

Real-Time Assessment of Jalyukt Shivar Campaign for Drought Problem in Anpatwadi (Koregaon Taluka)

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Abstract: Jalyukt Shivar (JYS) Campaign is a programme of Government of Maharashtra, aims to bring water empowerment to the drought-affected villages to make Maharashtra Drought Free by the year 2019. This Campaign is organized action plan where in many departments are collectively & collaboratively working towards a common goal i.e. 'Water for All'. The JYS proposes a framework for village level water balance calculation which includes crop-water estimation requirements, drinking water stress etc. This paper is an assessment of Jalyukt Shivar Abhiyan works executed at Anpatwadi Village, Tal Kolhapur in Satara District. This program is one of the projects approved by government of Maharashtra to makes 5000villages free from drought in a year. The main aim of the study is to study the JYS programme from the aspects of Construction management and performed assessment of JYS Abhiyan works. The Idealistic project time of the construction of various water and soil conservation structures is defined and the problems responsible for the substantial delays in JSA processes are discussed. The probable measures, suggestions and alterations in the existing processes of implementation of campaign are listed out.

Keywords: Jalyukt Shivar Abhiyan, Anpatwadi village, Impact assessment format.

1. Introduction

Maharashtra is 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 and around 84% of its agricultural land is rain fed. Around 159 lakhs hectares' area is drought-prone. Maharashtra has always faced droughts. The drought has persisted for four consecutive years and has affected drinking water security, crop production, productivity severely all over the Maharashtra state. Maharashtra government has launched a new program named Jalyukt Shivar Abhiyan to make Maharashtra drought-free state by 2019. Program promotes an integration and coordination between various government agencies and program during planning and implementation levels and stresses on people's participation as one of the key objectives. Government is authorizing implementation of 'Jalyukta Shivar' in all districts of the state, in order to permanently overcome drought situation by convergence of funds approved for schemes under various

departments and through MREGS/MLA/MP Fund/District-level, Fund/Non-governmental Organizations/CSR and public participation. last couple of months, the problems related to the ground water, geological conditions, soil type and the climatically data was collected as a base for the present study. It is learnt that Satara district has a varied climatic conditions wherein talukas like Maan, Khatav, Khandala, Phaltan, some parts of Koregaon are highly drought prompt. So, it was decided to consider one of the village as a case study for the present work wherein the Jalyukt Shivar programme is implemented. Accordingly, the geographical and other parameters are explained. The present work is undertaken with a view to study the impact of various JSA works like cement concrete bandhara (CCB), continuous contour trenches (CCT), compartmental bunding (CB), farm pond, deepening and widening of existing structures, percolation tank, special repairs to K. T. weir, etc. on the particular locality, where they are constructed, by visiting the sites and carrying the field survey in the form of questionnaire. Also, the technical aspects as per the guideline set by MERI (Maharashtra Engineering Research Institute) and CDO (Central Designs Organization) for the construction of such projects is also checked.

2. Literature Review

A. *Drought in India: Its impact and mitigation strategies-A review*, R.C. Gautam, R.S. Bana

In this paper authors discuss the drought is temporary reduction in water or moisture availability significantly below the normal amount for a specific period. Drought is categorized into meteorological drought, hydrological drought, agricultural drought and socio-economic drought.

B. *Jalyukt Shivar" A Combat to Water Stresses in Maharashtra alyukt Shivar" (2015), "Zeeshan Adib Ahmed, R. T. Pachkor"*

This paper concludes that this program should be strictly implemented as a campaign through government departments, voluntary organizations, public participation and funds available with private businessmen (CSR), to make ensure

drought does not occur in future in drought prone areas and remaining area. Implementing Jalyukta Shivar Campaign in other parts of country will be helpful to overcome permanently drought and water scarcity problems with unique initiative like Jalyukta Shivar, water scarcity will surely be a thing of the past.

C. "Assessment of Works under Jalyukta Shivar Campaign—A Case Study of Pusad Region" R. T. Pachkor, D. K. Parbat

This paper is study on the assessment work under Jalyukta shivar on pusad village, this report concludes that the Implementing Jalyukta Shivar Campaign in other parts of country will be helpful to overcome permanently drought and water.

D. "Analysis of delay in works under Jalyukrt Shivar Campaign (2017)," "Niranjan J. Khillare"

This paper is a study of the JYS campaign is running behind the schedule with respect to year wise plan. Project initiation, planning, formulation and other pre-construction activities involve many complex stages. Most of the activities under these stages can be avoided or can be done concurrently so as to expedite the cycle time of JYS works. Lack of accountability in pre-construction phases, lesser technical & non-technical staff division and subdivision offices, Inadequate fund allocation then required, concurrent or pre-existing day-to-day duties of the personnel involved in the JYS woks are some of the common reasons why the targets of first two years have missed.

3. Objectives

1. Study the JYA and collection of required data.
2. Examine the technical feasibility of selected area for Jal-Yukt shivar.
3. Analyse the Techno-social impact of work through assessment format.
4. To recommend suitable alterations in existing processes and solutions to increase the effectiveness of the structures.

4. Methodology

1. Study historical data from literature survey.
2. Study JSA, and Select the area for Jalyukt Shivar assessment.
3. Collect and analyse the Technical Data of Jal-yukt shivar.
4. Analysis of Case study with respect to the data provided during interview and site visit to verify actual physical condition of works.
5. To recommend suitable alterations in existing processes and solutions to increase the effectiveness of the structures.

5. Jalyukt Shivar Abhiyan

The Jalyukt Shivar Abhiyan (JSA) is a program of Govt. of Maharashtra launched in 2015, as per the Government resolution (G.R) dated 5th December, 2014. The idealistic time estimates, around 224 days (i.e. 32 weeks) are required for a completion of JYS Works; whereas the Govt. guidelines

considers a year wise (52 weeks) plan for JYS Work

A. Stages involved in JYS campaign works

1. Village mapping to District level Jalyukt Shivar Abhiyan plan finalization.
2. Detail survey work to technical sanction.
3. Submission foe administrative approval to getting approval.
4. Grouping of works to floating/flushing of tender.
5. Tender assessment to insurance of work order
6. Lineout of final completion of work

B. Briefly description of different types of works under JYS

1) Cement Concrete Bandhara (CCB)

Cement concrete bandhara is constructed across a stream or small river using reinforced cement concrete.

2) Gabion bandhara

When loose boulder is covered with iron grid, the structure formed is called as gabion bandhara.

3) Farm pond

This is the most effective water harvesting structure but Indian farmers do not put it to regular use. Farm pond is of small size depression mode for collection of surface runoff and the collected water will be used in scarcity time.

4) Compartmental bunding

It consists of building earthen embankments across the slope of the land, following the contour as closely as possible. Types of compartmental bunding is Graded Bunding, Peripheral Bunding, Contour Ploughing, and Terrace Farming.

5) Continuous Contour trenches

Continuous Contour trenches are an agricultural technique that can be easily applied in arid areas to allow for water and soil conservation.

6) Percolation tank

The percolation tanks are mostly earthen dams with masonry structure only for spillway.

7) Earthen nala bunding

Nala bunding is comprehensive activity. Nala bunds are embankments constructed across nalas or small streams for checking velocity of runoff, increasing water percolation and improving soil moisture regime.

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6. Anpatwadi Village (Koregaon Taluka)

Anpatwadi is a village situated at North side of Koregaon taluka in Satara district which comes under Wathar station division. The area of village is 527.55 ha, the total geographical area of Anpatwadi village is 2167.03 ha, out of that 1920 ha area is under cultivation.

A. Main problems faced by the village

- 1) Protection of kharif crops
- 2) Increase in rabii area, especially in the vulnerable zone.
- 3) Drinking water security, especially in the low rainfall years.

The problems i) and ii) were addressed through JSA.

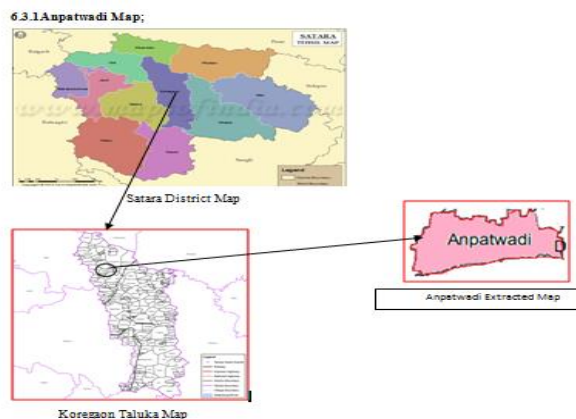


Fig. 1. Anpatwadi map

Table 1
Structures constructed in the village under JYS

S.No.	Name of work	Selected work	Completed work
1	Cement chain Bandhara	5	5
2	Repair of cement Bandhara	2	2
3	Stream deepening	6	6
4	Repair MNB	1	1
5	Gabion structure	3	3
6	Drip/sprinkler	25 he	25he
7	Cement chain Bandhara	1	2
8	Remove silt in percolation tank	1	1

7. Impact Assessment of JYA at Anpatwadi Village

The assessment work has two main components,

1. Technical assessment of JSA works: - To check accuracy of locations and structural soundness of interventions.
2. Utility assessment: To identify beneficiaries and assess impact of JSA.

In order to accomplish above two objectives, intervention wise survey formats have been designed which are to be used as guides for recording observations. In project report we assess all the JSA work which had done in Anpatwadi village. From which one assessment shown below:

A. Continuous Contour Trenches (CCT)

It is an agricultural technique that can be easily applied in arid areas to allow for water and soil conservation and to increase agricultural production. Trenches can be artificially dug along the contour lines.

Structural soundness: Dimensions were measured at different locations and were found as per estimates.

Location and utility: All the surveyed farmers reported

positive impact of work. Farmers reported that soil moisture retention had increased due to compartment bunding.



Fig. 2. Continuous Contour Trenches

Table 2
Impact Assessment format for CCT

S. No.	Questions	Possible answer	Answer
Suitability of CCT			
1	Slope Distance between trenches Slope 10% -15-20m 10-15% -15-10m 15-20% - 10-5m	Steep/ mild	Mild slope (10-15%)
2	Type of trenches	Continuous contour	Continuous contour
3	CCT	Yes/ No	Yes
4	Staggered trench gap (5 to 10m)	Yes/ No	Yes
5	Drainage line passing through Trench	Yes/ No	Yes
6	Trenches on contour	Yes/ No	Yes
Structural soundness of CCT			
1	Dimensions	L B H	L=460m B=1m H=1m
2	Berm provided	Yes/ No	Yes
3	Berm is Equal Trench depth and Maintained	Yes/ No	Yes
4	Dense vegetation	Yes/ No	No
5	Trapezoidal trench shape	Yes/ No	Yes
Utility of CCT			
1	Soil erosion reduced	Yes/ No	Yes
2	Water level increased in nearby Structure	Yes/ No	Yes

8. Conclusion

1. After the study JYS campaign it is clear that scheme running behind the schedule with respect to year wise plan. The Project initiation, planning, formulation and other pre-construction activities involve many complex stages. The activities in Stage 1 & Stage 2 of project cycle shall be done well in advance if any delay in these stages will result in the overall delayed project cycle. All the activities up to Stage 6 shall be completed well in advance such that the contractor will get enough time to complete the works under his scope.
2. Many of the CNBs assessed had leakages, loose foundation with the main body of the structures either corroding badly or in some cases broken, exposing the rebars. At some sites where deepening work was carried out, sand layers had also been removed.
3. The excavated material was dumped along the banks without compacting and stabilising the banks.
4. Increase in Ground Water level.

5. Reduction in runoff and change in cropping pattern- The reduction in runoff resulted in soil moisture retention. According to the JSA beneficiaries; this has been possible because of the CCT.

9. Recommendation

A. Interaction and Coordination between Departments

For proper representation of data on the GIS platform requires integration of data from different departments. This requires proper interaction and communication between all departments. It is need to make clear provision of room to make such interaction and coordination in the village planning framework.

So that it is possible to avoid the problem and correct analysis of all JSA activities.

B. Groundwater Modelling and Simulations

Some complex problems require more research and analysis and use of tools such as groundwater modelling for greater understanding of the problem. Finding suitable areas for interventions like lake-deepening would require understanding of the geology, aquifer characteristics and groundwater flows. Impact of recharge shafts and identification of source of contamination of drinking water in villages etc. can be carried out by using groundwater modelling and simulations. A

simulations and ground water modelling will help in designing JSA better.

C. Revisiting Current Practices

This is important; it is not a complete solution to address water scarcity issues as the water saved is used to bring more area under cultivation, mostly sugar cane. Some Institutions; for example, water user associations (WUAs) said that There is need to be created farmers can come together to plan the crops as per water availability, distribute water equitably and use it more efficiently.

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