

Sustainable Management and Utilisation of Common Property Resources: A Case Study in the Bheta Gad-Garur Ganga Watershed in the Central Himalayas

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Abstract

In the mountain environment of the Indian central Himalayas, both ecological and socioeconomic sustainability is largely determined by the status of the common property resources (CPRs). Under the PARDYP project, an effort has been made to develop a better understanding of the sustainability of CPR through frequent interactions with village communities. The present paper describes some of the existing practices related to the use and management of CPRs in the Bheta Gad-Garur Ganga watershed, and discusses the factors behind both successes and failures in the management and utilisation of three main types of CPR—forest, pasture, and water. The main finding was that improved management and utilisation of CPRs is determined to a significant extent by the structure, composition, and degree of social cohesiveness of the user community. It is emphasised strongly that the CPRs in the Indian central Himalayan region can be the key to sustaining the rural hill economy. To exploit this potential, project teams need to act as facilitators rather than top-down 'doers'. Moreover, future research activities, development programmes, and community-selected interventions need to be undertaken using a participatory approach, with particular emphasis on ensuring the active involvement of women. This will ensure that the eco-cultural specificity of each region is recognised, and will provide a motivating force rather than an obstacle in the process of strengthening the sustainable management of CPRs.

Introduction

In the recent past, the mountains of the Indian central Himalayas have experienced extensive problems of environmental degradation as a result of commercial forestry, expansion of agricultural land, and demand for fuel (Jodha 1992), and this is leading to a process of degradation in both economic and social values. So far development in the Indian Himalayan region has been based on uncritical evaluation and extrapolation from western experiences of the economic growth model, and a gross disregard for the socio-cultural matrix of its traditional societies (Topal *et al.* 1998). This is particularly true with respect to the property rights of natural resources.

While the western approach recognises only two types of property rights, state and private, in India there are common rights as well. These rights are a bundle of entitlements defining both the rights and obligations in the use of common property resources and may include the right of access, the right to exclude other potential users, the right to manage, and the right to sell the resource base (Schlager and Ostrom 1992; Berkes *et al.* 1998).

Further to these, a number of Forest Acts and their amendments, from the Indian Forest Act of 1878 formulated during British India times to the Forest Conservation Act of 1980, have been passed by central as well as by state governments to ensure proper management and utilisation of forests.

The present study was undertaken in the hills of Uttar Pradesh and is based on micro-level evidence (the watershed and villages). Although the issues related to the CPRs are not new, it was only in the late 1960s, particularly after Garret Hardin's 1968 documentary 'Tragedy of the Commons', that proper attention was focused on this matter by academics and the scientific community. Since then, a number of reports have highlighted the importance and vital role played by CPRs in the economic activities of village communities, and particularly in the survival strategies of the poor (Jodha 1986; Wade 1987).

Formulations of conservation strategies and development programmes, and identification of potential alternative sources of income and livelihoods for the rural population of the Indian central Himalayan region, need to be based upon studies of the causes of imbalances in the ecosystem. The main finding in this paper is that better management and utilisation of CPRs is determined to a significant extent by the structure, composition, and degree of social cohesiveness of the user community. It is also argued that the management of such resources requires collective decision making, and the enforcement of rules agreed by group members. Hence, local social organisations and institutions are crucial (Berkes *et al.* 1998). The present study investigates some of the existing practices related to CPRs in the Bheta Gad-Garur Ganga watershed and discusses the factors behind both successes and failures in the management and use of the three main types of CPR—forest, pasture, and water.

The Study Area

The Bheta Gad-Garur Ganga watershed lies between 29° 50' and 29° 55' N and 79° 03' and 79° 30' E. The watershed is characterised by significant variations in terms of altitude (1090-2520 masl), slope, aspect, forest cover, soil characteristics, and hydrological features.

The watershed covers a total geographical area of 82.6 sq. km., and comprises 63 revenue villages with a total population of 14,524 (census 1991), mostly Hindus. Village communities are characterised by the existence of the traditional institution called '*zajmani pratha*', which is based on a give-and-take of different socioeconomic services. The economy is characterised by subsistence agricultural practices under both irrigated and rainfed conditions. All agricultural operations are still performed using age-old traditional implements and local breeds of bullocks. Adoption of science and technology in this sector can only be observed in terms of the use of chemical fertilisers and the recent introduction of a few improved varieties of crops.

Each household owns on average one bullock and one milch animal, and a few of them own sheep and goats. Buffaloes are mostly stall fed, with a few grazing openly in the nearby common areas—the pastures, forests, and wastelands.

Chir pine forest (*Pinus roxburghii*) is predominant in the watershed and occupies approximately 70 per cent of the total forest cover. The remaining forest is mostly of mixed type with a few patches of broad-leaved forest. The species of trees found include *Quercus leuochotrichophora* (banj), *Alnus nepalensis* (utis), *Grewia optiva* (bhimal), *Quercus glauca* (phalyant), *Bauhinia retusa* (kanol), *Bauhinia variegata* (kweral), *Ficus roxburghii* (timil), *Cedrus deodara* (deodar), *Myrica esculanta* (kafal), *Jhanjhari*, *Debregeasia longifolia* (tusar), *Celtis* sp. (khareek), *Prunus cerasoides* (padam), and *Rhododendron arboreum* (burans).

The village communities in the watershed consist mainly of three castes—Brahmins, Rajputs, and Scheduled Castes (SCs, formerly Harijans)—with a number of sub-castes, which are placed hierarchically in terms of social stratification. This type of mixed community is traditionally marked by the affectionate personal *zajamani* type of relations that sustain the socioeconomic life within the village. Most of the cultivable land in the villages is owned by the upper castes (Brahmins and Rajputs) with the SCs owning only small areas. Most of the SCs cultivate the fields of the upper castes on the basis of a customary food for grain share system called *baikar* in which approximately 1/10th of the total food grain produced during the crop season is provided to the SC farmer at the time of harvest. Lack of cultivable land among the SCs on the one hand, and demand for additional labour from the upper castes on the other, have forced the entire village community to develop this mutual interdependency. In addition, various sub-castes or functional groups within the SCs like Lohar (blacksmiths) and Dholi (drummers) provide their services to upper caste people as well as to their own community on various social, religious, and ritual occasions, receiving clothes, food grain, and money in return.

In the course of time some significant changes have been observed in *zajamani* relationships. For example, most of the SCs who provide their services to the upper caste during agricultural operations and on other occasions now prefer cash payment. Further, the Lohars prefer to sell their agricultural implements at the local markets instead of providing tools to the upper caste directly for food grain and clothes. The traditional *zajamani* relations based on exchange of goods and services are weakening day by day and being replaced by the more impersonal and dehumanised, but probably fairer, market economy.

The Survey

The survey was conducted at both the watershed and village level with the help of various secondary sources—for example the Almora District Census Hand Book, Census of India (1951-1991); the Almora District Statistical Hand Book, Office of the Block Development Officer, Garur; and information from the Office of the Tehsildar, Bageshwar and from local Land Revenue Records. The following criteria were adopted to select key villages.

- The people—e.g., social composition of the village community, population, and number of households

- The **geophysical characteristics**—e.g., altitude, geographical area, slope, aspect, and distance from the road head and Block Headquarters (BHQ)
- The **economic status**—e.g., per capita cultivable land, per capita livestock units, percentage of irrigated land
- The **level of development**—the degree of adoption of technological and development interventions by the village community, and the access to essential amenities and infrastructure

Data on the above attributes for all the villages of the watershed were analysed. They showed significant variations at village level. The 63 villages fell into ten different categories on the basis of the above attributes measured from least/lowest to most/highest. One village from each of the ten categories was selected for detailed study.

A detailed study of the population and basic community economics was carried out in all 622 households (HH) of these ten villages from January to September 1998. Quantitative data and other information were collected using a structured and pre-tested interview form, PRA techniques, participant and non-participant observation, special case studies, and informal individual and group discussions.

Results and Discussion

The social structure and composition of the village community varied from village to village. Most of the villages had three castes with seven to eight sub-castes, but some had only one caste. Some of the basic socioeconomic information for the ten villages is summarised in Table 38.

The sex ratio (female population per 1000 males) for the total sample population was 960, higher than for the UP hills overall (954), the state of UP (882), and the national level (929). However, it varied considerably from 742 (in Lohari Talli) to 1214 (in Bhitarkot). The literacy rate also varied from 61 per cent (in Laubanj) to 83 per cent (in Lohari Talli), with an overall average of 73 per cent.

The average HH size was 6.0 persons and the average proportion of main workers (engaged in economic activity for at least 183 days per year) 49.4 per cent. The average amount of cultivable land per capita was 0.14 ha, and the highest amount 0.27 ha (Doba Malla). The average number of livestock units per capita was 0.57, and the highest number 0.93 (Kafaldunga).

Agriculture is the main occupation in the watershed and was therefore placed first in the sustainability matrix. However, secondary data shows that between 1961 and 1991 the percentage of main workers engaged in this activity decreased by 24 per cent in the Bheta Gad sub-watershed and increased by 1.3 per cent in the Garur Ganga sub-watershed. Since 1991, however, data for both the sub-watersheds suggest that overall the population engaged in agriculture as the main occupation has declined from 80 per cent (District Census

Table 38: Basic Information from the Ten Selected Villages

Features	Lbj	Kdr	Ptl	Dbm	Lht	Tkl	Bik	Bgl	Kfl	Bml	Total sample
Total no. of HHs	113	51	108	38	21	48	34	66	75	68	622
No. of Brahmin HHs	15	39	71	10	13	42	21	12	-	-	223
No. of Rajput HHs	71	-	1	22	-	6	13	54	10	-	177
No. of SC HHs	27	12	36	6	8	-	-	-	-	68	157
No. of other HHs	-	-	-	-	-	-	-	-	65	-	65
Total population	702	313	630	216	115	308	217	413	481	358	3753
Sex ratio	857	1006	994	1000	742	1139	1214	1005	795	1046	960
Average HH size	6.2	6.1	5.8	5.7	5.5	6.4	6.4	6.3	6.4	5.3	6.0
Literacy rate	60.8	72.6	79.5	78.0	83.0	80.7	73.6	79.9	63.7	75.5	72.8
Male literacy	62.4	85.7	92.9	95.4	96.7	85.4	83.1	90.1	74.7	91.9	82.5
Female literacy	58.9	60.3	66.9	60.9	64.4	76.8	62.3	69.9	49.4	59.3	62.9
Main workers* (%)	67.5	43.5	43.2	44.9	41.7	51.6	40.1	47.5	44.5	47.5	49.4
Per capita cultivable land (ha)	0.08	0.16	0.08	0.27	0.24	0.10	0.21	0.05	0.11	0.05	0.14
Per capita livestock (units)	0.51	0.33	0.52	0.71	0.72	0.76	0.36	0.47	0.93	0.37	0.57
Lbj = Loubani Tkl = Thakala	Ptl = Patali Bgl = Bhagartola										
*those engaged in economic activity for the greater part of the year—at least 183 days	Kdr = Khaderiya Bik = Bhitarkot										
Source: Field investigations, 1998	Dbm = Doba malla Kfl = Kafaldunga										
	Lht = Lohari talli, Bml = Bimola,										

Hand Book 1991) to 58 per cent (primary survey PARDYP 1998). Rapid population growth leading to out-migration from the watershed in search of more lucrative employment is the most important factor responsible for this; a contributory factor is the degradation and depletion of natural resources.

Forests, pasture, and water resources are the three major CPRs of immediate concern to the local people. Efforts were made to develop a better understanding of the relationship between communities and the CPRs through frequent discussion with the residents.

Degradation and depletion of CPRs in the Bheta Gad-Garur Ganga watershed has resulted from a number of causes. Over the last four decades (1951-1991) the watershed experienced a population growth of 44 per cent and the number of households increased by 35 per cent. This has placed increased pressure on various natural resources, and sustainable management and utilisation of the CPRs has become a major concern.

Major changes have also occurred in land cover and use in recent decades. Between 1963 and 1996, the total forest area decreased by 5.1 per cent and barren land was reduced by 2.3 per cent. This reduction was matched by an expansion of agricultural land, largely in the mid-elevation range between 1400 and 1600m. The area of CPR land and availability of water in each of the villages sampled is shown in Table 39.

Table 39: Status of the Main CPRs in the Sampled Villages

Village	Panchayat Van		Pasture (incl. wasteland) (ha)	Water Resources (drinking/irrigation)
	Area (ha)	Date established		
Laubanj	24.6	May 11, 1952	14.5	<i>Naula</i> x 4, tap x 6 Irrigation by Govt. canal
Khaderiya ¹	15.5	Feb. 20, 1970	5.3	<i>Naula</i> x 2, <i>dhara</i> x 3, tap x 10 No irrigation system
Patali	13.3	Feb. 28, 1956	2.0	<i>Naula</i> x 13, tap x 4 Irrigation by govt. canal
Doba Malla ²			51.5	<i>Naula</i> x 3, tap x 2 Irrigation by a few personal water harvesting tanks
Lohari Talli ²			0.9	<i>Naula</i> x 2, tap x 7 Irrigation by govt. canal
Thakala	30.6	Mar. 4, 1970	35.8	<i>Naula</i> x 4, tap x 10 (6 functioning, 4 out of action) Irrigation by govt. canal
Bhitarkote	14.1	Mar. 29, 1968	6.6	Tap x 7 Irrigation by govt. canal
Bhagartola	6.0	Apr. 20, 1971	6.3	<i>Naula</i> x 2, tap x 8 Irrigation by govt. canal
Kafaldunga	7.7	Dec. 15, 1956	6.0	<i>Naula</i> x 5, <i>dhara</i> x 1 Irrigation by traditional irrigation canals
Bimola ²			6.2	<i>Dhara</i> x 1, tap x 5 Irrigation by govt. canal

Sources: Office of the Block Development Officer, Garur, and primary survey PARDYP 1998

Note: *naula*—an enclosure in which seepage ground water is tapped; *dhara*—a spring which flows openly

1 *panchayat* body non-existent at present

2 No *panchayat* forest

Panchayat van, or community forest, constitutes only about 6.9 per cent of the total forest area of the entire Indian Central Himalayas (GoUP 1995), but it is one of the most important CPRs for villagers and is a crucial resource for meeting the community's demand for fuel, fodder, and grass. In some cases village communities have developed and maintained their own rules, regulations, and policies for managing and harvesting their CPRs; other communities have not established rules and regulations with the result that the CPRs are in poor condition. Grass, leaf litter (mostly fallen pine needles), and fuelwood are the most important resources available from the *panchayat van*.

In most villages the *van panchayat*, a local governing institution, looks after all the matters related to the community forest. The *van panchayat* is an elected body and has a fixed tenure of five years. The body is headed by a '*surpanch*' and the number of members may vary from five to eleven (for more details see the *Panchayat Van Niyamawali*, GoUP 1976). The *van panchayat* has legal powers to develop its own rules and regulations for sharing the costs and benefits from the community area. The powers and limitations of the *van panchayat* are clearly listed in the *Panchayat Van Niyamawali* 1976 under section 28 (2) of the Indian Forest Act, 1927. Fifty to 70 per cent of the total area of *panchayat van* forest is kept closed to open grazing and grass collection throughout the year, except during one month in October/November when it is usually opened for grass collection only. The *panchayat van* is divided into a number of plots depending upon the number of households within the village. The right to collect green grass from the plots is distributed by a lottery method. The number of a particular plot and its cost are written on a slip of paper, one representative from each village household selects a slip from the bag and is then entitled to cut the grass from the plot named on the slip after paying the cost to the *van panchayat* body. The cost of a plot may vary from Rs.10 to Rs.80 depending upon its size and productivity. Sometimes the slip may be sold to another household if the 'winner' does not, for example, either need the grass or have the labour to cut it.

The HHs also share the leaf litter from their *panchayat van*, but the system of sharing is different. During the months of May, June, and July, each village HH is charged an equal amount (usually Rs.5 or Rs.10) for the collection of pine needles from the *panchayat van*. Only one member from a HH is permitted to collect pine needles at any one time, even though the quantity collected depends upon the size, effort, and strength of the selected individual. Pine needles are used in two ways: first as a bedding material for cattle; and second, after mixing with cattle urine and dung, as compost on fields (Laubanj, Kafaldunga, Patali, and Thakala).

Villagers are also entitled to obtain timber and stones or slates for housing repair and construction purposes from the community areas, and these are made available at very low cost. Trees marked silviculturally appropriate for felling, or having fallen naturally, are sold through auction to the local community—the cost usually varies from Rs.20 to Rs.80. *Van panchayat* bodies maintain the right to charge penalties when rules are broken, for example when someone is found guilty of illegal tree felling in the community area. However, the *van panchayat* is only permitted to charge a penalty of up to Rs.500; if the amount should exceed

this, the local Divisional Forest Officer (DFO) is responsible for the matter. A few cases of penalty charging by the *van panchayats* were recorded in the study watershed.

The rules on benefits and cost sharing of CPRs provide two main benefits to village communities, first they prevent conflicts and disputes among the villagers, and second they provide revenue, which is used to purchase community assets like cooking ware, *panchayati* beds, and carpets. The maintenance cost and salary of the watchman of the *van panchayat* area is drawn from the same revenue (Laubanj and Kafaldunga).

Water for both irrigation and drinking is another crucial CPR on which village communities rely. Until 1917, there were no acts or legal rules concerning water resources in the study area, and the water resources were used on the basis of '*pahala huq*' (prior right). In 1917, the 'Kumaon Water Rules 1917' were enforced by declaring all water resources to be the property of the state government. The currently relevant act on the use of the water resources in the study area, the 'Kumaon and Garhwal Jal Sangrah, Sanchay, and Vitaran Act, 1975', was passed by the state legislative assembly through the then Minister for Community Development and Panchayati Raj, Mr. Baldev Singh Arya.

After the 1950s, the state government started to develop irrigation canals. Previously all irrigation systems had been managed by the village community or *panchayat*. In some cases, the water resources were so small that a special association (*pani panchayat*) was needed to enable the beneficiaries to manage the system themselves (Shah 1992). Although this type of local *pani panchayat* was quite common until the late forties, it has become very rare now. These days most irrigation systems are the property of the state government, and the farmers pay for use of the scheme and the water.

In villages where no formal irrigation system has been developed by the state government, people maintain their own systems, locally called '*sanjayati gool*'. In such cases, the distribution of water for irrigation depends on mutual understanding between the villagers. The proper functioning and maintenance of the system is the common responsibility of each household.

Field verification showed that the area identified by the local land revenue department as pasture' lies on moderately to highly degraded land. Furthermore, it was very difficult to observe any clear-cut differences between pasture and wasteland. In all cases, areas classified by the local authorities as pasture or wasteland are open for grazing throughout the year and no revenue is charged for using this resource.

Table 40 shows the mode of cost and benefit sharing in the different villages. Sharing was more equal in villages with a more complex structure and more social heterogeneity.

Table 40: Composition of Village Communities and Mode of Sharing Resources

Village	No. of Castes	No. of Sub-castes	Types of Benefit	Mode of Sharing Costs	Mode of Sharing Benefits
Loubanji	3: Brahmins, Rajputs & SC	Purohit (B), Pandey (B), Alamiyan (R), Pandey (B), Koranga (R), Harjians (S)	Green grass Fuelwood Pine needles Grazing	Equal Nil Equal Nil	Equal Unequal Equal Equal
Khaderiya	2: Brahmins & SC	Joshi (B), Pandey (B), Harjians (S)	Open grazing Fuelwood Pine needles	Nil Nil Nil	Unequal Unequal Unequal
Patali	3: Brahmins, Rajputs & SC	Joshi (B), Pathak (B), Pandey (B), Adhikari (R), Harjians (S)	Green grass Fuelwood Pine needles Grazing	Equal Nil Nil Nil	Equal Unequal Unequal Equal
Doba malla	3: Brahmins, Rajputs & SC	Upreti (B), Bora (R), Joshi (B), Harjians (S)	Open grazing Fuelwood Pine needles	Nil Nil Nil	Equal Unequal Equal
Lohari Talli	3: Brahmins, Rajputs & SC	Pandey (B), Harjians (S), Joshi (B), Lohani (B)	Open grazing Fuelwood Pine needles	Nil	Unequal
Thakala	2: Brahmins & Rajputs	Pathak (B), Tewari (B), Kulegi (R)	Green grass Pine needles Fuelwood	Unequal Nil Nil	Equal Unequal Unequal
Bhitarkot	2: Brahmins & Rajputs	Kandpal (B), Sati (B), Dasila (R)	Open grazing Fuelwood Pine needles	Nil Nil Nil	Unequal Unequal Unequal
Bhagarjala	2: Brahmins & Rajputs	Baiswal (B), Bora (R), Bishti (R)	Open grazing Fuelwood	Nil Nil	Unequal Unequal
Kafaldunga	2: Rajputs & OBCs	Rawat (R), Nath (O), Negi (R), Giri (O), Bora (R), Puri (O)	Green grasses Fuelwood Pine needles Grazing	Equal Nil Equal Nil	Equal Unequal Equal Equal
Bimola	1: SC	Harjians (S)	Open grazing	Nil	Equal

B = Brahmins; R = Rajputs; SC = Scheduled Castes; O = Other Backward Castes

Source: field investigations, PARDYP 1998

Conflicts and Options between Multiple Stakeholders

Case Study No. 1

The boundaries of the Bhitarkot *panchayat van* adjoin Kafaldunga village, which is far from and out of sight of Bhitarkot village. As a result, illegal encroachment of Bhitarkot's *panchayat van* area by the villagers of Kafaldunga has been a conflict issue between these villages for a long time. The products of this *panchayat van* (e.g., grass, fuelwood, pine needles) are being illegally shared by the other village (Kafaldunga), and this conflict is identified by the Bhitarkot villagers as an important obstacle to managing the *panchayat van* effectively. When the issue was raised during a number of informal meetings held between the Bhitarkot *Van Panchayat* and the PARDYP-India team, as well as during the PRA exercise, it was decided to learn from and imitate the practices of villages like Lawbanj and Thakala where management systems were working well. The Bhitarkot *Van Panchayat* has agreed to pass similar resolutions for their own village, and the appointment of a 'chowkidar' (guard) by the villagers was also seen as an appropriate solution to their problem.

Case Study No. 2

Illegal encroachment and acquisition of land belonging to the Bhagartola *Panchayat Van* by individual HHs has created major management problems for the Bhagartola *Van Panchayat*. This has been exacerbated by doubtful and improper demarcation of the land by government officials. During meetings and informal discussions between the *Van Panchayat* and the PARDYP-India team, it was decided that the first step to solving this intra-village conflict was to clearly demarcate the boundaries both in the field and on maps, and that this should be done by the local revenue officials.

Case Study No. 3

There are a few historical and important cases within the watershed which show that the interventions undertaken by the people themselves can be more effective and fruitful than those imposed by state officials. The following case is an example.

Until the late 1960s, the cluster of villages that included Naugaon village had no irrigation system and suffered from severe irrigation and drinking water supply problems. Mr Uday Ram of Naugaon village, a member of the SCs, raised this issue on several occasions with the government department concerned with no result. He finally took a personal initiative and started to construct a small earthen irrigation canal (*gool*) starting from the higher point of the Garur Ganga stream and passing through Thakala village. A number of local people reported that Uday Ram spent about Rs.20,000 of his own money and that the higher caste people of Thakala and the other villages did not provide him with any cooperation, financial help, or assistance with labour. When the *gool* became functional it attracted the attention of the state government and was taken over by the irrigation

department who then became responsible for management and maintenance. Uday Ram was offered the post of *chowkidar* (guard) by the then District Magistrate but refused because:

- he was of the opinion that the water from the *gool* should not be shared by the higher caste people, since their souls could be polluted by using the water touched by an SC person; and
- the higher caste people had no moral right to the water because none of them had helped or cooperated during the construction.

Mr. Uday Ram was finally honoured in public and the District Magistrate placed a garland around his neck. Now the *Koltulyari Nahar*, the name given to the *gool*, is one of the major irrigation canals in the watershed and an important CPR for a number of villages. Unfortunately all the water carried by this canal is being used by other villages adjacent to its course and the villagers of Naugaon still suffer from a severe shortage of water for irrigation.

General Comments

Socioeconomic aspects and indicators are relevant for better understanding of the sustainable management and use of CPRs, and the causes of degradation and its prevention. At the same time, socioeconomic studies also help to target areas where management improvements can potentially result in higher productivity and returns from the CPRs.

Since time immemorial, the CPRs in the Indian central Himalayas have been managed by the traditional '*padhanchari*' system, in which the *padhan* (village head) together with the *panchayat* body was responsible for all the CPRs. The office of the *padhan* was hereditary, and thus there were many possibilities for the incumbent to exploit the weaker sections of the village community. These problems were tackled by the *panchayati raj* system and the subsequent formation of formal local institutions like the *village panchayat* and the *van panchayat*.

The results of the present study indicate that social heterogeneity within a village leads to greater efficiency in the management and harvesting of CPRs. Table 3 shows that the cost and benefit sharing is slightly more equal in villages with a complex structure and a more heterogeneous social composition in terms of sub-castes (e.g., Laubanj, Kafaldunga, Patali, and Doba Malla) than in villages with a simpler structure and less heterogeneity (e.g., Khaderiya, Lohari Talli, Bimola, Bhagartola, and Thakala).

Discussions with people from different sub-castes within the more heterogeneous villages revealed that they are compelled by their social and economic interests to see that rules are established to ensure equal distribution of the benefits from the CPRs to all community households. The least heterogeneous villages have failed to develop and enforce such fair-share rules. In such villages, families are often related and relationships are closer, and thus the enforcement of rigid rules and penalties against those breaking rules is less easy.

Gender issues are also crucial in the management and harvesting of CPRs. While conducting PRA exercises in a few of the villages, it was found that the women in the watershed have a better knowledge of the relative importance of different fodder, grass, and fuelwood species than the men. Women have also been reported to be better environmentalists than men (Gbadegesin 1996). Usually, females in the Indian central Himalayas become very familiar with the forests and pastures from the age of six to seven. Almost all the activities related to forests, grass, and agriculture are performed by women, but their participation in local institutions is almost negligible. Age-old traditions dictate that women should not take an active part in decision making either inside or outside the house.

Conclusion

The significance of CPRs is that the established governance groups represent locally-devised mechanisms to address problems of resource use, allocation, and conflict (Berkes et al. 1998). In the Indian context, CPR local management groups and institutions are essential for two reasons.

- The nation is set on a path of decentralisation, and the process can only be moved forward by giving decision-making authority to the grass roots level.
- It is believed that local people are, or can be, the best managers of their common resources.

In some villages, people have developed their own rules and regulations for managing and harvesting their CPRs to meet their day-to-day basic demands for fuel, fodder, and grass, while keeping the idea of sustainability in mind. The entire village community follows these rules strictly and when any deviation is observed the local institution uses its power to discipline the miscreant or improve a difficult situation.

It is emphasised strongly that the CPRs in the Indian central Himalayan region have the potential to be the key for sustaining the rural hill economy. In this connection, future research activities, development programmes, and community interventions need to be based on a participatory approach and to ensure the active involvement of women.

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