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Original Article

Impact of Jalyukta Shivar Abhiyan on Irrigation Development in Upper Manganga River Basin: A Geographical Perspective

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Abstract

Irrigation is an important determinant influenced the growth and distribution of the population in the region. "Irrigation is an important infrastructural component which successfully determines the socio-economic development. With the benefit of irrigation facilities, farmers may practice various crops throughout the year" (Husain, 1996). In Maharashtra as well as Satara district and Upper Man River basin area, the farmers are not able to cultivate different crops throughout the year, due to seasonal, irregular and inadequate rainfall, because scanty water in the summer season adversary the agriculture as well as the dry climatic condition which incompatible for the growth of crops. "Rainfall is uneven, unpredictable and also drought is a steady phenomenon in the study region. Therefore, there is a high possibility of crop failure and crop damages during the period of summer. For the successful crop cultivation, irrigation is an important, particularly during the summer season. It is important for motivates to the farmers to do cultivation more intensive and productive" (Singh, and Dhillon, 1984).

It has been observed that the 3 medium irrigation projects which are completed since the First five-year plan from 1951 to 1 June 2014 viz. Andhali Dam, Ranand Tank and Mhaswad Tank in the study region. As well as 9 minor irrigation projects and Several K.T. weirs are obtained in study region. Therefore, to study is an attempted as proportion of irrigation, sources of irrigation and methods irrigation important in the study region.

Keywords- *Jalyukta Shivar Abhiyan, Irrigation Development*

Objectives

1. To evaluates the Contribution of Jalyukta Shivar Abhiyan on irrigation development in the study area.
2. To study the source of effective irrigation development in the study area.

Database and Research Methodology

Database

The present research paper is based on both primary and secondary data.

Primary data will be collected through structured questionnaire and personal interviews of the local people and collected photographic evidence are helps to present research paper

Secondary data is collected from the agriculture department of Man tehsil and other information about this research paper is collected from googal search.

Research Methodology:

1. The statistical and cartographic techniques will be used for the analysis of the research paper.
2. The entire study region base map done by using survey of India toposheet nos.47K/5,47K/6,47K/9,47K/10,47K/13 and 47K/14 at 1:50000 scale.

Introduction

The study region belongs to Semi-arid type climate and the study region is situated in rain shadow area. The present study region has 432 mm annual rainfall therefore there are many problems to inhabitants they are drinking water, water for agriculture and animal use and also domestic use etc. Water is a fundamental need for human settlement so it is the most important input for survival not only plants but also human beings and animals. And it is a dynamic component of the soil and plant system so agriculture depends on water.

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So, water is the most precious natural resource. In drought prone area it is called Liquid Gold. Water is known as a natural solvent. Although water covers more than seventy percent of the Earth surface but only one percent of the Earth's water is available as a source of drinking water scarcity problem due to insufficient rainfall every year. The present research paper is very useful for the people living in the drought prone area. Hence here attempt is made to study the water conservation management and watershed development. If this could happen these nala bundings provide many benefits to people like drinking water, Water for animals and domestic use, agriculture and plantation etc. So, increase of water availability from nala bunding ponds, lakes, check dams, vanrai Bundara, gabion bunds, loose boulder structure, Farm Lake, continuous contour trenches and reservoirs. People have increased their economic and social conditions. Therefore, their standard of living is also increase.

Study Area

The Upper Man River Basin catchment area under study is the eastern part of Satara district. The study area extends between 17o 30' 27" to 17o 50' 77" north latitude and 74o 20 '59" to 74o 5' 29" east longitude. The total study area of the catchment area of the Upper Man River is 1291 sq. km. According to the 2011 census, the total population of the study area is 203932.

This region has a semi-arid climate. The average maximum temperature is 40oC in summer and 15o C in winter. The government has declared the area as drought-prone due to very low rainfall between June and September. The northern boundary of the region is mountainous while the average elevation is between 700-800 meters above sea level. The highest elevation of the study area is found on Kulakjai hill at 1061 m and the lowest elevation of the region is near Mhaswad Talav at 590 m. The forest cover in this region is thin and small. The slope of the study area is mild and is from north-west to south-east. Therefore, the Man is a major river in the study area and it flows from north-west to south-east. Air, water, food, clothing and shelter are the rudimentary, fundamental needs of human being. Water is the prime and most vital resource. All living being including plants and animals need water to survive. One cannot expect life on the earth without water. Requirement of water is inevitable as it is required for daily human activities as well as for economic activities like agriculture and industries.

Fig.1

Fig.2

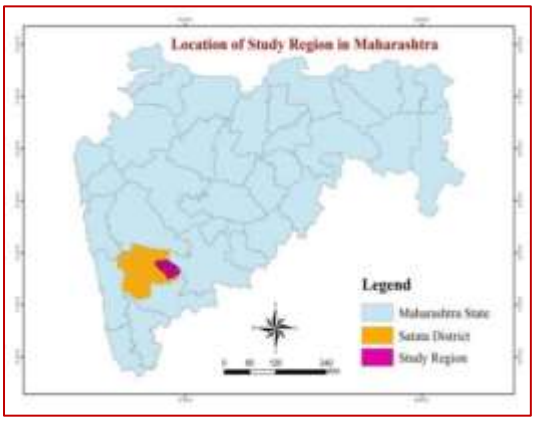

Fig.3

Irrigation Development in Upper Manganga River Basin:

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Table: 1
Sub-Watershed Wise Irrigation

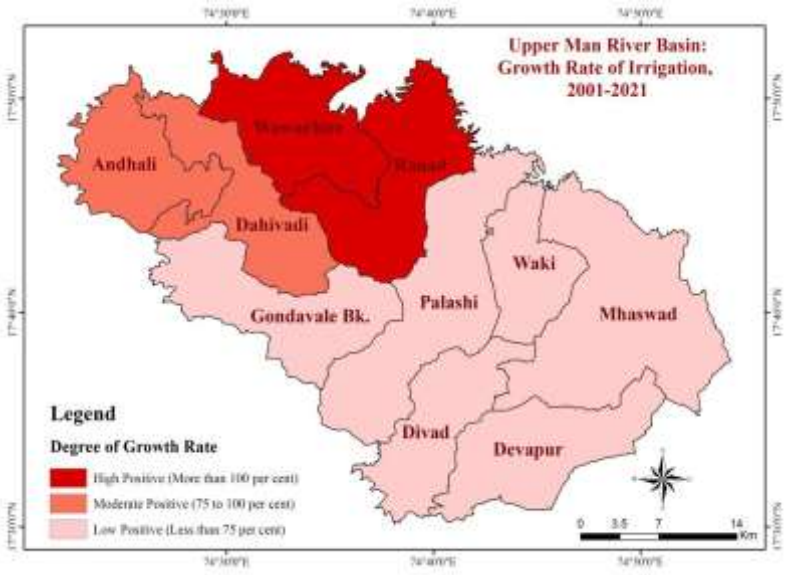
Sr. No.	Name of Sub-Watershed	2001	2021	Growth Rate in %
1	Andhali	17.51	31.54	80.15
2	Dahivadi	26.70	47.06	76.26
3	Devapur	21.66	33.97	56.83
4	Divad	25.81	39.87	54.43
5	Gondavale Bk.	30.26	41.29	36.44
6	Mhaswad	18.60	30.02	61.40
7	Palshi	23.69	37.41	57.92
8	Ranand	10.12	21.19	109.48
9	Waki	25.67	39.18	52.61
10	Wawarhire	9.93	21.08	112.27
	Entire Study Region	**21.08**	**34.26**	**62.53**
	Mean	**21.00**	**34.26**	**69.78**
	SD	**6.25**	**7.68**	**22.56**

Source: Irrigation Department, Man tehsil, 2021

Data Analysis:

Table 1 indicates that the remarkable positive changes in the irrigation due to the work of water conservation under the different NGO's and government scheme of Jalyukt Shivar Abhiyan as resulted the increased water level and water storage capacity of the ground in the study region. In the entire study region i.e. Upper Man River Watershed, the proportion of irrigation is 21.08 per cent in 2001, it is increased and reached to 34.26 per cent during the period of 2021 due to the work of water conservation and management. But the proportion of irrigation is not uniform throughout the study region. The high positive growth rate of irrigation to net sown area is recorded in Wawarhire and Ranand sub-watershed. Because, these sub-watersheds are located in the upper portion of the study region, hilly area, rugged topography therefore there are very low proportion of irrigation in this sub-watershed before the work of watershed development, but the work of watershed development, there are the proportion of irrigation is increased more than double in these sub-watersheds. The moderate positive growth rate is registered in Andhali and Dahivadi sub-watersheds. There are 75 to 100 per cent positive changes in the proportion of irrigation to net sown area. The low positive growth rate of proportion of irrigation i.e. less than 75 per cent is noted in Devapur, Divad, Gondavale Bk., Mhaswad, Palshi and Waki sub-watersheds. These sub-watersheds are located on the bottom of study region therefore already there are high proportion of irrigation to net sown area compared to the other sub-watersheds.

Fig: 4



In short, it is significant that the positive changes in the proportion of irrigation to the net sown area in the entire upper Manriver watershed during the period between before and after the work watershed development and water conservation

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Sources of Irrigation

Table: 2

Irrigation Sources and Irrigated Land in Hectares

Sr. No.	Sources of Irrigation	Per-Work 2001	Percentage	Post-Work 2021	Percentage	Absolute Change in Ha	Growth Rate in %
1	Well and Tube Well	535.18	92.51	861.00	88.93	325.82	60.88
2	Canals	26.04	4.50	47.93	4.95	21.87	83.95
3	Tanks	17.27	2.99	59.25	6.12	41.98	243.07
4	**Total Irrigation Net Sown Area**	**578.49**	**100**	**968.18**	**100**	**389.67**	**387.9**

Source: Field Survey by Researcher, 2022.

Data Analysis

The sources of irrigation are greatly impact by the geological, physical and climatological conditions. The study region comes under the drought-prone area therefore, wells and tube-wells are the important sources of irrigation in the study area.

The above table 2 presents the data regarding the different sources of irrigation and the area in hectares under a particular source of irrigation among the sample farmers in the study region. It is observed that the total area under irrigation of 578.51 hectares (36.43 per cent) before the work of Watershed Development programs and it is reached up to 968.18 hectares (57.12 per cent) after the work of Watershed Development programs. The more than one and half growth rate of irrigation during the period between before and after the work made Watershed Development.

Under well and tube-well irrigation, in pre-period, among the 535.18 hectares farm, the proportion of well and tube-well irrigation is 92.51 per cent. Whereas, in post-period, among the it has been increased up to 861 hectares farm under the well and tube irrigation, but the proportion of its declined up to 88.93 per cent. There is large farmers have dominant absolute change is 325.82 hectares and growth rate is 60.88 per cent during the period of investigation.

Under canal irrigation, in the pre-period of the watershed development among only 26.06 hectares farm, the proportion of total irrigated area is 4.50 per cent. On the contrary, in the post-work watershed development programme the area under canal is near about doubled and reached 47.93 hectares and proportion to total irrigation is 4.95 per cent.

The remarkable change in the source of irrigation is recorded in tanks in the study region. The area under tank irrigation in per-work of watershed development is only 17.27 hectares, it has been increased three times after the work of watershed development and reached up to 59.29 hectares, but the proportion of tanks irrigation is increased twice during this period i.e. from 2.99 per cent to 6.12 per cent.

Overall, it has been observed that the work of watershed developments important for the increasing water level, water storage capacity resulted increased area under irrigation in the different sources.

Conclusion

This paper presents analyses and interprets on the basis of primary data collected from the sample respondent-farmers through the field survey in the study area. In this chapter have been attempted to analysis of the impact the work of irrigation development in the study area with the various aspects of the benefits there of being derived by the beneficiary farmers. It has been observed that irrigation development deals with the data concerning to changes in the water level and storage capacity, general land-use pattern, cropping patterns, increase in crop production and productivity, use of fertilizers, employment generation, adoption of modern farming techniques, livestock, milk production, etc. Overall, it has been observed that the irrigation development has rendered a positive impact on the farming community in the study area.

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Conflicts of interest

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

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