

National Joint Forest Management Project, Haryana, India: a Success Story in Land Degradation and Desertification Control¹

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Introduction

Location

The National Joint Forestry Management Project (JFM) is located in the Himalayan foothills (Siwalik Hills) in the Haryana State of India, about 300 km north-west of New Delhi. Approximately 82 per cent of the State is under cultivation, and 3.8 per cent of the state is forest, amounting to 1,685 km², 40 per cent of which is found in the Siwalik Hills which form the foothills of the Himalayas. The project covers 20,000 hectares of degraded forest area in the Siwalik Hills.

The problem

Since the early 1800s the Siwalik Hill forests have been used as grazing areas by neighbouring village communities. People kept large herds of cattle as well as sheep and goats which were grazed in the state forest. This open access resource system led to severe erosion in the hills and poor agricultural production. Decreasing agricultural production brought increased pressure on the forest area and decreased forest productivity. Restrictions on access to the forest were imposed on communities by the Haryana Forest Department.

In the Siwaliks, inherent soil properties govern the extent of soil erosion in the region. In the hill watersheds, the shales, the clay formations and the sandstones occur side by side in the horizontal and vertical bands. Landslides, slips and potholes lead to the release of a large amount of sediments in the rivers. Vertical gully and ravine-like erosion features are common. The detritus carried by the flash floods is deposited over productive agricultural fields year after year, rendering them unfit for cultivation. Deforestation, uncontrolled grazing and frequent fires increase the rate of soil erosion and landslides in the Hills.

In the mid 1970s the rate of erosion in the catchment of Lake Sukhna was estimated to be 700 tons per hectare per annum which was reflected by the level

of siltation in the lake. Efforts by the Forest Department to prevent the erosion in the forest area of the catchment were costly and ineffective. Money spent by the Department on the construction of barriers to prevent erosion and on replanting trees did not produce the desired results.

Biophysical background

Soils

The Siwalik Hills consist of alternating beds of sandstone, conglomerates, pseudo-conglomerates, clays and silts. The area is composed mainly of tertiary sediments forming low parallel ridges with south-facing escarpments. The soils are prone to serious erosion. Prior to the 1980s, a long history of uncontrolled exploitation of forest resources resulted in the depletion of vegetation cover, leading to desertification.

Vegetation

The major forest types are the Siwalik chir pine forests; tropical dry mixed deciduous forests; dry deciduous scrub forest; *Dodonea* scrub and dry bamboo brakes. Chir pine (*Pinus roxburghii*) is the predominant tree species and is mixed with *Acacia catechu*, *Lannea*

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coromandelica, *Bauhinia* spp, *Toona ciliata*, *Embllica officianalis*, *Ougenia oogenesis*, *Cassia fistula*, *Grewia* spp and *Pyrus pashia*. The area close to the communities of the project area is dry deciduous scrub forest which is a degraded stage of tropical mixed deciduous forest. There has been overgrazing, lopping of trees and recurrent fires. Natural regeneration was absent prior to the JFM project. Shrubs such as *Lantana* and *Carissa* species dominated the areas close to human habitation.

Bamboo (*Dendrocalamus strictus*) forests occur with shrub species on clay loam soils or loosely textured conglomerate formations between 500 to 950 metres above sea level. In good sites the bamboo forms a close canopy. On poor sites the bamboo clumps are scattered and mixed with scrub species such as *Carissa spinarum* and *Dodonea viscosa*, with thickets of *Lantana camara*. The key grasses are *Eulaiopsis binata* (bhabbar grass), *Chrysopogon fulvus* and *Heteropogon contortus*. In the pre-project period, natural regeneration of all the above species was low due to fire and over-grazing.

Climate

The climate of the Siwalik Hills region is sub-tropical with humid and semi-arid conditions prevailing. The area receives an average annual rainfall of 1,116 mm, ranging from 716 to 1,897 mm. The rainfall is bimodal with about 886 mm or 79 per cent of the total rain falling during the monsoon months of June and September, and about 164 mm during the winter season, between November and March. Winter rains are most erratic and poorly distributed.

Solving the problem

It was realised by state forestry officials that individuals could be motivated to collective action in pursuit of common goals, in this case the regeneration and rehabilitation of degraded state forests, if they were provided with enough incentive. The neighbouring communities debated the options with the state foresters. The lack of alternative resources available to most village families left no option but to be dependent on forest resources for their livelihoods.

Key incentive

The Haryana Forest Department identified a key incentive. This was to provide water for irrigation to neighbouring communities by building dams on or near the forest area. The Department approached communities in the Sukhormajri village which formed part of the catchment of Lake Sukhna. After much debate the communities agreed to cooperate in the protection of the water catchment area in return for water for irrigated agriculture.

The water from the dams was distributed equally to all households, irrespective of land holding, caste or gender. The increased crop yields resulted in reduced pressure on the forest for fodder and fuelwood. The communities voluntarily chose to stop grazing their livestock in the forest. They formed a Water Users' Association (WUA) in 1980 to regulate water distribution and catchment protection. The numbers of goats decreased and villagers changed to stall feeding their cattle and buffalo instead of open grazing in the forest.

Institutional development

In order to share the increased productivity of the state forest with the communities and to develop community participation in forest management, the Water Users' Associations were reorganized into Hill Resource Management Societies (HRMS), registered under the Societies Registration Act (1860) with responsibilities for:

- (i) Protection of forests against grazing and illicit felling;
- (ii) Distribution of irrigation water;
- (iii) Fixing of rates for water and grass;
- (iv) Maintenance of dams and conveyance systems;
- (v) Maintenance of accounts;
- (vi) Cooperation and interaction with the staff of the Forest Department.

All adults of all families in the village are free to become members of the Society.

Economic incentives

The improved management practices and changes in attitude of the villagers led to

leasing of the forest areas to registered management societies by the Department. The societies paid the average price obtained in the last three open auctions with an annual increase of 10 per cent. This resulted in a reduction of rates for fodder grass from Rs 450 per head per year charged by the contractor, to Rs 150 per head per year charged by the societies. This was an early and important incentive for community involvement.

The role of the Non-Governmental Organization

In 1990 the Government of India issued a circular on the 'involvement of village communities and voluntary agencies in regeneration of degraded forests'. It outlined the key role of non-governmental organisations (NGOs) as the interface between the State Forest Department and the village communities. The government circular proposed a tripartite agreement between the Forest Department, the communities and NGOs. The Government of Haryana also issued enabling orders for JFM in 1990 following which Tata Energy Research Institute (TERI) became involved with the programme in order to act as the facilitating agency and to maintain the growth in the number of villages seeking to form new HRMS.

TERI focused on the development of institutions for the joint management of forests both within the Haryana Forest Department and within the target communities. The new tripartite arrangement had positive impacts in social, ecological, legal, economic and institutional areas and developed the new objectives of the Joint Forest Management Programme (JFMP). These are:

- To integrate JFM into the policies, programmes, procedures and operations of the Department;
- To motivate local communities to protect and manage the forests on a sustainable basis for their own benefit;
- To provide institutional training and development related consultation services;
- To disseminate information on the impacts of JFM on ecological regeneration, economic productivity and environmental security through publications and workshops.

A state level working group was established in 1989 as a decision-making and coordinating body which makes recommendations to the state government regarding JFM. TERI has focused on capacity building through village meetings, training of stakeholders (members of the Department and management societies) and workshops.

Impacts of the project

The effects of years of increased state forest protection are seen in a number of biophysical and ecological indicators, such as grass productivity, an increase in tree stems per hectare, basal area, and the regeneration of trees and shrubs. The results show that the longer the protection, the greater the improvement in the forest ecosystems. The management societies have developed their own systems for regulating forest use and produce harvest (see photo 1). Rules have also been developed for stopping outsiders from illicitly felling wood or harvesting grasses. This system of self-policing by the communities has relieved the Department of the formerly onerous task of trying to protect the forest.

Income and savings created

Increased income at household level has come from increased agriculture capacity with irrigation water, from increased bamboo supply, provision of bhabbar grass at low rates for rope making, increased milk yield and sale proceeds from high milk yielding cattle due to increased fodder from forest and agriculture lands. Income to HRMS from sale of water, fodder grass, surplus bhabbar in open auctions, pisciculture, fines levied, and membership fees. Savings at management society level are reflected in the books of accounts maintained by the societies and at the individual level in an improved lifestyle and living conditions.

Employment generated by the project

Employment to the community has come from increased agricultural activity, from increased bamboo supply for basket making, bhabbar at low rates for rope



Photo 1: Sustainable harvesting of fuelwood and fodder grass.

making, an increase in livestock rearing due to increased fodder from forest and agriculture lands. Employment has been generated at the household level from increased opportunities for wage labour on agriculture fields, and forest areas.

Production of crops, livestock, forest and other commodities

Increased agricultural activity, increased bamboo supply for basket making, increased productivity of bhabbar and

fodder grasses (see figure 1) in forest areas and agriculture fields, tree density in the forest areas (see figure 2).

Aspects of community empowerment

The project has ensured equitable distribution of benefits to all members of HRMS which include the marginalised members of the community and women. The project ensures participation of all members in the decision making process and management of the village institutions (see photo 2).

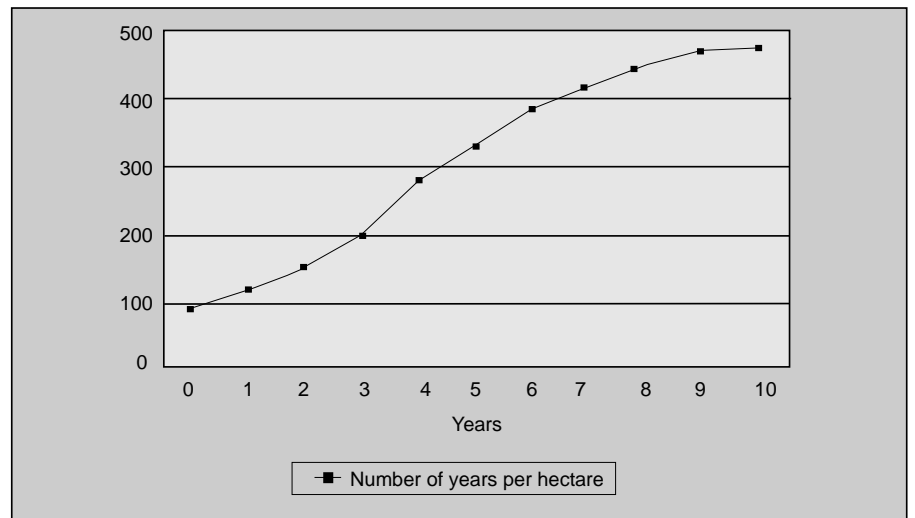


Figure 1. Average yield of community protection.

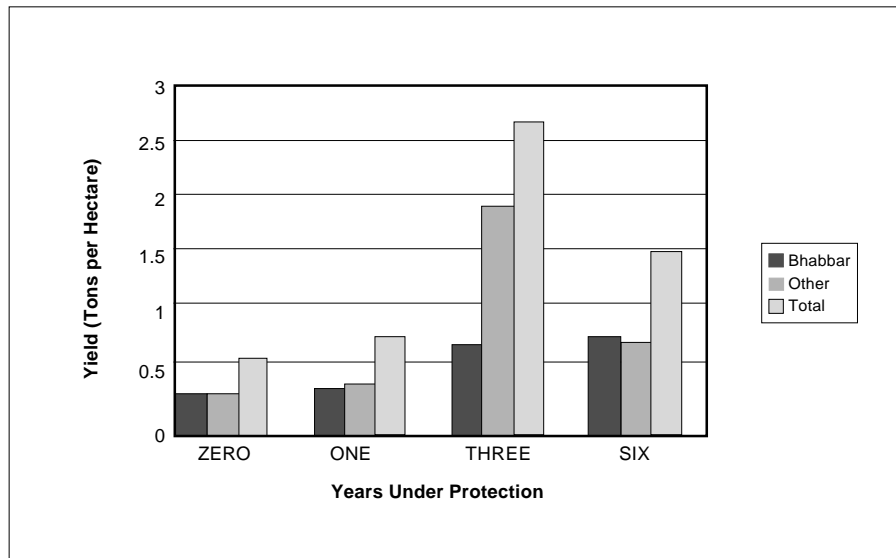


Figure 2. Effect of community protection on stocking of trees.

Resource use and conservation aspects

The project interventions have resulted in enhanced tree and grass cover in the forest areas, improved soil moisture regime, reduced silt load from the forest catchment

areas, reduced water run-off from the catchment resulting in reduced incidence of floods downstream.

Cost effectiveness

The financial resources required for the

construction of dams by the Department came from the budgets allocated for other forestry works such as afforestation and reforestation, protection, and fire control.

Under the benefit sharing arrangements the state derives a percentage of the profits from the joint management of forest areas. Also, a portion of the communities share is set aside for development of the forestry resources.

Replicability

The initial success achieved by the Department and the Association at Sukhomajri has been replicated at 60 other sites.

The Joint Forest Management Programme is being implemented in 17 other states across the country, covering nearly two million hectares of degraded forest areas.

The community based forest management programmes are being successfully replicated and implemented in south and south-east Asian countries like Bhutan, Cambodia, Indonesia, Nepal, Philippines, Thailand, and Vietnam.



Photo 2: Meeting of village decision-makers.

The key incentives

Incentive	Effect
Water for irrigation	reduced villagers' dependence on forests and encouraged them to stop grazing in the catchment area to protect their water source; provided for an alternative form of agriculture i.e. irrigated cropping.
Grass for fodder leases	grass leases given to HRMS instead of auctioning to private contractors resulted in communities accepting the need to protect forests from open grazing.
Grass concessions	commercial grass leases given to HRMS instead of private contractors or paper mills encouraged villagers to protect the forest.
Bamboo for basket making	increased quotas of bamboo on the condition that villagers maintain the clumps at optimum productivity levels and assist in fire prevention motivated villagers to look after bamboo forests.
Timber, firewood and other forest products	gave HRMS a stake in improved management which has resulted in sustainable protection of these resources. HFD has committed a percentage of the increased timber resources to the villagers.