Participatory Watershed Management: A Case Study of Salaiyur Watershed in Coimbatore, India

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Abstract: This paper presents the participatory watershed development at Salaiyur watershed in Coimbatore District of Tamil Nadu, India. The strategies adopted towards community organization, basic resource survey/bench mark data collection, plan preparation and implementation through community participation have been discussed. Watershed interventions have helped in increasing groundwater recharge and duration of water availability in wells. The lining of shallow ponds with HDPE sheets resulted in significant water saving. Introduction of drip irrigation under banana and sugarcane observed water saving of 29 per cent. Crop Diversification Index has increased from 0.469 to 0.707 under rainfed condition and under irrigated condition from 0.59 to 0.762. The performance of mango and tamarind was observed to be good in the pits filled with original sieved soil + pond silt +FYM. People's participation was high. The SHGs formed in the watershed for non-land based income generation activities are performing very well.

1 Introduction

Watershed management becomes increasingly important as a way to improve livelihood of people while conserving and regenerating their natural resources. It has been observed in India and elsewhere that, effective community participation is a must to ensure the success and sustainability of watershed management programmes. Central Soil & Water Conservation Research & Training Institute, Research Centre, Udhagamandalam took up Salaiyur Watershed in Annur block of Coimbatore District in Tamil Nadu as a model watershed for wasteland development under Integrated Wasteland Development Programme (IWDP) during the middle of 1997. Based on the Participatory Rural Appraisal (PRA) exercise and basic resource survey, an integrated action plan was developed and the works are being implemented through involvement of local community.

About the watershed

The Salaiyur watershed is located at the latitude of 11°13′ N and longitude of 77°04′ E. The watershed is characterized by a vast stretch of undulating to moderately sloping lands with hilly patches with an elevation varying from 370 m to 470 m above MSL. The average annual rainfall of the area is about 602mm and it comes under semi-arid sub tropical climate with high evaporative demand. The soils of the watershed in general are gravely with light textured red soils moderately deep to shallow. There is scarcity of available water resources and the ground water is depleting at an alarming rate.

Participatory Planning and Implementation

The programme was implemented following a participatory approach with active community participation at planning, execution and management levels. The bottom line concept in this programme was to develop it into a self sustaining programme through capacity building of the watershed community during the project planning and implementation phase so that after withdrawal of the project, community can keep the programme alive.

Community Organisation and Capacity Building: Participatory Rural Appraisal (PRA) and/or Rapid Rural Appraisal (RRA) exercises were conducted in the village to gather information, diagnose their problems, needs and priorities to arrive at a common outline of watershed development plan. A number of meetings were organized with the Watershed Community members in this regard and Watershed Association (WA), Watershed Committee (WC), Self Help Groups (SHGs) and User Groups

(UGs) were formed. The Watershed Development Plan was also discussed in a General Body Meeting for seeking their social acceptability to the Plan so prepared.

Salaiyur Watershed Project Account and Salaiyur Watershed Development Fund Account were opened in the name of Watershed Committee. These are joint accounts operated by Watershed Committee Chairman/Secretary and/or representative of Watershed Development Team (WDT) member. About 77 per cent of the total expenditure of the project was made through joint account and all the records and accounts are being kept and maintained at the watershed level by the watershed committee. This ensured cent per cent transparency in the watershed programme. Construction of community hall was taken up through project funding along with contributions and support of watershed community and this was substantially supplemented by the District Rural Development Agency (DRDA), Coimbatore under "Namakku Naame" i.e. Self Help Scheme as Entry Point Activity(EPA) for rapport building. Initially nine SHGs were formed with an amount of Rs.44,341/- and through revolving of repaid amount nineteen more SHGs were formed (Sikka *et.al*.,2000).

A series of exposure visits, farmers training, nursery training, training to landless, training to members of WC, SHGs and UGs and training on accounts and record keeping for office bearers were organized. A total of 7 training cum awareness camps were organized in the watershed. In general, follow up after training was found to be good in the range of 40% to 80%, except for nursery raising training.

The over all community participation was found to be high (68 %). People's participation was highest (74.6%) at planning stage followed by implementation stage (62.8%).

2 Works/Activities and their impact

Rejuvenation of 5 percolation ponds (PPs); 3 on private land and 2 on community land was completed by desilting and reshaping of pond to increase its capacity including repair of spillway. Five new percolation ponds were constructed on community as well as private lands. Three check dams with drop structures constructed in series in one of the gully to harvest runoff behind these structures. Pondage area was also created by clearing the upstream area of these check dams so that these check dams also act as percolation structures. In addition to this, two more new percolation ponds were got constructed through State Agricultural Engineering Department in the watershed as an example of convergence of their schemes into the watershed.

A total of 266 ha • cm additional surface water storage capacity has been created. The watershed interventions helped in increased ground water table, increased Perenniality of water in the wells and recuperation/water yield that ultimately resulted in increased area under irrigation and crop diversification. Duration of water availability in wells has gone up from 3—6 months before watershed interventions to 9—12 months after watershed interventions (Figure 1). HDPE lining of small ponds (21m×12m) with 500 gauge HDPE sheet was found to have water saving of 33% over the control and drip irrigation introduced in sugarcane and banana observed a water saving of 29%.

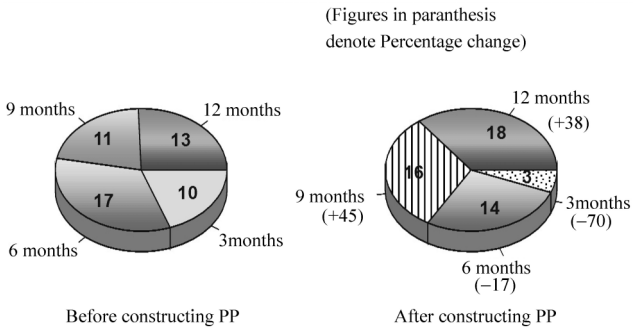

Fig. 1 Increased duration of water availability in wells

3 Alternate land use measures

Horticulture plantation as a pure crop or in agri-horti system was taken up in an area of 31.88 ha covering marginal/degraded lands with shallow gravely soils. Mango (*Mangifera indica* L.)and tamarind (*Tamarindus indica* L.) covered an area of 11.88 ha and 20.00 ha respectively, mostly on private lands under rainfed condition with moisture conservation practices. Besides this, Amla (*Embelica officianalis*), Pomegranate (*Punica granatum* L.), Guava (*Psidium guajava* L.) and Sapota (*Manilkara achras*) were introduced. Improved variety of Coconut grafts were also distributed to the farmers and landless people to raise these near their agricultural fields and homestead.

(1) **Performance of mango and tamarind under manual pitting with improved micro site condition:** The average survival rate of mango was found to be 83.35% and 83% at 14^{th} and 49^{th} MAP, respectively. Average survival rate of tamarind was 76% and 70% at 14^{th} and 25^{th} MAP, respectively. In all the sites, pits filled with original sieved soil + pond silt + FYM recorded better survival and better growth performance in terms of plant height and basal diameter of mango and tamarind as compared to pits filled with only original sieved soil + FYM. This was attributed to improved micro site condition in pits by application of tank silt and FYM that resulted in improved water holding capacity (Madhu *et al*.,2001).

(2) **Performance of tamarind (Grafted:PKM-1) under mechanical and manual pitting with improved micro site condition:** The average survival per cent of tamarind was 100% and 94% in mechanical pitting by JCB machine and manual pitting, respectively. Mechanical pitting by JCB gave better growth performance in terms of plant height, basal diameter and crown area cover as compared to manual pitting. In mechanical pitting by JCB, greater pits size, loosened sidewalls of the pits coupled with improved micro site condition , soil moisture holding capacity and cracks / fractures for easy / better penetration of roots resulted in cent percent survival and better growth performance. The cost of pitting was comparable in both the mechanical and manual methods in the range of Rs.16/m^3 to 17/m^3 (at the price level of 1998). However the pit size dug by mechanical pitting was more i.e. 1.2 m^3 as against 1.0 m^3 for manual pitting.

The performance of fruit trees like Sapota, Guava, Pomegranate and Amla introduced in the watershed during the year 1999 was found to be good due to proper soil working and planting technique (1m^2 pits) and care taken by the watershed farmers in terms of providing live mulch, shade and supplemental watering.

Sericulture: The mulberry (*Morus alba* L.)was introduced in the watershed during 1999 and drip irrigation was installed in some of the mulberry plots. The average survival percent of mulberry was found to be 1998 per cent. Silkworm rearing was started in the watershed and farmers are getting good returns.

Crop diversification Index (CDI): Season wise Crop Diversification Index was worked out based on the area under each crop in different season for the period before and after the project. CDI values near to 1 show the complete diversification . Crop Diversification Index has increased from 0.469 to 0.707 under rainfed condition and under irrigated condition from 0.59 to 0.762.

Watershed Eco-Index : The value of induced WEI was found to be 0.14, suggesting that an additional 14% of watershed area was rehabilitated through green biomass cover.

Employment Generation: A total of 9139 mandays of employment was generated with maximum employment generation through water harvesting structures and plantation works.

Community contribution for different works in Salaiyur watershed: Contribution received from farmers towards various works varied between 10% to 40% depending upon the nature of work. It is important to note that most of the contribution came in cash rather than kind. This suggests positive impact of the project in terms of community participation and sustainability.

4 Conclusion

Results of the project and our experience have shown that the development and management of wastelands through Integrated Watershed Management with active participation of local community is a successful proposition. The works relating to water harvesting and ground water recharge, plantation with

mango and tamarind, water use measures etc. have received greater social acceptability. SHGs involving lesser investments with a smaller group have proved worthy in generating alternate source of income for land less people and this has tied up their interest in watershed programmes. This has helped in capacity building of local level people's institutions to ensure smooth take over and future maintenance and sustenance of the programme by them after withdrawal of the project. Overall, the impacts of watershed project have been encouraging in terms of technological, socio-economic and participatory indicators.

References

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