

IMPACT ASSESSMENT OF JYS PROJECT AT DARPHAL VILLAGE TQ-OSMANABAD

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Abstract - Water is one of the earth's most precious resources. Though, 70% of Earth's surface is water a major 97.5% of this is salt water and only 2.5% is freshwater. Moreover, less than 1% out of this 2.5% amount of freshwater is accessible (the majority is frozen in ice caps or as soil moisture) with growing population this amount of water is becoming insufficient. Moreover, India and other developing countries are the worst affected by fresh water crisis mainly because of comparatively lack of better planning to manage their respective fresh water reserves both on surface and in the aquifers. Therefore, sometimes we can say that water crisis is manmade problem up to some extent. And this is a long term problem. A combination of measures is required to tackle the issue. Water related problems are not new to the state but there have been some rapid changes in recent years. Maharashtra government has launched the project "Jalyukta Shivar Campaign" in Maharashtra for drought-free state by 2016-2019. This project involves deepening and widening of streams, construction of cement and earthen stop dams, work on nallas and digging of farm pond. There is need to recharge ground water and create decentralized water bodies to overcome the water scarcity problems in rain fed areas. That's why Government has launched a new programme named Jalyukta shivar campaign if this scheme properly implemented then water scarcity will surely a thing of in Maharashtra.

Keywords: Jalyukta Shivar Campaign, Water Scarcity, Drought-free, Water Crisis

1. INTRODUCTION

Case study of Jalyukta shivar Yojana in Osmanabad district at Darphal Village. Fieldwork is the key process to understand ground scenario in a better way and that is why the theoretical and practical perspectives are different in their dimensions. Our field work was arranged in OSMANABAD district at Darphal village. It is an administrative district in Marathwada region of Maharashtra. From the point of disasters and hazards this particular district is mainly prone to Drought condition. And the district routinely experiencing scarcity of water (Drought) with an interval of some years. The reasons behind these types of conditions in the region can be manmade as well as natural. Some of the studies reasoned sugarcane cultivation for drought in this area. Because already the area is suffering from limited water and sugarcane cultivation consumes more water which again affect the ground water table of the region. But it is not only the reason behind drought in Osmanabad district because still the district is facing drought even after reducing the sugarcane cultivation under "BEYOND SUGARCANE" campaign from 43,000 hector to 10,000 hectare. There are the two types of sources of this essential resource viz. surface water and ground water. Maharashtra, the second largest state in India, both in area as well as in population, has very limited assured irrigation. Considering drought-like situation occurring frequently in the state, Jalyukta Shivar Campaign is being taken up under 'water for all - drought-free Maharashtra 2019'.

2. LITERATURE SURVEY

In 2017, R. T. Pachkor, et.al, [1] studied a case study of Pusad region in Maharashtra which is on the assessment of works under the Jalyukt Shivar Campaign. In 2019, Ms. Nikita Nanaware, Dr. N.V. Khadake [2] were studied the impact of JSA works. A Case Study of Ranzani Village Tal-Pandharpur, Solapur District, Maharashtra. the author concluded, Approximately 96% of the total area is cultivable through JSA works. Due to JSA, Rabi crops are taken in some lands, which results in maximum crop yield. In 2017, Potekar U. P. et.al, [3] had studied Jalyukt Shivar Abhiyan and Micro-irrigation in Maharashtra. In this study that due to Jalyukt Shivar Abhiyan the Improvement into efficiency and financial state of farmers. In the year 2017 Mr. Khillare N. J.[4] studied analysis of delays in work under the Jalyukt Shivar campaign. The author concludes that a significant segment of the venture process duration is being consumed by undertaking inception, detailing, and endorsement stages than the real development stage.

3. METHODOLOGY AND MATERIAL

3.1 STUDY AREA

According to census 2016 information the location code or village code of According to census 2016 information the location code or village code of darphal village is 561446. Darphal village is located in osmanabad tehsil in osmanabad district in Maharashtra, India. It is situated 15km away from district headquarter osmanabad. Darphal village is also a gram panchyt. The total geographical area of the village is 533 hectares. Darphal has a total population of 1595 people in which male population is 835, and female population is 760. Latitude of Darphal is 34°24'95.31"N and Longitude is 76°16'34.98"E.

3.2 MATERIALS

3.2.1 DATA REQUIRED

1. Total geographical area of the village
2. Total area under irrigation

3. Total number of wells
4. Total population of the village
5. Total livestock in the village

Table: Total water demand

Activity	No.	Per Day Liter	Total Need Water
Man	1617	90	101.87
Animal	335	60	7.34
Goat - Sheep	346	06	0.76
Total	2298		109.96

(Ref: Gram Panchayat Darphal)

3.3 STRUCTURES UNDER JALYUKT SHIVAR YOJANA

3.3.1 Cement Nala Bund- A cement nala bund (CNB) is a bund/obstruction across the nala or stream constructed by using cement concrete to obstruct and store the flowing water.

3.3.2 Drip Irrigation - Drip irrigation is a type of micro-irrigation system that has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants.



Source: Google

Fig. Drip Irrigation

3.3.3 Gabion Bundhara- When loose boulder is covered with iron grid, this is called as gabion bandhara. The gabion bandhara is constructed where the slope of nala is 3 percent. The length of the bund is not more than 10 meter.

3.3.4 Farm pond

Farm Ponds is the most effective water harvesting structure but Indian farmers do not put it to regular use. Farmpond is of small size depression mode for collection of surface runoff and the collected water will be used in scarcity time. These farm ponds are helpful for ground water recharge, if a dug well or a bore well is located near such a farm pond.

4. IMPACT OF JYS

This chapter deals with the results obtained during the research work. This study depends upon the water requirement and water availability in the selected area. Results obtained during the research work are presented by the graphs and tables and analysis was done on the basis of these results. After every 4 to 5 years draught was observed in that region. The main problem has been observed in summer season i.e. from March to June in every year.

Table 4.1 : Status of Water Distribution by Tankers

Sr. No.	Name of Village	No. of tankers required				
		May-2016	May-2017	May-2018	May-2019	May-2020
1	Darphal	20	14	10	3	0

(Ref: GramPanchayat Darphal)

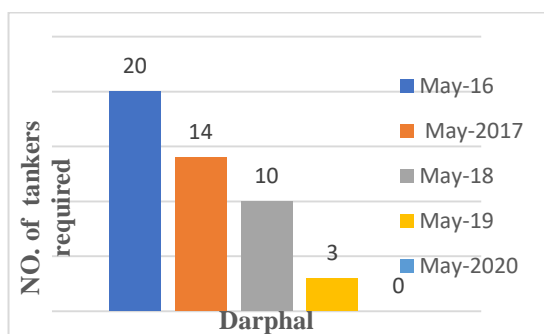


Fig: Status of Water Distribution by Tankers (2016 to 2020)

4.2 Crop Water Requirement Study

The crop-water requirement figures used in the water-balance calculations correspond to the extra water (besides rainfall and soil moisture available due to rainfall), i.e. the irrigations which farmer must give to the crops. e.g. for Moong, Corn and Udid, the crop-water requirement is zero because these are kharif crops which require no extra rotations, while Rabi crops like Sorghum or Wheat are shown to need 0.24 and 0.70 TCM/ha water, which are the rotations (extra water) to be given besides water available from soil moisture. However in the whole report identical crops have different crop-water requirement numbers entered by Krushi Sahayaks darphal village.

Table 4.2 : Crop Water Requirement Study

Crop Name	Area (Ha)	Needed Water Per Ha. TCM	Total Need Water TCM
Green gram	0	0	0
Maize	15	4	60
Tur	7	2	14
Animal Food	12	2.5	30
Cotton	35	5	175
Bazaar	5	2	10
Wheat	15	5	75
Vegetable	8	2	16
Fruits	49	7	345.45
Total	146		725.25

(Ref: Village data sheet)

Above data more of the water is used for fruits farming (7Tcm). The chief crops of Darphal village are cotton ,groundnut, bajara, Different types of soils are required for raising different types of crops .heavy retentive soil (40%) is favorable for raising crops .Light sandy soil (2 to 8%) is suitable for crop like gram requiring less water medium or normal soil (having about 10to 20% of clay)is suitable for crops like wheat , cotton, maize, vegetables, etc. requiring normal amount of water.

Table 4.3 : Water level in the selected wells located at downstream side of CNB during the year 2018-19 and 2019-20

Sr. No.	Observation Date	Depth of water level in the well (m)		Increase in water table depth (m)
		Pre development	Post development	
		2018-19	2019-20	
		Darphal	Darphal	Darphal
		W	W	W
1	1-Jun	12.9	10.82	2.08
2	1-Jul	11.5	9.38	2.12
3	1-Aug	9.2	5.26	3.94
4	1-Sep	7.1	3.7	3.4
5	1-Oct	5.85	2	3.85
6	1-Nov	4.9	1.42	3.48
7	1-Dec	4.85	2.09	2.76
8	1-Jan	6.1	4.08	2.02
9	1-Feb	7.68	5.88	1.8
10	1-Mar	9.35	7.71	1.64
11	1-Apr	10.85	9.1	1.75
12	1-May	12.75	11.03	1.72
Average increase in water table				2.37

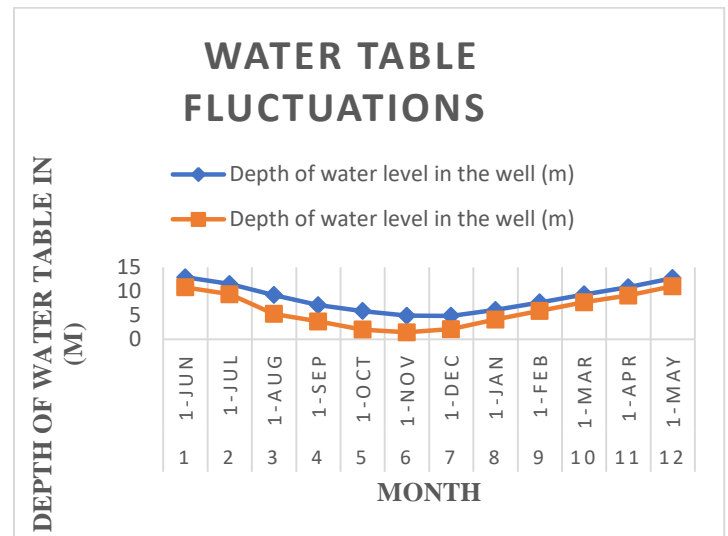


Fig: Water table fluctuations at Darphal

In the study area of Darphal village wells which are located in the zone of influence of the water conservation structures were selected for ground water level monitoring. Data on the water level in the wells were monitored fortnightly from the June 2017 to May 2018. The information regarding the water levels in wells before village development was collected from Office of Tata Institute of social science ,Tuljapur. Tq. Tuljapur Dist.Osmanabad. The water levels of selected well before and after development of SWC works were compared for assessing the impact of water conservation structures on ground water recharge.

The impact of water conservation works of “Jalyukt Shivar Abhiyan” at Darphal villages was studied with respect to land use pattern, irrigation potential and productivity of different crops of the village. The data was collected by using standard survey format during personal interview method in the village. This data was compared with previous data to assess the impact of soil and water conservation structures on irrigation and crop productivity.

Table 4.4: Total water demand

Activity	No.	Per Day Liter	Total Need Water
Man	1617	90	101.87
Animal	335	60	7.34
Goat – Ship	346	06	0.76
Total	2298		109.96

Ref: Village data sheet

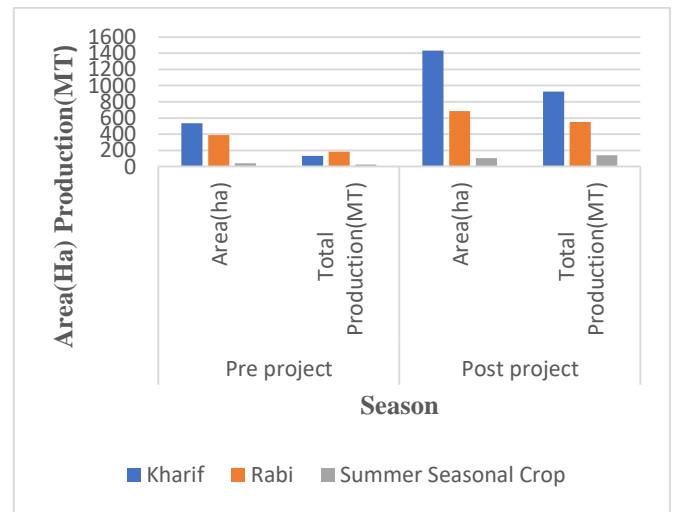


Fig. Details of kharif, Rabi and Summer seasonal crop area and production

Table 4.6: Details of Structures completed in darphal village

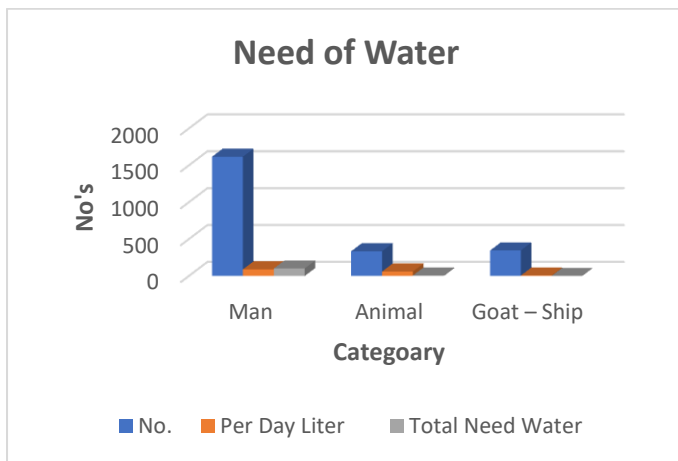


Fig. Catrgoary wise live stock population Village in a project area

Table 4.5 : Summary of Details of kharif, Rabi and Summer seasonal crop area and production

Name of villages	Season	Pre project		Post project	
		Area(ha)	Total Production(MT)	Area(ha)	Total Production(MT)
Darphal	Kharif	537	134	1433	925
	Rabi	390	184	685	553
	Summer Seasonal Crop	40	24	105	139

(Source: Department Of Agriculture, Gov. of Maharashtra.)

Sr no.	Type of treatment	Unit	Pre project quantity No./ha	Post project quantity No./ha
1	Compartmet bunding	Ha	01	05
2	Cement Nala Bund	No.	00	01
3	Bore Well Recharge	Ha	00	08
4	LBS	No.	0.00	00
5	DOHA/ Pazar Talav Repair	No.	0.00	01
6	K.T. Weir	No.	00	03
7	Farm pond	No.	0.00	06
8	Well	No.	00	02
9	Sprinkler	No.	0.00	17

10	Drip	No.	0.00	15
11	Vanrai Bandhare	No.	00	03

Table 4.7: Abstract of Expected outcomes in the Project Area

Sr No .	Item	Unit	Pre project Status	Post project status
1	Status of water table	mtr	14.75	12.20
2	Ground water structures repaired /rejuvenated	nos	6	34
3	Availability of drinking water	month	9	12
4	Increase in irrigation potential	ha	45.8	112.87
5	Increase in area under horticulture	ha	10	37
6	Increase in area under fodder	ha	800	1000
7	Increase in milk production	liters	147600	221184
8	Increase in no livelihoods	no.	47	135
9	Change in migration status	no.	462	245
10	Cropping intensity	%	125	150

5. CONCLUSIONS

While studying the Jal Yukta Shivar Yojana impact of water conservation works of “Jalyukt Shivar Abhiyan” at Darphal villages was studied with respect to rainfall, availability of drinking water, Ground water table, land use pattern, irrigation potential and productivity of different crops of the village. The data was collected by using standard survey format (questionnaire) during personal interview method in the village. This data was compared with previous data to assess the impact of water conservation structures on irrigation and crop productivity. On this information following conclusions are determined:

1. Increase in agricultural productivity 30 to 50 %.

2. Increased the level of groundwater up to 2-3 meter.
3. It is observed that approximately 87% of the total area is cultivable through JSA works.
4. Decrease in area under dry land and increase in area under irrigated crops
5. In almost field kharif crops are sown and yield availability of water under JSA works. Increase in social and economical standards
6. Reduction in migration for employment
7. Reduction in tanker feeding by 90 percent since project implementation.
8. Increase in cropping intensity by 1.25 to 1.5 times.

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