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THE STUDY OF WATERSHED DEVELOPMENT PROGRAMME AND AGRICULTURAL LANDUSE IN SATARA DISTRICT

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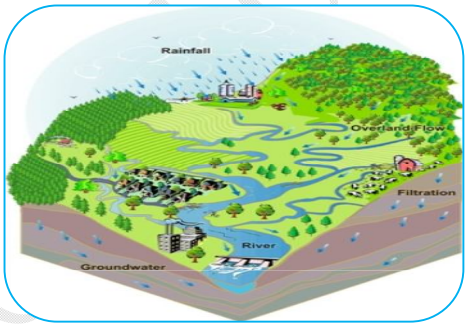
ABSTRACT:



Agriculture is the determining as well as chief part of Indian economy, where; above 60 percent people are directly or indirectly related to agricultural sector. It is leading source of livelihoods in India. About 70 percent rural populations in India still depend principally on various agriculture activities for their livelihood. Due to highly seasonal rainfall patterns, watershed development programme is deeply rooted in rural India. Watershed development involves the balanced utilization of land and water resources with least hazard to natural resources. It is the process of guiding and organizing the use of land and natural resources without negatively affecting soil and water resources. Due to watershed development programme has managed soil and water, huge development have occurred in agriculture with increasing overall productivity, where, increases agricultural land use. Therefore, Watershed Development Programme and Agricultural land use have correlated to each other. The Satara district has taken for study which is located in the drought prone areas in western part of the Maharashtra. There is effectively done various water conservation works under the Watershed Development Programme. It has positively impact on agricultural development and on agricultural land use. This paper is an attempt to analyze the correlation between watershed development programme and agricultural land use in Satara district. Spearman's Rank order method is applied for analyzes the correlation of between watershed development programme and agricultural land use. The correlation between between watershed development programme and agricultural land use in Satara District is r = 0.44. It is moderate positive or direct correlation.

KEYWORDS: *agricultural landuse, rainfall, cultivation, Correlation, Satara.*

INTRODUCTION

Agriculture is the determining as well as chief part of Indian economy, where; above 60 percent people are directly or indirectly related to agricultural sector. It is leading source of livelihoods in India. About 70 percent rural populations in India still depend principally on various agriculture activities for their livelihood. There is lived world's 17.5 percent population on world's 2.4 percent geographical region. So, agriculture sector is facing intense pressure of population in India. The Satara district is located in western part of the Maharashtra. Where, Man, Khatav, Phaltan, Koregaon etc. tahsils comes in severe drought prone region. There is effectively done various water conservation works under the Watershed Development Programme. As a result, there is increased land use in recent years. According to 2011 Census of India, about 5, 21,786

populations are observed the main cultivators in Satara district as well as 2,43,687 population active in the agricultural activities.

STUDY AREA

The Satara district selected for the study of watershed development programme and agricultural landuse. Satara district is located in Sahyadri Mountain and situated during $17^{0}5'$ to $18^{0}11'$North latitude and $73^{0}33'$ to $74^{0}54'$East longitude. The Krishna River, Mahadeo and Bamnoli hill ranges, Sitabai and Aagashive are some other hills located in the district. According to 2011 Census, 30, 03,922 persons population are lived in Satara district. Totally. 10,484.0 Sq. k.m area is covered by Satara district with 742 m (2,434 ft) elevation from the sea level. From 302.6 mm to 3449.7 mm normal annual rainfall is recorded in the district. This district has eleven tahsils namely- Satara, Wai, Khandala, Koregaon, Phaltan, Man, Khatav, Karad, Jaoli, Mahabaleshwar, Patan etc. and 1739 villages.

OBJECTIVES

The main objectives of this research paper are as under:

1. To study the spatial distribution of watershed development programme in the study region.
2. To study the spatial distribution of Agricultural landuse in the study region.
3. To examine the correlation between watershed development programme and Agricultural landuse in the study region.

DATABASE AND METHODOLOGY

The paper is mainly based on the secondary data sources. To complete the objectives data regarding watershed development programme and agricultural landuse area of Satara District is taken from Socio-economic abstract (2014-15), statistical abstract of Satara district. The collected data are processed to analyze the work of watershed development programme and agricultural landuse in Satara District. Arc GIS 9.3 software used for preparing the map and to show the spatial distribution of watershed development programme work and agricultural landuse area in Satara District. The tahsils of Satara District are grouped into three categories i.e. high, moderate and low level on the basis of simple statistical method. To analyze spatial pattern of agricultural landuse area, the same technique is applied for calculation. The Spearman's Rank Order method is used for analyzes the correlation between watershed development programme work and Agricultural landuse.

Formula:-

Rank Order Spearman's Method

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

WATERSHED DEVELOPMENT PROGRAMME (WDP) SCHEME

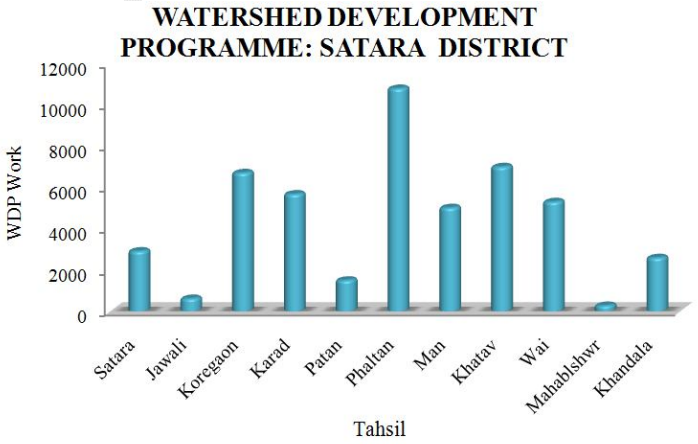
Satara district is western part of Maharashtra state, where eastern part- Man, Khatav, Phaltan, Koregaon etc. comes under severe drought prone climate. There is observed highly shortage of water for drinking as well as agriculture in every summer season. Hence, compare to other tahsil, watershed development programme is effectively done in these drought prone regions. About 48466 number of water conservation work completed under the watershed development programme in the district. Big Project, Medium Project, Small Irrigation Project, Percolation Tank, Kolhapur Type Bunds, Underground Bunds, Lift Irrigation, Storage Irrigation Scheme, etc, several water conservation works are done under the WDP scheme in the district.

Table No. I

WATERSHED DEVELOPMENT PROGRAMME: SATARA DISTRICT

Name of Tahsil	Differents WDP Schemes Work								
	Big Project	Medium Project	Small Irrigation Project	Perco. Tank	Kolhapur Type Bunds	Undergr. Bunds	Lift Irrigation	Storage Irrigation Scheme	Total
Satara	02	0	13	12	30	02	08	2853	2920
Jawali	00	00	01	06	14	07	04	590	622
Koregaon	00	00	09	110	33	33	13	6516	6714
Karad	01	02	16	56	61	18	00	5529	5683
Patan	01	03	18	15	13	41	11	1405	1507
Phaltan	00	00	13	90	37	109	01	10552	10802
Man	00	03	9	212	75	69	18	4637	5023
Khatav	00	02	11	162	175	35	21	6599	7005
Wai	02	00	01	22	25	33	36	5191	5310
Mahablshwr	00	00	00	00	04	00	27	249	280
Khandala	01		04	51	45	41	13	2445	2600
Total	7	10	95	736	512	388	152	46566	48466

Source: Socio-Economic Abstract of Satara District (2014-15)



High WDP Scheme work (Above 6000)

Above 6000 number of works done under the different WDP scheme in districts is included in high category. High WDP Scheme work was done in the tahsils of Phaltan, Khatav, Koregaon etc.

Moderate WDP Scheme work (2000 to 6000)

From 5000 to 6000 number of works done under the different WDP scheme in districts is included in this category. Moderate WDP Scheme work was completed in the tahsils of Karad, Wai, Man, Satara, Khandala etc.

Low WDP Scheme work (Below 2000)

Below 5000 number of works done under the different WDP scheme in districts is included in low category. The Low WDP Scheme work was found in the tahsil of Patan, Jawali and Mahabaleshwar.

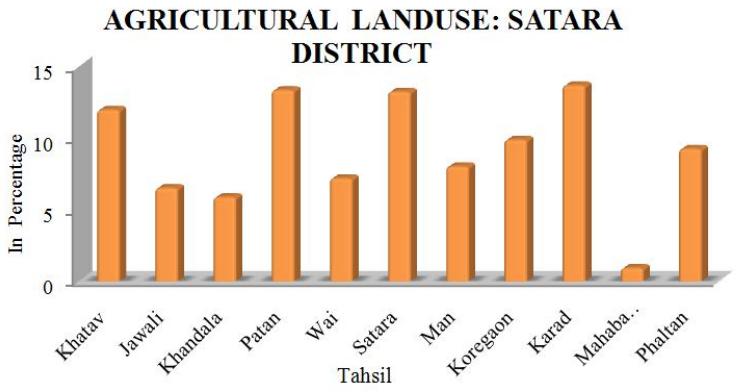
SPATIAL PATTERN OF AGRICULTURAL LANDUSE

Agricultural landuse is a land use for cultivation and production of several crops in zoning.It includes land under different crops- Wheat, Jowar, Maize, Sugarcane, Rice, Cotton, Groundnut, etc. and so on. In Satara District, agricultural landuse has occupied on the 695739 hectare land area in 2014-15. It widely distributed at tahsil level from 6468 hectare to 95278 hectare in different tahsils. All 11 tahsils are classified into three groups as follows: (in table no. 3 and Fig. 3)

Table No. 3
AGRICULTURAL LANDUSE:SATARA DISTRICT

Sr. No.	Name of Tahsil	Agricultural Landuse	
		In Hectares	In Percentage
1	Khatav	83428	11.99
2	Jawali	45355	6.52
3	Khandala	40903	5.88
4	Patan	92950	13.36
5	Wai	50112	7.20
6	Satara	92158	13.25
7	Man	55851	8.03
8	Koregaon	68817	9.89
9	Karad	95278	13.69
10	Mahabaleshwar	6468	0.93
11	Phaltan	64419	9.26
Total		695739	100

Source: Socio-Economic Abstract of Satara District (2014-15)



High Agricultural Landuse

This category involves tahsil of above 11 percent agricultural landuse. High agricultural landuse area is seen in the tahsils of Karad, Patan, Satara and Khatav.

Moderate Agricultural Landuse

From 08 percent to 10 percent agricultural landuse tahsils are included in moderate agricultural landuse. Moderate agricultural landuse area is shown in the Koregaon, Man and Phaltan tahsil.

Low Agricultural Landuse

This category involves tahsil of below 8 percent agricultural landuse. Low agricultural landuse area is seen in the tahsils of Wai, Jawali, Khandala, Mahabaleshwar,etc.

CORRELATION BETWEEN WATERSHED DEVELOPMENT PROGRAMME AND AGRICULTURAL LANDUSE

The Spearman's Rank Order method is used for the calculation of the correlation of watershed development programme and the agricultural landuse in Satara District. The formula are-

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

Table No. III

WATERSHED DEVELOPMENT PROGRAMME AND AGRICULTURAL LANDUSE IN SATARA DISTRICT

Sr. No.	Name of Tahsils	Different WDP Schemes Work	Rank	Agricultural Landuse	Rank	d^2
1	Jawali	622	10	45355	9	1
2	Karad	5683	4	95278	1	9
3	Khandala	2600	8	40903	10	4
4	Khatav	7005	2	83428	4	4
5	Koregaon	6714	3	68817	5	4
6	Mahabaleshwar	280	11	6468	11	0
7	Man	5023	6	55851	7	1
8	Patan	1507	9	92950	2	49
9	Phaltan	10802	1	64419	6	25
10	Satara	2920	7	92158	3	16
11	Wai	5310	5	50112	8	9

$r = 1-6(\Sigma d^2)/N(N^2-1)$
Here, r = Correlation, N= Number of observation, D= deviation
r = 1-6*122/11 (121-1)
r = 0.44

It is observed that there is weak positive correlation i.e. p= 0.44 between the watershed development programme and the agricultural landuse in Satara district. There are the some reasons for weak positive correlation in Satara district like political disturbances in watershed development programme, rainfall uneven pattern, highly mountainous region, drought prone region, river basin area etc.

CONCLUSION

The watershed development programme and the agricultural landuse is widely or unevenly distributed in Satara Disrict. The maximum rainfall is recorded in Mahabaleshwar tahsil and lowest in Man tahsil. The agricultural landuse is highly observed in Karad tahsil while minimum in Mahabaleshwar tahsil of Satara district. But the correlation between the watershed development programme and the agricultural landuse found weak positive correlation i.e. p = 0.44. It means high watershed development programme, medium agricultural landuse. It was observed higher the watershed development programme higher the agricultural landuse i.e. Phaltan and Khatav tahsil.

Above 7000 work of watershed development programme is done in Phaltan and Khatav tahsil and also, above 60000 hectare is seen under the agricultural landuse in Phaltan and Khatav tahsil.

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