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IMPACT ASSESSMENT OF JALYUKT SHIVAR ABHIYAN FOR KASARA VILLAGE AHMEDNAGAR

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Abstract The Maharashtra government in India has created the 'Jalyukt Shivar Yojana,' a water conservation program. The Jalyukt Shivar (JYS) Campaign is the state government's flagship program. This initiative intends to provide water empowerment to drought-affected areas to make Maharashtra drought-free by 2019. The goal of this program is to eliminate water scarcity in 5000 villages every year. The goal of present study is to evaluate the effectiveness of water conservation strategies in Kasara village in Ahmednagar District. The methodology used in this work as, the geographic information system (GIS) platform was utilized to create each layer of conservation methods for each community. In this work, an impact of water conservation practices namely: Compartment bunding, Nala extension, Well recharge, Sediment extraction, Farm pond, Drip and Sprinkler irrigation, Hydrofracturing, Continuous Contour Trench (CCT), Plantation, Kolhapur type weir (KT Weir), Gabion structure, Cement Nala dam, Loose boulder structure (LBS), Pond and percolation tank were assessed with the help of GIS techniques. The choropleth map was used to explicate the statistical variables in study area. After, the experimental analysis, results showed that, the different water conservation methods that has been developed in this tehsil proves beneficial to farmers and society. Moreover, the study concludes with the storage capacity of Nalas and dams have increased, also the water levels in open well has raised by 15.89% and bore well water levels has raised by 25% after implementation of JSA.

IndexTerms - Water Conversation, Jalyukt Shivar Yojana, Runoff, Groundwater.

I. INTRODUCTION

It has been discovered that the climatic, geological, and topographic circumstances of Talukas like Karjat, Jamkhed, and some areas of Nagar are extremely drought-prone, and the Water Table has been discovered to be extremely deep [1]. Based on the growing challenges caused by infrastructure and population growth, the government has made a number of steps to address the water scarcity issue and meet the ever-increasing demand for water for everyday use and agriculture in drought-prone areas [2].

Soil and water conservation work carried out under various schemes such as JalyuktShivar Abhiyan, District Planning programs, IWMP, MNREGA, and others were onsite confirmed and their influence on the surrounding area was researched in depth. The observations are drawn and suggestions for future performance improvements of such structures are provided based on the responses collected on the field survey and technical research.

Kasara is a medium size village in Ahmednagar district of Maharashtra, India. This village is located near Takli Dhokleshwar. To control the drought situation in the state, the government of Maharashtra has developed a Jalyukth Shivar Abhiyan (JSA) with the aim to make 'Drought Free Maharashtra' by 2019. The present work is devoted for impact analysis of Jalyukt Shivar Abhiyan.

II. STUDY AREA

Figure (1) shows a map of the Ahmednagar district in the Indian state of Maharashtra, which is being used as a research region for this project. Ahmednagar district has a total size of roughly 17048 square kilometers and is divided into 14 Taluka locations with 1556 villages. More than 70 percent of the population of more than 30 lakh people lives in rural areas. The digital elevation (m) map of Ahmednagar district was created using the DEM Model; with elevation values measured in m. The topography is unevenly dispersed, with an average elevation of 95 m and a maximum elevation of 1434 m.The study area has average annual precipitation 785 mm; the average annual temperature is 25.3 °C. The study region has Mula reservoir and Godavari River as principal water resources.

Fig. 1 Study area
(Google Earth)

1. Methodology Used

Agriculture and related activities are the most common occupations in Ahmednagar district. As a result, the network of irrigational projects and canals has been built to a good standard and is still being developed in numerous areas. Even while the network is improving in terms of providing water for agricultural purposes, there are still numerous regions where neither irrigational infrastructure nor rainfall intensity is sufficient or consistent.
As a result, a number of measures based on available resources and strategies were made to address the challenges of repeated droughts in places such as Nagar, Karjat, and Jamkhed. The structures' primary function is to collect and percolate rainwater [3]. The purpose of this study is to demonstrate the impact of various soil and water conservation projects, such as Cement Concrete Bandhara (CCB)/Cement Nalla Bunding (CNB) (Fig.3), Recharge Shafts (Fig. 5), Deep Continuous Contour Trenches/Deep CCT and Continuous Contour Trenches/CCT (Fig.4), Compartmental Bunding , Farm Pond/Shet Tale.

Fig. 2 Nala Dipping and Widening

Fig. 3 Concrete bandhara

The key wall, flange wall, end beam, basin, and overflow section are all part of the cement concrete bandhara (CCB) and cement Nala bunding (CNB) (Fig.2). It is built on a little creek called a Nala. The primary goal is to preserve water while also replenishing adjacent water supplies. This is a permanent tiny structure, as opposed to a dam, which is placed across a watercourse to hold water while also reducing the velocity of the stream to enhance water infiltration [4]. It contributes to recharging the aquifer and raising groundwater levels in the surrounding area [5, 6].

Fig. 4 Continuous Contour Trenches/CCT

Fig 5. Recharge Shaft

The inquiry was carried out in stages in several rural areas [7], depending on the structures and needs of the area. Actual site visits on more than 70 sites were used to conduct field surveys and technical inspections of constructed work. Details are reported in the work as and when required in the following subsections.

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III. RESULT AND DISCUSSION

1. Analysis of well

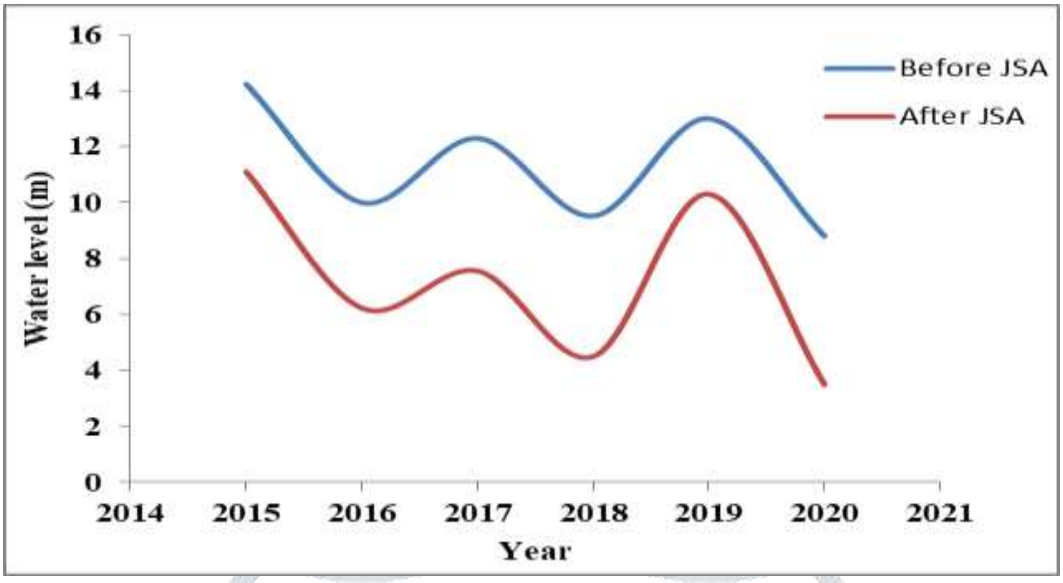

Fig. 6 Analysis of well

Fig. (6)Shows variation in well water levels from year 2015 i.e. prior to implementation of Jalyukta Shivar Abhiyan (JSA). From fig. (6), it is clearly seen that due to JSA implementation the study area resulted into increase in water levels by average 15.89% for well andfor bore well is 25%. The impact of JSA was seen in increased groundwater table and reduction in secondary soil salination. The soil erosion problem in study area has greatly reduced due to water conservation works.

As, JSA implies the soil and water conservation, both are the important aspect as far as agriculture is considered. In study area, it was observed that due to water conservation works, the water available for agriculture is increased, so the farmers are practicing the cash crops like sugarcane and turmeric which leads to overall strengthening of financial scenarios of people.

IV. CONCLUSION

From this study, it concludes that JSA works helps in soil protection and water harvesting. Water couldn't be received in the construction, so it results in decreasing of water level due to the absence of rainfall in Kasara village. This determination was not only exclusively for farmer's economy but common people also experienced because of market methodology of "furthermost order and low accessibility guidance".

The growth which falls under JSA support stored 469.51 TCM water. Water collected in the constructed structure is used for irrigation purpose; also the advantage of this project was increased well water level which leads to growth in crop production and its intensity. This shows that JYS project is very helpful for us to solve shortage of problem and can create drought free region. The impact conclusions regarding different aspect in this study are as follows:

1. Increase in Ground Water level:

The main objective of launching Jalyukt Shivar Abhiyan (JSA) was to ensure "Water for all". The works which are scheduled under JSA were therefore planned and designed to increase the water availability by creating new water storage capacities and restoring the capacities of existing structures through silt removal, deepening and repair. The water storage structures play an essential role with storing water and allow sufficient time for water to percolate into ground. Increase in ground water is the Success of JSA. Percentage increase in open well is 15.89% and or bore well is 25% after JSA from.

2. Run Off Reduction:

It was observed that the program is victorious in achieving this goal by increasing in runoff reduction. According to the JSA recipient, this has been possible because of the CCT and Deep CCT or compartment bunding. The reduction in runoff resulted in soil moisture retention. Utilization of soil Moisture retention is 82%.

3. Cropping Pattern and Agriculture Productivity:

Water is very essential to the growth of agricultural production, with available water harvesting Structure Farmers are shifted to take new cropping Pattern. From table number 18, in kharif season average increase in Kh. Jowar is 400 Production kilo/Ha , in Soyabean 425 Production kilo/Ha, in Groundnut 1449 Production kilo/Ha, in Pulses 180 Production kilo/Ha, and in Maize 500 Production kilo/Ha, now in Rabi Season average increase in Rabi Jowar is 255 Production kilo/Ha, in Wheat 570 Production kilo/Ha and in Bengal Gram is 215 Production kilo/Ha, now in Summer Season average increase in Groundnut is 500 Production kilo/Ha, now in cash crops season average increase in Sugarcane is 20000 Production kilo/Ha, in Turmeric 500 Production kilo/Ha, and in Ginger is 7000 Production kilo/Ha , now in Vegetables average increase in tomato is 7000 Production kilo/Ha, and at last in Fruits average increase in Mango is 1000 Production kilo/Ha and in pomegranate is 1000 Production kilo/Ha (Fig. 7).

4. Overall status of social life:

Due to execution of Jalyukt Shivar Abhiyan, there is change in the life of village people. Overall increase in water levels, crop production, animals, employment generation, irrigation land, therefore the economic condition is improved. Overall status of social life has changed.

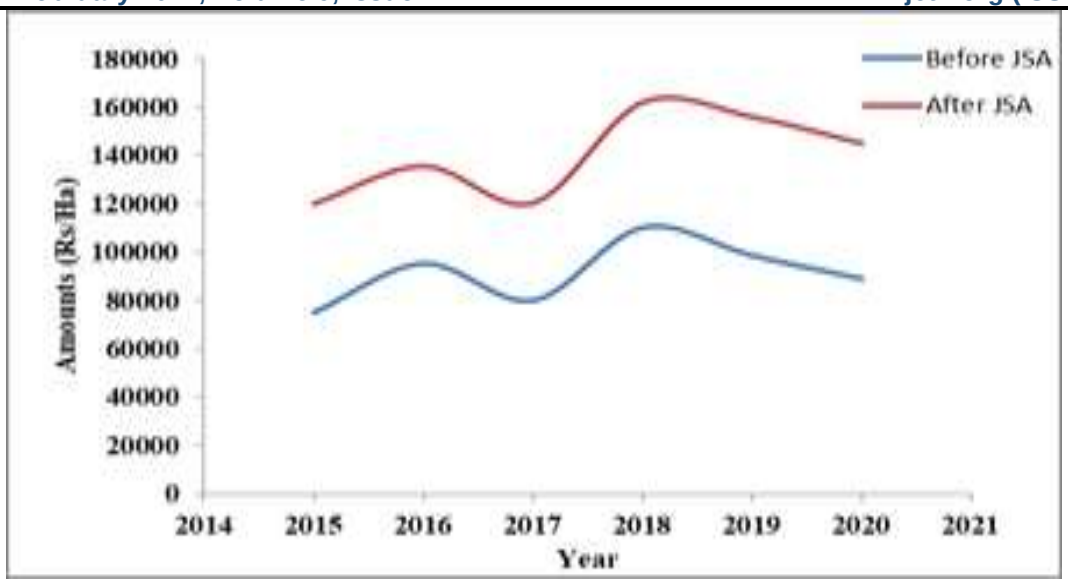

Fig. 7 *Benefits from agriculture*

Table. 1 Crop production in study area

Seasons	Crop Name	Before JSA		After JSA		Increase(in Kg)
		Area (Ha)	Production Kilo/Ha	Area (Ha)	Production Kilo/Ha	
Kharif	Kh. Jowar	293	1355	350	1755	400
	Soybean	293	1525	335	1950	425
	Groundnut	6	66	65	1515	1449
	Pulses	23	340	50	520	180
	Maize	11.65	2300	16.85	2800	500
Rabi	Rabi Jowar	3.65	990	6	1245	255
	Wheat	12	1285	75	1855	570
	Bengal Gram	28	730	55	945	215
Summer	Groundnut	4	1810	20	2310	500
Cash crops	Sugarcane	101	73000	120	93000	20000
	Turmeric	3.73	1800	10	2300	500
	Ginger	5.2	21000	8	28000	7000
Vegetables	Tomato	3	21000	10	28000	7000
Fruits	Mango	2	16000	4.50	17000	1000
	Pomegranate	3	8000	5	9000	1000

V. REFERENCES

[1] https://www.ahmednagar.gov.in/
[2] www.Ahmednagar.nic.in

[3] A report on Watershed Interventions for Kurlod and Botoshi Phase-II, Technology and Development Solutions Cell (TDSC) Centre for Technology Alternatives for Rural Areas (CTARA), Indian Institute of Technology, Bombay (IITB), July 2015

[4] A report on Watershed Interventions for Kurlod and Botoshi Phase-I, Technology and Development Solutions Cell (TDSC) Centre for Technology Alternatives for Rural Areas (CTARA), Indian Institute of Technology, Bombay (IITB), December 2014.

[5] Kolekar A., Tapase A.B., Ghugal Y.M., Konnur B.A. (2020) Impact Analysis of Soil and Water Conservation Structures-Jalyukt Shivar Abhiyan- A Case Study. In: El-Naggar H., El-Zahaby K., Shehata H. (eds) Innovative Solutions for Soil-Structure Interaction. GeoMEast 2019. Sustainable Civil Infrastructures. Springer, Cham. https://doi.org/10.1007/978-3-030-34252-4_5

[6] http://mrsac.maharashtra.gov.in

[7] www.cse.iitb.ac.in