±ÊÊ

बीड जिल्ह्यातील सामान्य भूमी उपयोजन कार्यक्षमता, एक भौगोलिक अभ्यास.

डॉ. प्रकाश काशीनाथ मोरखंडे

भूगोल विभाग, उज्वल ग्रामीण महाविद्याल घोणसी, तालुका जळकोट जिल्हा. लातूर

सारांश :-

जमीन हे मानवी समाजाचे मूलभूत साधन आहे. त्याचे सिलायझेशन पोर्टिकाडोर प्रदेश आणि माणसाच्या पर्यावरणीय परिस्थिती मधील संबंध दर्शवते. जमीन विलीकरण हा शब्द जमीनीच्या विविध वापरासाठी आणि सर्वेक्षणासाठी वापरले जाते. आणि जे. एल. बॉक च्या म्हणण्यानुसार जमीन खारटपणा हे समाधान आहे जे कृषी प्रकारातील शेत लोकसंख्येच्या उपकरणांनी भविष्यातील उत्पादन आणि राष्ट्रीय गरजांमध्ये योगदान देण्याची तरतूद विकसित केली आहे. सॉल्टर खालीलप्रमाणे जमीन वापर संशोधनाचे वर्णन समस्येच्या पापांशी संबंधित म्हणून केले जाऊ शकते ज्यामध्ये दिलेल्या परिसरातील लोक विशिष्ट जमिनीच्या आवश्यकतांसह क्रियाकलापांमधून बदलण्याच्या प्रक्रियेत आहेत किंवा विविध जमिनीच्या आवश्यकता असलेल्या क्रियाकलाप. हे घटक जमिनीचे तापमान पर्जन्यमान आणि माती आहेत, जे एका कॉन्फिगरेशन मध्ये एकत्रितपणे जमीन बनवतात ही सर्वात महत्वाची नैसर्गिक संसाधनां पैकी एक आहे. ज्यावर मनुष्याच्या सर्व क्रियाकलाप अवलंबून असतात. आणि त्याबद्दल संपूर्ण माहिती, ज्यात जमिनीचा वापर/जमीन समाविष्ट आहे. अनेक नियोजन आणि व्यवस्थापन उपक्रमांसाठी ते अत्यंत आवश्यक आहे.

बीज संज्ञा : - जमीन वापर कार्यक्षमता जमीन वापर, ग्रास पीक क्षेत्र, मानवी क्रियाकलाप, निव्वळ पेरणी क्षेत्र.

प्रस्तावना:

"जमीन वापर" हा शब्द मानवी क्रियाकलाप किंवा जमिनीच्या विशिष्ट भागाशी संबंधित आर्थिक कार्याशी संबंधित आहे, तर "जमीन कव्हर" हा शब्द पृथ्वीच्या पृष्ठभागावर असलेल्या वैशिष्ट्याच्या प्रकाराशी संबंधित आहे. म्हणून, माणूस आणि त्याच्या परस्परसंवादाला समजून घेण्यासाठी जमिनीचा वापर/ जमीन कव्हर आणि अभ्यास क्षेत्राच्या जमीन वापराच्या संबंधित गुणधर्म, जमीन वापर एका विशिष्ट प्रदेशातील विविध श्रेणी अंतर्गत प्रत्यक्ष जमिनीची कल्पना देते. हे जमिनीचे आर्थिक महत्त्व देखील दर्शवते. जमीन वापर नियोजनाची संकल्पना अलीकडेच जमीन वापर अभ्यासात सादर करण्यात आली आहे, ज्याचा अर्थ जमीन धोरणांची निर्मिती आणि प्रशासन आणि जमीन वापर अभ्यासाच्या प्रादेशिक आणि राष्ट्रीय उपचारांना आर्थिक, भौगोलिक आणि लोकसंख्या शास्त्रीय परिमाणे प्राप्त होतात.

अभ्यास क्षेत्र:

बीड जिल्हा औरंगाबाद विभागात महाराष्ट्राच्या मध्य भागात स्थित आहे. आणि मराठवाडातिल एक भाग आहे जिल्हा 18027’ ते 19027’ उत्तर अक्षांश आणि 74047’ आणि 76044’ 'पूर्व रेखांश दरम्यान आहे. गोदावरी नदी संपूर्ण उत्तर सीमेवर जिल्ह्याची सीमा बनवते. बीड जिल्हा मध्य भारतातील महाराष्ट्र राज्याच्या मध्य भागात आहे. प्रशासकीय हेतूने जिल्ह्याचे दोन भाग केले आहेत. एका विभागाला

बीड असे नाव देण्यात आले आहे आणि त्यात बीड, गेवराई, .पाटोदा, आष्टी आणि शिरूर (कासार) 5 तहसील समाविष्ट आहेत . तर दुसरा विभाग अंबाजोगाई आहे आणि 2011 च्या जनगणनेनुसार अंबाजोगाई, केज, मांजलगाव, धारूर, परळी आणि वडवणी या 6 तहसील समाविष्ट आहेत, जिल्ह्यातील साक्षरता दर 73.53% आहे. जे राज्यातील सरासरी साक्षरतेच्या दरापेक्षा खूपच कमी आहे.(82.91%) जिल्ह्याला उत्तरेत औरंगाबाद आणि जालना, पूर्वेला परभणी आणि लातूर, दक्षिणेत अहमदनगर आणि उस्मानाबाद आहे. आणि पश्चिमेकडील अहमदनगर. बीड जिल्ह्याची लोकसंख्या 25.86 लाख (जनगणना 2011) होती. आणि भौगोलिक क्षेत्र 10615 3 चौ. कि. मी. व जिल्ह्यात 11 तहसील आहेत.

संशोधन आणि कार्यपद्धती :-

पर्यटनावरील सध्या अभ्यास दुय्यम डेटा वर आधारित आहे. दुय्यम आकडेवारी सामाजिक, आर्थिक पुनरावलोकन जिल्हा जनगणना हँडबुक, गॅझेटीज, भारत सरकारच्या दशवार्षिक शतक अहवालातून गोळा केली आहे . भारत सरकार आणि महाराष्ट्र सरकारच्या संबंधित लेख, संशोधन पत्रिका, अहवाल, धोरणे आणि योजना दस्तऐवजांमधून डेटा प्राप्त झाला आहे. काही डेटा भारत सरकार आणि सरकारच्या वेबसाइटवरून प्राप्त झाला आहे. महाराष्ट्रातील, beed.nic.in, पर्यावरणाची स्थिती जाणून घेण्यासाठी हाती घेण्यात आले आहे. दुय्यम स्त्रोतांकडून डेटा गोळा केलेला आहे.

उद्दिष्टे

1. लागवडी खालील आणि संभाव्य जमीन लागवडी खाली आणून लागवडीच्या जमिनीच्या विस्ताराची व्याप्ती वाढवणे.
2. शेतीचा भौतिक आणि अ-भौतिक निर्धारकांचा अभ्यास करण्यासाठी जमीन वापर कार्य क्षमता क्षेत्रातील भिन्नतेसाठी देखील जबाबदार आहेत.
3. तत्काळ गरज सुधारणे म्हणजे पीक घेण्याच्या तीव्रतेवर अधिक भर देणे आणि विद्यमान गणना केलेल्या क्षेत्रातून उत्पन्न वाढवणे.
4. जमीन वापर कार्यक्षमतेच्या विकासासाठी जबाबदार असलेल्या घटकांची तपासणी करणे.

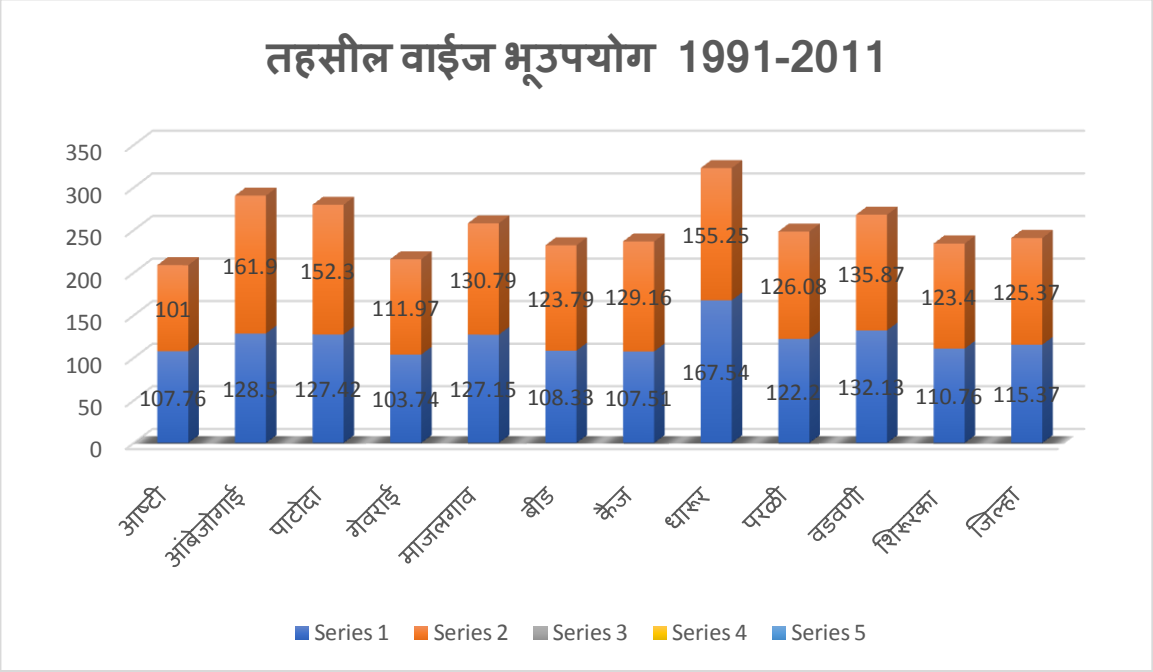
भूउपयोगी कार्यक्षमता:पडझड

लागवडीखालील जमिनीचा विस्तार करण्यास वाव आहे,आणि संभाव्य जमीन लागवडीखाली आणून बीड जिल्ह्यात 1990-91 ते 2010-11 दरम्यान, म्हणूनच, सध्याच्या गणना केलेल्या क्षेत्रामधून पीक घेण्याची तीव्रता आणि उत्पादन वाढवण्यावर अधिक भर देण्याची त्वरित गरज आहे. निव्वळ पेरणी क्षेत्राचा वापर कमी उत्पादकता आणि पीक अयशस्वी होण्याचा धोका ही मुख्य समस्या ग्रामीण लोकसंख्येबद्दल बोलत आहेत. भूउपयोगी कार्यक्षमता निव्वळ पेरणीचे क्षेत्र किती प्रमाणात कापले जाते म्हणून परिभाषित केले जाऊ शकते. निव्वळ पेरणी केलेल्या क्षेत्राच्या टक्केवारीनुसार सकल पीक क्षेत्र जमिनीच्या वापराची कार्यक्षमता मोजते, म्हणजे पीक घेण्याची तीव्रता. जमीन वापर कार्यक्षमतेच्या निर्देशांक साठी खालील सूत्र वापरले.

एकूण पीक क्षेत्र भू उपयोग कार्यक्षमता निर्देशांक = ---------- x 100

तहसील वाईज भूउपयोग क्षमता बीड जिल्हा 1991-2011. (हेक्टर मधील क्षेत्र)

अ. क्र.	तहसील	1991-2001 एकूण पीक क्षेत्र	निव्वळ पेरणी क्षेत्र	जमीन यौग्य निर्देशाक	2001-2011 एकूण पीक क्षेत्र	निव्वळ पेरणी क्षेत्र	जमीन यौग्य निर्देशाक	बदल
1	आष्टी	120100.91	118908.40	101.00	140499.98	130386	107.76	6.76
2	अंबाजोगाई	92128.48	56904.20	161.90	95241.90	74166	128.50	-33.04
3	पाटोदा	68871.01	45222.10	152.30	61507.80	48273	127.42	-24.88
4	गेवराई	154311.50	137882.90	111.97	139908.78	134862	103.74	-08.23
5	मांजलगाव	102066.63	78036.00	130.79	104981.66	82562	127.15	-03.64
6	बीड	150078.13	121237.00	123.79	135391.00	124985	108.33	-15.44
7	केज	120940.91	93635.40	129.16	95821.84	89129	107.51	-21.65
8	धारूर	37266.00	34003.10	155.25	36652.00	21876	167.54	12.39
9	परळी	68433.72	54277.7	126.08	70485.00	57681	122.20	-03.88
10	वडवणी	26170.00	19261.00	135.87	25865.00	19576	132.13	-03.74
11	शिरूर	59594.00	48294.00	123.40	57357.74	51787	110.76	-12.64
	जिल्हा	1000031.29	767661.70	125.37	963630.26	835233	115.37	-10.00



i) कमी तीव्रतेचे क्षेत्र (120 टक्के खाली):

कमी तीव्रतेचे क्षेत्र आष्टी, कैज, जिओराई आणि बीड तहसील. या तहसीलमधील बहुतेक क्षेत्र नापीक आहे माती गरीब आहे: विहिरी सिंचनासाठी पाणी पुरवत आहेत परंतु उन्हाळ्याच्या मोसमात बहुतेक विहिरी कोरड्या पडल्या आहेत त्यामुळे या तहसीलमध्ये जमीन वापर कार्यक्षमतेची तीव्रता कमी आहे.

ii) मध्यम तीव्रतेचे क्षेत्र (120 ते 140 टक्के):

मध्यम तीव्रतेचे क्षेत्र प्रामुख्याने पाटोदा, माजलगाव, परळी आणि वडवणी तहसील मध्ये आहे. या तहसीलमध्ये कमी सिंचन क्षेत्र आहे. या तहसीलच्या काही भागांमध्ये जमीन वापर कार्यक्षमतेची उच्च तीव्रता आहे. शेतीचे भौतिक आणि अ-भौतिक निर्धारक मध्यम जमीन वापर कार्यक्षमतेसाठी जबाबदार आहेत.

iii) उच्च तीव्रतेचे क्षेत्र (140 टक्के):

पेक्षा जास्त जमीन वापर कार्यक्षमतेच्या उच्च तीव्रतेचे क्षेत्र धारूर आणि अंबाजोगाई तहसील मध्ये आढळते. जमिनीची सुपीकता, रासायनिक खतांचा वापर, उच्च उत्पन्न देणारी, विविध प्रकारची बियाणे आणि आधुनिक कृषी अवजारे जमीन वापर कार्यक्षमतेच्या उच्च तीव्रतेसाठी जबाबदार आहेत,

निष्कर्ष:

जमीन वापर कार्यक्षमतेचा निर्देशांक 1990-91 ते बीड जिल्ह्यात 125.37 मध्ये आढळला. 2000-01, आणि 2000-01 ते 2010-11 मध्ये जमीन वापर कार्यक्षमता निर्देशांक 115.37 पाळला गेला. याचा अर्थ असा की अभ्यास क्षेत्रामध्ये जमीन वापर कार्यक्षमता निर्देशांक 10% कमी झाला. आष्टी आणि जिओराई तहसील मध्ये, 1990-91 ते 2000-01 दरम्यान, शिरूर (के.), माजलगाव, वडवणी, बीड, कैज, आणि परळी पाच तहसील मध्ये 120 भूउपयोग कार्यक्षमता निर्देशांक आणि 120 ते 140 जमीन वापर

कार्यक्षमता निर्देशांक दिसून आला. . पाटोदा, धारूर आणि अंबेजोगाई तहसीलमध्ये 140 पेक्षा जास्त जमीन वापर कार्यक्षमता निर्देशांकाचा अनुभव होता आणि 2000-01 ते 2010-11 पर्यंत 125 जमीन वापर कार्यक्षमता निर्देशांक अस्ती, शिरूर (के), जिओरल, बीड, कैज आणि पाटोदा, वडवणी, माजलगाव आणि अंबाजोगाई तहसीलमध्ये परळी व्ही तहसील आणि 125 ते 150 जमीन वापर कार्यक्षमता निर्देशांक दिसून आला. अभ्यास क्षेत्रातील धारूर तहसीलमध्ये 150 पेक्षा जास्त जमीन वापर कार्यक्षमता निर्देशांक आढळला.

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