

COMMON RESOURCES AND SUSTAINABLE LIVELIHOOD OF MOUNTAIN ENVIRONMENT: A MICRO-LEVEL EXPERIENCE OF UPPER KULLU VALLEY**R. B. Singh & B.W. Pandey**Department of Geography
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Delhi-110007, INDIA**INTRODUCTION:**

The term common property resources denotes the property that has no restrictions placed on its use. The whole community of a particular area has right to use the resource or property to fulfil their needs and aspirations. The term has originated from British villager's practice of using certain area for, among other things, collectively grazing their animals and cutting firewood. Gradually, common property resources have been converted to common resources as the inhabitants do not have proprietary right, but only use right due to the process of privatization of the resources. The common lands have been distributed among the landless households under the policy of Natur Land Act 1986. Ongoing degradation of the forest due to ever increasing pressure of livestock as well as human population forced, the Forest Department to prohibit the grazing in forest area. Consequently, this lead a crisis of fodder and fuel among the local communities.

The main issue in the mountain ecosystem such as the Upper Beas Basin, is how to meet community needs without damaging the forest resources. There is a close relation between livelihood security and access to common property resources. An over exploitation of commons in the area have created the environment fragile and vulnerable, thus increasing exposure to risk from natural hazards. Enhanced land use capability however, can reduce the vulnerability of a region. Therefore, improved understanding of development policies conducive to the promotion of economic activities compatible with land capability and sustainability and monitoring population, land use, environmental interactions may improve resource management and lead to better policies towards long term environmental sustainability.

The study examines the existing situation, level and extent of the utilization of common resources distributions pattern, status of degradation and disruption trend at the village level in the Upper Beas Basin. The study involves the household survey in order to understand the mass perceptions and attitudes regarding the significance and utilization of common property resources for their basic needs satisfaction and economic development. Sixty five households were surveyed from various social and economic groups. The common resources which are

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Himalayas have been taken by Singh et al. (1984), Moench (1989), Chaudhari et al (1991). Based on a previously established view that increasing population pressure is the main cause for deforestation (Bhati, 1983). There is much potential but observed little progress in harnessing the traditional knowledge and practice of local people for wise-use conservation (Gadgil and Berkes 1991).

There is large and vibrant literature in India dealing with commons for livelihood (Jodha, 1986; 1992; Chopra et al., 1990; Agarwal, 1992). Large scale commercial cutting of Himalayan forests began 1965 in the Garhwal Himalaya and resulted in the removal of much of the rich Deodar forest of the area (Denniston, 1993). This produced not only an ecological sustainability problem but also a social sustainability problem (Bandyopadhyay 1992). Shiva (1993) has drawn attention to pervasive global forces which impose on all societies a uniform image of what the world should look like a "monoculture of the mind," linked among others to biodiversity and cultural diversity loss. The security of livelihoods is closely related to equity. Titi and Singh (1994) defines sustainable livelihoods as people's capacities to generate and maintain their means of living, enhance their well being and that of future generations. Most Himalayan forests are protected under the control of Forest Department, but they are regularly logged by villagers and viewed as their forests (Monech, 1989).

Common property theory emphasizes the importance of understanding property rights and institutions (Berkes, 1989, Bromley, 1992). Also it draws attention to the solution of two fundamental problems of the commons, exclusion and subtractability, as a prerequisite to sustainable development.

The risks from natural hazards are also posing increasing threats to sustainability (Gardner, 1993; Singh and Pandey, 1995). The impact of tourism has direct bearing over depletion of forest commons and highland ecology (Gardner, 1995). Improved understanding and monitoring of community activities are must for long term maintenance of rural commons and livelihood security (Singh, 1991a; 1991b; Pirazizy and Singh, 1992; Singh and Robotham, 1995). Apart from scholars and institutional efforts, several NGOs are increasingly initiating their work towards the protection and management of rural commons for sustainable livelihood of the community.

COMMON PROPERTY RESOURCES AND RURAL LIVELIHOOD:

In a developing country like India, the Common Resources (CRs) and Common Property Resources (CPRs) are important means of livelihood in the rural community. So far as the mountain environment is concerned, the life is very hard and absolutely in the hand of the nature where enormous risks from natural hazards exist. The CPRs as well as CRs are the substantial sources of livelihood security and economic development, as the economic

opportunity is not available throughout the year due to heavy snowfall at least four months in a year. Accordingly the people are forced to migrate outside the region for off-seasonal activities to sustain their livelihood.

At the outset, this study ~~was~~ aimed at investigation of Common Property Resources. But following several field visits of the area it was found that, there do not exist the Common Property Resources as these Resources have been converted into Common Resources. Therefore, the Common Resources have been taken to analyse the extent and potentiality of common resources to sustain rural livelihood of Upper Beas Basin.

Four major types of common resources namely, community forest, pasture land, river/rivulets and watershed/river bank were identified. To access the level of awareness of the users regarding various common resources and their suitability to the people were interviewed. According to the response of the inhabitants community forest received the principal place by fulfilling their daily needs of fuel, fodder, etc. followed by river, pasture land and river bank/watershed (Table 1).

Table 1: Perception of Common Resources needed for Meeting their daily Requirements.

Village	Items (No. of Respondents)			
	Community Forest	Pasture Land	River/Rivulets	Riverbank/Watershed
Paichan	12	12	12	9
Buruwa	21	22	22	21
Vashisth	13	11	11	7
Manali	11	10	11	11
Total	57	55	56	48

source: Personal Survey

From Table 1, based upon a personal survey, according to the people's perceptions, the importance of the forest for the area is secondary only to agriculture and orcharding. This view is universal across the economic profiles of the villagers. Naturally, when the later is absent the former dominates. In other words, the dependency increases with the decrease in economic stability of the households. The villagers depend on forest for fodder, fuel, timber and grazing for their livestock and in this way forests are the major source for sustenance.

Since the settlement is in close proximity of the forest on either side of the river Beas along the mountain slopes, it is highly susceptible to rapid changes in the mountain environment, in terms of hazards and economic cycle. It is, therefore, the

forest that provides environmental stability to the inhabitants of the region.

It has been observed that women are the main users of common property and play a paramount role in environmental conservation. Field work conducted in the Upper Beas Basin, Pully District, Himachal Pradesh concludes that women are intensely connected with common property resources, being engaged in collecting fuel, food and fodder from the forests as well as from agricultural holdings. Land holdings and animal ownership are two main factors which affect the level of involvement of the people with the Common Property Resources.

The study found that, the dominant caste within the village has a much stronger voice in setting the rules for forest management and also holds a stronger social power to enforce the rules of management. It is assumed, however, that all women interact equally with common property resources, while considerable differences among males, due to the fact that majority of the males are engaged in agricultural as well as other productive works.

Different types of species are used for fodder and fuel, also the seasonal suitability of various species is common for different uses. Among all the species of tree, Oak locally called Morr is very popular for winter fodder while Alder, locally called Josh, is used for fuel purposes (Table 2). The grazing system is complex and widespread. There exist five categories of land used for grazing purposes. These are: village grazing area and unprotected forest areas; agricultural land and old terraces, locally called kooth which are found as private lands; haying area which are regulated by seasonal access for hay cutting, called Path; forests meadows called Thatches; and alpine meadows called Theli. Some of these categories of land are in the protected forest areas and grazing rights for the villagers have legally specified through government.

The Beas River Basin has a distinct identity acquired mostly through its vegetation besides beautifying the river basin is also an air purifier as well as source of timber, fuel, fodder, flower and fruits. The forest shields the crops from the scorching sun and sweeping winds, regulates moisture in the atmosphere, attract rainfall and mitigates the climate for plant growth. Forests also play an important role for mitigating floods, droughts and for controlling run-off and soil erosion. They are important also in maintaining humidity and in abating noise. They provide habitat to a variety of wild animals, birds and insects, some of whom control the insects and pests that infest agriculture. Apart from the above, manure, off season activities and ground water recharge are the benefits received from community forests. People utilize the stones, rocks and sands of the rivers and rivulets for small scale constructional activities. Overall the majority of respondents seemed to be in favour of community forests as the most useful common resources (Table 3).

Table 3: Contribution of Common Resources in Various Products

Products Bank/ Watershed	Common Resources				
	Community	Forest	Pasture Land	River/Rivulets	River
Food/Fruits	10	-	-	-	1
Fodder	55	5	-	-	2
Fuel	55	3	-	-	1
Timber	40	-	-	-	-
Fibre	5	-	-	-	-
Off Season Activity	8	1	-	-	3
Sands/Stones	-	-	-	11	8
Additional Animal Trading	-	15	-	-	-
Better Micro Climate Env.	42	10	-	25	1
Ground water	5	-	-	10	2
Mannure	40	-	-	-	-

Source: Personal Survey.

DEGRADATION OF THE COMMON AND COMMON PROPERTY RESOURCES:

Massive decline of common property resources and common resources disruption of traditional management system, due to ill conceived public policies and side effects of development strategies has been observed. The major impact of such changes are exploitation and is manifested in degradation of resources threatening sustainable livelihood. Among all the common property resources, the grazing lands have been reduced in size due to Natur Land Act (1986), in which common grazing lands have been privatized as people shifted to garden farming. Also the thatches (pastures) in the forests have been closed by the Forest Department in order to check the over exploitation of the forests.

The increasing population remains a threat to wood resources. According to an estimate from the 1980s, the average fuelwood consumption in the area is about 0.6 tonne per head. If the total fuelwood consumption is calculated on this basis, it would work out to be 0.66 million tonnes in 1961, about 2 million tonnes in 1971 and nearly 3 million tonnes in 1986. This means that deforestation must have increased by about four times in order to serve fuel requirements, timbers for dwellings, furniture and the meeting other agricultural and domestic needs have also increased correspondingly with the rise in population as well as with the increasing pace of westernization and urbanization. There is considerable change in the number of sheep, goats, cows and buffaloes. At present, on an average there are 10 or less than 30 sheep at household level as opposed to about 200 during 60s and 70s (Table 4).

Table 4: Livestock Change per Household (Average Number)

Livestock	Present	20 Years Back
Cows	2	4
Buffaloes	1 or nil	2
Goats & Sheep	30	200

Source: Personal Survey

In addition to the human population, the growing numbers of livestock are also impinging heavily on the forests. Since independence a lot of changes have been taken place in the number of livestock. The negative growth has been observed in the number of livestock. The number of sheep has fallen since 1950s in large numbers (during 50s and 60s the number of sheep was 25,300 which decreased to 7,200 during 1985-86. While in general, the overall livestock decreased in the valley, which were about 11,450 during 1984-85). In spite of its decrease, the livestock population, grazing in the forest land has been causing considerable havoc to the process of regeneration. The shoots are devoured by the grazing animals (Gupta, 1990).

Nomadic graziers as well as villagers bring sheep, goats and cattle into the forests in search of scarce pastures, and the shrubs escape destruction. As a result of the increasing numbers of animals, the area available per animal has been experiencing a decrease in the carrying capacity of the commons. Apart from the havoc caused to regeneration, excessive grazing has also led to soil erosion. On the one hand the animals eat away the grass which is vital for regulating the flow of water; on the other hand, as they ascend and descend the slopes, their hoofs loosen and break up the uneven forest land in a manner that speeds up the process of soil erosion. Of all the animals, goats do the maximum damage and it is precisely the population of goats has been on the increase constantly. The increasing population of animals is also causing a great deal of damage to the green trees. Leaves and twigs are lopped for cattle feed by the people. Excessive lopping has led to the stunting and finally to the death of many trees. The destruction of the forests through fire is also partly attributed to the increasing livestock. Many people set fire to the dry cover of grass and pine needles, which pose a danger to livestock grazing on the slopes. Fires are caused either through sheer carelessness or sometimes also because of the malpractices of corrupt officials and contractors.

The development policies and activities of the government, particularly growth of tourism, have also been responsible for the degradation of common resources. To improve the common economy an extensive network of roads have been laid. Roads have been actively damaging the slopes. Explosives construction and blasts have opened new fissures in the fractural-slopes and have weakened by the vibrations caused by movements of heavy vehicles.

The net result is frequent landslides. Some of these landslides have been discrete events that occurred but once and there after left the hillside stable. Many of the landslides are associated with trees and shrubs.

In spite of disturbances in the Kashmir valley as well as in U.P. Himalaya, the process of inter-regional tourist flow has been observed on a large scale. Tourist traffic has direct bearing over the common resources of the region. Also the permanent settlements are increasing in numbers, thus encroaching further on common resources of the region.

The opening of a large number of hotels in Manali and Vashisth has been occurring for some time now. The new area has become the victim of tourism in recent, consequently loosing its own natural values. The Solang Nala is the best example where new hotels are competing up to support the growth of tourism on one hand and reducing the common resources such as forests and pastures on the other.

During the decade of 60s the apple orcharding started in the Upper Beas Basin. Since the advent of time, a large tracts of forests have been removed by orchards. The upward recession of forest is quite obvious in the valley. The vacant areas are being replaced by orchards of apple. Mathiana, Kosla, Chadiary, Nanchanifoot (Vashisth), Chichoga, Buruwa, Goshal, Manali, Shunag and Bahang are the villages where report was collected.

Since, it is a hilly area, prone to seismic processes, the houses are constructed by timber, thus causing further deforestation of the area. Not only quantity, but the quality of the forest has also been decreasing since the growth of tourism and introduction of the hotels, as high quality of species of trees are removed away for the construction of the hotels. The Manu Temple, Hotel Picca Dilly, Banon Resorts all are examples of new wooden constructions.

As the human activities especially agro-horticultural, increased, the expansion of orchard as well as agricultural fields caused the scarcity of fodder and fuels in the valley. The response of the aged inhabitants of the valley reveals that, they spend more time in collecting the fodder and fuel from the forests as the distance between the hamlets and the forests has been increasing over the last 20 years. Majhah, Buruwa and Vashisth are the highly affected villages, where 10,11,10 kms distance are now travelled by the inhabitants respectively, as opposed to about 6 kms during 70s (Table 5).

Table 5: Average Distance Travelled for Fuel and Fodder Collection in Different Villages (km)

Village	Field		Forest	
	Present	20 Years Back	Present	20 Years Back
Solang	2	2	6	5
Kothi	3	2	6	4
Palchan	2	2	6	4
Ruwar	2	2	6	3
Kulang	2	1	5	3
Shanag	3	2	4	2
Buruwa	4	3	10	6
Majhahj	2	2	11	6
Goshal	2	2	4	3
Vashisth	2	2	10	6
Manali	2	2	8	5
Chichoga	3	2	4	2
Average	2.4	2.0	6.5	4.0

Source: Personal Survey

The greater the distance travelled, the more time is spent for collecting the fuel and fodder from the forests. The study highlights that there has been a significant change in the time involved for collecting the fodder and fuels from the forest. The time ranges from 2 hours to 4 hours among the settlements according to their distance from the forest. For example village Chichoga which is close to the forest has only 2 hours time involvement while Buruwa, Majhahj and Vashisth have 4 hours each (Table 6).

Table 6: Average Time Spent By Villagers To Collect Fodder and Fuel From the Field.

Village	Time spent in hours	
	Before 20 Years	At Present
Solang	2.0	2.5
Kothi	2.0	3.0
Palchan	2.0	3.0
Ruwar	2.0	3.0
Kulang	2.0	3.0
Shanag	1.0	2.0
Buruwa	3.0	4.0
Majhahj	3.0	4.0
Goshal	2.0	3.0
Vashisth	3.0	4.0
Manali	3.0	4.0
Chichoga	1.0	2.0

Source: Personal Survey

STRATEGY FOR SUSTAINABLE DEVELOPMENT:

Since the initial stage of human development man has been interacting with the environment and continues to do so even in this stage of advanced technology age a large scale. With the growth in population there is increasing demand of renewable and non-renewable resources to meet the basic needs of food and raw materials. The obvious resultant environmental degradation and serious ecological imbalances are posing threat to the very survival of mankind. A rational probe into the relationship between man and environment, is therefore called for, with the set objective to utilize the resources judiciously and to maintain the environment in a healthy condition so that the needs of the growing population may be fulfilled and the resources may sustain the future generation.

The World Commission on Environment and Development defines the sustainable development as "development that meets the needs and aspirations of the present without compromising the ability of future generations to meet their own needs." Since the sustainable development could be achieved through sound resource strategy, resources need to be managed properly with care and with concern for they are not limitless. The common property resources are based on cooperation rather than competition, the collective sharing of a resource rather than the individual attempting to maximize yield without regard to the community. Common resource management practices incorporate a rich and varied library of traditional knowledge, that has sustained the living resource base upon which the social communities depend. The World Conservation Strategy (WCS) has been extremely successful in promoting greater conservation awareness, but much more needs to be done. The following points may be cited as indicators of the sustainability in the rural mountain environment such as in the Upper Beas Basin.

In this region every settlement is physically isolated from the next, its inhabitants have developed a considerable degree of self-sufficiency and even the smallest landholder owns some livestock. In fact animal husbandry is highly important to the people. The number of livestock is decreasing. It should be maintained with proper care and management, as the carrying capacity of the land is low and further decreasing.

The developmental activities are increasing the risks from natural hazards thus destroying the ecological balance and self sufficiency. The introduction of new hotels near and around Manali has degraded the forest resource by illegal cutting of trees on a large scale. Since the area is vulnerable and prone to fragility, the constructional activities should be stopped immediately and new hotels should be allowed to be constructed between Manali and Palchan. The road is over utilized, as it is of paramount importance being the National Highway as well as Border Road (under Border Road Development Organization [BRDO]) the highest altitude road in the World (Manali-Leh Road). The road passes through numerous hazardous points such as

landslides, rockfalls, cracks and snow avalanches. The road should be maintained properly and new trees should be planted on both sides along the road so that the hazard risk can be minimized.

The homogenization of apple orcharding due to commercial activities of the inhabitants, has considerably reduced the biodiversity of the area. Even the highly cultivated areas have been transformed from agriculture to agro-horticulture. According to an estimate about 80 per cent of the total agricultural areas have been converted into apple orcharding in the region as a whole. No doubt, apple orcharding means a cashable economic resource, and, thus, it is the back-bone of the economic development of the region. For the long term environmental sustainability, however, such activity can prove a hazardous process breaking the bio-ecological balance of the region. Therefore it should be checked and other variety of fruits suitable for climate and topography should be considered to maintain the bio-diversity of the region.

Not only is the apple horticulture reducing the species of the plants in the area, but also the monoculture of chir pine is affected. The exploitation of chir pine has been accelerated recently due to increase in the market rate of the resin extracted from it. With a increasing competition of trapping resin from the chir forest, the species is facing extinction which in turn will create scarcity of fodder and fuel in the valley. The new alternative of the resin should be developed to fulfil the needs of the local community and the marketing of the resin should be strongly checked by the authorities. Else, the sound ecological system of the valley will become enveloped in a crisis. A number of afforestation programmes are presently underway in the region. These however, will not solve the problem as stress is on the growing species like "Popular" for apple packaging cases and other commercial purposes exploiting the scarcity of firewood. To meet the demand the apple packaging, the other alternatives should be introduced such as plastic boxes or hard paper boxes, which can be used or can be recycled many times.

Cultivation of agriculture crops with slopes of areas 15 degree or higher should be stopped. These areas should be planted with trees which can help solve the problems of food, fodder, fuel, fibre and fertilizer at the same time, since the present cultivated area in the valley cannot sustain the total population. The tree culture should also be extended to the forest and other barren areas.

The settlement pattern should be properly planned and managed in the rugged terrain of the valley. It is, therefore, desired that the settlement patterns, socio-economic and cultural parametres of different sectors should be studied in order to reduce disturbances on the eco-forestry system during the developmental works.

Seasonal as well as permanent immigration is taking place in the valley, blessed with abundance of natural beauty and favourable climate. In view of our previous comments, population control measures should be introduced. Agronomic experiments should be initiated with the object of identifying cropping systems and rotations which are harmless to the ecology and environment of the valley. A well thoughtout programme should be initiated for the expansion of horticulture on the higher areas of the valley. Considering that domestic animals are of great importance to the people of the valley, it is of utmost importance to develop suitable leguminous plants and fodder grasses. Food banks should be introduced to avoid acute temporary shortage of foods and fodders, to reduce the pressure on the forests.

In the hilly terrains, loans from banks, cooperative societies or other organizations should be offered to the people in order to promote the productivity of best breeds of sheep, goats, cattle, yak and other useful animals. To sustain these livestock, the pasture land should not be closed by the Forest Department as it happened in the last two decades.

There also is an urgent need to check deforestation and promote afforestation. The degraded areas and wastelands should be brought under permanent vegetation cover. The Social Forestry scheme should be encouraged and every fraction of wasteland be used. The concept of monoculture needs to be discouraged and mixed plantation comprising both coniferous and broad leaved species should be encouraged so as to suit the local conditions. There should be a close coordination among the irrigators, foresters, conservators and geologists. It would ensure optimum social and economic returns to the local inhabitants without causing any damage to the ecological sustainability of the valley.

A special Fodder Development Programme should be launched together with a Livestock Development Programme which concentrates on the popularization of stall feeding in rural areas. This appears to be particularly necessary due to the fact that grazing land is already degraded and there is little scope for maintaining high quality stock with resource to stall feeding. In this way, stall feeding can check the overgrazing as well as the further degradation of the commons.

The policy of supplying raw material on subsidised basis to users other than the rural poor should be reviewed and raw material pricing should be suitably revised so as to obtain a higher price for raw material. This would motivate small and marginal farmers to grow the raw material needed by industry, which they are not doing now in the absence of remunerative prices. Such a policy will also provide a fillip to the use of alternative packaging material such as corrugated cardboard, plastic packs etc. which are not being used adequately at present as raw material for wodden packaging is being made at cheaper price. A similar effort is called for in promoting the

substitution of timber in house building activities with other available house building material. Such effort can prove a successful policy to conserve the forest resources as well as to accelerate its regeneration capacity.

CONCLUDING REMARKS:

The Upper Kullu Valley has the most spectacular ecosphere both in its physical appearance and human dimensions. Modernization processes have done more harm than benefit. In the name of progress and regional development, the valley has experienced constant anthropogenic stress and tensions between economy and ecology, self reliance and dependance. Growth of tourism is the main factor increasing the risks from natural hazards which is most evident since last decade. It is assumed to be more intensified further, as the Kashmir valley as well as U.P. Himalaya got badly disturbed due to regional political movements. Therefore, the flow of tourists has been channelled towards Upper Kullu Valley, consequently, the constructional activities have been increased, degrading the ecological sustainability by reducing the community forests and other common resources as the common resources have been privatized.

It is obvious that a complex system of common grazing and traditional ecological knowledge on grazing land is being lost as the local village spectrum is being transformed from leading traditional based economy to an orcharding cash economy. The valley is in distress, the environment is in jeopardy. Although the area ought to be tree generating ecosystem, tree felling is common place. Immediate and urgent remedial measures are called for conserve the splendid environment of the valley. The concern for participatory development and environmentally friendly natural resources management system is a must for strengthening the sustenance of mountain environment. This target can be achieved by establishing the harmonious relationship between man and forests.

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UPPER BEAS BASIN

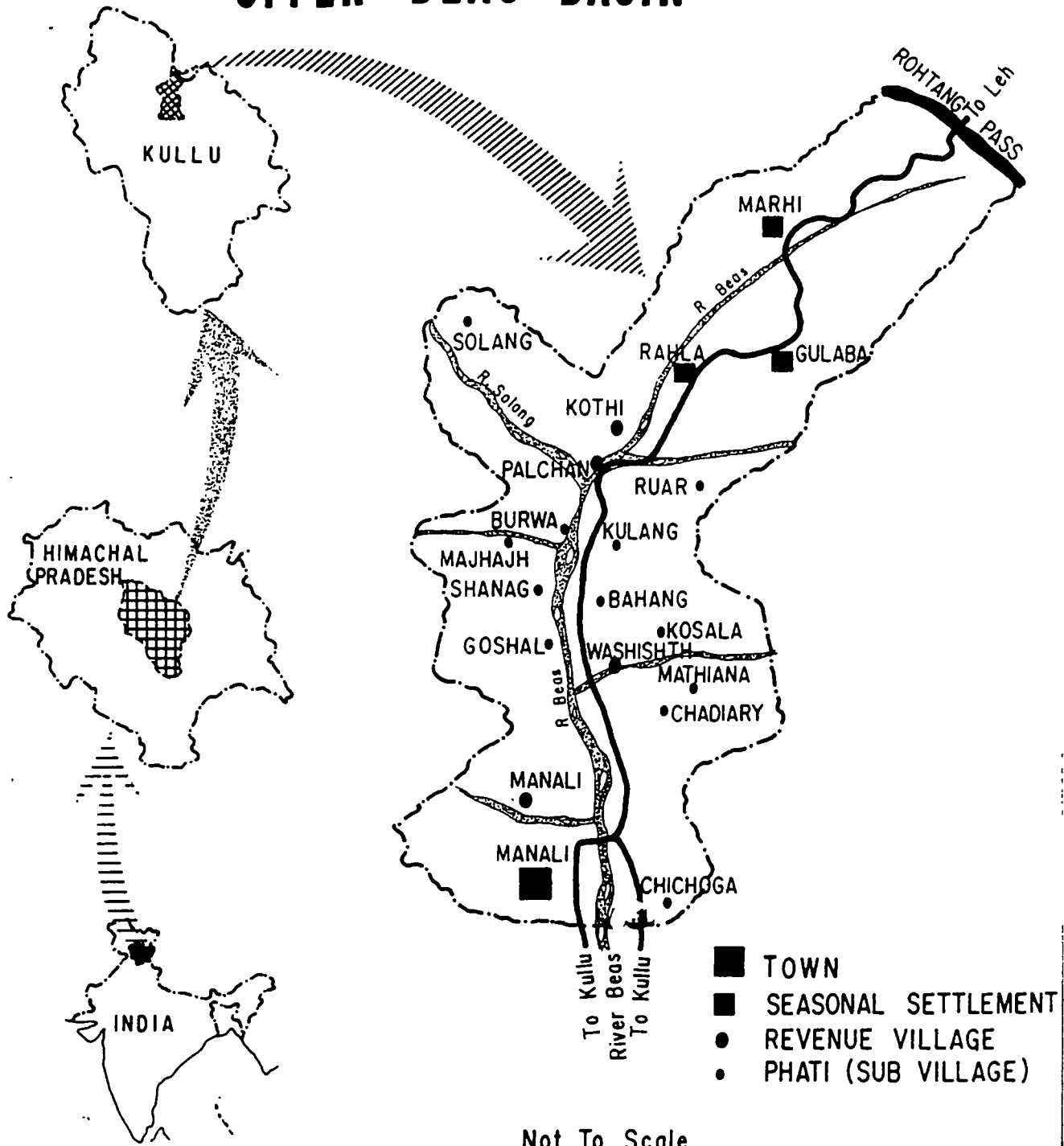


FIG. 1 STUDY AREA

Table 2: Tree species and trends in change¹ over 30 years according to Chachoga and Goshal villagers (CIDA-SICI Project Tech. Report No. 7).

<u>ENGLISH NAME</u>	<u>LOCAL NAME</u>	<u>SCIENTIFIC NAME</u>	<u>CHACHOGA</u>	<u>GOSHAL</u>
PREFERRED FOR CONSTRUCTION:				
Deodar	Deyar/Kaol	<i>Cedrus deodara</i>	↓↓	↓↓
Pine	Kail	<i>Pinus wallenchia</i>	↓↓	↓
Spruce	Roi/Rai	<i>Picea smithiana</i>	↓↓	↓↓
Silver Fir ²	Tos	<i>Abies pindrow</i>	↔	↓
PREFERRED WINTER FODDER:				
Oak	Morr	<i>Quercus himalayana</i>	↓	↓
Black Mulberry	Chehwn/Tut	<i>Morus spp.</i>	↓	↔
PREFERRED FUEL:				
Alder Shrub	Kosh	<i>Alnus nitida</i>	↓	↓↓
Shrub	Kathi (black)	<i>Indigofera spp.</i>	↓	↔
Shrub	Kathi (white)	<i>Desmodium spp.</i>	↓	↔
Oak	Ban/Bon	<i>Quercus leucotricophora</i>	↓	
MULTI-USE:				
Robinia	Kicker	<i>Robinia pseudoacacia</i>	N	N
Poplar	Paoous	<i>Populus spp.</i>	↑	↔
Willow	Behli/Manjanu	<i>Salix spp.</i>	N	N
Sweet Chesnut	Kenorr	<i>Castanea sativa</i>	↔	↔
Wild Chesnut	Jangli Kenorr	<i>Aesculus indica</i>	↔	↓
Elm	Mahan	<i>Ulmus wallenchia</i>	↓	↔
Black Walnut	Awkrot/Korr	<i>Juglans nigra</i>	N	↑
Wild Walnut	Jangli Awkrot/Korr	<i>Juglans regia</i>	↓	↓
Maple	Maundre	<i>Acer spp.</i>	↔	↓
Jarainth	Shegaal	<i>Pyrus spp.</i>	↓	↓
Wild Apricot	Jangli Koobahni	<i>Prunus armeniaca</i>	↔	↔
Oak ²	Korsh	<i>Quercus semecarpifolia</i>	↔	↔
Birch ²	Bhojh pater	<i>Betula alnoides</i>	↔	↔
Hazelnut	Himli/Himri	<i>Corylus spp.</i>	↔	↔
Ash	Ongu	<i>Fraxinus excelsia</i>	↔	↔
Shrub	Beckeli/Becki	<i>Principia utilis</i>	↔	↓
Shrub	Shambel	<i>Berberis spp.</i>	↔	↓
Shrub	Shyen	<i>Spirea spp.</i>	↓	↓↓

¹ Changes are denoted by: (↑↑) large increase, (↑) increase, (↔) constant, (↓) decrease, (↓↓) large decrease, (N) introduced in the last 30 years, and (blank) species not found in area.

² High altitude (above 2800 M) species.