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Case Study 14

Combating drought in Rajasthan through the watershed approach

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THE HORIZON

The summer of 2000 has been the worst ever for Rajasthan. In this state, 26 out of 32 districts have been affected by the drought. This grim picture is worsened by the fact that out of 34,609 villages, 23,500 are reeling under drought. 37.5 million cattle have been affected and are now left in the open to die. At least 35 million people have been also affected.

In contrast, the summer of 2000 is a time for celebration for 2 villages and 4-5 hamlets in Bundi district of Rajasthan. This is due to the phenomenal impact of a development programme on watershed basis being implemented since 1997 by BAIF, a non-government organisation based in Pune with financial assistance of India Canada Environment Facility, New Delhi. Earlier, the badly affected villages would have faced a similar crisis. However, due to watershed programme, they have sufficient water at their door-steps for drinking and have also harvested abundant crops in both *Kharif* and *Rabi.*They still have surplus water to cultivate the summer crops.

BASELINE SITUATION OF AREA

The Project covers the core villages of Gokulpura and the Govardhanpura with about 535 families and 700 hectares and about 3 villages surrounding these villages. The socio-economic and technical surveys conducted in 1997 revealed a very poor picture. The watershed area receives an average annual rainfall of about 360mm but this is also very erratic and rainfall failures are common. The rainfall in 1998 was only 220 mm and that of 1999 was 250 mm. The groundwater system in the area consists of an unconfined aquifer formed by the phyllitic rocks. Hilly terrain, low soil fertility, denuded wastelands with rock outcrops (both common and individual) and high rate of soil erosion, are the typical features of the area. About 100 hectares of common land was totally barren and with stray grasses, which could hardly bear the biotic pressure. About 200 odd open wells serve the source of protective irrigation for the crops. The use of traditional water lifting method using bullocks (C*hadas*), indicates the low yield of the well. A few farmers also use the diesel engine operated pumpsets.

The *Meena* tribe dominated the area. The literacy is only 49 % and all the elderly women are illiterate (except 20 women). The women play a very important role in the economic matters of the families. Apart from grinding the grains for 2 to 4 hrs daily with traditional grinding stones, rearing children and fetching the drinking water, women have been playing a very active role in agriculture work. The common problems of women due to their heavy workload were headache, backache, bodyache, nausea, and weakness.

Majority of the population is engaged in agriculture and the second occupation is land labour and cattle rearing. A few families are also in the service (private and government) and some are artisans. About 80% households were consuming the total grains produced and had no surplus to sell. Maize and wheat are the two main crops in the area. The dependency on money lenders with very high rates of interest 2 to 5 % per month had been a common practice.

THE PROGRAMME

The activities are being implemented through People's Institutions developed in the villages (7 Village Watershed Committees, 1 *Charagah Samittee* i.e. Silvipasture Management Committee and 13 Women's Self Help Groups). The work done include Field Bunding on 176 ha, Silvipasture on 45 ha (on *Panchayat* land), Afforestation on 30 ha and Horticulture on 30 ha. Under the Drainage Line Treatment, 1300 Gully Plugs, 25 Stone Bunds, 13 Permanent Checkdams/ Annicuts, 3 *Underground Bandharas* (Sub-surface dyke) and construction of 11 Gabion structures. The indigenous knowledge of the people and scietific methods of geo-

hydrological and engineering investigations blended well for initial assessment, planning and implementation of project activities. Innovative measures like subsurface barriers using the clay soil in the drainage, gabion structures and an eco-friendly and low cost structure such as gabion with the locally made net using the grass, have proved very successful and effective structures of water harvesting.

PROGRAMME OUTCOME

A mid-term survey and analysis (end of 3rd year) to find out the impact of the project revealed very encouraging facts. The results are of the drought year when the annual rainfall was only about 250 mm (in 1999) which is much below the average rainfall of 360 mm.

- The area under *kharif* crop in 1999 has increased by 30% over the baseline. K*harif* crop is now grown on 350 ha area as against 268 ha before the project.

- The Rabi crop area has been increased by 65% with assured irrigation water from the open wells (450 ha against 272 ha).

- There is also increase in the summer crop area by 7% over the baseline (which was negligible).

- The main crops of the area include maize in *kharif* season and wheat in *rabi* season. Due to sufficient water availability and improved agricultural practices, the increase in the crop yield is very high. There is about 3 tonnes per ha production of maize against 1 ton per ha at the baseline situation (before the project). The increase in production of wheat is almost double i.e. about 5 tons per ha against the 2.7 tons per ha at the baseline.

- About 80% families are using the improved varieties of crops and at least 40% have improved breeds of cows and buffaloes. Sale of a crossbreed cow for Rs.12000/- was the first case noticed in the area (this is a very high price for their standard).

- Over 60% women are now using improved cooking devices and reducing their cooking time by 15%. The firewood quantity saved is about 25%.

- The drinking water sources, mainly the hand-pumps, are now free of microbial counts due to the close supervision of the villagers. Women have to spend only 60 minutes (maximum time) for fetching the drinking water against 2 hrs before the project.

- Some of the *nallahs* have been rejuvenated and have started flowing perennially and in a couple of water harvesting structures, water remains in summer as well.

The combined effect has resulted in ground water recharge and increased water table, which benefits most of the wells i.e. about 200, which earlier used to remain dry during the summer season. There is now sufficient water to ensure irrigation for hot weather crops. Thus the ultimate outcome is boost in production of agricultural crops and no dearth of food grains and water for the villagers. The rough estimate based on the additional area brought under cultivation and the increase in production per hectare, indicates a net benefit of Rs. 14 million worth to the villagers.

A green cover has been developed on 60 ha. The Silvipasture on 45 ha area of the village common land has been developed and it is managed by the *Charagh Samittee* of locals. The benefits accrued in 1999 (second year after development) from the charagah area include 8 tons of fodder grass, 50% of which is used by the people for their cattle and remaining 50% is auctioned. The broom grass collected was 250 bundles out of which 50% has been used by the villagers and 50% was sold. The benefit gained from the Silvipasture remains with the Charagah Samittee for future maintenance and development. It is estimated that from this area, after meeting the fodder requirement of the villagers, the net annual benefit will be above hundred thousands of rupees.

The capacities of the communities are being built to manage resources developed and to make the development sustainable. Some of the measures like operational people's institutions and trained locals are the initial important steps. So far, about Rs. 2 lakhs have contributed and kept aside in the common fund accounts of communities for future maintenance and management.

The fact and figures given above indicate a drastic shift from under employment, food and water scarcity to year round self-employment, food security and sufficient water supply for drinking and irrigation.

FUTURE DIRECTION

With the enormous success being experienced at the mid way of the project period, the excited villagers of the surrounding area have decided to start a similar programme in their area to combat drought situation like the drought of 2000.

It is also very clear that the money required for drought relief is huge. If the problem is not seriously thought of and steps are not taken to uproot the basic cause, drought will be occurring more frequently and with more intensity. The long term planning requires foreseeing the situation and initiating micro-watershed level development programme on a wider scale to eradicate the chronic problem and its after effects. The investments may seem very high at the moment but in the long term, it will definitely save a lot of resources required for relief measures and prevent the crisis faced by the communities in the area and political chaos created in the country.

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village watershed committees at Gokulpura and Govardhanpura. This is the fourth year of the project implemented by the team under the leadership of the Programme Director, Dr. M.S.Sharma. From project financing agency's side (India Canada Environment Facility, New Delhi), Mr. Lak Tewari monitors the programme. The overall programme, which is also being implemented in Uttar Pradesh and Karnataka, is managed from BAIF Pune by Mr. B.K. Kakade and Mr. S.E.Pawar.