India- Arvari Catchment

Water harvesting in the Arvari catchment - reduce siltation and raise water table

SUMMARY

Communities with support from a local NGO have paid for the construction of new water storage devices and forest regeneration on upstream, degraded slopes. This is an interesting example of a watershed management initiative that has produced the desired benefits- that is, increase water availability throughout the year. However, as this involves intra-village agreements to tackle environmental problems, with no separate identification of buyers and sellers, it is not strictly a PES scheme.

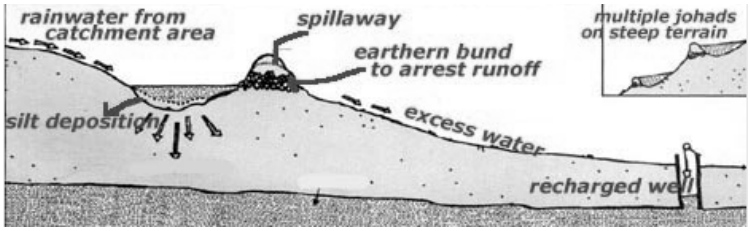
MATURITY OF THE INITIATIVE

Mature - initiated in 1986

DRIVER

Water flow in the Arvari river had reduced considerably in the last decades, becoming either a temporary stream during the monsoon or remaining completely dry the entire year. Faced with increasing concern over future water supplies and indifference from Government, the local communities, together with the NGO Tarun Bharat Sangh (TBS), began building Johads* on their lands to collect rain and increase infiltration in order to recharge ground water reserves and eventually increase the flow of the Arvari river.

* Johads are earthen structures built across a slope to retain run off and sediments; sometimes a series of them are constructed to hold the run-off from one structure to the next.



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STAKEHOLDERS

Supply

Private individuals: increased water supplies are to be achieved through traditional water harvesting techniques involving a dual focus on construction of new water storage facilities and forest regeneration on upstream degraded slopes. Over the last decade, local villages have invested in building seventeen water structures and regenerating several hundred hectares of forestland.

Demand

Private individuals in the Bhaonta-Kolyala villages of the Arvari catchment who depend on continued water supplies for agriculture and animal husbandry. The twin villages are two of the seventy located in the catchment area and have a total population of about 600 and cover 1,200 ha. (covering about 25% of costs).
Donors, government, other sources (about 75% of costs), facilitated through TBS. Funding for TBS comes from various agencies in Europe, as well as the Ford Foundation, OXFAM India, and some government agencies.

Intermediary

CBO (Community based organization).

Facilitator

NGO Tarun Bharat Sangh (facilitator).

MARKET DESIGN

Service
Water quality (reduced siltation) and flow regulation.

Commodity

Improved management practices: Water harvesting and soil and water conservation techniques on farmland. (field bunding: *"bunds" are microcatchments with trenches dug on the inside of the plot, earthen mounds on the outside, to hold soil and water)*
Conservation and protection of existing ecosystems, through protection of forestland.

Payment Mechanism
CBO intermediary - with support from a local NGO, Tarun Bharat Sangh (TBS) the villagers have paid for the construction of new water storage devices and reforestation. Costs have been split with 75% paid by TBS and 25% by local villagers. The payment system (involving contributions of 5kg grain/year/family) is managed by a village assembly with a 22-member decision-making body. A Gram Kosh (village fund) keeps cash from sales of grain. The CBO is not recognised by Indian Law, but wields local power.

"Buyers" and sellers" within the group are difficult to distinguish since decisions are taken as a group. For this reason, this case is not strictly a payment for watershed environmental services.

Terms of Payment
Cash and in-kind contributions.

Funds Involved

Cost of construction of Johads: In the Arvari catchement, TBS supplied certain materials and equipment and villagers were required to contribute labour and other materials. The total investment came to Rs. 150 million (US$3.5 million)- the construction of each Johad costs between US$400-1000

Figures related to the investment in forest regeneration on upstream degraded slopes were not found.

ANALYSIS COSTS AND BENEFITS

Economic
The "market" is within a village community and decisions are made on a group basis. The key point is that returns from water harvesting activities are high enough to cover costs for the group.

Reported economic benefits include water availability for all-year round (domestic and livestock uses), increased food production and biomass availability due to more water. Water fetching time (for women) has been reduced as water is now readily available, and women are able to spend more time on other economic activities.

Environmental

Benefits already realised are forest regeneration and improved water supplies According to TSB, water flow in the rivers Arvari and Ruparel is now permanent, the water tables have risen and wells are perennial. In addition, the johads provide water storage closer to the villages.

A survey conducted by TBS with the help of AFPRO in 1998 suggests that out of 970 wells in 120 villages, only 170 wells were operational and the rest didn't have any water. The same team conducted another survey in 2004 and found all 970 wells supplied water perennially and the ground water level has risen by 6m to 15 m above the level 10 years ago in the villages where similar projects have been carried out (Kishore, A., Eco-Economics *The Ecologist* Asia).

> "Water conservation has brought new life to rivers in the region. The Arvari and Ruparel, which flow from the Aravali Hills through hundreds of villages, once dried up each year after the monsoons. But the villagers built more than 250 structures along these rivers, and year by year, the flow lasted a little longer. Today, both rivers are perennial. Villagers talk about Arvari's revival as they would about the birth of a child. Hydrogeologists consider it to be a hydrological miracle." (Agarwal and Narain, 2000)

Social

Improvements in social dynamics: Local social capacity has been built with support from TBS. The creation of a local village assembly has strengthened cooperation, conflict resolution and management skills.

Health Benefits: More water availability has direct positive effects on health and sanitation.

Assess to land: All households own land and common areas used for water harvesting do not involve the suspension of use rights. Yet the "lower" Balai community claim their livelihoods have been negatively affected since they had expected to be given the common land for their personal use.

LEGISLATION ISSUES

Who owns the water:

> "When Tarun Bharat Sangh (TBS) built its first johads in the village of Gopalpura, the state irrigation department declared them illegal and asked that they be removed. Under the Rajasthan Drainage Act of 1956, water resources on private or government land, including groundwater, belong to the state. The irrigation agency first argued that the structures would reduce water downstream. Later the agency claimed that these structures could get washed away and flood villages. The next rains, ironically, washed away several official structures, while the johads built by the people endured. After a protracted resistance from the villagers, the administration finally backed down" (Agarwal and Narain, 1989, cited in Agarwal and Narain, 2000

MONITORING

There has been monitoring of depth of wells as well as crop production, before and after the introduction of the Johads.

MAIN CONSTRAINTS

Difficult beginnings of the TBS as NGO:

> "TBS came and settled down in Bhikampura. They were outsiders, unknown and thus were looked upon with scepticism. They lived in the villages and shared their joys and sorrows, while providing unobtrusive assistance by facilitating the rural folk in actualising their own potential. In initial stages, people did try to oust the TBS, even throughout this period there was confrontation with the government agencies. Local administration chief brought outsiders to be resettled on the villagers' community land. The 'mining Mafia ' was encouraged and forest preservation laws were flouted. The TBS on the other hand used Gandhi means like undertaking protests, marches and networking with other NGO's in searching for peaceful solutions.
>
> The TBS first focused on Gopalpura. Like most of Rajasthan, this village was also in the grip of a severe drought. Water levels in wells had all disappeared. In such a scenario, TBS approached the Block development officer for assistance, as irrigation was under the latter's jurisdiction. The officers pleaded their helplessness in using the Government funds, instead they assured the villagers technical help, if the villagers themselves did the work. TBS returned to Gopalpura and persuaded the villagers to offer help. As a test case, a village johad was taken up for desalting and deepening. Two years later, the villagers could see the results of this reconstruction. The monsoon helped the johad to retain the water for a longer period, and this enthused the villagers and a bigger task, that of masonry repair was taken up. With TBS' encouragement and engineers' technical guidance, the reconstructed johad was an incredible success".
> (TBS website http://www.tarunbharatsangh.org/about/history.htm)

MAIN POLICY LESSONS

This example illustrates the very long-term nature of watershed management, especially in situations of limited funding and mistrust from local communities. However, it is interesting to see how relatively simple systems that produce recognisable direct benefits become catalysts for change in the longer term.

The Arvari example illustrates the success of linking people with the landscape and involving local communities in restoration and protection efforts using traditional methods for water harvesting.

Lessons on social institutions: TBS's work with villages has five lessons:

- A collective effort from the villagers in which all would benefit;
- Conceived in an atmosphere of informal communication;

- All decisions would be strictly enforced;
- Each person in the collective community would be individually responsible to carry out the tasks;
- The community would only use outside help as a catalyst for guidance.

Discussions with the villagers, revealed that they could provide most of the materials required themselves, except technical help. TBS always insisted that in some way or another, the community would have to bear at least 25 percent of the cost of repair, and after they worked out the benefits, the community would always agree.

OTHER INFORMATION

The same scheme was also implemented in the Ruparel watershed where 219 bandhs and johads were built with the financial support of the Swedish International Agency, in the late 1980s and with the same positive results.

CONTACT

TSB email: rajendrasingh@tarunbharatsangh.org OR watermantbs@yahoo.com

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TBS website: http://www.tarunbharatsangh.org/

LINKS

http://www.tarunbharatsangh.org/programs/water/arvari.htm
http://www.tarunbharatsangh.org/programs/water/ruparel.htm

http://www.ecotippingpoints.org/rajasthan.html