Biodiversity Conservation Through Ecodevelopment

A Preliminary, Indicative, Plan
for
Great Himalayan National Park
and
Kalakad Mundanthurai Tiger Reserve

1993

The front cover photograph of Mudumalai Bana Thirtham, Kalakad Mundanthurai Tiger Reserve, is by Vasumathi Sankaran. The back cover photograph of Great Himalayan National Park, is by Partha S. Mudgil.

Our apologies for the poor quality of the text, but the only surviving copy of the report had faded significantly over the years.

Biodiversity Conservation Through Ecodevelopment

A Preliminary, Indicative, Plan

for

Great Himalayan National Park, Himachal Pradesh

and

Kalakad Mundanthurai Tiger Reserve, Tamil Nadu

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EXECUTIVE SUMMARY

1. The level of pressure and disturbance in most Indian protected areas (national parks and sanctuaries) is high. Traditional approaches at protecting these areas need to be supplemented by ecodevelopment

2. The ecodevelopment approach has been envisioned as aiming at developing alternate sources of biomass and incomes, to divert pressures from the protected area. This is to be achieved in participation with the affected community, and with their support and cooperation, and involves site specific, micro level, planning and integrated area development.

3. Management planning for the protected area must be concurrent and appropriate, and must lead to the upgradation, as required, of management practices and facilities.

4. The two sites chosen for the project are both among the best representative sites of their own ecosystems, Western Himalayas and the Western Ghats. These two ecosystems are among the most valuable in the country, in terms of biodiversity.

GREAT HIMALAYAN NATIONAL PARK

5. Great Himalayan National Park (GHNP), in Himachal Pradesh, is 62,000 ha. and currently is only a proposed national park with the intention to constitute it into a national park having been declared. At present, the southern 8396 ha.is a part of the earlier notified Tirthan Sanctuary. The remaining area is either reserve or protected forest. The State Government are proposing to, initially, declare the middle portion (Sainj Valley) into a sanctuary, pending the final declaration of a national park.

6. There are only four villages inside GHNP, of which recent reports suggest that two have been abandoned. The remaining two villages are in the Sainj valley and have a population of 66 persons (12 families). The project does not anticipate the need to shift them out as they can participate in management and tourism related activities.

7. The northern, eastern and southern boundaries of GHNP are

impassable as they are mostly under permanent snow or with very steep ridges. The park itself has an altitudinal range of between 1300 and 5805 meters. The valleys and ridges run from west to east and the altitude increases from west to east.

8. Adjoining the western boundary of the park, there are revenue 18 villages in an approximate radius of ten kilometers. These 18 villages are subdivided into about 200 hamlets. The total population of the area is 16,618 and the area is about 38,500 ha. The approach to the park is from the west, though there is no motorable road upto or within the park.

9. The major pressures on GHNP come from these 200 odd hamlets where many of the people claim traditional grazing rights and also collect herbs and mushrooms from the park. It is estimated that around 35,000 sheep and goats graze in the park during the summer months. In addition, around 2500 people collect herbs and mushrooms from the park each year, again during the summer months. There is also the disturbance to wild animals and the habitat, and the use of firewood, by the graziers and herb collectors. Some fodder is also collected by villagers, from the periphery of the park, for their winter requirements.

10. There are no significant pressures of the park on the people as, currently, no restrictions are being imposed on the traditional uses of the park. Some of the villagers complain about crop damage by bears and monkeys, but it is not certain if these animals are from the park or from the neighbouring forests.

11. The project area is remote, with almost no motorable roads. Though almost all the villages are electrified, there is not much other evidence of 'development'. The people have enough to eat and live well and, therefore, in a real sense are not poor. Their major constraint is cash income. Because of their remoteness and the sparseness of the population, they do not have easy access to markets for their goods. Also, traditionally, they seemed to have met their minimal cash

requirements through the sale of herbs and mushrooms that they collected in the forests. There does not appear to be many other activities in the region which are done for cash income. Even the sheep and goats they keep, or the honey they collect, or the shelas and pattus (local cloth) that they make, are for their own consumption, as are their agricultural produce.

12. The constraint of a lack of access to markets also affects the effort to set up sustainable income generation activities under the project. This is aggravated by the fact that some of the local people, influenced by the pattern of development in Kullu valley and in some other parts of Himachal Pradesh, seem to want the setting up of apple orchards and the construction of motorable roads to be the major strategy of development for the area. The absence of active NGOs in the area is another constraint.

13. The income generation activities suggested as part of the project include the promotion of tourism, the production and marketing of honey and wax, wooden furniture, poultry items, handloom items, indigenous vegetables and fruits. It is also proposed to set up sheep farms, in the last two years of the project, and to cultivate the local herbs and mushrooms, thereby using and building upon traditional skills and activities available in the region to develop environmentally sustainable activities. These activities would be supported and facilitated through a strong training programme, a marketing organisation, a tourist facilitation organisation, visitor cum training centers, production centers and the provision of start up loans and seed money, apart from other financial and material support.

14. The communication needs of the region would be met by the provision of bridle paths, to be built and maintained by the local people, and mules, to be operated by the villagers.

15. Biomass needs of the villagers are sought to be met through fuel and fodder plantations in revenue common lands, by managing some of the degraded forests in a joint participatory manner, by improving local and

village grasslands and meadows, and by providing irrigation water.

16. There would also be an effort to improve the agricultural lands, mostly terraced, and to take up soil conservation measures in the region.

17. The project would be implemented through village level committees, and along with a JFM agreement, there would be an agreement renouncing the collection of herbs and mushrooms from the park. There would also be an agreement to regulate and restrict grazing activities according to the management requirements.

18. Adequate short term income generating activities have been identified and provided for in the project to tide over the transitional period.

KALAKAD MUNDANTHURAI TIGER RESERVE

19. Kalakad Mundanthurai Tiger Reserve (KMTR), in Tamil Nadu, is 81,700 ha and comprises of the two sanctuaries of Kalakad and Mundanthurai.

20. There are four tribal villages inside the Reserve, which are inhabited by Kani tribals. There are also five cardamom and tea plantations inside the reserve, the areas being on lease to private parties and companies. There are two water reservoirs inside the Reserve, along with a residential colony of staff of the state electricity and irrigation departments.

21. The tribals living inside the Reserve seem to want to shift out on their own and, for the purpose, a rehabilitation plan will be prepared. It is not proposed to meet the cost of their rehabilitation from the project.

22. Most of the leases for the plantations inside the Reserve will expire within the next few years, except one, which is valid till 2027. The State Government has not been renewing leases which expire.

23. Some disturbance is caused by the people living inside the Reserve, especially by their livestock and movement within the Reserve. Management will be upgraded, and made more participatory, in order to minimise this disturbance.

24. The Reserve is surrounded on the west, north and south by forests and faces no significant pressures from these directions. Its western boundary runs contiguous to the boundary of the State of Kerala. The major pressures are from villages situated near the eastern boundary. The surrounding area of approximately upto 5 km radius from the Reserve boundary, has an area of about 46,000 ha and a population of 2,09,003, with 66 villages.

25. The major pressures are in the form of headloading, grazing, collection of non wood forest produce (NWFP), and of small timber. The headloading of firewood is for sale, to earn cash income, while the remaining are for the villagers' own use.

26. The project aims at developing fuel, fodder, fruit, small timber and NWFP plantations to meet the local biomass needs. Fortunately, the villagers are not dependent on the Reserve for their fuelwood, as they collect this from the numerous Prosopis juliflora trees in the region.

27. The need for cash income will be met through promoting income generating activities like the promotion of tourism, the production and marketing of honey and wax, poultry items, banana and cissal fiber items, and palm jaggery.

28. It is also proposed to support soil and water conservation and storage initiatives in the form of check dams, wells, tanks and contour bunding.

29. The income generation activities would be supported and facilitated through a strong training programme, a marketing organisation, a tourist facilitation organisation, visitor cum training centers, and the provision of start up loans and seed money, apart from other financial and material support.

30. The project would be implemented through village level committees, and there would be an agreement renouncing headloading and other prohibited activities. There would also be an agreement to regulate and restrict grazing activities according to the management requirements.

31. Adequate short term income generating activities have been identified and provided for in the project to tide over the transitional period.

PREFACE

This preliminary, indicative, ecodevelopment plan has been prepared in an impossibly short time to meet deadlines of the Ministry of Environment and Forests, Government of India. As such, it is not as rigorously edited, clearly presented or comprehensive as it ordinarily should be.

The purpose of this plan is to secure funding for ecodevelopment activities around two of the protected areas: Great Himalayan National Park (GHNP) and Kalakad Mundanthurai Tiger Reserve (KMTR). The process of micro level, participatory, planning will start in earnest when funds for implementation have been assured.

As part of the preparation of this plan, 7 villages (out of 18) were visited around GHNP, and twelve villages (out of 66) were visited around KMTR. In both areas, detailed discussions were held with a sample of local villagers and their views form a basis for this plan.

Many people have contributed to the finalisation of this plan and helped the project team in many ways. The team would especially like to thank the villagers of the various areas visited for their warm hospitality, and for their time. Special thanks are due to the officers of the forest departments of Himachal Pradesh and Tamil Nadu, especially the park/field directors, for all their help.

Thanks is also due to the various NGOs (especially SCAD and CAST), which helped the team in KMTR.

Shekhar Singh
Project Director

New Delhi
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I INTRODUCTION

BIODIVERSITY CONSERVATION AND ECODEVELOPMENT IN INDIA

India is considered one of the mega-diversity countries of the world.

The Zoological Survey of India, the Botanical Survey of India and the Forest Survey of India have been studying and documenting the plant and animal diversity of the country. Of the estimated 45,000 plant species, about 15,000 species of flowering plants have been described. Estimates of other plant taxa include 5,000 species of algae, 1,600 lichens, 20,000 fungi, 2,700 bryophytes and 600 pteridophytes. There are about 75,000 species of animals including 50,000 insect, 4,000 molluscs, 2,000 fishes, 140 amphibians, 420 reptiles, 1,200 birds and 340 mammals, and other invertebrates.

A very large number of the species described are endemic to India. Among the larger animals 79 species of mammals, 44 of birds, 15 of reptiles, and three of amphibians are threatened. Nearly 1,500 plant species are considered endangered.

1.1 Protected Area Network

India has a network of 75 national parks and 419 sanctuaries. These protected areas are the main repositories of India's wild biodiversity.

Unfortunately, a very large proportion of these parks and sanctuaries are subject to major human pressures, both from development projects and industrial activities, and because of basic biomass and other requirements of the people living in and around them.

1.2 Summary of Pressures

A recent report of the Indian Institute of Public Administration (Kothari et. al., 1989) records the status of human pressures in wildlife protected areas. Some of the important findings are summarised below.

1.2:1 Rights, Leases and other Legal Uses

1.2:1.1 Human Population

Information was obtained separately for human populations residing inside each park or sanctuary and those living in areas adjacent to it (i.e. within a 10-km. radius).

Population within parks and sanctuaries

Of the 32 national parks and 138 sanctuaries responding, 18 (56%) and 100 (72%) respectively reported human populations within their boundaries.

Since the absolute quantum of population inside is not a good indicator of the potential biotic pressure it can put on to the ecosystem, the extended data base was used to work out population densities. This has been worked out by a simple division of the total population with the total area of each park and sanctuary. The resultant list is reproduced in the Table below, with areas arranged in descending order down to a density of 0.01.

The data obtained reveals the following ranges of density:

Density (No. of people per ha.)	No. of N/S		
	N	S	T
> 10.00	0	3	3
5.0 to 10.00	0	3	3
1.0 to 4.99	0	24	24
0.5 to 0.99	1	14	15
0.1 to 0.49	4	35	39
0.01 to 0.09	11	22	33

Population adjacent to parks and sanctuaries

Of the 23 national parks and 132 sanctuaries responding, 19 (83%) and 115 (87%) respectively, reported populations in their adjacent areas. These high percentages are only to be expected in a country like India where the only areas left uninhabited are the most inaccessible ones.

An index of population pressures was worked out for each protected area by dividing the total population reported from adjacent areas with the total area of the park or sanctuary, both sets of data obtained from the extended data base. (Note that the index thus worked out is in relation to the area of each park and sanctuary, and not in relation to the area adjacent).

The ranges of index of population pressures on national parks and sanctuaries is presented below:

Pressure (No. of Persons per ha.)	No. of N/S		
	N	S	T
> 1000.00	0	2	2
100.0 to 1000.00	0	3	3
10.0 to 99.00	2	9	11
5.0 to 9.90	2	11	13
1.0 to 4.99	6	38	44
0.5 to 0.99	1	19	20
0.1 to 0.49	3	26	29
0.01 to 0.09	2	6	8

1.2:1.2 Rights and Leases

In 19 (43%) of the 44 national parks and 128 (68%) of the 187 sanctuaries responding there exist some rights or leases. In national parks the most common types of rights and leases pertain to grazing, which was present in 60% of the 20 parks with rights and leases, habitation in 50%, religious yatra in 45% and agriculture in 45%. Similarly, in sanctuaries grazing is by far the most common right, present in 84% of the 128 with rights. The other common ones are fuelwood collection in 54%, collection of minor forest produce in 47%, agriculture in 43%, and habitation in 42% of the sanctuaries with rights.

1.2: 1.3 Grazing by Livestock

Of the 36 national parks and 138 sanctuaries responding, 14 (39%) and 101 (73%) respectively, allow grazing of livestock within their boundaries.

Of the 36 national parks and 138 sanctuaries responding, 24 (67%) and 114 (83%) respectively report incidence of grazing. In other words, grazing is occurring, though it is not authorised, in 10 of the national parks responding (42% of those which have grazing) and in 13 (11% of those with grazing) of the sanctuaries.

The range of densities obtained is as follows:

Cattle (Table 1.2:1.3a)

Density (No. of cattle per ha.)	No. of N/S		
	N	S	T
> 10.00	0	1	1
5.0 to 10.00	0	1	1
1.0 to 4.99	1	10	11
0.5 to 0.99	0	22	22
0.1 to 0.49	5	57	62
0.01 to 0.09	8	32	40

Goats (Table 1.2:1.3b)

Density (No. of goats per ha.)	No. of N/S		
	N	S	T
1.0 to 4.99	0	6	6
0.5 to 0.99	1	7	8
0.1 to 0.49	1	22	23
0.01 to 0.09	6	36	42

1.2:1.4 Extraction of Fodder

Information presented below is from the extended data base. Of the 51 national parks and 204 sanctuaries responding, 7 (14%) and 63 (31%) respectively reported permitting extraction of fodder and from all these areas fodder was, in fact, being extracted.

1.2:1.5 Extraction of Timber and Non Timber Forest Products

Timber

Of the 44 national parks and 183 sanctuaries responding, 7 (16%) and 78 (43%) respectively reported extraction of timber.

Non Timber Forest Produce

14 (36%) of the 39 national parks and 104 (56%) of the 185 sanctuaries responding reported extraction of non timber forest produce (NTFP).

1.2:1.6(a) Use and Occupation by other Government Departments and Agencies

Of the 45 national parks responding, 25 (56%) reported use or occupation by government departments and agencies other than the Wildlife Wing. Similarly, of the 188 sanctuaries responding, 119 (63%) have such use.

In national parks the most common use or occupation is that of roads controlled/used by other departments, which is present in 60% of the parks reporting any use. Other relatively common ones are tourism and transmission lines, present in 28%, and irrigation and housing in 20% of the parks responding.

In the case of sanctuaries, 55% of those having such uses reported the existence of roads, 36% reported transmission lines, and 31% reported irrigation under other government agencies. 20% also reported forestry activities being carried out by wings of the Forest Department other than the wildlife wing.

1.2:1.6(b) Thoroughfare

Of the 47 national parks and 204 sanctuaries responding, 22 (47%) and 117 (57%) respectively, reported the existence of a public thoroughfare.

1.2:2 Illegal Use and Activities

1.2:2.1 Illegal Occupation and Use

Of the 36 national parks and 176 sanctuaries that responded, 3 (8%) and 46 (26%) respectively reported incidence of illegal occupation or illegal use, or both. "Occupation" in this context, means the spatial location of people or buildings, or both, while "use" refers only to activities without involving spatial location of people or buildings.

The most frequently reported illegal use was cultivation, 37% of all reported cases (of illegal uses and occupations). Next came grazing (20%), encroachment (20%), and fishing (5%). The other illegal use activities were all below 5% of the total number of cases reported.

Encroachment (20%), was the most frequent form of illegal occupation, followed by labour camps (2%) and temples (2%).

In response to the query "by whom", villagers were said to be responsible in 52% of the cases, Scheduled Tribes in 13%, "private persons" in 12%, agriculturists in 7% and lessees in 5% of the cases. The Government and nomadic tribes tied for sixth place with 3% each. Gujjars, mineworkers and "hillmen" were each mentioned in 2% of the cases. It might be noted that the term villager could also cover most of the other categories mentioned above.

Though *prima facie* these activities cannot be judged in terms of their ecological impact, their illegality certainly seems to imply that they have not been evaluated and found acceptable.

1.2:2.2 Encroachment

3 (7%) of the 44 national parks and 32 (20%) of the 160 sanctuaries responding reported encroachment (extended data base). These areas have been listed in the table, along with information on what action has been taken about the encroachment.

1.2:2.3 Offences

Of the 45 national parks and 172 sanctuaries responding, 31 (69%) and 96 (56%) respectively reported incidence of one or more types of offences.

Of the different types of offences, for national parks, destruction of habitat (average of 971 per park over the period 1979-84), illegal grazing/entry of cattle (369), causing fire hazards (38), illegal hunting (28) and improper entry (22) were the most common [Table 1.2:2.3(b)]. Similarly, for sanctuaries destruction of habitat (471), improper entry (221), illegal grazing/entry of cattle (158), and causing fire hazards (22) were the most common. However, these averages do not give a very good picture, as variations between different areas was significant.

1.2:3 Conflicts

1.2:3.1 Injury or Death to Human Beings

A disturbing aspects of the human pressures in and around parks and sanctuaries is the incidence of injury or death of human beings caused by wild animals.

Of the 39 national parks and 167 sanctuaries responding, 14 (36%) and 49 (29%) respectively reported incidents of injury or death of human beings due to attacks by wild animals.

A total of 629 cases were reported for the five year period (1979-84) of which 379 (60%) were reported from national parks and 250 (40%) were reported from sanctuaries.

Fatal Cases: Of the 629 cases reported, 485 (77%) were fatal. Of these 485 fatal cases, 329 (68%) were in national parks and 156 (32%) in sanctuaries. Seen another way, of a total of 379 cases reported from national parks and 250 reported from sanctuaries, 87% and 62% respectively were fatal.

1.2:3.2 Clashes

The alienation of the local people from the natural resources around them and the inadequate alternative sources of fuel, fodder, water, timber and of earning a livelihood, often force the local people to make demands on the resources of parks and sanctuaries, thereby coming into conflict with park and sanctuary authorities. Sometimes vested interests also provoke, or directly participate in, such confrontations.

Whatever the reasons, very often conflicts over the use and control of natural resources become law and order problems and result in physical clashes between the people and the authorities.

16 (37%) of the 43 national parks and 31 (17%) of the 179 sanctuaries responding, reported the incidence of such clashes.

The major reasons given for these clashes were: illicit felling of trees, poaching, illegal grazing, encroachments and other forest offences.

1.3 Past Management Approach

From the setting up of the protected area network in India, the approach has been to protect by policing. This has meant that, funds permitting, parks and sanctuaries have been protected by walls and fences, guards and guns, against the local people and their livestock. The current state of these areas, as described earlier, bears witness to the fact that such a policing approach has proved increasingly ineffective. Public debates in the media, and confrontations between wildlife authorities and the affected people, bear witness to the fact that the policing approach is also considered to be undesirable.

II. ECODEVELOPMENT PRINCIPLES

Definitions

1. Ecodevelopment is a strategy for protecting ecologically valuable areas (protection areas) from unsustainable or otherwise unacceptable pressures resulting from the needs and activities of people living in and around such areas.

2. It attempts to do this by atleast three means:

   2.1 by identifying, establishing and developing sustainable alternatives to the biomass resources and incomes that are being obtained from the protection areas in a manner, or to an extent, considered unacceptable.

   2.2 by increasingly involving the people living in and around such protection areas into the conservation planning and management of the area, thereby not only channelising some of the financial benefits of conservation to them, but giving them a sense of identity with it.

   2.3 By raising the levels of awareness, among the local community, of the value and conservation needs of the protection area, and of patterns of economic growth and development which are locally appropriate and environmentally sustainable.

3. Though, by their very nature, ecodevelopment initiatives will differ from area to area (and even from village to village), the three basic principles defining ecodevelopment are:

   3.1 Site - specific, micro-level planning

   3.2 sectoral integration

   3.3 People's participation.

4. Ecodevelopment is <u>not</u> just rural development, for it is not solely directed at the economic development of the rural population for its own sake, but seeks to protect an ecologically valuable area by eliciting the support of local communities.

5. Ecodevelopment is not policing in the sense that it does not seek to protect an area by keeping the pressures out solely or primarily through the enforcement of laws aimed at excluding local people. Rather it involves the local people in the process of protecting the park from destructive activities.

6. For any ecodevelopment plan to succeed, it must be backed by an appropriate management plan for the protection area. Such a plan must, in simple terms:

   6.1 define the requirements of conservation, thereby defining limits to human utilisation

   6.2. make provisions for the institutional structure and processes required to manage the area and implement the ecodevelopment activities.

   6.3 Identify ways in which the local population can be involved in conservation planning for, and management of, the protection area.

   6.4 Identify the interface between the management plan and the ecodevelopment plan, especially details about employment and income generation opportunities for local people and the involvement of the local communities in the planning for, and management and protection of, the area.

Ecodevelopment Planning

7. As already mentioned, ecodevelopment planning needs to be site-specific, micro level, and participatory.

8. Ecodevelopment is not a once-and-for-all, prior-to-project-implementation, planning process. It is a dynamic, ongoing, planning process which is concurrent to implementation.

9. Considering the planning process is essentially participative (using appropriate participatory rural appraisal (PRA) techniques), it involves going into village after village and taking up many days of the villager's time. Whereas this would be justified when

there is a certainty that funds are going to be shortly available for responding to the needs of the village, it seems very inconsiderate to waste so much of the villager's time and unnecessarily raise their hopes when funding is uncertain or much in the future.

10. Therefore, detailed, microlevel, ecodevelopment planning, for this and many other reasons, is seen as starting as soon as the project is approved and running concurrently with the first phase (18 months) of the ecodevelopment project implementation.

11. For the purpose of determining the broad thrusts and the budget required, and to avoid raising unnecessary expectations, a small sample of villages is surveyed and the costs worked out and extrapolated for the whole area.

12. The planning process involves detailed discussion with the village communities on various aspects, including:

12.1 Negative impacts of the protection area on the village (wild animals causing human death or injury, livestock death or injury, crop depredation; restriction of access to natural resources, or culturally or religiously significant locations; denial of traditional routes; ban on hunting; etc.)

12.2 Negative impacts of the village on the protection area (illegal or unsustainable grazing; collection of timber, fuelwood and non wood forest produce; setting fire or otherwise degrading the habitat; poaching or disturbing wild animals; etc)

12.3 Possibilities of minimising both types of negative impacts through ecodevelopment (measures for protection of humans, livestock and crops, and for compensating death, injury and damage; generation of biomass like fuel, fodder and small timber; soil and water conservation activities, both to generate employment and to conserve the environment; income

generation activities like bee-keeping, mat and rope weaving, poultry rearing, visitor facilitation and hospitality, manufacture and marketing of other artisanal goods; education and awareness; participation in protected area planning and management; etc.)

12.4 Village level institutional structures and processes existing and required (ecodevelopment committees, panchayats, mahila mandals, etc.)

12.5 Finances, training, research and other inputs required for implementing ecodevelopment activities.

12.6 Constraints, if any, to the success of such activities

12.7 Strategy for the transitional process and period, between the stopping of use of protection area and the establishment of the ecodevelopment initiative.

12.8 Perceptions of the villagers about the protection area, its value and management strategy.

Institutional Structures

13. There would be three main actors in the planning and implementation of ecodevelopment.

13.1 The protection area (park/sanctuary) management authority, who should have adequate staff, preferably exclusive staff, to look after their part of the work.

13.2 Local level NGOs or, where there are no suitable local level NGOs, regional or national level NGOs who are interested and capable of working in the area.

13.3 The village community, especially the women, who need to operate out of existing institutional structures (like panchayats or mahila mandals) or, preferably, organise themselves into ecodevelopment committees.

14. In addition, there need to be district level co-ordination committees (chaired by the Collector and, where more than one

departments.

15. Some regional and central research and training institutions also need to be identified and involved with the planning, training, research, monitoring and evaluation activities.

16. For the planning process, a planning team consisting of local wildlife officials (Rangers), local NGO representatives and some local community leaders needs to be set up. They would have the task of going from village to village and finalising village level plans in consultation with the people. They would be supported by a regional/national institution which would provide regional and macro level data, and help prepare the consolidated plan for the area.

17. Depending on the major thrust of ecodevelopment activities identified for the area, specialist groups, comprising of members from local NGOs and specialised government agencies, will be set-up to advise on specific issues (ground-water harvesting, water conservation, bee keeping, horticulture, poultry, etc. etc.). These specialist groups will assist both in the planning process and in the implementation. Only in rare cases would there be a need to bring in experts from outside.

18. Independent institutions will be identified to monitor and evaluate the project, periodically and at the end.

19. There might be a need to set up a trust or a society, involving the local wildlife officials and NGOs, in order to:

19.1 Provide an alternate process for financially supporting some of the ecodevelopment activities.

19.2 raise additional resources for ecodevelopment activities.

19.3 undertake various tasks, like the training and appointment of tourist guides, development and sale of local handicrafts, development of appropriate tourist facilities, through the

involvement of the local people, and to their benefit.

19.4 Develop educational and awareness programmes for visitors and local communities.

Transitional Phase Planning

20. Many, perhaps most, ecodevelopment activities have a gestation period of one to three years before they start giving the intended benefits to the local people. For ecodevelopment to succeed as a strategy, it has to be ensured that during the gestation period (transitional phase) the people are not put through unnecessary hardships, nor is the protection area allowed to degrade.

21. Measures aimed at tiding over the transitional period could include the making available of alternate sources of biomass (fuel, fodder, etc.) to the community on terms and conditions not worse than what they were getting earlier. However, care should be taken to ensure that transitional measures do not compromise, for example by making people dependent on free handouts, the chances of success of sustainable ecodevelopment initiatives.

22. Such measures could also include developing alternate systems of income, for example long term employment as forest guards or or occasional employment in the various management activities in the protection area. Training programmes, with stipends, intended to develop the skills required for pursuing various ecodevelopment activities can also be scheduled in the transitional period. Efforts must also be made to find employment in construction and other activities related to the ecodevelopment project and to schemes of districts agencies. Transitional planning must attempt to make accessible, to the local people, other areas in the region, especially waste, common and forest land. Whereas ecological regeneration and afforestation work in waste and common lands can provide almost immediate employment to a significant number of the local people, forest land outside the protection area can support

Joint Forest Management (JFM) initiatives.

23. The development of appropriate tourism can also provide almost immediate employment to the local people, especially as tourist guides or through the provision of food and accommodation to the tourists.

24. The Environment (Protection) Act might also need to be invoked in the buffer areas for ensuring the success of ecodevelopment initiatives.

Financial Arrangements

25. The timely release of ecodevelopment funds to the park director and, further, to the concerned voluntary agencies and village committees has to be guaranteed.

26. There also has to be adequate decentralisation of financial powers to ensure that sanction of activities and expenditure are not delayed. It also has to be ensured that field officers have the flexibility to respond to all of the various eco-development needs.

27. There must also be an ability to release funds to voluntary organisations and village level committees.

Criteria for Site Selection

28. From the protected areas in India, a list has to be developed of those which are threatened by the types of pressures that can be tackled by ecodevelopment. Eco-development, as a strategy, is appropriate only for those areas where the threats are due to pressures from local (rural) communities. In areas where the major threat is from a national highway, or from commercial logging by an industry, or from pollution by a factory, strategies other than eco-development might be more appropriate.

Ofcourse, an area can have both types of pressures. In such cases, ecodevelopment can become the means of tackling pressures

from local communities and other strategies can be utilised to tackle non-localised problems.

29 After a selection has been done of potential areas for ecodevelopment, they need to be classified as follows.

I. Areas where current, local community, needs for biomass (grass, fuelwood, fodder, non-timber produce etc.) are the major threats and these can be sustainably met from available resources, once these resources are better managed (closing/rotation of grazing areas, regeneration/plantation of fuelwood and other species, soil and water conservation activities etc.)

II. Areas where though current, local community, needs for biomass cannot be completely met, in a sustainable manner, from local resources, there is potential for reducing local needs for biomass to sustainable levels through indirect methods.

Such indirect methods could include minor interventions like stall feeding of livestock, replacement of local breeds of cattle with high yielding breeds, or introduction of smokeless chullahs, to major interventions like setting up schools and training programmes to enable villagers to seek non-biomass based employment, minor irrigation, water harvesting and soil conservation schemes to enhance agricultural productivity, development of cottage industries and artisanal skills, etc.

III. Areas where even the combination of direct (biomass regeneration) and indirect (diversion of biomass needs) strategies would not be adequate to remove the threat to the environment and where larger, perhaps regional, interventions would be required.

Within each category, the areas should be graded in accordance

with the severity of the problem.

30. A decision has, then, to be made on which areas are to be selected. In the long run it might be possible to cover all the areas, but in the short run a priority has to be established.

Given the circumstances, in some cases it might be preferable to first take up the easier areas (category I), especially if experience needs to be accumulated and resources are scarce. On the other hand, the more difficult areas (category II & III) might require attention more urgently and any further delay might cause irretrievable damage. Though the final decision would have to be made case by case, depending on the experience, training and confidence of the persons concerned, the resources available and the ecological value and level of threat pertaining to each area, as a general principle it is advisable to go from the simpler to the more difficult areas as the experience and confidence gained would help in facing increasing levels of difficulty.

Another factor that should influence the choice of the area is the willingness and ability of the local communities to participate in the process. Even simple problems cannot be tackled without involvement of local communities, while the most difficult ones can be overcome if the people are willing to co-operate.

31. Initially it is advisable to deal with each area separately, though at a later stage it might be advantageous to link up the various ecodevelopment initiatives in a region.

III. THE PROJECT AREA

A. GREAT HIMALAYAN NATIONAL PARK

1. The Protected Area

1.1 Location: The proposed Great Himalayan National Park is located in the north-western Himalayas in Kullu District of Himachal Pradesh, some 60 km to the south-east of Kullu. The Park covers the catchment areas of the Jiwa Nal, Sainj and Tirthan rivers, which together comprise the upper catchment of the Beas river.

The Park headquarters are located at Shamshi, 2 km from Bhuntar Airport {See maps - 1 & 2}.

1.2 Legal Status: The intention to constitute the Great Himalayan National Park was notified vide letter no. 6-16/73-SF-II dated 1 March, 1984.

Final notification of the Park is pending the completion of various procedures stipulated in the Wildlife (Protection) Act, including the settlement of land use rights.

At present, part of the proposed park is reserved forest and the remaining part is either protected forest or is part of the Tirthan Sanctuary.

1.3 Area and Zoning: The present proposed Park area is 62,000 ha. There is currently no zoning, but when the Park was first notified a buffer zone of 111,600 ha was also notified. This was subsequently denotified vide letter no. 6-16/73-SF-IV, dated 30.7.1990 {See map - 1}

1.4 Ecosystems and Biodiversity Values:

Altitudinal Range and Terrain: Altitude ranges from 1300-5805 m (tp), and terrain is characterized by numerous high ridges over 4,000 m high, deep gorges and precipitous cliffs, rocky crags, glaciers and narrow

valleys. A little over half the Park area lies above 4000 m. Much of the eastern part of the Park is perpetually snow-bound or under ice (Gaston et al., 1981). Pleistocene glacial advances have greatly influenced the topography of the region and have left extensive moraines, river terraces and hanging valleys (Gaston et al., 1981) {See Map - 1}.

The topography of the area has also been influenced by avalanches and landslides. Avalanches occur frequently after heavy snow, often originating from steep southern aspects, especially from April to June (QQ). Landslides are common from January to March and during the rainy season in July and August, and affect approximately 100 ha a year (Q.A2, QQ). Avalanches and landslides are natural phenomena and both result in heavy loss of top soil, decrease in pasture area, and wild animal deaths (QQ).

Geology and Soils: The main rock formations in the Park are quartzite and mica-schist. Soil type varies from sandy loam to thick humus beneath Kharsu oak and fir forests (mp).

Climate: No meteorological data has been collected from the Park, but Park authorities report that temperature ranges from -10 to 35 degrees celsius (Q.A2). Gaston et al. (1981) report that the Sainj and Tirthan Valleys have a milder climate than the rest of the Beas area, with lower snowfall in winter and higher rainfall during the monsoon. The rainy season lasts from June to September with most rain falling in July and August. Annual precipitation in most parts of the Western Himalayas is in the range of 1000-2000 mm. Heavy frosts occur from December to February (Q.A2). From

November/December to March, most of the precipitation above 2000 m is in the form of snow (Gaston & Garson, 1991). Snow falls throughout the Park, but below 3000 m it does not remain on the ground long. Above 3000 m, snow persists from November to March (Gaston & Garson, 1991). Hailstorms occur from April to June (Q.A2).

The nearest meteorological stations are at Sainj and Shangarh (Q.A1), both in the Sainj valley. Sainj is about 12 km to the west of the Park, at an altitude of about 1,400 m and Shangarh is about 6 km to the west of the Park, at an altitude of about 2,000 m.

Hydrology, Wetlands and Water Bodies: The Park is mainly drained by the westwards-flowing Jiwa Nal, Sainj and Tirthan rivers and their many tributaries. All three rivers originate within the Park, near the eastern boundary, and are steep-sided and narrow throughout their length (Gaston et al., 1981). The Jiwa Nal and the Sainj meet outside the Park, shortly before the latter merges with the Tirthan at Largi, about 30 km from Sainj, to flow into the Beas. Thus, the Park includes a major part of the upper Beas catchment. Several seasonal streams also drain the Park and there are numerous springs (Q.A2). There are some 30 small lakes in the Kamba Reserved Forest to the north of the Tirthan, 1 small lake to the south of the Tirthan, and 4 small lakes in the Paniharu Protected Forest, south of the Jiwa Nal. Waterfalls of varying heights (10 m to more than 60 m) are found throughout the Park, but are particularly common in the Sainj Valley. In addition, there are some 50 glaciers of different sizes (dir).

Natural seasonal water shortages occur in the upper reaches from mid-September to October (mp, QQ) and wild animals are reported to come down to lower altitudes in search of water. Such shortages have been noted in the Base Protected Forest and in the underlisted thaches: Asurbag and Jatholi in Tirthan Valley; Dhela, Kaili and Niari Naina in Sainj Valley; Apgain and Kasol in Jiwa Valley.

Forests: There was little commercial exploitation of the forests in the present Park area, prior to World War II, because of their inaccessibility (Garson and Gaston, 1985; mp). However, some felling took place during World War II (mp). Felling of certain trees, notably fir, increased between 1949/50 and 1979/80 under the Fourth Forest Working Plan, but this appears to have been confined to a relatively small area of 2,288 ha (mp). About one third of the Park comprises closed canopy forest. Most forest cover occurs in belts around the Jiwa, Sainj and Tirthan and their tributaries, in the western half of the Park {See map - 3}, extending to 3,300-3,600 m, depending on aspect. Throughout the Park, north-facing slopes are more densely forested than south-facing ones, as is characteristic of the front ranges of the Himalayas. This is thought to be due to the moist conditions typical of north-facing slopes which inhibit the spread of natural and human-made fire. South-facing slopes are more exposed to the sun and are consequently more prone to fire and erosion, thus creating a steep dry habitat where oak (Moru and Ban) is probably the natural climax. Above 2500 m, open areas tend to occur mainly on moderately sloping ground.

Fourteen forest types have been recorded in the Park, according to Champion and Seth's (1968) detailed classification (Annexure 1). A more general categorization used by Gaston et al. (1981) is as follows:

- subtropical pine forest, characterized by chir pine, between 600-1700 m
- Himalayan moist temperate forest, characterized by both coniferous and broad-leaved species, between 1,500-3,600 m;
- subalpine forest dominated by birch and fir species, between 3,000-3,400 m;
- moist subalpine scrub characterized by Rhododendron species, between 3,000-3,5000 m, and
- dry alpine scrub characterized by juniper species, between 3,400-3,800.

Chir pine forms dense stands at low altitudes. Blue pine or Kail is dominant below 2,000 m on north-facing slopes in both the Sainj and Tirthan valleys. Mixed deciduous forest harboring such species as oak, horsechestnut, walnut, maple, elm and bird cherry, tends to occur from around 1,800 m onwards, on moderately sloping ground, often on valley floors. Riparian vegetation is frequently dominated by alder trees.

Oaks are thought to form the climax vegetation throughout most of the moist temperate zone. Three species with differing, but overlapping, altitudinal distributions occur in the Park. Particularly noteworthy is the presence of undisturbed low/middle-altitude

Himalayan oak forest, which is now very rare elsewhere. Kharsu oak may occur from about 2,000 m upto about 3,500 m. Ban oak varies between 1,800-2,400 m, overlapping the lower limit of Kharsu oak. Moru oak is a middle altitude oak, overlapping the upper range of Ban oak and the lower range of Kharsu oak.

Both Ban and Moru oak are frequently associated with Rhododendron arboreum which rarely forms pure stands, as well as with deodar and kail.

Aspect greatly influences the altitudinal distribution of different species, with most species reaching their lower limit on north-facing slopes, and their upper limit on southernly aspects. However, deodar and Kharsu oak are found mainly on south faces over most of their altitudinal range, while spruce and fir are especially associated with northernly aspects.

Kharsu oak and fir trees become smaller in stature as they occur closer to the tree line and gradually become mixed with birch and Rhododendron campanulatum. Moist subalpine scrub (less than 2 m high) and lower scrub (less than 0.5 m high) comprising chiefly Rhododendron lepidotum and R. anthopogon, mixed in places with juniper (Juniperus commoris), predominates after about 3,400 m, continuing upto 3,700 m, usually occurring in patches interspersed with meadows and bare rocky crags.

Lower altitude forests generally support a dense understory with a high diversity of shrubs. Common understorey shrubs include Indigofera, Viburnum, Sarcococca and Berberis species. Some areas, particularly forests on north-facing slopes, harbour a dense understorey of bamboo (Arundinaria spathiflora)

which forms impenetrable thickets in places.

Ground vegetation is strongly seasonal in character: dense thickets of annuals develop during the rainy season and die off in autumn. The perennial Iris Kumaonensis, reported to spread as a result of disturbance, forms an important component of the ground vegetation in some coniferous forests. (Gaston et al, 1981, FVI&2)

Grasslands: The area of grassland in the Park is not fully known. The FSI map only shows grasslands around the headwaters of the three rivers {See map - 3}. However, grasslands are known to be found elsewhere, e.g. Dhela Thach in Sainj valley and Nada Thach in Tirthan valley {See map - 4 for location of Thaches}.

Alpine meadows occur above about 3,800 m, the upper limit of subalpine and alpine scrub communities (Gaston & Garson, 1991). These meadows have a high diversity of herbaceous species, many of which have medicinal or aromatic properties and are of great commercial value (see Annexures - 2). Grasslands are also found below the tree-line, and it is not clear whether these have been created and maintained by human activities such as pastoralism, especially grasslands surrounded by natural forest, e.g. Nada Thach in Tirthan Valley. Lower altitude grasslands are sometimes associated with scrub vegetation, which is usually dominated by Indigofera, Berberis and Rubus species.

Weeds: A number of weed species have also been identified, viz.: Polygonum, Strobilanthus, Cannabis, Balsam (QQ) and Rumex species and Girardiana heterophilla(A.J. Gaston, pers. comm., 1991). Weed infestation has increased since 1984 and has been observed in the following forest blocks: Rolla, Tirath,

Dhela, Deun and Maraur (QQ).

Wild Animals: Very little is known about the Park's fauna, other than some general information on bird and mammal species.* A number of threatened mammal and bird species are found in the Park, including some endangered species such as Musk deer, Western tragopan pheasant and possibily the Snow leopard and the wolf. Other threatened species found in the Park include the Himalayan brown bear, Himalayan tahr, Snowcock, Serow, Bharal, Giant flying squirrel, leopard and Monal pheasant.

High altitude mammals which appear to attain the upper limit of their range at or around the snow-line (5,000 m - 5,300 m) include Blue sheep, Brown bear, and possibly Snow leopard.

Himalayan tahr, Musk deer and Pika occur at middle to high altitudes.

Low (1,600 - 2,200 m) to middle (2,200 - 2,800 m) altitude species include porcupine, Rhesus macaque, Barking deer, jackal, Himalayan weasel, Himalayan palm civet, Jungle cat and possibly Leopard cat.

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* The term 'threatened' has been used here in accordance with the internationally accepted usage coined by the International Union for Conservation of Nature and Natural Resources (IUCN). This term is used for species which are in one of the following categories:

Endangered:	Species/taxa in danger of extinction and whose survival is unlikely if factors threatening them continue to operate.
Vulnerable:	Species/taxa likely to move into the endangered category in the near future if threatening factors continue to operate.
Rare:	Species/taxa with small world populations that are not at present endangered or vulnerable, but are at risk of becoming so.
Source:	Himachal Pradesh Directory (p. 154)

Certain species have a wide altitudinal range (spanning low to high altitudes), notably Himalayan black bear, leopard, fox, Yellow-throated marten, langur and Flying squirrel.

Several species inhabiting the middle and upper altitude forests show annual altitudinal migrations, probably in response to heavy snow fall. These include langur, fox, Yellow-throated marten, and possibly also Goral, tahr and Black bear, but to a lesser extent.

Musk deer are known to live permanently between 2,500 - 3,400 m. The distribution of Himalayan weasel and the jackal appears to be associated with areas of human habitation.

The exact local status and geographical distribution of different species needs to be established, particularly for Snow leopard, Brown bear, wolf and Musk deer. (Gaston et al 1981)

The highly endangered Snow leopard is reported to occur in areas within and adjacent to the park. Local reports suggest that it occurs at very high altitudes in snow bound areas, within the Park but it is thought to be rare. Also the highly endangered wolf is known to occur in the region, but Gaston et al. (1981) found no signs of its presence in either the Sainj or Tirthan Valleys. Gaston et al. (1981) also felt that the Brown bear population is on the decline and that the Musk deer will become locally extinct unless poaching is greatly reduced. Recent surveys suggest that the Musk deer population has been recovering, but no evidence of Snow leopard or wolf was found in the areas visited in the three valleys (Gaston & Garson, 1991). Barking deer are also relatively rare. It is thought that these two deer

may also be affected by grazing of livestock, as both prefer areas with a dense understorey. However, Black bear and leopard are believed to be relatively widespread, and "quite substantial" tahr populations are also believed to be present.

Jungle cat, Himalayan palm civet and Leopard cat appear to be much rarer than Yellow-throated marten, fox and Himalayan weasel. Yellow-throated marten seems to be widely distributed in forested areas (Gaston et al., 1981), but is less numerous than fox or weasel (mp).

A list of mammals reported from the Park is given in Annexure 3.

Gaston et al. (1981) identified 117 bird species in the Sainj and Tirthan Valleys alone. More recently, they have compiled a list of 137 species from the Tirthan, Sainj and Jiva nals (1992). The Management Plan cites 150 bird species, but the source of this list is obscure. Another bird list was recently prepared by the Park authorities, based on field observation of the staff. Putting all these lists together, there is now a bird list of over 300 species for the Park. (see Annexure 4).

The classification of the 221 species of birds sighted in the whole upper Beas catchment area by Gaston et al. (1981) suggests that a large proportion of species found in the Park are residents. However, a significant number of summer migrants and a smaller proportion of winter migrants are also present.

The majority of species are passerines. A number of major raptor and pheasant species also occur in the Park. Notable among the latter, is the highly endangered Western tragopan, of which a viable population is

believed to be present in the Park, as well as the threatened Monal and Cheer pheasants.

Reptiles reported to occur in the Park include the Himalayan pit viper Agkistrodon himalayanus) (dir).

Biodiversity and Other Values of the Park:

i) Exceptional biological diversity in the Park, much of which is yet to be properly documented and scientifically studied. (See listing of Medicinal herbs, Mammals & Birds in annexures 2,3,4 respectively.

ii) The presence of one of the few known viable populations of the highly endangered Western tragopan pheasant.

iii) The Park contains the largest population of Himalayan tahr (endemic to India) in Himachal Pradesh.

iv) The presence of several other endangered or threatened species of flora and fauna.

v) The Park contains economically valuable species such as medicinal herbs & aromatic plants.

vi) Upper catchment forests of the Beas are crucial for the maintainence of associated ecological processes.

vii) One of the least disturbed, Western Himalayas, representative ecosystems.

In addition, the Park is contiguous to Tirthan Sanctuary (6,112.98 ha) to the south for a distance of about 15 km, and also to Rupi Bhaba Sanctuary (26,914.50 ha) to the east for a distance of about 5 km. Rupi Bhaba is in turn contiguous to Pin Valley National Park (67,500 ha) to the north for a distance of about 10 km. These four conservation areas together form the largest and least disturbed block of natural vegetation in Himachal, and possibly the Western Himalayas (Gaston & Garson, 1991). Rodgers and Panwar (1988) have identified the

establishment of the Park as both a national priority for wildlife conservation and as the foremost priority for wildlife conservation in Himachal Pradesh. (See map - 6).

1.5 Population: There are 4 villages in the Park, the population of which, according to Park records, is as follows:

Village	No. of Families	Total Population
Kundar *	1	24
Manjhan *	11	80
Shakti	4	16
Maraur	8	50
TOTAL	24	170

Source: QQ/FV2

1.6 Land Use:

Agriculture: The villagers practice rain-fed, low-input agriculture for subsistence. In Shakti and Maraur, generally one major crop is sown annually. Maize and wheat are grown in alternate years (FV1). In Manjhan, the species grown are maize, wheat, potato, saryara, rajma, pumpkin and Cannabis species (FV2). Other crops grown by Park villagers include barley, kothu, Chenopodium and Phaseolus (QQ).

The villagers of Kundar and Manjhan cultivate 11.33 ha and those of Shakti and Maraur cultivate 54.68 ha.

Grazing: Park villagers, local people from surrounding areas, as well as people coming from as far as Ani Tehsil graze their livestock in the Park. Apart from the

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* Reportedly, these villages have now shifted out.

Park villagers and people from villages close to the Park boundary, such as Lapah, Bah and Khrongcha, all others come on a seasonal basis, from June to September, to graze their livestock in the high altitude pastures or thaches. Only sheep and goats are taken upto the high altitude pastures. Sheep and goats of Park villagers and villagers in adjacent areas are also taken upto to the high altitude pastures in the summer.

Livestock from Park villages and some adjacent area villages graze in the Park throughout the year, excluding the winter months when there is snow on the ground. More intensive grazing takes place from April/May to September/October when thousands of sheep and goats are brought to the Park from villages in Ani Tehsil, upto 30 kms to the south. Approximately 10,000 migratory sheep and goats visit the Park in addition to about 25,000 sheep and goats of local origin (Gaston et al, 1992). The graziers concentrate on pastures at lower altitudes in the early summer, moving upto the alpine zone in June where they remain until they begin the homeward journey in September.

Fodder: Villagers living in the Park and an unknown number from villages very close to the Park cut fodder in the Park. Fodder is cut throughout the year for cattle which, unlike sheep and goats, are not sent up to the high altitude pastures. Fodder is cut in larger quantities in September and October and stored for the winter months.

Herb Collection: Herb (jaddibooti) collection, which includes the collection of both medicinal herbs and aromatic plants, is considered to be one of the most

Serious pressures on the park as about 2,500 people enter the Park from May to November to collect herbs. Many of the herbs are found only in the high altitude meadows, but some are also found in the forests. Although it does not seem as if any rights for herb collection were granted as per the Forest Settlement in 1886, the extraction of herbs can not be treated as entirely illegal. This is because, in order to be able to transport any herb outside the boundary of the Panchayat it is extracted from, a royalty has to be paid to the Panchayat as well as the Forest Department, and the name and quantity of herbs being transported are entered into the records of the Forest Department (Annex-5).

NWFP Collection in Addition to Herb Collection: Gucchi or morel mushroom (Morchella esculenta) collection is one of the main types of NWFP collection. Other NWFP collected includes honey, bamboo, nuts (Pahari badam, walnuts), fruits (Jammu, Thena, Sharorh, peaches), flowers, juniper (Juniperons macropode), the bark of birch, the pith of yew trees and talshi (Rhododendron lepidotum) (QQ, FV2).

Timber: Trees which have been marked by the forest department staff may be felled by Park villagers for house construction and repair of buildings, or for making agricultural implements and other tools, at the rate of one tree every five years per household.

1.7 Management Plan: The management plan for the Park was prepared in 1987 by Shri R.C. Sharma (I.F.S.), Chief Wildlife Warden of Himachal Pradesh, and approved in 1988. The plan is valid from 1987/88 (in retrospect) to 1996/97 (Q.A1, mp).

2. Protected Area Surrounds

2.1 Population About 16,000 people from the 200 odd hamlets and villages in the adjacent area of the Park claim to have traditional rights in the Park area. These include livestock grazing, collection of fodder, fuelwood, NWFP, extraction of timber, herb collection, religious yatra, fairs and monuments and right of way (Q.A, Q.A1, Q.A2) A profile of the adjacent area (10 km) is given below:

Total Area	- 38500 ha. approx.
Total number of revenue villages	- 18
Total number of households	- 3028
Total population	- 16618
Total male population	- 8580
Total female population	- 8038

Source [Census Handbook, 1981]

According to Alex Anderson (1886), most of the villages in the periphery of the park have grazing rights and right of way. Few hamlets like Lapah, Dhara etc. have right to cut stumps of kail for torches and right to cut grass. Hamlets like Nahin, Ghat, Bharun, Lapah, Dhara and Dhingcha etc. also have right to cut wood for agricultural implements. Full rights were granted only to three Hamlets i.e. Dhar, Sharnira and Sungcha.

2.2 Land Use: The major land uses in the adjacent area of the Park to its west, which is where human habitations are located, are Agriculture, Pastoralism, and Horticulture which is mainly Apple orchards. In addition, fodder collection for livestock is also undertaken. According to the 1981 census the total land use figures are given below:

Total Land 4807 ha

Total Agricultural Land - 3326 ha.

Total Culturable waste - 529 ha.

2.3 Legal Status and Land Tenure: The project area is mostly reserve and protected forest land. The hamlets and settlements are located on revenue land which is under private ownership.

2.4 Existing Development Programmes: The Parvati Hydel Project in Kullu District, and the Sanjay Vidyut and Nathpa Jhakeri Hydel Projects in Kinnaur District are the two development programmes being undertaken in areas adjacent to the Park.

3. Local Dependencies on the Protected Area The dependencies of the local people on the Park can be divided into two major categories, which are:-

3.1 Biomass: The biomass dependency of the local poeple on the Park is for the maintenance of their livestock. As already mentioned, the local people rear goats and sheep which are taken for summer grazing to the Alpine Pastures located inside the Park. They also collect small quantities of fodder to store for the winter months.

3.2 Cash: The cash dependency of the local people on the Park manifests itself mainly in the extraction of Medicinal Herbs and Aromatic Plants, as well as Guchis (Morel Mushrooms). These activities, details of which have been given above, are the major source of monetary income for the local people.

ANNEXURE I

Forest Types reported from Great Himalayan NP

1) Ban Oak Forest 12/C1(a)

2) Moist Deodar Forest 12/C1(c)

3) Western Mixed Coniferous Forest 12/C1(d)

4) Moist Temperate Deciduous Forest 12/C1(e)

5) Kharsu Oak Forest 12/C2(a)

6) Western Himalayan Upper Oak/Fir Forest 12/C2(b)

7) Montane Bamboo Brakes 12/DS1

8) Himalayan Temperate Parkland 12/DS2

9) Himalayan Temperate Pastures 12/DS3

10) West Himalayan Sub-Alpine Fir Forest 14/C1(a)

11) Sub-Alpine Pastures 14/DS1

12) Birch/Rhododendron Scrub Forest 15/C1

13) Deciduous Alpine Scrub 15/C2

14) Alpine Pastures 15/C3

Source: mp, FV1, Q.A1, dir

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ANNEXURE 7

LIST OF MEDICINAL HERBS REPORTED FROM GREAT HIMALAYAN NATIONAL PARK

LATIN NAME	LOCAL NAME	ENGLISH NAME	USES	
Aconitum heterophyllum	Ateas, Atis, Patis	Atis root	Root - to treat fever, stomach ache	Root - febrifuge
Acorus calamus (PA/FV1)	Bach			Rhizome - mental ailments, dysentery
Aieslizea aptera (PA/FV1)	Karaibuti, Sathjalari	Aerons Rod		Root - diuretic, stomach aches
Angelica glauca	Chora		Root - to treat stomach aches & wind	Root - condiment and spice, carminative diaphoretic, expectorant
Artemisia maritima (PA/FV1)	Seski, Kirmala	Worm Seed		Whole plant - laxative floral tops - vermifuge
Atropa acuminata (PA/FV1)	Jharka?	Belladonna		Root and leaf - narcotic, sedative, diuretic, mydriatic
Berberis lyciua (PA/FV1)	Kasmal, Kirmora			Root - various uses
Corydalis govaniana	Bhutakishi		Medicinal	
Cuminum cyminum/Carum carvi?s (PA/FV1)	Kala jeera			Seed - flavouring
Dactylorhiza hatagirea	Hathpanja, Salam Panja, Hathjari		Root - to treat warts, boils (FV1)	
Dioscorea deltoidea	Shingli mingli		Root - use for soap	Tuber - soap for washing wool, silk, hair fish poison lice killer
Girardiana heterophylla	Bichhu booti, Chikri	Himalayan Nettle	Leaf - saag/chutney	
Juniperus squamata	Bittal		Incense	
Jurinea dolomiaea	Dhupe		Incense	
Jurinea macrocephala	Dhoop, Gugal		Root - incense, impt. in religious functions	d.o.
Kaempferia galanga (PA/FV1)	Kapoor kachri, Chandra moola			Rhizome - carminative, expectorant
Leptadenia reticulata (PA/FV1)	Dori			Whole plant - stimulant, restorative
Morchella esculenta	Gucchi	Morell mushroom	Whole mushroom eaten	
Nardostachys jatamansi (PA/FV1)	Jatamansi, Balchora			Rhizome - various uses
Physochilaina praealata (PA/FV1)	Bajar bang, Laltang			Leaf - narcotic, mydriatic seed - vermifuge to treat round worms

LATIN NAME	LOCAL NAME	ENGLISH NAME	USES	
Picrorhiza kurroa	Karoo, Kutki		Medicinal	Root and rhizome - adulterant of Indian gentian cholagogue laxative
Pistacia integerrima	Kakra, Kakri, Kakkar Singi		Fruit - to treat coughs: ash of fruit used	Wood - decoration leaf galls - dyeing, tanning, carminative
Podophyllum hexandrum (PA/FY1)	Ban kakri, Bakrachinaka, Bhavanbakua, Papra, Papri	Indian Podophyllum		Various parts for various ailments
Polygonatum vertiallatum (PA/FY1)	Salam misri			
Rheum emodi (PA/FY1)	Reward chini, Dolu			Root and rhizome - purgative, astringent, tooth powder
Salvia moorcroftiana	Thooth, Thunt		Root - soap (commercial)	Various parts - vermifuge, poultice, emetic
Saussurea lappa/costus? (PA/FY1)	Kuth, Kur, Pachak	Costus	Medicinal	Root - incense, other uses
Sida acuta (PA/FY1)	Bariala, Bariara			
Thalictrum foliolosum (PA/FY1)	Gurbiani, Pilazari, Mamiri			Root - diuretic, purgative
Thymus serpyllum (PA/FY1)	Banajwain	Wild thyme	Medicinal & Flavouring	Shoots - flavouring leaf - beverage seed - vermifuge leaf & floral tops - aromatic oil
Valeriana jatamansi	Mushkbala, Mihani	Indian Valerian	Leaf & Root - added to dhoop, cosmetic	Root & rhizome - incense and perfume to treat hysteria & hypochondria
Viola odorata/serpens	Banafsha		Flower & leaf - to treat wounds, fever & headaches	Flower - emollient, demulcent leaf - painkiller, perfume root - emetic
Zanthoxylum armatum (PA/FY1)	Tiaru, Tezbal, Nepali dhania			All parts - various uses
	Maora kala		Root - to treat maggot infected wounds	
	Losar		Leaf - to treat throat aches, generates heat	
	Banajaan		Leaf - crushed & used to treat stomach ache	
	Tardi		Root - to make sabzi & acchaar	
	Mungo		Tuber - to make sabzi	
	Baria		Flower - to treat diahorrea	

LATIN NAME	LOCAL NAME	ENGLISH NAME	USES
	Talash/Sharbul		Talash=Leaf & flower - for itching Sharbul=tuber - grated & used to treat boils
	Shabla		Root - chewed & used to clean eyes of livestock
	Kaodakat		To clean eyes of livestock
	Nasangur		Root - outer covering used to make tea
	Berthad		Leaf - used as incense like Dhoop.
	Balcharr		Root
	Lalchuri		Root - to clean and treat wounds
	Mehendi		Whole plant - dye, used like henna for decoration of hands & feet

ANNEXURE 3

LIST OF MAMMALS REPORTED FROM GREAT HIMALAYAN NP

COMMON NAME	SCIENTIFIC NAME	LOCAL NAME
Bear, Brown	Ursus arctos	Lal Bhaloo, Seta Bhaloo, Shaim
Bear, Himalayan Black	Selenarctos thibetanus	Reech, Kala-Bhaloo
Cat, Jungle	Felis chaus	
Civet, Himalayan Palm	Paguma larvata	
Deer, Barking or Muntjac	Muntiacus muntjak	Kakkar
Deer, Musk	Moschus moschiferus	Kastura Bira
Fox, Red	Vulpes vulpes	Lomri
Goral	Nemorhaedus goral	Ghorar
Ibex	Capra ibex	
Jackal	Canis aureus	Gidder
Langur, common	Presbytis entellus	Langur, Guni
Leopard, Snow, or Ounce	Panthera uncia	
Leopard, or Panther	Panthera pardus	Bragh
Leopard-cat	Felis bengalensis	
Macaque, Rhesus	Macaca mulatta	Bander
Marten, Himalayan Yellowthroated	Martes flavicula	Gotu
Mouse, House	Mus musculus	
Mouse-Hare, Himalayan	Ochotona roylei	
Porcupine, Hodgson's	Hystrix hodgsoni	
Porcupine, Indian	Hystrix indica	
Serow	Capricornis sumatraensis	Eau
Sheep, Blue or Bharal	Pseudois nayaur	Niatu, Bharal
Shrew, Grey Musk or House Shrew	Suncus murinus	
Shrew, Himalayan	Soriculus nigrescens	

LIST OF MAMMALS REPORTED FOR GREAT HIMALAYAN NP

COMMON NAME	SCIENTIFIC NAME	LOCAL NAME
Shrew, Himalayan Water		
Squirrel, Common Giant Flying	Petaurista petaurista	
Squirrel, Kashmir Flying	Hylopetes fimbriatus	
Tahr, Himalayan	Hemitragus jemlahicus	Karth, Bakri
Vole, Royle's	Alticola roylei	
Weasel, Himalayan	Mustela sibirica	
Wolf	Canis lupus	Bherija

(Source: np, Park Authorities/Q.A2/FY2)

ANNEXURE 4

LIST OF BIRDS REPORTED FROM GREAT HIMALAYAN NP

COMMON NAME	LATIN NAME	
Accentor, Alpine	Prunella collaris	
Accentor, Altai	Prunella himalayana	
Accentor, Rufous-breasted	Prunella strophiata	
Babbler, Blackthroated	Stachyris nigriceps	
Babbler, Goldheaded	Stachyris chrysaea	
Babbler, Redbilled	Stachyris pyrrhops	
Babbler, Redheaded	Stachyris ruficeps	
Babbler, Rufousnecked Scimitar	Pomatorhinus ruficollis	
Babbler, Rustycheeked Scimitar	Pomatorhinus erythrogenys	
Babbler, Slatyheaded Scimitar	Pomatorhinus horsfieldii	
Babbler, Slenderbilled Scimitar	Xiphirhynchus superciliaris	*
Babbler, Spotted	Pellorneum ruficeps	
Barbet, Goldenthroated	Megalaima franklinii	*
Barbet, Great Hill	Megalaima virens	
Barwing, Hoary	Actinodura nipalensis	*
Barwing, Spectacled	Actinodura egertoni	*
Blackbird	Turdus merula	
Blackbird, Greywinged	Turdus boulboul	
Black Redstart	Phoenicurus caevuleocephalus	
Blackbird, Whitecollared	Turdus albocinctus	
Bluebird, Fairy	Irena puella	*
Bulbul, Black	Hypsipetes madagascariensis	
Bulbul, Blackheaded Yellow	Pycnonotus melanicterus	
Bulbul, Redvented	Pycnonotus cafer	
Bulbul, Rufousbellied	Hypsipetes mcclellandi	*
Bulbul, Striated Green	Pycnonotus striatus	*
Bulbul, Whitecheeked	Pycnonotus leucogenys	
Bullfinch, Brown	Pyrrhula nipalensis	
Bullfinch, Redheaded	Pyrrhula erythrocephala	
Bunting, Crested	Melophus lathami	
Bunting, Rock	Emberiza cia	
Buzzard	Buteo buteo	
Buzzard, Longlegged	Buteo rufinus	
Buzzard, Upland	Buteo hemilasius	
Chat, Blue	Erithacus brunneus	
Chat, Collared Bush	Saxicola torquata	
Chat, Dark-grey Bush	Saxicola ferrea	
Chloropsis, Goldfronted	Chloropsis aurifrons	
Chloropsis, Orangebellied	Chloropsis hardwickii	
Chough, Redbilled	Pyrrhocorax pyrrhocorax	
Chough, Yellowbilled	Pyrrhocorax graculus	
Common Rosefinch	Carpodacus erythrinus	
Creeper, Himalayan Tree	Certhia himalayana	
Creeper, Tree	Certhia familiaris	
Creeper, Wall	Tichodroma muraria	
Crossbill	Loxia curvirostra	
Crow, House	Corvus splendens	
Crow, Jungle	Corvus macrorhynchos	
Crow-pheasant	Centropust sinensis	
Cuckoo, Himalayan	Cuculus saturatus	

COMMON NAME	LATIN NAME	
Cuckoo, Indian	Cuculus micropterus	
Cuckoo, Indian Plaintive	Cacomantis passerinus	
Cuckoo, Pied Crested	Clamator jacobinus	
Cuckoo, Sirkeer	Taccocua leschenaultii	
Cuckoo, Small	Cuculus poliocephalus	
Cuckoo, The	Cuculus canorus	
Curlew	Numenius arquata	*
Curlew, Stone	Burhinus oedicnemus	
Darter	Anhinga rufa	
Dipper, Brown	Cinclus pallasii	
Dove, Indian Ring	Streptopelia decaocto	
Dove, Little Brown	Streptopelia senegalensis	
Dove, Red Turtle	Streptopelia tranquebarica	
Dove, Rufous Turtle	Streptopelia orientalis	
Dove, Spotted	Streptopelia chinesis	
Dove, Turtle	Streptopelia turtur	
Drongo, Ashy	Dicrurus leucophaeus	
Drongo, Black	Dicrurus adsimilis	
Drongo, Bronzed	Dicrurus aeneus	
Drongo, Haircrested	Dicrurus hottentottus	
Eagle, Black	Ictinaetus malayensis	
Eagle, Crested Serpent	Spilornis cheela	
Eagle, Golden	Aquila chrysaetos	
Eagle, Greyheaded Fishing	Ichthyophaga ichthyaetus	
Eagle, Imperial	Aquila heliaca	
Eagle, Short-toed	Circaetus gallicus	
Eagle, Tawny	Aquila rapax	*
Egret, Little	Egretta garzetta	
Falcon, Redlegged	Falco vespertinus	*
Finch, Redbrowed	Callacanthis burtoni	
Finch, Tibet Snow	Montifringilla adamsi	
Flowerpecker, Firebreasted	Dicaeum ignipectus	
Flowerpecker, Tickell's	Dicaeum erythrorhynchos	
Flycatcher, Bluethroated	Muscicapa rubeculoides	
Flycatcher, Brown	Muscicapa latirostris	
Flycatcher, Ferruginous	Muscicapa ferruginea	*
Flycatcher, Greyheaded	Culicicapa ceylonensis	
Flycatcher, Kashmir Redbreasted	Muscicapa subrubra	
Flycatcher, Largebilled Blue	Muscicapa banyumas	*
Flycatcher, Little Pied	Muscicapa westermanni	*
Flycatcher, Orangegorgeted	Muscicapa strophiata	
Flycatcher, Pale Blue	Muscicapa unicolor	
Flycatcher, Paradise	Terpsiphone paradisi	
Flycatcher, Pigmy Blue	Muscicapella hodgsoni	*

LIST OF BIRDS REPORTED FROM GREAT HIMALAYAN NP

COMMON NAME	LATIN NAME	
Flycatcher, Redbreasted	Muscicapa parva	
Flycatcher, Rufoustailed	Muscicapa ruficauda	
Flycatcher, Slaty Blue	Muscicapa leucomelanura	
Flycatcher, Sooty	Muscicapa sibirica	
Flycatcher, Verditer	Muscicapa thalassina	
Flycatcher, Whitebrowed Blue	Muscicapa supercilaris	
Flycatcher, Whitebrowed Faintail	Rhipidura aureola	
Flycatcher, Whitegorgeted	Muscicapa monileger	
Flycatcher, Whitethroated Faintail	Rhipidura albicollis	
Flycatcher, Yellowbellied Fantail	Rhipidura hypoxantha	
Flycatcher-shrike, Pied	Hemipus picatus	
Flycatcher-warbler, Blackbrowed	Seicercus burkii	
Flycatcher-warbler, Blackfaced	Abroscopus schisticeps	*
Flycatcher-warbler, Chestnut-headed	Seicercus castaniceps	*
Flycatcher-warbler, Greycheeked	Seicercus poliogenys	*
Flycatcher-warbler, Greyheaded	Seicercus xanthoschistos	
Flycatcher-warbler, Yellowbellied	Abroscopus superciliaris	*
Forktail, Little	Enicurus scouleri	
Forktail, Spotted	Enicurus maculatus	
Goldcrest	Regulus regulus	
Goldfinch	Carduelis carduelis	
Goshawk	Accipiter gemtilis	
Grandala, Hodgson's	Grandala coelicolor	
Greenfinch, Himalayan	Carduelis spinoides	
Griffon, Himalayan	Gyps himalayensis	
Grosbeak, Allied	Coccothraustes affinis	
Grosbeak, Black-and-Yellow	Coccothraustes icterioides	
Grosbeak, Spottedwinged	Coccothraustes melanozanthos	
Grosbeak, Whitewinged	Coccothraustes carnipes	
Hawk-cuckoo, Large	Cuculus sparverioides	
Hawk-eagle, Booted	Hieraaetus pennatus	
Hawk-eagle, Hodgson's	Spizaetus nipalensis	
Howk, Sparrow	Accipiter nisus	
Hen-harrier	Circus cyaneus	
Hobby	Falco subbuteo	
Hoopoe	Upupa epops	
Jay	Garrulus glandarius	
Jay, Blackthroated	Garrulus lanceolatus	
Kestrel	Falco tinnunculus	
Kestrel, Lesser	Falco naumanni	*
Kingfisher, Whitebreasted	Halcyon smyrnesis	
Kite, Pariah	Milvus migrans	
Magpie, Redbilled Blue	Cissa erythrorhyncha	
Magpie, Yellowbillied Blue	Cissa flavirostris	
Martin, Crag	Hirundo rupestris	

LIST OF BIRDS REPORTED FROM GREAT HIMALAYAN NP

COMMON NAME	LATIN NAME	
Martin, House	Delichon urbica	
Minivet, Longtailed	Pericrocotus ethologus	
Minivet, Scarlet	Pericrocotus flammeus	
Minivet, Shortbilled	Pericrocotus brevirostris	*
Minivet, Yellowthroated	Pericrocotus solaris	*
Minla, Redtailed	Minla ignotincta	*
Myna, Common	Acridotheres tristis	
Myna, Jungle	Acridotheres fuscus	
Nightjar, Indian Jungle	Caprimulgus indicus	
Niltava, Large	Muscicapa grandis	
Niltava, Rufousbellied	Muscicapa sundara	
Niltava, Small	Muscicapa macgrigoriae	
Nutcracker	Nucifraga caryocatactes	
Nuthatch, Whitecheeked	Sitta leucopsis	
Nuthatch, Whitetailed	Sitta himalayensis	
Oriole, Blacknaped	Oriolus chinesis	*
Owl, Brown Wood	Strix leptogrammica	
Owl, Great-Horned or Eagle-owl	Bubo bubo	
Owl, Short-eared	Asio flammeus	
Owl, Spotted Scops	Otus spilocephalus	
Owl, Tawny Wood	Strix aluco	
Owlet, Barred	Glaucidium cuculoides	
Owlet, Collared Pigmy	Glaucidium brodiei	
Parakeet, Blossomheaded	Psittacula cyanocephala	
Parakeet, Rose-ringed	Psittacula krameri	
Parakeet, Slatyheaded	Psittacula himalayana	
Partridge, Black	Francolinus francolinus	
Partridge, Chukor	Alectoris chukar	
Partridge, Common Hill	Arborophila torqueola	
Partridge, Snow	Lerwa lerwa	
Peafowl, Common	Pavo cristatus	
Pheasant, Chir	Catreus wallichii	
Pheasant, Kalij	Lophura leucomelana	
Pheasant, Koklas	Pucrasia macrolopha	
Pheasant, Monal	Lophophorus impejanus	
Piculet, Speckled	Picumnus innominatus	
Pigeon, Ashy Wood	Columba pulchricollis	
Pigeon, Blue Rock	Columba livia	
Pigeon, Hill	Columba rupestris	*
Pigeon, Snow	Columba leuconota	
Pigeon, Speckled Wood	Columba hodgsonii	
Pigeon, Wedgetailed Green	Treron sphenura	
Pipit, Indian Tree	Anthus hodgsoni	
Pipit, Tree	Anthus trivialis	
Pipit, Upland	Anthus sylvanus	
Plaincoloured mountain Finch	Leocosticte nemoricola	
Plover, Eastern Golden	Pluvialis dominica	*
Raven	Corvus corax	
Redstart, Bluefronted	Phoenicurus frontalis	
Redstart, Blueheaded	Phoenicurus caeruleocephalus	
Redstart, Eversmann's	Phoenicurus erythronotus	

LIST OF BIRDS REPORTED FROM GREAT HIMALAYAN NP

COMMON NAME	LATIN NAME	
Redstart, Plumbeous	Rhyacornis fuliginosus	
Redstart, Whitecapped	Chaimarrornis leucocephalus	
Redstart, Whitethroated	Phoenicurus schisticeps	
Robin, Golden Bush	Erithacus chrysaeus	
Robin, Orangeflanked Bush	Erithacus cyanurus	
Robin, Rufousbellied Bush	Erithacus hyperythrus	*
Robin, Whitetailed Blue	Cinclidium leucurum	*
Rosefinch, Pinkbrowed	Carpodacus rhodochrous	
Rubythroat	Erithacus calliope	
Shikra	Accipiter badius	
Shortwing, Gould's	Brachypteryx stellata	
Shortwing, Lesser	Brachypteryx leucophrys	
Shortwing, Whitebrowed	Brachypteryx montana	
Shrike, Greybacked	Lanius tephronotus	
Shrike, Rufousbacked	Lanius schach	
Shrike-babbler, Chestnut-throated	Pteruthius melanotis	*
Shrike-babbler, Green	Pteruthius xanthochlorus	
Shrike-babbler, Redwinged	Pteruthius flaviscapis	
Shrike-babbler, Rufousbellied	Pteruthius rufiventer	*
Sibia, Blackcapped	Heterophasia capistrata	
Siva, Barthroated	Minla strigula	
Siva, Bluewinged	Minla cyanouroptera	*
Snipe, Solitary	Gallinago solitaria	
Snowcock, Himalayan	Tetraogallus himalayensis	
Sparrow, Cinnamon Tree	Passer rutilans	
Sparrow, House	Passer domesticus	
Sparrow, Tree	Passer montanus	*
Sunbird, Yellowbacked	Aethopyga siparaja	
Swift, Alpine	Apus melba	
Swift, Large Whiterumped	Apus pacificus	
Swiftlet, Himalayan	Collocalia brevirostris	
Swiftlet, Indian Edible-nest	Collocalia unicolor	
Thrush, Blackfaced Laughing	Garrulax affinis	*
Thrush, Blue Rock	Monticola solitarius	
Thrush, Blue Whistling	Myiophonus caeruleus	
Thrush, Blueheaded Rock	Monticola cinclorhynchus	
Thrush, Bluewinged Laughing	Garrulax squamatus	
Thrush, Chestnut-bellied Rock	Monticola rufiventris	
Thrush, Greyheaded	Turdus rubrocanus	
Thrush, Greysided Laughing	Garrulax caerulatus	*
Thrush, Large Brown	Zoothera monticola	
Thrush, Longtailed Mountain	Zoothera dixoni	
Thrush, Mistle	Turdus viscivorus	
Thrush, Plainbacked Mountain	Zoothera mollissima	
Thrush, Plaincoloured Laughing	Garrulax subunicolor	
Thrush, Redheaded Laughing	Garrulax erythrocephalus	

COMMON NAME	LATIN NAME	
Thrush, Rufouschinned Laughing	Garrulax rufogularis	
Thrush, Scaly	Zoothera dauma	
Thrush, Streaked Laughing	Garrulax lineatus	
Thrush, Striated Laughing	Garrulax striatus	
Thrush, Variegated Laughing	Garrulax variegatus	
Thrush, Whitecrested Laughing	Garrulax leucolophus	
Thrush, Whitespotted Laughing	Garrulax ocellatus	
Thrush, Whitethroated Laughing	Garrulax albogularis	
Tit, Brown Crested	Parus dichrous	
Tit, Crested Black	Parus melanolophus	
Tit, Firecapped	Cephalopyrus flammiceps	
Tit, Greenbacked	Parus monticolus	
Tit, Grey	Parus major	
Tit, Redheaded	Aegithalos concinnus	
Tit, Rufousbelied Crested	Parus rubidiventris	
Tit, Simla Black	Parus rufonuchalis	
Tit, Whitethroated	Aegithalos niveogularis	
Tit, Yellowbrowed	Sylviparus modestus	
Tit, Yellowcheeked	Parus xanthogenys	
Tit-babbler, Chestnut-headed	Alcippe castaneceps	*
Tit-babbler, Goldenbreasted	Alcippe chrysotis	*
Tit-babbler, Whitebrowed	Alcippe vinipectus	
Tit-warbler, Stoliczka's	Leptopoecile shophiae	
Tragopan, Western	Tragopan melanocephalus	
Tree Pie, Himalayan	Dendrocitta formosae	
Tree Pie, Indian	Dendrocitta vagabunda	
Vulture, Bearded	Gypaetus barbatus	
Vulture, Black	Aegypius monachus	
Vulture, Egyptian	Neophron percnopterus	
Vulture, Griffon	Gyps fulvus	*
Vulture, Indian Black	Sarcogyps calvus	
Vulture, Indian Longbilled	Gyps indicus	
Vulture, Indian Whitebacke(	Gyps bengalensis	
Wagtail, Grey	Motacilla cinerea	
Wagtail, Large Pied	Motacilla maderaspatensis	
Wagtail, White	Motacilla alba	
Wagtail, Yellowheaded	Motacilla citreola	
Warbler, Aberrant Bush	Cettia flavolivacea	
Warbler, Blackthroated Hill	Prinia atrogularis	*
Warbler, Blyth's Leaf	Phylloscopus reguloides	
Warbler, Blyth's Reed	Acrocephalus dumetorum	
Warbler, Brown Hill	Prinia criniger	
Warbler, Brown Leaf	Phylloscopus collybita	
Warbler, Chestnut-headed Ground	Tesia castaneocoronata	
Warbler, Dull Green Leaf	Phylloscopus trochiloides	
Warbler, Greyfaced Leaf	Phylloscopus maculipennis	

LIST OF BIROS REPORTED FROM GREAT HIMALAYAN NP

COMMON NAME	LATIN NAME	
Warbler, Greyfaced Leaf	Phylloscopus maculipennis	
Warbler, Large Bush	Cettia major	
Warbler, Large Crowned Leaf	Phylloscopus occipitalis	
Warbler, Largebilled Leaf	Phylloscopus magnirostris	
Warbler, Orangebarred Leaf	Phylloscopus pulcher	
Warbler, Pallas's Leaf	Phylloscopus proregulus	
Warbler, Plain Leaf	Phylloscopus neglectus	
Warbler, Rufouscapped Bush	Cettia brunnifrons	
Warbler, Slatybellied Ground	Tesia olivea	*
Warbler, Smoky Willow	Phylloscopus fuligiventer	*
Warbler, Strongfooted Bush	Cettia montana	
Warbler, Tickell's	Phylloscopus affinis	
Warbler, Tytler's Leaf	Phylloscopus tytleri	
Warbler, Yellowbrowed Leaf	Phylloscopus inornatus	
White-eye	Zosterops palpebrosa	
Woodcock	Scolopax rusticola	
Woodpecker, Brownfronted Pied	Picoides auriceps	
Woodpecker, Crimsonbreasted Pied	Picoides cathpharius	*
Woodpecker, Fulvousbreasted Pied	Picoides macei	
Woodpecker, Himalayan Pied	Picoides himalayensis	
Woodpecker, Large Yellownaped	Picus flavinucha	
Woodpecker, Rufous	Micropternus brachyurus	
Woodpecker, Scalybellied Green	Picus squamatus	
Woodpecker, Small Yellownaped	Picus chlorolophus	
Wren	Troglodytes troglodytes	
Wren-babbler, Scalybreasted	Pnoepyga albiventer	
Wren-babbler, Tailed	Spelaeornis caudatus	
Yuhina, Rufousvented	Yuhina occipitalis	*
Yuhina, Stripethroated	Yuhina gularis	
Yuhina, Whitebellied	Yuhina xantholeuca	*
Yuhina, Yellownaped	Yuhina flavicollis	

* The occurance of these species inside the park is at variance with their known distribution in Salim Ali, et.al.

Source: Garson P.J., & Gaston A.J. Himalayan Wildlife Project III A Re-appraisal of the GHNP. July 1992

Directory, Park Authorities, Q.A2

ANNEXURE - 5

HERB COLLECTION IN GREAT HIMALAYAN NATIONAL PARK

1. HERBS AND HERB COLLECTION

For the purpose of this note, herb collection in Great Himalayan National Park has been defined as the extraction of plants having medicinal, aromatic and/or other properties.

Although a total of 309 species of trees and other plants have been reported from the Park (Singh et al. 1990), only 61 have been reported as "herbs" from different sources (see Annexure-2). Of these only 33 have been confirmed with scientific, local and English names (where available) (see Annexure-2). For the remaining 28 species only local names are available (see Annexure - 2). Species reportedly having commercial value are : Balchhar (Nardostachys jatamansi), Dhoop (Jurinea macrocephalla), Glaeucda (scientific not known), Guchhi (Morchella esculenta), Hathpanja (Dactyloirhiza hatagirea), Karoo (Picrorhiza kurroa), Mehndi (scientific name not known), Nihanoo (Valeriana jatamansi), Patish (Aconitum heterophyllum) and Shingli mingli (Dioscorea deltoidea).

Herbs are found in a variety of locations including forests, meadows and cliff faces with most of them occurring at high altitudes and are being collected from all over the Park where they grow. A list of areas visited by herb collectors is at Annexure - A.

Most of these plants are extracted for properties contained in their roots. The method of collection involves the uprooting of the plants using a sharp edged trowel (gaint), while other species have only their leaves e.g. Jharka (Scientific name not known) or flowers e.g. Banafsha (Viola odorata), taken. In the case of Guchhi (Morchella esculenta) the whole plant is uprooted and taken.

Herb collection is a physically strenuous activity involving between four to six trips into the Park per person, per season (ref. fv'92 schs.). It is also a dangerous activity as herbs are often found in not easily accessible locations, at high altitudes and on difficult terrain, with a number of fatalities taking place among collectors every year (ref fv'92 schs.). A weight of upto 40 kg of rations and personal equipment has to be carried up on each herb collection trip and a similar amount in herbs carried down.

Once the herbs are collected they are dried in the sun or sometimes over a fire in an improvised oven. This task is carried out in the Park itself as it reduces the weight of the herbs by upto 90% and a larger quantity can be carried back. Sometimes salt is added as a preservative to some species of herbs during the drying period. (ref. fv '91 sch.)

Herbs are collected from May to November with the peak season being between June-July and August-September. There is no official declaration of the commencement or termination of the herb collection season. One of the reasons given for the decline in availability and quality of herbs is their "early" extraction. According to local people the best time to collect is after "seeding" has taken place. For most plants this does not occur till after July when the previous seasons snow has melted followed by few weeks of sun prior to the monsoon, in which the plant grows, matures,flowers and seeds (AQHCS # Sainj 01). Due to the increase in demand for herbs they are now being extracted in the growing season which in turn has led to availability going down progressively over the years (see Table - 1).

Table - 1

STATUS OF SOME HERBS REPORTED FROM GREAT HIMALAYAN NATIONAL PARK

Local/ (scientific) name	Status * (A,R,E)	Changes in status	Reasons for change
Balchhar (Nardostachys jatamansi)	R	none	---
Dhoop (Jurinea macrocephalla)	A/R	availability low in recent years	annual extraction, no fully mature plants
Glaeucda (scientific not known)	A	none	---
Guchhi (Morchella esculenta)	A	none, availability depends on weather	---
Hathpanja (Oactylorhiza hataqirea)	A	none	---
Karoo (Picrorhiza Kurroa)	R	availability low in recent years	early extraction, no seeding
Mehndi (scientific not known)	A	none	---
Nihanoo (Valeriana jatamansi)	A/R	availability low	over extraction, no seeding
Patish (Aconitum heterophyllum)	R	availability low in recent years	early extraction, no seeding
Shingli mingli (Dioscorea deltoidea)	A/R	availability low	over extracted in previous years

* A : Abundant R : Rare E : Extinct

Source : AQHCS # Sainj 01

Interviews with Park authorities, herb collectors and other local people have revealed that there may be a significant amount of "illegal" herb collection that the Park is also being subject to. It must however be pointed out here that since no satisfactory definition exists for what is "legal" herb collection (see Section 5. Legal Status), information on the "illegal" aspects of the activity is based primarily on peoples perceptions and what is locally understood as a "right" to herb collection.

The quantum of illegal collection and, what are the species being extracted, is unknown. Illegal collection includes both those who do not have any right to collect and those who may have a right but collect from areas outside the jurisdiction of their right.

The maximum amount of illegal collection has been reported from the Jiwa Nal valley of the Park. This may be due to the fact that the Jiwa Nal is the least protected of the three valleys of the Park. The nearest Forest Guard to this valley is stationed at Pashi village, approximately 6 km outside the Park boundary. Phangchi Galu in this valley , located at an altitude of 4636 msl on the extreme north boundary of the Park, is reported to be a major entry/exit point for illegal herb collectors (pers. comm. Virinder Sharma, 1991).

2. HISTORY

Herb collection has probably been taking place in the region for centuries. The earliest references to the activity have been made by Anderson who states, "I have seen girls bringing to Sultanpur little baskets of wild violets (banafsha) and getting in exchange some salt: so also karu and patis are collected...". (1886:11)

Most of the collectors spoken to over the last two field visits reported that they had started collecting herbs by the time they were about 14 or 15 years old, and that they had heard of the activity being practised by several generations of their families (ref. fv'92 schs.).

However, the commercial market for herbs, opened up at different points in time for different species of herbs (see Table-2).

Table-2

ORIGIN OF COMMERCIAL VALUE OF SOME HERBS REPORTED FROM GREAT HIMALAYAN NATIONAL PARK

Local/ (scientific) name	No. of years ago
Balchhar (Nardostachys jatamansi)	20-25
Dhoop (Jurinea macrocephalla)	14
Glaeucda (scientific not known)	2-3
Guchhi (Morchella esculenta)	20-25
Hathpanja (Dactyloirhiza hatagirea)	15
Karoo (Picrorhiza kurroa)	16
Mehndi (scientific not known)	3-4
Nihanoo (Valeriana jatamansi)	40-45
Patish (Aconitum heterophyllum)	40
Shingli mingli (Dioscorea deltoidea)	not known

Source : AQHCS # Sainj 01

3. HERB COLLECTORS

Herb collectors come to the Park from villages along the north-west to south-west boundary. Illegal collectors are reported to come from villages to the north of the Park. Anderson suggests that herb collection may have been an occupation of the "...poorer classes...(who) by the sale...eke out a scanty livelihood" (1886 :11).

Data collected over previous field visits seems to indicate that nearly every family from these villages has at least one person doing herb collection and in many cases all able-bodied men from a family are

engaged in making collection trips into the Park. (ref. fv'92 schs.)

Until recently it was believed that herb collection was an exclusively male activity. However, on the July '92 field visit women were encountered collecting Guchhi (Morchella esculenta) in Sainj and Nehani and Dhup in the Tirthan valley. The total extent of involvement of women in herb collection is not yet known.

Nepali settlers, who have started settling down in villages adjacent to the Park since the last 10 years have reportedly also taken up herb collection among their other activities (AQHCS # Sainj 01).

4. LEGAL STATUS

Herb collection in the Park is reported to be carried out on the basis of a "right". All the herb collectors encountered so far have claimed to be "rightholders". Nevertheless, it still remains unclear, a) what is a "right" and b) who qualifies as a "rightholder".

In the course of trying to understand these two concepts several statements were reported to the Team as "facts" by different sources. However, none of these has so far been backed up with documentary, or any other form of evidence.

The collectors themselves claim that the details of their rights are recorded in documents available with the Forest Department at Sainj and Banjar. According to the Park authorities these are recorded in Alex Anderson's Settlement Report of 1886 The Team has so far been unsuccessful in obtaining a full copy of this Report. However, preliminary investigations into an abbreviated copy available at the Kullu Forest Division DFO's office have revealed, that except for 2 or 3 exception, rights for herb collection have not been recorded for any of the hamlets in the periphery of the park.

5. IMPACT OF HERB COLLECTION

No studies have yet been done to assess the impact of herb

collection on the habitat or on the ecological status of herbs. However, the Park authorities and other experts are of the opinion that of all the human activities taking place inside the Park, herb collection is having the most serious impact (Vijay Kumar, Sanjeeva Pandey, Virinder Sharma, A.J. Gaston and P.J. Garson, pers. comm., 1991).

Interviews with herb collectors have indicated that there has been a progressive decline in the quality and quantity of herbs. For example, some 6-8 years ago the roots of Dhoop (Jurinea macrocephalla) used to be as thick as a persons forearm from a 4-5 year old plant. today 4-5 year old plants are not to be found any where, only 1 year old plants exist and these yield a root no thicker than a finger (AQHCS # Sainj 01). See also Table-1 for status of other herbs reported from the Park.

6. MANAGEMENT EFFORT

Herb collection today is being undertaken as it always has, regardless of the intention of the government to declare the area a National Park. The Park authorities have been attempting to monitor the quantum and extent of herb collection for the last 4 years by maintaining records at checkposts. There are at present two manned checkposts in the Park. The following information is recorded at a checkpost: name of collector(s), village of residence, date of entry and exit, herb species and quantity collected, and the area visited in the Park. However, there are far more entry/exit points to the Park than those where checkposts exist. In addition, these checkposts are not always manned as the current availability of personnel is very low.

Some sporadic efforts have been made in the past to control herb collection. Extraction of Shingli mingli (Dioscorea deltodia) has been banned by the State government. No details are available as to the basis for the imposition of this ban, how successful it proved and whether it is still in force. On the July '92 field visit, a group of six herb collectors, encountered at Maraur village in the Sainj valley, had

collected of Shingli Mingli. They had reportedly never heard of the ban and had been collecting the herb every year.(ref.fv sch). Some herb collectors encountered in the Tirthan valley also admitted to the fact that they collected this herb.

Till about a few years ago, any one could obtain a permit from the Park authorities to buy herbs for export out of Kullu District. In an attempt to regulate the trade a series of regulations were imposed by the Agricultural Marketing Commitee for Kullu Lahaul/Spiti. First, anyone wishing to export herbs had to register themselves with the Committee on payment of Rs. 100 as registration fees. The Committee then sends the list of applicants to Shimla where the names are either accepted or rejected. The final list of approved names is then sent to the Park Director who is then authorised to give export permits only to those traders/exporters whose names appear on this list.

ANNEXURE - A

AREAS VISITED BY HERB COLLECTORS IN GREAT HIMALAYAN NATIONAL PARK

1. Kande Dhar in Kalikanda PF
2. Sharyogi(?) in Kalikanda PF
3. Galu Thach in Kalikanda PF
4. Raal in Parli PF
5. Naina in Parli PF
6. Rakti in Parli PF
7. Paru/Chahen(?)
8. Gehera(?)
9. Thanoye(?)
10. Rakali(?)
11. Ropa(?)
12. Chaingarh(?)
13. Varhi Shahni(?)
14. Dudhshaïp(?)
15. Ghanaodi(?)
16. Ghienghati(?)
17. Chahan Gohan(?)
18. Dudhu Ropa(?)
19. Chaihan(?)
20. Maihan(?)
21. Pula(?)
22. Shakti
23. Shadogoli(?)

Note: All names marked (?) have been illegibly entered in the Park checkpost records. The verification of these names by the Park authorities is pending.

Source: 1989-90 Park checkpost records (Sainj Range, Bah Checkpost)

ANNEXURE - 8
LIST OF HERB DEALERS

S.No.	AGENCY	CITY	STATE	PIN	HERBS
1	Dabur S.K.Burman Pvt Ltd.				Herbal Crude Drugs
2	Krishna Pharmacy Pvt. Ltd.	Amritsar	Punjab	143001	Aconitum heterophylum (Atis), Cinnamomum tamala (Tejpatta), Cinnamomum zeylancium (Dalchini), Mesua ferrea (Nageshwar)
3	Dinesh Gurban Bawa & Sons	Amritsar	Punjab	143001	Herbal Crude Drugs
4	Ashok Kirana Bhandar	Amritsar	Punjab		Herbal Crude Drugs
5	Roshan Lal Syam Sunder	Amritsar	Punjab		Aconitum heterophylum (Atis), Acorus calamus (Barae), Saussurea lappa (Kuth), Gentiana spp., Picrorhiza kurroa (Karoo) ,Glycorhiza glabra, Valeriana spp.
6	Orient Traders	Amritsar	Punjab	143001	Aconite spp.(Aconite), Angelica glauca (Chora), Angelica archangelica, Berberis aristata, Colchicum luteum, Valeriana spp., Saussurea spp.
7	Gian Chand Ram Gopal	Amritsar	Punjab	143001	Herbal Crude Drugs
8	Bharat Agencies	Amritsar	Punjab		Herbal Crude Drugs
9	S.D.Mehta & Co.	Amritsar	Punjab	143001	Centella asiatica, Saussurea spp., Glycorhiza glabra, Picrorhiza kurroa (Karoo), Berberis aristata, Taxus baccata (Rakhal), Abies webbia
10	Sarwan Singh Lachhman Singh	Amritsar	Punjab		Apium graveolans (Celery seed), Mallotus phillipinis (Kammilla powder), Valeriana spp. roots, Valeriana jatamansi (Nihanoo)
11	Himalayan Traders	Amritsar	Punjab	143001	Angelica spp. roots, Acorus calamus (Barae), Colchicum candicans, Iris spp. roots
12	Deepak Bawa & Co.	Amritsar	Punjab	143001	Aconitum sp.,Chiraita (?), Swertia chiraita (?), Gentiana

LIST OF HERB DEALERS

S.No.	AGENCY	CITY	STATE	PIN	HERBS
					sp.(?), Picrorhiza (Karoo), Ruwolfia serpentina (?), Croceus sativus (?)
13	Kashmir Ayurvedic Works	Amritsar	Punjab	143001	Aconitum heterophylum (Atis), Cinnamomum tamala (Tejpatta), Cinnamomum zeylanicum (Dalchini), Mesua ferrea (Nageshwar)
14	Eastman and Co.	Calcutta	West Bengal	70002	Podoplyllum spp., Cothicum spp., Chiraita emodi (?), Valeriana spp., Rheum spp.
15	Biyanis	Calcutta	West Bengal	700013	Heracleum spp., Berberis spp., Dioscorea spp., Ergot spp., Solanum spp., Valeriana spp.
16	Sahkari Vikas Sangh Ltd	Chamoli	U.P.		Dioscorea spp., Picrorhiza spp., Acorus spp. Jurinea macrocephala (Dhoop) Artemisia spp.
17	Assam Drug Co.	Delhi		110006	Herbal Crude Drugs
18	Dewan Chand Dholari Dass & Co.	Delhi		110009	Atropa acuminta (Belladonna)
19	Drug and Alkaloid Co.	Delhi		110006	Gloriosa superba, Iphigenia stellate (?)
20	Ravashi Industrial Corp.	Delhi		110051	Ayurveda and Unani Medical Crude Drugs, Henna powder, Laugonia inermis (?)
21	Amar Kiran Co.	Delhi		110006	Apium graveolens (Celery seed), Mollotus phillipinis (Kammilla powder), Valeriana spp. roots, Valerina jatmansi (Nihanoo)
22	Rajidya Shital Prashad & Co.	Delhi		110006	Herbal Crude Drugs
23	Anant Ram Lachaman Dass Aggarwal	Delhi		110006	Apium graveolens (Celery seed), Mallotus phiillipinis(Kammilla powder), Valeriana spp. roots, Valarina jatamansi (Nihanoo)

LIST OF HERB DEALERS

S.No.	AGENCY	CITY	STATE	PIN	HERBS
24	Asian Drug Co.	Delhi		110006	Aconite spp., (Acpmote), Atropa spp., Berberis spp., Digitalis lanata, Saussurea lappa (Kuth), Valeriana jatamansi (Nihanoo)
25	Desh Rah Shah Avshadhalya	Haridwar	U.P.	249408	Herbal Crude Drugs
26	Mahesh Trading Co.	Lucknow	U.P.		Matricanis spp.
27	Lucknow Kirana Co.	Lucknow	U.P.		Valeriana spp., Solanum spp., Asparagus. spp.
28	Mahersh Trading Co.	Lucknow	U.P.		Matricaria spp., Rauwolfia spp., Asparagus spp.
29	Indo Herbelex and Chrmlex Traders	Muzaffar Nagar	U.P.	251001	Colchicum spp., Gloriosa spp.
30	Himalayan Herbalist	Nainital	U.P.		Valeriana, Piper spp., Marsilea spp.
31	Sharda Brothers Herb Suppliers and Commission	Nainital	U.P.		Valeriana spp.
32	Inder Singh Rawat	Nakuri	U.P.		Aconitum heterophyllum (Atis), Picrorhiza kurroa (Karoo), Nardostachys jatamansi (Nihani)
33	Aruna Brothers	New Delhi			Aconite spp. (Aconite), Atropa spp., Berberis spp., Digitalis lanata,Saussurea lappa (Kuth), Valeriana jatamannsi (Nihanoo)
34	Roshma Overseas Pvt. Ltd.	New Delhi		110001	Herbal Crude Drugs
35	Himalayan Drugs, Herbs & Alkaloids Syndicate	New Delhi		110035	Herbal Crude Drugs
36	Timex Agencies	New Delhi		110035	Herbal Crude Drugs
37	Mohan Dass Lal Chand	New Delhi		110006	Herbal Crude Drugs
38	Zubex India	New Delhi		110057	Herbal Crude Drugs

S.No.	AGENCY	CITY	STATE	PIN	HERBS
39	S. Chandera Enterprises	New Delhi		110001	Herbal Crude Drugs
40		New Delhi		110016	Dioscorea spp., Berberis spp., Valerinana spp., Canbtharanthis roseus
41	Parvatiya Shaskari Bhesaja Vikas	Pithoragar h	U.P.		Medicinal herbs of alpine and temperate zones, Picrohiza kurroa (karoo)
42	Northern India Pharmaceutical Lab	Saharanpur	U.P.	247001	Aconite spp. (Aconite), roots, Berberis spp., Rauwolfia roots, Gloriosa superba seeds
43	Himalaya Herbs Stores	Saharanpur	U.P.	247001	Aconite spp., Aristolcia spp., Atropa acuminata (Belladona), Hyocymus spp.
44	Brij Bhushan Lal Gupta	Saharanpur	U.P.		Dioscorea spp., Hyocymus spp., Nardostachys spp., Valeriana spp., Hibiscus spp.
45	Shobha Singh Contractor	Uttarkashi	U.P.		Jurinea macrocephala (Dhoop), Picrohiza kurroa (karoo)

Notes

1. Common English and/or local names of herbs and other plants are given in brackets

2. Scientific, common English, and local names of herbs and other plants have been standardised using Useful Plants of India, (CSIR 1986)

Source: Sharma, Dr. V. 1992

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KEY TO ABBREVIATIONS

AA	-	Adjacent Area (within 10 km radius of Park)
ADM	-	Additional District Magistrate
AV	-	Adjacent Area Villagers
AVS	-	Abbreviated Village Schedule
dir	-	Himachal Pradesh Directory
D.P.(F)	-	Demarcated Protected (Forests)
FSI	-	Forest Survey of India
FV1	-	Field Visit 1 (August 1989)
FV2	-	Field Visit 2 (September-November 1991)
HCS	-	Herb Collectors' Schedule
HHS	-	Household Schedule
HPSEB	-	Himachal Pradesh State Electricity Board
MG	-	Migratory Graziers
MGS	-	Migratory Graziers' Schedule
mp	-	Management Plan
NP	-	National Park
NWFP	-	Non-Wood Forest Produce
PA	-	Park Authorities
PD	-	Park Director
PV	-	Park Villagers
QA	-	Questionnaire completed by field visitors for Himachal Pradesh Directory (May 1985)
Q.A1	-	Questionnaire A completed with PD P.P. Madan during FV1

Q.A2	-	Questionnaire A completed by RO Sharma and RO Negi during FY2
QQ	-	Queries Questionnaire completed by RO Sharma and RO Negi during FY2
RO	-	Range Officer
S.O.	-	Settlement Officer
Sp.	-	Species
tp	-	Survey of India toposheets
U.P.(F)	-	Undemarcated Protected (Forests)
VS	-	Village Schedule

8. KALAKD MUNDANTHURAI TIGER RESERVE

1. The Protected Area

1.1 Location and Boundaries

The Kalakad-Mundanthurai Tiger Reserve is situated in the southern Western Ghat ranges of the Ambasamudram and Nanguneri Taluks of Tirunelveli District. The total area is 817 Sq. Km. of which 250 Sq. Km. falls in Nanguneri Taluk and the rest in Ambasamudram Taluk. The Reserve lies between latitudes of $8^{o}\ 25'N$ to $8^{o}\ 53'N$ and longitudes of $77^{o}\ 10'E$ to $77^{o}\ 35'E$. [MP]

The Reserve is demarcated on the western side by a natural boundary line starting from the base of the Agasthiarmalai peak, and runs northwards to touch the chief peaks over the western watershed line all along the Western Ghats. This is the inter-state boundary between Kerala State and Tamil Nadu State. The Reserve is bounded by Tenkasi Taluk, on the northern side. To the east the following villages abut the Reserve boundary; Kadayam, Perumpathu, Melakadayam, Govindaperi Sivasailam and Mela Ambur villages of Ambasamudram Taluk. Padmaneri, Vadagarai, Manjuvilai, Pathai, Kalakad, Chidambarapuram, Mavadi, Malayadipudur and Rosmiapuram of Nanguneri Taluk. To the south the Reserve is bounded by the inter-district boundary of Tirunelveli and Kanyakumari Districts.[MP]

1.2 Description of the Local Ecosystem

1:2.1 Topography

The terrain within the Reserve is fairly undulating with elevations ranging from 40 to 1867 metres above msl and an average elevation of 950 metres above msl. The terrain is a combination of steep and rugged hill slopes and undulating grass lands. In the deep gorges and ravines flow the perennial rives that are a special feature of the sanctuary [MP].

1.2.2 Natural Features

Soil

The texture, structure, chemical composition and mineral content of the soil varies considerably in the area, resulting in the growth of a wide variety of vegetation from one part of the Reserve to the other. This has a natural bearing on the different kinds of wildlife that the vegetation of each area supports [Koshy 1993].

Based on a study conducted by Prof A. Mahadevan, Director, Centre for Advanced Study in Botany, University of Madras, soil analysis has shown PH ranging from 4.7 to 7.4 in the evergreen ranges and 5.1 to 6.8 PH in the semi evergreen forests [MP].

The semi evergreen forests have the maximum available nitrogen content, varying from 61.75 to 469.34 g/h in surface soils. On the other hand, phosphorous content in soil is highest in the teak and scrub jungles as also the grass lands, going as high as 128.44 kg/h.

Traces of micro nutrients like copper, iron, magnesium and zinc were identified. The moisture content varied from 56.1 to 84.6% and the potassium content varied form 66.69 to 694.97kg/h [MP].

Water

Many rivers traverse this Reserve. The main river Thamiraparani with its tributaries flows eastwards into the district. The other rivers that traverse the sanctuary are Pambar, Mylar, Karaiyar, Ramanadhi, Kadanadhi, Servalar, Kusanguliar, Kulirattiar, Melamanimuthar, Keelamanimuthar, Pachayar, Nambiar, and

Koodmudiar rivers. They have well marked channels, but are non-perennial. There are also some picturesque waterfalls scattered around the forest. The hydrology of the area is simple as all the rivers flow in an easterly or south easterly direction. The surface drainage being good, the rivers provide valuable irrigation facilities to the region outside the Reserve. However, there is wide variation in the sub- soil drainage. Water logging occurs in pockets with a heavy clay sub-stratum. The catchment for all the major rivers flowing from the Reserve are in the higher ghat forests. These areas are thickly wooded and inaccessible. The Reserve has a large swamp on the road from Kalakad to Sengaltheri. It is popularly known as Yanai Sathumbal or the 'elephant's mudbath'.

The natural availability of water spread over the entire reserve supports rich vegetation. It also ensures the even distribution of animals, without concentration and over congestion in particular areas [MP].

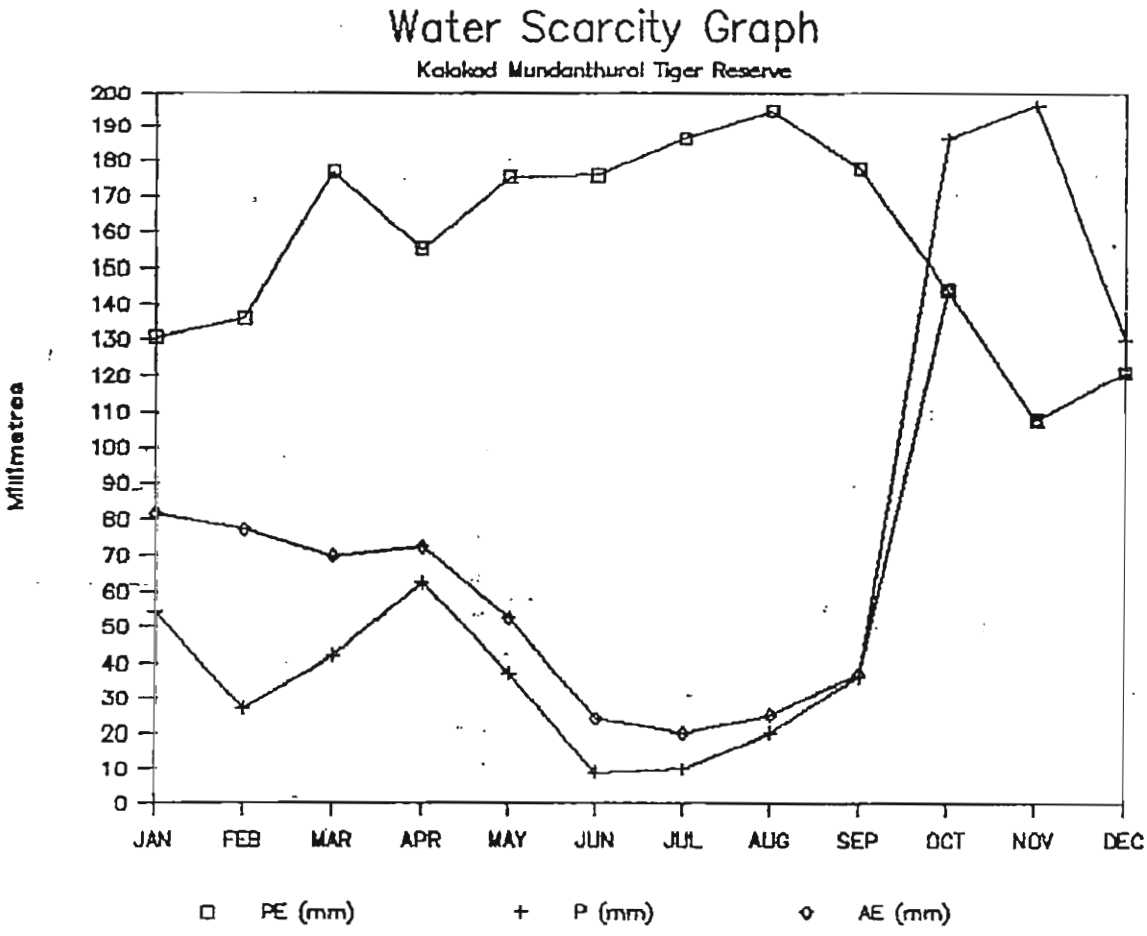
The following table explains the ground water position for the five blocks in which the project area falls.

Distribution of Blocks Under Four Agro Zones

Agro Zone	Characteristics	Blocks
I.	- More than 1000 mm of rainfall - Predominantly hilly and bazada areas with flat lands - High surface and ground water	Ambasamudram
II.	- Rainfall 900-1000 mm - Predominantly river basin area with flood plains and deep pediments - High surface and ground water potential	Kadayam Pappakudi Cheranmahadavi Kalakad

Source : [PP]

The hydrogeology map prepared by Regional Remote Sensing Centre, Anna University, Madras, gives a clear indication of ground water availability in the region. A number of rivers occupy lineament zones. Hope lake/Upper dam lies on intersecting lineaments, which must be greatly enhancing the water availability in the core zone of the Reserve.



The graph shown above has been constructed from the data given in Champion and Seth (1968) for Tirunelveli station. It helps in indicating the amount and period in months, of water deficit in the region. Water surplus is also indicated which would show the run-off amount and period. As the data is for Tirunelveli station, these conditions would be held true only for the villages around the Reserve. This calculation helps in planning water conservation and management for cultivation of fodder and food grains *. The three parameters used are potential evapotranspiration (PE), actual evapotranspiration (AE) and precipitation (P). The ratio of AE to PE (AE/PE) will show the moisture adequacy for crop growth, which is not enough from the months of May to September in this region.

---

* This is the water balance graph developed by Thornthwaite. In any region the entire water input is from precipitation, the other component of climate; the temperature, has a large part to play in the utilization of precipitation. Evaporation from the land surface and transpiration (which is a function of the vegetation cover) together is called evapotranspiration. The actual water, which will be spent by the region if all that water is available, is called Potential Evapotranspiration (PE) This is an ideal condition. The actual evapotranspiration (AE) is calculated by a method of credit and debit. P is the credit and AE is the debit but AE is composed of two parts. One is the actual precipitation and the other is the soil moisture storage (SMS) Each type of soil has a property called Field Capacity (FC), which is the maximum amount of water it can hold. For this area the soil being laterite it is taken to be 200 mm. SMS is a function of the FC and is computed from an exponential equation :

$$SMS = FC * Exp [\Sigma - (P-PE)/FC].$$

The value of AE = P+SMS which is all the water available in soil for evapotranspiration. Water surplus is given by the difference between P and PE when P is more than PE. Water deficit is given by deducting AE from P-PE for each month. PE being the water need of the region and AE being the water availability the ratio of the two AE/PE would give the moisture adequacy of the region. This is known as moisture adequacy index (MAI). Experiments have shown that in Indian conditions over 40% of MAI is enough for crop growth without irrigation.

1.2.3 Climate and Rainfall

The Reserve experiences sharp climatic conditions. Temperatures vary from a high of 44 °C to a low of 24 °C [Koshy]. From dry to humid and hot weather in the plains to cooler climates in the high ranges. 12.8'c in winter [Q1].

The Reserve receives both the south-west monsoon (from June to August) and the north-east monsoon (from October to December). Rainfall varies from 750 mm in the plains to 3000 mm in the higher ranges. The north east monsoon is accompanied by winds of high velocities. Similarly, the south-west monsoon, brings winds of varying velocity onto the western ranges of the Reserve [MP].

1.2.4 Biogeographic Realms and Vegetation Types

The Reserve is situated in the Western Ghat Mountains Province (5B) of the Western Ghats Biogeographic Zone (5) [Rodgers & Panwar 1987].

The flora in the Reserve is unique because of it's wide variety. Such diversity is a direct result of the tremendous variations in the topographical, edaphic and climatic conditions that prevail there. The vegetation varies from the thorny shrubs seen near the plains to the lush evergreen forests on the higher slopes of the Reserve [MP].

The classification given below is based on the Forest Resources Survey Report of Tirunelveli District and a study by the Central Council of Research in Ayurveda and Siddha at Palayamkottai. They have classified the forests of Kalakad as follows :

1. 1A/C4 West coast tropical evergreen forest
2. 2A/C3 Tirunelveli semi evergreen forest
3. 3B/C2 Southern moist mixed deciduous forest
4. 4E/RS1 Tropical riparian fringing forest

5. 5A/C1(6) Dry teak forest

6. 5A/C3 Southern dry mixed deciduous forest

7. 6A/C2 Carnatic umbrella thorn forest

8. 8A/E1 Ochlandra reeds

9. 11A/C1 Southern montane wet temperate forest

10. Grass land at low and high altitude

1. West Coast Tropical Evergreen Forests

Mostly visible from 920 M MSL to 1600 M MSL, the growth pattern of these forests is uneven mainly due to climatic variations. Though dense and evergreen, the growth is often stunted or uneven.

2. Tirunelveli Semi-evergreen Forests

This belt receives heavy showers from both the monsoons. The top canopy has dense vegetation. Epiphytes and orchids are abundant with less of mosses and lichens. Varieties of cane and climbing vegetation.

3. Southern Moist Mixed Deciduous Forests

With a predominance of deciduous species, the forests in these belts also have some evergreen species. These forests are mainly in the damp valleys, the lower hill ranges or on high grounds with shallow and porous soils.

4. Tropical Riparian Fringing Forests

Mainly found along the banks of the many perennial rivers within the Reserve, they act as a sort of tree lined avenue to the flowing waters of the river.

5. Dry Teak Forests

Such forests are in areas receiving annual rainfall between 900 mm and 1300 mm. As can be imagined, the range is particularly susceptible to forest fires.

6. Southern Dry mixed Deciduous Forests

These forests are at a height of 300 MSL. The soil in this region is hard and shallow. In the past it has also suffered the onslaught of grazing, frequent fires and felling. Annual rainfall is only between 750 mm and 1000 mm. In the past, these forests were also exploited fuel working circles.

7. Ochlandra Reed Brakes

Three varieties of reeds occur in these forests, Ochlandra travancorica, Ochlandra rheedii and Ochlandra brandisii

The Senkurinji tree is a unique species found only in the wet evergreen forests of Kalakad and in some parts of Kerala. It is totally unknown in any other part of the country. Under ideal conditions the Senkurinji attains a height of over 30 meters and a girth of over 3 meters. It is slow growing and flowers between February and May. Botanically known as Gluta travancorica, its wood has an attractive reddish hue and takes an excellent polish. Yet another species endemic to the region is the palm Bentinckia coddapanna.

1.2.5 Vegetation Density

The semi evergreen and the tropical evergreen forests have a crown density of more than 40% along the northern and western boundaries of the Reserve. Open forests with crown density of 10-40%, and scrub and grassy lands, are found along the eastern boundary of the Reserve.

1.2.6 Wild Animals

The Kalakad Mundanthurai Tiger Reserve is home to a rich variety of wild animals including carnivores like the Tiger and the Panther. There is a large variety of hoofed mammals including the Sambar and the Chital. The Reserve is also rich in bird life, including a wide variety of water fowl. It is a home of the rare Great Indian hornbill [Koshy 1993].

The tragedy of human exploitation of a once rich heritage of rare and beautiful wildlife is familiar. Kalakad Mundanthurai is no exception. As a result, a large number of the Reserve's animal species are on the endangered list. These include the Tiger, Lion tailed macaque, Slender loris, Nilgiri tahr, Leopard, Elephant, Gaur, and Great Indian hornbill, to name just a few [MP].

Significantly, the Reserve is the home of five of the eighteen primates found in the country. They are the Lion tailed macaque, the Common langur, the Nilgiri langur, the Slender loris and the Bonnet macaque [MP].

1.3 Access and Communication

1.3.1 Approaches

The Reserve can be conveniently approached by rail, road and air. The nearest railway station is Ambasamudram, about 17 Km from Mundanthurai. Trivandrum airport is about 120 km away and is just three hours away by road from the Tiger Reserve.

1.3.2 Roads

There are only three roads in the Reserve, ie Kalakad to Sengaltheri, Thirukarangudi to Nambikoil and Vikramsingapuram to Kakachi estate. But there are a lot of bridle paths that were used in the old days as mule paths. Some of these have

now been converted into Nature Trails for encouraging trekking. Ten such paths have been identified and are being improved [Anon. 1986].

1.4 Population

The Kanis are now settled near Kannikatty "They are supposed to be the oldest group in he division, having been driven into the hills by the first invaders of the plains. Their settlements are called 'Vadis', consists of huts made of reed grass and small timber and situated strategically away from the haunts of men and animals. They were practicing shifting cultivation from times immemorial and caused real devastation of sholas and evergreen forest. Some how the Forest Department succeeded and brought them down from sholas in 1933 and thus prevented further ravages. Now about 18 families of Kanis have settled near Mundanthurai in Agasthianagar colony on 12 hectares of land that has been assigned to them. Though they are not good agriculturists they raise tapioca, cholam, sweet potato and chillies on their land. They send their children to school in Upper Dam and Papanasam. The Kanis of Kannitally are really good in identifying the evergreen species and they possess unrivaled knowledge of the forest. No party can venture on an expedition to Agasthiamali without guidance by the Kanis. Though they are good hunters, they do not poach. Apart from these authorised settlements they are living in four unauthorised settlements in Ambasamudram range and still continue with their shifting cultivation. These four unauthorised settlements are Injikuli (180 acres) Mylar (50 acres) Kidavettiparai (30 acres) and Viltamparai (2 acres). These are situated in good evergreen forests posing problems to adjoining forests" [WP].

1.5 Landuse

The PA land cover of forests has been described earlier (see section 1.2.4). There are a few dams and reservoirs inside the PA. The construction of some of them have taken place in earlier years. Some areas have been declared enclosures and are being worked as plantations. It is planned to allow regeneration of forest as and when the lease gets over. Besides these areas, around the Kani settlement some lands are being worked as agricultural lands. At the lower dam, in the buffer zone, the Electricity Board has a large colony. These are the non-forest uses to which the Reserve area has been subjected.

1.6 Management

Legal status

Kalakad Sanctuary was notified by the Goverhment of Tamil Nadu, Department of Forests and Fisheries, vide G.O. No: 183 on 6 March 1976. Mundanthurai Sanctuary was notified on 21.3.1977. Prior to this, the area was a Reserve Forest.

In 1983, both Kalakad and Mundanthurai Sanctuaries were declared a Project Tiger Reserve.

Management Plan

The first management plan for Kalakad Sanctuary was written by Thiru S. Ramanathan for the period April 1978 to March 1987. A new management plan for the Tiger Reserve (undated) has since been drafted.

Zonation

The total area of the Reserve is 817 sq km. This is has been demarcated into 4 zones [MP], which are as follows:

Core Zone: The core zone is proposed to be left undisturbed as far as possible, except for the necessary, restricted, departmental activities, like research, which are required for better management [MP]. At present there are some enclosures within this zone. The total area of the core zone is 459 sq km.

Buffer zone: This lies in between core zone and multiple use zone. The total area of this zone is 162 sq km. This area will be managed as a supplementary area to the core zone, for supporting wild life populations. The area will be intensively managed. According to the Ecodevelopment Plan of the Kalakad Sanctuary, this zone has been divided into the Eco-restoration and Assets Creation zone.

Tourism zone: It comprises of an area of around 35 sq. km. in the Thalayanai region and Nambikoil region [MP].

Multiple use zone: This area includes the degraded areas along the outer periphery of the Reserve and also covers 5-10 km. radius from the outer boundary of the Protected Area [MP].

Resources

For the year 1991-92 the proposed budget for Kalakad Mundanthurai Tiger Reserve was Rs 128.75 Lakhs [MP].

Research

Very little research work has been carried out so far in this Reserve. Even though research areas of short term and long term need are identified [MP].

Monitoring

For monitoring rainfall, there are rain gauges existing in Sengaltheri, Thalayani and Mundanthurai. In addition, information of precipitation is now received regularly from rain gauges installed in Naraikkadu, Bombay Burma Trading Corporation gauges in Manjolai, Kakkachi, Nalumukku and Oothu [MP]. Periodical animal census are undertaken [MP].

Veterinary practices

There is no vet attached to the Reserve [Q1]. No Vaccination programme for livestock in the sanctuary or surrounding villages has been carried out so far [Q1].

Water structures

A number of water holes have been made, especially in the Kalakad, Kodumodi, Valliyoor and Vadakarai beats. 118 check dams and 31 weirs have been constructed across several streams and rivulets to help in soil and moisture conservation [Anon. 1986].

Salt licks

Natural Salt licks are found normally on river banks and other sites where boulders stand exposed. Around 100 artificial salt licks have been provided in the Sambar home range, as natural salt licks are scarce in that area [Q1].

Breeding & Reintroduction programmes

No breeding or reintroduction programmes for fauna or flora have been carried out [Q1].

2. Description of Protected Area Surrounds

2.1 Population

In all the villages, the predominant communities were the Nadars and the Thevars. Some Nadars are Hindus and other are Christians. Christian missionary activity had been widespread in the area some decades ago, and almost all the villages have at least one church. There are a few Muslims living in the area. Detailed sample village profiles are given at Annexure - 1. Some population figures for villages in a 5 km radius from the Reserve boundary are given below :

Total area - 46,000 ha. approx.

Total number of revenue villages - 66

Total population - 2,09,003

Total number of households - 46,065

Source : [DCH 1981a and 1981b]

Blockwise Number of Households According to Main Occupation (1988)

NAME OF BLOCK	LARGE FARMS	MED. FAR.	SMALL FARM	MARGINAL FARM	TOTAL FARM	AGRI. LAB.	NON-AGRI. LAB.	ARTISAN	BUSINESS	SALARIES	TOTAL RURAL HOUSE-HOLD
CHERMAHADEVI	82	299	3517	6268	10166	4979	5955	2233	459	2469	26261
AMBASAMUDRAM	13	65	1037	6799	7914	5480	3957	976	989	7692	27000
KADAYAM	710	919	2423	3500	7552	5337	1562	1505	903	1044	18703
PAPANKUDI	81	122	1369	3850	5422	3753	4262	675	461	1184	15157
KALAKKAD	146	519	4234	5933	10732	7662	951	1331	495	803	21982

Source : [PP]

The marginal farmers are the largest group among the farming households. The agricultural labourers and non-agricultural labourers comprise the landless households, about 40% of the total number of households. For the purpose of indicative ecodevelopment planning, the bottom 10% are the target population.

2.2 Landuse

Identified 66 target villages are placed administratively under the five blocks of (1) Cheranmahadvi (2) Ambasamudram (3) Kadayam (4) Kalakkad (5) Pappakudi.

Blockwise Landuse Pattern in ha. (1986-87)

NAME OF BLOCK	FOREST	BARREN & UNCULT. LAND	AREA UNDER NON-AGRI. USE	CULLTIV. WASTE	PERMANENT PASTURE	AREA UNDER TREE GROVES	CURRENT FALLOW	PERMAN. FALLOW	NET AREA SOWN
CHERMAHADEVI	2115	1503	4821	2704	2225	175	1759	1822	4993
AMBASAMUDRAM	57842	1124	3937	763	668	112	1266	1610	3790
KADAYAM	61	1533	2459	2757	755	391	4162	2676	4757
KALAKKAD	20893	2133	4472	1253	846	282	1635	6792	5878
PAPPANKUDI	37	97	3427	3197	427	179	2363	2528	3202

Source : [PP]

The Land use map shows that a large area of the targeted villages are fallow. A small portion of land is facing problems like erosion (covered with scrub) and barren rocks) The agro zone characteristics indicate that fallow lands can be brought under cover.

2.3 Land Tenure

There are three types of ownership (1) individual owners having hereditary rights over their holdings (2) Institutional owners like trusts and religions institutions - whose lands are worked by employees, share croppers or lessees (3) State Government and Panchayat - the former called 'Poramboke' land. Very little is under panchayat control. The cultivated and fallow lands are under these three ownerships.

2.4 Existing Development Programmes

Agriculture : Extension of modern farming techniques, distribution of inputs, special programmes for crop production like paddy oilseeds etc.

Soil conservation : work carried out by agricultural engineering department includes soil conservation in western ghats, popularisation of drip irrigation. Now about 50000 ha. have been covered.

Animal husbandry : Activities under this sector are to provide assistance to small and marginal farmers for sheep production. The number of dispensaries in the district is 33 under the jurisdiction of four veterinary hospitals.

Fisheries : Fish culture has been scientifically promoted in the district by the fish farmers development agency since 1981 - 82.

Dairy Development : gave subsidy to purchase milk animals under state sector scheme during 1986-88. A number of dairy cooperatives have been set up.

Sericulture : is a new venture, at present 230 acres of land is under mulberry and 600 farmers are engaged in the

activity. For purchase of cocoons the government agencies are operating in Kalakad and have monopoly over procurement.

Handicrafts and village industries : The Khadi and village industries commission has released funds to the tune of 37.19 lakhs for benefit of 557 artisans. It was anticipated that 5000 will be covered by 1990. the rural development programmes include IRDP, TYSEM, DPAP and NREP/RLEGP etc.

3. Local Dependencies on Protected Area and Surrounding Resources

3.1. Internal Pressures on the Reserve

Within the Tiger-Reserve two artificial water bodies are located, which are used for power generation. About 2500 people are living within the limits of Reserve in the Electricity Board Colony [MP]. Besides this, there are four tribal settlements, a few cardamom estates and five private estates. Apart from this there is a lease by Bombay Burma Trading Corporation, which hold 3391 ha. at Manjolai. Five thousand people live and work in the Cardamom and Coffee plantation :

3.2 External Pressures on the Reserve

3.2.1. Grazing

The Reserve Forests adjacent to villages have been traditionally serving as the grazing grounds for local livestock, and now support populations larger than the carrying capacity, leading to degradation of the forests [EDP].

3.2.2 Removal of firewood

Fire wood is the main source of energy for the villages and towns further away from the Reserve. However, most of the fuelwood requirements of the villagers are met by the *prosopis juliflora* growing profusely in the area.

Headloads of firewood are collected for sale, in order to generate some cash income.

3.2.3 Collection of Non Timber Forest Produce (NTFP)

Considerable disturbance is being caused by the collection of green manure and other NTFP by the people living around the Reserve. The NTFP collected includes seeds, fruits, cane, honey, medicinal plants and mushrooms [EDP].

3.2.4 Pilgrimage and Tourism

There are two major pilgrimage centres where large numbers of pilgrims congregate overnight, once a year. The pilgrimage centres are Nambikoil, about 8 kms from Thirukkurungudi, which is a popular Vaishnavite place of worship, and Karumandiammankoil. The movement of pilgrims during the season of worship is regulated by the Forest Department and causes little disturbance in the sanctuary. There is, however, a problem of littering and waste disposal because of these pilgrims [MP].

3.2.5 Poaching

23 cases of illegal hunting were registered between 1979 & 1983 [Q1]. The current situation is not known.

3.2.6 Removal of small timber

During a survey conducted recently by the Forest Department, it was found that the total requirement of timber for the people living in 20 villages situated near Kalakad Wildlife Sanctuary is about 300M^3 per year. This survey was conducated only for peripheral villages of Kalakad Wildlife Sanctuary. Therefore the estimate its likely to be more if the entire surrounding areas of the Reserve were to considered. This timber is required for construction of houses, household furniture as well as for agricultural implements. It is assessed that about half the requirement can be met by the villagers from other sources. For the remaining half, the villagers are dependent on the Reserve [EDP].

3.2.7 Forest fires

Forest fires kindled by graziers to get a new flush of tender grass have been one of the major causes for degradation. Fire is also caused by Non Timber Forest Produce collectors and tourists [MP]. 16 forest fires were reported in the year 1983-84 affecting an area of 15.62 ha in the core zone [Q1].

Occurrence of forest fires is reported to be very common between March & September. Due to frequent outbreak of fires, bamboos have been restricted to the banks of Pachayar River [MP].

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ANNEXURE - 1

KALAKAD MUNDANTHURAI TIGER RESERVE: SAMPLE VILLAGE PROFILES

The village profiles given below have been drawn up, based on a field visit to Kalakad Mundanthurai, between March 22 - April 05, 1993. These villages were selected randomly from a list of 66 villages, falling within a 5 km radius of the Reserve boundary. The names of the villages/hamlets visited are given, along with the associated census village and its Location Code Number (LC No.), as they appear in the Tirunelveli District Census Handbook. For example, Hamlet Alagappapuram -- the hamlet visited -- (of village Dharmapuramatam -- the census village to which this hamlet belongs -- LC No.24) -- Location Code Number in the District Census Handbook --, Taluk Ambasamudram -- the Taluk in which and the hamlet and census village fall. In some cases, the village/hamlet visited and the census village are the same i.e. Kesavneri, Pappankulam and Sivalaperi. The Land Use, Livestock and Amenities table, and the Pouplation Profile table, accompanying each sample village profile, are from the District Census Handbook, Village and Town Directory [DCH 1981a], and Village and Townwise Primary Census Abstract [DCH 1981b], for Tirunelveli District.

3. Hamlet Alagappapuram (of village Dharmapuramatam I.C No.24), Taluk Ambasamudram

Alagappapuram is located 2 km away from the east boundary of the Reserve. It is one of the hamlets of Sivasailam village. The village is situated on the banks of the Gatana river, 3 km downstream of the Gatana Dam.

Much of the land in this hamlet has been bought up by absentee landlords from Kerala. Some have even resold land locally, after developing of the land. Some wasteland is available around the hamlet.

The Tirunelvelli Social Service Society has organised a women's group in the hamlet. They have recently given grants of Rs. 5000 for milch animals to 15 families. Criteria for selection of beneficiaries included those who had no outstanding loans with banks. The selection process was facilitated through the women's group.

The cyclone of November 13-14, 1992, had wrought considerable damage to life and property in this hamlet. Several houses were washed away, standing crops destroyed and communications disrupted. The hamlet is currently being assisted in reconstruction by SCAD, as well as the government.

A special feature of this hamlet is the number of educated youth, a majority of whom are unemployed. The hamlet comprises of only Muslim and Harijan families.

Land Use, Livestock and Amenities Available in Village Dharmapuramatam

Land Use (in ha.)

Total Geographic Area (TGA)	614.68
Total cultivated land	398.92 (64.89% of TGA)
Total irrigated land	205.37 (33.41% of TGA)
Total unirrigated cultivated land	193.55
Total land not available for cultivation	215.76 (35.10% of TGA)

Livestock

Cows	70
Buffaloes	40
Bullocks	70
Goats	250
Sheep	150

Amenities

Primary school	1
Middle school	1
Medical aid	5-10 km from village
Post and telegraph	5-10 km from village
Drinking water	Handpump, river, well, tube well
Bus stop	1
Power supply	Electricity for domestic use and agriculture

Table - 1.2

Population Profile of Village Dharmapuramatam

Category	Male	Female	Total	% of Total
General				
Total Population	1176	1284	2460	100.00
Scheduled Caste	863	373	1236	50.21
Literates	713	616	1329	54.02
Employment				
Total Main Workers	595	312	907	36.86
Cultivators	257	21	278	---
Agricultural Labourers	285	251	536	---
Other Workers	53	40	93	---
Marginal Workers	1	7	8	---
Non-workers (NW)	580	965	1545	62.80
Employable Non-workers (16 - 60 years)	337	540	877	35.65

Main Worker - A person who has worked for a major part of the year i.e. 183 days or more, in the year preceding the date of enumeration.

Marginal Worker - A person who has worked for less than 183 days, in the year preceding the date of enumeration.

Cultivator - A person who is engaged either as an employer, single worker, or as a family worker in cultivation of land owned or held by government, private person, or an institution.

Agricultural Labourer - A person who works on another person's land for wages in money, kind, or share.

Non-worker - A person who has not worked any time at all during the reference period of one year preceding the date of enumeration.

Employable Non-worker - Indicates population among the non-workers who are in the age group 15 - 60 years. The employment generation schemes will address this thrust group. This calculation is based on the percentage of population between 16 - 60 years, as given in the social and cultural tables of Census of India, Series 1 for Tamil Nadu. 58% among males and 56% among females are in this age group. The figures given in the row Employable non-workers are the above percentage for male and female populations of non-workers.

2. Hamlet Kanavur (of village Kadayamperambathu LC No.2), Taluk Ambasamudram

Kadayamperambathu is made up of ten hamlets, of which Kanavur is one. Kanavur is situated in the northwestern extremity, of the Reserve, upstream of Jambunadhi. It is the settlement closest to the Reserve boundary. A metalled road from Thorana Malai temple runs east west to Mailappapuram. Three hillocks adjoining the Reserve boundary are in a degraded state. They are not part of the Reserve.

The villagers are of the Nadar caste group with only four families of scheduled castes, who live adjacent to the fields. The Nadars themselves live in two separate hamlets, one for the Christians and the other for the Hindus. They seem to be living in harmony with each other, with no large difference in occupation or preferences.

Table - 2.1

Land Use, Livestock and Amenities Available in Village Kadayamperambathu

Land Use (in ha.)

Total Geographic Area (TGA)	1640.3
Total cultivated land	1006.14 (61.33% of TGA)
Total irrigated land	168.59 (10.27% of TGA)
Total unirrigated cultivated land	887.55
Total land not available for cultivation	634.16 (38.66% of TGA)

Livestock

Cows	60
Buffaloes	30
Bullocks	20
Goats	50
Sheep	50

Amenities

Primary school	1
Middle school	1
Medical aid	5-10 km from village
Post and telegraph	5-10 km from village
Drinking water	Well, handpump
Bus stop	1
Power supply	Electricity for agriculture

Table - 2.2

Population Profile of Village Kadayamperambathu

Category	Male	Female	Total	% of Total
General				
Total Population	2044	2090	4134	---
Scheduled Caste	2044	2090	4134	100.00
Literates	138	162	300	7.20
Employment				
Total Main Workers	1312	1335	2647	64.02
Cultivators	580	305	885	---
Agricultural Labourers	423	359	782	---
Other Workers	309	671	980	---
Marginal Workers	2	8	10	---
Non-workers (NW)	730	747	1477	35.72
Employable Non-workers (16 - 60 years)	423	418	841	20.34

3. Village Kesavneri (LC No. 18), Taluk Nanguneri

5 km away from the southern tip of the Reserve lies the village of Kesavneri, 2 km off the Kalakad-Valliyoor highway. The link road between Rajapudur and Valiyoor passes through this village.

The men in the village work as agricultural labourers between April-July and October-November. Through the rest of the year they work as daily wage labourers in nearby villages and towns. Women from this village work as labourers at the Kodumadi estate adjacent to the Reserve, 5 km away. The occupation, which lasts 5 months, fetches them Rs. 18-20 per day. Most women are also engaged in beedi making and some in Agave fibre extraction.

Large tracts of patta and wasteland are available in this village, some of which has been taken up for Acacia sp. plantations by the Forest Department under Social Forestry, to which the village people have no access. Although there are no existing water facilities to develop the land currently lying unused, there are several indications of the presence of groundwater in the region.

The village comprises of 120 households all of whom are Nadars, except for four Harijan households.

Table - 3.1

Land Use, Livestock and Amenities Available in Village Kesavneri

Land Use (in ha.)

Total Geographic Area (TGA)	361.10
Total cultivated land	23.00 (6.3% of TGA)
Total irrigated land	21.00 (5.8% of TGA)
Total unirrigated cultivated land	2.00
Total land not available for cultivation	338 (93% of TGA)

Livestock

Cows	60
Buffaloes	6
Bullocks	5
Goats	200
Sheep	75

Amenities

Primary school	1
Medical aid	5 km from village
Post and telegraph	5 km from village
Drinking water	Well, River
Bus stop	5 km
Power supply	Electricity for agriculture

Table - 3.2

Population Profile of Village Kesavneri

Category	Male	Female	Total	% of Total
General				
Total Population	92	129	221	100.00
Scheduled Caste	41	60	101	45.70
Literates	63	66	129	58.30
Employment				
Total Main Workers	40	31	71	32.00
Cultivators	14	9	21	9.50
Agricultural Labourers	21	16	37	---
Other Workers	5	---	5	---
Marginal Workers	---	---	---	---
Non-workers (NW)	52	98	150	67.80
Employable Non-workers (16 - 60 years)	30	55	85	38.46

4. Hamlet Manjuvilai (of village Pattai LC No. 16), Taluk Nanguneri

Manjuvilai is located to the north of Kalakad village, about 2 km east of the Reserve boundary. The land slopes from the Reserve boundary towards the east. Manjuvilai is a hamlet of Pattai village, which is 2 km away, connected to it by an unmetalled road. On either side of the Pachayar river there are settlements. On the lower slopes of hills there are some private Teak forests belonging to a religious institution.

The Pachayar dam is to be constructed in the upper reaches, due to which large areas of the private forest will be inundated. Some of these lands are being cultivated under tenancy by the villagers.

In the past the people were allowed to hunt wildlife on issue of a license. The activity is still carried out surreptitiously, though on a much reduced scale.

The main caste in the hamlet are the Nadars. Some Scheduled Castes live on the fringes. Among these, a few families are tenant farmers working on institutional land. More than half the hamlet comprises landless households. Nadar women are engaged in the preparation of palm jaggery, a fuel intensive activity. The settlement on the south bank has 150 households of Nadar Christians. The settlement on the north bank has 120 households of Nadar Hindus. There are about 30 Scheduled Caste households in the hamlet.

Table - 4.1

Land Use, Livestock and Amenities Available in Village Pattai

Land Use (in ha.)

Total Geographic Area (TGA)	921.41
Total cultivated land	401.10 (43.53% of TGA)
Total irrigated land	401.10 (43.53% of TGA)
Total unirrigated cultivated land	---
Total land not available for cultivation	518.78 (56.30% of TGA)

Livestock

Cows	350
Buffaloes	225
Bullocks	310
Goats	95
Sheep	950

Amenities

Primary school	3
Medical aid	5 km from village
Post and telegraph	1
Drinking water	Well, handpump
Bus stop	5 km from village
Power supply	Electricity for agriculture

Table - 4.2

Population Profile of Village Pattai

Category	Male	Female	Total	% of Total
General				
Total Population	1639	1829	3468	100.00
Scheduled Caste	512	618	1130	32.50
Literates	1012	716	1728	49.82
Employment				
Total Main Workers	897	578	1475	42.53
Cultivators	544	162	706	20.35
Agricultural Labourers	193	231	424	---
Other Workers		160	185	
Marginal Workers	6	19	25	---
Non-workers (NW)	736	1232	1968	56.74
Employable Non-workers (16 - 60 years)	427	690	1117	32.20

5. Hamlet Mathrakulam (of village Malaiyankulam LC No. 88), Taluk Ambasamudram

The hamlet is adjoining the Reserve boundary to the southwest of Cheranmahadevi. A major portion of the hamlet is fallow, with scrub land and rock outcrops. Though the Manimuthar canal and three tanks irrigate the hamlet, the land is not very productive.

A large number of Scheduled Castes inhabit the hamlet, most of whom are land owners. The Naddars, who are the other dominant group are landless. Apart from wage labour, the people are also engaged in headloading. Livestock from this hamlet are grazed inside the Reserve.

Table - 5.1

Land Use, Livestock and Amenities Available in Village Malaiyankulam

Land Use (in ha)

Total Geographic Area (TGA)	918.26
Total cultivated land	193.51 (21.07% of TGA)
Total irrigated land	140.63 (15.2% of TGA)
Total unirrigated cultivated land	52.88
Total land not available for cultivation	724.75 (79% of TGA)

Livestock

Cows	216
Buffaloes	21
Bullocks	71
Goats	525
Sheep	470

Amenities

Primary school	3
Medical aid	5 km from village
Post and telegraph	Post office
Drinking water	Well, handpump
Bus stop	5 km from village
Power supply	Electricity for domestic use and agriculture

Table - 5.2

Population Profile of Village Malaiyankulam

Category	Male	Female	Total	% of Total
General				
Total Population	538	616	1154	100.00
Scheduled Caste	204	214	418	36.22
Literates	259	136	395	34.40
Employment				
Total Main Workers	361	400	761	65.94
Cultivators	22	---	22	2.00
Agricultural Labourers	278	217	495	---
Other Workers	40	5	45	---
Marginal Workers	---	---	---	---
Non-workers (NW)	177	216	393	---
Employable Non-workers (16 - 60 years)	103	121	244	19.40

6. Village Pappankulam (LC No. 81) Taluk Ambasamudram

Pappankulam is situated in the command area of Manimuthar Reservoir, to the south of the urban area of Kallidaikurichi town. It is located on the feeder road connecting Kallidaikurichi to Manimuthar Dam site.

Three caste groups live in this village. They are Maravars (Thevars), Nadars and Scheduled Castes. They have separate areas of dwelling. The Scheduled Castes live in houses built by the government under the Indira Ahwas Yojana. They are new migrants to this village, having settled here after working on the construction of Manimuthar Dam.

Table - 6.1

Land Use, Livestock and Amenities Available in Village Pappankulam

Land Use (in ha.)	
Total Geographic Area (TGA)	549.59
Total cultivated land	251.28 (45.72% of TGA)
Total irrigated land	214.24 (38.93% of TGA)
Total unirrigated cultivated land	37.04
Total land not available for cultivation	298.30 (54.275 of TGA)
Livestock	
Cows	70
Buffaloes	102
Bullocks	130
Goats	80
Sheep	200

Amenities

Primary school	1
Medical aid	5 km from village
Post and telegraph	5 km from village
Drinking water	Tap and tubewell
Bus stop	1
Power supply	Electricity for domestic use

Table - 6.2

Population Profile of Village Pappankulam

Category	Male	Female	Total	% of Total
General				
Total Population	766	772	1538	100.00
Scheduled Caste	172	182	354	23.00
Literates	421	216	637	41.41
Employment				
Total Main Workers	430	189	619	40.24
Cultivators	282	113	395	25.68
Agricultural Labourers	114	75	189	12.28
Other Workers	34	1	35	2.27
Marginal Workers	---	122	122	7.39
Non-workers (NW)	336	461	797	51.82
Employable Non-workers (16 - 60 years)	196	258	454	29.50

7. Hamlet Pottal (of village Terku Kallidaikurichi LC No. 80), Taluk Ambasamudram

The hamlet of Pottal forms a part of Terkku Kallidaikurichi village. It is adjoining the Reserve boundary. There are three tanks in the hamlet. It is connected by an unmetalled road to Kallidaikurichi.

The majority of the hamlet belongs to the Thevar community with a few Scheduled Castes. The landless among the households are dependent on wage labour and headloading.

Table - 7.1

Land Use, Livestock and Amenities Available in Village Terku Kallidaikurichi

Land Use (in ha.)

Total Geographic Area (TGA)	20184.64	
Total cultivated land	681.94	(33.7% of TGA)
Total irrigated land	681.94	(33.7% of TGA)
Total unirrigated cultivated land		
Total land not available for cultivation	1336.7	(66.21% of TGA)

Livestock

Cows	212
Buffaloes	38
Bullocks	95
Goats	372
Sheep	291

Amenities

Primary school	2
Medical aid	Located 5 kms away
Post and telegraph	Located 5 kms away
Drinking water	Tap, well, handpump
Bus stop	1
Power supply	Electricity for agriculture and domestic use

Table - 7.2

Population Profile of Village Terku Kallidaikurichi

Category	Male	Female	Total	% of Total
General				
Total Population	1902	1913	3815	100.00
Scheduled Caste	894	916	1810	47.40
Literates	922	440	1362	35.70
Employment				
Total Main Workers	1122	1215	2337	61.25
Cultivators	442	89	531	14.00
Agricultural Labourers	383	499	882	---
Other Workers	297	627	924	---
Marginal Workers	5	29	34	---
Non-workers (NW)	775	669	1444	37.55
Employable Non-workers (16 - 60 years)	449	373	824	21.60

8. Hamlet Pudur (of village Terku Viravanallur LC No. 79), Taluk Ambasamudram

This hamlet lies 14 km to the north of Vikramsinghapuram. It is situated on the north bank of Ramanadi. The village lies 5-6 km away from the Reserve boundary, therefore the incidence of headloading is low. The adjoining areas have agricultural fields, hence they get enough wage labour. They do not have enough grazing ground. There are three tanks for irrigation. Some rocky outcrops are found in the village. A large area is lying fallow.

The entire village comprises of the Nadar caste, many of whom are land owners, though marginal farmers. Often they seek wage labour on agricultural land in adjoining villages. Several people in the village own livestock.

Table - 8.1

Land Use, Livestock and Amenities Available in Village Terku Viravanallur

Land Use (in ha)

Total Geographic Area (TGA)	2456.63
Total cultivated land	344.52 (14.02% of TGA)
Total irrigated land	344.52 (14.02% of TGA)
Total unirrigated cultivated land	---
Total land not available for cultivation	2112.11 (85.97% of TGA)

Livestock

Cows	173
Buffaloes	18
Bullocks	65
Goats	475
Sheep	510

Amenities

Primary school	3
Medical aid	Maternity and child welfare centre
Post and telegraph	1
Drinking water	Tap, well, handpump
Bus stop	1
Power supply	Electricity for agriculture and domestic use

Table - 8.2

Population Profile of Village Terku Viravanallur

Category	Male	Female	Total	% of Total
General				
Total Population	972	1046	2018	100.00
Scheduled Caste	124	149	273	13.52
Literates	440	341	781	38.70
Employment				
Total Main Workers	510	306	816	40.43
Cultivators	204	8	212	10.50
Agricultural Labourers	205	211	416	---
Other Workers	101	87	188	---
Marginal Workers	3	62	65	---
Non-workers (NW)	459	678	1137	56.34
Employable Non-workers (16 - 60 years)	266	380	646	32.01

9. Hamlet Singampatti (of village Ayan Singampatti LC No. 82) Taluk Ambasamudram

Singampatti is located in the command area of Manimuthar Dam. It is adjoining the Reserve boundary, about 4 km to the south of the urban area of Ambasamudram. The hills and forest around this hamlet were once the property of the Singampatti Zamindari. It was later acquired by the government and merged with the other Reserved Forest areas. The land in this hamlet slopes to the west and is full of rocky boulders. All other available land is being cultivated.

The entire population of the hamlet belong to the Thevar community, except for a few Scheduled Caste villagers. Most of the Scheduled Castes are landless labourers engaged in wage labour. the landless among the Thevars (Marvars) are engaged in headloading. The women of this caste have taken to beedi making in a big way. They still continue to enjoy old usufruct rights, though on a lesser scale.

Table - 9.1

Land Use, Livestock and Amenities Available in Village Ayan Singampatti

Land Use (in ha.)

Total Geographic Area (TGA)	701.64
Total cultivated land	212.52 (30.2% of TGA)
Total irrigated land	212.19 (30.1% of TGA)
Total unirrigated cultivated land	0.33
Total land not available for cultivation	489.11 (69.7% of TGA)

Livestock

Cows	203
Buffaloes	195
Bullocks	140
Goats	140
Sheep	200

Primary school	2 Middle 1
Medical aid	1
Post and telegraph	5 km from village
Drinking water	Tap, Handpump
Bus stop	1
Power supply	Electricity for domestic use and agriculture

Table - 9.2

Population Profile of Village Ayan Singampatti

Category	Male	Female	Total	% of Total
General				
Total Population	1193	1272	2465	100.00
Scheduled Caste	385	421	806	32.70
Literates	715	465	1180	47.80
Employment				
Total Main Workers	689	497	1186	48.10
Cultivators	294	96	360	14.60
Agricultural Labourers	290	356	646	---
Other Workers	103	9	112	---
Marginal Workers	---	---	---	---
Non-workers (NW)	504	775	1279	51.8
Employable Non-workers (16 - 60 years)	292	434	726	29.4

10. Village Sivalaperi (LC No. 35), Taluk Nanguneri

Close to the southeast boundary of the Reserve lies Sivalaperi, 5 km off the Kalakad-Valliyoor highway, about 2 km from Kalakad village. The associated hamlets of the village are Ramkrishnapuram and Seeraiapuram.

Between the village and the Reserve boundary 2 km away, is a tank covering an area of 100 ha. The tank holds water only four months between August and November.

Only two households possess land in the village, a meager one to two acres between them. Several years ago virtually everyone owned some land however, low productivity, lack of capital for additional agricultural inputs and general poverty, forced people to sell. Today they work as agricultural labourers on the very same land, now owned by landlords in nearby Kalakad. The occupation is available only for 5 months between October - December and February - April. It fetches the men Rs. 30 and women Rs. 15, per day.

The village has been identified for ecodevelopment by the Reserve authorities. In March 1993, six smokeless chullahs were distributed in the village, though they have yet to be installed in specific households. However, since the abundantly available Prosopis adequately meets their fuelwood requirements, there appears to be little justification for this input as there is no dependence of the village on the Reserve for any resources.

CAST has been working in Sivalaperi providing non-formal education to adults and making available seedlings of useful trees.

Table - 10.1

Land Use, Livestock and Amenities Available in Village Sivalaperi

Land Use (in ha.)

Total Geographic Area (TGA)	936.00
Total cultivated land	218.08 (23.3% of TGA)
Total irrigated land	178.14 (19% of TGA)
Total unirrigated cultivated land	39.94
Total land not available for cultivation	598.71 (64% of TGA)

Livestock

Cows	500
Buffaloes	425
Bullocks	620
Goats	600
Sheep	450

Amenities

Primary school	4
Middle school	2
Medical aid	5 km from village
Post and telegraph	1
Drinking water	Well, Handpump
Bus stop	1
Power supply	Electricity for agriculture

Table - 10.2

Population Profile of Village Sivalaperi

Category	Male	Female	Total	% of Total
General				
Total Population	3254	3615	6869	100.00
Scheduled Caste	431	480	911	13.20
Literates	2269	1868	4137	60.20
Employment				
Total Main Workers	1745	1427	3172	46.10
Cultivators	614	76	660	9.60
Agricultural Labourers	489	299	788	---
Other Workers	607	253	860	---
Marginal Workers	31	108	139	---
Non-workers (NW)	1478	2080	3558	51.70
Employable Non-workers (16 - 60 years)	857	1165	2022	29.40

A. RATIONALE AND OBJECTIVES

The rationale for the project is the protection of two areas of outstanding biodiversity values (see sections ?? for details), representing two of the most valuable ecosystems in India: the Western Ghats (Kalakad - Mundanthurai Tiger Reserve) and the Western Himalayas (Great Himalayan National Park).

These two areas have relatively low to medium pressures, compared with protected areas in India (see section ??). They also are representative of two distinct regions of the country, the North and the South, and thereby represent diverse social and administrative cultures and varying conservation traditions.

Both these protected areas are such that a reasonable amount of effort and investment, in a short time span of three to five years, could dissolve the current pressures and establish a management strategy which is sustainable both for the protected area and for the communities living around them.

A successful ecodevelopment initiative in these areas would make it much easier to plan and implement other projects. The planning, implementation, monitoring and evaluation processes in this project would serve as paradigms, and as a learning process, for the projects in the future.

The objectives of the project are to establish a system of management that guarantees protected area conservation in a sustainable manner with the co-operation and participation of the local community and in a manner that does not have adverse social and economic impacts on their lives.

Identification of the Project Area

Taking a five to ten kilometer radius around the protected area, for it is estimated that by and large daily pressures on the protected area rarely come from outside this radius, there are 66 villages in a

five kilometer radius around KMTR and 18 villages (with over 200 hamlets) in a ten kilometer radius around GHNP.

Whereas it is important to finally cover all of these which are having, or are likely to have, an impact on the PA, paucity of funds and the sheer scale of the activities involved make it impossible to take up all of them together. As such, a set of criteria has to be developed for identifying priority areas.

In taking up ecodevelopment activities, it is important to realise that there is a danger in concentrating economic development activities on the periphery of the PA as these can act as magnets for the rural populace in other parts of the region. If ecodevelopment interventions result in attracting more and more people to the periphery of PAs, then they would militate against, rather than for, the conservation of these PAs. Therefore, the project sites have to be chosen keeping this in mind.

As the objective of the exercise is to protect the park or sanctuary, as a first priority those problems and areas need to be selected which pose the greatest threat to the protected area. However, proper assessment needs to be made of the resources available, so that the selected problems can be sustainably managed and not left half tackled when the funds run out.

Obviously success in the initial stages would not only encourage those involved with the activity but also encourage other villages to be receptive to the programme. Therefore, in the first phase, those villages should be selected where there is a good chance of success. A strong indicator of this is the availability of non governmental and community organisations active in the area.

The willingness of the villagers for participating, infact running, the programme, is also crucial to its success. Villager enthusiasm, or the lack of it, should also be a strong criterion for village selection.

Broadly speaking, everything else being equal, it is easier to

establish ecodevelopment activities in areas where forest land for joint forest management, or other waste land, is available to develop alternate sources of biomass. Therefore, at least a part of the initial activities should be started in and around villages with such land.

The linking up of ecodevelopment activities with other development schemes is always an advantage. This not only often provides supplementary resources, but can also reduce the environmental damage that many of the schemes of other sectors unknowingly cause. Therefore, the existence of such schemes must be an important criterion for village selection.

In the ultimate analysis, the selection of the villages where action will first be taken up can only be done once the quantum of funds and the project duration are finalised, so that the best use of the time and money can be achieved.

B. SUMMARY DESCRIPTION

The project involves the following activities:

1. Micro-level ecodevelopment planning
2. Initiation of ecodevelopment activities aimed at environmental conservation, biomass generation, income generation and protected area management.
3. Human Resources Development
4. Research and Development
5. Environmental education and awareness
6. Monitoring

In addition, the following activities will be prior or concurrent to the project, and supportive of the project, but not a part of the project.

1. Preliminary, indicative, Planning (Prior; MOEF/SFD/IIPA)
2. Ecodevelopment training for park director/ other officers (Prior; WII)
3. Management Planning (Prior and concurrent; SFD/WII)

C. DETAILED DESCRIPTION

1. PROTECTED AREA MANAGEMENT

Ecodevelopment planning and management planning, for any protected area, must go hand in hand. There must be a clear interface between the management plan, specifying managerial and protection objectives and strategies within the protected area, and the ecodevelopment plan which identifies strategies to divert human pressures from without.

Just as management without ecodevelopment is often futile, so is ecodevelopment without proper management. The formulation and execution of an adequate management plan is not only a prerequisite for proper ecodevelopment, for it is the management plan which specifies the park priorities, it also ensures that the gains from ecodevelopment in terms of reduced pressures are consolidated for the betterment of the protected area.

The initiation of an ecodevelopment project should, therefore, be preceded by the process of drawing up a management plan and the allocation of adequate funds to implement it. Fortunately, for KMTR a reasonably comprehensive and recent management plan exists, which only needs some minor modifications. The management plan for GHNP is older and needs to be substantially re-written.

There is also a need to set up processes and institutions that can ensure the increasing involvement of the local people in the planning and management of the protected area.

PA Management

GHNP is an area with comparatively few management issues. The northern and eastern boundary of the park are under permanent snow and mostly impassable. The southern boundary is along a high ridge, and almost impassable. The remaining surrounds are sparsely populated with harsh terrain and poor communications.

The major management issues and pressures are:

1. Pressure of herbs and mushroom collection.
2. Pressure of seasonal, migrant, grazing of sheep and goats.
3. Habitation within the Park
4. Occasional poaching

In addition, some of the management issues that need consideration are:

5. Promotion of appropriate tourism and interpretation in the park.
6. Research and monitoring
7. Extension and education

There are no significant pressures of the park on the people, except some crop depredation and injury to livestock by wild animals.

Herbs and Mushroom Collection

This is the most destructive of the various pressures on the park. The collection of medicinal and aromatic herbs and of mushrooms (guchhis) has been going on for many years, despite the fact that there are no recorded rights permitting this, except for three villages, namely Dhar, Sharnira, and Shungcha.

It is estimated that most of these herbs have been over exploited, as is obvious from the fact that they are becoming harder and harder to find (fv, Gaston & Garson 92). Some of the species collected earlier are no longer found and might even have become locally extinct.

Current estimates suggest that almost 2500 people enter the park each year for herbs and mushroom collection.

Herb collection is carried out primarily to earn a cash income, especially during the summer months. An informal estimate by the local wildlife authorities suggest that herb collectors make a total of ten lakhs of rupees a year from the sale of herbs collected from the park. But, considering the number of people entering the park, for this purpose, the total amount is likely to be three or four times higher. Obviously, the final value of these herbs, when they come to urban centres, is far more.

Any management strategy for the park must tackle the problem of herb collection on a priority basis. It is proposed to adopt a dual approach to tackling this problem.

First, income generation alternatives would be progressively developed for the herb collectors, in their villages. Detailed interviews with herb collectors (see section ??) establish that almost all of them would be happy to give up herb collection if they had alternative sources of income. This is mainly because it is tedious, often dangerous work involving a lot of time. Income generation activities would be funded for their villages on the condition that they give up herb and mushroom collection.

Secondly, research and development efforts would be made to see whether these herbs and mushrooms can be cultivated, naturally or through tissue culture, outside the park. Already some of the herbs have been cultivated under laboratory conditions. Field trials will be initiated and, if successful, then herb and guchi cultivation can become another income generation activity for the villagers.

Grazing

Alex Anderson, in his forest settlement exercise, had recorded, in 1886, grazing rights for families and villages in the region. Unfortunately, these rights were never updated and, today, all

the villages from where even a single family had a right are assuming that all of the villagers have grazing rights. Consequently, an estimated 25,000 to 30,000 sheep and goats graze in the park every summer.

As grazing has been going on at least since 1886, and perhaps from even before, arguably the ecosystem has become adapted to it. Therefore, there appears no urgency to stop all grazing. However, over the years the number of sheep and goats entering the park seems to have increased. It is, therefore, important to control the numbers and to ensure that grazing is restricted to the traditionally grazed areas without allowing the "thatches" (high altitude alpine pastures) to get overgrazed. The management initiatives envisaged are the following.

First, the traditional grazing areas of the proposed park will be initially notified as sanctuaries so that there is no legal impediment to allowing controlled grazing. The Tirthan valley in the south is already a part of the Tirthan sanctuary, and its status needs no change. Part of the Sainj valley in the north, which is the other traditional grazing area, would now be notified as a sanctuary.

Secondly, a process of voluntary revocation of rights will be encouraged. Villages will be persuaded to give up their grazing rights in return for ecodevelopment inputs of their choice. At present, there appears to be mixed feelings about grazing, with some villages wanting and willing to abandon it if alternative avenues of income generation were made available, and others feeling that there were no real alternatives to sheep and goat rearing. The attitude towards grazing also seems to be influenced by the location of the village. Villages with good soil and access to water, especially the north facing villages, seem less dependent on their flock. However, villages with poor land, steep slopes or water scarcity appear more dependent.

Nevertheless, it seems likely that if, initially, only those villages opted out that were already so inclined, the pressure on the

park would decrease substantially As ecodevelopment activities succeeded in these villages, perhaps other villagers would also want to follow suit.

Thirdly, there would be research relating to the "thatches" and other alpine pastures in the park. By rotation and the use of control samples, an assessment would be made of the impact that grazing has on the biodiversity of the park.

On the basis of this, a more appropriate management strategy and a better understanding of the carrying capacity would emerge.

Fourthly, research would also be conducted to analyse the grasses and other feed available to the livestock within the park. The villagers believe that the high altitude "thatches" have some grasses which are so nutritional that it is worth taking the sheep and goats up long distances to feed on them.

In the medium and long term, research will have to be done to see whether this nutritional value, if present, can be replicated by artificial feeds so that co-operative sheep farming can be encouraged, thereby further reducing the pressure on the park.

Habitation within the Park

There were four hamlets within the proposed park, two in the Sainj valley and two in the Jiwa Nala valley. However, the two hamlets in Jiwa Nala have now been abandoned and the people from there have shifted near two hamlets called Majharna and Pashi, outside the park.

Though the remaining two hamlets have almost no impact on the park (except on their immediate surrounds), they can, if not properly managed, become a problem in the future.

The area of these hamlets would now be in the proposed (Sainj) sanctuary and, therefore, they can be allowed to stay there if they want.

As there is a need to post some foresters or other park personnel there, and as the remoteness of these villages would make it

difficult to get people to agree to live there, the existing population of these two villages, or at least a part of it, can be asked to perform this role. They can be the representatives of the wildlife authorities and keep a watch out for poachers, unauthorised graziers and herb collectors. They could also be trained to manage a series of huts where researchers, tourists and forest staff could stay.

If and when they themselves want to shift out, a rehabilitation package can be provided for them.

Poaching

There have been reports of occasional poaching of wild animals and birds. Whereas, in a park as large and inaccessible as GHNP, it would be impossible to totally stop an occasional case of poaching, efforts have to be made to see that this does not become too frequent, or organised, commercial, poaching.

There are many animals in the park which have high commercial value for their furs and skin, or their musk (musk deer).

The monitoring network of the park would be strengthened, with the involvement of the local people as guards and members of anti-poaching squads. There would be more frequent patrolling and better communications through the provision of a wireless network.

Tourism and Interpretation

There is a potential and perhaps the desirability of promoting appropriate tourism in GHNP. Apart from providing employment opportunities to the local people, especially as tourist guides. and by providing accommodation and food to visitors, it would also benefit the park to have an increasing number of supporters committed to its conservation.

For the purpose, it is proposed to develop the existing trails so that they can be used by tourists on foot. The villages inside would be the location for visitor huts, managed by the local population.

The difficulty of the terrain would, in any case, limit the number of visitors. However, an upper limit will be prescribed to

ensure that the carrying capacity is not exceeded.

Tourists would only be allowed in the existing and proposed sanctuary portion of the area

At the entrance to the park an interpretation centre will be set up. As at present, no motorable road would be built to or inside the park.

Research and Monitoring

Apart from the research activities already mentioned, related to the management of the park, GHNP will be developed into a site for research into Western Himalaya's high altitude ecosystems. For this purpose, some research facilities including a research centre outside the park, would be set up.

Organisations like the Wildlife Institute of India, the Bombay Natural History Society or the World Wide Fund for Nature would be invited to collaborate with the wildlife department in research and monitoring activities.

Extension and Education

The people living in and around the park have a lot of knowledge about the park and its fauna and flora. It is important to record this information and make it available to visitors and to the larger world (what is the local name of plants and animals? What use are some of the plants? What changes have occurred in the area, over years? What is the religious and cultural significance of the trees, the flowers, the animals, the rocks, among other things, in the park? What myths surround it? What does it mean to them?).

Similarly, there are many things that modern science has discovered, which should be shared with them (the meaning and value of biodiversity. What are the "western" systems of classifying plants and animals? What does the area look like from a satellite? What types of rocks, stone and soil lie beneath the park? What is the significance and value of the park in the regional, national and global context?)

A dynamic system of educational exchange will be set up to learn and inform.

Crop Depredation and Livestock Injury

Though the incidence of crop depredation is not high, with inputs through the proposed ecodevelopment project the value of crops in the region is expected to increase significantly. It is, therefore, important that compensation be given for crop depredation. Compensation is already being given for injury or death of livestock.

PA Management

KMTR is an area with low to medium pressures. Though there is a significant population adjacent to its eastern boundary (approximately 200,000 people), the western boundary runs contiguously to forested area in Kerala, with almost no direct pressures. Even the population adjacent to the eastern boundary exerts what can be considered, in comparison to many other Indian protected areas, moderate pressures.

The major pressures and management issues in KMTR are:

1. Disturbance due to private plantations inside the reserve.
2. Disturbance due to residential colonies of State electricity and irrigation board personnel inside the Reserve.
3. Disturbance due to two tribal (Kani) villages in the Reserve.
4. Disturbance due to headloading, grazing, NWFP and small timber collection pressures from the neighbouring villages.
5. Occasional forest fires and poaching.
6. Crop depredation in adjacent villages by Wild boar and elephant.

Plantations

The cardamom and tea plantations inside the Reserve are on long term leases, the last of which is due to expire only in 2027 AD. The passage of people to and from these plantations is a major source of disturbance to wild animals and to the habitat. Though the Government has refused to renew those leases that have already expired, and is expected to act similarly in future, some effort has also to be made to persuade the lease holders to give up their leases earlier. In any case, strict regulation of the activities of the people working in and visiting these plantations has to be ensured.

Residential Colonies

Apart from pressures due to movement to and from these colonies, there is the added problem of grazing in the Reserve by livestock belonging to residents of these colonies. It is important to prevent such grazing and to ensure that the livestock are stall fed with fodder got from outside the Reserve. The proposed fodder plantations under the ecodevelopment project could provide fodder for these colonies.

Tribal Villages

There are two tribal villages inside the Reserve, inhabited by a small number of Kani tribals. Another village has already been rehabilitated outside the Reserve.

The Kanis are expert naturalists and have vast knowledge about the forests and the wild animals. Infact, they were originally brought to the area and settled here because the forest department wanted to make use of their expertise in growing teak.

Fortunately, the Kanis seem themselves to want to shift out of the Reserve, if proper rehabilitation facilities are provided. Besides, they have great value as tourist guides, trackers and educators about the Reserve and it would not be difficult to find ways of using their talents and in the process helping them to earn a living.

Pressures from Neighbouring Villages

There are basically two types of pressures. The greater pressures are for income generation through headloading and sale of firewood. These are sought to be relieved through the development of alternate income generation activities and through the support of the villagers in stopping this practice. The second type of pressures are for biomass, especially fodder, small timber and NWFP. Alternate sources, by plantation and regeneration, for these requirements are being developed under the ecodevelopment project. Also, the local people themselves will be employed to protect the Reserve against such activities.

Grazing in the Reserve would ordinarily be stopped, in a phased manner However, legally a part of the reserve could be opened for

grazing, at the discretion of the Project Director, in exceptional circumstances like a drought.

Fires and Poaching

The goodwill of the people, earned through the ecodevelopment project, will go a long way in stopping these activities. In addition, the local people themselves, especially the tribals, will be employed to work as fire watchers and as wildlife guards.

Crop Depredation

Various measures have been envisaged, in the ecodevelopment plan, for the protection of crops. However, crop damage compensation will have to be paid to villagers as long as their crops are destroyed. There is also a provision of hiring crop watchers and initially paying them from the ecodevelopment project. In the long run they can be paid out of the value of crops saved.

2. ECODEVELOPMENT

Each of the proposed ecodevelopment activities are being listed below, along with their description, the basis and rationale for selecting the particular activity, which of the impacts on the protected area it is expected to mitigate, how much and what segments of the population would it cater to, its phase and duration, any pre requisites to its success, and the costing. The calculations for costing and number of beneficiaries has been made on the basis of standard village units. For GHNP, the number of village units is 100, each with 30 households, while for KMTR it is 57, each with 800 households.

GREAT HIMALAYAN NATIONAL PARK

Ecodevelopment

Some General Observations

A. The economic activities of the people living in the periphery of GHNP (see map 5) can be divided into two broad categories. These are:

I. Subsistence activities

II. Activities for earning cash

The two major economic activities which fall in the first category are agriculture and pastoralism. Of the two, the people depend upon the resources of GHNP for pastoralism. Almost everyone in the area rears sheep and goats. Between June and October, large flocks of these goats and sheep from almost every village in the area, go up to the alpine pastures in GHNP, and graze. The people find it essential to maintain atleast some goats and sheep since their wool is used for making clothes as well as other items which are used during the bitterly cold winter months. Another reason for maintaining flocks of goats and sheep is that these animals are the source of valuable manure which is used in the fields. In addition, sheep and goats are assets which can be sold off for cash in times of crisis.

The major economic activities that fall in the second category listed above are extraction of medicinal herbs and aromatic plants (from hereon referred to as herb collection) and the collection of Guchis (Morchella esculenta). Both these activities are undertaken inside GHNP and, for many of the villagers, are the only source of cash income. These activities are undertaken between the months of April and November, and constitute a major pressure on GHNP. An indirect impact of these activities is the growing scarcity of deadwood for fuel in the Park, especially in the alpine zone since the herb collectors light big bonfires to keep themselves warm. This deadwood is also used by the Guchi collectors for lighting fires, which also pose a fire hazard.

B. The villages situated at higher altitudes of the south-facing slopes in the area attach a much greater importance to goats and sheep, as compared to other villages, especially those situated on the north-facing slopes. This is because, as a general rule, the soil on the north facing slopes is richer and better able to support agriculture, as compared to soil on the south facing slopes. Also, forest cover is richer and more extensive on the north-facing slopes as compared to the south-facing slopes.

C. At present, the local people do not have any problems arising out of GHNP having been notified, because they have so far not been restricted by the Park authorities from exercising their traditional rights and carrying out traditional activities. Therefore, the creation of GHNP has so far not had any adverse impact on the local people.

D. In general, the people, except in Nahin and Sharan, were quite sure that ecodevelopment inputs in the area would be able to divert pressures from the Park. This is because although the income they are able to generate from extraction of Guchis and herbs is high, it involves a lot of hard labour and at times is even life

threatening. They would prefer to be able to make their money in their village if they could. Also, the returns with respect to the input of labour are beginning to diminish, since the productivity of the herbs is declining due to over-exploitation.

E. The people in every village/hamlet visited, including Nahin and Sharan, had a sense of belonging towards the Park, and wanted to participate in protecting it.

F. In every single village/hamlet visited, the first demand of the people in lieu of the resources of the Park was motorable, preferably metalled, road. When asked why they needed a road, the standard response was something like this "We want the road because we want to grow apples here. Without a road we can not do so because the cost of transportation is very high."

However, further probing seemed to suggest that the two interconnected demands of a road and apples, are not the outcome of a well thought out process of weighing the various feasible development strategies which can be used for the area. These demands are manifestations of the urge to emulate the development model being followed in the Kullu valley and other parts of Himachal Pradesh, like Shimla and Kotgarh. Unfortunately, the model of development being followed in the Kullu valley and elsewhere is neither socially just nor environmentally sound.

Therefore, even though some of the options for ecodevelopment listed below have not been suggested by the people, these options appear less destructive ecologically, socially, and culturally. Needless to say, before they can be finalised or implemented, the people of the region will have to consider and accept them.

Impact of GHNP on the Villages : As already mentioned, currently there is no impact of GHNP on the people except for some minor incidents of crop damage by monkeys, bears, and porcupine, or livestock injury by jungle cat reported by the people at Nahin, and leopards and bears which was reported by people of Lagcha and Shenshar. At present, injury to livestock is compensated in cash by the Park authorities, if such injury occurs within the boundary of the Park. In case injury to livestock occurs outside the boundary of the Park, it is compensated in cash by the Territorial Wing of the Forest Department. Crop damage, however, is not presently being compensated.

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* The indicative planning team held nine meetings with the people living in the adjacent area of GHNP. These meetings were held at Tindar, Nahin, Lagcha, Pekhri, Sharan, Suchen, Shangarh, Lapah, and Neuli. Except in the case of meetings held at Suchen, Shangarh, and Neuli, the people spoken to belonged to the hamlet where the meeting was held. In case of Suchen, Shangarh, and Neuli, the people spoken to represented various hamlets in the revenue villages of Suchen, Shangarh and Shenshar respectively. A list of hamlets for each of the above three revenue villages from which people came for our meetings is given below:-

Suchen	Suchen, Girshaira, Narvali, Seri, Ropa, and Tungru.
Shangarh	Kahna, Birashangarh, Madana, Katawali, Dagara, Patara, Dharali, and Virshangarh.
Shenshar	Manara, Chinairi, Khain, Tung, Taliara, Bajara, Guidi, Rehara, Damairi, Jungla, Bhalru Ouar, Seri, Kainthage, Dartha, Seen, Shefari, Pachairi, Neuli, Gouli, Patara, Banogi, Bagishari, Satesh, Dharmera, Karail, Reara, and Jyalu

Impact of Villages on GHNP: There is considerable impact of the people on GHNP. The major economic activities of people, carried out mainly during the summer months and exerting pressure on the Park are:

A. Grazing of goats and sheep.

B. Herb collection.

C. Guchi collection.

Of the above, the people of Lagcha felt that for them grazing is the most important of these activities. The people of Pekhri, on the other hand, identified herb collection to be the most important. For the rest, all the three activities were almost equally important.

In addition to the above, the people of Lapah, Lagcha, and Tindar reported that they collected grass from GHNP for use during the winter months, but the importance attached to it was low.

Possible future pressures of the people on the Park could be slate quarrying, since this is already a major activity around Sainj. Also, many villages, especially on the south-facing slopes, have a shortage of fuelwood. They could pose a potential future pressure on the Park.

[See Annexure - 1 for a profile of the villages visited.]

ACTIVITIES FOR DEVELOPMENT OF TRANSPORT AND COMMUNICATION

1. Construction of Bridle Paths

1.1 Description: To construct bridle paths connecting selected villages/hamlets to each other and to the existing motorable roads.

1.2 Specific Benefits: Access to markets, income generation, and getting the support and cooperation of the local people.

1.3 Basis of Selection: As motorable roads within the area would have a high environmental and social impact, bridle paths would be the alternate solution. Another alternate, the construction of ropeways, can lead to the displacement of local labourers. Bridle paths could be used by the local labourers as well as by mules and ponies owned and operated by the local people.

1.4 Numbers and Types of Beneficiaries: Indirectly, almost everybody will economically benefit as access to markets will become easier. Also, those owning and operating mules and ponies, or involved in tourism activities, will also benefit. Besides, the construction of these bridal paths will provide employment to the extent of 2,66,667 person days. It might be mentioned that almost all villages are within six to seven kilometres of the existing motorable roads. Therefore, the provision of bridle paths would make all villages at most a few hours away from the motorable road head.

1.5 Constraints: The construction of the bridle paths will disturb the local environment. Also, the path will require regular maintenance. They would also make the Park that much more accessible.

1.6 Costing: For the entire area falling in the periphery (10 km radius) of GHNP, a network totaling approximately 200 km of

bridle paths is needed. The expected cost of the network is Rs. 80,00,000.00 @ Rs. 40,000.00 per kilometre [Anon. 1992].

2. Mules (Khachhars) and Ponies

2.1 Description: Provision of mules/ponies to facilitate transportation of goods and services, and people, to and from the nearest roadhead.

2.2 Specific Benefits: Income generation and improved communication.

2.3 Basis of Selection: Directly, this will generate income by providing employment to those who will own these animals. Indirectly, it will stimulate economic growth of the area by providing a mode of transportation for goods. As a mode of transportation, it is less environmentally destructive than motor vehicles.

2.4 Numbers and Types of Beneficiaries: Around 50 households would be given two mules/ponies each.

2.5 Constraints: People would have to be trained to look after and operate these animals. Also, some amount of veterinary care would have to be arranged.

2.6 Costing: 100 mules (two per beneficiary household) @ Rs. 10,000.00 per mule. The total cost of this would be Rs. 10,00,000.00.

ACTIVITIES FOR SOIL CONSERVATION AND IRRIGATION

3. Irrigation

3.1 Description: There are several perennial streams in the region from which water can be diverted through irrigation channels and brought to the fields of people.

3.2 Specific Benefits: Biomass regeneration and agricultural activities will benefit, providing both biomass and income.

3.3 Basis of Selection: This was suggested by people of Sharan, Shangarh, and Shenshar. In order to allow people to

successfully generate secure incomes from their land through growing peas, potatoes, and other vegetables and pulses, irrigation is desirable.

3.4 Numbers and Types of Beneficiaries: Everybody who owns agricultural land will benefit from this. In addition, employment will be generated to the extent of 1,25,000 person days.

3.5 Constraints: The viability of a diversion channel will depend on distance and slope.

3.6 Costing: There are about 25 clusters of hamlets in the periphery of the Park. On an average, a 5 km long diversion channel should be enough to get water to each cluster, since the entire area is criss-crossed by several perennial streams. Therefore, a network of about 125 km of diversion channels is needed. The cost of this would be Rs. 37,50,000.00 @ Rs. 30,000.00 per kilometre.

4. Agricultural Land Development

4.1 Description: To increase productive capacity of the agricultural land in the area by improving existing, and making new, terraces on the hills, and replenishing the topsoil.

4.2 Specific Benefits: Income generation through improved agricultural productivity.

4.3 Basis of Selection: In general, the villagers were keen to be helped to improve agricultural productivity.

4.4 Number and Types of Beneficiaries: An estimated 300 cultivators (males and females) in the area will be direct beneficiaries of this activity. In addition, employment could also be generated for others since this will be a labour intensive activity. This would generate employment equivalent to 40,000 person days.

4.5 Constraints: Some amount of ecological disturbance due to collection of top soil from valleys.

4.6 Costing: Rs. 12,00,000.00 for 300 ha. @ Rs. 4,000.00 per hectare [Anon. 1993].

5. Soil Conservation

5.1 Description: The package of soil conservation measures would include check dams, gully plugging, vegetative bunding etc.

5.2 Specific Benefits: Income generation, ecological benefits to the advantage of biomass plantations and agricultural activities.

5.3 Basis of Selection: This is being undertaken in order to arrest degradation wherever it is taking place, especially in the Sainj valley, and in the south-facing slopes in general.

5.4 Number and Types of Beneficiaries: Although everyone in the area would benefit indirectly, the direct benefits of employment generation will be for 83,333 person days.

5.5 Constraints: The terrain is harsh and sometimes very steep.

5.6 Costing: Rs. 25,00,000.00 for 500 ha. @ Rs. 5,000.00 per ha. [Anon. 1993].

ACTIVITIES FOR BIOMASS GENERATION

6. Mixed (Fuel and Fodder) Plantations

6.1 Description: To establish plantations for fuel and fodder in the culturable waste lands (revenue lands), estimated to be 529 ha. [Census 1981].

6.2 Specific Benefits: Grazing and Fuelwood collection.

6.3 Basis of Selection: This activity has been taken up to address the problem of grazing within the Park, and the mounting scarcity of fuelwood for villages situated on the south-facing slopes.

6.4 Numbers and Types of Beneficiaries: The increased availability

of fuel and fodder in the region would benefit all the villagers. This would provide sustainable employment for 200 families.

6.5 Constraints: The climate and vegetation does not lend itself to easy or quick regeneration.

6.6 Costing: Rs. 42,32,000.00 for 529 ha. @ Rs. 8,000.00 per hectare.

7. Joint Forest Management

7.1 Description: To jointly manage degraded forest lands, especially the south-facing slopes. The village communities will have rights over a percentage of the produce, including the timber.

7.2 Specific Benefits: Income and biomass generation.

7.3 Basis of Selection: There are vast forest lands in the project area, some of which are degraded. Also, the area produces valuable timber, especially Deodar and Kail. The local people, in return for protecting and regenerating these areas, should have a share of this timber which can then be crafted into furniture and other wood items, as described later, to earn them an income. This was also a demand of many of the villagers.

7.4 Numbers and Types of Beneficiaries: Most people in the area would benefit from this activity. Direct employment is expected to be generated for about 500 households.

7.5 Constraints: As mentioned earlier, the area is not easy to regenerate. However, this is compensated by the fact that other pressures are low and, therefore, the area is easy to protect.

7.6 Costing: Rs. 60,00,000.00 for 1,000 ha. @ Rs. 6,000 per hectare.

8. Development of [illegible] and Grazing Areas Around Villages/Hamlets

8.1 Description: To improve the productivity of the existing grasslands being used by the people around their villages.

8.2 Specific Benefits: Alternate grazing grounds.

8.3 Basis of Selection: The people expressed the need for winter grazing or fodder, and for the grazing of their cattle which do not go into the Park.

8.4 Number and Types of Beneficiaries: All the villages having "Ghasnis" will benefit. In addition, wage labour will be provided for 66,667 person days.

8.5 Constraints: A lot of these "Ghasnis" might be very heavily used and it may not be possible for the people to immediately start regulating its use. Also, a lot of them might be very small in size, and it may not be possible to use techniques like rotation etc. on them.

8.6 Costing: Rs. 20,00,000.00 for 400 ha. of grasslands @ Rs. 5,000.00 per hectare [Anon. 1993]

9. People's Nurseries

9.1 Description: Establishment of nurseries, run by the women, to provide saplings and seeds for the activities listed in sections 6 and 7.

9.2 Specific Benefits: Income generation.

9.3 Basis of Selection: As already mentioned, there are no coppicable species and, given the harsh climate, survival rates are enhanced if well developed saplings are planted.

9.4 Numbers and Types of Beneficiaries: About 200 women are expected to be employed in these nurseries.

9.5 Constraints: Women will have to be trained for running nurseries.

9.6 Costing: Rs. 9,00,000.00 for 3 lakh saplings in 10 nurseries of 0.5 ha. each @ Rs. 3.00 per plant.

10. Poultry Farming

10.1 Description: Poultry farming, especially of the local variety of chickens and hens, is one possible alternate income generating activity in the region.

10.2 Specific Benefits: Income generation.

10.3 Basis of Selection: This option was suggested by people of Tindar, Pekhri, Suchen, Shangarh, Lapah, and Shenshar. The possibility of this kind of an activity taking off exists because the towns of Manali and Kullu are important tourist destinations. At the moment, much of the demand for chickens and eggs in these towns is catered to by areas around Chandigarh. In any case, the quantum of tourists coming to Himachal has been rising steadily. Also, slowly but surely, tourists are beginning to find their way to this area, in order to visit the Park as well as other places around it.

10.4 Numbers and Types of Beneficiaries: Women from 60 households would be supported for this activity.

10.5 Constraints: Such activities will be successful only if the end users can be assured of regular supplies. For this, an efficient transport system is needed. Also, the people will have to compete with established poultry farms from areas around Chandigarh.

10.6 Costing: Rs. 3,90,000.00 for 60 families @ Rs. 6,500.00 per unit of 250 birds each.

11. Khaddi (Handloom) Centre

11.1 Description: Traditionally, the people, especially women, here weave shawls and blankets (locally known as Pattus and Shelas) for themselves and their families. They could take up this as an income generating activity.

11.2 Specific Benefits: : Income generation.

11.3 Basis of Selection: This was an option suggested by people, especially women, in Tindar, Nahin, Lagcha, Pekhri, Sharan, Suchen, Shangarh, and Shenshar. Taking up of this activity will not be difficult for people since the required skills already exist. Also, it is not an activity which is land based, and therefore will benefit small and marginal landholders. However, they want this to be organised in such a way that the Government sets up a handloom centre in a village, in which women are employed, and paid a stipend. There were, however, some women who were willing to take this up on their own.

11.4 Numbers and Types of Beneficiaries: This will mostly benefit women. There are an estimated 4296 women in the area in the age group between 16 and 60. Funding will be provided for 100 families.

11.5 Constraints: Again, marketing is a major constraint for this activity since the people will have to compete with weavers from the Kullu valley.

11.6 Costing: Rs. 12,00,000.00 for 100 looms @ Rs. 12,000.00 per loom. One loom will be given to each family.

12. Stitching

12.1 Description: The women wanted to also have stitching and knitting centres along the same lines as the handloom centre described above in 11.1.

12.2 Specific Benefits: Income generation.

12.3 Basis of Selection: This was suggested by people in Tindar, Nahin, Lagcha, Pekhri, Suchen, Shangarh, and Shenshar. At present the people get their garments stitched from elsewhere. This activity will help them to save some of their expenses.

12.4 Numbers and Types of Beneficiaries: 100 women, one per household.

Constraints: Not many.

12.5

12.6 Costing: Rs. 1,00,000.00 for three families @ Rs. 1,000.00 per sewing machine.

13. Carpentry

13.1 Description: To make furniture and other items of household and other uses from wood. In order to support the efforts of the villagers, a carpentry centre, along with marketing and training support will be provided under the ecodevelopment plan. It is proposed to provide training cum production centres at Sai Ropa and Ropa. The trained carpenters will be provided tools and other facilities to work in this production centre during the winter months and other slack periods. The timber that the villagers get as a part of their JFM agreement would be crafted into furniture and sent to the markets in Kullu, Shimla, Chandigarh, and even Delhi. The carpenters will be paid wages and the remaining profits will be shared by the villagers after paying for the running of the centre.

13.2 Specific Benefits: Income generation.

13.3 Basis of Selection: This option was suggested by people in Suchen, Shangarh, and Lapah. Their argument was that at present, many trees are cut for timber and then exported out of the area. If these trees could be used to make furniture here, then people could earn something. There are traditional skills, in the region, of wood carving, which can be upgraded.

13.4 Numbers and Types of Beneficiaries: 50 people are proposed to be trained in carpentry.

13.5 Constraints: The remoteness of the area makes the transportation of finished goods expensive.

13.6 Costing: Rs. 60,000.00 for 20 tool kits @ Rs. 3,000.00 per tool kit. In addition, Rs. 2,00,000.00 for two training centres cum workshops (200 sq ft each). The total cost would be Rs. 2,60,000.00.

14. Iron smithy

14.1 Description: There are many people (scheduled castes) who make iron implements used in people's houses and in their farms. What they want is some improved tools to be able to increase the quality and quantity of what they produce.

14.2 Specific Benefits: Income generation for scheduled caste families.

14.3 Basis of Selection: This option was suggested by people in Suchen, Shangarh, and Lapah.

14.4 Numbers and Types of Beneficiaries: Traditionally, iron smiths in the area have been scheduled caste males. In fact, this option was suggested by members of the scheduled castes themselves. It is proposed to provide improved tool kits to about 20 people in the area.

14.5 Constraints: If production is more than the local demand is able to absorb, then marketing will become another constraint. In addition, the fuel requirements for this activity are high.

14.6 Costing: Rs. 1,40,000.00 for 20 tool kits @ Rs. 7,000 per tool kit.

15. Beekeeping

15.1 Description: Beekeeping for honey and wax.

15.2 Specific Benefits: Income generation.

15.3 Basis of Selection: This was not an option for ecodevelopment suggested by the people. However, this is a traditional activity which the people carry on for their own consumption, and can be promoted in a manner which can become income generating. The proposed marketing set-up will provide support to the people for distribution of honey and wax.

15.4 Numbers and Types of Beneficiaries: 100 people are proposed to be provided with beekeeping units. In addition, another 10 people can be engaged in collecting honey and packaging it for

marketing.

15.5 Constraints: None.

15.6 Costing. Rs. 2,00,000.00 for 100 units @ Rs. 2,000.00 per unit.

16. Cultivation of Vegetables and Pulses

16.1 Description: There is potential in the area for people to grow vegetables, mainly peas, potatoes, cabbage, cauliflower, capsicum etc. and pulses like rajma, urad etc. which have a relatively bigger profit margin than crops like wheat, corn, rice and other cereals. Though irrigation facilities will be developed as a part of the ecodevelopment activity, the effort is to grow vegetables without the use of chemical fertilisers and pesticides. Initially, these vegetables will be marketed locally, but efforts will be made to link up to urban markets where there is an increasing demand for organically grown vegetables, which fetch a higher price.

16.2 Specific Benefits: Income generation.

16.3 Basis of Selection: This was suggested by people in all the villages/hamlets visited by the team. The crop with maximum potential, both economically and technically, is peas.

16.4 Numbers and Types of Beneficiaries: Mainly beneficial for those who have adequate land There are an estimated 5990 cultivators in the area, according to the 1981 census. It is proposed to provide a 50% subsidy on cost of seeds for upto 25% of agricultural land in the area.

16.5 Constraints: The small and marginal farmers are not able to benefit from such activities as much as the big farmers do.

16.6 Costing: Rs. 12,48,000.00 @ Rs. 1500.00 per hectare (50% subsidy) for 832 ha. (25% of total agricultural land in the area) for approx. 150 kg seed per hectare @ Rs. 20.00 per hectare.

17. Horticulture

17.1 Description: The growing of fruit trees of indigenous species for generating cash in the area.

17.2 Specific Benefits: Income generation.

17.3 Basis of Selection: This was suggested by people in all the villages/hamlets visited by the team. Funding will be given for local fruit trees like apricots, almonds, plums etc.

17.4 Numbers and Types of Beneficiaries: Mainly beneficial for those who have adequate land. There are an estimated 5990 cultivators in the area, according to the 1981 census. It is proposed to provide a 50% subsidy on cost of saplings for upto 25% of agricultural land in the area.

17.5 Constraints: The small and marginal farmers are not able to benefit from such activities as much as the big farmers do.

17.6 Costing: Rs. 12,48,000.00 @ Rs. 1500.00 per hectare (50% subsidy) for 832 ha. (25% of total agricultural land in the area) for approx. A 50% subsidy will be given on cost of saplings. About 300 saplings are planted in one hectare, and cost Rs. 10.00 per sapling.

18. Setting up of Sheep Farms

18.1 Description: To set up sheep farms for the production of wool.

18.2 Specific Benefits: Income generation.

18.3 Basis of Selection: The people of this region have a vast pool of knowledge, accumulated over several centuries, of practising sheep and goat rearing. This knowledge could be used in setting up these farms which could provide an income to several people. The farms would provide for improved varieties of sheep which give more wool. Currently, the wool in the region is mostly used for subsistence.

The setting up of sheep farms, if they are successful, will also put an end to the practice of sending the sheep to GHNP for grazing.

18.4 Numbers and Types of Beneficiaries: 100 people are expected to benefit from this activity.

18.5 Constraints: The successful organising of these farms would involve a lot of research and experimentation.

18.6 Costing: Rs. 20,00,000.00 for 2000 sheep @ Rs. 1000.00 per sheep.

19. Cultivation and Tissue Culture of Herbs

19.1 Description: Artificial cultivation of some of the medicinal herbs and aromatic plants being currently extracted from the Park.

19.2 Specific Benefits: Income generation.

19.3 Basis of Selection: Since there is considerable money to be made from extraction of herbs from the Park, people could make money by cultivating these herbs and selling them. This would help discourage the collection of herbs from the Park.

19.4 Numbers and Types of Beneficiaries: Everybody who has some land stands to benefit from this activity.

19.5 Constraints: At present, only a few of the herb species being extracted from the Park have been successfully cultivated. R&D inputs are needed to establish the cultivation of other species.

19.6 Costing: Since the costs of being able to do this are uncertain, a lumpsum of Rs. 10,00,000.00 is being budgeted.

20. Seed Money

20.1 Description: To finance the initial working capital expenditure of people who will be taking up new income generating activities. Depending on the local conditions, some of this money can be given as loans which, on recovery, can be recycled.

20.2 Specific Benefits: This will help the people to tide over the

gestation period

20.3 Basis of Selection Since the people will be running risks in order to set up new businesses, they should be provided with the necessary financial support needed initially, before things begin to take off. Also, some of them might not have the required capital.

20.4 Numbers and Types of Beneficiaries: All the people who will be taking up income generation activities.

20.5 Constraints: Recovery of loans can sometimes prove difficult.

20.6 Costing: Rs. 4,00,000.00 for four activities mentioned in 20.4 above, @ Rs. 1,00,000.00 per activity.

21. Marketing

21.1 Description: To set up a unit for marketing of products which will be produced by people undertaking some of the income generating activities.

21.2 Specific Benefits: Will help to provide people with a market for the goods which they produce.

21.3 Basis of Selection: Since the people are going to be engaged in various activities which will throw up goods which need to be marketed, a network needs to be organised for the sale of these goods. There are few nearby markets for the various goods.

21.4 Numbers and Types of Beneficiaries: All the people who are directly employed in this unit as well as all those who will be producing the goods which have to be marketed.

21.5 Constraints: This would need some inputs from marketing professionals.

21.6 Costing: Rs. 2,00,000.00 for the unit.

22. Miscellaneous:Rs. 20,00,000.00 has been budgeted under this head for taking care of action priorities in addition to the above, which may be suggested by the people, or may come up during the process of micro planning.

23. Employment in the Park/Wage labour and support staff

23.1 Description: Appointments of staff for all the appropriate vacant posts in GHNP to be those of the local villagers. In addition, all construction and other work being undertaken by the Park authorities, as a part of the ecodevelopment project or from their regular budget, to be done by engaging local people, as far as possible. Daily wage appointments of wildlife watchers from villages/hamlets close to the Park. Also, appointments of support staff for ecodevelopment on a contract basis.

23.2 Specific Benefits: Income generation, especially in the transitional period, and involvement of the local population in Park management. Provision of institutional support for ecodevelopment activities and work force for park management.

23.3 Basis of Selection: This was a very forceful demand of the people. It also has a lot of merit, since this will help in promoting a sense of belonging to the Park among the local people, and also enable them to participate in a small way in the management of the Park. According to the people, the level of protection of the Park would also go up if local people were engaged in it.

23.4 Numbers and Types of Beneficiaries: 50,000 person days of wage labour will become available from the project.

23.5 Constraints: There are very few jobs vacant. As such, this is not an activity which can benefit a majority of the people. Also, the construction and other work being undertaken by the Park authorities will not go on for very long, and in any case can not provide employment for very great numbers. However, at least 200 people could be employed on daily wages as wildlife watchers during the summer months.

23.6 Costing: The cost of permanent employees will be met out of the Park budget. Rs. 15,[illegible]0.00 will be provided from the ecodevelopment budget to employ daily wage persons, for five years, during the summer months. An additional Rs. 10,00,000.00 will be provided for engaging support staff for ecodevelopment on a contractual basis.

24. Crop Compensation:

24.1 Description: Cash compensation for crop damage.

24.2 Specific Benefits: The people's losses due to damage of crops by wild animals will get compensated.

24.3 Basis of Selection: The people wanted damage to their crops to be compensated in cash.

24.4 Numbers and Types of Beneficiaries: The villagers who live close to the boundary of the Park would benefit from this.

24.5 Constraints: Crop compensation is at best only a short term solution to the problem of crop damage.

24.6 Costing: Rs. 2,50,000.00.

25. Tourism

25.1 Description: There is a lot of potential in the area, even outside the Park, for development of tourism. Given the lack of roads and the harsh terrain, it is expected that only serious wildlifers and special groups of young men and women (perhaps organised by NMNH, WWF, or BNHS), who are able and willing to trek, will visit the Park. Such tourists would also be careful about not disturbing the environment and would serve as supporters of the Park.

25.2 Specific Benefits: Income generation.

25.3 Basis of Selection: This option was suggested to us by the people in Shangarh and Lapah. Tourism has a lot of multipliers and can have linkages with a lot of sectors in the area. People can be trained as guides and can even provide bed and breakfast facilities to visitors in the area. It is also

proposed to set up a tourist hospitality co-operative/trust/society of the local people. This co-operative will not only provide tourist guides from among the local, trained, people, but maintain the visitor facilities in and around the Park and develop literature of the Park.

25.4 Numbers and Types of Beneficiaries: Directly, 60 people will be given training as tourist guides and facilitators. In addition, most people in the area will be able to benefit from the linkages.

25.5 Constraints: Uncontrolled tourism can be destructive, both culturally as well as environmentally. Moreover, since tourism is yet to take off in the Park and in this area in general, the actual potential is unclear.

25.6 Costing: Two visitor's centres outside the Park will be made. The cost of this would be Rs. 5,00,000.00 each, plus furniture etc. at Rs. 1,00,00.00 each. There will also be expenses for buying tents and other camping equipment for use by tourist, estimated to be around Rs. 4,00,000.00. In addition, seed money, Rs. 1,00,000.00 per centre, would be needed. The total costs would be Rs. 18,00,000.00.

These centres will be used during off seasons (winter) as

ACTIVITIES RELATED TO HUMAN RESOURCES DEVELOPMENT (HRD)

The following activities relating to training and other inputs for HRD will be undertaken.

26. Training for Handlooms: A stipend of Rs. 300.00 per month plus cost of boarding and lodging at Rs. 600.00 per month, total Rs. 900.00 per month for three months training will be given to each woman at a total cost of Rs. 2,70,000.00. The trainers salary of Rs. 1,500.00 per month for six months will also be provided at a cost of Rs. 9,000.00. The total cost of this would be Rs. 2,79,000.00.

27. Training for Stitching: A stipend of Rs. 300.00 per month plus cost of boarding and lodging at Rs. 600.00 per month, total Rs. 900.00 per month for three months will be paid to all the women at a total cost of Rs. 2,70,000.00. Also, the trainers salary for six months @ Rs. 1,500.00 per month will be provided. The total cost of this would be Rs. 2,79,000.00.

28. Carpentry: Rs. 300.00 per month plus cost of boarding and lodging at Rs. 600.00 per month, total Rs 1,35,000.00 for 50 trainees for three months with a stipend of Rs. 900.00 per month. Rs 9,000.00 as trainer's salary for three months @ Rs. 1,500.00 per month. The total cost of this would be Rs. 1,44,000.00.

29. Tourism: 30 males will be trained as tourist guides for a period of one month. A stipend of Rs. 300.00 per month plus cost of boarding and lodging at Rs. 600.00 per month, total Rs. 900.00 per month can be paid to them. In addition, 30 women will be trained in managing visitor accommodation for one month at the stipend mentioned above. The total cost of this would be Rs. 54,000.00. Trainers costs at Rs. 1,500.00 per month for two months equals Rs. 3000.00. Therefore the total expenditure on HRD for tourism would be Rs. 57,000.00.

30. Management: 300 people will be trained in wildlife management for a period of three months. A stipend of Rs. 300.00 per month plus cost of boarding and lodging at Rs. 600.00 per month, total Rs. 900.00 per month can be paid to them. The cost of this would be Rs. 81,000.00. Trainers costs at Rs. 1,500.00 per month for twelve months equals Rs. 18,000.00. Therefore the total expenditure on HRD for wildlife management would be Rs. 99,000.00.

31. Ecodevelopment Planning: Rs. 50,000.00 has been budgeted for the purpose of training for ecodevelopment planning.

32. Miscellaneous: Rs. 1,00,000.00 has been budgeted for training needs in addition to the ones listed above, which may come up because of people's demands or during the process of micro planning.

RESEARCH AND DEVELOPMENT

Various research activities have already been identified, like the nutritional content of high altitude grass, methods of cultivating medicinal herbs found in the area, research and development related to the setting up of sheep farms, etc. Other research needs would be identified in the process of micro-planning and discussions with the local people. Total project allocation for R&D is Rs. 20 lakhs.

AWARENESS PROGRAMMES

As has already been described, there has to be a sharing of information between the local villagers and outsiders. Where as the local villagers would have much to tell about the ecology and culture of the area, they might benefit from discussion regarding sustainable development strategies and regional, national and even global environmental issues.

It is proposed to organised educational and scientific expeditions (like 'jathas') to visit the villages and both learn and communicate

environment

ideas of science, culture and [illegible]. The [illegible] budgeted is expenditure budgeted is Rs. 10 lakhs.

MONITORING

As already described, there would be an ongoing monitoring exercise from the first year, to ensure that the project is developing properly. The finding of such monitoring would be used for future planning and to modified and improve the project activities, as required. The total amount budgeted is Rs. 5 lakhs.

INSTITUTIONAL STRUCTURES

The men in all the hamlets/villages except Nahin, Sharan and Tindar, welcomed the idea of an ecodevelopment committee. The women said that they would prefer this to happen through the Mahila Mandal. However, they were not averse to the idea of an ecodevelopment committee. In Tindar, the men were indifferent to whether ecodevelopment inputs should be routed through the Panchayat or through the ecodevelopment committee. However, the women of Tindar wanted the inputs to come through the Panchayat. In Nahin and Sharan, this question was not asked because the people did not agree to look at ecodevelopment inputs as alternatives to pressures on the Park, but wanted them as increments to income from the Park.

In all the hamlets/villages where the idea of an ecodevelopment committee was supported, people wanted the committee to be organised for each hamlet, except in Shangarh. The men in Shangarh wanted the committee to be formed for all villages in Shangarh Panchayat, but with representation of each of these villages. In effect, the committee would then become a parallel institution to the Panchayat but the difference would be that each village would be allowed to elect/nominate a member to the committee. The women however, wanted the ecodevelopment inputs to come through the existing mahila mandals in the area.

One of the demands of the people in both Sangarh and Lapah was that since their panchayat would lose out on the royalty of herbs and Guchis being exported *, it should be compensated by the Government.

Some of the earnings of the communities could be shared with the Panchayats, but the details would have to be worked out between the Panchayats and the ecodevelopment committees, as and when they are set up.

At the district level, there would be a District Co-ordination Committee, chaired by the Collector. Also, as already mentioned, there is a need to set up a marketing co-operative, with some young professional help, as also a tourist hospitality co-operative.

* When any person wants to transport herbs or Guchis to any place outside the boundary of a panchayat whose rightholders have extracted them, he has to pay a certain amount of royalty to that panchayat. For almost all the panchayats in the area, this is a major, and sometimes the only source of revenue.

OPTIONS FOR THE TRANSITIONAL PERIOD

When asked about options for the transition period, people in all the villages, except in Nahin and Sharan for reasons already mentioned above, replied that while the bridle paths were being built, they could get employed there. This would be viable for about one or two years. Meanwhile, they would be able to establish themselves in some activity with a short gestation period, for example, poultry, or cultivation of peas or potatoes.

In order to establish themselves in an activity which has a long gestation period or has a large capital outlay, they might need a loan on favourable terms from the Government.

The people in Shangarh also said that, in the interim, they would use the resources of the forests in the adjacent area of the Park to tide over the transition. There are possibilities of a JFM kind of arrangement in this case.

Also, if as many people as possible were to be employed in the Park as soon as possible, it would help.

In addition, some of the activities like mixed fuel and fodder plantations, people's nurseries, joint forest management, and the building up of irrigation channels, all of which have a wage labour component, would help the people to tide over the transition period.

ANNEXURE - 1

Village Profiles

1. Tindar

Profile of the Village: The hamlet of Tindar is located about 3 km east of Gushaini in the Tirthan Valley, on a north-facing slope. One has to approach it on foot. The nearest roadhead is also at Gushaini. The hamlet of Tindar along with some other adjoining hamlets forms a revenue village* called Tindar. This revenue village has a population of 541 people (276 males and 265 females) with 94 households, and covers an area of 298 hectares [District Census Handbook, Kullu, 1981]. The hamlet of Tindar, visited by our team, has about 40 households with a population of about 400 (these and all subsequent figures for hamlets visited by our team, unless otherwise stated, were given by the people and are approximate). There are no scheduled caste households in the hamlet, but the revenue village has a population of 87 scheduled castes (41 males and 46 females) [District Census Handbook, Kullu, 1981]. According to our information, most of them stay in a hamlet called Ropa.

Most people in the hamlet of Tindar are engaged in primary economic occupations like agriculture and pastoralism.

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* A revenue village is the smallest unit of habitation recognised by the district administration. The revenue village need not be a single agglomeration of habitation. It may have one or more hamlets. But the revenue village is a distinct administrative unit with a separate village account.

An occupational and land use profile of the Tindar revenue village is given below:

CATEGORY	MALE	FEMALE
Total Main Workers	183	4
Cultivators	166	-
Agricultural Labourers	3	2
Household Industry (Manufacturing, Processing, Servicing, and Repairs)	-	-
Other Workers	14	2
Marginal Workers	-	156
Non Workers	93	105

LAND USE	HECTARES
Forest Land	-
Irrigated Land	-
Unirrigated Land	183
Culturable Waste	52

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* The definition of the above mentioned occupational categories as per the District Census Handbook is as follows:-

Main Worker	A person who has primarily worked for more than six months in the year of enumeration.
Cultivator	A person is a cultivator if he or she is engaged either as employer, single worker, or family worker in cultivation of land owned or held from Government or private persons or institutions for payment of any money, kind or share.
Agricultural Labourer	A person who works in any person's land for wages and money, kind or cash, is regarded as an agricultural labourer.
Household Industry	It is an industry which involves atleast manufacturing, or processing, or servicing, or repairing conducted by the head of the household and/or by a member of the household at home or within the village.
Other Workers	All those who work in economic activities other than cultivation, agricultural labor, or household industry are other workers.
Marginal Workers	A person who has worked for atleast one day but less than six months in the year of enumeration.
Non Workers	A person who has not worked at all in the year of enumeration.

2. Pekhri

Profile of the Village: The hamlet of Pekhri is located about 3 km east of Gushaini in the Tirthan Valley, on a south-facing slope. However, since this hamlet is not situated at a high altitude, and the aspect of the slope it is situated on protects it a little from the Sun, the soil here is not as poor as is usually the case on south-facing slopes. One has to approach it on foot. The nearest roadhead is also at Gushaini. The hamlet of Pekhri along with some other adjoining hamlets forms a revenue village. This village has a population of 841 people (444 males and 397 females) with 145 households, and covers an area of 355 hectares [District Census Handbook, Kullu, 1981]. The hamlet of Pekhri has about 60 households with a population of about 450. There are no scheduled caste households in the hamlet, but the revenue village has a population of 130 schedule castes (65 males and 65 females) [District Census Handbook, Kullu, 1981].

An occupational and land use profile of the Pekhri revenue village is given below:

CATEGORY	MALE	FEMALE
Total Main Workers	267	82
Cultivators	242	76
Agricultural Labourers	-	-
Household Industry (Manufacturing, Processing, Servicing, and Repairs)	2	-
Other Workers	23	6
Marginal Workers	9	158
Non Workers	168	157

LAND USE		HECTARES
Forest Land	Forest land	-
	Irrigated land	-
	Unirrigated land	239
	Culturable table	45

In addition to Pekhri, our team visited Nahin and Lagcha,

two other hamlets which are a part of the Pekhri revenue village. Both these hamlets are situated at an altitude above 2200 msl, on a south-facing slope in the Tirthan Valley. Nahin is about 5 km east of Gushaini, the nearest roadhead, while Lagcha is about 4 km east of Gushaini. Both the hamlets have to be approached on foot. The hamlet of Nahin has about 35 households with a population of about 450 people. Of the total number of households, about 15 households are of scheduled castes. There are 10 households in Lagcha with a population of about 80 people. There are no scheduled caste households in Lagcha. The people in Lagcha told the team that their land was not very productive and that they could get only one crop a year from it.

3. Railah

Profile of the Village: This revenue village has a population of 2,225 people (1,181 males and 1,044 females) with 392 households, and covers an area of 559 hectares. There are 536 schedule castes (270 males and 266 females) [District Census Handbook, Kullu, 1981]. An occupational and land use profile of the Railah revenue village is given below:

CATEGORY	MALE	FEMALE
Total Main Workers	685	128
Cultivators	628	124
Agricultural Labourers	3	1
Household Industry (Manufacturing, Processing, Servicing, and Repairs)	3	-
Other Workers	51	3
Marginal Workers	18	352
Non Workers	478	564

LAND USE	HECTARES
Forest Land	-
Irrigated Land	3
Unirrigated Land	383
Culturable Wastes	43

Our team visited Sharan hamlet which is a part of the Railah revenue village. This hamlet is situated on a south-facing slope in the Jiwa Nal Valley. It is about 2 km north of Seund, a hamlet located at the confluence of Jiwa Nal and Sainj. Sharan has to be approached on foot. The nearest roadhead is also Seund. Sharan has about 40 households with a population of about 300 people. Of the total number of households, about 15 households are of scheduled castes.

4. Suchen

Profile of the Village: This revenue village has a population of 914 people (493 males and 421 females) with 170 households, and covers an area of 233 hectares. There are 299 schedule castes (157 males and 142 females) [District Census Handbook, Kullu, 1981]. An occupational and land use profile of the Suchen revenue village is given below:

CATEGORY	MALE	FEMALE
Total Main Workers	316	152
Cultivators	302	145
Agricultural Labourers	5	5
Household Industry (Manufacturing, Processing, Servicing, and Repairs)	-	-
Other Workers	9	2
Marginal Workers	4	113
Non Workers	173	156

LAND USE	HECTARES
Forest Land	-
Irrigated Land	2
Unirrigated Land	162
Culturable Wastes	28

Our team spoke to people from the hamlets of Suchen, Girshaira, Narvali, Seri, Ropa, and Tungra in the Sainj Valley. All these hamlets are a part of the Suchen Revenue Village. The meeting was held near Suchen, about 3 km from Ropa, which is also the nearest Roadhead. There are about 50 households in the hamlet of Suchen of which 7 households

belong to scheduled castes. The population of the hamlet of Suchen is about 300.

5. Shangarh

Profile of the Village: This revenue village has a population of 463 people (227 males and 236 females) with 89 households, and covers an area of 166 hectares. There are 168 schedule castes (85 males and 83 females) [District Census Handbook, Kullu, 1981]. An occupational and land use profile of the Shangarh revenue village is given below:

CATEGORY	MALE	FEMALE
Total Main Workers	163	143
Cultivators	155	143
Agricultural Labourers	-	-
Household Industry (Manufacturing, Processing, Servicing, and Repairs)	-	-
Other Workers	8	-
Marginal Workers	-	1
Non Workers	64	92

LAND USE	HECTARES
Forest Land	-
Irrigated Land	1
Unirrigated Land	118
Culturable Wastes	31

Our team spoke to people from the hamlets of Kahna, Birashangarh, Madana, Katawali, Dagara, Patara, Dharali, and Virshangarh, also located in the Sainj Valley. All these hamlets are a part of the Shangarh Revenue Village. The meeting was held at Madana, about 5 km from Ropa, which is also the nearest Roadhead.

6. Lapah

Profile of the Village: The hamlet of Lapah is located about 20 km east of Ropa in the Sainj Valley, on a north-facing slope. One has to approach it on foot. The nearest roadhead is at Neuli, about 17 km away. The hamlet of Lapah along with some other adjoining hamlets forms a revenue village. This

village has a population of 173 people (90 males and 83 females) with 33 households, and covers an area of 100 hectares [District Census Handbook, Kullu, 1981]. The hamlet of Lapah has about 25 households with a population of about 200. There are 5 scheduled caste households in the hamlet.

Most people in the hamlet of Lapah are engaged in primary economic occupations like agriculture and pastoralism. An occupational and land use profile of the Lapah revenue village is given below:

CATEGORY	MALE	FEMALE
Total Main Workers	61	59
Cultivators	60	59
Agricultural Labourers	-	-
Household Industry (Manufacturing, Processing, Servicing, and Repairs)	-	-
Other Workers	1	-
Marginal Workers	-	-
Non Workers	29	24

LAND USE	HECTARES
Forest Land	-
Irrigated Land	-
Unirrigated Land	68
Culturable Wastes	15

7. Shenshar

Profile of the Village: This revenue village has a population of 1183 people (616 males and 567 females) with 228 households, and covers an area of 368 hectares. There are 630 schedule castes (329 males and 301 females) [District Census Handbook, Kullu, 1981]. An occupational and land use profile of the Shenshar revenue village is given below:

CATEGORY	MALE	FEMALE
Total Main Workers	428	206
Cultivators	406	206
Agricultural Labourers	-	-
Household Industry (Manufacturing, Processing, Servicing, and Repairs)	3	-
Other Workers	19	-
Marginal Workers	1	155
Non Workers	187	206

LAND USE	HECTARES
Forest Land	-
Irrigated Land	14
Unirrigated Land	228
Culturable Wastes	43

Our team spoke to people from the hamlets of Manara, Chinairi, Khain, Tung, Taliara, Bajara, Guidi, Rehara, Damairi, Jungla, Bhalru Duar, Seri, Kainthage, Dartha, Sin, Shefari, Pachairi, Neuli, Gauli, Patara, Banogi, Bagishairi, Satesh, Dharmera, Karail, Reara, and Jyalu. All these hamlets are located on the south-facing slopes in the Sainj valley. The venue of the meeting was at Neuli.

Ecodevelopment

Activities for ecodevelopment have been categorised under the following broad heads :

Activities for Irrigation and Soil Conservation to increase water availability in the region for domestic use, agriculture and plantations.

Activities for biomass generation to meet the requirements for fuel, fodder small timber and NWFP, currently being met from the Reserve, and also to provide some wage labour especially, during the transitional period. These include:

- Fuel, fodder and small timber plantations
- Development of fodder pastures
- People's nurseries

Income Generation Activities to provide alternate sources of income generation, so as to replace the activity of headloading. These include:

- Poultry keeping
- Banana/Cissal fibre production
- Stitching
- Bee keeping
- Palm jaggery preparation
- Seed money
- Marketing
- Miscellaneous

Activities Related to Reserve Management aimed at involving the local people in the management of the Reserve, as also at providing employment opportunities. These include:

- Wildlife management activities
- Setting up a Training cum Visitor Center
- Crop protection measures

Human Resource Development Activities will comprise the training component of some of the activities mentioned above. These include:

- Training in Banana/Cissal fibre production
- Training in stitching
- Training for tourism facilitation
- Training for wildlife management
- Miscellaneous training

ACTIVITIES FOR IRRIGATION AND SOIL CONSERVATION

1. Irrigation and Soil Conservation Measures

1.1 Description : In order to enhance availability of water resources, two or three tube wells will have to be located in each village, in the fallow lands, preferably government or institutional lands. In addition, checkdams, percolation tanks and contour bunding will also be undertaken.

1.2 Specific Benefits : Presently, the shortage of water is a cause of low agricultural productivity. The availability of water will also ensure higher success rate of plantations.

1.3 Basis of Selection : This was a requirement voiced by the people.

1.4 Numbers and Types of Beneficiaries : It is expected to generate 2,26,270 persondays of work.

1.5 Institutional Structures Existing/Required : Actual planning and execution of these measures will be done in consultation with the Agricultural Engineering Department. Modalities of using water for agricultural use is presently worked out by a water sharing committee in most villages. However, the village ecodevelopment committee will also undertake this work.

1.6 Pre-requisites and Constraints : A detailed study needs to be done for prospecting for water availability in the region, using remote sensing and GIS capabilities.

1.7 Costing :

114 wells @ Rs. 21,000 per well	Rs. 23,94,000
114 checkdams @ Rs. 6,000 per checkdam	Rs. 6,84,000
57 percolation tanks @ Rs. 20,000 per tank	Rs. 11,40,000
14.5 km. bunding @ Rs. 1,00,000 per km.	Rs. 14,50,000
Total	Rs. 56,68,000

2. Fuel, Fodder, Fruit and Small Timber Plantations

2.1 Description : A mix of species which are useful as fuel, fodder, NWFP, and fruit bearing trees can be planted on available common lands.

2.2 Specific Benefits : Presently, these requirements are being met from the Reserve. Plantations will help ease pressure on the Reserve, besides giving people some employment and an alternate source of meeting these requirements.

2.3 Basis of Selection : The loss of access to existing natural resources necessitates establishing plantations. On discussion, the people were very keen on planting timber trees along with trees giving green manure and fodder. Fuelwood for subsistence use is not a problem as there are numerous Prosopis juliflora bushes in virtually every village.

2.4 Numbers and Types of Beneficiaries : About 800 beneficiary household units can get sustainable employment.

2.5 Institutional Structures Existing/Required : Village ecodevelopment committees are required to identify wastelands and work out benefit sharing mechanisms.

2.6 Pre-requisites and Constraints : Selection of a suitable plot and negotiating with the owners requires a strong ecodevelopment committee. Identification of species and their physical requirements have to be made.

2.7 Costing : 5,700 ha. @ Rs. 8000 per ha.

Total Rs.4,56,00,000

3. Development of Fodder Pastures

3.1 Description : Pastures for meeting fodder requirements will have to be raised on available fallow land.

3.2 Specific Benefits : Meeting the existing fodder requirements, in order to reduce grazing pressure on the Reserve.

3.3 Basis of Selection : Each hectare of wetland or fodder grassland can maintain 3.5 cow units. Together with agricultural residue, the area could produce adequate fodder to meet the local requirements. The activity will also provide a source of wage labour.

3.4 Numbers and Types of Beneficiaries : Apart from enhanced fodder availability for all the people in the region, it would provide employment to 475 beneficiary household units.

3.5 Institutional Structures Existing/Required : Village ecodevelopment committees are required to identify wastelands and work out benefit sharing mechanisms.

3.6 Pre-requisites and Constraints : Common and wasteland will have to be identified and where the control of such lands is with the government or with local trusts, its use will have to be negotiated. In some areas, water would be required for irrigation. Efforts to enhance water availability is, however, a part of the project.

3.7 Costing : 1425 ha. @ Rs. 6000 per ha. Total Rs. 85,50,000

4. People's Nurseries

4.1 Description: Establishment of nurseries, primarily run by women, to provide saplings and seeds for the activities listed in sections 2 and 3.

4.2 Specific Benefits: Income generation.

4.3 Basis of selection: Though the forest department could provide the technical inputs for nurseries, in the long run it would give people a greater sense of involvement, if they managed their own nurseries.

4.4 Numbers and Types of Beneficiaries: About 200 women are expected to be employed in these nurseries.

4.5 Institutional Structures Existing/Required : Village ecodevelopment committees are required.

4.6 Pre-requisites and Constraints- Women will have to be trained for running nurseries.

4.7 Costing: 10 lakh saplings in 30 nurseries of 0.5 ha. each @ Re. 1 per plant. Total Rs. 10,00,000

INCOME GENERATION ACTIVITIES

5. Poultry Keeping

5.1 Description : Two types of poultry keeping are possible: one a broiler unit and another given by the IRDP scheme of 10 hens and 1 cock. The infrastructure is given for housing 500 broiler chicks per unit, including feed and vaccine.

5.2 Specific Benefits : Income generation.

5.3 Basis of Selection : This is an activity which generates income without any impact on the Reserve. On the other hand, it also has inputs for agriculture.

5.4 Numbers and Types of Beneficiaries : 1,140 beneficiaries, preferably women, at 10 beneficiaries per poultry unit.

5.5 Institutional Structures Existing/Required : None existing. A village ecodevelopment committee is required. SCAO a local NGO, with past experience in poultry management, would be involved.

5.6 Pre-requisites and Constraints : An effecient marketing network is necessary to ensure returns.

5.7 Costing : 114 units @ Rs. 20,000 per unit. Total Rs. 22,80,000

6. Banana/Cissal Fibre Production

6.1 Description : Utilitarian articles like bags, mats etc. are produced from banana and cissal fibre.

6.2 Specific Benefits : Income generation.

6.3 Basis of Selection : This is an income generation scheme available to women, at home. CAST, a local NGO, has been promoting the activity in the area.

6.4 Numbers and Types of Beneficiaries : 1,140 household beneficiary units.

6.5 Institutional Structures Existing/Required : None existing. Ecodevelopment committees and local NGOs will be involved.

6.6 Pre-requisites and Constraints : There are some castes in the area that consider the activity an inferior one. Marketing net work has just been set up.

6.7 Costing : Cost of training 10 trainees for a period of 6 months Rs. 32,000. Loan for purchase of raw materials Rs. 10,000 for 10 trainees. 57 units @ Rs. 20,000 per unit.

Total Rs. 11,40,000

7. Stitching

7.1 Description : Imparting training to 10 men/women in tailoring.

7.2 Specific Benefits : Income generation.

7.3 Basis of Selection : It is an income generating scheme suited to women and interested men and handicapped persons.

7.4 Numbers and Types of Beneficiaries : It is expected to benefit 100 families.

7.5 Institutional Structures Existing/Required : None existing. The existing NGO's can impart training.

7.6 Pre requisites and Constraints : Trainees are likely to drop out after initial training expenditure. Not many beneficiaries can be targeted for this activity as employment opportunities are likely to diminish.

7.7 Costing : Total cost of training Rs. 31 500. Loan facility for buying 10 machines Rs. 10,000. 100 units @ Rs. 1,000 per machine Total Rs. 1,00,000

8. Bee Keeping

8.1 Description : The space needed for this unit is 1 acre of land. 20 boxes will be supplied as bee hives. The income generation would be Rs. 2000 per month.

8.2 Specific Benefits : Income generation.

8.3 Basis of Selection : The village people were receptive to the idea. Their situation near a forest could facilitate the activity. Also, bee keeping has proved successful in some of the villages of the area.

8.4 Numbers and Types of Beneficiaries : 570 beneficiary household units, preferably women.

8.5 Institutional Structures Existing/Required : To be handled through the local NGOs who have experience in this.

8.6 Pre-requisites and Constraints : The envisaged unit of 20 hives requires a certain amount of land (1 acre). Training is also needed.

8.7 Costing : 570 units @ Rs. 6,000 per unit. Total Rs. 34,20,000

9. Palm Jaggery Preparation

9.1 Description : The Tamil Nadu Khadi and Village Industries Board (KVIB), can set up a palm jaggery extraction unit, which can provide employment to women. The KVIB can also buy the finished product from the women.

9.2 Specific Benefits : Income generation.

9.3 Basis of Selection : The activity, considered an inferior one, at present involves extreme physical and mental strain. It is undertaken for a period of four months in a year. In its present form, the activity is highly exploitative, especially for women. The extraction unit would avoid this.

9.4 Numbers and Types of Beneficiaries : 10 units, employing 200 women in centers of palm jaggery extraction.

9.5 Institutional Structures Existing/Required : None existing. Village ecodevelopment committee to set up co-operatives and link up with KVIB.

9.6 Pre-requisites and Constraints : The scheme has yet to be tried out in this region.

9.7 Costing : 10 units @ Rs. 1,00,000 per unit.Total Rs. 10,00,000

10. Seed Money

10.1 Description : To finance the initial working capital expenditure of people who will be taking up new income generating activities. Depending on the local conditions, some of this money can be given as loans which, on recovery, can be recycled.

10.2 Specific Benefits : This will help the people to tide over the gestation period.

10.3 Basis of Selection : Since the people will be taking risks in order to set up new businesses, they should be provided with the necessary financial support needed initially, before things begin to take off. Also, some of them migh not have the required capital.

10.4 Numbers and Types of Beneficiaries : All the people who will be taking up income generation activities.

10.5 Institutional Structures Existing/Required : None

10.6 Pre-requisites and Constraints : Recovery of loans can sometimes prove difficult.

10.7 Costing : Seed money requirement for the relevant activities
Total Rs. 10,00,000

11. Marketing

11.1 Description: To set up a unit for marketing of products which will be produced by people undertaking some of the income generating activities.

11.2 Specific Benefits: Will help to provide people with a market for the goods which they produce.

11.3 Basis of Selection: Since the people are going to be engaged in various activities which will throw up goods which need to be marketed, a network needs to be organised for the sale of these goods.

11.4 Numbers and Types of Beneficiaries: All the people who are directly employed in this unit as well as all those who will be producing the goods which have to be marketed.

11.5 Institutional Structures Existing/Required : None

11.6 Pre-requistes and Constraints: This would need some inputs from marketing professionals.

11.7 Costing: For the marketing unit Total Rs. 2,00,000

12. Miscellaneous

Rs. 50,00,000 has been budgeted under this head for taking care of action priorities in addition to the above, which may be suggested by the people, or may come up during the process of micro planning. Total Rs. 50,00,000

ACTIVITIES RELATED TO RESERVE MANAGEMENT

13. Wildlife Management Activities

13.1 Description : Wildlife management activities will include weed eradication, fireline building and maintenance, fire watching and control, census, animal tracking, identification of species, control of poaching, etc.

13.2 Specific Benefits : Income generation and involvement with the Reserve management.

13.3 Basis of Selection : There is a consistent labour requirement for Reserve management activities, which can be met by giving priority to people from villages adjacent to the Reserve.

13.4 Numbers and Types of Beneficiaries : It will create about 1,00,000 persondays of work.

13.5 Institutional Structures Existing/Required : The Reserve authorities will employ people from the villages surrounding the Reserve.

13.6 Pre-requisites and Constraints : For some of these activities, the villagers will have to be trained. Such training will be organised under the project.

13.7 Costing : 1,00,000 persondays @ Rs. 25 per persondayTotal Rs. 25,00,000

14. Setting up a Training cum Visitor Center

14.8 Description : Training cum visitor centers will be built at the three entry points to the Reserve at Papanasam (for Mundanthurai), Kalakad and Nambikoil. They will provide inexpensive boarding and lodging for visitors to the Reserve and religious sites.

14.2 Specific Benefits : Employment and income generation.

14.3 Basis of Selection : Such facilities are currently not available.

14.4 Numbers and Types of Beneficiaries : 300 beneficiaries would

be trained to manage and run the training cum visitor centers.

14.5 Institutional Structures Existing/Required : Forest Department will handle this activity.

14.6 Pre-requisites and Constraints : Some training in running such a complex will have to be provided.

14.7 Costing :

3 visitor center complexes @ Rs. 5,00,000 per center construction	Rs. 15,00,000
Furniture and fittings for 3 centers @ Rs. 1,00,000 per center	Rs. 3,00,000
Seed money for 3 centers @ Rs. 1,00,000 per center	Rs. 3,00,000
Capital costs Rs. 18,00,000 Recurring costs Rs. 3,00,000	
Total	Rs. 21,00,000

15: Crop Protection Measures

15.1 Description : Crop protection measures will include a combination of possibilities. These would include, a rock pile wall, topped with concrete, and having a foundation of two feet; 'green fencing' of Cissal and other thorny bushes; an elephant pit of specific dimensions; and the appointment of watchmen by the village ecodevelopment committee. There will also be some research in new and innovative methods of protecting crops from wild boars.

15.2 Specific Benefits : To protect crops against depredation by wild boar and elephant, thereby enhancing income from agricultural activities and getting the support of the local people.

15.3 Basis of Selection : Crop protection was one of the main demands of the villagers, especially of those whose fields were bordering the Reserve. Presently, crop damage is estimated to be to the tune of Rs. 2,00,000 per annum.

15.4 Numbers and Types of Beneficiaries : It will benefit all the

villages and is expected to create upto 65,700 persondays of work.

15.5 Institutional Structures Existing/Required : These measures will be undertaken by the village ecodevelopment committee in consultation with the Reserve authorities.

15.6 Pre-requisites and constraints : None

15.7 Costing :

85 km green fencing @ Rs. 4,500 per km.	Rs. 3,82,500
1 km elephant pit @ Rs. 5,00,000	Rs. 5,00,000
2.5 km. wall @ Rs. 200 per meter	Rs. 5,00,000
Other measures over 50 km. @ Rs. 5,000 per km.	Rs. 2,50,000
Crop loss compensation @ Rs. 6,00,000 over a period of 5 years	Rs. 6,00,000
Total	Rs. 22,32,500

HUMAN RESOURCES DEVELOPMENT ACTIVITIES

16. Training for Banana/cissal fibre production

16.1 Number and type of trainees : 1,140, mainly women

16.2 Duration : 3 months

16.3 Cost :

Stipend for 1,140 persons @ Rs. 900 per month for 3 months (stipend @ Rs. 300 + boarding & lodging @ Rs. 600)	Rs. 30,78,000
Honorarium for trainer @ Rs. 1,500 per month for 30 months (6 courses of one month each)	Rs. 45,000
Total	Rs. 31,23,000

17. Training in Stitching

17.1 Number of trainees : 100

17.2 Duration : 1 month

17.3	Cost :	Stipend for 100 persons @ Rs. 900 per month for 3 months (stipend @ Rs. 300 + boarding & lodging @ Rs. 600)	Rs. 2,70,000
		Honorarium for trainer @ Rs. 1,500 per month for 6 months (6 courses of one month each)	Rs. 45,000
			Total Rs. 3,15,000

18. Training for Tourism Facilitation

18.1 Number of trainees : 300

18.2 Duration : 1 month

18.3	Cost :	Stipend for 300 persons @ Rs. 900 per month for 1 month (stipend @ Rs. 300 + boarding & lodging @ Rs. 600)	Rs. 2,70,000
		Honorarium for trainer @ Rs. 1,500 per month for 6 months (6 courses of one month each)	Rs. 90,000
			Total Rs. 3,60,000

19. Training for Wildlife Management

19.1 Number of trainees : 100

19.2 Duration : 3 months

19.3	Cost :	Stipend for 300 persons @ Rs. 900 per month for 3 months (stipend @. Rs. 300 + boarding & lodging @ Rs. 600)	Rs. 2,70,000
		Honorarium for trainer @ Rs. 1,500 per month for one year (4 courses of 3 months each)	Rs. 18,000
			Total Rs. 2,88,000

20. Miscellaneous

Besides the above, an additional Rs. 10,00,000 would be required for training requirements identified by the people, during the course of micro-planning.

RESEARCH AND DEVELOPMENT

Various research activities have already been identified, like the development of biological and innovative crop protection measures, methods of cultivating some of the herbs and other NWPP found in the area, etc. Other research needs would be identified in the process of micro-planning and discussions with the local people. Total project allocation for R&D is Rs. 20 lakhs.

AWARENESS PROGRAMMES

As has already been described, there has to be a sharing of information between the local villagers and outsiders. Where as the local villagers and the Kani tribals would have much to tell about the ecology and culture of the area, they might benefit from discussion regarding sustainable development strategies and regional, national and even global environmental issues.

It is proposed to organised educational and scientific expeditions (like 'jathas') to visit the villages and both learn and communicate ideas of science, culture and environment. The total amount budgeted is Rs. 20 lakhs.

MONITORING

As already described, there would be an ongoing monitoring exercise from the first year, to ensure that the project is developing properly. The finding of such monitoring would be used for future planning and to modified and improve the project activities, as required. The total amount budgeted is Rs. 10 lakhs.

OPTIONS FOR TRANSITION PERIOD

The activities available for the transitional period include activities for Irrigation and Soil Conservation; Activities Related to Reserve Management; Activities for biomass generation like Fuel, fodder and small timber plantations, Development of fodder pastures, People's nurseries; Training in Poultry keeping, Banana/Cissal fibre production, Stitching, Bee keeping, Palm jaggery preparation, etc.

There are also activities related to Reserve Management.

- Wildlife management activities
- Setting up a Training cum Visitor Center
- Crop protection measures

D. PROJECT COSTS

1. Consolidated

The consolidated project costs are:

Area	Total Cost	Yearly breakup 1	2	3	4	5
GHNP (Rs. Crores)	5.07	1.22	1.64	1.20	0.67	0.34
(US $ millions)	1.69	0.41	0.55	0.40	0.22	0.11
KMTR (Rs. Crores)	9.50	2.21	3.25	2.51	1.37	0.16
(US $ millions)	3.17	0.74	1.08	0.84	0.46	0.05
TOTAL (Rs. Crores)	14.57	3.33	4.89	3.71	2.04	0.50
(US $ millions)	4.86	1.15	1.63	1.24	0.68	0.16

2. Great Himalayan National Park

For the purpose of calculating costs and coverage, a village unit of 30 households was taken as a norm. The project area was, therefore, divided into a total of 100 village units. The project attempts to cover approximately a third of the households (10), in each village unit through some sustainable income generation activities. As such, the project would cover over a thousand households in the project area. In addition, there would be wage labour provided for 7,21,300 person days. For detailed costing of activities, please see Table D1 in this section.

3. Kalakad Mundanthurai Tiger Reserve

For the purpose of calculating costs and coverage, a village unit of 800 households was taken as a norm. The project area was, therefore, divided into a total of 57 village units. The project attempts to cover approximately 10% of the households (80), in each village unit through some sustainable income generation activities. As such, the project would cover approximately four thousand five hundred of the poorest households which are using the Reserve area. In addition, there would be wage labour provided for 6,33,140 person days. For detailed costing of activities, please see Table D2 in this section.

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* Conversion into US $ at Rs. 30/ for $ 1. Totals do not match due to rounding off.

Table - 01

DETAILED COSTING FOR GREAT HIMALAYAN NATIONAL PARK

Sno.	Item/Activity	Rate (in Rs.) per unit	Total No. of Units	Total Cost Recurring (in Rs. Lakhs)	Capital	Yearly Break Up of Costs 1	2	3	4	5
A.	PLANNING	5000/hamlet	200	10.00		7.50	2.50			
B.	ECODEVELOPMENT									
	Transport									
	1 Bridle Paths	40000/km	200	80.00		20.00	30.00	20.00	10.00	
	2 Mules	10000/Mules	100	10.00		2.00	3.00	3.00	2.00	
	Irrigation & Soil									
	3 Irrig Canal	30000/km	125	37.50		10.00	10.00	10.00	7.50	
	4 Agri Land Dev	4000/ha	300	12.00		4.00	8.00			
	5 Soil Cons	5000/ha	500	25.00		5.00	10.00	10.00		
	Biomass									
	6 Fuel and Fodder	8000/ha	529	42.32		5.00	20.00	17.32		
	7 JFM	6000/ha	1000	60.00		12.00	12.00	12.00	12.00	12.00
	8 "Ghasnis"	5000/ha	400	20.00		4.00	8.00	8.00		
	9 Nurseries	3/Sapling	300000	9.00		3.00	3.00	3.00		
	Income Generation									
	10 Poultry	6500/250 birds	60	3.90		0.50	1.20	1.20	1.00	
	11 Handlooms	12000/Loom	100	12.00		3.00	3.00	3.00	3.00	
	12 Stitching	1000/Machine	100	1.00		0.50	0.50			
	13 Carpentry									
	## Tools	3000/Toolkit	20	0.60		0.30	0.30			
	## Workshop	500/sq ft	2 x 200	2.00		2.00				
	14 Iron smithy	7000/Toolkit	20	1.40		1.40				
	15 Beekeeping	2000/Unit	100	2.00		1.00	1.00			
	16 Vegetables	1500/Hectare	832	12.48		3.00	6.00	3.48		
	17 Horticulture	1500/Hectare	832	12.48		3.00	6.00	3.48		
	18 Sheep Farms	1000/Sheep	2000	20.00					10.00	10.00
	19 Herb Cultivation			10.00		1.00	2.00	3.00	3.00	1.00
	20 Seed Honey			4.00		1.00	1.00	1.00	1.00	
	21 Marketing	200000/Unit	1	2.00		0.50	1.00	0.50		
	22 Miscellaneous			20.00		3.00	5.00	5.00	5.00	2.00
	Management									
	23 Employment in Park									
	## Wage labour	30/Personday	50000	15.00		3.00	5.00	5.00	2.00	
	## Support staff			10.00		2.00	2.00	2.00	2.00	2.00
	24 Crop compensation			2.50		0.50	0.50	0.50	0.50	0.50
	25 Tourism									
	## Visitor ctr	500000/centre	2		10.00	5.00	5.00			

DETAILED COSTING FOR GREAT HIMALAYAN NATIONAL PARK

Sno.	Item/Activity	Rate (in Rs.) per unit	Total No. of Units	Total Cost Recurring (in Rs. Lakhs)	Capital	Yearly Break Up of Costs 1	2	3	4	5
	" Furniture	100000/centre	2		1.00	0.50	0.50			
	" Camping Eqpmnt				4.00	2.00	2.00			
	" Seed Money	100000/centre	2	2.00		1.00	1.00			
C.	HUMAN RESOURCES DEVELOPMENT									
	26 Handloom									
	" Stipend	2700/person	100	2.70		1.35	1.35			
	" Trainer	1500/month	6	0.09		0.045	0.045			
	27 Stitching									
	" Stipend	2700/person	100	2.70		1.35	1.35			
	" Trainer	1500/month	6	0.09		0.045	0.045			
	28 Carpentry									
	" Stipend	2700/person	50	1.35		0.675	0.675			
	" Trainer	1500/month	6	0.09		0.045	0.045			
	29 Tourism									
	" Stipend	900/person	60	0.54		0.27	0.27			
	" Trainer	1500/month	2	0.03		0.015	0.015			
	30 Management									
	" Stipend	2700/person	300	8.10		4.05	4.05			
	" Trainer	1500/month	12	0.18		0.09	0.09			
	31 Ecodev Plng			0.50		0.50				
	32 Miscellaneous			1.00		0.20	0.20	0.20	0.20	0.20
D.	RESEARCH AND DEVELOPMENT			20.00		2.00	5.00	5.00	5.00	3.00
E.	AWARENESS PROGRAMMES			10.00		2.00	2.00	2.00	2.00	2.00
F.	MONITORING			5.00		1.00	1.00	1.00	1.00	1.00
			Total	491.55	15.00	122.34	163.64	119.68	67.20	33.70
			Grand Total	506.55						

Table - D2

DETAILED COSTING FOR KALAKAD MUNDANTHURAI TIGER RESERVE

Sno.	Item/Activity	Rate (in Rs.) per unit	Total No. of units	Total Cost Recurring (in Rs. Lakhs)	Capital	Yearly Break Up of Costs 1	2	3	4	5
A.	PLANNING	20000/village	66	13.20		7.00	6.20			
B.	ECODEVELOPMENT									
	1 Irrigation & Soil									
	" Wells	21000/well	114	23.94		11.00	12.94			
	" Check Dams	6000/Dam	114	6.84		4.00	2.84			
	" Tanks	20000/Tank	57	11.40		5.00	6.40			
	" Bunding	100000/ha	14.5	14.50		2.85	5.00	5.00	1.65	
	Biomass									
	2 Plantations	8000/ha	5700	456.00		75.00	150.00	150.00	81.00	
	3 Fodder	6000/ha	1425	85.50		10.00	35.00	30.00	10.50	
	4 Nurseries	1/plant	1000000	10.00		2.00	3.00	3.00	2.00	
	Income Generation									
	5 Poultry	20000/unit	114	22.80		4.00	8.00	8.00	2.80	
	6 Fibre	20000/unit	57	11.40		4.00	4.00	3.40		
	7 Stitching	1000/machine	100	1.00		0.50	0.50			
	8 Beekeeping	6000/unit	570	34.20		6.00	10.00	10.00	8.20	
	9 Palm jaggery	100000/unit	10	10.00		5.00	5.00			
	10 Seed Money	500000/activit	2	10.00		3.00	5.00	2.00		
	11 Marketing	200000/unit	1	2.00		0.50	1.00	0.50		
	12 Miscellaneous			50.00		10.00	15.00	15.00	10.00	
	Management									
	13 Employment in Reserve									
	" Wage labour	25/personday	100000	25.00		8.00	8.00	5.00	3.00	1.00
	" Support Staff			20.00		4.00	4.00	4.00	4.00	4.00
	14 Tourism									
	" Visitor ctr	500000/centre	3		15.00	10.00	5.00			
	" Furniture	100000/centre	3		3.00	2.00	1.00			
	" Seed Money	100000/centre	3	3.00		2.00	1.00			
	15 Crop Protection									
	" Green Fence	4500/ha	85	3.825		3.825				
	" Pit	500000/ha	1	5.00		5.00				
	" Wall	200/metre	2500	5.00		5.00				
	" Other	5000/ha	50	2.50		0.50	0.50	0.50	0.50	0.50
	" Crop compensation			6.00		2.00	2.00	1.00	0.50	0.50
C.	HUMAN RESOURCES DEVELOPMENT									
	16 Fibre									
	" Stipend	2700/person	1140	30.78		15.39	15.39			

DETAILED COSTING FOR KALAKAD MUKURTHURAI TIGER RESERVE

Sno.	Item/Activity	Rate (in Rs.) per unit	Total No. of units	Total Cost Recurring	Capital (in Rs. Lakhs)	Yearly Break-Up of Costs 1	2	3	4	5
	## trainer	1500/month	30	0.45		0.225	0.225			
	17 Stitching									
	## Stipend	900/person	100	0.90		0.45	0.45			
	## trainer	1500/month	6	0.09		0.045	0.045			
	18 Tourism									
	## stipend	900/person	300	2.70		1.35	1.35			
	## trainer	1500/month	6	0.90		0.45	0.45			
	19 Management									
	## Stipend	2700/person	100	2.70		1.35	1.35			
	## Trainer	1500/month	12	0.18		0.09	0.09			
	20 Miscellaneous			10.00		1.00	3.00	3.00	2.00	1.00
D.	RESEARCH AND DEVELOPMENT			20.00		2.00	5.00	5.00	5.00	3.00
E.	AWARENESS PROGRAMMES			20.00		4.00	4.00	4.00	4.00	4.00
F.	MONITORING			10.00		2.00	2.00	2.00	2.00	2.00
			Total	931.805	18	220.525	324.73	251.4	137.15	16
			Grand Total	949.805						

ORGANISATION AND MANAGEMENT

1. INSTITUTIONAL ARRANGEMENTS

1.1 Planning

Ecodevelopment planning is seen as a participatory and ongoing process. Essentially, micro-level site specific plans have to be evolved with the active participation of the local communities. Infact, the objective is to encourage the local communities to plan for themselves, with the availability of macro level data and other inputs that they might want from research institutions and the government.

Also, it is recognised that, given the experimental nature of the ecodevelopment approach and the value of flexibility, the planning process should be an ongoing one where a minimum of long and medium term objectives and strategies are identified at the start, and the detailed planning is done as the activities develop.

There are two phases of planning. There is the preliminary, indicative, planning being carried out prior to and for project appraisal. This has been done jointly by the State Wildlife Wing and the Indian Institute of Public Administration, New Delhi. For indicative planning in Kalakad Mundanthurai Tiger Reserve, two local NGOs, Community Action for Social Transformation (CAST) and Social Change and Development (SCAD), were also involved.

The second phase of planning would be the detailed, ongoing, planning, which will commence at the initiation of the project. This will be done by planning teams initially of representatives of the park authority (Range officers), and representatives of NGOs. They would be trained (one lot has already been trained) in participatory and rapid rural appraisal techniques, in interpersonal communication skills and in elements of ecodevelopment and wildlife management planning. It would be their responsibility to initiate the process of ecodevelopment planning by starting interactions with the local communities. These teams will, in the process, identify village and community institutions which can

increasingly take on the responsibility of ecodevelopment planning and implementation for their own area. The local NGOs and the local wildlife officials will also be continually involved in the process, in so far as they are required by the village community.

Efforts will be made to include those members of the local community who show an interest and penchant for the work. It is hoped that, within a year, the planning team would have many members of the local community who can continue the task of village interactions independently or with minimal help from the local NGOs.

This planning team would be supported by specialists, on call, who could be requested to give their inputs on specialised issues, like poultry development or water harvesting, etc.

Where a particular expertise is going to be in high demand (for example vegetable and fruit farming in GHNP and poultry development in KMTR), the concerned expert can be taken on deputation or otherwise attached to the park for the first year or two, depending on the requirement.

1.2 Human Resources Development

Ecodevelopment and management training would be organised by the Wildlife Institute of India and the Society for Promotion of Wastelands Development. State Government and Central Government extension services, as well as NGOs with the relevant expertise, will have to be identified for training in income generation skills.

Specialised NGOs would have to be identified to set up educational exchange activities, as described in section ??.

1.3 Implementation

The Project will be implemented through the State Government, specifically through the park authorities. The Park Director would be the overall incharge of the project, and he would be assisted by appropriate staff exclusively for the project. The level and number of

staff would be as per the existing norms of the State forest departments.

The implementation of ecodevelopment activities has also to be on a local, site specific scale. Whereas some activities, like water management structures or training programmes, might cater to two or more villages or to a whole region, many of the other activities have to be village or even household specific. Consequently, institutional structures for the implementation of the programme must also be appropriately decentralised.

At the village level, there would be a village (ecodevelopment) committee which would be formed along the lines of village protection committees in West Bengal and other states. These committees must have adequate (majority?) representation of women. These committees would also have, as members, local forest or wildlife officials (Foresters ?). For two or more very small or neighbouring villages, a single committee can be formed. These committees will manage the implementation of the ecodevelopment programmes and, wherever required, would enter into agreements with the Forest Department and the State Government for Joint Participative Management or other such arrangements.

1.4 Coordination

At the national level, there will be a project coordination committee, with representatives of the State Forest Department and of selected NGOs and Institutions as members.

At the State level, coordination will be the responsibility of the Chief Wildlife Warden.

For the protected area as a whole, there needs to be a coordination committee which would be convened by the Ecodevelopment Project Director (the PA director) and Chaired by the Collector of the District.

This coordination committee must have as members representatives of all the concerned line departments as also representatives on a

rotational basis, of some of the village committees. Representatives of the local NGOs and the concerned research institutions should also be members of this committee.

This committee has the responsibility of coordinating between the different departments concerned with the ecodevelopment project. It must also liaise with the State and Central Governments. This committee would also be responsible for organising periodic external assessments of the project.

2. MONITORING AND EVALUATION

Whereas the day to day monitoring would be the responsibility of the village committees, there would be a simultaneous, periodic, monitoring of the ecodevelopment activities by external, independent, agencies who would have the objectivity and ability to identify local administrative and political constraints to the success of the programme. Whereas the programme must be run the way the local people want it to run, the external monitoring agency would primarily monitor whether this is actually happening or not, and if not, why not.

3. FINANCIAL ARRANGEMENTS

The project funds will be routed through the State Government, and spent through the Protected Area Director, who would be the Ecodevelopment Project Director. The procedures set up by the State Government for handling project funds must ensure:

1. That there is adequate delegation of financial powers to ensure that there is no delay in project implementation. Based on the approval of the budget by the Government, the Project Director should have power to sanction all expenditure.

2. That the funds are released to the Project authorities in time each year so that the project activities are not disrupted or the funds do not lapse at the end of the year.

3. That there is enough flexibility built into the budget and government sanction to allow the Project Director to respond to the varying demands of the area.

4. That there is ability to release funds to NGOs and community organisations (like ecodevelopment committees) for implementing various project activities.

Needless to say, the ecodevelopment requirements, of most of the protected areas, are too large, long term and varied to be met out of one source. Fortunately, there are various State and Central schemes, of various sectors, that can be tapped once an ecodevelopment project has been initiated. Infact, one major function of the ecodevelopment project should be to channelise resources, of all types, from all sources.

Considering the dimensions of the problems, the sustainability of interventions becomes a serious problem. However much money one invests, it is not clear that, when the investment finally comes to an end or is significantly reduced, things will not deteriorate rapidly. Therefore, it is important to generate some surpluses, during the project period, which can be put into into trust funds, for the Protected Area, where

the utilisation can be in the form of easy loans to the local people. In some cases, where small amounts of money are needed, the interest rather than the capital of the trust funds can be used.

F. IMPLEMENTATION SCHEDULE

GREAT HIMLAYAN NATIONAL PARK : TIME PHASING FOR ECODEVELOPMENT

	PRE-INVESTMENT PERIOD	INVESTMENT PERIOD								
Year :		1994 - 1995		1995 - 1996		1996 - 1997		1997 - 1998		1998 - 1999	
Month :		01-06	07-12	13-18	19-24	25-30	31-36	37-42	43-48	49-50	55-60
Indicative planning	-8 _ -7										
Ecodevelopment planning		1			24						
Transport and Communication		3							48		
Biomass generation and soil and water conservation activities		3									60
Income generation activities		3									60
Park management activities		3									60
Human Resources Development		3									60
Research & Development		1									60
Awareness Programmes		1									60
Monitoring				56							60

Note: For more details see Table - 01 in section on Project Costs

KALAKAD MUKHAMTHURAI TIGER RESERVE : TIME PHASING FOR ECODEVELOPMENT

	PRE-INVESTMENT PERIOD	INVESTMENT PERIOD									
Year :		1994 - 1995		1995 - 1996		1996 - 1997		1997 - 1998		1998 - 1999	
Month :		01-06	07-12	13-18	19-24	25-30	31-36	37-42	43-48	49-50	55-60
Indicative planning	-8 __ -1										
Ecodevelopment planning		1			24						
Biomass generation and soil and water conservation activities		3							48		
Income generation activities		3							48		
Reserve management activities		3									60
Human Resources Development		3			24						
Research & Development		1									60
Awareness Programmes		1									60
Monitoring				11							60

Note: For more details see Table - 02 in section on Project Costs

G. PROJECT BENEFITS

1. Biodiversity and the Environment

Through the upgradation of management and the initiation of ecodevelopment, the project would lead to the better conservation of two of the most valuable biodiversity areas in the country.

GHNP

In GHNP, the project would lead to substantial reduction of grazing pressures on the alpine meadows, which are under severe threat all over the Himalayas. The stopping of herb and mushroom collection from the park will go a long way in ensuring that these herbs and mushrooms do not become extinct and that the habitat of the GHNP, which is among the least disturbed of the remaining habitats of the Western Himalayas, is conserved.

Joint forest management activities in the project area outside the Park would go a long way in regenerating the forest and grass cover of the region and in improving the environment.

Aspects of the ecodevelopment project will also upgrade the management activities, increase the level of support and cooperation of the local people to park protection, help prevent poaching and forest fires and provide an ability to monitor and study the park ecology.

KMTR

KMTR is one of the richest biodiversity areas in the Western Ghats. The project, by upgrading the management and initiating ecodevelopment activities, is going to create a situation where headloading, NWFP collection, small timber collection, grazing and poaching pressures on the Reserve can be totally eliminated with the agreement and cooperation of the people. Though some pressures will still remain due to the habitation and plantations inside the Reserve, however, much of the area could be freed of all disturbance.

Extensive plantation, soil and water conservation work in the project area will contribute significantly to the improvement of the environment of the surrounding area. The much needed monitoring and

research inputs will also significantly help in the better management of the Reserve.

2. Socio-economic Benefits

In both the areas, the project will significantly improve the socio economic lot of the people by providing them wage labour, training in various income generation skills, seed money for setting up income generation activities, a marketing network and some infrastructure like bridle paths, visitor cum training centers, and irrigation channels in GHNP, and crop protection structures, checkdams, percolation tanks and visitor cum training centers in KMTR (for details see Table G1 and G2 in this section).

The possible invocation of laws and the channelising of other development schemes, for the benefit of the local people, and the greater levels of employment and involvement in the Protected Area planning and management, are other socio economic benefits of the project.

Special schemes for women, for scheduled castes (blacksmithy in GHNP), and for tribals (as for the Kanis in KMTR) would ensure that the benefits of the project reach those segments of the society which are most deserving.

The involvement of the people in the micro level planning process, the involvement of NGOs in the planning and implementation, and the inbuilt flexibility in the project design will allow the interventions to be appropriate to the social, cultural and economic needs of the people.

At the completion of the project, there would have been significant development of skills among the local people, many of whom would have got established with help from the project, in sustainable income generation activities. They would be assisted by the various networks (marketing, tourism) set up under the project but to continue

subsequently.

3. Sustainability

Great care has been taken in the project design to ensure that the suggested strategy and the specific activities suggested are socially, economically and environmentally sustainable. Even activities preferred by the local people which were found to be unsustainable environmentally (roads and apples in GHNP), economically (crop protection wall in KMTR) or socially (beedee or match making in KMTR) have not been recommended, and reasons for exclusion detailed.

The project expenditure has been so distributed that the major expenditure is concentrated in the second and third year, significantly reducing in the fourth year and almost disappearing by the fifth and last year. This is to ensure that by the time the project comes to an end, the various income generation activities have got well established. The fifth year is seen as the period when corrective measures can be taken or spillovers handled.

Table - 61

SOCIO ECONOMIC BENEFITS IN GREAT HIMALAYAN NATIONAL PARK

Sno.	Item/Activity	Rate (in Rs.) per unit	Total No. of Units	Total Cost Recurring (in Rs. Lakhs)	Total Cost Capital (in Rs. Lakhs)	Person days	House-holds
A.	PLANNING	5000/hamlet	200	10.00			
B.	ECODEVELOPMENT						
	Transport						
	1 Bridle Paths	40000/km	200	80.00		266667	
	2 Mules	10000/Mules	100	10.00			50
	Irrigation & Soil						
	3 Irrig Canal	30000/km	125	37.50		125000	
	4 Agri Land Devp	4000/ha	300	12.00		40000	
	5 Soil Cons	5000/ha	500	25.00		83333	
	Biomass						
	6 Fuel and Fodder	8000/ha	529	42.32			200
	7 JFM	6000/ha	1000	60.00			500
	8 "Ghasnis"	5000/ha	400	20.00		66667	
	9 Nurseries	3/Sapling	300000	9.00			200
	Income Generation						
	10 Poultry	6500/250 birds	60	3.90			60
	11 Handlooms	12000/Loom	100	12.00			100
	12 Stitching	1000/Machine	100	1.00			100
	13 Carpentry						50
	" Tools	3000/Toolkit	20	0.60			
	" Workshop	500/sq ft	2 x 200	2.00			
	14 Iron smithy	7000/Toolkit	20	1.40			20
	15 Beekeeping	2000/Unit	100	2.00			100
	16 Vegetables	1500/Hectare	832	12.48			
	17 Horticulture	1500/Hectare	832	12.48			
	18 Sheep Farms	1000/Sheep	2000	20.00			100
	19 Herb Cultivation			10.00			
	20 Seed Money			4.00			
	21 Marketing	200000/Unit	1	2.00			
	22 Miscellaneous			20.00			
	Management						
	23 Employment in Park						
	" Wage labour	30/Personday	50000	15.00		50000	
	" Support staff			10.00		33333	
	24 Crop compensation			2.50			
	25 Tourism						60
	" Visitor ctr	500000/centre	2		10.00		
	" Furniture	100000/centre	2		1.00		
	" Camping Eqpmnt				4.00		
	" Seed Money	100000/centre	2	2.00			

SOCIO ECONOMIC BENEFITS IN GREAT HIMALAYAN NATIONAL PARK

Sno.	Item/Activity	Rate (in Rs.) per unit	Total No. of Units	Total Cost Recurring (in Rs. Lakhs)	Total Cost Capital (in Rs. Lakhs)	Person days	House-holds
C.	HUMAN RESOURCES DEVELOPMENT						
	26 Handloom						
	" Stipend	2700/person	100	2.70		9000	
	" Trainer	1500/month	6	0.09			
	27 Stitching						
	" Stipend	2700/person	100	2.70		9000	
	" Trainer	1500/month	6	0.09			
	28 Carpentry						
	" Stipend	2700/person	50	1.35		4500	
	" Trainer	1500/month	6	0.09			
	29 Tourism						
	" Stipend	900/person	60	0.54		1800	
	" Trainer	1500/month	2	0.03			
	30 Management						
	" Stipend	2700/person	300	8.10		27000	
	" Trainer	1500/month	12	0.18			
	31 Ecodev Plng			0.50		1667	
	32 Miscellaneous			1.00		3333	
D.	RESEARCH AND DEVELOPMENT			20.00			
E.	AWARENESS PROGRAMMES			10.00			
F.	MONITORING			5.00			
			Total	491.55	15.00	721300	1540
			Grand Total	506.55			

Table - 62

SOCIO ECONOMIC BENEFITS IN KALAKAD MUNDANTHURAI TIGER RESERVE

Sno.	Item/Activity	Rate (in Rs.) per unit	Total No. of units	Total Cost Recurring (in Rs. Lakhs)	Total Cost Capital (in Rs. Lakhs)	Person days	House-holds
A.	PLANNING	20000/village	66	13.20		52800	
B.	ECODEVELOPMENT						
	1 Irrigation & Soil						
	## Wells	21000/well	114	23.94		95760	
	## Check Dams	6000/Dam	114	6.84		27360	
	## Tanks	20000/Tank	57	11.40		45600	
	## Bunding	100000/km	14.5	14.50		58000	
	Biomass						
	2 Plantations	8000/ha	5700	456.00			800
	3 Fodder	6000/ha	1425	85.50			475
	4 Nurseries	1/plant	1000000	10.00			200
	Income Generation						
	5 Poultry	20000/unit	114	22.80			1140
	6 Fibre	20000/unit	57	11.40			1140
	7 Stitching	1000/machine	100	1.00			100
	8 Beekeeping	6000/unit	570	34.20			570
	9 Palm jaggery	100000/unit	10	10.00			200
	10 Seed Money	500000/activit	2	10.00			
	11 Marketing	200000/unit	1	2.00			
	12 Miscellaneous			50.00			
	Management						
	13 Employment in Reserve						
	# Wage labour	25/personday	100000	25.00		100000	
	# Support Staff			20.00			
	14 Tourism						
	## Visitor ctr	500000/centre	3		15.00		300
	## Furniture	100000/centre	3		3.00		
	## Seed Money	100000/centre	3	3.00			
	15 Crop Protection						
	## Green Fence	4500/km	85	3.825		15300	
	## Pit	500000/km	1	5.00		20000	
	## Wall	200/metre	2500	5.00		20000	
	## Other	5000/km	50	2.50		10000	
	## Crop compensation			6.00			

SOCIO ECONOMIC BENEFITS IN KALAKAD MUNDANTHURAI TIGER RESERVE

Sno.	Item/Activity	Rate (in Rs.) per unit	Total No. of units	Total Cost Recurring	Capital (in Rs. Lakhs)	Person days	House-holds
C.	HUMAN RESOURCES DEVELOPMENT						
	16 Fibre						
	" Stipend	2700/person	1140	30.78		123120	
	" trainer	1500/month	30	0.45			
	17 Stitching						
	" Stipend	900/person	100	0.90		3600	
	" trainer	1500/month	6	0.09			
	18 Tourism						
	" stipend	900/person	300	2.70		10800	
	" trainer	1500/month	6	0.90			
	19 Management						
	" Stipend	2700/person	100	2.70		10800	
	" Trainer	1500/month	12	0.18			
	20 Miscellaneous			10.00		40000	
D.	RESEARCH AND DEVELOPMENT			20.00			
E.	AWARENESS PROGRAMMES			20.00			
F.	MONITORING			10.00			
			Total	931.805	18.00	633140	4925
			Grand Total	949.805			

V. ISSUES AND FOLLOW-UP

A. Policy Issues

1. The Wild Life (Protection) Act, as amended in 1991, allows the conditional recognition of rights and permits sustainable levels of grazing inside a sanctuary. It also permits, in a sanctuary and a national park, activities related to the management of the park. Ecodevelopment must be seen as a strategy to help uphold the Act by providing viable alternative sources of biomass and income to the people using the protected area in violation of the Act.

Off the shelf, ready to implement, income generation schemes would be provided to tide over the loss of income during the transitional phase, before the various sustainable income generation activities get established and begin to give returns. Similarly, alternate arrangements will be made for any biomass requirement that is denied because of the application of the Act.

2. Appropriate provisions of the Environment (Protection) Act, 1986, would be invoked, along with provisions of other, relevant, State Acts, to ensure that the surrounds of protected areas including the project area are not subjected to any unsustainable activities. The provisions of these acts will also be invoked, where necessary, to assist in establishing a sustainable development model in the areas and in ensuring that the economic benefits from the protected area and the ecodevelopment project (like earnings from tourism or employment in jobs and as wage labour) go first to the local communities who have suffered deprivations due to the setting up of the protected area.

B. Project Implementation Issues

1. The State Government will allow the joint participatory management of forests in and around the project area in order to promote the protection of these forests and the sharing of benefits.

2. Management Planning for the protected areas, and management and ecodevelopment training for the concerned officers, will be ensured by

the State Government.

3. The State Governments will attempt to assist in providing a market for the products of ecodevelopment income generation activities by ensuring, as far as possible, that government orders are made available to them.

4. The State Government will try and recruit women forest guards and other women staff, for management and ecodevelopment work, both in order to provide an opportunity to the women to get employment and making interaction with women members of the community more effective.

5. The State Government will try and channelise other development schemes available to the project area in a way that these are complementary to the ecodevelopment project.

6. The State Government shall provide adequate compensation, as per their rules, for crop damage or livestock and human injury or death, by wild animals, in the periphery of the protected area and in the project area.

C. Further Preparation

1. The State Government shall ensure a process of participatory planning, as specified in the project document, as a part of the project implementation.

2. The planning process could start as soon as project was approved and even before official initiation of the project.

3. Identification of, and discussions with, regional institutions and local/regional NGOs, who would be assisting in the planning, implementation, monitoring, research, and education and awareness work could also be initiated before the project formally starts.

4. Planning for setting up appropriate institutional structures and for identifying the appropriate staff for project implementation should also be initiated as soon the project is approved.

5. Collection of macro level data relevant for micro level planning should also be collected as soon as possible.

MAPS

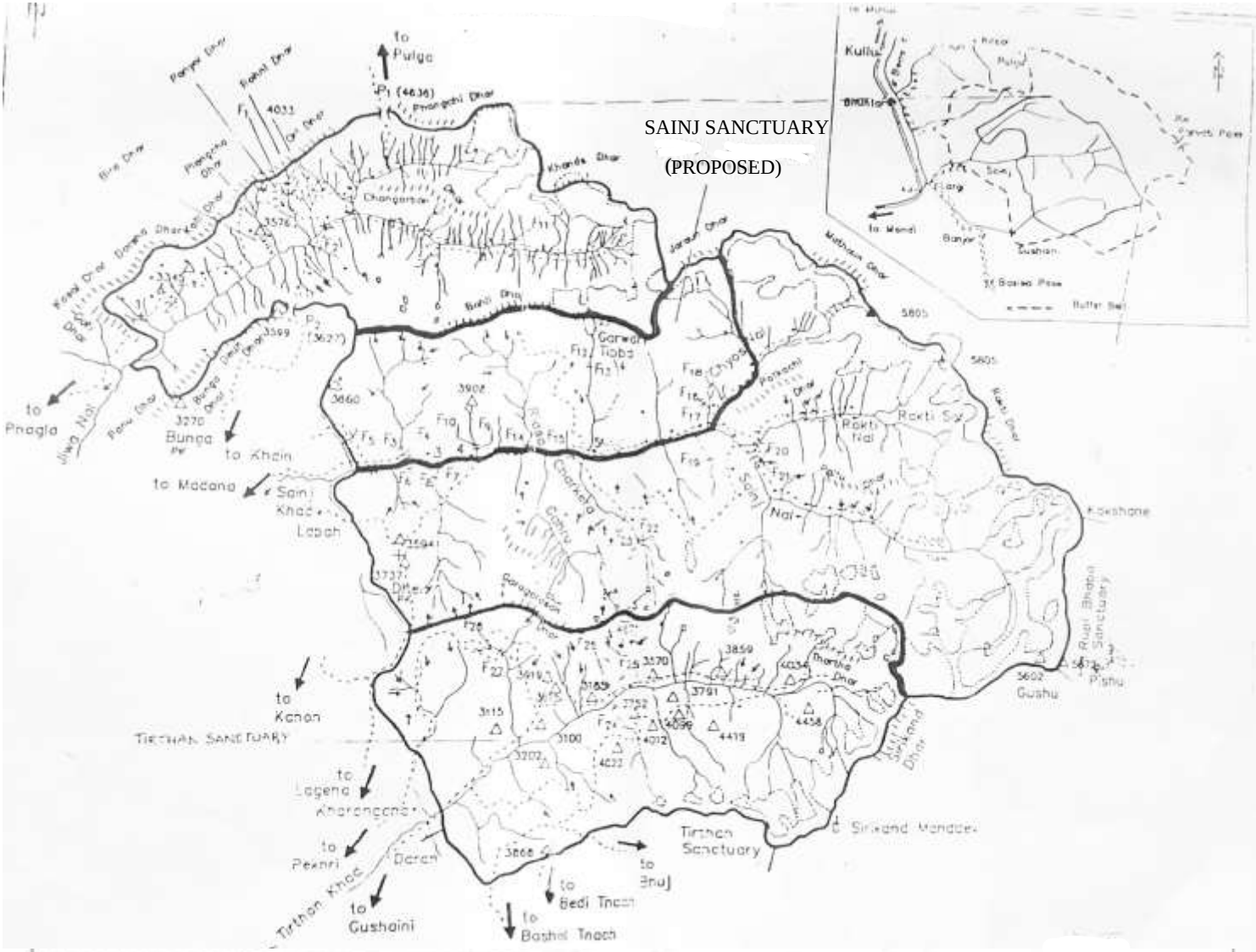
KEY TO SYMBOLS USED IN MAPS

)(P_2	Mountain pass
	Old palace
	Metalled road
	Un-metalled road
	Path, track
	Bridge
	Railway line
	Railway line not in use
	Airport
	Hospital
	Veterinary hospital
	Dam
	Checkpost
RHQ	Range headquarters
G.H.	Guard hut
D.O.	Dairy office
W.T.	Watchtower
Nur	Nursery
N.H.	National highway
.8	Village / Town
.G	Got
.J	Jot
.D	Dogri
.T	Thach
.Guj	Gujjar settlement
	Forest corridor
	Ridge
	Park / Sanctuary boundary
	State boundary
	Buffer belt boundary
	River with dry bed and islands
	River or stream (arrow shows direction of flow)*
	Lake / Reservoir
	Glacier
+	Spring
▲	Highest point (altitude given in metres above sea level)
△ / 3051	Other high points and peaks (altitude given in metres above sea level)
	Religious monument
□ FRH R.H.(PWD) T.B.	Accommodation [Forest Rest House / Rest House (Public Works Department) / Tourist Bunglow]
→	Direction arrow (showing nearest town / habitation from the park sanctuary)
	Waterfall

MAPS FOR

GREAT HIMALAYAN NATIONAL PARK

MAP - 1: GREAT HIMALAYAN NATIONAL PARK - PHYSICAL FEATURES



VILLAGES

1 – Kundar
2 – Manjhan
3 – Shagar
4 – Shakti
5 – Maraur

MOUNTAIN PASSES

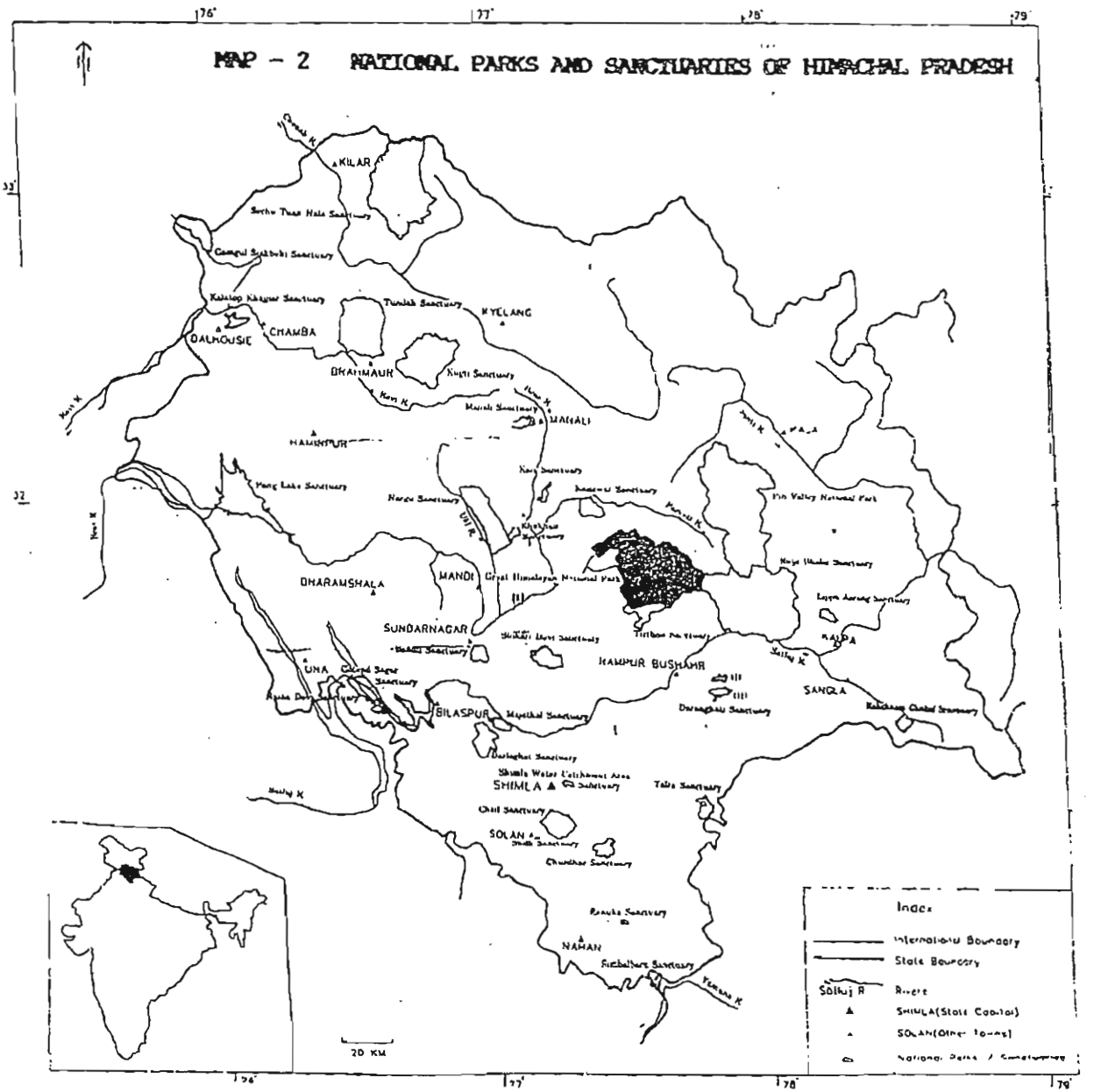
P_1 – Phangchi Galu (Open from June to October)

P_2 – Kandi Galu (Open from May to November)

WATER FALLS

F_1 – 36 Metres	F_8 – 15 Metres	F_{15} – 10 Metres	F_{22} – 20 Metres
F_2 – 25 Metres	F_9 – 10 Metres	F_{16} – 15 Metres	F_{23} – 20 Metres
F_3 – 5 Metres	F_{10} – 15 Metres	F_{17} – 10 Metres	F_{24} – 20 Metres
F_4 – 12 Metres	F_{11} – 10 Metres	F_{18} – 30 Metres	F_{25} – 20 Metres
F_5 – 6 Metres	F_{12} – 60 Metres	F_{19} – 20 Metres	F_{26} – 10 Metres
F_6 – 10 Metres	F_{13} – 40 Metres	F_{20} – 60 Metres	F_{27} – 30 Metres
F_7 – 60 Metres	F_{14} – 10 Metres	F_{21} – 40 Metres	F_{28} – 10 Metres

Source: Singh, S. et al., eds., (1990). Directory of National Parks and Sanctuaries of Himachal Pradesh: Management Status and Profiles



Source: Singh, S. et al. eds. (1990) Directory of National Parks and Sanctuaries of Himachal Pradesh: Management Status and Profiles

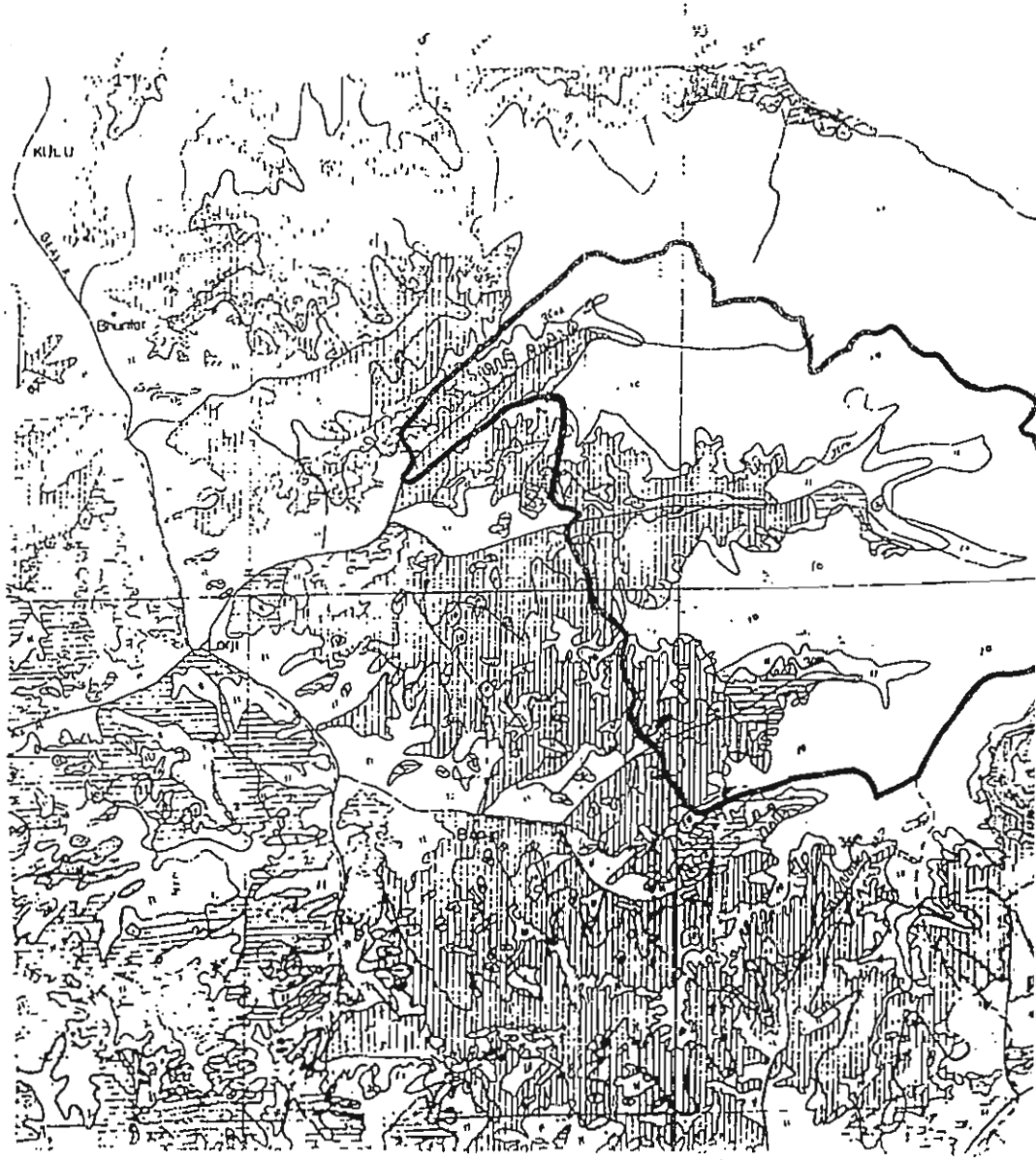
MAP – 3 GMP : FOREST SURVEY OF INDIA – FOREST DENSITY MAP

KEY FOR FOREST VEGETATION MAPPING

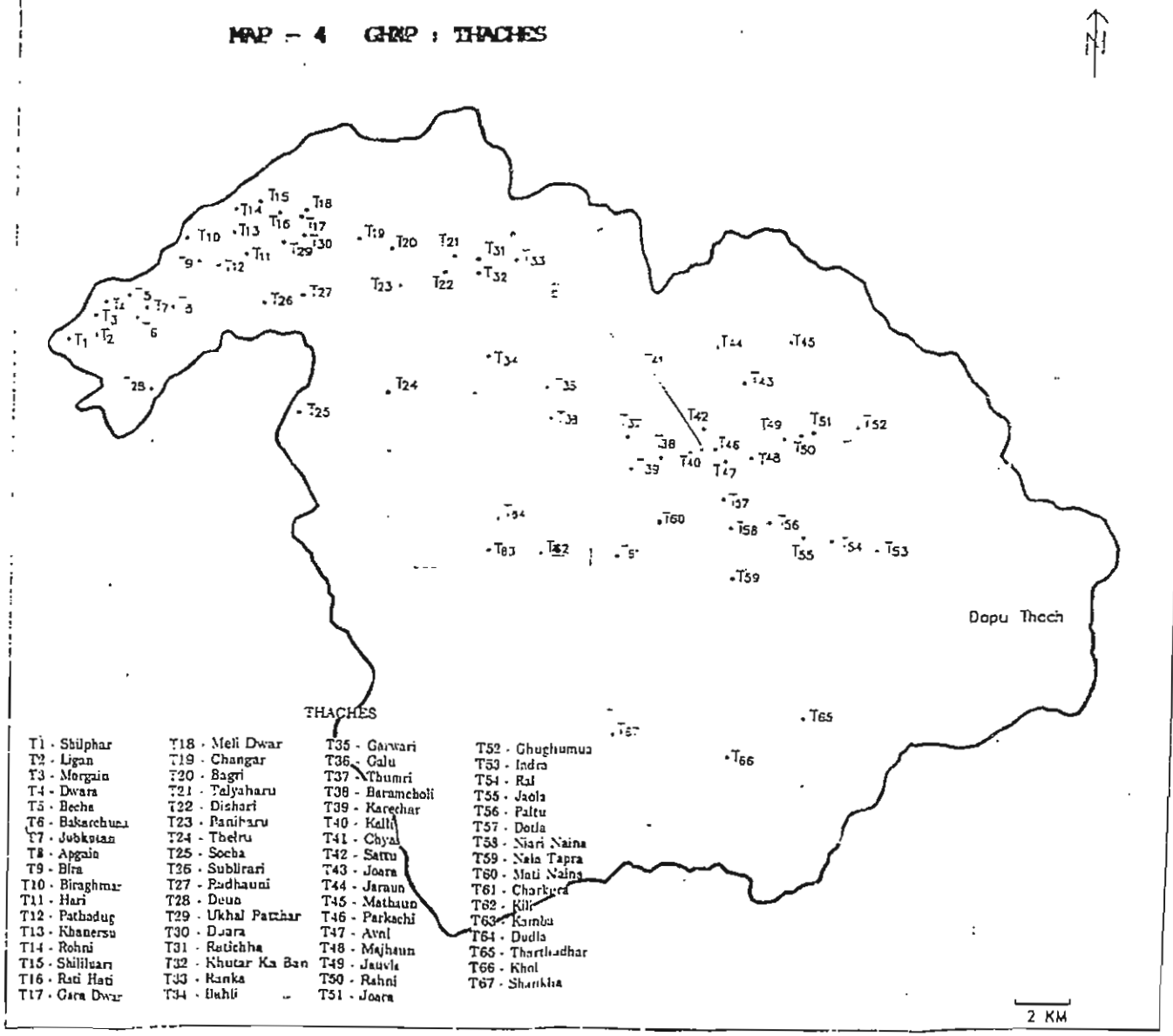
ON 1:250,000 SCALE.

2nd edition 1985-1987

1. DENSE FORESTS CROWN DENSITY ABOVE 40%
2. OPEN FORESTS CROWN DENSITY 10 TO 40%
4. TREE FARM LAND / GROVES
   a) CROWN DENSITY ABOVE 40 %
   b) CROWN DENSITY 10 TO 40 %
5. MANGROVE FORESTS
6. COFFEE / CARDAMOM
7. SCRUB
8. TEA GARDENS
9. WATER BODIES
11. FOREST BLANKS / GRASSY LANDS / PERMANENT CULTIVATION. (NF)
12. UN-INTERPRETED AREA / GAP / CLOUDS / HILL SHADOWS / SNOW COVER.

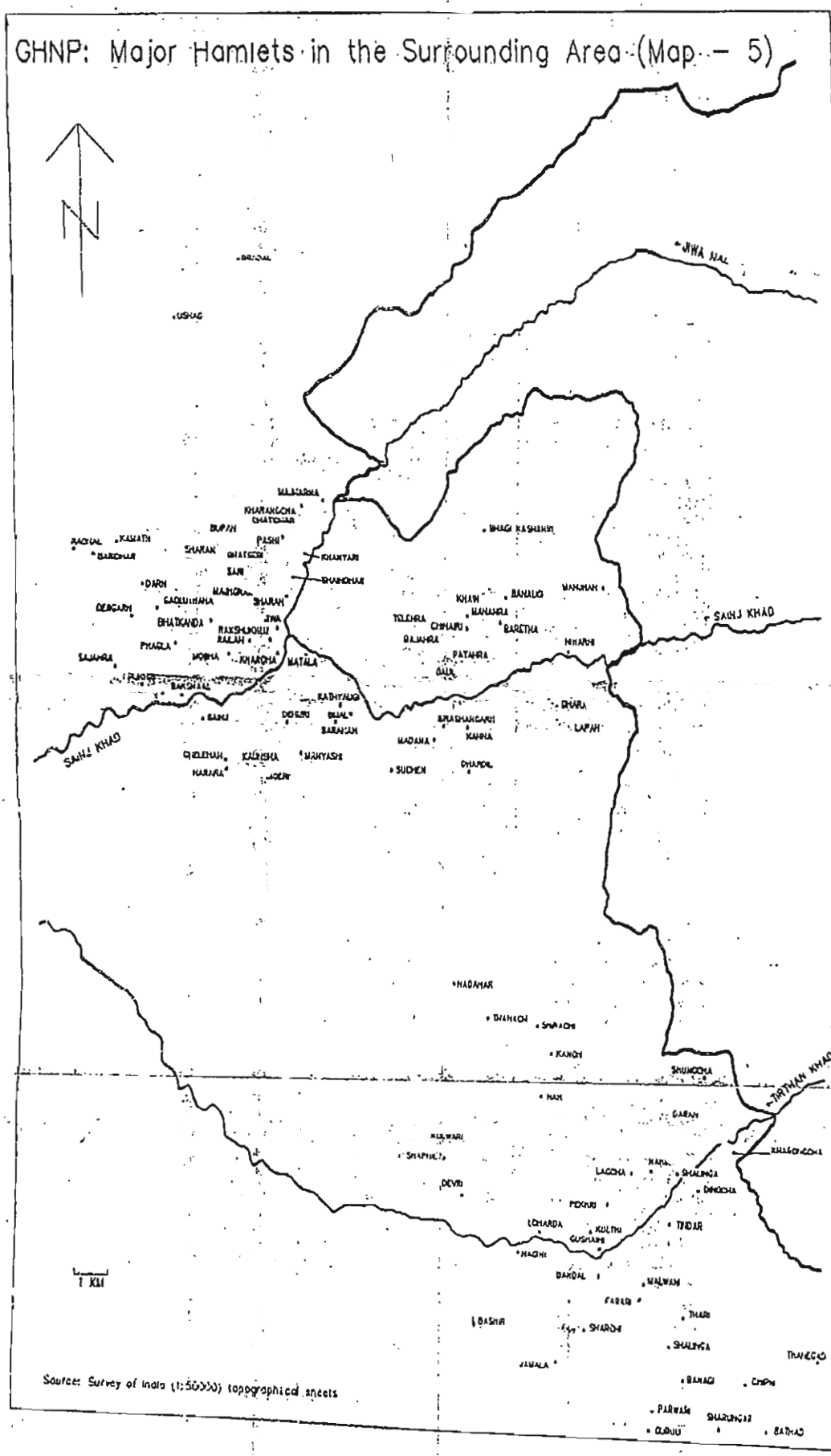


MAP – 4 GMVP : THACHES



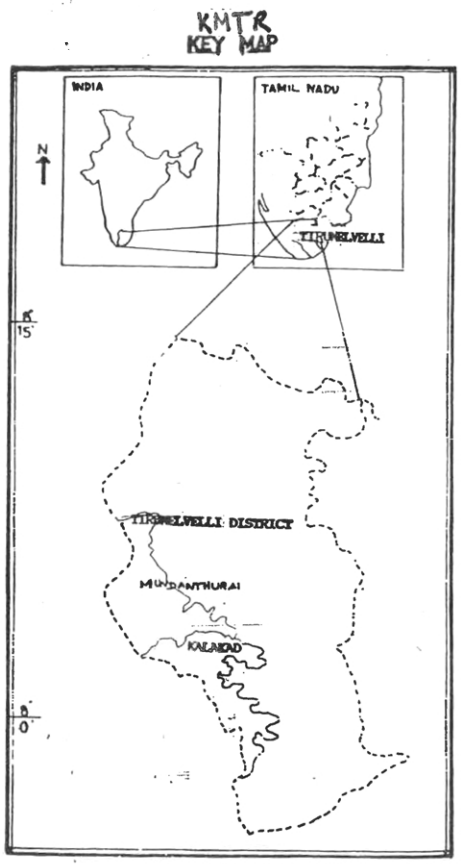
T1 - Shilphar
T2 - Ligan
T3 - Morgain
T4 - Dwara
T5 - Beeha
T6 - Bakarchuna
T7 - Jubkotan
T8 - Apgain
T9 - Bira
T10 - Biraghmar
T11 - Hari
T12 - Pathadug
T13 - Khanersu
T14 - Rohni
T15 - Shilikhari
T16 - Rati Hati
T17 - Gara Dwar
T18 - Meli Dwar
T19 - Changar
T20 - Bagri
T21 - Talyaharu
T22 - Dishari
T23 - Panibaru
T24 - Thelru
T25 - Socha
T26 - Sublirari
T27 - Padhauni
T28 - Deun
T29 - Ukhal Patthar
T30 - Duara
T31 - Ratichha
T32 - Khutar Ka Ban
T33 - Ranka
T34 - Bahli
T35 - Garwari
T36 - Galu
T37 - Thumri
T38 - Baramcholi
T39 - Karechar
T40 - Kalli
T41 - Chyal
T42 - Sattu
T43 - Joara
T44 - Jaraun
T45 - Mathaun
T46 - Parkachi
T47 - Avni
T48 - Majhaun
T49 - Jauvla
T50 - Rahni
T51 - Joara
T52 - Ghughumua
T53 - Indra
T54 - Rai
T55 - Jaola
T56 - Paltu
T57 - Dotla
T58 - Niari Naina
T59 - Naia Tapra
T60 - Mati Naina
T61 - Charkura
T62 - Kili
T63 - Kamba
T64 - Dudla
T65 - Thartiadhar
T66 - Khol
T67 - Shankha

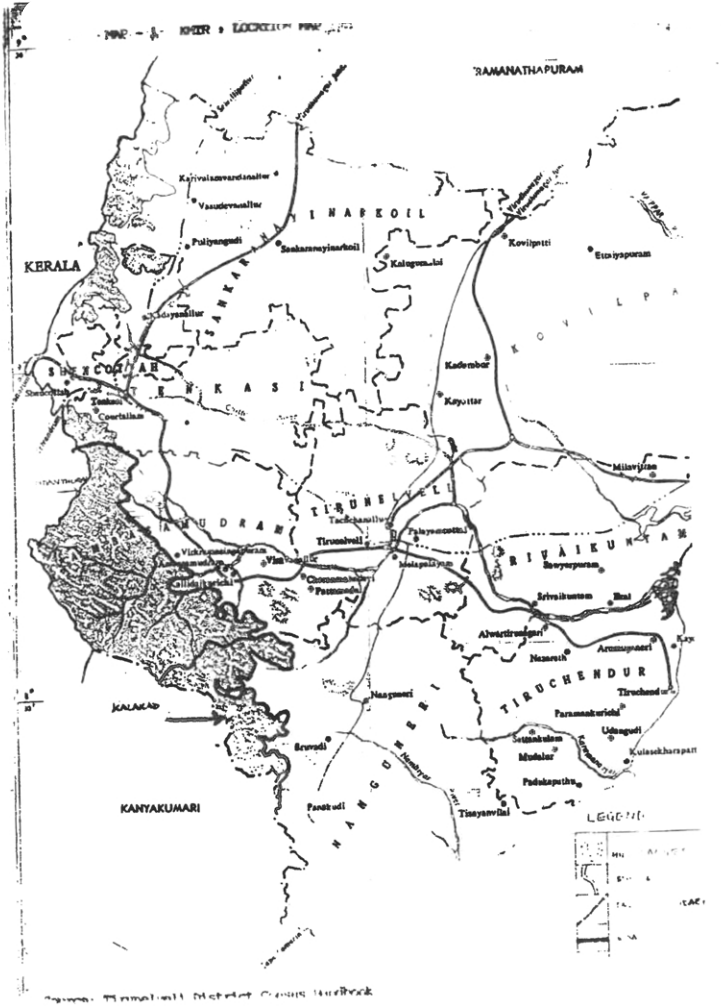
GHNP: Major Hamlets in the Surrounding Area (Map – 5)



MAPS FOR

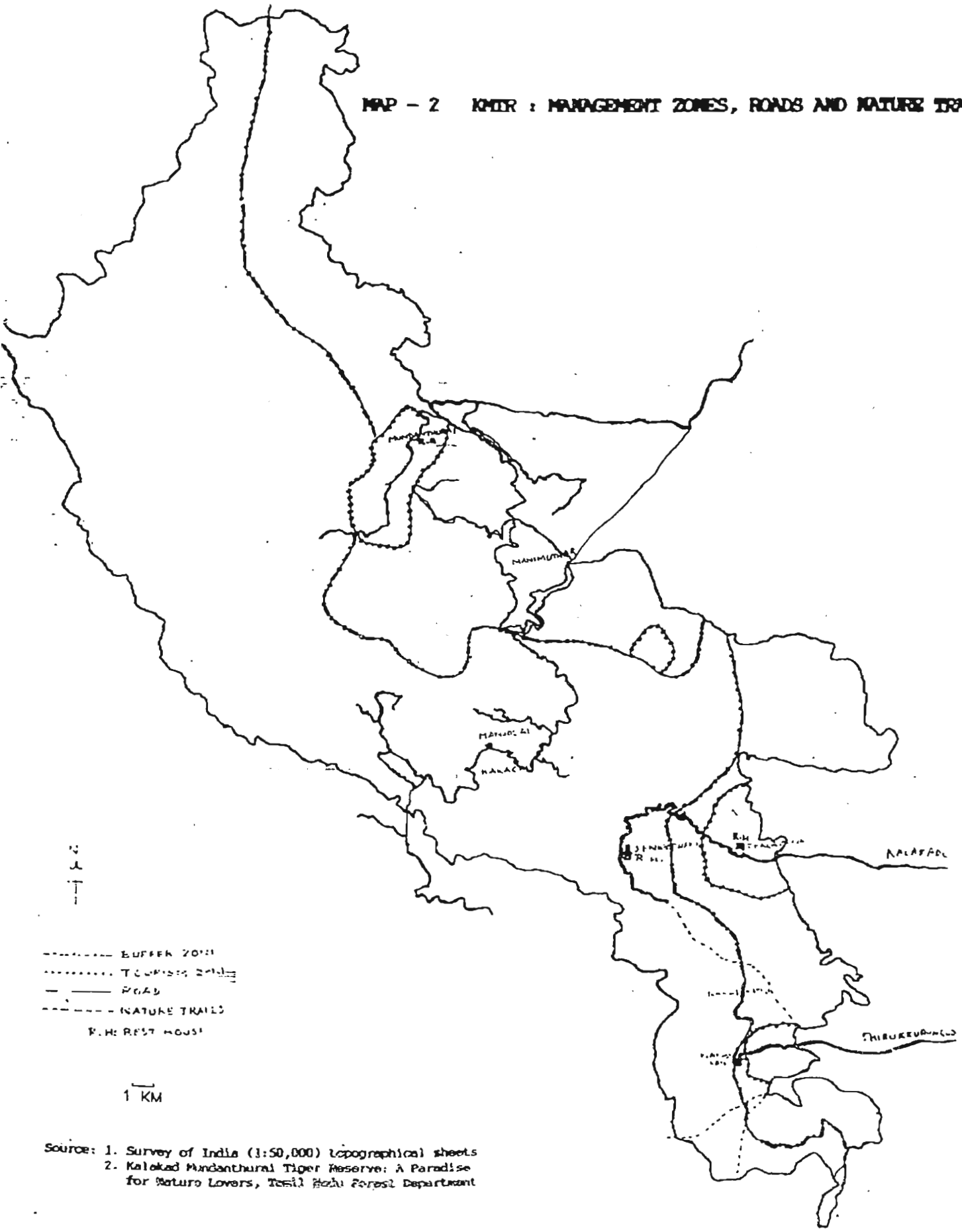
KALAKAD MUNDANTHURAI TIGER RESERVE



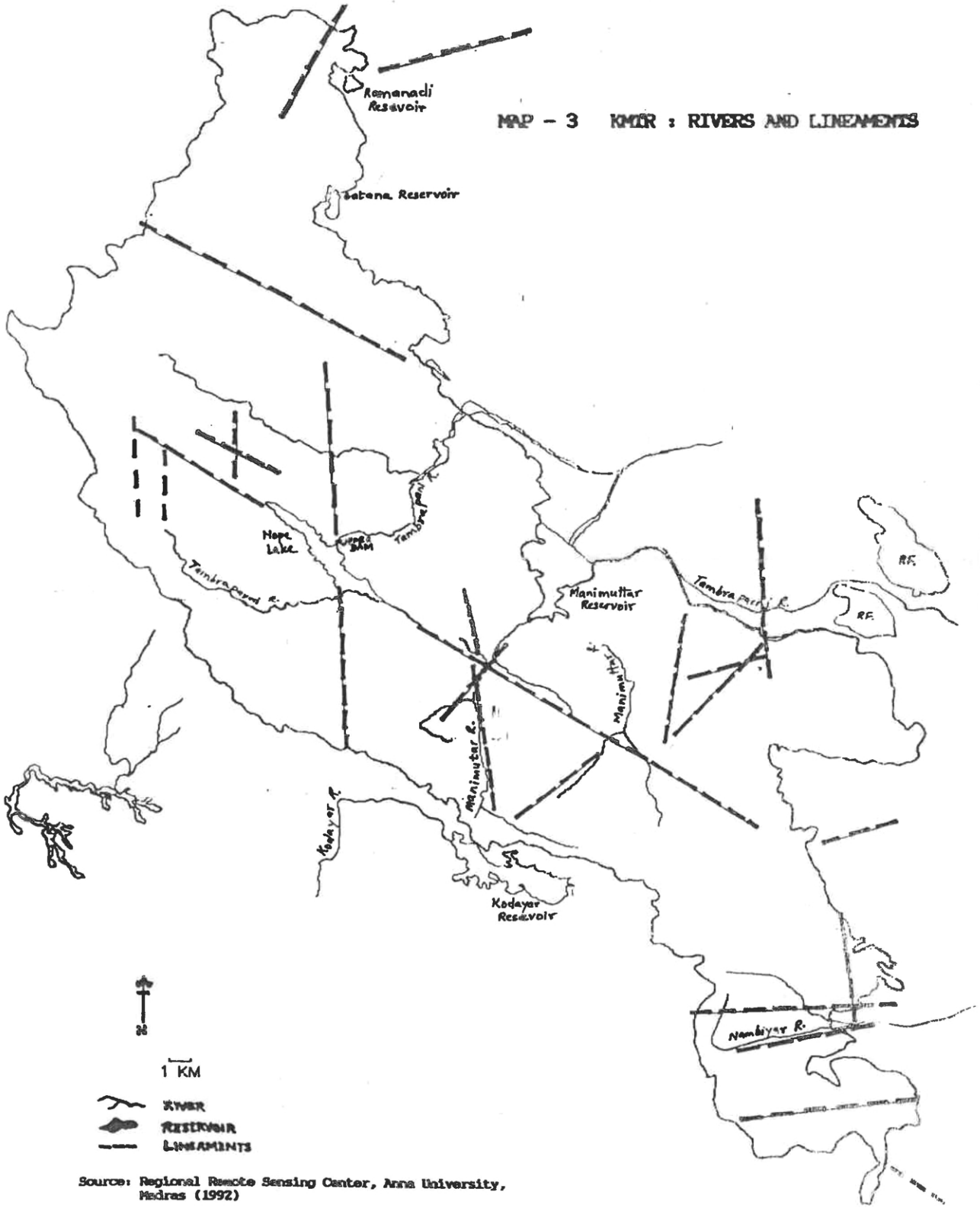


Source: Tirunelveli District Census Handbook

MAP – 2 KMTR : MANAGEMENT ZONES, ROADS AND NATURE TRAILS



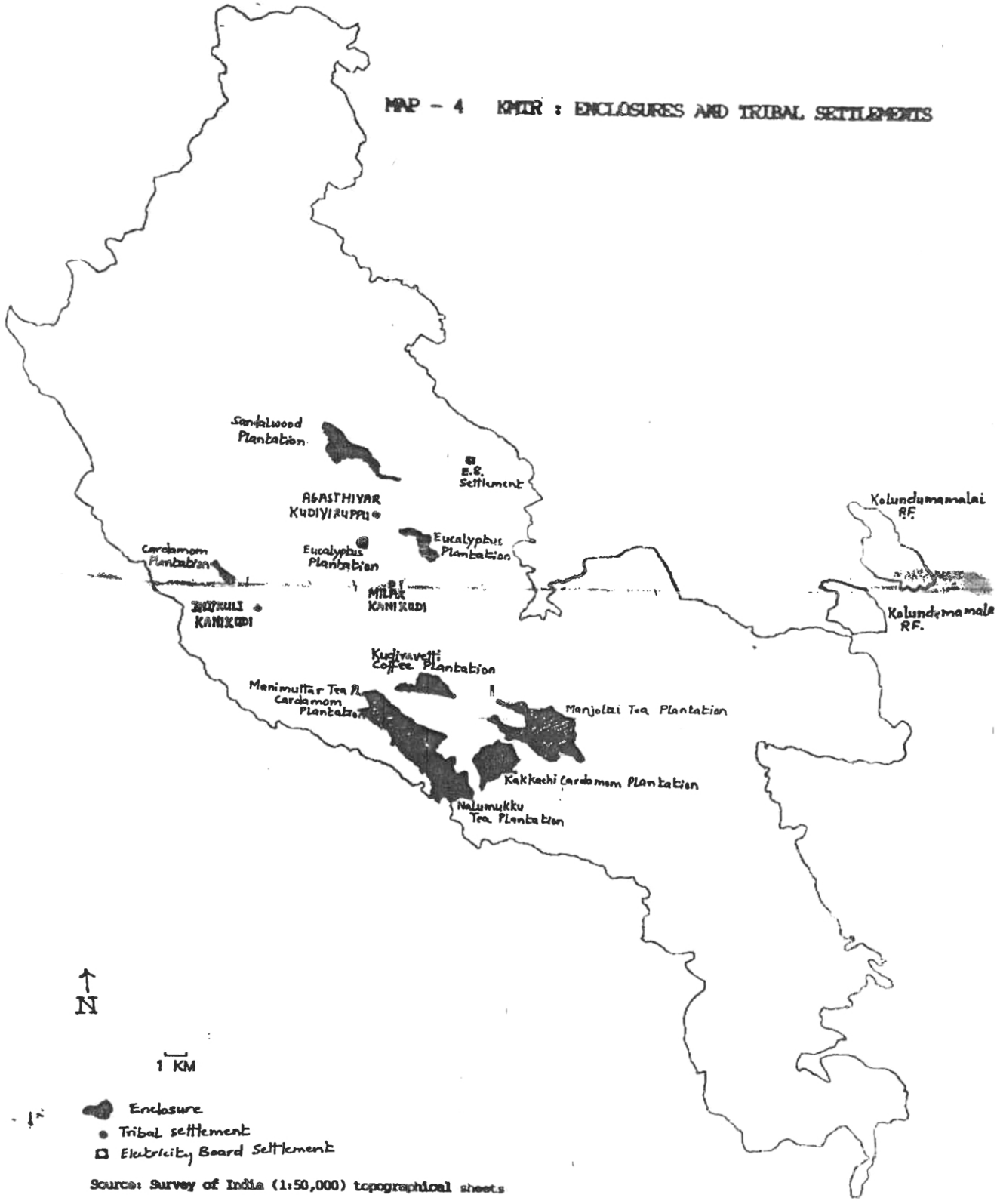
Source: 1. Survey of India (1:50,000) topographical sheets
2. Kalakad Mundanthurai Tiger Reserve: A Paradise for Nature Lovers, Tamil Nadu Forest Department



MAP - 3 KMDR : RIVERS AND LINEAMENTS

Source: Regional Remote Sensing Center, Anna University, Madras (1992)

MAP - 4 KMTR : ENCLOSURES AND TRIBAL SETTLEMENTS



Source: Survey of India (1:50,000) topographical sheets