



A STUDY OF CHANGES IN IRRIGATION SYSTEMS IN BHADGAON TALUKA OF JALGAON DISTRICT IN MAHARASHTRA

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INTRODUCTION

Agriculture is the major occupation of Bhadgaon tahsil and irrigation is the soul of agriculture. We can't imagine agriculture and its sustainable development without irrigation. If water is available for irrigation in full manner then farmers use it as they wish for irrigation and so on. But whenever it is not sufficient then farmers used different techniques to save water and increase irrigation area. Bhadgaon taluka is lying on Deccan trap. It is covered by Basalt rock. The percentage of percolation of rain and surface water are found very low in this area and water storage capacity also less than other rock, so the underground water storage are found in deeper layer with thin layer of underground water in this reason.

Ground water is often called underground water which occurs below the surface of the earth. The formation of underground water takes place when under hydrostatic pressure the permeable rocks get saturated with water. From the surface, water moves down by gravity to enter this zone, the upper surface of which is called the water table or phreatic surface. The quality and quantity of ground water depends upon the geological structure.

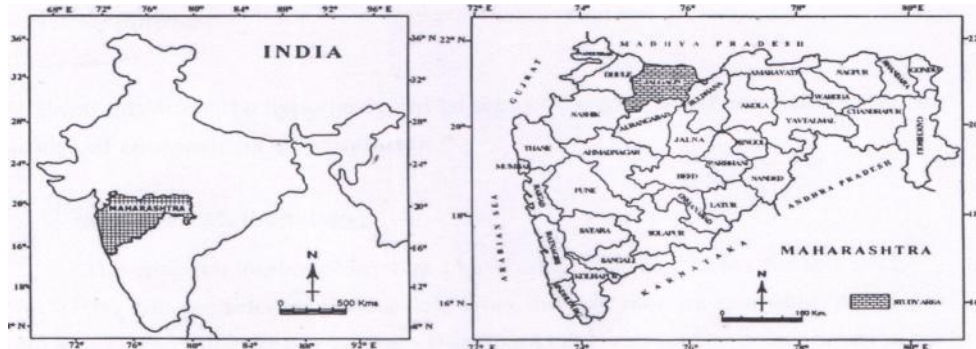
Bhadgaon taluka is come under semi-arid climate. So the rainfall is low in this taluka. The average rainfall is 665.5 mm and temperature is up to 45° C. Average rainy days are 40 in this area. Now a day, atmospheric condition is going to variable situation day by day. Seasonal rainfall continuity is also inconsistent in India. That's why farmer are facing lot of difficulties in this occupation. In Jalgaon district some major and minor projects are constructed on the Girna River in various Taluka. Bhadgaon Taluka lies in southern part of Jalgaon district. The Girna River is most important river in this Taluka. It is the life line of Bhadgaon taluka. The upper course of the river Girna dam has been constructed by Maharashtra government. Bhadgaon Taluka receives canal irrigation by the dam reservoir. But in last few years, this area is facing the decreasing average rainfall and Girna reservoir not achieves the storage of water of dam capacity. Malegaon, M.I.D.C. water Project and Chalisgaon city and other villages in Girna basin also depend on potable water of this dam. Because of Girna dam reservoir is not able to supply continuous water for irrigation purpose. So the irrigation problems are big challenges to farmers. Due to such circumstances farmers are moving towards to dig well and tube well in their farm for the irrigation and trying to use drip, sprinkle irrigation system for increase crop production.

STUDY AREA

Bhadgaon Taluka lies between 75°13'N to 75°22' N latitude and 20°40'E to 20°66'E longitude. The total area is 43,841.41hectores covered by this Taluka. At the Northern side of Bhadgaon is Parola and Jalgaon Taluka, at the eastern and southern side is Pachora Taluka and at the western side is Chalisgaon Taluka to Bhadgaon Taluka.

Map No. 01

Location Maps of Bhadgaon Taluka of Jalgaon District in Maharashtra

**OBJECTIVES**

- i. To find out irrigation problems in Bhadgaon Taluka.
- ii. To list out the factors affecting decreasing underground water level in Taluka.
- iii. To account for the irrigation transformation that has been within last three year, (2012-13, 2013-14 and 2014-15).
- iv. To study the substitute irrigation systems used by farmer on own perception.

HYPOTHESIS

From this study the hypothesis can be set as “**Decreasing underground water level affected to irrigation in Bhadgaon Taluka.**”

RESEARCH METHODOLOGY

The research methodology that I have adopted is as follows for this study-

1. Primary Data and Information

Some villages are selected through random sampling via contours and measure depth of wells, tube well and water level. 40% villages (25 out of 59) I have selected for the sampling. The data is collected from 274 farmers by personal interviews and questionnaires. The supporting evidences like photographs have been taken during the field work.

2. Secondary Data and Information

I have collected secondary data from published and unpublished document of Talathi, irrigation department, agriculture department of Taluka head quarter and District Geological Office at Jalgaon.

The data is analyzed and maps and diagrams are finalized. Finally, I have interpreted the data and generate conclusion of the paper.

Table No. 01

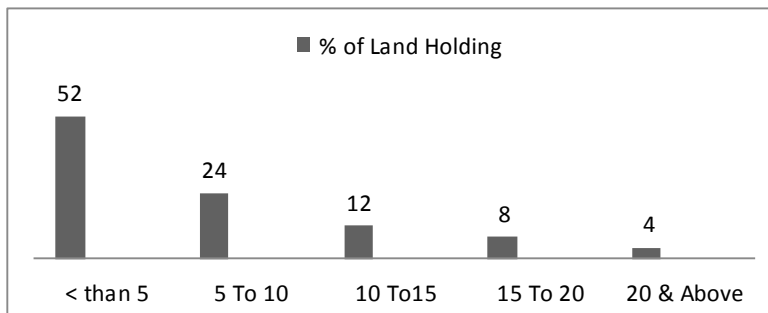
Percentages of Land Holding in Bhadgaon Taluka

Sr. No.	Size of Land Holding (in Acres)	%
01	< than 5	52
02	5 To 10	24
03	10 To 15	12
04	15 To 20	08
05	20 & Above	04
Total		100

Sources:- Personal survey by questionnaire and interview.

According to above table it means small land holder numbers are greater than large land holder in this taluka. Those are small land holder; they have not their own irrigation facilities. They are depending on other large land holder farmers

Figure No. 01
Percentages of Land Holding in Bhadgaon Taluka



In above graph, the agricultural land distribution is shows in percentages. The less than 5 acre land holders graph is high at 52%, 5 to 10 acre land holder percentages are half than small land holder. The 10 to 15 acre land holders’ percentages are half than 5 to 10 acre land holder. 15 to 20 acre land holders number are low than 10 to 15 acre land holders and lastly the above 20 acre land holder are only 5% in this region. Only one farmer has 90 acre land in Bhadgaon taluka.

Table No. 02
Total Net Sown Area of Bhadgaon Taluka

Name of Crops	2012-13		2013-14		2014-15		Remarks About area
	Average area	Net sown area	Average area	Net sown area	Average area	Net sown area	
Total	42131	42131	42131	42131	42131	40067	Decrease
%	100	100	100	100	100	95.10	4.90%

Source:- Tahsil Agriculture Office, Bhadgaon.

The total geographical area of Bhadgaon taluka is 43841.41 hectares. The total agriculture land is available 42131 hectares out of that 28107 hectares (67%) land is non-irrigated and 14024 hectares (33 %) land came under irrigation in Bhadgaon taluka. During 2012-13 to 2013-14 the net sown area was 100% occupied under crop about in 2014-15 it has decreased towards 40067 hectares, it means 4.90% net sown area decreased in Bhadgaon taluka.

Table No. 03
Average Land Holding and Area under Irrigation in summer

Sr. No.	Name of Villages	Average Land holding (in acres)	Area under Irrigation in Summer (in %)
Total		134.95/25	1405/25
Average		5.40	56.22

Source:- Personal survey by questionnaire and interview.

According to the survey the average land holding is 5.40 acre and average area under irrigation in summer season is 56.22% in Bhadgaon taluka. It means that 43.78% area has not irrigation facilities. So the mostly area is found as barren land in summer season. Those have irrigation facilities they use drip irrigation system to increase irrigated area and take production from crops.

METHODS OF IRRIGATION

In those areas availability of water is not in well condition then irrigation management plays important role. Due to lack of water availability the need of irrigation is more important. Bhadgaon taluka has thin layer of underground water, so availability of underground water is not good in whole taluka. So maximum farmers are applying modern irrigation systems like drip and sprinkle irrigation. The drip irrigation system is used in Bhadgaon taluka in large scale and it helps to conservation of water and agriculture.

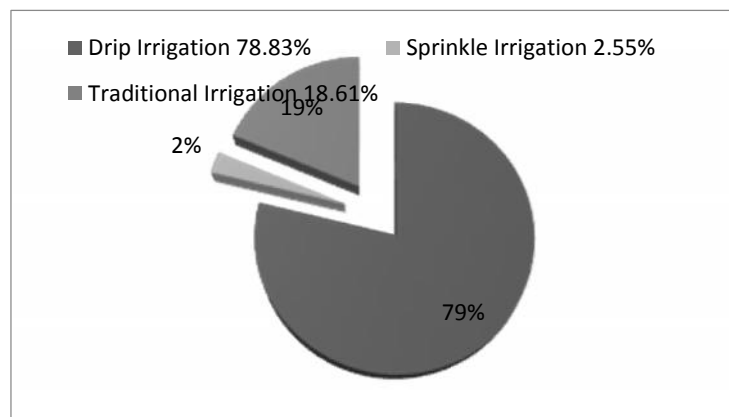
Table No. 04
Methods of Irrigation in Bhadgaon Taluka

Method of Irrigation	Irrigation system		
	Drip	Sprinkle	Traditional
%	78.83	2.55	18.61

Sources:- Personal survey by questionnaire and interview.

The methods of irrigation are playing an important role in agriculture. Drip irrigation, Sprinkle irrigation and Traditional irrigation systems are using by farmers of Bhadgaon taluka. 78.83% drip irrigation system is using by farmers in Bhadgaon taluka. This system is very helpful to farmer in the view of saving water, increasing irrigation area and yield rate of crops. The sprinkle irrigation is only 2.55% using by farmers. Those farmers are cultivate floriculture in their farm they use sprinkle irrigation system. Near about 18.61% farmer is using traditional irrigation system. Maximum farmers are took subsidy for drip irrigation system in this area. The drip and sprinkle irrigation system are very helpful to save water and protection to crop in summer season. Although the farmers are using these irrigation system in their farm for irrigation but the area under irrigation is not 100% and they are not capable to irrigate their whole farm with help of these system because of lack of water availability.

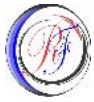
Figure No. 11
Methods of Irrigation in Bhadgaon Taluka



Mostly the drip irrigation system is used in Bhadgaon taluka that is 78.83%. The sprinkle irrigation system is used by on 2.55% farmers and 18.61% traditional irrigation system using the farmers of Bhadgaon taluka. It means that mostly farmers of Bhadgaon taluka are using drip irrigation systems and it is very helpful to save underground water.

CONCLUSION

The study of irrigation is the most important for the future plan. Water scarcity forth coming various problems lie droughts, food security, Drinking water, production, fodder and natural biodiversity. So decreasing of underground water level is very dangerous for the human life as well as wild life and plants. To overcome this problems various measures will be suggested by government planner which in term help to bring some solutions in the irrigation. Therefore the present study is quite relevant to the present day's problems of society and country.



This taluka depends on agriculture and this is the main source of farmers of living life. Due to the less rainfall and availability of water, maximum farmers are getting uplift underground water for irrigation because they want to save his crops and increase yield of crops. Because of highly perform of uplift underground water, the water level goes down and well started to get dry and irrigation goes to decrease during the period and drip and sprinkle irrigation techniques are help to rural economy of this taluka.

The total agriculture land is available 42131 hectares, out of that 28107 hectares land is non-irrigated and 14024 hectares land came under irrigation in Bhadgaon taluka but the under irrigation area is decreasing during the year due to lack of water availability.

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