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The Study of Spatio-Temporal Changes in Irrigated Area in Solapur District (2015-2025)

Dr. Konade Bhairappa Naganna

Abstract:

Irrigation is an important component of agricultural development, particularly in regions where rainfall is uncertain, irregular and insufficient. Solapur district of Maharashtra lies in the rain-shadow region and receives an average annual rainfall of about 545.4 mm, making irrigation essential for stable agricultural production. The present study examines the spatio-temporal changes in irrigated area in Solapur district during the period 2015-2025. The study is based on secondary data collected from the Agriculture Department, District Statistical Department, Solapur, and the Socio-Economic Abstract of Solapur district.

The analysis reveals that the total irrigated area of the district increased from 304,782 hectares in 2014-15 to 317,445 hectares in 2024-25, showing an overall increase of 12,663 hectares. However, the distribution and changes in irrigated area vary significantly among the tahsils. Mohol recorded the highest increase of 20,795 hectares, followed by Mangalwedha, Sangola and North Solapur. In contrast, Malshiras, Akkalkot, Karmala and South Solapur recorded considerable declines in irrigated area. The spatial variation is mainly associated with differences in irrigation infrastructure, availability of surface water and groundwater, canals, reservoirs, rivers, dams, wells and bore wells. The study highlights the need for efficient water-resource management and expansion of sustainable irrigation facilities in areas where irrigated land has declined.

Key Words: Spatio Temporal Changes, Agriculture, Irrigation and Solapur.

Introduction:

Agriculture is one of the oldest and most important occupations of Human Civilization. The concept of the origin of agriculture is an old phenomenon, but it seems to be a relatively recent innovation when viewed in terms of the historical development of mankind (Noor Mohammad, 1992). Agriculture is the science and art of cultivating soil growing and harvesting of crops, domestication of animals and raising of plants for the use of human being (Hussain Majid, 1996).

Irrigation is generally defined as the artificial application of water to the plant needs, for assured food supply, profitable farming and economical use of land (Raj R. and Bilas R., 2010). Among the essential factors for agriculture development water is important. Its use for irrigation is conditioned by several variables, while low rainfall and its variable nature necessitate the development of artificial means of moisture supply i.e. irrigation practices, the increasing employment of fertilizers and to some extent high yielding variety of seeds make timely supply of water a prerequisite (Sharma S. K. and Jain C. K., 1992).

Irrigation plays an important role in Indian agriculture due to uncertain, unreliable, irregular, variable and seasonal and unevenly distribution of rainfall. Irrigation is imperative for successful agriculture particularly in the arid, semi-arid and sub humid areas, which are prone to drought and famine conditions due to partial failure and delayed arrival or early withdrawal of Monsoon (Reddy & Reddy, 1992). Apart from that, there are certain crops such as Rice, Sugarcane, Jute, Cotton, etc. which require more water and have to be provide with irrigation even in area of heavy rainfall. Therefore, attempt is made here to, "A study of spatio temporal changes in irrigated area of Solapur district (2015-2025)"

Study Region:

For the present investigation Solapur district is selected as a study region. Geographically Solapur district is located between $17^0$10' North to $18^0$32' North latitude and $74^0$42' East to $76^0$15' East longitude. It covers an area of 14,895 sq. km. The shape of district resembles flying eagle. The proportion of area of Solapur district as compare to Maharashtra is about five (5%) per cent. It is administratively sub-divided into 11 tahsils. The soils of the district can be classified into three main types. These are black soil, coarse grey soil and reddish soil. Agro-climatically, the entire district comes under the rain shadow area. Rainfall is uncertain and scanty. The average rainfall for the district is 545.4 mm.

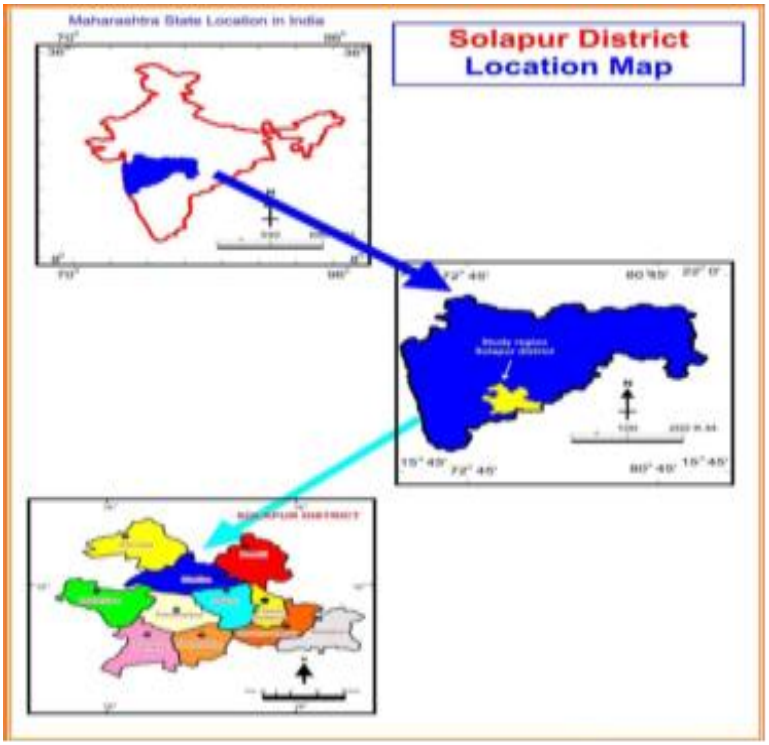

Figure No. 01

Objective:

The main objectives of this paper are as following.

1) To study the spatio temporal changes in irrigated area of Solapur District.
2) To suggest solution to increases irrigated area in Solapur district.

Database and Methodology:

The study was conducted in Solapur district of Maharashtra state. For the purpose of the study, only secondary information was collected from different sources. Data regarded irrigated area and geographical information collected through Agriculture Department, District statistical Department of Solapur and socio-economic abstract of Solapur district in 2014-15 and 2024-25.

Result and Discussion:

Irrigation has, of course, been a basic farm operation for centuries in many parts of the world. Its major attribute is that it greatly enhances crop yields. Irrigation has been one of the most important infrastructural components supporting green revolution in India. Following table no. 01 shows tahsil wise irrigated area of Solapur district. The table no. 01 reveals that the total irrigated area of the district increased from 304,782 hectares in 2014-15 to 317,445 hectares in 2024-25, showing an overall increase of 12,663 hectares.

Table No.1

Spatio-Temporal Changes in Irrigated Area in Solapur District 2015 to 2025

Sr. No.	Tahsil	Irrigated Area 2014-15	Irrigated Area 2024-25	Changes
1	Akkalkot	29007	16176	-12831
2	Karmala	43178	33167	-10011
3	Barshi	17676	20233	2557
4	Madha	40845	38692	-2153
5	Malshiras	34047	20685	-13362
6	Mangalwedha	19672	36106	16434
7	Mohol	34790	55585	20795
8	North Solapur	9351	15516	6165
9	Pandharpur	42201	45648	3447
10	Sangola	10418	18487	8069
11	South Solapur	23597	20150	-3447
	District	**304782**	**317445**	**12663**

Source: Compiled by Researcher on the basis of Agriculture Department and Socio-Economic review and district statically abstract of Solapur district 2014-15 and 2024-25.

Table No. 01 indicates that region as a whole has 304782 hectors irrigated area in 2014-15, but spatial distribution varies from tahsil to tahsil, high irrigated area is recorded in Karmala, Madha and Pandharpur tahsil i.e. above 40000 hectors. The moderate irrigated area is recorded in South Solapur, Akkalkot and Malshiras tahsil from 20000 to 40000 hectors, while low irrigated area is found in Barshi, Mangalwedha, North Solapur and Sangola tahsil i.e. below 20000 hectors.

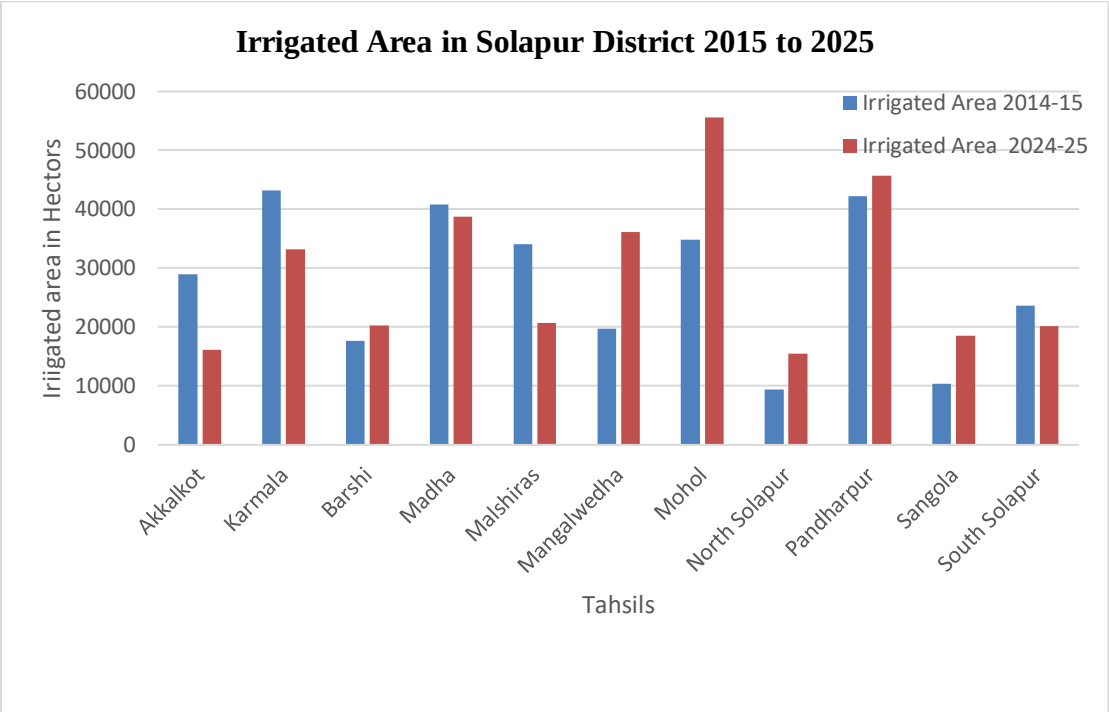

Fig. No. 02

The table No. 01 indicates that study region as a whole has 317445 hectors irrigated area 2014-15, but spatial distribution varies from tahsil to tahsil, the high irrigated area is recorded in Mohol and Pandharpur tahsil i.e. 40000 hectors, due to the ground water recharge by surface irrigation. The moderate irrigated area is recorded in Karmala, Barshi, Madha, Mangalwedha, Malshiras and South Solapur tahsil i.e. 20000 to 40000 hectors, while it is low in Akkalkot, North Solapur and Sangola tahsil i.e. below 20000 hectors.

The table No. 01 indicates that the region as a whole has positive 12,663 hectares change in irrigated area during the period of investigation, due to Ujani irrigation project, Nira Devdhar Project and Bhima-Sina Joint Cannel. The negative change in irrigated area is recorded in Akkalkot, Madha, Malshiras and South Solapur tahsil of study region, due to lowering of ground water.

Conclusion and suggestion:

From the above study we can conclude that, the irrigated area of Solapur District has experienced an overall increase irrigation during the period 2015-2025, although the pattern of change is spatially uneven. The total irrigated area increased by 12,663 hectares, from 304,782 hectares in 2014-15 to 317,445 hectares in 2024-25. Mohol, Mangalwedha, Sangola, North Solapur, Pandharpur and Barshi tahsils recorded an increase in irrigated area, whereas Akkalkot, Karmala, Madha, Malshiras and South Solapur recorded a decline. The highest increase was observed in Mohol tahsil, while Malshiras recorded the largest decrease.

The empirical results suggest that, irrigation infrastructure should be expanded in tahsil where the irrigated area is low or has declared particularly Akkalkot, Karmala and South Solapur tehsil. It is also suggested that, farmer should encourage to adopt drip irrigation and sprinkler irrigation system and government give the more subsidy for it.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of thesis paper.

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