



## A Geographical Analysis of Tahsil wise area under Irrigation Facility in Solapur District (MS)

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### Abstract:

The present study is focus on “A Geographical Analysis of Tahsil wise area under Irrigation Facility in Solapur District (MS)”. There are six 11 Solapur District. Thus, the present study is entirely based on the secondary data. The data irrigation Facility- 2022, Net area under irrigation and Net area under Cultivated is collected from Socio-Economic Abstract of Solapur District, 2022. The Tahsilwise area under Irrigation is computed by using Rank Correlation though the MS Excel. Results shows that huge inequality and Very weak correlation is found between the geographic area of Solapur District, Irrigation Facility, Net Area Under Irrigation and Net Area Under Cultivation. Because, that irrigation resources are not evenly distributed in Solapur District. In entire study area high availability of irrigation source has observed in Madha, Pandharpur and Karmala Tahsil. In whole study area, highest number of wells have existed in that Tahsils. The moderate irrigation sources are found in Mohol Tahsil. While Lowest irrigation resources are found in Barshi, North Solapur, South Solapur, Malshiras, Mangalwadha, Sangola and Akkalkot. These are a deprived Tahsils from irrigation facility in Solapur District.

Government should be irrigation facility in entire Tahsils of Solapur District. Irrigation facility should be necessary increase except that the Pandharpur. Because, about 66.87% geographic area of Pandharpur Tahsil is under irrigation facility. Government should be urgently implement irrigation programme to increasing irrigation facility. If irrigation facility increases, with Net area under cultivation also increases. Farmers should be strictly implement of “पाणी आडवा, पाणी जरिवा” Movement”.

**Key Words:** Geographic area, Irrigation Facility, Net Area Under Irrigation, Net Area Under Cultivation.

### Introduction

Irrigation is the artificial application of water to the soil to assist in the growth of crops. It is a crucial component of agriculture, especially in regions where natural rainfall is insufficient for proper crop development. The primary aim of irrigation is to provide crops with the necessary moisture to ensure optimal growth and yield. Irrigation involves the controlled supply of water to agricultural fields through various methods such as canals, pipes, ditches, and sprinklers.

Irrigation ensures a consistent and reliable water supply, leading to increased agricultural productivity and crop yields. It helps mitigate the impact of erratic rainfall patterns, droughts, and other climatic variations, reducing the vulnerability of crops to adverse weather conditions. By providing a stable water supply, irrigation contributes to the stabilization of food production, ensuring food security for growing populations. It allows for multiple cropping seasons in a year, maximizing the use of available land and increasing overall productivity. It enables farmers to diversify their crop choices, leading to a more varied and resilient agricultural system.

Irrigation plays a pivotal role in rural development by creating employment, generating income, and developing associated infrastructure.

In drought-prone areas like Maharashtra, irrigation is essential for agriculture, mitigating the impact of droughts by providing a stable water supply. It protects crops from withering, ensuring continuous growth and allowing farmers to reduce reliance on unpredictable rainfall. With a rising population, irrigation becomes crucial for scaling up agricultural production and supporting intensive farming. It influences cropping patterns by facilitating multiple cropping, enabling diverse and

profitable agricultural practices. Additionally, farmers can shift to cultivating high-value, water-intensive crops, contributing to increased income and economic development. Irrigation also contributes to changes in land use, expanding cultivable land and allowing for the diversification of land use with a mix of crops and activities.

\* **Objective**

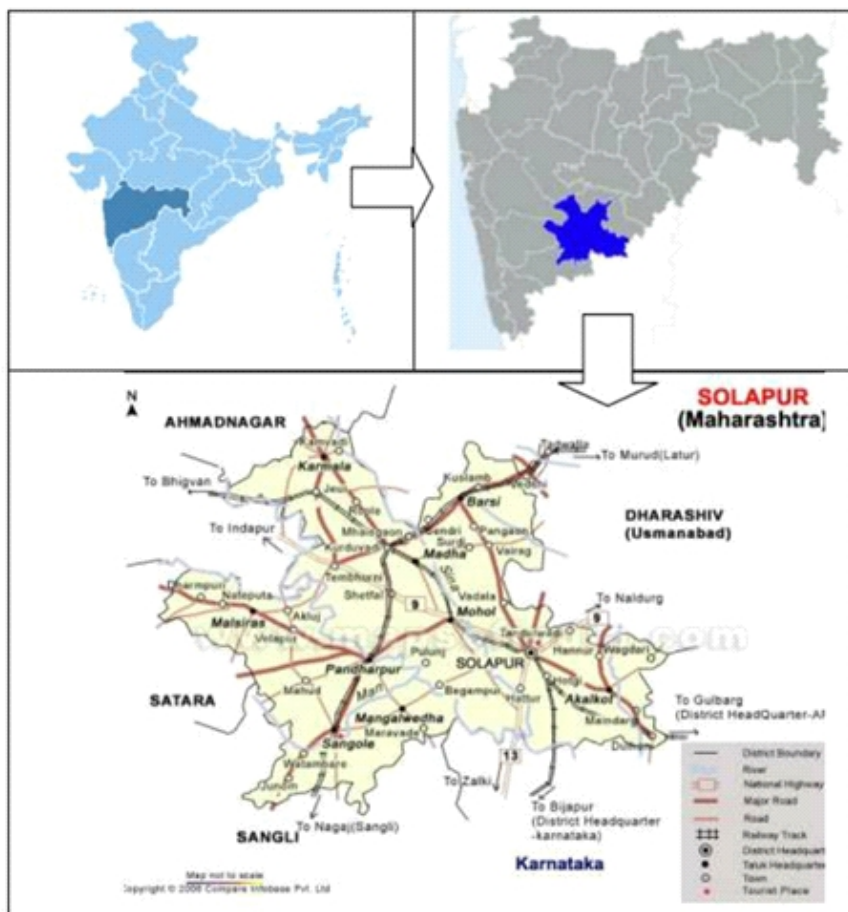
The main objectives of present study are as follows.

1. To study the Tahsil wise Irrigation Facility in Solapur District in 2022.
2. To examine the correlation between geographic area, area under irrigation and area under cultivated in Solapur District as per 2022.

\* **Study Area**

Solapur district spans from 17°10' N to 18°32' N latitudes and 74°42' E to 76°15' E longitudes. Bounded by the Phaltan and Dharashiv (old Osmanabad) plateau scarps to the west and east, respectively, Solapur shares borders with Sangali to the southwest, Satara to the west, Pune to the northwest, Ahmednagar to the northwest, Dharashiv to the north and northeast, and Bijou district to the south, along with Gulbarga district to the east in the state of Karnataka.

**Map No. 1**  
**Solapur District: Location Map**



Source: Chavan, Accessed 2023

The district's East-West length measures around 200 kilometers, and its North-South width is approximately 150 kilometers. It is Covering a total geographical area of about 14,895 square kilometers, the population of Solapur District in 2023 is 48,42,000. Urban areas occupy 338.8 square kilometers (2.28%), while rural regions encompass 14,556.2 square kilometers (97.72%). Karmala stands as the largest tahsil in terms of geographical area, while North Solapur tahsil is the smallest. Solapur district constitutes about 4.88% of the total area and approximately 3.68 % of the population of Maharashtra state, ranking fourth in terms of area and seventh in terms of population among the districts of Maharashtra.

The irrigation facility in Solapur District is increasing year by year. Much more part of Solapur District is considering in a drought prone area of Maharashtra state. Government of Maharashtra start to work on the Major project, Medium Project, Minor Project, Percolated tank, KT Weir, Storage Bund and Well irrigation for increasing irrigation facility Solapur District. A scarcity of another source of irrigation, the agriculture of Solapur District is majorly dependent on type of well irrigation.

**\* Source of Data and Methodology**

Whole district has been selected as study area for present research paper. The period is selected for the present study is 2022. the present study is entirely based on the secondary data. The data irrigation Facility- 2022, Net area under irrigation and Net area under Cultivated is collected from Socio-Economic Abstract of Solapur District, 2022. The Tahsilwise area under Irrigation is computed by using Rank Correlation though the MS Excel.

Where,

R= Rank Correlation  $d^2$ = Sum of  $d^2$

N= Number of item  $d = R_1 - R_2$   $d^2 = (R_1 - R_2)^2$

$$R = 1 - \frac{6(R1-R2)^2}{n(n^2-1)}$$

**Result and Discussion**

**\* Tahsilwise Irrigation Facility in Solapur District**

**Table No. 1: Solapur District: Irrigation Facility - 2022**

Sr. No.	Tahsils	Irrigation Facility- 2022								
		Major Project	Medium Project	Minor Irrigation Project		Percolated Tank	KT Weir	Storage Bund	Well	Total Irrigation Facility
				State Level	Local Level					
1	Karmala	2	1	10	0	231	59	253	8519	9075
2	Madha	2	0	03	0	275	75	248	9280	9883
3	Barshi	0	3	12	3	271	123	440	1115	1967
4	North Solapur	0	1	02	0	102	56	127	1190	1478
5	Mohol	0	1	01	13	469	76	227	5381	6168
6	Pandharpur	0	1	0	0	55	45	173	9541	9815
7	Malshiras	0	0	0	0	202	92	280	3300	3874
8	Sangola	0	1	06	0	484	115	369	694	1669
9	Mangalwadha	0	0	09	0	203	69	243	2373	2897
10	South Solapur	0	0	03	0	118	64	172	2309	2666
11	Akkalkot	0	1	10	0	207	92	144	3536	3990
	<b>Total</b>	<b>04</b>	<b>9</b>	<b>56</b>	<b>16</b>	<b>2617</b>	<b>866</b>	<b>2676</b>	<b>47238</b>	<b>53428</b>

Source: District Statistical Department 2022

Table No. 1 resents that Irrigation facility of Solapur District- 2022. Some of major, medium and minor irrigation project, Percolated Tanks, Storage Bund and Well are major irrigation resources are available in Solapur District. About 53, 482 total irrigation resources are providing water for various purpose in Solapur District. But, that irrigation resources are not evenly distributed in Solapur District. Tahsilwise irrigation facility in Solapur District is divided in following categories.

**1. Low availability of Irrigation Facility Tahsils (Below 4000)**

Table No. 1 Shows that irrigation facility is not evenly distributed in tahsils of Solapur District. low (Below 4000) irrigation resources are observed in North Solapur (1478), Sangola (1669), Barshi (1967), South Solapur (2666), Mangalwedha (2897), Malshiras (3874), and Akkalkot (3990) in Solapur District.

About 1 Medium, about 2 state irrigation project, about 102 percolated tanks, about 56 KT Weir, 127 storage bund and 1190 wells are provided water for agriculture, drinking water and different purpose in Tahsil of North Solapur.

Sangola is one of the major drought prone area of Solapur district. About 1 Medium, 6 state irrigation project, 484 percolated tanks, 115 KT Weirs, 369 storage bunds and 694 wells are provided water to agriculture, domestic and other purpose in Sangola Tahsil.

About 3 Medium, 12 state irrigation project, 271 percolated tanks, 123 KT Weirs, 440 storage bunds and 1115 wells are provided water to agriculture, domestic and other purpose in Sangola Tahsil.

About 3 state level minor irrigation project, 118 percolated tanks, 64 KT Weirs, 172 Storage Bunds and 2309 wells are irrigation resources are work for providing water for different purpose in South Solapur Tahsil.

About 9 state level minor irrigation project, 203 percolated tanks, 69 KT Weirs, 243 Storage Bunds and 2373 wells are irrigation resources are provided water for different purposes in Mangalwedha Tahsil.

About 202 percolated tanks, 92 KT Weirs, 280 Storage Bunds and 3300 wells are irrigation resources are provided water facility for different purposes in Malshiras Tahsil. Malshiras is one of the major sugar cane producer and agricultural developed tahsil in Solapur District. Akluj and surrounded villages of Akluj is agriculturally well developed in Malshiras Tahsil. There is major source of canal irrigation for agriculture. About 1 medium, 10 state level minor irrigation project, 207 percolated tanks, 92 KT Weirs, 144 Storage Bunds and 3536 wells are an irrigation resources provided water in Akkalkot Tahsil.

**2. Medium availability of Irrigation Facility Tahsils (4000 to 8000)**

Medium irrigation resources are observed in Mohol tahsil (6168) of Solapur District. The Sina River, canal irrigation, Medium, State and Local level irrigation Projects, Percolated dam, KT Weir, Storage Bunds and wells are a major irrigation resources are in Mohol Tahsil. Some rural area of Mohol Tahsil is deprived from irrigation facility. Rainfall, percolated tanks, KT weir and storage bunds and wells are a major resource of irrigation in Mohol deprived irrigation rural area Mohol Tahsil. About one 1 Medium, 1 state level minor, 13 local level minor irrigation projects, 469 Percolated Tanks, 76 KT Weir, 227 Storage Bunds and 5381 wells are an irrigation resources provides a water facility for different purposes in Mohol Tahsil.

**3. High availability of Irrigation Facility Tahsils (8000 and Above)**

High availability of irrigation resources are founded in Madha (9883), Pandharpur (9815) and Karmala (9075) in Solapur District.

The highest irrigation resources (9883) are found in Madha Tahsil. About 2 Major, 3 State level minor irrigation projects, 275 Percolated tanks, 75 KT Weir, 248 Storage Bunds and 9280 wells etc. are irrigation resources are observed in Madha Tahsil. Ujani Dam, Sina- Bhima Joint Underground water canal, Sina River and other irrigation are provided a water for agriculture, Agro based Industries, Domestic Water etc. Some major neighbouring rural area of Kurduwadi had deprived from canal irrigation facility in Madha Tahsil.

Well-developed irrigation facility in Pandharpur tahsil. There are about 9815 irrigation resources in Pandharpur tahsil. Out of that about 1 Medium, 55 Percolated tanks, 45 KT Weir, 173 Storage Bunds and 9541 wells etc. are irrigation resources are observed in Pandharpur Tahsil. Ujani Dams canal irrigation, Bhima (Chandrabhaga) River, Bhatghar Dam Canals and other irrigation are provided a water for agriculture, Agro based Industries, Domestic Water etc.

**\* Correlation between Geographic Area and Net Area Under Irrigation and Total Area Under Cultivation- 2022**

Table No. 2 seems that Solapur Districts Tahsil wise Geographic Area Under Irrigation and Total Area Under Cultivated.

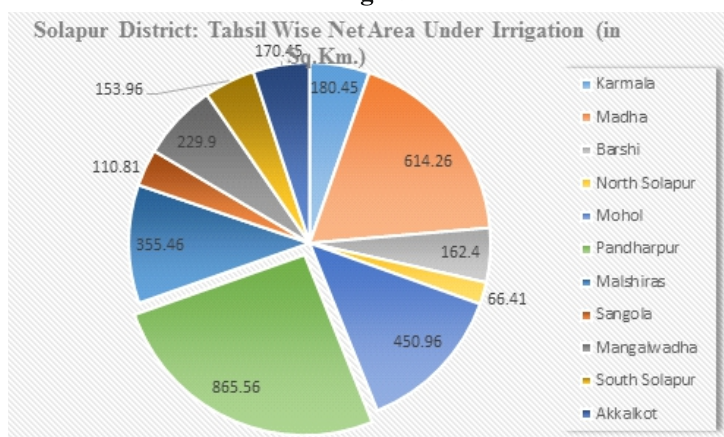
**Table No. 2: Solapur District: Geographic Area, Net Area Under Irrigation and Total Area Under Cultivation- 2022**

Sr. No.	Tahsils	Geographic Area of Tahsil (Sq.km)	Net Area Under Irrigation (In. Sq. Km)	Total Area Under Cultivation (In Sq. Km)
1	Karmala	1571.75	180.45	198.65
2	Madha	1526	614.26	264.34
3	Barshi	1522.5	162.4	242.55
4	North Solapur	683.03	66.41	117.39
5	Mohol	1316.89	450.96	566.09
6	Pandharpur	1294.37	865.56	481.92
7	Malshiras	1608.02	355.46	329.24
8	Sangola	1594.31	110.81	27.03
9	Mangalwadha	1141.59	229.9	196.96
10	South Solapur	1194.63	153.96	184.48
11	Akkalkot	1401.3	170.45	60.89
1	<b>Total</b>	<b>14854.39</b>	<b>3360.62</b>	<b>2669.54</b>
<b>Correlation</b>			<b>Correlation Between total Geographic area and Net area under Irrigation = 0.18</b>	<b>Correlation Between total Geographic area and Net area under Irrigation = 0.07</b>

**Source:** District Statistical Department 2022

The Fig. No. 1 represents that Net Area Under Irrigation – 2022 (In Sq. KM). The highest Net area under irrigation is observed in Pandharpur Tahsil. Second highest Net area under irrigation is in Madha Tahsil.

**Fig. No. 1**



While Lowest Net area under Irrigation is observed in Sangola Tahsil. The Total (Tahsil wise) Geographic area of Solapur District is compare with Net area under irrigation. A Correlation between Total Geographic Area and Net Area Under Irrigation of Solapur District -2022 is 0.18. Its represents a very week correlation between Total Geographic Area and Net Area Under Irrigation of Solapur District in 2022.

Fig. No. 2  
Solapur Dsitrict: Tahsil Net Area Under Cultivated (in Sq.Km.)

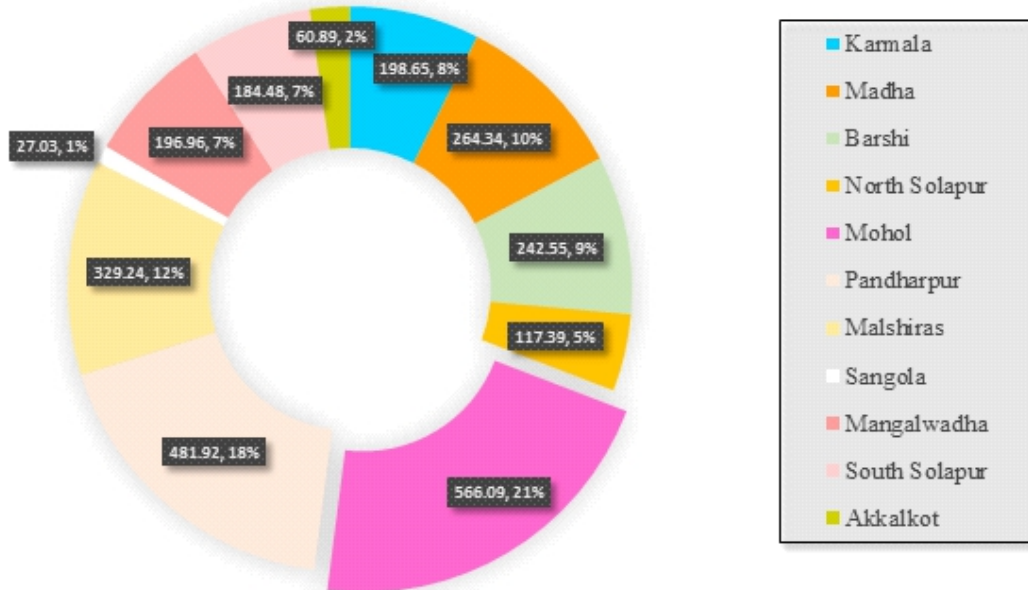


Fig. No. 2 expresses that Tahsil wise Net area under cultivated in Solapur District – 2022 (In. Sq. Km). A highest cultivated area is observed 566.09 Sq.Km.in Mohol as well as Second highest cultivated area is observed 481.92 Sq. Km. in Pandharpur Tahsil. On the contrary of very lowest net area under cultivated in Sangola Tahsil. But, the correlation between Geographic Area and Tahsil wise Net Area under cultivated in Solapur District is founded 0.07. It shows that very weak correlation between Geographic Area and Tahsil wise Net area under cultivated in Solapur District.

\* **Conclusion and Recommendation**

Irrigation is the artificial application of water to the soil to assist in the growth of crops. It is a crucial component of agriculture, especially in regions where natural rainfall is insufficient for proper crop development. The primary aim of irrigation is to provide crops with the necessary moisture to ensure optimal growth and yield. In drought-prone areas like Maharashtra, irrigation is essential for agriculture, mitigating the impact of droughts by providing a stable water supply. It protects crops from withering, ensuring continuous growth and allowing farmers to reduce reliance on unpredictable rainfall. About 53, 482 total irrigation resources are providing water for various purpose in Solapur District. But, that irrigation resources are not evenly distributed in Solapur District. Well is the major source of irrigation in entire study region. Out of that irrigation resources approximately 47,238 resisterd well is observed in entire Tahsils of Solapur District.

In present study, as compare with entire study area high availability of irrigation source has observed in Madha, Pandharpur and Karmala Tahsil. In whole study area, highest number of wells have existed in that Tahsils. The moderate irrigation sources are found in Mohol Tahsil. While Lowest irrigation resources are found in Barshi, North Solapur, South Solapur, Malshiras, Mangalwadha, Sangola and Akkalkot. These are a deprived Tahsils from irrigation facility in Solapur District.

A Correlation between Total Geographic Area and Net Area Under Irrigation of Solapur District -2022 is 0.18. Its represents a very weak correlation between Total Geographic Area and Net Area Under Irrigation of Solapur District in 2022. Thus correlation between Geographic Area and Tahsil wise Net Area under cultivated in Solapur District is founded 0.07. It shows that very weak correlation between Geographic Area and Tahsil wise Net area under cultivated in Solapur District.

To increase Net area under irrigation and Net Area under Cultivation as compare with Total geographic area of district, government should urgently implement irrigation programme for increasing irrigation facility, social participation, strictly implementation of “पाणी आडवा, पाणी जरिवा” Movement” etc. If irrigation facility increases, with Net area under cultivation also increases.

\* **Recommendation**

1. Government should take strong action against increasing area under irrigation in study area.
2. Government should be irrigation facility in entire Tahsils of Solapur District. Irrigation facility should be necessary increase except that the Pandharpur. Because, about 66.87% geographic area of Pandharpur Tahsil is under irrigation facility.
3. Government should be urgently implement irrigation programme to increasing irrigation facility.
4. Government should provide funding to build canal irrigation in deprived Tahsils of Solapur District.
5. Increasing irrigation facility helps to development of secondary and tertiary economic activity.
6. Underground water capacity should increase with help of social participation. i.e. Social forestry, contour bunding, water recharge, Natural Bund etc.
7. If irrigation facility increases, with Net area under cultivation also increases.
8. Farmers should be strictly implement of “पाणी आडवा, पाणी जरिवा” Movement”.
9. A very weak Correlation is observed between Total Geographic Area of Solapur District with Net Area Under irrigation and Net Area Under Cultivated.

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