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CHANGING AGRICULTURE AND IRRIGATION PATTERN OF SATARA DISTRICT

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INTRODUCTION

Agriculture is a large activity in India as well as Maharashtra. The economic base of the country depends on agriculture. Water is an important element for increasing the agricultural production. Natural or artificial application of water to soil for the purpose of moisture and the timely application of water for the growth and production of plants will depends largely on the implementation of various irrigation projects . Normally, groundwater and surface water are used for irrigation and when water available in these sources is taken away artificially by flowing it for supplying water in required quantity to crops, it is called irrigation. Irrigation is one of the key factors in agricultural development and its impact on cropping pattern, farm income and employment in Indian agriculture has been broadly studied.

Irrigation is a lifeline of agriculture especially in the drought prone zone according to many scholars. Irrigation constitutes one of the most effective technical means of raising agricultural production. The availability of irrigation facility plays a vital role in the socio-economic and agricultural development area. Irrigated area has established strong positive correlation with area under agricultural. As a consequence, it has potentiality to bring transformation in land use, cropping pattern, techniques of production or productivity and also in occupational structure. These transformations in agricultural sector may also bring change in the socio-economic structure of an economy because of direct effects of growth in irrigation. It has advantage of assured irrigation in using other modern farm inputs in the context of increasing agricultural productivity and raising the level of rural living. The Eastern part of the district has always been characterized abundant supply water from the water of Koyana, Urmodi dam, Nira and Krishna River. Man, Khatav, Khandala and Phaltan tahsil has provided an example of imbalance in the development of irrigation facilities in its spatio – temporal perspective. Agricultural practices have changed from time to time. They do differ from place to place, depending upon the variations in environmental conditions, cultural level and scientific, technological and economic development. Agriculture has become an increasingly complicated occupation with increasing population; man has been forced to modify agricultural practices to increase agricultural output. The study of agricultural provides us the changing pattern of agricultural output and land relationship.

Irrigation development in Satara district has to be viewed, in the context of the climatic conditions, especially rainfall with a wide difference in rainfall from one part to other part of the district and from year to year. The present study is aimed to explain Tahsil-wise irrigation patterns and chronological changes in irrigation in Satara District. In study area there are different types of irrigation systems namely canals, tanks, wells and others.

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Agriculture is most accepted occupation in the rural area. It is a mean of living. Now, agriculture is not only remained for food production but also for business. Now arable land turns under irrigation. Farmers are not using traditional seeds but they are using Modern agricultural implements such as improved or hybrid seeds, use of different pesticides, insecticides, fungicides and irrigation facilities have increased the agricultural production of the study region. Farmers are selling their food production not only in district but out of state and country.

OBJECTIVES

1) To study the profile of physical background of the Satara District.
2) To analyze Tahsilwise irrigation pattern in Satara District.
3) To calculate the change in irrigation pattern in Satara District.

STUDY AREA

Satara district is located in the western part of Maharashtra. It extends from 17º 05´ to 18º 11´ north latitudes and from 73º 33´ to 74º 54´ east longitudes. The geographical area of Satara district is 10,480 Sq. Km. which is about 3.4 % of the state's total geographical area**.** Satara district is situated in the river basins of Bhima and Krishna**.** In term of area, Satara district ranks fifteenth in Maharashtra state. Satara district is bounded by Pune district in north, Solapur district in east, Sangli district in south, Ratnagiri district in west and Raigad district in northwest. The west portion is enclosed by Sahyadri hilly region. The outstanding features of the relief in the district are its highly uneven nature. There is not wide scope to bring more and more land under agriculture in the study region. According to 2011 Census, Satara district consists of 11 tahsils having 1739 villages. The study area has three important river basins viz.the Krishna-Koyana basin, which covers Mahabaleshwar Wai and Karad Tahsils, and the Venna basin, which covers Koregaon and Satara Tahsils, the Manganga -Banganga basin which covers Man and Phaltan tahsils are play an important role in the irrigation facilities of the area. The Satara district varies in relief, climate and vegetation. The physical settings of Satara shows a contrast of immense dimensions and reveals a variety of landscapes influenced by relief, climate and vegetation. The climate

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ranges from the rainiest in the Mahabaleshwar region which has an average annual of over 6000 mm to the driest in Khatav, Man, Khandala and Phaltan tahsil where the average annual rainfall is about 500 mm.

As per the Census 2011, the total population of the Satara district was 3003741 with a population density of 287 per sq. km. Out of the total population, 2433363 (81%) reside in rural areas while 570378 are in urban areas. The ratio of female population per thousand of male was 986. Out of the total population, 8.76 % belong to SC and 0.78 percent to ST communities. The district has high literacy level of 92.09 %.

DATA BASE AND METHODOLOGY

The present study is based on the secondary data collected from Census Reports of Government of India, Agriculture Department of Zillah Parishad (Satara), Agriculture office of Satara district, District Gazetteer of Satara, Socio-Economic Review and District Statistical Abstracts of Satara District 2001and 2011, The obtained data has been processed and analyzed by using different quantitative and statistical techniques. Results of tabulation have been depicted in the form of table and it has also shown using graph and map wherever appropriate. The period selected for the study is 2000-01 to 2010-11.For the purpose of comparative analysis of Tahsil-wise agriculture and irrigation patterns in Satara District.

TAHSIL-WISE IRRIGATION PATTERN

In Satara District, the total area under irrigation was found to be 196149 hectares (2001) but over the period of study it has increased to 230702 hectares. This is mainly due to 3 reasons viz. modernization of agricultural activities, urbanization and industrialization. Khandala Tahsil is a drought prone region as it receives very less rainfall throughout the year. In 2011, the irrigation facility was found to be in a poor state in Khandala Tahsil. Out of 40903 hectares, the total area under irrigation was 16346 hectares only (39.96%) during the year 2011. Even though the Govt. is providing all the necessities to the farmer but due to unfavorable conditions of climate and physiographic the area under irrigation has decreased by 3.05% during the study period. While the area under irrigation in Wai Tahsil in 2001 and 2011 is 16894 hectares and 16900 hectares respectively, but in terms of total land under agriculture there is a change. In 2001, it was 8.61% and in 2011 it was 7.32%. The area under irrigation has decreased by 1.29% In Wai Tahsil, maximum area was under irrigation but there was not proper order for utilization of water due to introduction of various other minor and major irrigation projects. In 2001, the irrigation facilities in Mahabaleshwar Tahsil were very poor. But during 2010-2011 the area under irrigation changed tremendously, it is observed 28.49 % of the agricultural land is under irrigation. Because of awareness of the people in this span of 10 year there is extreme change in irrigation; Government is helping the people to carry maximum land under irrigation by giving them facilities such as finance, capital, and loans etc.

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Table-I
Agriculture and Irrigation Pattern of Satara District. (Area in Hectares)

Sr. No.	Name of the Tahsil	2000-2001			2010-2011		
		Agricultural land	Area under Irrigation	%	Agricultural land	Area under Irrigation	%
1	Khandala	33794	19875	58.81	40903	16346	39.96
2	Wai	53862	16894	31.37	50112	16900	33.72
3	Mahabaleshwar	11812	3303	27.96	22700	6468	28.49
4	Phaltan	54425	34027	62.52	64419	34120	52.97
5	Man	74077	20402	27.54	55851	20316	36.38
6	Khatav	110335	21020	19.05	83428	27301	32.72
7	Satara	69795	24900	35.68	92158	25670	27.85
8	Koregaon	67757	18011	26.58	68817	22299	32.4
9	Jawali	51301	9509	18.54	45355	12462	27.48
10	Patan	74998	12715	16.95	92950	18915	20.35
11	Karad	94980	15493	16.31	92278	29905	32.41
Total		697136	196149	28.14	708971	230702	32.54

Source: Socio-Economic Abstracts, Satara District 2001 and 2011

Table II
Changes in Irrigation Pattern of Satara District (Area in Hectares)

Sr. No.	Name of the Tahsil	2000-2001		2010-2011		% Change
		Land under Irrigation	%	Land under Irrigation	%	
1	Khandala	19875	10.13	16346	7.08	-3.05
2	Wai	16894	8.61	16900	7.32	-1.29
3	Mahabaleshwar	3303	1.68	6468	2.84	1.16
4	Phaltan	34027	17.34	34120	14.78	-2.56
5	Man	20402	10.4	20316	8.82	-1.58
6	Khatav	21020	10.71	27301	11.83	1.12
7	Satara	24900	12.69	25670	11.12	-1.57
8	Koregaon	18011	9.18	22299	9.66	0.48
9	Jawali	9509	4.84	12462	5.4	0.56
10	Patan	12715	6.48	18915	8.19	1.71
11	Karad	15493	7.93	29905	12.96	5.03
Total		697136	100	708971	100	-

Source: Socio-Economic Abstracts, Satara District 2001 and 2011.

Phaltan is the leading tahsil in Satara district according to agricultural area that is 64419 hectors. In 2001, the area under changes in irrigation pattern in this Tahsil was 34027 hectares (17.34%) and in the year 2011 it was 34120 hectares (14.78%). Over the period of time, it has been observed that the area under irrigation had increased in Phaltan Tahsil. The condition of irrigation changed in the last 10 years .This change is due to change in farmer's

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attitude, awareness of modern agricultural techniques, diversification of agricultural crops, government facilities like minor and major irrigation projects. Man tahsil is also a drought prone area it receives very less rainfall throughout the year. The area under changes in irrigation pattern in this tahsil is 20402 hectares (10.4 %) during the year 2000-2001, but in year 2010-2011 it was 20316 hectares (8.82%). While the Govt. is providing all the necessities to the farmer but due to unfavorable conditions of climate and physiographic the area under irrigation has decreased by 1.58percent during the study period. The total area under irrigation was 21020 hectares during 2000-2001 and in 2011 it was 27301 hectares. This is one of those tahsils which are hugely benefitted by the implementation of various irrigation projects like tank canal irrigation, other minor projects. One major cause of worry is that the water in this canal, tanks is getting dried-up due to severe summers and frequent drought condition.

The irrigation facilities of eastern part of Satara tahsil is more developed than the western part due to the Krishna, Venna River and their tributaries. The level of well water is always medium level due to availability of water in dams and canals. In 2000-2001, the area under irrigation was 24900 hectares (12.69%) whereas in 2010-2011 it was 25670 hectares (27.85%). The needs of the farmers are well satisfied with the existing irrigation facilities. Hence, the farmers are concentrating more on bringing the land unavailable for agriculture into use. In 2001, total area under agriculture was 69795 hectares whereas in 2011 it was found to be 92,158 hectares. There was tremendous change in area under irrigation in Satara taluka.The total area under irrigation was 18011 hectares (26.58%) during 2000-2001whereas in 2010-2011 it was 22299 hectares (32.40%). One of the biggest advantages of this tahsil is the presence of the Krishna River. Water from this river is tapped into Dhom and Kanher dams and this water is circulated by the left and right canals. This tahsil lies in the western part of Satara district its topography is not favorable. Even though it receives good amount of rainfall, the water cannot be stored due to its physiography. In 2001, the area under irrigation was 9509 hectares (4.84%) and in 2011 it was 12462 hectares (5.40%). During the 2010-11 only 0.56% of land was brought under irrigation.

Patan tahsil is in the extreme western side, due to the rugged topography and forest area, there is very less area under irrigation in spite of the presence of the Koyana river. In 2000-01, the total area under irrigation was 12715 hectares (16.95%) and in 2010-11 it was 18915 hectares (20.35%).The total land under agriculture has increased by 3.40percent over the study period but the land under irrigation has increased by only 1.71%.Only this tahsil which has recorded a tremendous change in irrigation. This is mainly because of the education and awareness of farmers. Farmers here use modern techniques for agricultural activities, extensive use of fertilizers, urbanization, multiple cultivation of crops and proper use of water resources. In 2001, the total area under irrigation was 15493 hectares (16.31%) and in 2011 it was 29905 hectares (32.41%). This can be seen here i.e. in 2000-01 the total area under agriculture was 94980 hectares and in 2010-11 it was 92278 hectares. There are increase in area under irrigation but there was decrease in agricultural land because, farmers illiteracy in irrigation, over dosage of water, extensive use of fertilizer, urbanization, formation of saline and alkaline soil and soil selling for bricks making.

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CONCLUSION

The study reveals that the total area under irrigation in Khatav, Koregaon, Jawali, Patan, Karad, Wai and Mahabaleshwar tahsils has increased from 2000-01 to 2010-11. The factors responsible for this change are industrialization, urbanization and modernization of agricultural techniques. The total area under irrigation in Khandala and Man tahsils has decreased from 2000-01 to 2010-11. Karad Tahsil has recorded the maximum change in area under irrigation i.e. 16.10%. The area under irrigation has decreased in Khandala, Wai, Phaltan, Man, and Satara tahsils over the period of study. The main reason for this is the rugged topography and physiographic conditions of the region which makes the storing of water difficult. In 2000-01, the area under irrigation in Khandala Tahsil was 58.81% and in 2010-11 it further reduced to 39.96 %. Mahabaleshwar, Khatav, Koregaon, Jawali, Patan and Karad Tahsils have shown positive change in irrigation pattern, Karad showing the maximum change i.e. 5.03% in the study period. Wai, Khandala, Phaltan, Man and Satara Tahsils have shown negative change in irrigation pattern, Khandala showing the maximum change i.e. 3.05% in 2000-01 to 2010-11.

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