



A GEOGRAPHICAL ANALYSIS OF IRRIGATION PROJECTS IN SANGLI DISTRICT

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ABSTRACT:

Agriculture plays a predominant part of the Indian rural economy. Development of agriculture is a multidimensional process. Irrigation has been playing a vital role in the agriculture as well as the overall development of the region. In drought prone area of Western Maharashtra where agriculture is perpetual gamble with the monsoon, irrigation acts not only as a protective and establishing factor but also a productive input.

The present study is deals with the impact of various irrigation projects on agriculture in Sangli district, which is include in drought prone area where rainfall is below 75 cm per year. To overcome the frequent drought condition of this area Government of Maharashtra has undertakes various canal irrigation projects in Sangli district. The research work is entirely based on secondary data. Collected data is processed by various statistical and quantitative techniques for proper inferences and it also support by means of cartographic techniques. The study concludes that there are great differences in agriculture system. Significant shift have been observed in cropping pattern.

Key words: Agriculture, Irrigation, Cropping, Projects, Drought, Monsoon.

INTRODUCTION:

Irrigation has been practiced in India traditionally. Use of groundwater for agriculture is not a new thing. However, technological support for fetching groundwater for agriculture has created severs issues. Canal irrigation is a modern facility and so is the case of lift irrigation. It might have been simple to state that canals have shown positive impact on agricultural development. Indian agriculture gambles with the monsoon causes high fluctuation in production. Inadequate rainfall of Monsoon and frequent drought condition hampered the development of agriculture. However, because of the natural imbalance and disparity it is very difficult to source the water naturally for irrigation. It is therefore, efforts can be done to available water for irrigation applying artificial means. Water can be made available for irrigation through damming the rivers, construction of bunds, weirs, walls etc. Lift irrigation is a method of irrigation in which water is not transported by natural flow but it is lifted with pumps or other means

In the present research paper we have to studied geographical locations of Irrigation projects. For the purpose of this research secondary data have been used which is collected from district census handbook, Googol Earth and Cartosat-1/Carto DEM Version-3 R1 data downloaded from bhuvan.nrsc.gov.in website. Statistical methods and GIS mapping techniques have been used for creating map for this research paper.

STUDY AREA:

The Sangli district is located in the southern part of Maharashtra & covers an area of 8572 sq. kms. Its longitudinal extent is $73^{\circ} 42' E$ to $74^{\circ} 40' E$ & $16^{\circ} 44' N$ to $17^{\circ} 33' N$ Latitudes .It includes 10 tahsils & bordered by Solapur District in north-east, Bijapur in east-south, Sangli in south-west & Satara in north –west. This district falls partly in Krishna basin and partly in Bhima basin. Consequently, it is divided into different drain systems. The whole district can be divided into three different parts on the basis of topography, climatology and rainfall viz. western hilly area of Shirala tahsil with heavy rainfall. The basin area of Krishna, Warna & Yerala rivers, comprising of Walwa Tahsil & western part of Tasgaon and Miraj Tahsils with medium rainfall. Eastern drought prone area which comprises of eastern part of Miraj, and Tasgaon tahsils, north-eastern part of Khanapur tahsil and whole of Atpadi, Kadegaon, Kavathe Mahankal & Jath tahsils.

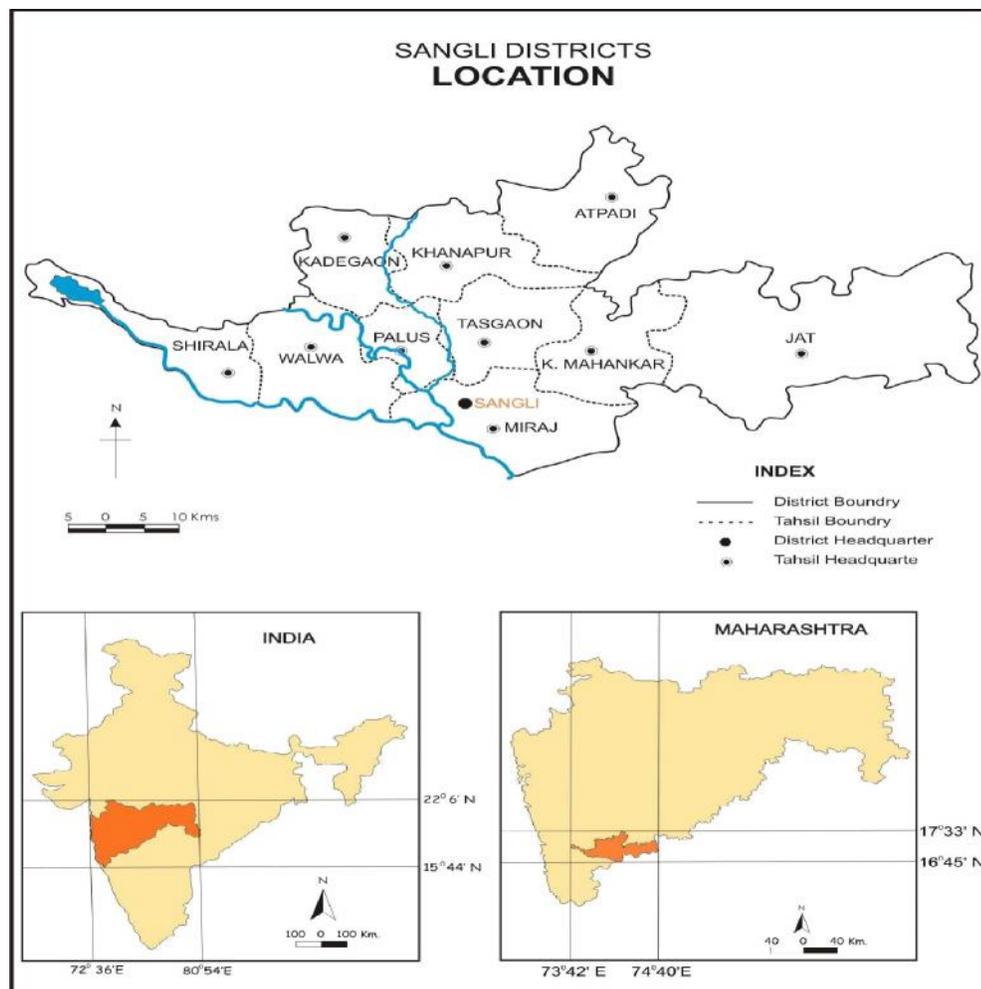


Figure 1

The climate gets hotter and drier towards the east and humidity goes on increasing towards the west. The maximum temperature ranges between 31.5 degree C and 38.2 degree C, while the minimum temperature ranges from 12.9 degree C to 22.7 degree C. The climate



in the district is fairly tolerable throughout the year. The winter is pleasant from December to February. The summer season starts from mid February to May. June to September is the months of normal rainy season. July and August are the months of heavy rainfall. The western part of Shirala tahsil gets heavy rainfall on an average over 1300 mm in a year. The central and eastern parts receive annual rainfall about 900 mm in a year. The northeastern portion receives the lowest rainfall in the district - only 300 mm in a year. Due to this lowest rainfall, the tahsils of Atpadi, Jath, Kavathe Mahankal, Miraj (East), Tasgaon (East) and Khanapur (East), Kadegaon are drought prone areas. As per 2011 census the population of the Sangli district is about 2,820,575.

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OBJECTIVES:

1. To Study drainage pattern and Irrigation Projects in Sangli district.
2. To Analyze Major, Medium and Minor Irrigation Projects in Sangli district.

DATABASE AND METHODOLOGY:

Present study is totally based on secondary source of data, which is collected from Sangli district census handbook, Googol Earth and Cartosat-1/Carto DEM Version-3 R1 data downloaded from bhuvan.nrsc.gov.in website. Statistical methods and GIS mapping techniques have been used for creating map for this research paper. Percentage of Irrigated Area is calculated by following formula

$$\text{Irrigated Area} = \frac{\text{Area under Irrigation in Tahsil}}{\text{Total Area under Irrigation}} * 100$$

Drainage Pattern in Sangli District

Water resources emerge from nature's gift of rain, wells, rivers, lakes and streams. Irrigation water i.e. dams, canals are important and assured source for agriculture. Availability potable drinking water is also equally important today.

In the Sangli district, the river Krishna, Yerala and Warana and its tributaries make the region fertile. River Krishna flows the south- western border of the region and also makes the region fertile.

A. Yerala River:

The Yerala, the largest river of the left bank of the northern feeders of the Krishna rises in Solkanath hills in the extreme north of Khatav. It flows north to south in a valley flanked by the Vardhangad - Machhindragad range on the right or west and by the Mahimangad – Panhala range on the left or east. It flows 90 kms in Tasgaon and Miraj tahsil joins the Krishna near the Bramhnal. The east bank tributaries of the Yerala are generally longer though somewhat drier than those of the west.

The important west bank tributary of the Yerala is Nandani River. It has parallel to the Vardhangad – Machhindragad range and is joined by several small tributaries which drain the eastern slopes of that range, the chief of which is Mahadev Odha. Half a mile below the junction of the latter, the Nani has been dammed at Chikhli and the chikhli canal taking off from it on the western bank of the river affords some limited irrigation facilities between it and the river.

- B. Agrani River :-** The Agrani River is second important river in the Sangli district. River begins from the temple of Agasthi Hrushni near village Ainwadi (Venapur) in Khanapur tahsil. After flowing about 32.18 km. in a southward direction, river turns towards the south – east. The river has narrow valley bottom. There are number of small a tributaries which joins the river Agrani. One important tributary of the Agrani River rises on the plateau some 3.21 km. above Kundlapur and flows due southwards passing by Kuchi and Kavathe Mahankal before joining the Agrani.
- C. Krishna River:-** River Krishna is a main source of supply of water for drinking, Industries and irrigation for Sangli district. It flows south – western border of the Sangli district especially Walwa and Miraj tahsils. Yerala joins the Krishna river by border the Sangli district but Agrani joins it just outside. The Krishna valley of the Sangli district is the most fertile.
- D. Warana:-** The Western Part of Sangli district is bordered by Warana Rivar. The Warana River Origins in the Sahyandri range. Chandoli dam is constructed on this river.

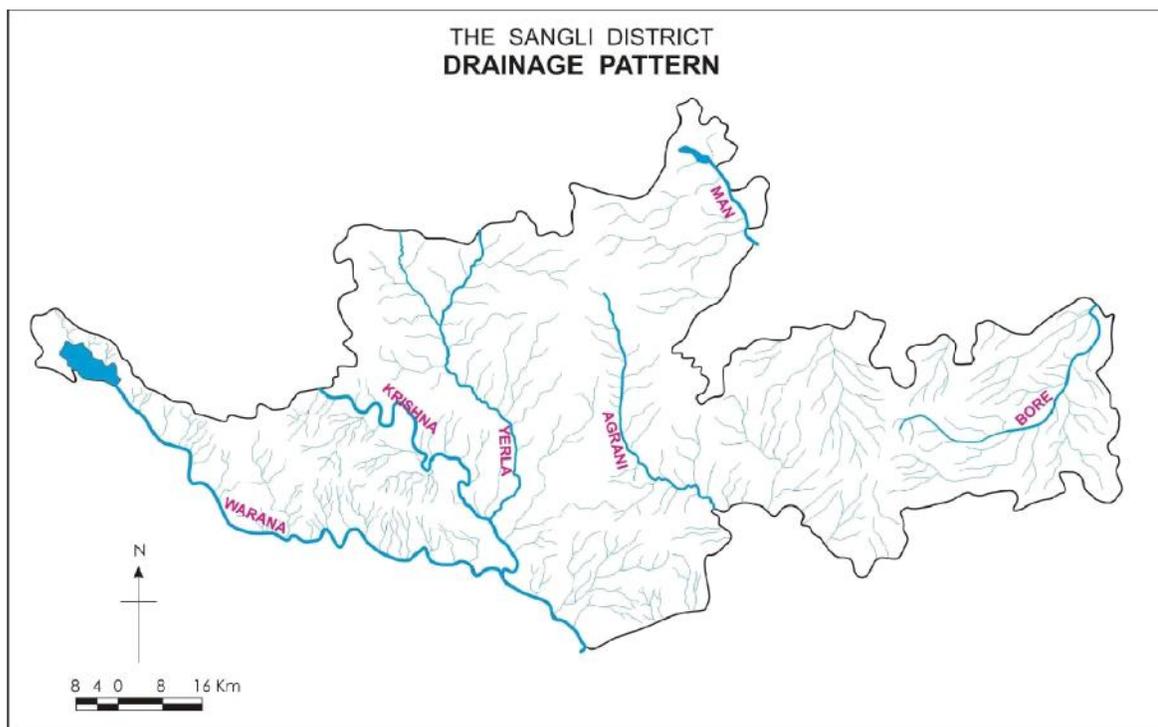


Figure 2

IRRIGATION PROJECTS IN SANGLI DISTRICT:

In year 2013-14 there are Mhaisal, Takari, Arphal, Tembhu lift irrigation projects which irrigates major area of district these are Major irrigation projects, 7 Medium projects 88 Minor projects, 904 percolation tanks and 53 Kolhapur type KT weirs are completed.

1. Takari Lift Irrigation Project

The Takari Lift Irrigation canal scheme is sanctioned in 1984 & sourced from the Krishna River near Takari Tal -Walwa in Sangli District. This scheme irrigates the drought prone tahsils Kadegaon, Khanapur, Tasgaon, Palus and Miraj of Sangli district. The overall length of the canal is 160 kms covers an area of 27630 hectares with four stages. The water requirement is met with from Koyana dam through Krishna River.

2. Mhaishal Lift Irrigation Project

The Mhaishal Lift Irrigation canal scheme is sanctioned in 1986 & sourced from the Krishna River near Mhaishal Tal -Miraj in Sangli District. This scheme irrigates the drought prone tahsils like Kavathe Mahankal, Tasgaon, Jat and Miraj of Sangli district & Sangola, Mangalwedha of Solapur District with an irrigated area of 81697 hectares with six stages. The water requirement is met with from Koyana dam through Krishna River.

3. Arphal Canal Irrigation Project

The Arphal canal is sourced from the Kanher dam in Satara district which comes under the Krishna river basin at 17° 45' N Latitude and 73° 55' E Longitude with 204.69 km² of catchments area. Through entire canal, water flows by natural gravity. The overall length of the canal is 235 km covers an area of 31005 hectares of Satara, Koregaon, Karad, Khanapur, Tasgaon, Palus and Kadegaon of Satara and Sangali districts.

Distribution of irrigated area under Major, Medium and Minor projects in Sangli District

Tahsil	Irrigated Area Under Various Irrigation projects in Hectors (Year 2013-14)							
	Minor (Hectors & %)		Medium (Hectors & %)		Major (Hectors & %)		Total Area (Hectors & %)	
Shirala	799	0.91	1540	22.15	0	0.00	2362.057	1.22
Walwa	30589	34.77	1159	16.67	103	0.10	31902.44	16.44
Palus	16992	19.32	2213	31.83	580	0.59	19836.14	10.22
Kadegaon	1815	2.06	0	0.00	9455	9.54	11272.06	5.81
Khanapur	1211	1.38	0	0.00	6565	6.62	7777.377	4.01
Atpadi	2824	3.21	0	0.00	0	0.00	2827.21	1.46
Tasgaon	935	1.06	1591	22.88	12769	12.88	15318.95	7.89
Miraj	29249	33.25	0	0.00	33347	33.64	62629.25	32.28
Kavathemahankal	1865	2.12	397	5.71	13758	13.88	16027.83	8.26
Jat	1689	1.92	53	0.76	22550	22.75	24294.68	12.52
Sangli District Total	87968	100.00	6953	100.00	99127	100.00	194248	100

Table 1 Source: Socio Economic Abstract of Sangli District 2013-14.

4. Tembhu Lift Irrigation Project

The Tembhu Lift Irrigation canal scheme had sanctioned in 1996 and it started at the Krishna River near Tembhu, Tal -Karad in Satara District. This scheme is irrigating the drought prone tahsils of Sangli and Solapur districts, with having an irrigated area of 80672 hectares. The water requirement is met with from Koyana dam through Krishna River⁶.

Distribution of irrigated area under Major, Medium and Minor projects in percent in Sangli District

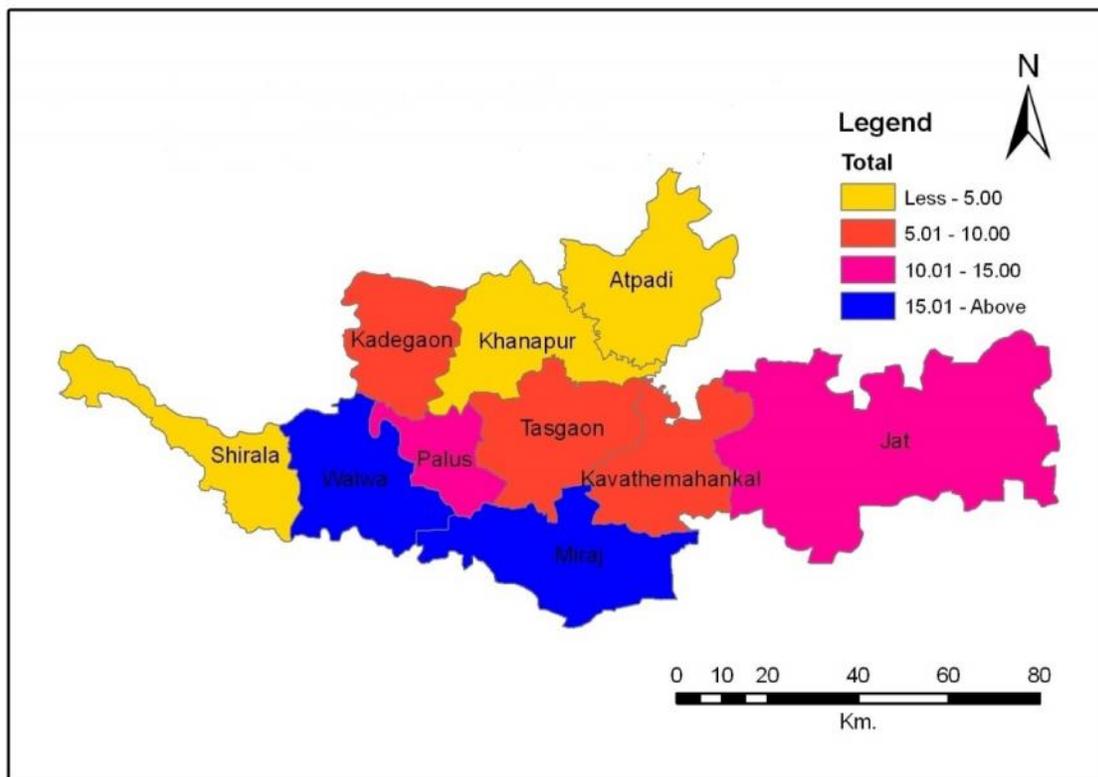


Figure 3

1. Total area under irrigation below 5 %

In this category western part of district Tahsil Shirala 1.21 %, northern part Atpadi tahsils 1.46% and Khanapur 4.01% these three tahsils included.

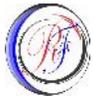
2. Total area under irrigation 5.01 to 10 % Total area under irrigation 5.01 to 10 % is found in tahsils Tasgaon 7.88 % and Kavathe Mahankal 8.26%.

3. Total area under irrigation 10.01 to 15 %

Tahsils Palus 10.20% and Jath 12.52% are included in total area under irrigation 10 to 15 %.

4. Total area under irrigation more than 15.01 %.

Highest area under irrigation observed in Walwa tahsils 16.41% and Miraj Tahsil 32.26% in



Sangli district.

CONCLUSION:

1. General topography of Sangli district, rainfall distribution and drainage pattern these geographical factors broadly affects on the distribution of area under various irrigation projects in the Sangli District.
2. Highest area under irrigation to the total cultivable area under Major, Minor and Medium irrigation projects is in Tahsil Walwa 16.41% and Miraj Tahsil 32.265 in Sangli district.
3. Area irrigated under Major projects identified in Miraj tahsils 33.64 % and Jath Tahsil 22.75 %. These tahsils are under command area of Mhaisal lift irrigation project.
4. Area irrigated under Medium projects identified in Tahsil Shirala 22.15%, Walwa 16.67% Palus 31.83% and Tasgaon 22.88%. In these tahsils projects like Siddhewadi, Morana.
5. All above projects are not totally completed because of this Sangli district faces frequent drought condition .So there is need to sanction the allotted amount to complete these projects.

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