



## IRRIGATION PATTERN IN SOLAPUR DISTRICT OF MAHARASHTRA: A GEOGRAPHICAL ANALYSIS

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**Abstract-** Initially the objective of irrigation was confined to supply water to crops whenever it requires. Many regions of the earth experiences uneven distribution and irregularity of rainfall. There are densely populated regions on the earth surface depends on agriculture. In such regions, provision of irrigation is important aspect. Irrigation is necessary in traditional agriculture to overcome droughts scarcity of rainfall. In modern agriculture need of irrigation increased tremendously. Irrigation constitutes one of the most effective technical means of the raising agricultural production in the developing countries. So in the present research paper, the major objective is to understand the irrigation pattern in Solapur District.

**Keywords:-** Tube wells, Ground water irrigation, Surface water irrigation, Canal, Lift irrigation, Tube Wells

### Introduction

Irrigation constitutes one of the most effective technical means of the raising agricultural production in the developing countries. Where irrigation by gravity is possible, much work of installing facilities can be carried out by manual labour, through there is an obvious economic advantages, even in countries with very low wage level, in using technical aids in the constructional and earth moving works. Where the necessary water. Cannot be brought to the land to be irrigated slowly by the force of gravity, it is necessary use pumping installation. Mechanical source of power has considerably increased the efficiency of water pumping and have extended the use of irrigation by making. It possible to use ground water located at considerable depth and with the aid of sprinkling arrangement, to brings irrigation to areas that, could otherwise not have been brought under cultivation except at uneconomically high cost. There is still a very large potential field for development by means of this system.

Drought prone area of Maharashtra like most of other parts of the country is basically agricultural and rural. However agriculture of this area dissipate limited irrigation facilities, coarse, shallow and poor quality soil and precarious and erratic rainfall has given way to a verity of crop patterns to adjust with prevailing best possible alternative cropping system. In view of increasing pressure of population on land and the growing demand for food and other materials. Agriculture land use refers the proportion

of area used to grow different crops during the agriculture enter year.

The study of agricultural land use not only provides base for understanding the complex structure of agriculture landscape of the study region but also helps for better planning.

### Objective

The main objective of the study is to showing the irrigation development in the Solapur district. Analysis the irrigation pattern of

Solapur district besides the sources of irrigation, the regional disparities in irrigation and irrigation impact on agriculture land are the specified objective of the study.

### Source of data and information

Basically the entire research paper is based on secondary data. The secondary data and information have been taken from the Director, District Irrigation Department of Solapur, District Superintengint Agricultural office, Solapur Socio-economic review and district statistical abstract of Solapur district 1961-2007.

### Methodology

The basic unit of investigation will be district as well as the talukas. The collected data is processed and edited the various cartographic and quantitative as well as statistical method would be used analysis of different aspect of proposal study. The collected

data have been processed and presented through the tables and maps. Solapur district has been considered as an areal unit.

### Study region

Drought prone area in Maharashtra average about one third of the geographical area of the state, entire Solapur, except few patches irrigated by canal, is the heart of the drought prone area (fact finding committee, 1973). Solapur district occupies southern part of Maharashtra state. It occupies an area of 14,84,559 sq.km. And supports 32.32 lakh of population. Administrative the district is divided into eleven talukas.

Solapur district occupying southern part of Maharashtra lies between 17° 10' N and 18° 32' N latitude and 76° 42' E and 76° 12' E longitude. The topography of the region comprising long, low uplands separately by shallow basin has an elevation of about 550m above mean sea level.

### Explanation

#### Irrigation in Solapur District

There are imbalances in irrigation development in Solapur district. They are natural as well as created imbalance. The natural imbalances are caused due to the relative advantages and disadvantages of regions with respect to irrigation sources. The total irrigated area is 25,77,900 hectares in 2000/01 year among them 74.53 percent by well and 25.47 percent by other surface irrigation sources. The share of irrigation area to net sown area is more in Sangola (15.90%) in the district and followed by Pandharpur (14.92%) by these irrigation sources. In Solapur District, seven medium project are used and they irrigated 18,54,620 hectares area in 2008/09. The minor irrigation project and tanks (750) are also used for irrigation and they cover 35,800-hectare area cover. According to District Superintendent Agricultural office, the crop-irrigated area is 25,94,760 hectares in 2000/01. For them 23,24,670 hectares, (89.60%) area is under food crops and remaining area is under non food crops. The area of sugarcane crop (non food grains) is higher (29.81%) than all food crops. Jawar (food grains) (26.03%) is second dominant food crops irrigated in the region. The gram-irrigated area is highest in all the cereal crops. Among the non-food crops, the oil seed irrigated area (75.57%) is larger than other non-food crops.

#### Irrigation Development in Solapur District

The total irrigated area is 7.47 percent to State irrigated area in 2008/09. This irrigated area is 1.3 lakh hectares in 1960, which is only 10.60 percent to net sown area. In this period irrigation technology was not satisfactory means electronic pump sets or diesel engines were absent in well, tank irrigation. The canals and bore-wells were not used for irrigation. After the green revolution, irrigation area increased tremendously i.e. in 1980, irrigation area

is 1.8 lakh hectares which contribute 14.71 percent to net sown area. It reached 2.5 lakh hectares in 2000 year and cover 30 percent net sown area. After that the irrigation area and share in net sown area decreased due to the decreasing average rainfall of the region, the more time absence of electricity, continuously down going water surface level and non planning irrigation use by farmers.

#### Irrigation Types in Solapur District

There are imbalances in irrigation development in Solapur district due to the natural as well as created imbalance in irrigation sources. The natural imbalances are caused due to the relative advantages and disadvantages of regions with respect to irrigation sources. These natural differences in regions can be described as regional disparities. The sources of irrigation in Solapur district is classified as follows,

**Wells irrigation:-** The main source of irrigation in the Districts Lake, tanks, river, canal and wells. The distribution of wells is different according to the taluka. In the district 75 per cent of the area from total irrigated is from the wells. The Pandharpur and Mohol talukas are the two highly irrigated by the wells. Pandharpur 85.5 per cent of the area from the cultivated land is irrigated by the wells and 11,818 wells are available in the talukas. In Malshiras 82.9 per cent area is irrigated by the wells. 4,824 wells are available to the irrigated. Most of talukas are the medium, irrigated land by wells. Akkalkot, S.Solapur, Madha, Sangola, Mohol are the medium wells irrigated land. N.Solapur, Mangalwedha are the low irrigated land. There is the low number of wells. In this way the distribution of wells irrigation is different taluka. The total no. of wells in district are 65,364 in the district. It is main source of irrigation in the district.

**Tube wells irrigation:-** Tube wells are the most important source of water in Solapur district, in purpose of irrigation. Tube wells are the type of irrigation method similar to wells irrigation. The distribution of Tube wells is different according to the taluka. In the district few areas from total irrigated is from the tube wells. The highest number of tube wells found in Pandharpur, Malshiras, Mohol, Mangalwedha. i.e. above 1,300 tube wells. There are Sangola, Madha, Karamala talukas are included in such category therefore number of tubewells are above 1,000 to 1,300 respectively. Barshi, N.Solapur, S. Solapur, involved in this category. i.e. 390 to 943 tubewells occur in these talukas respectively.

**Canal irrigation:-** Tank and canal irrigation is very important in agriculture of Solapur District. It is wealthier district, all district mainly two rivers are important i.e. Bhima and Sina river. The western

taluks enjoy this facility from Nira right bank Canal system seasonally . Recent development of Ujani Project are also provide water to almost two third area of the district .There are two canal covered the irrigated area farming system 125939 hectors in district and totally land irrigation 3.39 lakh hectors covered the area .

**Lift Irrigation Scheme:-** Water is lifted from the rivers, wells, tanks etc., and used for irrigation purpose. Formerly water was lifted by leather mots or iron mots. The co-operative lift irrigation societies, therefore, have been formed as an alternative to provide irrigation facilities. This has helped in bringing larger area under irrigation, reduce the cost of irrigation per acre, raise more than one crop a year and make farming more profitable. The Solapur Zilla Parishad has taken up 23 lift irrigation schemes in the district. With the two big rivers, viz. Bhima and Sina, and small rivers like Man, Bori and Harna, lately a few lift irrigation schemes have been taken up in the co-operative sector. The Zilla Parishad has undertaken 23 such schemes for implementation, out of which seven have been completed. Bhima river traverses about 180 miles in Solapur district and has a minimum discharge of 200 km. Besides the Bhima, the Sina and the Bori are suitable for lift irrigation; A major lift irrigation scheme is located at Tandulwadi in South Solapur taluka. It irrigates about 4,000 acres. Generally in such schemes, area irrigated varies between 125 acres and 1,500 acres. These schemes are found more in South Solapur, North Solapur and Akkalkot talukas. More schemes have been proposed throughout the district and some of the co-operative sugar factories have undertaken to finance some lift irrigation schemes.

#### **Irrigation Project in Solapur District**

Today, irrigation projects play major role in agriculture of Solapur District. Minor irrigation projects help to promote irrigation area.

**Major Project:-** The irrigation capacity of project is more than 10,000 hectors is known as major project. Bhima irrigation project and Sina Kolegaon irrigation project are the major irrigation project in the district. The both irrigation capacity is 4.5 lakh hectors in 2009.

**Medium Project:-** The irrigation capacity in which project is 2000 to 10,000 hectors is known as medium project. According to the 2009 year, only seven medium project are available in the study region. The average capacity of this projects are 54,000 hectors.

**Minor Project:-** The average capacity of irrigation project is below 2000 herctorsis known as minor project. All minor irrigation schemes that irrigate up to 18000hectares (51 projects) are under the administrative charge of the Zilla Parishad. The

Zilla Parishad is empowered to take up minor irrigation works costing into Rs. 5 lakhs. It has however been found that projects for Irrigation cannot be undertaken within the above-mentioned financial limit by the Government.

#### **Spatial Distribution of Irrigation**

The problem of irrigation has been an important one concerning the Solapur district since long. Agricultural activities in the district are still dependant on the varies of monsoon. At a present the main source of water supply in the district are wells bandharas, tanks and canals. The spatial distribution of Solapur district is uneven.

The Pandharpur taluka is highly irrigated in the district. It consist 46.25 percent of area is irrigated from the cultivated land and only 8.27 percent of district irrigated area. Followed by Sangola, North Solapur and Malshiras are highly irrigated tahsils in the district. They consist more than 25 per cent of area is irrigated from the cultivated land. Akkalkot Mangalwedha and N.Solapur are the low irrigated from their cultivated area in the district. Among the total district irrigated area Madha taluka is ahead form all the tahsil and it capture 11.26 percent district area. Followed by Karmala, Barshi and Akkalkot capture large irrigated area of the district. North Solapur capture very small share of district irrigated area.

#### **Conclusion**

The irrigation situation of Solapur district is not satisfactory come to Maharashtra state. The total irrigated area is 7.47 percent to State irrigated area in 2008/09 among them 74.53 percent by well and 25.47 percent by other surface irrigation sources. The irrigation growth is very slowly in the district. Distribution of wells, tube wells, lakes, and project shows distinct disparity in the district. The distribution of wells is mainly concentrated either in the drought prone talukas or agriculture based talukas. Canals are not uniformly distributed all over the district. Pandharpur, Malshiras, Mangalwedha, Mohol, N.Solapur are having better proportion of canals. This talukas have their sources from 3 – 4 decades. Dams constructed across Bhima, Sina, Nira Rivers provides canal irrigation of these talukas. The Pandharpur taluka is highly irrigated in the district. Akkalkot Mangalwedha and N.Solapur are the low irrigated from their cultivated area in the district. Among the total district irrigated area Madha taluka is ahead form all the tahsil and it capture 11.26 percent district area.

For improving irrigated area and agriculture production, it is very essential to inform the farmers about the facilities provided by government and co-operative agencies i.e. loans and subsidy for the wells, Shettale etc. the groundwater survey and development agency should be providing information regarding the water table and for the

location the sites for the wells. To avoid water losses through evaporation, seepage, the crop should be irrigated by drip and sprinkler method.

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*Table 1- Irrigation in Solapur District. (1960 to 2009)*

Sr	Year	Total irrigated area (0000 hectors)	Percentage of irrigated area to net sown area
1	1960	13.0	10.60
2	1970	14.4	12.18
3	1980	18.2	14.71
4	1990	23.8	21.02
5	2000	25.0	30.00
6	2009	25.7	25.22

Source: -Socio-economic Abstract of Solapur District year 2008/09 Table No1.1, Pp-2

*Table 2-Irrigation project in Solapur District (2008/09)*

Source: -Socio-economic Abstract of Solapur District year 2008/09 Table No1.1, Pp-3

Sr	Project	No. of project	Area irrigated(hectors)
1	Major	2	452000
2	Medium	7	54000
3	Minor	51	18000

*Table 3- Tahsilwise irrigation area in Solapur District (2009)*

Source:- Socio-economic Abstract of Solapur District year 2008/09 Table No6.5, Pp-45

Sr. no	Taluka	Irrigated area (hectors)	Percentage to total irrigated area	Percentage to total cultivated area
1	Karmala	123138	10.48	19.74
2	Madha	132295	11.26	17.2
3	Barshi	123122	10.39	19.03
4	N. Solapur	55957	4.76	34.16
5	Mohol	104569	8.9	20.85
6	Pandharpur	97186	8.27	46.25
7	Malshiras	116559	9.92	25.09
8	Sangola	121501	10.34	39.02
9	Mangalwedha	85524	7.28	15.09
10	S.Solapur	95637	8.14	27.27
11	Akkalkot	118735	10.11	15.85
Total	District	1174221	100	100

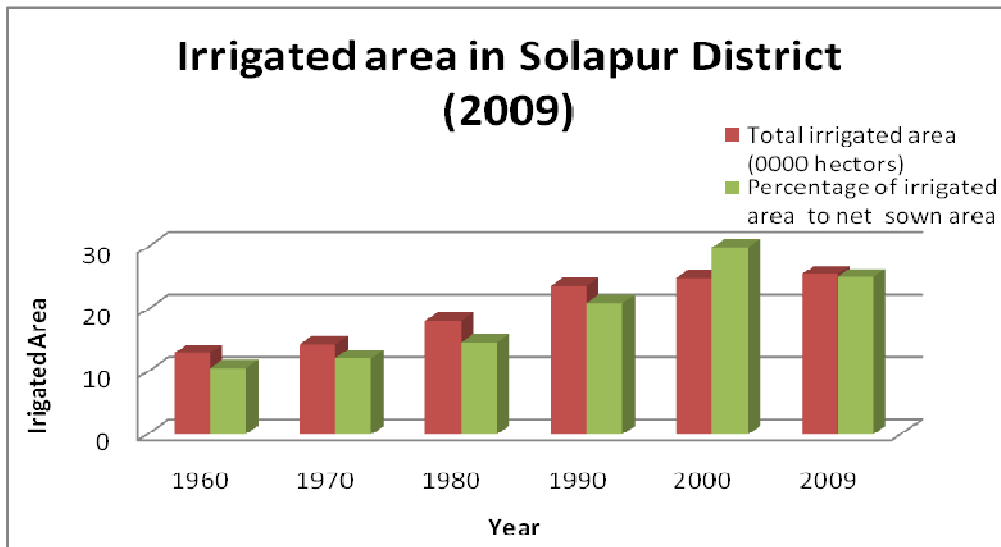


Fig. 1

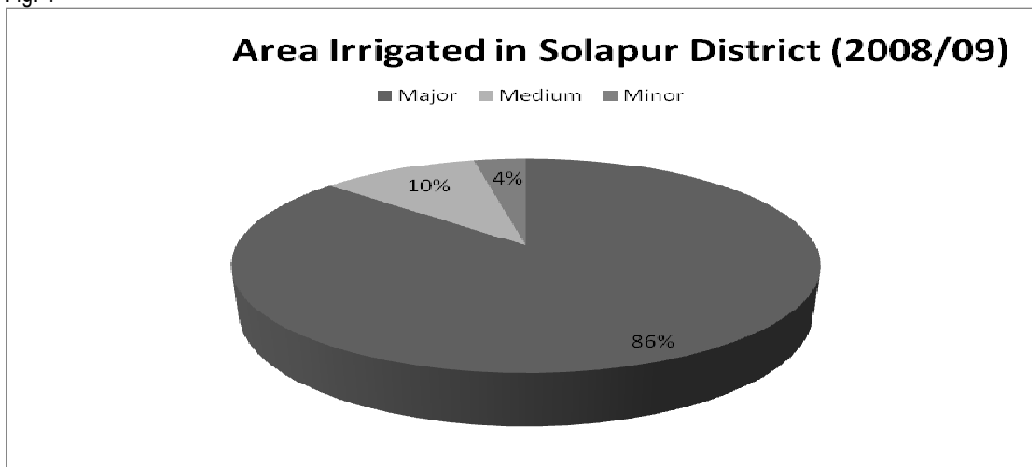


Fig. 2

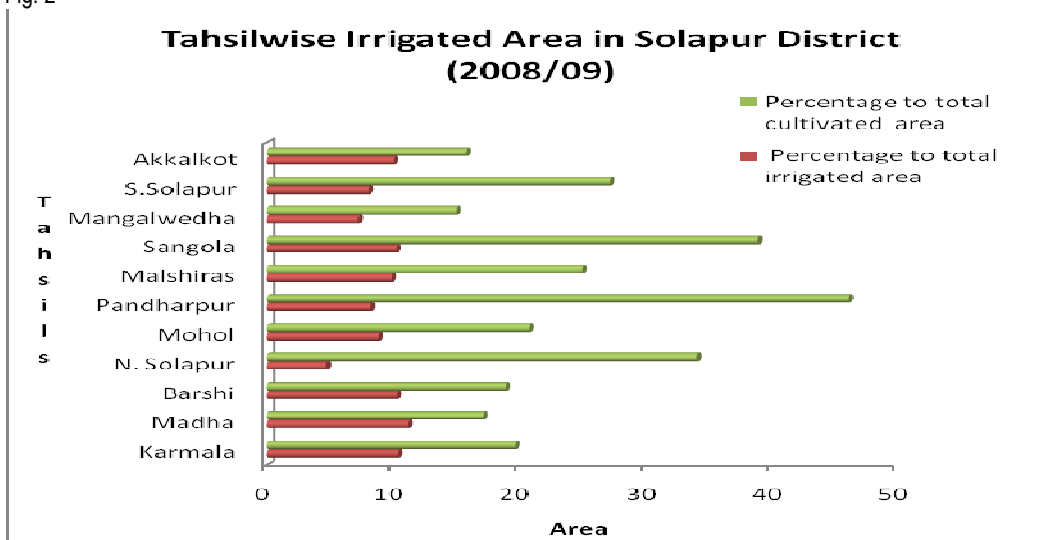


Fig. 3