Combating against drought

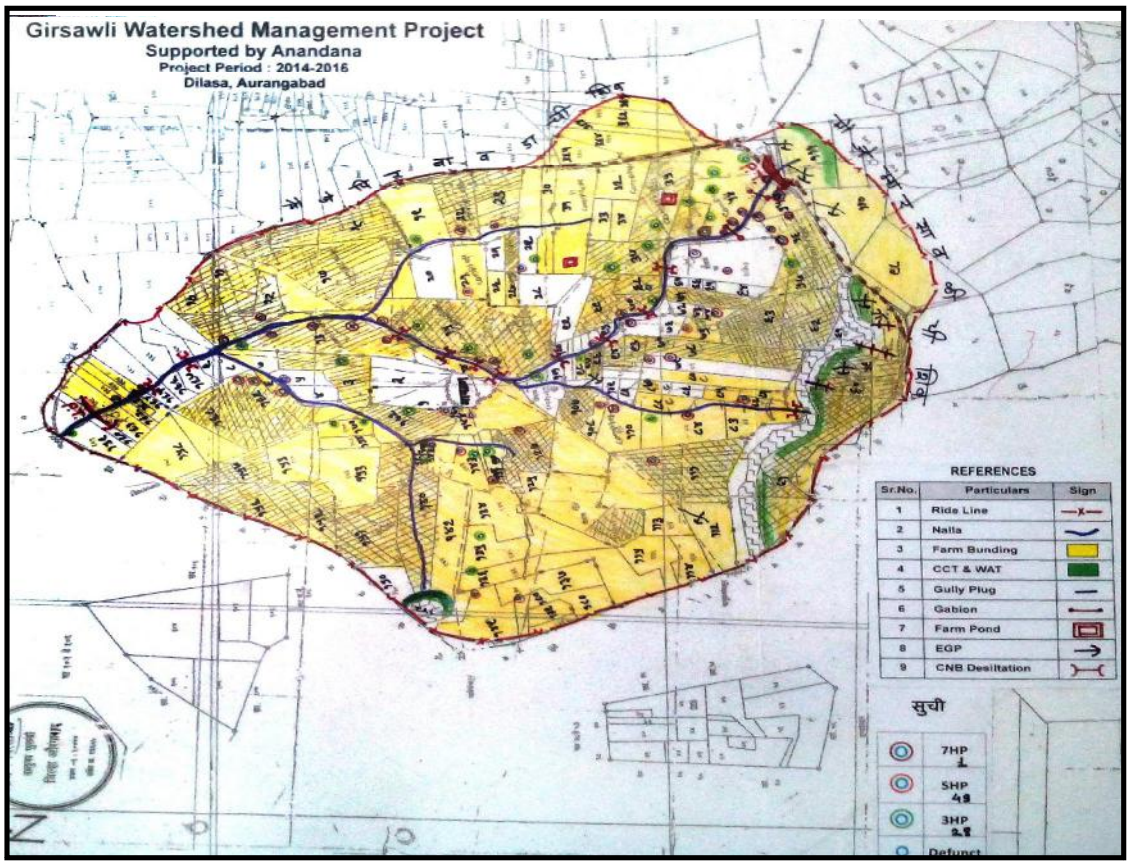
A pilot project in village Girsawali, Taluka Fulambri, Dist. A'bad.

Chain of activities in line from soil conservation, water conservation and livelihood

DILASA

Landscaping sustainability

Dilasa is the non-government organization working with the mission of rural development which had implemented watershed programme on 4.65 lakh ha of land apart from its spectacular performance in micro irrigation, women development and livelihood enhancement.



Girsawali soil and water conservation treatment map

Introduction

Girsawali watershed area is situated at a distance of 10 km from Phulambri block of Aurangabad district head quarter and 40 km from Aurangabad city in the state of Maharashtra (India) . The total area covered under this watershed project is 400.66 ha. The average annual rainfall in this watershed is only 535 mm while the soil is of silty loam and silty clay type. Consequently the entire agriculture is rainfed with very less agriculture production. The Girsawali village is facing severe drought, hailstrom and eratic raifall since 2014-15. Girsawali is in drought prone area of Phulambri block of Aurangabad district and the agriculture is entirely dependent on monsoon.

Looking the situation of area and conditions of villagers, Dilasa has started the implementation of the drought-proofing activities with systematic study of hydrogeology and GIS mapping technology from April 2013 with support of Anandana Foundation, Delhi. The main objective of this soil and water conservation activities is to create sustainable livelihood opportunities through natural resource management. As a result of these series of activities initiated, the livelihood of the villagers are enhanced and there is reduction in migration, Kharif crops yields better in village Girsawali as compared to adjoining non-watershed villages. The activities are implemented by keeping very less expected rainfall and within such circumstances the villagers should be able to get at least moderate agricultural production.

Visit of Raj Thackeray to Girsavali village the lush green area - To understand the concept of watershed development on the backdrop of severe drought in Marathwada region

Interventions Implemented

1) Farm bunding: In continuation to works carried out till October 2014, the demand for farm bunding activity was very encouraging. Farmers were eager to do farm bunding activity in order to conserve the moisture within their land in severe drought condition. Before 2015 monsoon, almost every farmer in series of serial gut numbers has completed the farm bunding activity. Completed farm bunding on 316 ha. in the village.

2) Stone outlets: Stone outlets are important structures in farm bunding activity to flow excess water outside the farm safely. Because of outlet, there will not be any water logging within the farm. This is low cost structure builds with stones only. The shape of the stone is made in trapezoidal manner so that water will safely flow over it. Total constructed stone outlets are 1130 in number.

3) Small Earthen Gully Plugs: This is a typical earthen structure in which 4 to 5 ha. catchment area water can be stored. This is typically effective in undulating land. The earthen material is compacted in such a manner that it will act just like stone wall. The excess water slowly gets flowed through the outlet of earthen gully plug. The stone pitching on upstream side is necessary to safeguard the earthen structure. Intact 25 EGPs are constructed covering two major gullies.

Earthen gully plug

4) Gully Plugs: Gully plug is a small structure across the gully. It reduces the velocity of water. It is economical structure in which only stones are placed without any cement and concrete. Peculiarity of the structure is within the series of gully plug good soil conservation is observed. A good quality soil is trapped in gully plugs. In Girsawali total 51 gully plugs are completed in small gullies, especially in hilly areas.

Completed gully plug

5) WAT (Water Absorption Trench) & CCT (Continuous Contour Trench): As per the satellite images of Girsawali the hilly area is having good ground water potential. Hence, if water absorption trench and CCT is made on hillock, it had contributed to ground water recharge for Girsawali area. Technically appropriate CCT lines are made with specific distance on the hillock. 17 ha. of CCT and 1000 RM WAT are completed.

WAT excavation

6) Gabion structure: To conserve the soil in the main nalla this is typically constructed structure without use of any cement and concrete. It is nothing but huge bundle of stones constructed in mesh wire. This has proved a very good stabilized and intact structure to cover flash rains occurred in Girsawali during year 2015. Two gabion structures seems to be activity-wise very small but in terms of impact, gabion proved as sustainable recharge structure.

Gabion structure

7) Innovative farm pond with concrete lining: Water storage structure is beneficial for protective irrigation. In case of erratic rainfall, the stored water will be utilized by the farmers for irrigation, animal water requirement, etc. Two water storage structures are built in Girsavali each having capacity of 675000 litre. These structures will be helpful for the farmers during electricity shutdown period which is almost 12 hours in the villages. Under such situation farmer can lift the water from the dug well and store it in the storage structure so that he can provide irrigation by gravity.

Apart from routine farm pond structure in which plastic lining is done, however the response of the farmers for such plastic lining is not very encouraging. Because the life of plastic lining is limited upto 2 to 3 years and again putting such lining is very difficult for the farmers.

Dilasa team specifically made interventions of concrete-lined farm pond which is permanent storage and excess water can go through the pipe opening into the nalla. Proper care is taken for safety of animals and children by constructing compound wall along the farm pond. To reduce the evaporation losses, green shednet cloth is used which can be again reusable by the farmers. With this type of farm pond, the farmers are able to save their pomegranates fruits and other crops like maize, bajra etc.

The total water conservation in Girsawali shows that huge potential is created before rainy season and if only 10% will contribute as recharge then the village can survive peacefully with sufficient income.

Completed water storage structure with compound sot that animals should not fail in it and also fishery activity by the beneficiary as livelihood activity

Saved evaporated water with shednet

Water Conserved in Girsawali

Sr. No.	Type of Structure	Water capacity of Structure (litre)
1	CCT under afforestration	3094200
2	Water absorption Trench (WAT)	1375200
3	Farm Bunding	42890080
4	Earthen Gully Plug	100000
5	Water Storage Structure	1350000
	Total	**4,88,09,480**

8) Livelihood activities: Considering the changes in precipitation pattern with respect to timing and quantity, there are more chances of crop failure and decrease in the crop production. It impacts mostly livelihoods of small and marginal farmers.

Dilasa has implemented these livelihood activities in a very systematic and participatory manner. Initially, a poultry shed from Sahyadri Industries Ltd. has been introduced in the village with the interested families. A resource person from Sahyadri Industries conducted meeting along with Dilasa Team in village Girsawali and narrated the complete costing of this activity of 120 poultry birds. Two families from the village came forward and Dilasa processed the activity through their 10% contribution. Dilasa staff is keeping the track of poultry activities with Sahyadri Industries through the Veterinary Doctors visiting poultry units in a regular interval. Vaccination and other services are regularly provided to the beneficiaries. Now the families are getting around 1800 Rs. per month as income of poultry. During this year severe drought, two families for which the demonstration of livelihood activities has been made are running successfully poultry activity. Similarly, Shade net and vermicomposting with vermiwash are executed as livelihood activities.

Specially round-shaped shade net is designed as demonstration of livelihood activity in Girsawali village. This is because two hailstorms occurred during year 2014 and 2015, which caused heavy damage of the existing crops. Hence, Dilasa took initiative in construction of shade net and

Vermicomposting with vermiwash

Poultry activity as allied activity

1 person in the family can take care of activity.

Shade net can save the crop

9) Convergence of drip system : watershed plus intervention: Every year the rains get more unpredictable and our farmers bear the brunt. To fight against climate change efficient water use is of prime importance for agriculture. Dilasa team specifically make convergence so as to get direct benefits to the farmers. It is observed that the flow of credit for micro irrigation interventions is not accessible to the farmers and limited resources available to them. Hence, small and marginal farmers could not get accessibility to the micro irrigation hence, Dilasa acts as techno-financial support group to these farmers. Dilasa made convergence with Netafem Financial Services and Ratnakar Bank Ltd. for getting loans to Girsawali farmers for drip. Dilasa team is acting as facilitator in between the farmers and financial company as well as micro irrigation company. Total 43 farmers are presenting equipped with 34.8 ha. area under drip.

With this intervention the impact of drip installation is very huge and the farmers are getting almost double income than flood irrigation. Under the situation of drought farmers are realizing its importance to the larger extent. More and more demand of the Girsawali farmers for micro irrigation installation which is very good signs of efficient use of water by them.

Dilasa has specifically planned activity of drip after completing all water storage structures. Because, the judicial use of water is necessary in drought-affected areas. Almost all farmers should use micro irrigation to save the water in totality.

Ginger crop sustained due to drip

Venturi and liquid fertigation

Women farmer pleased with good cotton growth of her land due to drip

Mr. Suryabhan Gadekar getting almost double income in cotton

Green Island in the severe drought

During the year 2013 to 2015, Girsawali watershed works are almost completed. Because of the water storage, it is seen commonly in almost every field that good amount of moisture available. Because of moisture availability in the farm the farm produce is with ample quantity can before watershed. e.g. production of jawar was just 2 quintal per ha. before watershed works but now in the same field the production is 10 quintal per ha. Similarly, the cotton production is almost 25 quintal per ha. as compared to the nearby village where the watershed works are not carried out which is just 7 quintal per ha.

Another impressive impact of Girsawali is that the concurrent drought situation from last 4 years the villagers are not migrating and this year they are surviving for drinking water without any tanker in the village. Systematic implementation of watershed proved as the only medicine for the drought-proofing as Girsawali is the green island situated in the drought of the Marathwada.

Summer crops and vegetables are still available in April 2016.

IMPACT

The constructed Farm Pond shows that result growing the Turmeric crop. The Gabion structure that result increase in ground water level. Because of water availability in the wells the crops like Gram, Maize, Bajara and Onion crops are being grown by the farmers for their sustainable livelihoods. In Girsawali only 2 heavy rain showers arrived during year 2015. On 7th June and on 18th September 2015 the rainfall was around 18 hours. The existing percolation tanks, all the completed farm bund, gabion structures were full of water. Within 18 hours of rainfall now villagers are able to manage natural resources for 365 days.

Impact Assessment using Google Images - Girsawali

Before treatment condition of Girsawali Village: 31-12-2013 google earth image show poor crop condition of village. In the image Yellow color polygon show the Boundary of Girsawali village and Red symbol indicate Girsawali gaonthan. Similarly in the image thin green color indicates the various crops condition, Blue color symbol indicate the water-bodies, Brown color of land indicate the wasteland i.e. barren land without any agriculture.

After treatment condition of Girsawali Village: 14-01-2016 google earth image show the increase in greenery. Image shows Green color which is the healthy condition of various crops. In this image it is clear that the wasteland have reduced and increased the cropping area with changing cropping pattern in the year of 2016 than year of 2013.

NRM (Natural Resource Management) works have been completed. The works indicated by various symbols like, rose color symbol indicate the Farm ponds, Yellow color symbol indicate the CCT (Continuous Contour Trenches), Dark Green color symbol indicate the WAT, Electron gold color symbol indicate the pits, Beryl green color symbol indicate the Gabion Structure, Light green color symbol indicate the FB (Farm bunding), Light green color symbol indicate the Cement nalla bund and Light Blue color symbol indicate the Water bodies.