India -Sukhomajri

Community watershed management

SUMMARY

Case ongoing since the 1970s. Due to the sedimentation problem of the lake serving the downstream town of Chandigarh, the Centre for Soil and Water Conservation Research and Training Institute (CSWCRTI) constructed soil conservation structures that, apart from reducing siltation of the lake, also stored rainwater for irrigation for the upstream village (purchased with water rights and later user fees). Other in-kind compensation was organized to provide additional incentives for villagers to abandon free-grazing and tree felling practices in the hills.

MATURITY OF THE INITIATIVE

Mature - initiated in mid-1970s and considered active as of 2008.

DRIVER

The Payment for Environmental Services (PES) component of this watershed management scheme arose from the need to create compensation/incentives for landless and more marginal farmers to participate in the watershed protection activities. Since not all of the villagers were benefiting from the improved water resources (which led to better agriculture production and even fish farming in the dams), benefit sharing arrangements (or PES) were set up to share the water resource more fairly (including non land owners) and provide incentives for all to take up the protection measures required.

The Problem:

> The degradation of their agricultural lands was forcing the villagers to bring more hill slopes under agriculture, but their indiscriminate practices of free-grazing, land clearance and tree felling were also creating a vicious cycle of unending land degradation and poverty. Under these circumstances, it was soon realised that no amount of technical soil conservation measures and watershed development could prevent the flow of silt to Sukhna Lake, unless the villagers could first be motivated to abandon free-grazing and tree felling in the hills (Sengupta, S. et al., 2003).

STAKEHOLDERS

Supply

Private landowners at Sukhomajri village (small landholdings), Haryana's Punchkula district. Water services were supplied by regeneration of vegetation cover and protection of upslope areas. Villagers had to refrain from allowing their animals to graze on the watershed hills in order to maintain vegetation cover for soil protection. As compensation, deals were made with the forest department for villagers to access *bhabbar* grass that allows them to better feed their buffalos and even sell the extra milk.

Demand

Private (small) landowners at Sukhomajri village who also benefit from improved water supplies).

Inhabitants of the downstream settlement of Chandigarh; this was the initial driver of the watershed management scheme. Chandigarh's water supply (and recreation) depends on Lake Sukhna, which was threatened by sedimentation, 80-90 per cent arriving from around Sukhomajri. The lake is fed by a seasonal stream carrying high sediment loads.

Intermediary
Water users association, Hill Resource Management Society (HRMS) managed the water allocation.

Facilitator
Supported by the CSWCRTI and the Ford Foundation.

MARKET DESIGN

Service
Water quality: sedimentation reduction (to maintain the lake's storage capacity) and management of water flows.

Commodity

Best management practices: through participatory integrated watershed management projects, especially in rain-fed agricultural areas; water harvesting and soil and water conservation techniques on farmland.

Conservation and protection of existing ecosystems, through protection of forestland from grazing.

Payment Mechanism
NGO intermediary-based transaction & (tradable) water rights/user fees - to ensure compensation to households that are excluded from reforested areas, Sukhomajri first allocated tradable water rights to every household so all have an interest in maintaining water flows.

Irregularity in water flows led to replacement of this system by a user fee system whereby the HRMS collects fees for water use and distributes the revenue to all villagers.

The HRMS also distributes revenue from extraction of *bhabbar* grass and, in future, timber from common areas, to all villagers.

Terms of Payment
In-kind and one-off: Construction of rain water collection dams that improved water supply to the village and allocation of water use rights to all households within the village. Also, access to other grazing areas.

Funds Involved
Water rights: Rs.16 per hour (from which Rs.4 per hour channelled to cover HRMS's administrative expenses). As of 2008, bhabbar grass sales were approximately worth US$3,000 per year. Accumulative dredging costs avoided by sediment reduction saved an approximate US$2,000,000. Other forest product sales provided an additional US$7,000,000 in income.

ANALYSIS OF COSTS AND BENEFITS

Economic
Initially water use rights were allocated to all villagers for buying and selling, then this system was later abandoned in favour of a less competitive system of user fees.

Agricultural productivity increase: Improved watershed protection has generated high returns in the form of improved agricultural productivity due to greater water availability in the check dam and reduced soil erosion. Between 1977 and 1986, agricultural productivity increased 500 per cent for wheat yields, 400 per cent for maize, and 30 per cent for milk production. From 1979 to 1984, household income went up from about Rs.10,000 to Rs.15,000, with villagers earning about Rs. 3,50,000 from milk sales and another Rs.1,00,000 or so from the collective sale of *bhabbar* grass (Agarwal & Narain, 1999).

In the 1990s the forest yielded nearly US$3,000 worth of grass annually. However, this led to a steep increase in government charges for the extraction of *bhabbar* grass from public forests.

Avoided costs: siltation in Sukhna Lake fell by 95 per cent, saving the city of Chandigarh about US$200,000 annually in dredging and related costs. Vegetation cover on the hillside increased from 13 trees per hectare to 1,292 trees per hectare, raising the value of the forest to an estimated US$20 million capable of generating at least US$700,000 per annum.

Environmental

Reduced siltation and increased tree cover (see above for avoided costs).

Social

Improved living conditions (see multiplier effects summarised in economic benefits section above).

Investment in social capital and building cooperative institutions (the HRMS). Sukhomajri has strong social institutions, which have provided a basis for setting up a system of benefit sharing. The Forestry Department has also provided support to ensure support for watershed protection.

As compensation for foregone benefits previously drawn from using the common lands for grazing and non-timber forestry products, farmers were able to profit from the sale of water rights and access to increased fodder from public lands (owned by the forest department).

Equity issues: families without land (or with small plots) who did not use up all of their water entitlement could sell it to those who needed more.

> "This market-like mechanism de-linked water rights from land rights and allowed the landless and the land poor to capitalise on their share of the water by selling them to the larger landowners, thereby not only providing the former with a direct incentive to participate in watershed protection activities and financially compensating them for their loss of access to traditional grazing lands, but also solving the problem of inequity in benefit sharing" (Sengupta, S. et al., 2003).

LEGISLATION ISSUES

Despite this great transformation, Sukhomajri stands in a precarious position today. As the land generates more wealth, all of the parties have a growing stake in obtaining their share. The village has regenerated the forest, but the Forest Department has refused to give more than 25 per cent of timber to the community. Meanwhile, the neighbouring town of Dhamala has sought to expand its rights to forest resources. Sukhomajri has been in prolonged struggles with both the Forest Department and Dhamala (Agarwal and Narain, 2000).

MONITORING

Peer-pressure: owners of cattle found grazing in the hills would lose their water rights.

MAIN CONSTRAINTS

There have been reports of reduction in water availability and shifting to other more individualized sources of water:

> "The sale of water from the dam is drying up, with people shifting to digging tube wells to irrigate their fields. Four such wells have come up over the last couple of years (Down to Earth, 2002). These wells are privately owned and water extracted from them is sold at Rs.30 per hour, double the rate of that from the dam, and this is slowly leading to cultivation of water intensive crops like paddy and sugarcane (ibid). However, even though the rules of common property resource are gradually being eroded, water from the earthen dam is still distributed as per the requirement of the farmers and, more importantly, the landless still have access to and rights over this water" (Sengupta, S. et al 2003).

MAIN POLICY LESSONS

Although the payment was one-off, it shows the providers how useful their own actions are: the suppliers also see the benefits of their actions to the initial demand pool (the city downstream) because their own rainwater reservoirs benefit from their erosion reduction measures:

> "If the villagers wanted water to keep collecting in the dams, they would have to prevent the dams from silting up, and this could happen only if they protected the vegetation of the surrounding catchment areas and hills. ... once the dams were constructed they saw immediate benefits of maintaining it for themselves and hence started protecting the catchments. This in turn benefited the Sukhna Lake downstream and the inhabitants of Chandigarh as well" (Sengupta, S. et al., 2003).

Mittal et al propose the following lessons from this project:

- Peoples' participation must be ensured right from the beginning.
- The needs and the problems of the people must be identified at the outset.
- Unless a project is aimed at meeting their needs, solving their problems and mitigating their hardship, it may not succeed.
- Watershed management projects should have a short gestation period. The benefits should become available in the shortest possible period.
- Constitution of a village society (HRMS) must be a pre-requisite before taking up such projects.
- The emphasis should be on sustainability and equity, i.e., all the common property resources must be available to all sections of the society.

OTHER INFORMATION

No information available.

CONTACT

No information available.

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