

Mission-Water for all



Shivjal Kranti

About Dilasa Janvikas Pratishthan

Dilasa Janvikas Pratishthan is an organization dedicated towards its mission to uplift the environmental, social and economic status of rural people by implementing sustainable natural resource management and women empowerment. Presently, it is working in 4464 villages of Marathwada, Vidarbha, North and West Maharashtra Regions and has its head office in Aurangabad. Dilasa has established its offices in Nashik, Akola and Osmanabad along with a strategic office at Pune. Altogether, Dilasa is working in water and livelihood sectors in 27 districts. Dilasa has created a strong foundation in water management.

Vision: Dilasa Janvikas Pratishthan shall be a professionally managed NGO committed to uplift the environmental, social and economic status of rural people. Dilasa interdisciplinary team shall be equipped with innovative, entrepreneurial and empowered professionals continuously trying to accomplish global benchmarks. Dilasa shall foster a culture of caring, mutual trust and continuous learning while implementing sustainable natural resource management.

Dilasa's work in sustainable natural resource management started with watershed development in 1995. Over the last 21 years, Dilasa has established a very strong base in water management. The organization has implemented watershed development projects over 5.65 lakh ha of land with ridge to valley approach. After the strong implementation, Dilasa played the role of Resource Support Organization (RSO) under Indo-German Watershed Development Project (IGWDP), RSO in NABARD Holistic Watershed Development Programme (NHWDP), RSO in Watershed Development Fund (WDF) of NABARD and completed all 64 projects with partnership of different NGOs. Dilasa is working with the project mode in a sustainable manner in which watershed plus activities are also conducted so as to mitigate the drought effects on agriculture. Specifically working with small, marginal farmers and landless families for their livelihood generation and try to link effectively agriallied activities like goatery, poultry and dairy.

Dilasa had undertaken the movement to form 2000 farmers groups in Osmanabad, Beed, Nanded, Solapur. Latur, Sangli, Satara and Kolhapur districts. All the groups are based on crops like Soybean, Onion, Vegetables, Jawar, Pomegranate, Tur under Maharashtra Agriculture Competitive Programme (MACP). With successful experience of forming Farmer Producer Organization (FPO) in Marathwada, Dilasa is acting as Producer Organization Promoting Institute (POPI) for NABARD.

CSR with Coca-Cola, ACC, DHFL and many more Dilasa has made all out efforts to make Corporate Social Respo-nsibility (CSR) activities more sustainable by implementing the chain of cement plugs with the help of ACC Cement under aquifer based identification of cement plugs. The Coca-Cola also came forward to implement full-flaged watershed programme. DHFL is supporting Holistic Watershed Development Programme in severe drought affected villages of Aurangabad.

Water Resource Development in Drought affected villages

Outreach	Location		
50 Villages 59 Structures 67511 Beneficiaries	Aurangabad district of Maharashtra		
Partner Dilasa Janvikas Pratishthan Aurangabad	Supported by Mahindra & Mahindra Mumbai		

Stored water quantity

..... litre

Project Goals & Objectives

Project Goals

- To undertake sustainable development of natural resources through restoration of ecological balance in catchment area and people living there in.
- 2. To improve standard of living of farmers through raised income and make their livelihood sustainable even in drought situation.

Objectives

- 1. To Increase ground water recharge.
- 2. To improve existing ecology for drought proofing.
- 3. Upliftment of environmental, social and economical status of rural population by implementing sustainable natural resource management.

Maharashtra and Drought

Maharashtra is the third largest state of India in terms of area (about the size of Italy) and second largest in terms of population (112 million people). It is prone to various types of natural disasters such cyclones, earthquakes, floods and droughts — the most frequently recurring phenomenon to severely impact the State since 2012. With a large percentage of families' dependent especially on rain-fed farming, droughts pose a significant and persistent risk to continued economic and human development.

Climate change on door step

Agricultural scientists observe that for the past two years, extreme weather events like hailstorms, heat wave, frost, unseasonal and erratic rains have played havoc with agriculture in Maharashtra. The sudden rise in temperature has also increased the population of pests which thrive and breed in warmer climatic conditions, ultimately ruining the standing produce. fluctuation in temperature is a problem too. It gives rise to evaporation losses. These things used to happen once in every 15 years, but this has now become an annual affair

In Maharashtra, successive year of rainfall have resulted in falling ground water levels and early drying of natural streams. The water crisis in Maharashtra now affects 90 lakh farmers, equal to almost entire population of Sweden.

As a direct result of the increase in drought frequency, severity and duration make the gap between water supply and demand. Because of drought, agriculture is the first and the most affected sector, many other sectors including energy, transportation and environment have also experienced significant losses. This mostly resulted in personal hardship in getting the normal resources.



Combating against drought

Drought is one of the most common disasters which can undermine livelihoods and well-being despite the use of various mitigation strategies It is a creeping phenomenon whose effects accumulate over time before they are felt and lingering on long after the actual event while problems associated with it can have economic, environmental and social impacts. They can cause decline in crop yields resulting in reduction in income for farmers which will cause increase in market prices of products (Dercon et al., 2005). Therefore, it is important to ensure that measures are in place to minimize impacts of drought on human beings and their livelihoods although the strategies also have limitations. urangabad district is situated in the north central part of Maharashtra between North Latitude 19°15' and 20°40, and East Longitude 74° 37' and 75°52'. It covers an area of 10,107 sq. km falling in parts of Survey of India Toposheet No.46 L & P and 47 I M.

The district headquarter is located at Aurangabad City. For administrative convenience, the district has been divided in 9 talukas viz., Aurangabad, Kannad, Soygaon, Sillod, Phulambri, Khuldabad, Vaijapur, Gangapur and Paithan talukas.



Available Resources

Geo-morphologically, the district comprises of varied topographic features and landscapes consisting of high hills and plains and low lying hills. Most of the hill ranges are located in the northern part of the district. The Satmala hills and Ajanta hills extend from east to west. The hills near Verul in Khulabad taluka are part of these ranges which extend to Chawaka ranges and Aurangabad hills.

The district is a part of the Deccan Plateau. In general, the slopes in the district are towards south and southeast Major part of the district falls in Godavari basin with a small area in north eastern parts falling Tapi Basin. The major river in the district is the Godavari with its tributaries namely; Purna, Dudhna and Shivna rivers. The other important tributaries are Sukna, Khelna, Kham, Gulathi, Shivbhadra and Girija rivers. Depending on the drainage and geomorphology, the district has been divided into 52 watersheds.

Medium rainfall ranging between 700 to 1000mm. High percentage of drought-prone area. Recurring drought. Two-thirds area under cultivation. Very little forest cover (4%), overgrazing and deforestation. Variation and late rainfall. Uneven spread of rainy days. Hydrogeology

The major part (95%) of the district constitutes Deccan Trap while alluvium occupies a small portion. There are two distinct hydrogeological units in the district i.e. fissured formations (different units of basaltic lava flows) and porous formations (isolated patches of alluvial deposits). The occurrence and movement of ground water is controlled by variation in water bearing properties of these formations.

The storage of ground water in compact massive unit totally depends upon the presence of joints and their nature, distribution and interconnection. The average depth range of dugwells is 12 .00 m to 15.00 m and that of bore wells is 50.00 to 60.00 m in hard rock areas where as the yield ranges from 0.60 to 3.10 lps.

Water Challenges

The district is facing severe drought situation since 2011 to 2015. The gap between water availability and demand is increasing. The agricultural sector suffers from "high" water stress and thereby food security, economic growth. It is becoming very much difficult in maintaining a delicate ecosystem under agri-water crisis.

Water Resource Development Potential

As per the study conducted by Central Ground Water Board, Ministry of Water Resources, Government of India recommended for Aurangabad district - In the Basaltic area, the artificial recharge structures feasible are check dams, gully plugs, percolation tanks, nalla bunds, etc. The existing village ponds/tanks need to be rejuvenated to act both as water conservation and artificial recharge structures. The design of ground water structures depends upon geological formation.

Pro-Active Role of Mahindra & Mahindra

Looking at deficit rainfall of more than 50% and severe water scarcity, it becomes impossible for the farmers plan, agricultural activities and resulting in poor productivity or total crop failure. The major problem is of drinking water supply of the village as a whole. People were becoming restless because there was no water, no fodder and no gainful employment.

Mahindra & Mahindra really made the global goal at local level. i.e. ensuring access to water for all. With strong support from Mahindra & Mahindra CSR team, immediate drought proofing measures can be planned and implemented in a very short span of seven months.

The activities are selected as need based works for water quantity and effective measures for water quality.

Methodology

Selection of project area

The selected villages list is given by Shivsena prominent leaders from every block of Aurangabad district. The villages who were constantly facing water scarcity are selected by them. Dilasa Team has made complete feasibility study of the villages by actually physical verification of the area, reconnaissance survey and finalized 35 villages to be considered for the execution. In cancelled villages, some of the reasons are: the villages will come under Delhi Mumbai Industrial Corridor Area; villages have already planned their activities through other schemes. Initial meetings with Sarpanch, Shivsena leader in the villages. The meeting agenda was to describe the villagers regarding the scheme objectives and their roles & responsibilities.

Activitiesselection

The district is expected to receive annual rainfall of 750mm.However; since last 4 years rainfall frequency and intensity varies. Due to low and erratic rainfall in district, natural low percolation capacity of black basalt rock and over-pumping are also significant contributors for scarcity. The deficit rainfall is more than 50%. Under such circumstances it becomes impossible for the farmers to plan agricultural activities and resulting in poor productivity or a total crop failure. In addition non remunerative rain fed farming, heavy indebtedness and uncertainties in prices of agricultural produce has resulted in severe poverty situation. The major problem is of drinking water supply of the village as a whole. The activities are selected as need based works for water quantity and also small but effective measures for water quality. The selected activities detailed survey is conducted and also priorities the activities as per MRSAC data of ground water potential. Google earth images are studied in detail before finalization of the structures in the villages. The overall project goals and objectives reflect as activity no 6 under Schedule VII of CSR policy i.e. ensuring environmental sustainability.

Approach

The structures selection criterion is based on following principles:

- The structure should be effective for the whole village i.e either direct benefit to drinking water supply well or borewell.
- Water storage facility to wadi or wasti (hamlet) where there is no any facility of water supply and storage facility arrangements - is selected on priority basis.
- Small intervention big impact as in case for any water purification or water fetching facility which leads to benefit almost all villagers

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- 3) The structures constructed should be in such a manner that a minimal maintenance will be required and people are oriented properly for minor maintenance and its periodicity.
- 4) The most of the selected structures are not a part of any government programme , hence no chances of any duplication of works.
- 5) Most of the structures are unique and innovative which can be replicated through Government programmes as per similar site situation.
- 6) Planned to have top 10 drought mitigation measures for water resource development, which are as follows :

Preparatory phase Activities

The major objective of this phase is to build



participatory approach so that community's acceptance for soil & water conservation measures in their village. During this phase, the main activities carried out are:

- i) Baseline information of the village and especially water budgeting
- ii) Selection of sites and beneficiaries, detailed technical survey by level & staff, Hydrogeological survey of the watershed to map out, Zones of potential groundwater recharge, storage and sustainable groundwater utilisation.
- iii) Selection of urgent works to be carried out from total list of expected works -as per the location, no. of beneficiaries covered and maximum



Implementation phase

This phase is the heart of the programme in which actual implementation for creating water storage potential is made. 8 masonary teams are made with skilled and unskilled labours for different site locations and proper quality control on material procurement and workmanship by technical supervisors of Dilasa. The project manager approved every time the structures phase wise and also scrutinized the quality and dimensions of the structures. The photo documentation before the structure, during the progress and after completion with painted name of the scheme and Mahindra Rise logo are kept for every structure.

Post-Implementation phase

Awareness generations on water saving technologies such as drip irrigation or innovative management practices are necessary for sustainability of resources. Adequate knowledge on maintenance of the structures is necessary for community during this phase. Final impact assessment and physical & financial reports will be generated after good rains. The detailed list of activities is attached with timeline is attached as annexure no.1.





Rain Water Harvesting Tank



It is a permanent water storage structure in the village. This is Ferro cement tank of 10,000 liter capacity. The ferro cement tank is as good as food grain storage (*Kanagi*) during ancient days. The tanks are fitted with a PVC pipe for roof top water collection with filter arrangement. Also in many villages direct pipeline connection or bore water supply is made. Hence the tank is used through out the year. The structure is most beneficial during village festivals, marriages to store ample amount of water in it.



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RWH structure is used for water storage benefitting a cluster of households (ranging from 35-40 families). The location of the water harvesting tanks was decided through participatory meetings in the target villages. The small wasti's (hamlets) did not have access to conventional water supply and were extremely water stressed before construction of these tanks supported by Mahindra & Mahindra. The tanks have life of more than 75 years and are cost effective compared to conventional metal or plastic tanks. These tanks have benefitted landless, small land holders and low income groups by providing water security, reduced drudgery and facilitated social dynamicsthrough ownership of a shared facility. Impact

Though the tank is expected to catch the rains when it falls, however in drought situation these tanks are great solace for the villages to store the tanker water. Otherwise, one tanker of 5,000 litre capacity cannot be stored anywhere in the Completion Report

village and most of the villagers struggle for fetching of the water especially old women and children.

- This is also good alternative for the selected villages where electricity shut down for more than 10 hours and villagers are storing the water in this tank from the borewell or dugwell and utilize it as and when required.
- Under severe drought situation, women & children deaths (*panibali*) are occurring in fetching water from the wells or getting water from the tanker. The tanks are very safe place to fetch the water at any time by many households.
- Drudgery of the women for fetching potable water is reduced.
- Water availability for animals as in most of the tanks the overflow pipe is attached the animal watertanks.
- Reduction in water-borne diseases because of protection of water sources from contamination.



Khamgaon villager from Hanuman vasti spontaneously said, "lot of distance we have to cover for fetching the water but now because of tank given by Mahindra fetching of water is becoming very easy. Nowadays, many marriage ceremonies are also comfortably happening because of this tank availability."

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Village Pond

Villages covered with Village Pond

> Water stored with minimum 3 water fillings

Size of Pond

Nillod village is located in Sillod block of Aurangabad district. It is observed during technical survey and discussion with the community that in Nillod village the main nalla is having good quality of sand. Near the main nalla, there is medium irrigation tank in existance. However, the tank is not giving any water recharge benefits to the Nillod villagers. Dilasa team under Mahindra & Mahindra supported project surveyed the main nalla of the village and found one place where recharge will be maximum. The site selection for the village pond is confirmed after taking levels in the nalla with the excavation & widening of the nalla. This pond has created direct recharge to number of wells which are usually used by the villagers for drinking and irrigation purpose. Due to increase in ground water levels in the wells, farmers can save their crop by irrigation. This will directly impact their livelihood.

Total

Liter

beneficiaries

This village pond constructed without any plastic lining because the plastic lining is the temporary lining for life of just 3 years. In Nillod village pond concrete lining is used which is durable. The size of pond is kept just 10 m x 10 m x 2.5 m in depth. The pond is constructed in such a way that during high intensity rainfall no damages will happen along the banks of the nalla and water will smoothly flow from the outlet. The village pond has simple inlet upon which the flow of water will be stabilized and the excess run-off will again run into the nalla through systematic stone outlet construction.



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The structure is supported by Mahindra & Mahindra which is innovative and adaptive by the community. Such structures are replicable and sustainable.





From the heart of beneficiaries

Balu Borade a farmer who has land near village pond and worked voluntarily during village pond construction. According to him, "No water availability in my well during month of January 2016. Because of village pond construction with little rains in month of March now I can see water in my well. This pond will be helpful for maximum wells and borewells in my village.

Cement Nalla Bund

Total number of villages covered





Total Cement Nalla Bund structures completed



Under Shivjal Kranti cement nalla bund structure are constructed across the nalla or river which will benefit drinking water supply well and maximum no. of dug wells in the area. This is permanent masonry structure having life of 75 years. This is almost maintenance free and requires only desiltation after period of 3 years.

This structure is necessary in Aurangabad district

area so as to create pressure of water in the nalla to recharge the nearby wells. This structure allows natural groundwater recharge which is very much necessary in drought-affected areas where withdrawal of water is more than recharge. Cement nalla bund is the structure which gives tangible benefits.

Cement nalla bund is the structure constructed across nalla to store water in it. Because of water storage the surrounding dugwells get recharged. This structure is very effective during high intensity rainfall for small duration. Cement nalla bund structure is environmentally friendly structure which is not storing 100% of water and upstream side but storing only required quantity and remaining water flow again into the nalla.



From the heart of beneficiaries



Former sarpanch of Andhaner Sriram Rajaram Raut spontaneously gave feedback for cement nalla bund structure, "In marathwada there are only temporary works happening for drought proofing. However, Shivjal Kranti by Mahindra is the only scheme which is actually working for combating against drought. Because of cement nalla bund structure on Khapri nalla in Andhaner almost 30 farmers will get benefit for rabi crop which is a big achievement."

Repair of existing cement nalla bund

In villages like Khamgaon, Ambhai the existing cement nalla bund are repaired like plastering, construction of wing walls to protect the banks, construction of water cushion so that, maximum amount of water can be stored. Initial survey of such structures have been made by technical team of Dilasa and these structures are rejuvenated within small expenditure but impact is same as new construction of cement nalla bund. This is the way of proper utilization of common property assets in the village.

The existing cement nalla bund desiltation is made. Desiltation is effective and immediate measure as at drought mitigation. The storage capacity of the structure is increased because of desiltation. Under Mahindra & Mahindra supported project, the



community has accepted to do the transportation of the silt by themselves. The silt contents maximum amount of nitrogen, phosphorous and organic carbon which is necessary to make the soil fertile. Desiltation activity and silt deposition in the farm fields is very effective for maximum agriculture production.





Bhungroo Technology

Total water storage

7 crore liter

Village Khamgaon is severely drought-affected village. The geographical area is more than 2,500 ha and population is around 3,000. The village is surrounded by hilly areas. Most of the rain water just washed out without any recharging in the area. The strata in the village is hard rock and murum type where ground water recharge is minimum.

Dilasa introduced first time globally-recognized

disaster mitigating technology called Bhungroo in Khamgaon village. Under this technology, rainwater from the catchment area gets stored underground for usage in lean periods. It is just storing and then using rainwater. As per the calculations in Khamgaon village, the total catchment area is around 2 kms. with width of nalla around 10 m. and it can store water of around 7 cr. litres.

No. of

....

beneficiairies

Bhungroo is an innovative technology of storing water in between the rocky strata and utilize the water during scarcity. It is just like a straw, sucking of water. In hard rock area it is necessary because natural percolation is very limited so this technology is useful in storing water on large scale.



Caption :.....

As per the discussion with the farmers in Khamgaon village, the water will be utilized for drinking water purpose in nearby area and vasti and the complete water will not be used only by single farmer. Bhungroo can work with just annual rainfall of 400 mm. The depth of Bhungroo in village Khamgaon is 266m which is the highest depth of Bhungroo in Maharashtra.

In the Bhungroo pit it is observed that the siltation may occur for the perforated PVC pipe. Hence, stone pitching is made for all sites of the pit so as to reduce the silt in the pipe. Similarly, the care has been taken for reduction in siltation from the long nalla coming from the hillock by constructing gabion structure. The location of the structure is decided in such a way that the filtered water with minimal amount of silt will go into the bhungroo pit.



Geo-technical survey for site selection



Repair of Shivkalin Wells

Total repair of Shivkalin Wells



No. of beneficiairies

Aurangabad district there are many Shivkalin wells which are effective for water storages. Such rehabilitation of Shivkalin wells has been taken by Mahindra on top priority. Small repairs, desiltation of drinking water supply well rejuvenate the whole water system. This is the most effective and impact oriented measure for drought proofing as the drinking water supply well is providing water to all the villagers. These simple but effective measures are not carried out by any agency as immediate drought proofing measure. Mahindra & Mahindra supported immediately after discussion with the community and looking at their felt need.

Chauka, Ta.Dist. Aurangabad



Slippery surface near well which is not very safe for fetching the water



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Providing slope in the periphery of the well and proper arrangement for its drainage, pulleys are repaired for ease in fetching the water.



Lot of grasses near well which is not healthier for the community After



Concrete work in the periphery of the well and clearance of excess grass

The drinking water supply well is lifeline of all villagers. In this drought situation though the water is available. However, water purification is neglected which is because of uncleanliness in and around the wells.

In Chauka village, under the urgent works they demanded for repair of pulleys on wells, proper facilities and cleanliness in and around the drinking water supply well. The well is daily used by 8,000 population of Chowka. The old well constructed in 1958, is having good quantity of water but because of slippery surface around the well it was becoming unsafe for fetching the water by women and children. Lot of grasses around the well which is not healthy condition around potable water source. When the surface is cleaned around the periphery of the well with proper slope to drain the water into the nalla.

Repair of pulleys to safe withdrawal of water by women and girls, everyone in the village appreciated the work and gaining benefits, which are intangible.

Small Intervention - Big Impact

 Drinking water availability for the whole village after desiltation of the well.

 Safety in fetching the water by providing pulleys and repair works.

- Not only water quantity but also quality is focused with small drainage works.



Construction of Wall for existing KT Weir

In Aurangabad district, there are so many old KT-weir constructions. Most of the constructions are without gates or the gates were corroded or bushes were not in working condition. This results in non storage of the water in the KT-weir. Under Shivjal Kranti, Dilasa team surveyed such structures in which most of the water in river will get stored and maximum benefit to the farmers due to recharge of groundwater.

In Devgaon Rangari village, Yelganga river is flowing for period of 4 to 5 months in good rainfall.

However, till the KT-weir wall construction the river water was just flowing without any benefit to Devgaon Rangari villagers. Because of the construction of wall in between the columns of KTweir now 1.1 m. height water storage with backwater length of 500 m. can be stored. The total length of constructed wall is 24 m. The desiltation activity is also carried out to store more quantity of water. This will directly beneficial for water supply well and nearby 20 wells of the villagers.



Gabion-Cum-Wall

Gabion is basically soil erosion control measure. It is the structure where big stones are bounded in wire mesh. Dilasa team have made innovative structure by transforming the gabion into gabion cum wall. Gabion cum wall is suitable at the locations where cement nalla bund structure is not possible and where nalla banks are not of same height and not stable. Gabion cum wall serves the purpose of water storage and allows excess water to overflow the structure. As this is erosion control structure good quality of soil gets deposited in the structure, which is again beneficial for the nearby farmers. This is low cost but effective water storage structures supported by Mahindra & Mahindra. **Impact**

The structure recharged nearby bore well in Golatgaon wasti and solved the water scarcity of more than 40 households. It is immediately benefitting the drinking water supply well in Pal and Ambhai villages.





Annexure – I

ACTIVITY - TIMELINE										
Sr. No.	Activity 1 - 7 months	Duration 1 - 7 months								
		1	2	3	4	5	6	7		
Preparatory Phase										
	Signing of MoU & request for advance amount for works.									
	Prepare team composition for proposed project and preparations of task sheet for them.									
	Conduct orientation programme for core team members regarding project goals and objectives.									
	Initial meeting in selected village for project works and their roles and responsibilities.									
	Implementation Phase		_							
	Start the execution of water storage structures									
	Mark out, excavation for foundation, oversee in the material procurement and procure skilled, unskilled labors for work execution and keen supervision during construction of new CNB									
	Water storage tanks: Discussion with the villagers for suitable site for water tank construction and supervision during the construction									
	Oversee in the material procurement and procure skilled, unskilled labors for work execution and keen supervision during repairing of CNB									
	De-siltation of CNB: Mark out of de-silted area, excavation of silt, transportation by labour, supervision during execution									
	Complete drainage line structures with proper quality control.									
Milestone No.1- Completion of urgent drought proofing structures.										
	Post Implementation Phase									
	Orientation of villagers on maintenance of water tanks, school related activities									
	Orientation of villagers on maintenance of drainage line activities.									
Milestone No.4: Detailed Impact Assessment Report										
	Submission of Impact report.									

Completed Activities

Proposed Activities

Dilasa Janvikas Pratishthan





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