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Jalyukta Shivar - A Strategy to overcome drought in Maharashtra

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Abstract: *In the state of Maharashtra, inconsistency of rains in the very times of crop growth and discontinuity of rains create drought-like situation and agriculture field is heavily affected.*

Considering irrigation facilities in the state, factors mainly challenging development of state are limited irrigation facility (according to report of water and irrigation committee, even if entire irrigation capacity is utilized, 44% area will remain dry land), large coverage of drought-prone area (159 Lacs Hectare which means 52% of cultivable area), large proportion of poor and downgraded land (42.20%), increasing uncertainty in the agricultural field due to uneven, unpredictable, and intermittent rainfall. For last four decades, heavy ups and downs have been observed in the production of crops on dry land in the state.

Less availability of water is a major factor responsible for this situation.

To make water available for assured farming and for drinking, solutions underwater conservation if strategically designed and implemented in integrated manner with coordination of all departments, provision for drinking water and protected irrigation for crops can be definitely made.

That's why Maharashtra Government in India has launched a water conservation scheme named Jalyukta shivar Abhiyan to make Maharashtra a drought free state by 2019.

Mainly this scheme has managed to recharge groundwater to a certain extent Particularly in the Drought hit areas of Marathwada and vidarbha. With unique Initiative like Jalyukta Shivar, water Scarcity will surely a thing of past!

Keywords: *Jalyukta Shivar, Drought- like Situation, Water Conservation Scheme, Drouht hit area, Groundwater Recharge.*

I. INTRODUCTION

Jalyukt Shivar Abhiyan (JSA) is a flagship program of Government of Maharashtra launched in the year 2014 to provide long-term and sustainable solutions to the water scarcity problem faced by rural communities.

The main objective of Jalyukta Shivar Abhiyan is to establish belief in a farmer that, "every drop of rainwater is owned by me and it should percolate in my land".

This means that, Public Participation Especially in the form of Farmers is of so much important. So, by taking into consideration public participation for this campaign Jalyukta shivar feri (a walk around the villages to ascertain the works to be carried out for achieving water neutrality) are being conducted. Also, so many programmes under the head like public awareness for Jalyukta shivar are conducted.

Many Jalyukta shivar Projects are inspired by Various Programmes of previous Government scheme, including the integrated water development programme, Vidarbha Intensive Irrigation Development Programme, Mahatma phule Jal bhumi Abhiyan(Mahatma Phule water and soil Conservation programme), Dry land Farming mission. The overall implementation is coordinated by the District Superintending Agricultural Officer (DSAO), the taluka level staff under him, and

Other departments such as Ground water survey department agency (GSDA), Forest, Minor Irrigation–Zilla Parishad (MI ZP), Minor Irrigation – Water conservation (MI WC), Rural Water Supply (RWS) and Social Forest.

This Abhiyan aims at Initiating Permanent measures to make the state drought- free by 2019 and to harvest rainwater within the village boundaries, thereby increasing ground water levels. Also reducing dependency on water tankers will be one of the aims of Jalyukta Shivar by 2019; Maharashtra will not only become Drought free but also free from water tankers. The Scheme aimed at solving water woes of drought-prone regions is already a hit with farmers as many villages are inching towards becoming water-sufficient.

II. JALYUKTA SHIVAR CAMPAIGN LOGO

The Water Conservation Department of Maharashtra Government conducted a logo competition on the Maharashtra My Gov Portal with an objective to widen its scope of public participation in flagship program.



Figure 1. Jalyukta Shivar Abhiyan (Campaign) Logo.

Mr. Kishor Gaikwad received in Mumbai an award for best design by Hon. Chief Minister of Maharashtra Devendra Fadnavis on 4 January 2018.

III. AIMS AND OBJECTIVES OF JYS CAMPAIGN

The various objectives of this campaign are

Considering drought-like situation occurring frequently in the state, Jalyukta Shivar Campaign is being taken up under 'water for all - drought-free Maharashtra 2019':-

- A. Harvesting maximum rainwater in the surrounding of village itself.
- B. Increasing level of groundwater.
- C. . Increasing area under irrigation in the state - Increasing assured water for farming and efficiency of water usage.
- D. Guaranteeing availability of sufficient water for all in the state - Increasing water supply by resurrecting dead water supply schemes in the rural area.
- E. Implementing groundwater act. (In that, so much Instructions are given to the Farmers about use of water of well)
- F. Creating decentralized water storages.
- G. Initiating new projects which will create water storage capacity in large quantity.
- H. Reinstating / increasing water storage capacity of existing and dysfunctional water Sources (small dams / village tanks / percolation tanks (P.T.) / cement dams).
- I. Extracting sludge from existing water sources through public participation.
- J. Encouraging tree plantation and planting trees in villages by public awareness.
- K. Creating public concern / awareness about balanced use of water.
- L. Encouraging / creating awareness about efficient utilization of water for farming.
- M. Encouraging people about water harvesting / increasing public participation.

IV. BACKGROUND

A. State Profile

In Maharashtra, out of total of 1531 watersheds, 76 have been categorized as overexploited, four as critical and 100 have been categorized as semi-critical, as per march 2011 assessment made by Central Ground Water Board, Government of India.

At the outset it would be important to realize that like we have field boundaries on the surface clearly demarcating the ownership over land resources, there is no such demarcation in ground water aquifers and there is probably no means to separate extraction of water through a tube well installed on one field from extracting water below the field of others. Normally one with more financial resources puts a deeper pipe to extract water and in this competition the ground water depletes fast. Without measures to replenish them, we are eating up our reserves, since ground water is the last resort for meeting the drinking water requirement. Unlike surface harvesting structures, it takes much more time to replenish. Groundwater is a long-term reservoir of the natural water cycle.

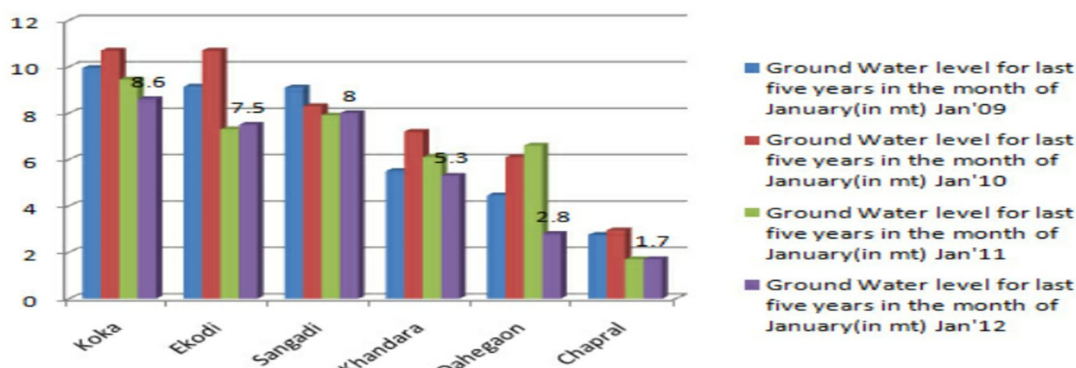


Figure 2 Ground Water Level in Various District of Maharashtra.

B. The need to recharge Ground Water

Ground water recharge is the process whereby groundwater is replenished by water percolating into the groundwater system. Groundwater can be recharged from rainfall, surface storage structures through percolation. Recharge to unconfined aquifers occurs over a wide area directly above the aquifer. Recharge to confined aquifers occurs where the aquifer is exposed at the surface, or from leakage through confining layers. Various measures can be undertaken in a watershed development programme to artificially recharge ground water.

V. DATA AND METHODS

- Selection of villages at taluka level based on - scarcity, drought-affected, GW over-exploited
- Preparation of base-line survey and village plan
- Determining water balance and matching demand-supply
- rainfall within village boundary
- runoff generated
- water impounded within village - supply
- water requirement - a) Drinking b) Crop water - demand
- Compute surplus/deficit and accordingly plan new structures
- Technical and administrative approval
- This plan has to be approved in Gram Sabha and needs to be prepared by coordinated effort from all concerned departments
- Integration at taluka and district levels

By, adopting this step by step procedure, we can easily choose villages which are really needful to implement the scheme jalyukta shivar campaign. That's why Government has prepared an organized action plan to make 'water for all-drought-free Maharashtra and to permanently overcome drought situation and implementing 'Jalyukya shivar' (water full surrounding) Campaign to increase water availability.



Figure 3: Observing Farm Pond At Shingoli, Osmanabad.

It was concluded that, from observations of structure this farm pond is constructed under the scheme 'Farm pond on demand'. It is really benefitted to farmers. Water storage capacity of this farm pond is 441 T.C.M. Size of farm pond is $25 \times 25 \times 3$.



Figure 4: Nalla Widening and Deepening at Shingoli, Osmanabad

In Jalyukta Shivar Campaign, location of nala-deepening/ widening correctly chosen. The deepening work was correctly chosen. No negative impacts of straightening were observed or reported by farmers. In case of good monsoon all bunds do overflow.

VI. BENEFITS DUE TO JYS CAMPAIGN ON PRACTICAL IMPLEMENTATION

A. Rivers Deepened, Water Level in the Wells Enhanced

The results of enhancement of water table in the nearby wells according to our whims are best explained by the villagers of Shingoli. With good precipitation, agriculture has been flourishing here. However, every year during the rains, the villagers used to be on their toes. To overcome the problem, there was a need to obstruct and store the water by means of C.N.B. Due to community awareness and support to agricultural department of shingoli, finally C.N.B was successfully constructed and now the results shows that there is enhancement of water table in the nearby wells. According to Villagers by using, poklene and JCB machines works are completed rapidly in shingoli.

B. C.N.B. work

According to Villagers, dependine upon suitability of compartment bunding work is completed on 6, 00 Ha area. According to, villagers initially some old people of village crate problems in construction of CNB but when work is completed and it is really benefitted then they realized that, Jalyukta shivar Campaign Is really useful. And furthermore they participated in Jalyukta shivar campaign.

C. Efficient Management of Rainwater

In Shingoli, when works are completed by jalyukta shivar activity, then water which is stored is effectively and efficiently used means wastage of water is avoided in large quantity. Basically, by using sprinkler Irrigation and Drip irrigation water is efficiently used.

D. Use of Mobile App and Representation on GIS Platform

In order to have proper representation and analysis, data collection of various parameters like Drainage, terrain, soil, geology, rainfall, wells. Crops, quality and so on, needs to be transported to GIS platform. JYS GR (dated 5-12-2014) mentions the importance and use of GIS in planning and representation. Currently most of the data like soil, geology, land use etc. is available with Maharashtra Remote Sensing Application Centre (MRSAC) as GIS shape files at village level. The mobile app developed by MRSAC, is being used to these locations. The mobile app developed by MRSAC is also gives so much accuracy in the work. The mapped location can be monitored through web page. These GIS layers can be very useful in understanding the nature and causes of drinking water scarcity, quality problems, impact of conservation structures etc. Use of GIS also makes available different maps like drinking water stress maps, quality affected areas maps, sugarcane belts, poor groundwater belts etc.

Such maps would serve two purposes;

- 1) Maps convey more information than tables and reports, hence villagers will become more aware and
- 2) These maps give further direction in understanding the problem better.
- 3) These maps can be easily understand by villagers and if any need arises for change in location of JYS structure according to suitability we can easily decide location for structure.

VII. BROADER SUGGESTIONS

A. *Interaction and Coordination between Departments*

Data on GIS platform requires integration of data from different departments. Different datasets like revenue and land use data from Revenue department, crop data from Agriculture department, canal and command area data from Water Resources department, groundwater assessment data from GSDA (Ground water survey Development Agency), conservation structures data from Soil conservation department, watershed data from IWMP (Agriculture department), drinking water data from Water Supply and Sanitation department etc. has to be brought to one place for correct analysis and formulation of the problem. This requires proper integration and communication between all these departments. JYS GR (Government Resolution) mentions this as a requirement while preparing all the Plan of Villages. But there is no clear provision to make such interaction and communication in the village planning framework.

B. *Groundwater Modeling and Simulations*

Some complex problems might require more research and analysis and use of tools such as groundwater modeling for Best understanding of the problems. For example, finding suitable areas for interventions like River deepening would include understanding of the geology, aquifer characteristics and groundwater flows. Similarly, impact of recharge shafts or identification of source of contamination of drinking water in villages etc. can be carried out by using groundwater modeling and simulations and by using Scientific methods. We know that, in each and every cases where there is need arises we must have to use Scientific methods. Here is also same we must have to use Scientific approach for carry out works effectively and efficiently. We have to apply all the principles of management; so as to we will carry out all the works of JYS campaign effectively and efficiently.

VIII. CONCLUSIONS

- A. In Jalyukta shivar campaign, by Scientific Approach We can easily achieve our predetermined goals of a Campaign
- B. We know that, when two or more peoples gather together and when working towards the same goal then there must be proper co-ordination in between different departments. Here is also same, we have to coordinate activities of JYS campaign properly.
- C. While making assessment in Villages it is observed that, initially peoples are not giving permission for JYS activities in their Farms. In order to avoid this; we have to create public awareness with help of animation Video.

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