Population And Environment Interface in the Great Himalayan National Park

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INTRODUCTION

Conservation of endowed natural resources practices have been applied since time immemorial. Declaring Sanctuaries, National Parks and Biosphere Reserves is one of the most important ways of conserving natural resources and enhancing, bio-diversity. In India the wild life protection act in 1972 and the wild life protection amendment act 1991 have been instrumental in providing legal provisions for the constitution and control of sanctuaries and National Parks. The act in strict interpretation ignores the historically evolved symbiotic relation between forest and forest people and drastically curtails their traditional rights to use forest resources. It accords priority to enforcement approaches for conserving natural resources. However, of late, it has been realized that enforcement approaches can not achieve the desired results and the cooperation and support of local people is crucial for the success of programs aimed at natural resources and conserving bio-diversity. Therefore, the new approach is of participation rather than enforcement. The Great Himalayan National Park conservation area (it includes national park and two sanctuaries) was selected as one of the Ist protected area in India to demonstrate this new approach thereby linking bio-diversity conservation with local social and economic development. World Bank floated a five year duration (December 1994 to December 1999) conservation of biodiversity project for this purpose. The basic strategy has been eco-development which revolves around the participation of local people in the preparation and implementation of micro-plans. In this project certain base-line surveys of natural resources endowments and human dependence on natural resources were conducted. Some eco-development plans were also initiated.

This paper is an attempt to assess the impact of population environment and development interface in the Great Himalayan National Park and its eco-development zone.

Although the intention of the state to conserve bio-diversity in GHNPCA were sincere, the implementation part faced a number of bottlenecks. The main hurdle in the implementation of the project has been lack of information, communication and lack of participation by the local population. Information/data required for this study were collected through household survey and participatory rural appraisal.

Great Himalayan National park

The Great Himalayan National park represents the Biogeographic zone - 2A North West Himalayas (Rodgers & Panwar 1988). The area is located between latitude 31° 38' 15" & 31° 56' 41" North and Longitude 77° 20' to 77° 52' 11" East. Administratively it lies in the Kullu district of Himachal Pradesh, covering a total

area of 765 sq. Km. Adjacent to Park are Tirthan and Sainj Wildlife Sanctuaries having an area of 61 and 90 sq. Km. respectively.

The Park falls within one of the globally important Endemic Bird areas (DO2 : Western Himalayas) identified by the ICBP Biodiversity project (1992). One hundred and eighty three bird species including 132 Passerines and 51 non-Passerines have been recorded in the Park which is substantially high compare to other areas of western Himalayas and suggests that the Park supports a substantial proportion of all the bird species occurring within its altitudinal range in the Western Himalayas (Panday 1997, Gaston at al. 1994).

The park supports several endangered mammals and Pheasants such as musk deer, seron, brown beer, blue sheep, chir pheasants and Moral. It is one of the only two national parks in the world to support a population of endangered western tragopan (Tragopan Malanoephalus) (collar & Andrew 1988).

The Plant Communities are representatives of temperate and alpine regions and consists of Oak and coniferous forests, high altitude mix forests and Sub alpine as well as alpine Pastures. The park flora includes a number of unusual Plant associations, with little disturbed low and middle altitude Oak forests and alpine meadows above 3800 meters rich in medicinal Plants such as Aconitum heterophyllum, Salvia moorcroftiana, Viola serpens, Jurinea macraephalay & Rheun emodi etc. (Gaston and Garson 1993).

The area represents the typical situation of resource and people relationship and varied forestry, wildlife, ecological, socio-economic and cultural values and Practices. It constitutes a large contiguous PA network with the adjacent PAs viz. the Pin Valley National Park in the East, Rupi Bhaba Wildlife Sanctuary in the South East & Kanawar Wildlife Sanctuary in the north west. The GHNP in continuation with other adjacent PAs thus becomes an area of immense bio-diversity conservation. Occurrence of less disturbed temperate and alpine ecosystems in a geographically compact area and inaccessible and rugged terrain representing the ecological, geomorphological and biological values of the North West Himalayas make Great Himalayan National Park (GHNP) a viable conservation unit (Panday and Wells 1997).

SOCIO ECONOMIC CONTEXT OF GHNP

Socio-Economic context of Great Himalayan National Park is equally important. There are numerous settlements situated on the Western and North Western boundaries of the Park. In addition, a few villages are inside the Park. The economy of these people is mainly based on forests, agriculture and livestock. Agriculture and livestock economy itself is deeply linked with forests. Apart from the economy, the polity, culture, and the religion of these people have evolved an interaction with the woods. Therefore forests play crucial role in the life systems of these people.

Agriculture is the prime economic activity of the area in which a significant majority of the rural population is engaged. On their small tilled terraces they grow subsistence crops adapted to local conditions. Recently profit making horticulture and modern yield increasing inputs have also been introduced. However, the changes introduced are confined to select pockets only particularly in the areas with motorable roads and other means of communication. In these thin mountain soils, severely deficient in humus and basic chemicals, crops do not grow without manure. The sources of manure are an important element of traditional agro-ecology linking tilled fields with domestic livestock and the forests. Farmers use farmyard manure, including cattle and sheep manure and chaff, mixed with green loppings from small pine fir trees (Tucker, 1997).

Forest use is the other dimension of the villager's subsistence. Historically they had unrestricted access to the forests for firewood and timber. They have been collecting a wide variety of medicinal herbs, bamboo, various grasses and branches of trees for their bonafide agriculture and domestic use. Most of the poor particularly landless, females and SCs make a variety of handicraft item, agricultural implements, households utensils etc. by using bamboo, certain grasses and branches of trees found at the higher altitude forests of GHNP. They either barter these or sell them for cash money. For most of them this is the main source of earning their livelihoods. Historically these people have also been collecting certain medicinal herbs in small quantities to fulfill the demand of local and adjoining medicinal practitioners.

The other important non-agriculture use of land in the area has been pastoralism. Households own small number of cattle, sheep and goats for

subsistence use. Each spring, when receding snows allow, flocks move upwards through the forest zone into alpine pastures for summer grazing of nutritious upland vegetation (Tucker, 1997). Grazing has importantly with the agriculture, domestic and forestry sectors. Sheep, goat and cattle are the back-bone of the farming system of this area. Sheep and goat are kept for fibre, meat and manure. Cattle are kept for manure, dairy and ploughing. As the population of the area grew more rapidly during the past century, the total number of livestock in the area also increased accordingly. According to estimates, at present near about 25000 livestock graze in the park in every summer.

A study by Richard Tucker (1997) revealed that until nineteenth century the pattern of human ecology for the light population of the area was largely subsistence with very limited export of natural resources beyond the area. The sharpest increase came in the form of timber extraction during British Colonial days. Commercial timber trade placed increasing pressure on both forests and subsistence in the hills. Further pressure on these forests from village life grew very slowly until nineteen sixty with the beginning of regional and international markets expanding enormously, giving local people a major new source of income in the sale of medicinal herbs as well.

Recently some of the research studies have indicated that 70-85% of the household are now gaining cash income from collecting and selling herbs (Tandon 1997). Before long, nearly 60 species of wild plants were being commercially harvested in GHNP and the adjacent areas. In consequence several species of herbs have become rapidly depleted including *Picrorhiza kurrooa, Valeriana jatamansi, Dioscorea delteodea, Taxus baccata* etc. Guchhi, the morel mushroom attracts hundreds of collectors in May and June to mid elevation forests. They probably disturb pheasants nesting sites and have cooking and warmth fires which may go wild (Gaston and Garson, 1992). Morels which are in high demand in foreign markets, now bring in large amounts of cash each year in the area.

In short, an increasing pace of population growth coupled with modern market economy has led to mounting pressure on Park resources. While in old time most of the resources were collected for self consumption, today market demand for medicinal plants and other minor produce has increased tremendously.

Human settlements and population in the GHNP

The following table 1 shows the population of various revenue villages falling in the eco-development zone alongwith number of hamlets forming part of each revenue village.

Table 1
Population and Number of Hamlets in the Revenue Villages of GHNP Eco-Development Area.

Tehsils/Waziri	Kothi	Phanti	No. of Hamlets	No. of Households	Total Population
Banjar / Inner Seraj	Tung	Chipni Mashyar	5 8	245 220	1537 1280
"	Nohanda	Pekhri Tinder	13 6	187 123	1098 677
"	Plach	Srikot Kalwari	7 9	78 195	417 1132
"	Sarchi	Shili	4	137	812
Sainj/Inner Seraj	Banogi	Suchen	6	202	1212
"	Shangarh	Shangarh Lapah	13 4	111 37	618 222
Sainj/Rupi	Sainshar	Sainshar Garaparli	22 7	302 116	1606 592
Kulu/Rupi	Balhan	Railla	19	512	512
Total	8	13	123	2465	11715

Source: Census of India 1991, Villages Census Hand Book. Table complied from the data collected from District Census Handbook SH, Kullu district 1991.

All the settlements shown in the table are scattered on the western and north western boundaries of the park on the accessible slopes in the valleys of Sainj, Jiwa and Thirthan rivulets. The other sides, being high ridges contiguous to the National Park and Sanctuaries have no settlements. As is seen from the table above, all the 123 hamlets have been grouped into 13 revenue villages or phanties. It is primarily because they are part of the same micro watershed, in close proximity to each other and with similar socio-economic characteristics and forest use etc. It is also because of the scarce availability of appropriate land for the expansion of existing settlements that more hamlets get included in a revenue village over time. Further, all these 13 groups (revenue villages) vary from each

other in respect of cultivable area, population size and availability of infrastructural facilities etc.

The following table 2 shows the distribution of hamlets according to the number of households in them falling in each of the revenue villages – phanties of GHNP Eco-development project area.

Table: 2
Revenue Villages with Number of Hamlets and Households

Name of Revenue villages	Number of Household														Total no. of Hamlets
	1-5		6-10		11-15		16-20		21-25		26-30		31 and more		
	H	%	H	%	H	%	H	%	H	%	H	%	H	%	
Shangarh	4	28.57	8	57.14	1	7.14	0	0	1	7.14	0	0	0	0	14
Lapah	0	0	2	50	2	50	0	0	0	0	0	0	0	0	4
Sachen	2	40	1	20	1	20	0	0	1	20	0	0	0	0	5
Ralla	8	42.10	6	31.57	3	15.78	1	5.26	0	0	0	0	1	5.26	19
Chepni	1	16.66	2	33.33	1	16.66	0	0	1	16.66	0	0	1	16.66	6
Mashlyar	0	0	1	12.5	3	37.5	2	25	1	12.5	0	0	1	12.5	8
Pekhri	6	37.5	4	25	2	12.5	0	0	1	6.25	1	6.25	2	12.5	16
Tinder	2	33.33	1	16.16	2	33.33	0	0	0	0	0	0	1	16.66	6
Srikot	3	42.85	2	28.57	0	0	0	0	0	0	0	0	2	28.57	7
Sill	0	0	0	0	0	0	1	25	3	75	0	0	0	0	4
Shanshar	8	27.58	11	37.93	4	13.79	2	6.89	1	3.44	2	6.89	1	3.44	29
Garaparli	2	28.57	2	28.57	2	28.57	0	0	0	0	1	14.28	0	0	7
Kalwari	0	0	2	100	0	0	0	0	0	0	0	03.14	0	0	2
Total	36	28.35	42	33.10	21	16.63	9	4.72	9	7.08	4		9	7.08	127

H = Number of Households

DEPENDENCE ON NATURAL RESOURCES

People of the area are dependent on the resources of GHNP and adjoining forest areas for a number of minor forest produce. Following are the major dependencies.

Herb Collection

It is natural that the traditional health care system of such interior and far flung areas has been traditionally governed by the use of various medicinal plants available in the vicinity. More than 24 medicinal plants have been found to be used/harvested traditionally. However at present, their number has decreased to a few for which higher market prices are available. It has been found that although the collection of medicinal plants has been taking place for centuries, its selling for substantial cash earning got momentum only a century ago. At that time also. Overall collection remained sustainable. Old persons of the area reported that compared to present time when one has to walk 20 to 40 kms. for herb collection: earlier (30 to 50 years ago) they walked comparatively very less distances for getting the same quantity of herb. Also they reveal that quantity was so abundant at that time that in took 1/4 time for collecting the same quantity compared to the present time. As the agriculture and pastoral economy works on subsistence level

only due to increase in requirement of cash money for fulfilling various needs of modern day society collection and selling of the medicinal plants has become only source of income in the absence of other avenue to fetch cash incomes. With the passage of time, the demand for medicinal plants has also increased tremendously particularly in the past 20 to 30 years where a number of herbs which were earlier not sold in the market such as Mushroom. Dhoop, Mahndi, Glaeucda etc. have also found good market. In old times, only the menfolk used to go for herb collection but now a days women have also joined their male counterparts in this activity and over the years the number of collectors as well as quantities to be extracted have increased many fold.

Almost all families know the art of herb collection/extraction. From March to November months, a large number of persons go for Gucchi and herb collection, their number differs substantially depending upon the kind of herb its market value and period of extraction. Table 3.5 shows the specific months during which major herbs are collected. Although nearly 15 plant species are collected for their commercial value, a significant number of collectors collect Guchi, Hath Panja, Paish, Dhoop, Nainhi and Kadu only while other herbs are collected by relatively less number of collectors.

Following table 3 shows the proportion of herb collectors in relation to type of herb and approximate income from it. it is evident that the number of families who do not go for herb collection is increasing and in the Thirthan catchment area of the Eco-Development, about 40 percent of the total households do not seem to be going for herb collection. However in other areas particularly in Jiwa catchment area the proportion of people not going for herb collection is comparatively very low. Perhaps because Jiwa's forests are mostly south facing and as a result the agriculture is less developed and forest resources are scarce. Therefore these people are comparatively more dependent on herb collection from the park compared to people of Sainj and Tirthan. Although they do not have legal rights to collect medicinal plant from the park, yet, a large number of them collect medicinal plant from Sara and Sakati areas of Jiwa catchment and from Homkhani and Dhela catchment areas of Sainj catchment areas of GHNP.

People of Sainj catchment area are legal right holders in respect of herb collection and upto 60% of the households go for herb collection inside the park

from March to September. In this area a considerable number of women folk were also found engaged in the collection of Guchi and Mehandi, the two species found in relatively near by forests. For Sainj people, main areas of herb collection are Kamba and Homkhani forest and Dhela Thatch of the Sainj catchment areas of GHNP.

Now a days , the total number of collectors is reported to be on the decline for a number of reasons such as socio-economic development, in agriculture and horticulture, availability of other occupational opportunities, coupled with lack of interest in this occupation on the part of young educated generation besides long time and distance involved in the collection. Nevertheless, the overall number of collectors as well as frequency of extraction has increased manifold in the past several years. Maximum herbs collectors go for Gucchi collection compared to the collection of other herbs. It is mainly because Gucchi are available at lower heights (forest) compared to the medicinal plants, most of which are found in alpine zone only. Also the market price of Gucchi is much higher compared to the medicinal plants. Therefore women folk and children also go for Gucchi collection.

In most of the plants roots are considered an important part containing beneficial properties and collection involves the uprooting of the plant using a sharp edged trowel (gaint) whereas some species have leave or flower as the main component. Gucchi collection involves the uprooting and selling or utilization of the whole plant. It is a physically a strenuous activity and one has to walk five to 40 kilometers for collecting herbs depending on the herb to be collected. For collecting herb like Dhoop, Kadu, Punja and Pathis, one has to walk very long distances while Gucchi, Mendhi, Banaksha, Chorai and Muskbala are available at comparatively less height. A weight of upto 50 kilograms of ration and personal equipment has to be carried up on each collector's trip and a similar amount of herbs is to be carried back. As it is very tedious and risky as mentioned earlier, many people die in the process. Herbs are preserved and dried in the park itself to reduce their weight.

Herbs are found in a variety of location: forests, meadows and cliff faces with most of them occurring at high altitudes and are being collected from all over the park. Also the number of families having rights to collection are only near about 400 while a large number of people from adjoining villages enter the park for their collection illegal herb collection i.e. collected by those who neither have rights inside the park nor resident of adjacent areas. However due to efforts such as vigilance, check post and people co-operation, this practice seems to be declining.

It has also been observed that people who are comparatively poor and residents of higher altitudes are comparatively more engaged in the extraction collection of herbs and medicinal plants.

An average household is reported to be earning an annual income Rs. 5000 to 17000 from herb/medicinal plants collection activity. Its importance is evident from the fact that farming and livestock alone cannot sustain even the food requirements of the households particularly those at higher altitude where agriculture provides for only four to five months ration and food items for rest of the year have to be brought from the money earned by herb collection. The quality as well as quantity of the herbs is fast decreasing due to excessive over exploitation and the average size of alpine originated plant material is reported to be reducing fast. Forest/areas adjacent to settlements have more or less lost the medicinal plants due to heavy load of exploitation and change in climatic conditions. In lower altitudes, people start their collection even in March-April instead of its usual time in August. This premature harvesting results in vanishing not only of the plant material but sometimes also the species itself as a whole. The size of plant material specially the under root parts, is reduced because of repeated digging also.

Table 3
Tirthan Eco-Development Area of GHNP-Collection of Herbs and Medicinal Plants by the Households

S. No.	Name of the Medicinal Plants	No. of Families (%)	Quantity	Price per Kg.	Areas of Availability
1	Dhoop	40 20 30 10	0 1-20 21-40 41-80	Rs. 40	Thirth, Gumatrao, Patal, Kobri, Falach
2	Kadu	48 28 16 8	0 1-20 21-40 40-80	Rs. 75	Kukhdinala, Rakundi, Patal, Pakhdi, Ansrubag, Darigad, Kundri, Bischula, Gumatrao
3	Nehni	46 24 25 5	0 1-20 21-40 40-80	Rs. 70	Kukhdinala, Rakundi, Patal, Pakhdi, Ansrubag, Jatoli, Grach, Bischula, Gumatrao, Dehla, Darach etc.
4	Patesh	75 13 7 5	0 500g-1kg 2-3 4-5	Rs. 300	Thith, Kukhdi, Rakundi, Kobri, Dharch, Jatholi.
5	Hath Panja	80 13 4 3	0 500g-1kg 2-3 4-5	0 400	Thith, Rolha, Jatholi, Kovri, Pankhdi, Kukdi
6	Guchhi	37 35 22 6	0 500g-1kg 2-3 4-5	2500	Basu, Badbalu, Kholipuie, Bandi, Khodudhar, Chalocha, Devkanda, Kanthi, Munandhar, Ladi, Jharna, Chathor
7	Mehndi	76 12 5 5 2	0 1-20 21-40 41-80 80+	20	Basu, Bakhadi, Yanch, Marhani, Gorcha, Kundri, Nada, Shilha, Bandi Rolha, Devkantha
8	Nehnu	85 6 6 3	0 1-20 21-40 40-80	20	Vasu, Bandi, Marhani, Deori, Vahli, Thach, Kanthi, Rareda.

BAMBOOS, NIRGAL, GRASSES BRANCHES OF TREES ETC. FOR BASKET MAKING, MAT MAKING, ROPE MAKING ETC.

A number of such minor forest produce are used by the local people for their various socio-economic requirements. Natural species of the bamboo growing in the area are exclusively used for preparation of different valuable items such as 'Kilta' (for carrying fodder, litter, agriculture produce), 'Tokri' for putting fruits, vegetables and other such products, patari (to store grains), parts of Khadi (weaving machine) shakru (to put seeds during sowing), Jharu (broom for sweeping of houses), and other such items. Bihul (branches of tree) are used for rope making while jangili haldi is exclusively used for the preparation of good quality mats used for seating and sleeping by almost all the families. Akhrot Ki Chhal (Walnet skin) is very popular for cleaning teeth and is also collected for its high monetary value in the market. Branches of Riuensh, Darli Ban and Jangli Bans are used for hedges. A number of grasses and dried leaves of kail, Cheed, Khonar etc. are collected and used for bedding for animals and for manure etc. In addition, a number of such article are used in performing various social and religious ceremonies such as for making different types of garlands and other items of Devota. However the quantities of various forest produce used in such socio religious ceremonies and for making household agriculture implements is very small.

From inside the park these resources except Bamboo and Jangali Haldi are extracted by most of the right holders and a few stakeholders living adjacent to the park. bamboo and Jangli Haldi is being harvested by a good number of stakeholders besides most of the right holders. Following table 3.7 illustrates the average proportion of households engaged in harvesting these produces in respect of quantities required by them as well as their place of availability in the Thirthan catchment area of GHNP (Eco-Zone).

A participatory research analysis in Jiwa and Sainj eco-development areas of GHNP revealed that in Sainj similar variety and quantity of these minor forests produce are collected by the households. On the contrary, in Jiwa catchment area the diversity of such species was found to be comparatively low. It is mainly because of its mountain being south facing and consequent less diversity as well as availability of various forest produce.

Table 4
Tirthan Eco-Development Area of GHNP-Various Minor forest Produce Collected by the Households

S. No.	Name of Forest Produce	Use	Quantity (Kgs)	Number of Families	Areas of Availability
1	Vann (Wood)	For burning, households and agricultural implements	0 1-2 3-5 5+	17 47 30 6	Khaltudhar, Pareshi, Kamedadhar, Ghaatgohar, Jemadhar, Dehorijomni, Panudhar, Damola, Kohdi, Sharoot, Khudinal, Raad.
2	Mohru (Wood)	Fuel wood, agricultural implements	0 1-2 3-5 5+	25 50 22 3	Khaltudhar, Pareshi, Kamedadhar, Deemadhar, Dehori, Jogni, Panudhar, Damola, Kaadi, Vanala, Sharoot, Khudinal and agricultural fields.
3	Kathi (Wood)	Fuel wood	0 1-2 3-5 5+	28 52 15 5	Khaltudhar, Pareshi, Kamedadhar, Dehori, Panudhar, Damola, Kanthi, Sharoot, Khudlinala and agricultural fields.
4	Khazor (Wood)	Fuel wood	0 1-2 3-5 5+	60 26 10 4	Pareshi, Khareda, Bandi, Devkonda, Ghaatgohar, Deradhar, Damola, Shalangcha, Changdi and from agricultural land.
5	Darli (Wood)	Fuel wood, household utencils	0 1-2 3-5 5+	60 27 6 6	Khaltudhar, Pareshi, Shalangcha, Bandi, Ghaatgohar, Khudlinala, Kashailanala, Rangad and Vahli.
6	Barah (Wood)	Fuel wood	0 1-2 3-5 5+	60 26 8 6	Bandi, Devkanda, Rangad, Vahli, Devri, Jogini, Kounchadhar, Deemadhar, Khareda.
7	Devdar (Wood) (Branches of Tree)	Construction of House, Furniture, Fuel wood	0 1-2 3-5 5+	60 20 12 8	Bandi, Jamedadhar, Jaleri, Gohar, Damola, Devkanda, Bahli, Basu
8	Kali (Wood) (Branches of Tree)	Construction of House, Furniture, Fuel wood	0 1-2 3-5 5+	60 25 11 4	Bandi, Devkanda, Ghuckoo, Bahli, Damola, Deori
9	Koiesh (Wood)	Fuel wood	0 1-2 3-5 5+	20 50 25 5	Vahi, Shlushidhar, Kadhi, Vahli, Kashaila, Rangad
10	Riunsh (Wood)	Household Utencils, fuel wood	0 1-2 3-5 5+	35 25 30 10	Lohdi, Shlushidhar, Devkanda, Vahli, Bhakhandi, Shalengcha.
11	Kharsu (Wood)	Agricultural implements, Household utencils, Fuelwood	0 1-2 3-5 5+	50 30 13 7	Baluwala, Gorcha, Deori, Vahli, Panudhar, Deshdhar
12	Wild Bamboo	Household Utencils	0 1-2 3-5 5+	70 17 5 8	Balu, Bada Basu, Charocha, Ladi, Bharnagahr, Thari
13	Jungli Haldi	Rope-making, Mats and other Households Utencils	0 1-2 3-5 5+	70 15 10 5	Basu, Khodudhar, Marhani, Munadhar, Devkanda and from agricultural fields.

Overall pressure on park resources in respect of minor forest produce less than the pressure due to herb collection and can't be considered significant in terms

of pressure of unsustainable harvesting. It has two major reasons i.e. most of the these produce are available to the people in nearby forests outside the park and most of these articles are used for self consumption rather than for earning cash income as in the case of herb collection. Although families have legal rights to collect these forest produce however due to ever increasing pressure and consequent decrease in their availability in areas peripheral to villages an increasing number of people are going inside park for harvesting these produce which if not unsustainable is otherwise against the park values for causing disturbance to the wildlife etc. If this trend is allowed to continue it may cause a significant pressure in on park resources future. Proper management and improvement of the nearby forests and slight diversion of users in areas outside the park coupled with provision of alternatives of present resources is hoped to decrease this pressure to a large extent.

TIMBER COLLECTION

For timber, significant majorities of the people prefer Deador followed by Kail, Rai and Tosh respectively. Due to increase in the population and improvement in the quality of life, the demand of timber for construction has increased manifold. Timber is distributed according to the provisions which allow only one timber per family once in five years after the state government imposed a moratorium of felling of timber in all the protected areas in 1984. It has been upheld for the National Park and WLS also. In case of extraordinary circumstances such as fire, earthquake etc. timber is granted out of turn also to the effected families but distribution on this account is very low. Forest corporation which has been created only for the purpose of felling and selling trees has been doing its jobs religiously and most of the forests in areas adjacent to the park have degraded by this activity. However felling is restricted inside the park. People are apprehensive that one tree is not sufficient for constructing house and according to the rules one has to wait for 20 to 30 years for constructing a house because at least five to ten trees are required for constructing a house. People also say that at least in third class forests, state has no right to property and these forests adjacent to hamlets belonged to their forefathers. Forest corporation has created grave scarcity of

timber for them. Therefore these third class forest should be reserved for fulfilling villagers requirement only.

As the people have been granted timber rights in specific forest areas and they are bound to take the timber from that forest only whatever its condition may be it has led be further complication. Now a days people are facing more problems such as small size of the tree, long distance, etc. due to fast decrease in the number of trees caused by excessive human pressure.

In short it is seen that due to ban on private felling and strict control and regulation of timber distribution timber is not a major problem so far as supply to the rightholders is concerned. In the park, only 40 families have right to timber.

However extraction of timber by the forest corporation is demoralizing the people for is being contradictory to the park values. People complain that in those areas where they have timber rights, forest have degraded to such an extent that no more timber can be extracted from them. Therefore they should be granted timber rights in other forests. People have shown interest and support for closing of degraded areas for timber distribution and advocating new plantation in the area.

FUELWOOD

Fuelwood consumption is very high because of two reasons -

a) Cold weather
b) Lack of other sources of energy

Table 5
Woods preferred as Fuelwood

Name of Wood	Quantity	Season	Distance
Kathi	2 Bundle	Oct.-Dec.	1-5 KM
Ban	2 Bundle	Oct.-Dec	1-5 KM
Mohru	2 Bundle	Oct.-Dec	1-5 KM
Burah	1 Bundle	March-May	1-5 KM
Darli	1 Bundle	Feb.-June	1-5 KM
Kail	1 Bundle	Aug.-Dec.	1-5 KM
Rai	1-2 Bundle		Nearby areas
Deodar	1 Bundle	Aug.-Dec.	1-5 KM
Koish	2 Bundle	Nov.-Dec.	1-5 KM
Saryaru	2-3 Bundle		Agricultural Land
Chimu	2-3 Bundle		Agricultural Land

Note: One Bundles contains approximately 30 Kgs of Wood

All families are dependent on forestry for their fuelwood requirements. In winter months, 40 to 60 kg fuelwood is required every day while in summer it is only 15-20 kg everyday. Most of the fuelwood is collected from nearby forest but now a day people are going to long distances for scarcity of fuelwood in the nearby areas. It is more true for Jiwa catchment area of the park because of less diversity and availability of fewer trees for most of the slopes their being South facing.

For winter, fuelwood has to be collected form September to December. One has to spend three to eight hours for collecting the required amount of fuelwood.

Consumption by one family

January to March 90 days	2 Bundle
April to September 183 days	1 Bundle
October to December 92 days	2 Bundle

Twenty per cent of the total fuel wood is consumed in the festivals and marriages etc. it is suggested that plantation of Popular, Robinia, Ban, Walnut and kail should be initiated. In addition fuel saving devices should be made available to the local people. Although most of the fuel wood is collected from third class forests from near by villages, no pressure on park resources is evident.

WOOD/TREES FOR MISCELLANEOUS PURPOSES SUCH AS AGRICULTURAL IMPLEMENTS, HOUSEHOLDS, UTENSILS, AND OTHER SOCIO ECONOMIC AND RELIGIOUS REQUIREMENTS.

As the society has very close interaction with the woods, a number of tree species are preferred for various requirements such as agricultural implements, households utensils, furniture, etc. For agriculture a number of implements are made from various trees such as Hal and Jua used for ploughing the fields, buts of Darant/Daranti and Kuladi used for cutting of hedges, crops and trees respectively Kudal, Farua and Kilani etc, are prepared using wood from various tree species. Apart from it, parts, implements of various machines based on indigenous technology such as Raksh and Khadi (machine for preparing a number of woolen items such as shawl, pattu, Jacket etc.) and water mills are manufactured from

various woods. A large number of domestic utensils as well as religious articles such as Ark and Gaddi of Deota and its Palki require different types of woods respectively. although the manufacture of these articles from various tree species is only on the level of subsistence and no monitory gains are made out of their manufacture. However, the total quantities are high due to high population growth and consequent increase in the land under plough coupled with extension form of agriculture resulting in the higher demand of different tools and implements.

Fast deterioration of the natural resources in the nearby areas in the past some decades has resulted in the scarcity of there species in areas very adjacent to village and now a days people have to walk much more distance for getting the woods/trees. It has affected the park also and although the actual number of right holders to these produce are only 150 households which in no manner constitute significant pressure given the quantities required by them, dependence of people from adjoining areas particularly from eco-development zone is gradually increasing on park areas for their requirements.

FODDER

As every household owns livestock and cattle, fodder is required in larger quantities through out the year. The following table shows the preferred fodder species in respect of seasons and quantity required by average household.

From December to May, broadleaf species of Mandru, Ban Madrot etc. constitute major fodder species amounting for nearly 40% of the total fodder requirements. In June-July straw and husk of wheat and barley is popularly used while from August to September, maize straw (10%) Rajma husk and siuk (5%) and grasses from forest (20%) fulfil the major requirements of fodder. From October to December, a number of grasses are collected from nearby forests and used as good quality fodder. People collect Banjha, Kharshu, Clocha, Chimu and Kandla etc. from September to November and store it to be used in winter season.

LEAF-LITTER FOR BEDDING ETC

During rainy season green leaves of Kail, Rai, Tosh, Pine and Khanar and Deodar etc. are used for cattle bedding. During summer, dry leaves of broad leaf species and niddle of Kail are used for bedding. Leaf litter is generally collected in the forest adjacent to village and does not constitute pressure on park resources.

Table 6
Fodder Species Used for Livestock

Fodder Species	Quantity	Season	Distance
Grasses			
Bazha	1 Bundle	Sept.-Dec	2-5 K.M.
Kandal	1 Bundle	Dec.-April	2-5 K.M.
Piplu	1-2 Bundle	May-Aug.	2-5 K.M. from agricultural land also
Murzha	1 Bundle	July-Sept.	2-5 K.M.
Karash/Bangad	1 Bundle		2-5 K.M.
Cholocha	1-2 Bundle	Sept.-Dec.	5-10 K.M.
Sol (from Com Saryara, Kathu, Rajma etc.		Aug.-Nov.	From own agricultural crops
Shayan (from Corn, Saryara, Kathu, Rajama etc.		Aug.-Sept.	From own agricultural crops
Bushes			
Kathi	2 Bundle	May-Aug.	1-5 K.M.
Pothi	1-2 Bundle	May-Aug.	Nearby forest
Sariaru	1 Bundle	Aug.-Feb.	1-4 K.M.
Panehu	Very small quantity		Nearby forest
Leaves of Trees			
Kharsu	2-3 Bundle	Nov.-Feb.	1-5 K.M.
Ban	1-2 Bundle	Aug.-March	1-5 K.M.
Mohru	1-2 Bundle	Aug.-March	1-5 K.M.
Chimu	1-2 Bundle	May-July	1-5 K.M. from agricultural land also
Khachud	1-2 Bundle	July-Sept.	2-5 K.M.
Rubinia	1-2 Bundle	July-Aug.	1-5 K.M.
Fagada	1 Bundle	Nov.-Aug.	1-5 K.M.

COLLECTION OF PRECIOUS STONES/ EARTHCLAY/ WILD EDIBLES ETC.

The number of people entering, the park for collecting the above mentioned items is very low. However, people collect them only when they are in the forest in connection with some other jobs such as grazing and herb collection etc. the area is endowed with a reach variety of wild edibles and precious stones etc. people have good knowledge of their uses for different purposes. These are known for their higher nutritive value, Khinaur given to cattle in winter for increasing milk). Jamun (for eating), Jangli Adu (for eating), Thalana (fruit for eating) and Gucchi (high nutritive value) etc. They are collected \ harvested by the people either living very adjacent to the areas of availability or going to these areas for grazing and herb collection etc. Therefore in itself collection of these produce do not constitute any significant pressure on park as very small quantities are collected though indirectly it may be against the Protected Area values for causing disturbance to wildlife etc.

Table 7
Eco-Development Area of GHNP-Collection of Wild Edibles & Precious Stones

S. No.	Name of Forest Produce	Use	Quantity (Kgs)	No. of Families (%)
1	Jamun	Wildfruit	0 1-5 6-10 11+	45 15 20 20
2	Wild Walnut	Edibles	0 1-5 6-10 11+	60 15 10 15
3	Precious Stone	For Selling	0 1-5 6-10 11+	75 12 10 3
4	Wild Aadoo	Fruit	0 1-5 6-10 11+	30 30 20 20
5	Seed of Sharol	Edibles	0 1-5 6-10 11+	25 30 35 10

GRAZING

Grazing along with herb collection has been considered most significant pressure on park resources. Unlike the rights to timber and MFP inside park which are recorded for a small number of village, the grazing rights are assigned to a large number of people. Pastoralism has always been a major component of the economy of local people and its role has been far more important compared to other forest related activities. Although the contribution of pastoralism in the overall economy of the area has decreases considerably over the past one century, its importance has not decreases substantially and even today almost every household has some sheep and goats. As it is important for successful sheep farming to have sufficient grazing and a moderately cool climate throughout the year, which most of the areas in the region can't provide, the flocks of sheep and goats are constantly on the move barring a few which are kept at home for domestic purposes.

Table - 8
Tirthan Eco-Development Area of GHNP - Livestock of Tinder/Chipni Phanti: Movement in Summer to Alpine Pastures

S.No.	Name of the Village	Sheep	Goat	Total
1	Dhingcha	200	150	350
2	Jhaleri	100	70	170
3	Karauncha	150	160	310
4	Kauncha	100	80	180
5	Tinder	200	150	350
6	Malwani	90	70	160
7	Dhara Ralinga	100	80	180
8	Naani	50	40	90
9	Vunagi	60	80	140
10	Chipni	100	130	230
11	Jhaniaar	180	120	300
Total		1330	1130	2460

General practice in Kullu has been that in the winter, livestock of the hamlets situated on higher altitudes are brought to areas on lower altitudes. When the cold/winter recedes they are again drawn back to spend the spring season in the neighborhood of heir native villagers. They remain there for nearly months manuring the fields. They are than further drawn to the forest (low altitude) areas near the cultivation where they graze for a considerable time and walk further on pastures on higher altitudes as the rainy season commences (June/July). Till the end of rainy seasons (Sept.), flocks of sheep and goat graze on various alpine pastures/Thatches. Thereafter they start their return march at once; again concentrate on pastures at relatively low altitudes till the cold gets severe. At the beginning they are brought to their native villages ad then to their winter quarters in the pastures situated at still lower altitudes. However in most of the villages falling in eco-development zone/adjacent to the park, livestock is kept at home only in the winter months and practice of sending them at lower altitudes has decreased to an large extent. The pressure on the park in respect of grazing reached its peak in May to September when in addition to local livestock, the right-holder from outside area(Kothi and Tehsils) come with their livestock for grazing in the park areas. According to park management, approximately 10,000 migratory sheep and goat graze in the park in addition to 20-25 thousand local livestock in peak months.

Conservation of Bio-diversity Project activities in GHNP

It has been noted earlier that since 1994 the forest department of Himachal Pradesh has been undertaking various eco-development activities in the area adjacent to park (Eco-development area) in order to conserve the biodiversity of the park and adjacent Sainj and Tirthan wildlife sanctuaries. The goal of biodiversity conservation is to be achieved by realizing the twin objective of Eco-development viz. Reduction of people's dependence on park resources and improving dependent community's socio-economic conditions by providing alternative income generation programmes and building in sustainable harvesting regimes. Seen in totality, the objectives are supposed to live to realization of project goal. Definite results or outputs are required to get to the objectives and the outputs can not come through without a set of activities and matching budgetary inputs. Table 9 lists out various inputs/ activities undertaken in the eco-development project area of GHNP with their success rates and shortfalls in the eco-development project are of GHNP. This table is largely based on secondary information, in-depth interviews with the park management, frontline staff and other concerned. .

Table 9
Activities/Programs implemented in the Eco-development area of GHNP under the Conservation of Biodiversity Project (According to Park Authorities)

Activity	Success	Shortfall
Encouraging People's Participation	With the sincere efforts made by management people's participation has been evolved. Eco-development committees have been successfully formed in most of the areas. People participation in preparing and implementing microplans is encouraging. Study tours have been organized	The degree of participation is less than desired for the success of the project. Eco-development committees are less broad based. No partnership in Management of forest resources. Most of the persons participate for securing of temporary labour work rather than achieving the overall objectives of the Eco-development project. Providing sustainable employment opportunities. Desired participation of other village institutions is lacking.
Site specific microplanning and implementation	Site specific micro planes have been made and implemented in various villages/areas with people's participation through Eco-development committees.	The poorest and SCs did not get due representation and priority which should have been given to them by virtue of their being relatively more dependent on forest resources. Some of them allege that a few influential persons have influenced the activities. Micro-plans lack specific institutional support planning for generating long term employment avenues such as finance, production, marketing etc. In short, these can be criticised on grounds of coverage, lack of problem solving objectives (Biodiversity conservation)

		and self-sustainability etc.
Public Awareness Campaigns	Public awareness campaigns have been launched by the park staff at grassroot level. Gian-Vigan Samiti was also given assignment to undertake public awareness campaigns throughout the Eco-development area which they have been doing through public meeting, street plays and exhibitions etc. Park Management has also been successful in holding exhibitions and information dissemination activities in various local level fairs, gatherings etc.	Not sufficient particularly due to lack of staff, (staff can't remain in constant touch with people) and organised efforts. Gian Vigan Samiti has been doing it according to their convenience. Cooperation of other departments particularly panchayats and public relation department is lacking. Due to lack of proper information, vested interests have been spreading the rumours that by participating in Eco-development activities, people shall lose their traditional rights over forest resources while in reality there is at least no formal link between Eco-development activities and settlement of rights.
Programmes for the improvement of transport and communication	These have been taken up at large scale as part of trust building as well as actual Eco-development activities. A number of footpaths, mule paths and jeep roads have been constructed or repaired. It has not only mobilized people to participate in Eco-development activities but also provided temporary employment to a number of people.	The programmes do not fall in the category of direct sustainable employment generation activities and provides employment on temporary basis only. Up to the stage of trust building/infrastructure building activities, it is desirable but thereafter direct objective related activities should be substituted.
Soil and water conservation activities.	A number of activities including slope stabilization, minor irrigation and agricultural land development	Coverage is very less. Only a small number of families benefited.

	have been undertaken.	
Agricultural development programs.	A number of activities have been undertaken including distribution of Plants, distribution of improved seeds, demonstrations, workshops and training programmes with the help of agricultural dept. and research institutes etc.	Not sufficient and due to lack of institutional support based on linkages, no substantial gains have been achieved.
Horticulture development	Efforts have been made to introduce new varieties of fruit trees. Free distribution of apple plants and insecticides/pesticides as well as counseling programmes have been undertaken.	It should be done carefully because horticulture particularly apple growing is likely to reduce the bio-diversity. Once trees are grown mature, no other crops particularly fodder/husk crops can be grown. Land is engaged for a long period.
Animal Husbandry programmes	Some activities like artificial insemination and veterinary camps in some parts of Eco-dev. area have been conducted, in which people have shown enthusiasm and participation. Granting loan for purchasing high breed cows etc. is being considered.	Concrete plans have not been made and activities under taken. There seem to be conducted no proper studies regarding the proposed stock improvement, dairy operations etc.
Bio-mass generation programmes, Fuel wood and Fodder plantation, Timber plantation etc.	Plantations particularly of broad leave trees have been done throughout the Eco-dev. Area on vacant land adjacent to the villages.	No concrete estimates are available regarding gap in supply and demand. Plantations of mixed fuel and fodder species as well as timber should be taken on priority bases considering the ever increasing future requirements. No arrangement for proper look after are made.

Sectoral integration	Various effort have been made in the past and success have been achieved in two direction viz. 1. On the one hand attempts have succeeded in co-ordinating the activities of various departments. 2. On the other hand organizing public meetings where officials of all departments come on one platform and listen to people's grievances, have been mooted.	No concrete plans made or institutional linkages established where all the budget of various departments are discussed and priority and policies formulated keeping in view the desired objectives.
Training to Staff	1. Training to front-line staff. a. micro-planning; b. Participatory methodology. 2. Training to officers.	Only a few members of the staff have got training. Further, a number of members got transferred after the training. Therefore the full benefits of training were never realized.

Impact of Eco-development activities

As it has been discussed in the preceding pages that all the 123 hamlets falling in the 13 revenue villages forming part of the eco-development area grouped into nearly 16 Eco-development units each having an Eco-development committee. Major activities initiated in these units are shown in table 9. In order to access the social and economic impact of various eco-development activities a case study of one of the units comprising Shangarh revenue village with its hamlets was undertaken.

Shangarh revenue village is comprised of 14 hamlets spread over an area of more than 200 hectares. This village falls in the Sainj Wildlife Range of GHNP Eco-development project area. For the purpose of undertaking CoB project activities, Shangarh village has been designated one unit by the Park Management. This cluster of hamlets has a total of 167 households with a total population of 760 persons. Rajputs are the majority caste having 111 households out of 167 who are followed by SCs(57). There are a few Brahmin households(5) whose main occupation is to perform religion ceremonies and conducting prayers etc. in the village temples. Rajputs are the prime landholders while the SCs own only marginal land holdings. The cluster has a literary rate of 60 percent. Near about 160 boys and girls are attending schools at present. It has a population density of 7 persons per household. Almost half of the village's total population is married and it has a sex ratio of 835 females for per 1000 males.

Revenue Land

Total revenue landholding of the area is 1757 bigha (126 ha.). Near about 70% of this total land of the cluster is agricultural which is mainly used for growing various traditional and modern crops important among them are wheat, corn, Razma, Saryara, and Maize etc. Out of the remaining land, 5% each is occupied by orchards and vegetables, 1% by Ghasnies (grassy blanks) and the remaining 19% is fellow land.

Village Forests

The area is very rich in natural resources. Main forests of the area are conifers and broad lived species. On the lower areas, mostly broad leafed species

of Tosh, mandrru, shagri, chaluna, Oak, Kail and chil etc. are dominant while on the higher areas of the cluster, coniferous forests of deodar, kail, tosh and kharshu etc. are predominant. In between cultivated lands, patches of Oak trees are found.

Dependence on Forest/Park resources

a) Collection of Mushroom & Medicinal plants -
b) Collection of other N.T.F.P./MFP
c) Fodder -
d) Collection of fodder species -
e) Grazing -
f) Fuel wood collection-
g) Timber -

It has been found that while collection of Mushroom, medicinal plants and grazing constitute some pressure on the park, collection of other minor forest produce is sustainable and does not cause any negative impact on the conservation area.

Eco-development Initiatives

A number of activities were planned in the area under the CoB project to reduce pressure on park resources by increasing the availability of forest resources in the vicinity of the villages and by providing alternative employment to the dependent households. The following table highlight various activities initiated in this unit & budget allocated for each of them as mentioned in the microplan:

Table 10
Various ecodevelopment activities and approximate budget Community Works

Type of work	Approximate Budget	Percentage of Total Budget
Civil work	946135	84.7
On Farm Employment Generation	163104	15
Increasing availability of Biomass	2500	.23
Total	1111739	100

Table 10 shows that out of total sum of nearly 11 lakh rupees earmarked for community works in the microplan, a sum of Rs. 1,63104 or nearly 15 per cent of the total budget is being invested in improving the productivity of agriculture and horticulture. Out of this near about Rs. 142333 is being spend on providing/strengthening irrigation facilities in the area by constructing check dams and kuhls etc. while the rest of Rs.20,000/- are invested on the distribution of seedlings and constructing compost pits.

The table further shows that so far increasing the availability of biomass in the vicinity of the villages is concerned only a marginal sum of Rs.2500/- is earmarked in the microplan which is only symbolic and is not likely to bring about any impact on the current availability of biomass to the villagers.

On the contrary a highly significant proportion of budget, more than 80% is allocated for civil works. Out of this, a sum of nearly Rs.45,000 or 5% is being spend on providing drinking water etc. to the villages while the rest of the budget is being spent on constructing bridle paths, jeep road, stone soling of village streets etc. It is submitted that while a portion of it is aimed at strengthening the transport and communication, rest of the money is being spent for soliciting the support of local villagers for the CoB project.

An analysis of the budget allocation on various eco-development activities indicate that most of the investments lack proper linkages with project objectives. Although people get employment in civil works, but it purely of temporary nature and is not expected to divert pressure from the natural resource in the long run. What is required is providing sustainable employment avenues which are socially accepted and economically feasible. It also shows that inputs on improving animal husbandry, increasing availability of biomass near villages and strengthening the existing employment avenues are marginal and needs to be increased substantially. There is also an urgent need to undertake feasibility review of the planned activities in the light of project objectives and make required adjustments.

Individual Activites

According to the proposals made in the micro-plan, dependent households who want to establish their own self-employment units are to be selected for training and after successful training they were to be provided with loans/subsidies for setting

up their units. In addition local artisans, farmers, etc. were to be provided with subsidised tools and implements. A survey of the villages in these units revealed that a number of needy artisans, farmers etc. have been provided required implements. However, training and loan for setting up household level units have been provided to a few only. The survey could not find any functional units in the area. Most of the budget allocated for individual activities is still pending unspent.

Local Institution

To find out the functionality of the local/ village institution (VEDC) meetings with key village persons were held. It also included the members of the VDC. After going through the records and general discussion, they were asked to assess the strength of their VDC by identifying the indicators of good VDCs and giving their VDC scores against each criteria / indicator on a 0-5 scale. Table below shows the capacities / strength of Shangarh Eco-development committee in respect of each of the indicator identified by the villagers.

Table 11 shows that people of the unit perceive their VDC moderately functional giving it 24 marks out of 50. They found their VDC lacking in formulating programmes for providing sustainable employment to the dependent populations and in capacities to handle financial transactions, maintaining records. They also found their VDC lacking in entering into and implementing the agreements aimed maintaining natural resources by developing sustainable resource use practices.

Discussions held with the villagers, members of the VDC & front line forest staff revealed that in practice, there is no general house and the executive committee of a few persons is known as VDC. Most of its office bearers are Rajputs and SCs and females have not got full representation. Most of the decisions are taken jointly by forest department and the office bearer and later conveyed to the villagers. Females want the training & setting up of tailoring, weaving the other household level units while males and officer bearer want civil works because they get instant incomes from them. Females complaint that from civil works they get no direct benefit. Females and SCs are also in favour of fodder, fuel wood and other plantation because they are more dependent on these forests resources. However, most of the investment are made on the civil works.

Table 11
Strengths and Weaknesses of Local Institution/VDC

Indicator	Score/points 0-5	Remarks
Collaboration between Department and VDC	4	--
Participation of all particularly poor and females	3	Marginal participation of SC's in VDC
Capacity to take decisions	4	All micro-plans are made by forest department
Capacity to maintain accounts and power to control financial transactions	2	Financial transactions controlled by department
Lack of disputes/Capacity to resolve disputes	3	There are number of disputes
Providing sustainable employment to the dependent people	1	Only casual employment in civil works
Capacity to convince others	2	People do not obey the decisions of VDC
Capacity to withstand approach/favoritism	3	VDC President/Forest Guard prefer their relatives for employment.
Capacity to maintain nature resources	2	Peoples don't have the authority to manage forests
Total	24/50	

Adequacy of Microplan

It is noted that all the microplans made in different units are similar in their contents and microplan for this unit is no different. The microplan does not make any serious attempt to address the objectives of the CoB project. Instead a highly significant proportion of money is being allocated to civil works, while a very marginal sum of money is allocated to the activities aimed at increasing the availability of biomass. It also does not spell the mechanism to introduce sound resource use practices though it mention it as one of the objectives. It also

mentions some agreements which the FD and VDC are committed to fulfil but lacks the processes of its implementation and monitoring. Villagers complained that they had only a marginal role in the preparation of microplan & it has been made by a team of forest department officials. There is an urgent need to revise the microplan.

Impact of Project Activities on Various Stakeholder

In order to assess the impact of various activities initiated under the CoB project, the villagers were first asked to assess the dependence of various stakeholders on the park/forest resources by giving scores to each of the stakeholder group against each type of dependency on a 0-5 scale. They were further asked to similarly assess the impact of each of the activity initiated in their area on each of the stakeholder group. Following tables show the assessment made by villagers.

Table 12

Dependency on various village shake-holder on park/forest resource

Shake holders	Mush-room	Medicinal Plants	Fuel-wood/Fodder	Bamboo/Branches of Trees etc..	Grazing	Forest Labour	Total
Farmers with more than 10 Bighas Ag. Land	2	0	2	0	2	0	6
Farmers (less than 10 Bighas land)	2	0	3	0	2	1	8
Landless and poor (Higher Caste)	4	3	4	2	3	4	20
SCs and Backward	5	4	4	3	4	4	24
Females	5	2	5	2	0	0	14
Artisans	5	2	3	5	3	2	20

Table shows that villagers admitted that SCs, Backwards, artisans and females are highly dependent on natural resources of the park compared to other social groups. The table further reveals that while all the stakeholder groups are by and large equally dependent on forest resources for grazing, collection of mushroom and fuelwood; there are sharp variations in the level of their dependence on bamboo, medicinal herbs and labour work in the park over which SCs, poor, females and artisans are more dependent than the other groups.

Table 13
Impact of Various Activities on Different Stakeholders

Stake holder	Water Manage-ment	Repair of Village Path	Horticulture / Agriculture Development	Increasing Biomass	Distribution of Tools/ Implements	Civil Works	Total
Big Farmer	5	2	4	0	4	3	18
Small farmer	3	2	3	1	3	3	15
Landless and poor	0	2	0	0	1	4	7
SCs & Backward	0	2	1	1	0	2	6
Females	2	2	0	3	2	0	9
Artisans	0	2	0	0	2	0	4

Table above shows the impact of various ecodevelopment activities on different stakeholder groups as perceived by the villagers. It reveals that the farmers are the biggest beneficiary of the project activities followed by small farmers and women folk while the SCs and artisans have relatively less benefited from project activities. The table further reveals that activities like improving irrigation facilities, distribution of agricultural implements and other programmes aimed at developing agriculture/ horticulture have largely benefited the comparatively better off groups of rural society while activities such as repair of village streets, provision of drinking water etc. have by and large equally benefited all social groups in the village.

Both the tables 12 and 13 suggest the need to review criteria of investment and make more inputs in the activities beneficial to the most dependent social groups as brought out by table.

Negative impact on Vulnerable stakeholders

Due to denial of assess inside the park, some of the social groups are likely to be severely negatively affected; important of those are –

Local artisans - Their only source of income is to sell household and agricultural implements and utensils. The make there articles by using species of bamboo and some species of grasses, branches of trees found inside the national park. Now that their access to the resources of GHNP is going to be restricted, they are likely to be severely affected if viable alternatives are not provided to them.

Marginal farmers and landless - They are highly dependent on both medicinal plant collection as well as grazing. In the absence of alternatives/ adequate compensation they are also going to be adversely affected as denying access to park resources shall also affect their agriculture and animal husbandry besides affecting their cash incomes.

Females - They collect Mehndi, Mushroom and some species of plants for earning cash incomes. Some poor women also earn their livelihoods by selling fuelwood etc. Denying access to park resources is likely to adversely affect their incomes. Further stopping grazing in the park shall also increase their work load manifold because they will have to go for fodder collection in the absence of grazing.

Strategies and Recommendations

Today, it has become quite clear that enforcement approaches to environment conservation can not achieve their desired objectives. The successful management of protected areas therefore depends on the co-operation and support of the local people. Therefore, the required approach is of participatory management involving local communities. There is a need to make programs by involving people to promote sustainable land use practices as well as income generating activities. It is suggested that generation of alternative resource management systems based on the existing customs have more chances of successful incorporation by rural societies. Successful implementation of resource conservation projects as well as their maintenance over time depends on the identification of local population with them. This in turn depends in great part on their perceived compatibility with local goals and customs. There is an urgent need to identify and strengthen the existing traditional institutions and organisations such as Devata committees, Mahila mandals, Traditional panchayats and Youth clubs etc. and provide them training for formulating and implementing eco-development plans. Moreover, the possibilities of joint forest management by the staff and local population is expected to facilitate the successful management of the national park and conservation of forest resources. It is further suggested that as far as farming system is concerned, though there are many profitable and climatically suitable crops for this region, research and policy support for

improvement in their yield and marketing are greatly lacking which require urgent attention. Government subsidy and credit along with technical know how should be increased.

As the reckless extraction of minor forest produce particularly the herbs, has resulted in sparser distribution and continuously decreasing regeneration of variety of species, urgent steps to conserve and increase its regeneration are required. The herbs collection must be, more vigorously regulated in terms of both quantity to be extracted as well as checking unauthorised encroachers/collectors. If possible co-operatives of collectors should be formed to safeguard the interests of the poor from the middle men. Illegal timber felling and poaching should be checked; for this purpose more vigilance posts should be established, particularly on the major outlets of forest produce. A number of thatches/pastures have been subjected to heavy destruction by migratory cattle/livestock. If possible they may either be diverted or settled elsewhere. Moreover the rotational closure of pastures is strongly recommended.

Any potential and viable employment schemes must be launched which should first be sustainable with minimum inputs and secondly socially acceptable. It shall restrain the villagers from longer stay in the forest/park along with decreasing economic dependence on forest produce. Alongwith it, local/indigenous technology, particularly non-conventional source of energy should be improved and encouraged besides development of traditional varieties of crops coupled with development of traditional household industry such as handicrafts, bee keeping, weaving etc. At the same time improvement in the quality of livestock/cattle is imperative. It is expected to reduce their number while increasing the quality and quantity of the produce.

Infrastructural facilities and availability of basic amenities in the area are greatly lacking which needs proper attention. Due to lack of transportation, people of remote areas are not able to earn cash incomes by selling their farm produce particularly fruits and vegetables (perishable goods) and have to depend on medicinal plants etc (non-perishable goods) for cash income.

Indigenous/resident people have the power to make decisions concerning the sustainable use and management of natural resources which is governed and managed by village institutions such as traditional panchays, Dewata committees

etc. Such institutions must be strengthened by providing adequate training and technical assistance to adapt their more traditional land use systems to modern economic conditions. Besides, there is a strong need to inform the people about the aims, objectives and consequences of national park.

Most of the villagers complain of damage to crops and livestock by wild animals and lack of proper compensation by the authorities. They are also annoyed by the fact that while forest corporation is exporting huge quantities of timber from nearby forests, while, their own right to timber is strictly regulated and timber given to them is insufficient for the purpose it is given. Both these factors discourage the residents and create suspicion in their minds regarding the intention and objectives of authorities and park staff . It is therefore strongly recommended that in case of damage to crop and livestock by wild animals, quick relief should be given to villagers and possible arrangements should be made to protect their crop and livestock. At the same time extraction of timber by the forest corporation be immediately stopped to create trust and confidence in the villagers.

In short, in order to conserve the biodiversity and reduce pressure caused by excessive exploitation of park resources, a two-dimensional strategy is required. On the one hand, there is a need to improve the environment of the park and control and recover the damage already caused. On the other, hand, improvement in the quality of life and economic status of the local people by providing them employment in occupations which are not based on major forest produce as well as improving the productivity of livestock and agriculture, can prove helpful in reducing pressure from park resources. The park management has been successful to a large extent in involving the people in development activities but the degree of participation is less than what is needed in such type of programs. Also there is no agreement or realization in the eco development committees that these activities are in consideration for the reduction in income from expletive activities in the forests. Secondly, as the activities required for such projects generally fall into two categories viz. Activities directly contributing towards mitigation of pressures on park resources and activities aimed at trust building infrastructure building or indirectly affecting the use of Park resources, there should be an appropriate mix of the two in which the degree of former should dominate. Although the investments made so far, do not reflect this idea, it is quite natural because most of the

investments in initial phases of the project go in trust/infrastructure building. But as soon as this objective is achieved, there should be a sharp shift of investments from trust infrastructure building activities to sustainable employment generation activities.

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