

# The Sustainable Management of Common Property Resources in the Indian Central Himalaya: A Case Study from Garur Ganga Watershed

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## Abstract

*This paper analyses the management practices of the three major common property resources of land, water, and forest through a case study from villages in the Garur Ganga watershed in the Uttarakhand Himalaya, India. The availability of resources in and around these villages and their effective management with the sharing of cost and benefits are helping to maintain and conserve these resources. A joint venture between the People and Resource Dynamics in Mountain Watersheds of the Hindu Kush-Himalayas Project (PARDYP) and a group of villagers has helped to resolve local conflicts that were preventing sound management. This paper advocates that any policies for the management and conservation of common property resources must be framed, implemented, and evaluated in terms of an area's specific needs, its socioeconomic characteristics, its bio-physical attributes, and the influence of external forces to ensure sustainable management and maintain harmony between man and nature.*

## Introduction

Common property resources play multiple roles in sustaining the livelihoods of mountain people. In the Himalayas most human population is located in the lower and middle hills with their livelihoods mostly depending on subsistence agriculture. The overall farming system of the Himalayan midhills is largely governed by the availability of the common property resources of forest, water, and land. Local people use these to meet their daily needs. The economy of this region is largely built around holistic systems involving the use and management of livestock, cultivable land, forests, and water. However, increasing population pressure and unsustainable harvesting has led to the deterioration of these resources which is leading to conflicts between man and nature (Kala 2004). Commercial forestry, the expansion of agricultural land, and demands for fuel and fodder are accelerating the degradation of natural resources. Academics and scientists have been raising concerns about the management and conservation of common property resources since the late 1960s. They have identified their importance to communities particularly in poor people's survival strategies (Jodha 1986 and 1992; Wade 1987).

The People and Resource Dynamics in Mountain Watershed of the Himalayas Project (PARDYP) works with local communities to identify and develop the best options for improving farming systems. It has worked in India since 1997 to improve the quality of life of mountain people by suggesting sustainable measures to improve the management of common property resources, improve access to these resources, and help in resolving conflicts and

conserving resources. The present study examines the management of forests, pastures, and water resources in six Uttarakhand villages. This paper also describes activities to demonstrate the bottom-up approach to the management and conservation of natural resources.

## Study area

The study was carried out in six representative villages of the Garur Ganga watershed in Uttarakhand India. The study watershed covers an area of 83 km<sup>2</sup>. The Bheta Gad-Garur Ganga watershed has 63 villages with a total population of 14,524 in the 1991 census. The local people are from the Brahman, Rajput (higher castes) and scheduled castes. Between 1963 and 1996 the area under agriculture increased from 35% to 42% with a concomitant decline in forest area (Table 16.1).

**Table 16.1: Land use change in Bheta Gad Garur Ganga watershed, 1963-1996**

Land use categories	Area in 1963 (%)	Area in 1996 (%)	Change (%)
Agriculture/settlements	34.97	42.34	+ 7.37
Forests	60.65	55.58	- 5.07
Barren land	3.63	1.32	- 2.31
Others	0.75	0.76	+ 0.01

Source: Bisht and Kothyari 2001

Per capita cultivable land is 0.13 ha and there is an average of 0.7 units of livestock per person (Mishra et al. 2001). The six study villages have 0.12 ha of cultivable land per person and an average 0.53 units of livestock per person (Table 16.2).

The village economy is characterised by subsistence agriculture, mainly on rainfed fields. The adoption of modern agricultural practices such as using improved variety seeds, applying chemical fertilisers, cultivating high value cash crops, and the artificial insemination of cattle were taken as the main indicators of the presence of more scientific farming methods.

**Table 16.2: Changes in population, per capita cultivable land (ha) and livestock units in sampled villages in Bheta Gad-Garur Ganga watershed, 1991-2001**

Village	% population growth 1991-2001	Growth in no. of households 1991-2001 (%)	Changes in per capita:					
			Cultivable land (ha)			Livestock units		
			1991	2001	Change	1991	2001	Change
Lawbanj	37.38	16.49	0.13	0.08	(-) 0.05	0.12	0.51	(+) 0.39
Patli	36.66	16.13	0.09	0.08	(-) 0.01	0.47	0.52	(+) 0.08
Lohari Talli	1.77	5.0	0.22	0.24	(+) 0.02	0.54	0.42	(-) 0.12
Bhagartola	51.84	15.79	0.23	0.21	(-) 0.02	1.11	0.47	(-) 0.64
Kafaldunga	78.15	36.36	0.12	0.11	(-) 0.01	1.21	0.93	(-) 0.28
Bimola	47.93	25.93	0.12	0.05	(-) 0.07	0.40	0.37	(-) 0.03
Average	42.28	19.28	0.15	0.12	(-) 0.03	0.64	0.53	(-) 0.11

Source: 1991 – Office of the Block Development Officer, Garur; 2001 – primary sample survey

All agriculture operations are performed by the local breed of bullocks while buffaloes, cows, and goats are the major cattle types. Forests cover 61% of the watershed mostly made up of chir pine (*Pinus roxburghii*). Broadleaved species like *Quercus leuochotrichophora* (banj), *Q. glauca* (phalyant), *Alnus nepalensis* (utis), *Rhododendron arboreum*, and *Myrica esculenta* (kafal) are found in mixed and a few pure patches.

The local communities are traditionally characterised by *jajmani* relations based on the exchange of different socioeconomic services. These mostly involve landless and marginalised people providing services to landowners and upper caste people. The services include processing grain and playing music at festivals for which they are mostly paid with food grains. Most of the scheduled castes that provided their services to the upper castes in this way now prefer cash payments. Furthermore the tool makers prefer to sell their agriculture implements to the local market instead of providing it to upper caste in return for food grains and cloths. The traditional *jajmani* relations are weakening and being replaced by the market economy (Topal et al. 2000).

Preliminary surveys identified six villages for intensive study that were deemed to be representative of the watershed's 63 villages.

## Results and Discussion

### Community forests

In Uttarakhand community forests (*panchayat ban*), pasture, degraded land and water resources are the major common property resources. Panchayat ban make up about 7% of Uttarakhand's total forest area (Saxena 1995) and are crucial sources of fuel and fodder for Uttarakhand's 4808 villages. In the study watershed chir pine accounts for over 70% of forest cover. *Quercus leuochotrichophora*, *Alnus nepalensis*, *Grewia optiva*, *Quercus glauca*, *Bauhinia retusa*, *Bauhinia variegata*, *Ficus roxburghii*, *Myrica esculenta*, *Debregeasia longifolia*, *Celtis saustrades*, *Prunus cerasoides*, *Rhododendron arboretum*, and *Cedrus deodara* are other important tree species.

The area's panchayat bans are divided into the same number of plots as there are user households. The harvesting rights over these plots are allocated by a lottery system. A main product from these forests is leaf litter for cattle bedding and mulching. It is collected during May and June either for free or on payment of a nominal amount to the panchayat ban fund. One member from each household is allowed to go to the forest and collect a load of pine needles at a time. The panchayat ban committees that oversee the management of these forests can impose penalties on offenders who commit illegal acts such as felling trees without permission. Local users are allowed to cut timber at a nominal cost for house repair and for building new houses. Uprooted or fallen trees are sold by auction with the cost varying from Indian rupees (IR) 20 to 80 per tree (US\$ 1= IR 46). Much of the revenue collected is spent on forest protection and management. A small amount goes for community welfare programmes.

### Water resources

Until 1917, the water resources in this and surrounding areas were considered as common property. After that time the state government put water resources under state control. In 1950, the state government took over the management and development of irrigation systems with villagers having the right to use them. At present, the Garur Ganga watershed is governed

by the Kumaun and Garhwal Water Collection, Storage and Distribution Rules, 1975. Farmers with irrigated land have to pay for irrigation water. However, the village of Kafaldunga in the study area is an exception as the irrigation system has not been taken over or developed by the state. This community has sufficient water available and follows their traditional water distribution regime of *sanchayati gool* (community canals) that are managed by the local pani panchayat (water council). Management and use is locally agreed. The proper functioning and maintenance of this traditional system is a common responsibility.

Natural springs and water piped to taps are the main sources of drinking water. *Naulas* (water stored in a traditional tank in the ground) and *dharas* (water flowing openly from a natural source) are the main traditional sources of drinking water in the survey villages (Table 16.3). Access to water is governed by two different mechanisms. Irrigation water use is governed by a common mechanism applicable to the entire community, while access to a particular source is governed by traditional rights. These traditional rights may be flexible or rigid depending on community structures and ownership of the land where water springs and *naulas* lie.

**Table 16.3: Common property drinking water and irrigation facilities in survey villages of Garur Ganga watershed**

Village	Common property resource land	Drinking water facilities*	Irrigation facilities** and percentage of irrigated to cultivable land
Lawbanj	8.1 ha pasture 6.4 ha wasteland	4 naula, 6 taps	Government canal 41.5%
Patli	5.3 ha wasteland	13 naula, 4 taps	Government canal 25.5%
Kafaldunga	0.9 ha pasture 5.1 ha wasteland	5 naula, 1 dhara	Traditional irrigation canal 89.1%
Lohari Talli	13.4 ha wasteland	2 naula, 7 taps	Government canal 11.8%
Bhagartola	1.7 ha pasture 4.5 ha wasteland	2 naula, 8 taps	Government canal 53.0%
Bimola	6.2 ha pasture	1 dhara, 5 taps	Government canal 79.8%

Naula = water stored in a traditional tank in the ground; dhara = water flowing openly from a natural source  
Sources \* primary survey 2001 \*\* Office of the Block Development Officer, Garur

## Pastureland

In Uttaranchal, most land classified as pasture by the state government is moderately to highly degraded. It is difficult to classify the pastures because pasture and degraded land are open for livestock grazing throughout the year and no revenue is charged for grazing them. Over-grazing has led to degradation. This study found that some villages have developed a system for sharing community pastures for grazing their cattle. However, in other cases its use is dominated by socioeconomically dominant households for grazing cattle or other personal uses. This often leads to disputes.

Rules to govern benefit and cost sharing of common property resources can minimise disputes over the use of community lands. Such degraded lands could provide a vital source of income if planted with fodder grasses and multipurpose trees. The enforcement of rules and measures in some villages in this watershed, such as encouraging the stall feeding of livestock, has helped to conserve these resources.

Socioeconomic and biophysical factors influence the management of common property resources. The socioeconomic factors include the composition of village communities, levels of economic inequality, gender issues, the level of infrastructure development, levels of participation, cumbersome systems and policies, fund-driven programmes, lack of awareness, and institutional weaknesses. The main biophysical factors are land degradation, access to alternative resources, and the availability of resources within and outside village boundaries.

Scarcity of livestock fodder is a major problem for farmers in the central Himalayas. The total annual production of fodder from all sources has been estimated at 705,000 tonnes when the annual demand is 29,115,000 tonnes. This leaves a huge gap (Sharma and Kumar 2002).

Water scarcities have greatly increased in recent years. Two thirds of total rainfall occurs during the monsoon and the rest of the year is almost dry. This impacts the production of agricultural crops and fodder, as more than 80% of this region's agriculture is rainfed and too little or too much monsoon rain drastically reduces production or destroys entire crops.

Management and conservation strategies have a strong influence on access, potential use, and conflict management. Reductions in the discharge of irrigation canals and increased numbers of users are the major causes of conflicts between users and management in government irrigation systems.

### **PARDYP's contribution to managing common property resources**

PARDYP has initiated and demonstrated the following measures to improve the management of common property resources in the survey areas.

- The introduction of nutritious and high yielding grass species that give green fodder year round. The grass species *Thysanoleana* and Napier grass have been adopted by many farmers.
- Areas of degraded community land have been rehabilitated to demonstrate its potential productivity. The introduction of community based natural resource management has led to increased biomass production and soil cover by planting useful tree and grass species and by more water harvesting.
- The protection of catchment recharge areas has increased the levels of water percolation and improved spring discharge. Communities are closely involved in this work and can now manage their springs, water storage tanks, and distribution and use mechanisms.
- The planting of quality grasses and fodder tree species in panchayat bans has made more fodder available and reduced women's workloads. The introduction of joint forest management in some villagers has helped to improve the availability of biomass and the understanding of community based natural resource management.
- The introduction of high yielding seeds varieties, bio-composting, vermicompost, improved irrigation measures, and high value grasses and improvements to terrace bunds have increased agricultural productivity.

## Conclusions

PARDYP's people-centred approach is promoting the sustainable, balanced and equitable development of the study area. Local people need to follow up on its interventions and demonstrations. The following measures have good potential to counteract the degradation of common property resources in Uttaranchal:

- build up the capacity of local institutions;
- amend policy in a participatory way that incorporates community level concerns;
- improve awareness among villagers and local common property resource institutions by circulating policy documents and providing demonstrations of improved management techniques;
- recognise the strengths of traditional practices and indigenous expertise for the sustainable management of natural resources;
- encourage the increased involvement of women in local institutions in managing natural resources; and
- ensure that all development interventions are framed, implemented and evaluated in line with area-specific needs and conditions.

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