Bohal Micro Plan

Himachal Pradesh Forest Ecosystem Services (HP-FES) Project

Ministry of Environment, Forest and Climate Change

Himachal Pradesh Forest Department

german cooperation
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HP-FES

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Shimla, 2019

Micro Plan for Bohal

Himachal Pradesh Forest Ecosystem Services (HP-FES) Project

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List of Abbreviations

amsl	Above Mean Sea Level
BA	Basal Area
BMZ	German Federal Ministry for Economic Cooperation and Development
CBD	Convention on Biological Diversity
CHF	Compartment History File
CSK HPKVV	Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya
DBH	Diameter at Breast Height
ES	Ecosystem Services
FD	Forest Department
FES	Forest Ecosystem Services
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HH	Household
HP	Himachal Pradesh
HPFD	Himachal Pradesh Forest Department
HPEDS	Himachal Pradesh Eco Development Society
HPFES	Himachal Pradesh Forest Ecosystem Services
IPH	Irrigation and Public Health
JFMC	Joint Forest Management Committees
MC	Municipal Committee

MCP	Municipal Council of Palampur
M&E	Monitoring & Evaluation
MoA	Memorandum of Agreement
MoU	Memorandum of Understanding
MT	Metric Ton
NTFP	Non-timber Forest Product
PES	Payment for Ecosystem Services
PFM	Participatory Forest Management
PRA	Participatory Rural Appraisal
PS	Planning Site
PWGI	Palampur Water Governance Initiative
VFDS	Village Forest Development Society
WP	Working Plan

1 Introduction

1.1 Forest Ecosystem Service (FES) Approach

The ecosystem approach, as defined by the Convention on Biological Diversity (CBD) in 2000, is the integrated management of ecosystems to promote conservation and sustainable use of the services and goods provisioned by these ecosystems to be enjoyed equitably by all sections of society. These services and goods are together termed as “Ecosystem Services”.

The ecosystem services derived from forests came to be referred to as “Forest Ecosystem Services” or FES. The FES Approach may be defined as “Forest Management that aims at sustainable provision of a set of ecosystem services based on stakeholder choices”.

The FES Approach states that stakeholders prioritize ecosystem services based on their needs.

The forest management under FES Approach will be guided by the ecosystem service/s thus prioritized, with due importance given to the remaining goods and services.

1.2 Himachal Pradesh Forest Ecosystem Service (HP-FES) Project

1.2.1 Project Background

The German Federal Ministry for Economic Cooperation and Development (BMZ) commissioned Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) to partner with the Himachal Pradesh Forest Department (HPFD) to integrate FES Approach in forest management. The project activities started from April 2016. Using the FES approach in a microplan can facilitate institutionalizing of the approach in management and planning processes of HPFD.

1.2.2 Project Objective

The overall objective of the HP-FES Project is to enable HPFD to introduce the ecosystem approach into its forest management.

For this purpose, Bohal is selected as a demonstration site. Microplan for Bohal is prepared with the FES prioritized by the dependent communities which includes water, soil conservation and fodder.

1.3 Role of Microplan in New Working Plan Code

Since 1837, the Indian forests are managed under working plan (WP) guidelines. However, it evolved with changing society and policy demands. Until the National Working Plan Code (2004), the major focus of these codes was on timber extraction which in turn determined the amount to be planted and harvested. The Honourable Supreme Court of India with its ruling (Dec 1996) towards a blanket ban on green tree felling triggered a policy evolution, of which the first step was the Forest Working and Management Plan Code (2014). This Code facilitates management of Indian forests to improve the provision of ecosystem services to dependent population. This enabled FES

approach in forest management. The FES approach makes participatory forest management plans (now known as microplans) essential in the new working plan code.

The National Working Plan Code 2014 has made provisions for use of microplans as tools for participatory forest management for forest areas under Joint Forest Management Committees (JFMCs) and working circle within the scope of the Forest Right Act 2006 and the Biodiversity Act 2002.

1.3.1 Objectives of the Microplan

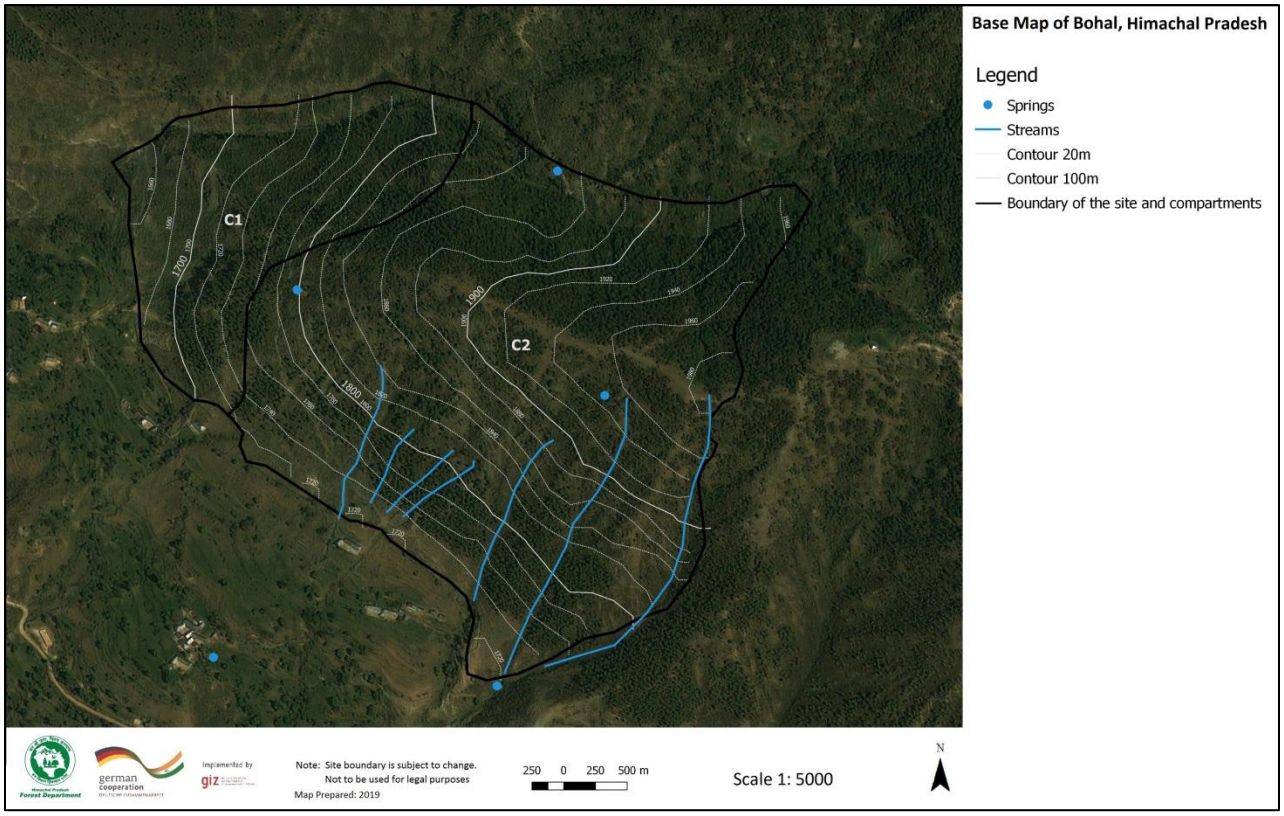
The objective of this microplan is to incorporate ecosystem services into the forest management in the Birni forest of Bohal. A forest assessment and a participatory rural appraisal (PRA) exercise were carried out as a base to formulate the management objectives of the plan provided in Chapter 5.

1.3.2 Description of Subsequent Chapters of the Microplan

Chapter 2 describes the planning site. It also includes data collection and results of data collection process. Chapter 3 provides the list of elected members of the VFDS Bohal along with their phone numbers. Chapter 4 discusses the aims of forest management clearly spelling out the short-term management objectives that leads to mid-term forest management objectives, resulting in long-term objectives of forest management. It is to be ensured that these objectives are in line with the visioning exercise undertaken with stakeholder participants during the PRA exercise. Chapter 5 dwells into the details of activities undertaken for meeting the short-term forest management goals for the prioritized FESs. Chapter 6 discusses the Monitoring and Evaluation plan for activities undertaken to meet the short-term forest management objectives. This chapter will also enlist the indicators for ex-post assessment of the project and its long-term impacts. This is followed by Annexures that support the microplan.

2 Description of the Planning Site

The demonstration site, the village of Bohal, is 7 km north of Palampur (Map 2.1). The elevation of the project site ranges from 1,600 m to 2,100 m above mean sea level (amsl). This site falls in gram panchayat Bandla which is in the forest beat by the same name under the forest block, range and division of Palampur in the forest circle of Dharamsala. Dharmasala is also the district headquarters of the district of Kangra. The latitude and longitude values of the extreme points of project boundary are given in Table 2.1.



Map 2.1: Base Map of Bohal

Table 2.1: Coordinates of Planning Site in Bohal

Direction	Latitude	Longitude
Northern mostpoint	$32^0$08’34.13” N	$76^0$33’25.93” E
Southern mostpoint	$32^0$08’15.67” N	$76^0$33’13.94” E
Eastern mostpoint	$32^0$08’19.07” N	$76^0$33’24.16” E
Western mostpoint	$32^0$08’36.70” N	$76^0$32’56.47” E

The Birni forest (comprising of compartments C1 & C2) (Map 2.1) is largely a natural forest, has habitations of village Bohal on its southern and western side. The forest has progressively degraded due to irrational use over a long period of time by the rights

holders. Chir and Deodar plantations were carried out during 1975 to 1980 by the Himachal Pradesh Forest Department (HPFD). The forest continued to be used indiscriminately by the rights holders. This forest was brought under Joint Forest Management (JFM) in the year 2010 and Village Forest Development Society (VFDS) Bohal-Odi was registered. A preliminary 20-year forest management plan largely for part of compartment C2 was devised. However, this was without a concrete implementation or funding strategy. Nevertheless, organizing villagers under VFDS resulting in enforcement of some forest use rules including controlled grazing, degradation was largely controlled. However, the forest fire of 2016 caused extensive damage to the Chir Pine forest. This resulted in open spaces later invaded by weeds like *Eupatorium* and *Woodelia*. Currently, the forest has a few patches of degraded or denuded area needing treatment. The Compartment History File (CHF) for Compartment C2 prescribes afforestation of degraded and denuded areas. The preliminary 20-Year Forest Management Plan drafted under Palampur Water Governance Initiative (PWGI) in 2009-10 focused only on regulated use of forest without any comprehensive measures for afforestation or water regeneration (See Box 1 and Box 2).

Box 1: Highlights of the 20 Year Forest Management Plan under Palampur Water Governance Initiative (PWGI) under GTZ

- Complete ban on grazing
- Leaf fodder extraction allowed for only 15 days in a year. This falls in the month of January when forest is to be divided into two parts with one part remaining closed while the other is open for extraction only by one person per house.
- Grass fodder collection allowed for 7 days in a year at a time decided by village forest development society (VFDS); only one person per house to be allowed.
- Mandatory for one person per house to participate in forest protection work. Fine to be imposed on a per day basis in case of non-participation.
- Complete ban on extraction in the Bohal Spring Recharge Zone.
- Annual fee of 100 INR to be paid by each house for implementation of 20 Year Action Plan.
- VFDS to select and appoint 'Rakha' for forest protection.
- Fine on grazing, theft of leaf fodder, grass fodder, fuelwood and damage to Bohal Spring recharge zone.

(Source: Palampur Water Governance Initiative by GTZ (now GIZ) https://www.slideshare.net/puneetkumarsrivastava/pwgiprocess-and-results-70729792)

Box 2: Mechanism for Payment for Ecosystem Services (PES) at Bohal under Palampur Water Governance Initiative (PWGI)

HP-FES demonstration site Bohal came into focus after a PES model was instituted under GTZ (now GIZ) funded PWGI in October 2010. A part of U13P Birni, compartment C-2 (**Error! Reference source not found.**) forms the catchment of a water source supporting piped water supply to the Municipal Council of Palampur. Under PWGI, an agreement for money transfer was signed between VFDS Bohal and Municipal Council of Palampur (MCP). As per the agreement, the MCP was to pay VFDS Bohal an amount of 10,000 INR annually (with a periodical notional increment) for protecting the catchment of Bohal spring against grazing, indiscriminate lopping

The provisions of this microplan will focus on activities for management of ecosystem services as prioritized by the local community. In this plan, the prioritized ecosystem services are water, soil conservation and fodder.

2.1 Methodology

2.1.1 Environmental Data

The environmental data describes the salient features of the environment at the planning site. This data has been collected based on field measurement, Working Plan of Palampur Forest Division and CHF of Birni forest in Palampur Forest Range. There is no meteorological station at Bohal. Hence, data record of meteorological stations at Palampur and Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya (CSK HPKVV) were used. The environment data of the planning site is listed in Table 2.3 in section 2.2.1 of this plan.

2.1.2 Demographic Data and User Rights

The data was collected using Participatory Rural Appraisal (PRA), baseline survey report, and other secondary sources like documents from the Gram Panchayats, Department of Animal Husbandry, Anganwaris (Department of Social Justice and Empowerment) and Local Revenue Office. The demographic data is presented in Table 2.4 under section 2.2.2.

Mapping and facilitation were the tools used to gather information regarding forest user rights. A Google image/map of forest U13 P Birni C1 and C2 was displayed to the PRA participants. The results of baseline survey on forest use rights of six villages namely Bandla, Bhatarka, Saan, Nachher, Jhandarda and Bohal were verified and recorded in Table 2.5 under section 2.2.2.

2.1.3 Seasonality of Labour Distribution

Facilitation and matrix were the tools used to collect information on seasonality and labour availability. Materials used were charts and sketch pens. Seasonality of engagement in agriculture, horticulture, wage labour, migration, labour availability for project activities and rain and snowfall were recorded. The calendar was displayed in front of the PRA group and information of months of occurrence; type of work and its availability was gathered and indicated against the corresponding period or month. Response for various variables were probed and recorded in the Table 2.6 under section 2.2.3.

2.1.4 Stakeholder Mapping

Facilitation and stakeholder map were the tools used during stakeholder mapping. The PRA participants were briefed about the concept of stakeholder. A diagram (Figure 2.1) on a chart with four concentric circles and three lines or axes emerging from the central theme of HP-FES was shared with the PRA participants. Almost equal sections were formed with HP-FES. The participants were asked to write names of institutions falling in the three broader categories namely civil society, private institutions and state institutions, which they considered potential in influencing the Project. The participants provided information that was recorded on the map and translated into Table 2.7 under section 0.

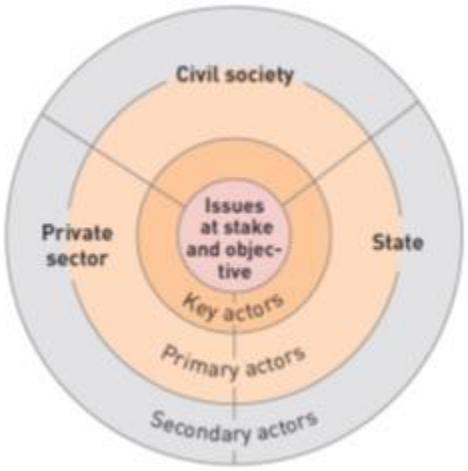


Figure 2.1: Stakeholder Diagram

2.1.5 Institutional Mapping

Through Facilitation and a Venn Diagram (Figure 2.2), the institutional mapping was undertaken to understand how the community members perceive institutions both within the community (in terms of decision making, accessibility, and services) and outside the community (in terms of participation, accessibility, and services). It also helped in identifying potential entry points for strengthening or improving relationships between key social actors while undertaking implementation of the plan.

On the site, the PRA participants identified government institutions as relevant to their procuring the forest ecosystem services and other dependent occupation. The information thus gathered is provided in Table 2.8 under section 2.2.5.

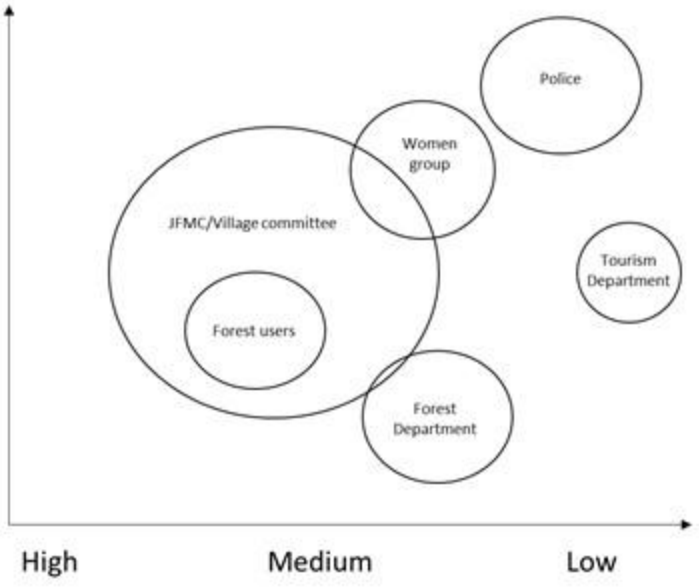


Figure 2.2: Example of Venn Diagram [The big circle is the group for which the relations to institutions is looked at (Village Forest Management Committee or Village community)]

2.1.6 Forest

Data on forest was collected through forest assessment during baseline survey and from documents of HPFD like the Divisional Working Plans, Compartment History Files (CHF), etc.

2.1.6.1 Forest Assessment during Baseline Survey

This section states in brief the methodology for forest assessment used in the baseline survey. The forest assessment served three objectives as given below:

i) Knowing the regenerating tree species
ii) Knowing the human impacts on different forest types
iii) Information of the basal area for each forest type

The assessment was based on circular plots arranged on a transect. A forest type was represented by at least two transects. The transects were placed in a way that they represent the forest type. Stands or parts of the forest type that were significantly different from other parts were assessed separately.

Allocation of the Transect: The investigator chose a spot representative of the forest type at the beginning of the transect in the forest 10 m from the edge. The transect was oriented along the longest site of the forest type. The first plot was allocated 30m away from the starting point of the transect and all subsequent plots were placed at similar intervals. Holes, riverbeds and similar locations unrepresentative of the stand were skipped and plots installed 30 m further along the transect.

Assessment of Regeneration: Regenerating tree individuals of different sizes were assessed in circular plots of different sizes. Details are shown in Table 2.2. For analysis, the existing data were combined into two categories: seedlings and saplings.

Table 2.2: Plot Size and Data Collected for Different Sizes of Regeneration Trees

Type	Definition	Plot used for assessment	Area of each plot	Data collected (Same for all plots)
Seedling 1	Tree species >0-0.30 m height	Circular plot (r=1 m)	3.14 sq. m	• Species Name • Number of individuals • Number of individual grazed/burnt/cut/others • Number of coppiced individuals • Photo number of species • Herbarium sheet number
Seedling 2	Tree species >0.30 m-1.3 m height	Circular plot (r=1.5 m)	7.06 sq. m	
Sapling 1	Tree species >1.3 m height and DBH <3.18 cm	Circular plot (r=2.5 m)	19.62 sq. m	
Sapling 2	Tree species DBH >3.18 cm-<7 cm	Circular plot (r=4 m)	50.24 sq. m	

Assessment of Human Impact: Signs of human impact (trampling, fire, livestock dung, lopping, resin tapping) were assessed using ocular method within 12m radius and noted as present or absent.

Assessment of Basal Area: Basal area gives an insight about the number and size of trees in an area. The basal area was assessed with the Angle Count Method in seven locations in each forest type. This method calculates the basal area for one tree based on the distance between the tree and the investigator and the diameter at breast height (dbh). The investigator counts the trees that fall in a certain range of dbh (count factor 4 or 2) while turning 360°. The number of trees counted in this manner are multiplied by the chosen count factor to get the basal area for the stand. The figures of all locations were averaged to get the value for the forest type.

2.1.6.2 HPFD Documents like Divisional Working Plan and Compartment History Files

Documents of HPFD used in planning and forest management were also referred. The Compartment History File (CHF) and Divisional Working Plans were referred to study the management objectives used historically, as well as forest use rights and practices by local communities.

2.1.7 Assessment of Forest Ecosystem Services (FES)

Information on the extent of FES use, the quantity used by different households (hhs) and information on the trends of FES demand and availability were gathered and verified during the PRA exercise. Information on the factors or drivers for these trends was also gathered. PRA group was further probed if the FES received were sufficient to

fulfill the current demand. All information thus collected is presented in Table 2.11 under section 2.2.7.

2.1.8 Human-Wildlife Conflict

Human-Wildlife conflicts often hamper the well-being of people and information on the same was collected during the PRA. Facilitation and matrix were the tools used in collecting this. Wild animals causing damage to crop were enlisted, and details of the type and extent of damage were discussed. The result of this exercise is given in Table 2.12 under section 2.2.8.

2.1.9 Conflict Management

Conflicts on FES use was discussed with PRA participants. Facilitated focus group discussion and matrix were the tools used to gather data. Issues of conflict with parties were identified and recorded along with their intensity. The PRA group was asked to narrate the conflicts (apparent and latent) on FES which occurred in the past or are ongoing. The information is recorded under section 0.

2.2 Results

This chapter provides the results of the data collected as described under the section 2.1 and includes information generated in PRA, baseline survey, census data and forest records. It is reproduced in this section in the form of tables and figures, supported by text.

2.2.1 Environmental Data

The results of environmental data are discussed in Table 2.3.

Table 2.3: Environmental Characteristics of Bohal

Features	Value	Source
Name of the Site	Bohal	-
Name of Hamlets	Odi and Bohal	-
Elevation Range (m)	1600-2100	Field measurement
Annual Average Precipitation (mm)	2125.6	Palampur Working Plan, (2010-11 to 2024-25) for the period 1984-2010
As Rain (%)	100%	
Maximum Rainfall recorded (mm)	3,341.7 in 1988	
Minimum Rainfall recorded (mm)	1,376.2 in 1991	
As Snow (%)	0%	
Dry Months (with precipitation <50 mm)	April, October and November	
Number of days with frost	0	
Period of Frost	Nil	
Temperature (^{o}C/No. of days)	Monthly mean temperature range is 10.3 – 24.3 ^{o}C with mean maximum temperature range of 15.3 - 30.0 ^{o}C and	Palampur Working Plan (2010-11 to 2024-25) for period of 1996-2010

Features	Value	Source
	mean minimum temperature 5.3 - 20.1 ^{o}C	
Planning Area (ha)	36	CHF and Google Map
Forest Type and Area (ha)	• 9/C1b Upper or Himalayan Chir Pine Forest (16 ha) • 12/C1a Ban Oak Forest (20 ha)	

2.2.2 Demographic Data and User Rights

The inhabitants of Bohal village belong to the Scheduled Cast (17%) and the Scheduled Tribe (83%). Most of them are not economically well off and are dependent on farming and daily wage labours. The average size of the family is 4.4 persons. According to the baseline survey, the average land holding per family is 0.6 ha with three per cent families being small farmers and remaining 97 % being marginal farmers. Most of the sheep and goat population is under transhumance. Flocks move to higher areas of Lahaul & Spiti district during summers and lower areas of district Kangra during winters. The demographic data of Bohal PES site is presented in Table 2.4.

Table 2.4: Demographic Data of Bohal

Particulars		Number	Source
Population (number)	Female (y)	160	Bundla Gram Panchayat Record
	Male (x)	165	
	Children (below 6 years)	23	Anganwari, Bohal
Gender ratio (adult > 14 years) (number)	x/y	970/1000	Calculation
Livestock (number)	Cow	45	Veterinary dispensary Bundla (Dept. of Animal Husbandry)
	Buffaloes	3	
	Bullocks	10	
	Sheep & goat	1200 and 1100	
	Horses & mules	6 and 4	
Occupation (No. of HH)	Government job	9(8)	PRA Data
	Private job	6(6)	
	Self employed	6(6)	
	Agriculture/Horticulture	52	
	Wage Labour	Men =17 Women = 30	
Land holding (No. of HH)	Marginal	72	Baseline Survey and PRA
	Small	2	
	Medium	Nil	
	Large	Nil	
Land use (%)	Agriculture	35	Land Revenue Officer, Bundla Patwar Circle, Deptt. of Land Revenue
	Grassland	28	
	Pasture	29	
	Non arable	8	

The information on the existing user rights as evidenced in the PRA conducted is given in **Error! Reference source not found.**. The column 'Others' in the table indicates NTFP collected. For example, Rhododendron flowers, fiddle headed fern, hill bamboo (Arundinaria falcata locally known as Nirgal) used for making baskets, collection of dry leaves for leaf litter and manure etc.

As per information on forest settlement rights, six villages of Mauza Bundla namely Saan, Nachher, Bundla, Bhatarka, Bohal and Jhandarda with a population of 2,175 individuals from 499 households have rights in the forest. There is an understanding amongst the villagers for use of forest adjacent to their villages. However access to the forest compartment of C1 and C2 is restricted to 775 individuals from 162 households belonging to Bohal and Jhandarda villages.

Approximately 25 tonnes of fodder is lopped in 15 days while 10 tonnes of grass is cut in seven days. This is in line with the usufruct rules of VFDS Bohal (WII, 2017-18).

Table 2.5: Forest User Rights of Communities in Bohal

Village Name	Timber		Fuelwood		Grazing		Fodder		Others	
	Ext.	Int.	Ext.	Int.	Ext.	Int.	Ext.	Int.	Ext.	Int.
Bohal	×	✓	×	✓	×	✓	×	✓	×	✓
Jhandarda	×	×	×	×	×	×	×	×	×	×
Saan	×	×	×	×	×	×	×	×	×	×
Nachher	×	×	×	×	×	×	×	×	×	×
Bhatarka	×	×	×	×	×	×	×	×	×	×
Bandla	×	×	×	×	×	×	×	×	×	×

(Ext. = user right holders outside Bohal; Int. = user right holders inside Bohal; × = No; ✓= Yes)
Source: PRA at Bohal, forest settlement records and facilitation through interview

2.2.3 Seasonality of Labour Distribution

The information on seasonality of labour distribution is important for planning the implementation of activities. The information collected during PRA using the season calendar is presented in Table 2.6.

Agriculture activities from May to July are wheat harvesting, sowing of Kharif crop and grass cutting while agricultural activities from October to December include Kharif crop harvesting and Rabi crop sowing.

The information on seasonality of labour distribution is important for planning the implementation of activities.

Table 2.6: Seasonal Calendar for Microplan Activities for Bohal

Seasonal activity & climatic events	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Wage Labour	■	■	■	■			■	■	■			
Agri/Horticulture					■	■	■			■	■	■
Labour Migration	■	■					■	■				
Rains	■	■			■	■	■	■	■			■
Snow	■	■										

Seasonal activity & climatic events	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Frost												
Labour Availability (person months)	85	75	80					55	55			

2.2.4 Stakeholder Mapping

There are a series of stakeholders who needs to be considered in the planning site. Among them the local communities and HPFD are the key stakeholders including groups such as the Self-Help Groups (SHG), an effective vehicle for women empowerment who could play an important role in regulating the FES use. The results from stakeholder analysis exercise of PRA are presented in Table 2.7.

Table 2.7: Stakeholders of Bohal

Type	Key	Primary	Secondary
Civil Society	Villagers (forest users)	• Gram Panchayat • Mahila Mandals (Shanti in Bohal and Santoshi in Odi)	HP Eco Development Society (HPEDS), Holta
Private	None	None	None
State	• HPFD • Wildlife Wing of HPFD and MC Palampur	• Municipal Council of Palampur for PES • Police	Department of Irrigation & Public Health

2.2.5 Institutional Mapping

Many institutions are identified in the planning site and were put together graphically in the form of an institutional map during the PRA. The institutions, their importance, relevance and relations with local communities and with each other were probed. The results of the exercise are presented in Table 2.8.

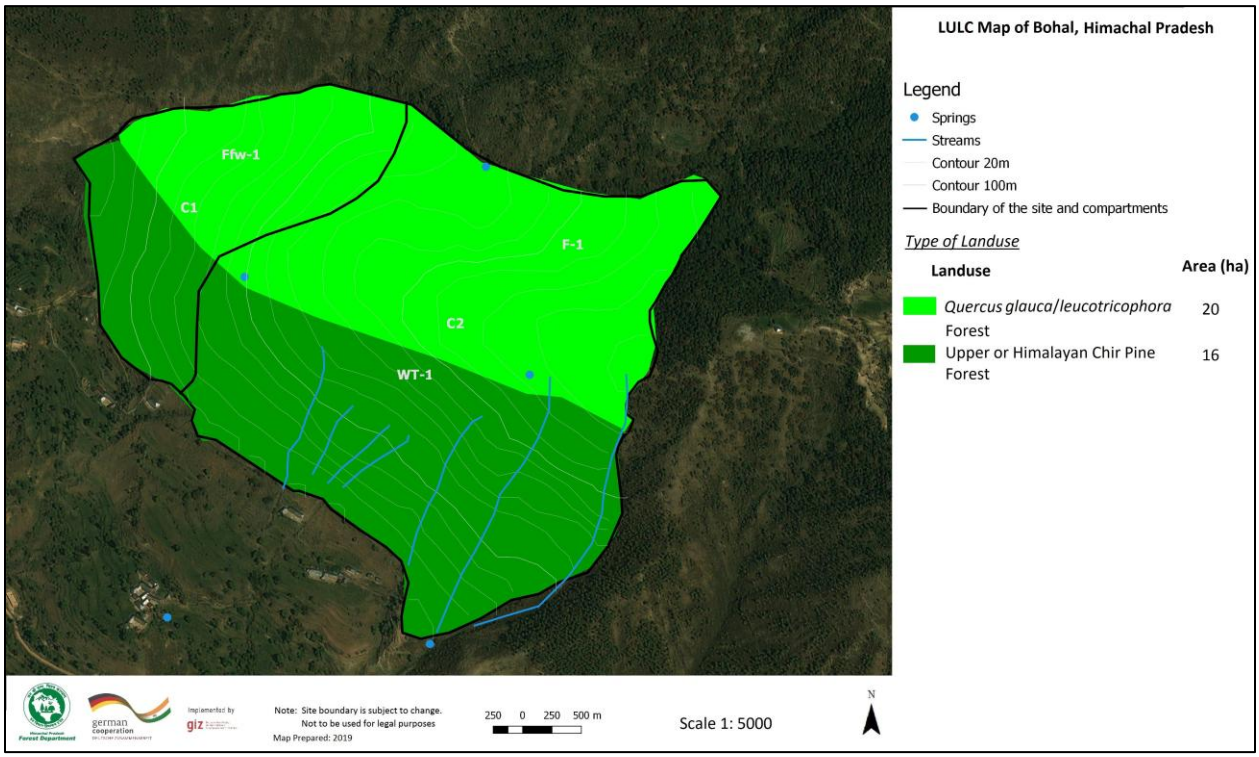
Table 2.8: Institutional Mapping of Bohal

Particulars/Item	Institutions				
	HPFD	Gram Panchayat Bundla	Mahila Mandal (Shanti - Bohal)	Mahila Mandal (Santoshi - Odi)	HPEDS Palampur
Importance	H	M	H	M	M
Relevance	H	M	H	M	L
Relation with VFDS Bohal	G	G	G	G	G
Conflict	N	N	N	N	N

Note: H: High, M: Moderate, L: Low, G: Good, N: None

2.2.6 Forest

The site consists basically of three forest types: Moist Deodar Forest, Upper or Himalayan Chir Pine Forest and *Quercus leucotricophora* Forest (Map 2.2). A total of five plots were laid in each of the forest type for the assessment of the human disturbance, tree species regeneration and basal area.



Map 2.2: Landuse/Landcover Map of Bohal

2.2.6.1 Forest Assessment during Baseline Survey

- **Human disturbances in different forest types of Bohal**

All forests in the demonstration site are disturbed. While the Chir Pine Forest is mainly disturbed by fire, the *Quercus leucotricophora Forest* is disturbed by grazing with isolated incidental fires. The Moist Deodar Forest faced disturbance mainly from livestock (Table 2.9).

Table 2.9: Percentage of Plots in which Signs of Human Interference were observed in Bohal

Forest Type	Fire	Cutting	Trampling	Lopping	Resin	Track	Dung
12/C1c Moist Deodar Forest	20	60	80	0	0	100	100
9/C1b Upper or Himalayan Chir Pine Forest	100	80	100	80	0	100	80
Quercus leucotricophora Forest	40	40	100	80	0	100	80

- Regeneration in different forest types of Bohal (Figure 2.3)
  - Regeneration in Moist Deodar Forest: In this forest type, no species was found to be regenerating

  - Regeneration in Upper or Himalayan Chir Pine Forest: The only regeneration recorded in Upper or Himalayan Chir Pine forest was of *Quercus leucotricophora*. However, saplings are recorded indicating establishment but in small numbers and in degraded state. This is mainly due to fire.

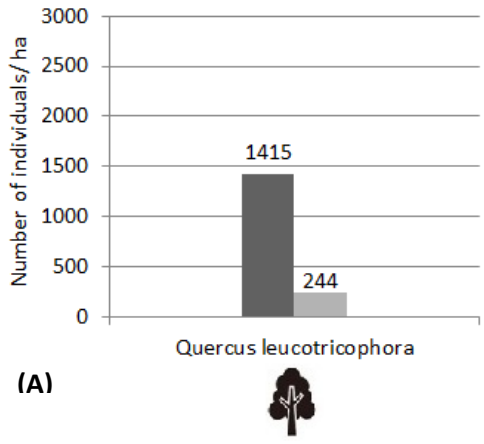
  - Regeneration in *Quercus leucotricophora* Forest: Regeneration and establishment of the species in *Quercus leucotricophora* forest was found to be very good. The regeneration of *Rhododendron arboreum* was also recorded but its establishment was not recorded

- Basal Area in different forest types of Bohal (Figure 2.3)
  - Basal Area in Moist Deodar Forest: In this forest type, *Cedrus deodara* has the highest basal area followed by *Pinus roxburghii* and *Quercus leucotricophora*.

  - Basal Area in Upper or Himalayan Chir Pine Forest: In this forest, *Pinus roxburghii* has the highest basal area as compared to other species.

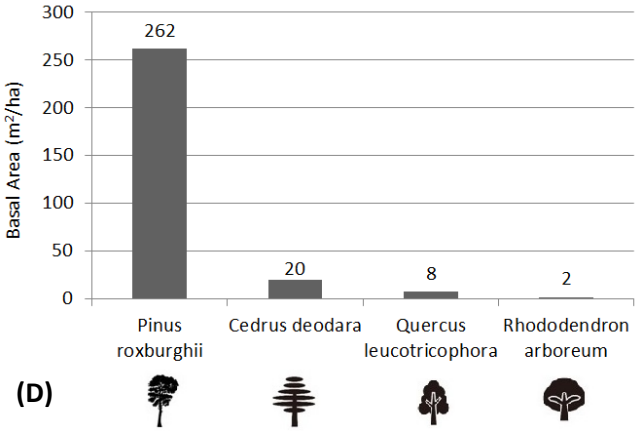
  - Basal Area in *Quercus leucotricophor*a Forest: In this forest, *Quercus leucotricophora* has the highest basal area while the other species have very less basal area compared to it.

Regeneration



(A)

Basal Area



(D)

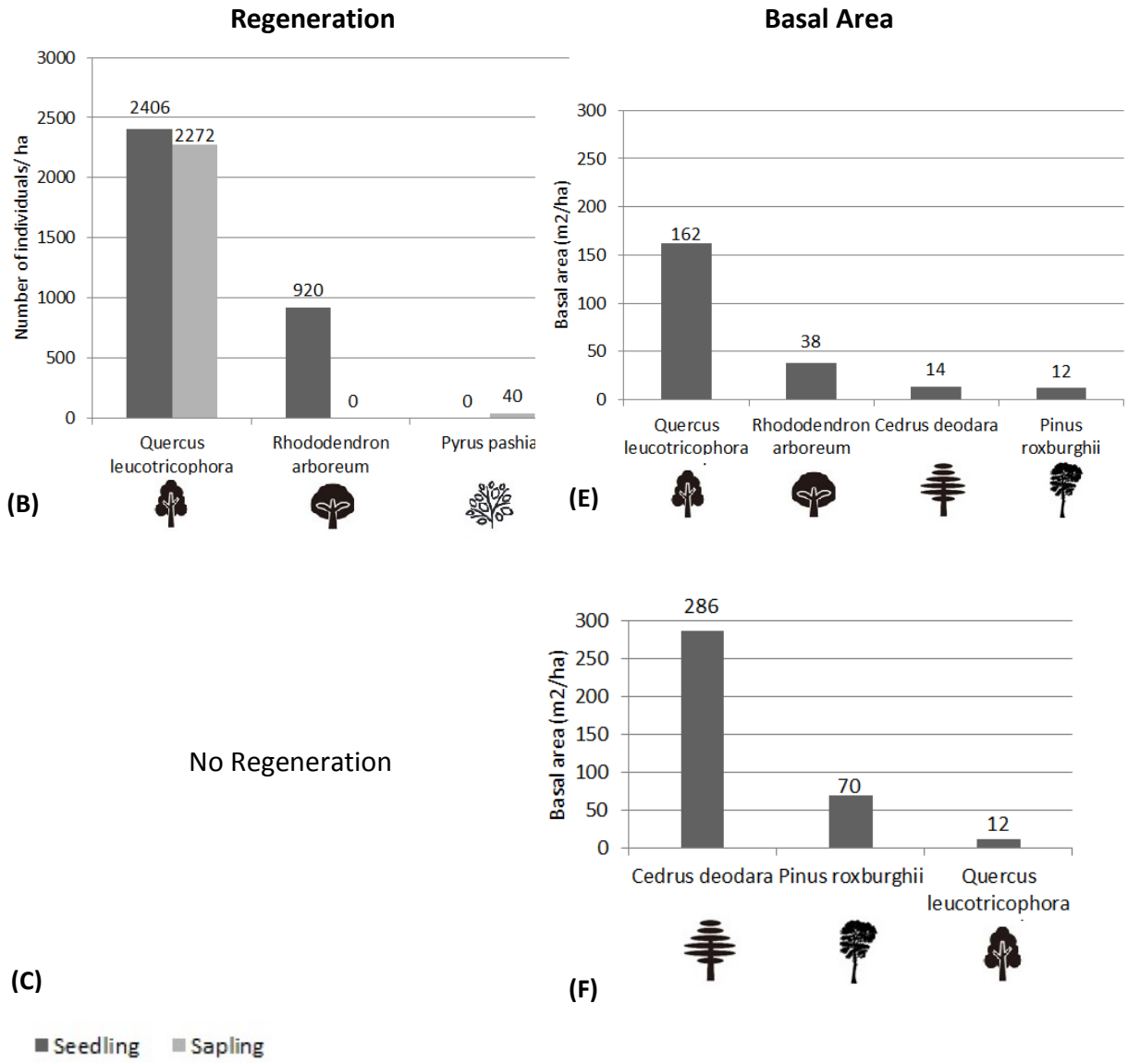


Figure 2.3: Regeneration and Basal area in different forest types of Bohal [A: Regeneration in Chir Pine Forest, B: Regeneration in *Quercus leucotricophora* Forest, C: No regeneration in Moist Deodar Forest, D: Basal area in Chir Pine Forest, E: Basal area in *Quercus leucotricophora* Forest, F: Basal area in Moist Deodar Forest]

2.2.6.2 Forest Assessment during Baseline Survey

The description of each of the compartment in the Bohal is shown in Table 2.10.

Table 2.10: Description of Forest Compartments at Bohal

Compartment	Forest Type	Area (ha)	Vegetation structure & composition
C1	9/C1b (Upper or Himalayan Chir Pine Forest)	8.90	• Chir Pine, Deodar seedling/saplings & a few trees with young to middle aged scattered Ban oak trees with some blank patches. • *Berberis aristata*, *Prinsepia utilis*, *Rubus ellipiticus*, *Rosa moschata* and grasses form ground storey.
C2	• 9/C1b (Upper or Himalayan Chir Pine forest) • 12/C1a (Ban Oak forest)	• 7.00 • 20.00	• Young Chir Pine in south western lower part and young to mature Ban oak with Rhododendron and scattered young deodar trees planted between 1974 & 1980 with mixing of *Pyrus* in lower and *Pieris* in upper parts. • *Berberis*, *Prinsepia*. *Robus*, *Rosa* and Nirgal (*Arundinaria*) form ground storey. • Two blank patches each about a hectare in extent lie south east to North West in the forest one on the top ridge and other above habitation of Bohal.

Source: Compartment History File and HPFD

2.2.7 Forest Ecosystem Service

A socioeconomic survey was also conducted during the baseline survey that probed the dependence of local communities (Bohal and adjoining villages) on forest. As per the survey, fuelwood sourced from forest is collected mainly from the lower ranges of Birni forest. The fuelwood collectors comprise of 67% women, 31 % men and 2% children. Fuelwood is collected mostly before the rainy season during May to June and before the onset of winter season i.e., from October to November.

Forest area under the Project, except the south eastern portion in C2 above Bohal habitation is accessed for grass and grazing. Fodder is sourced from private fields, grass lands and forest. Green leaf fodder is sourced both from forest and private lands.

In compartment C2, two years ago, a forest fire caused extensive damage in the south eastern part predominated by Chir Pine forest. Such occurrences can be contained by interplanting Chir Pine trees with Ban Oak. This is one of the recommendations of stakeholders derived through the PRA exercise. The FES derived from Bohak, its trend and drivers are presented in Table 2.11.

Table 2.11: Forest Ecosystem Services: its rank, trends and drivers

Category	Service	Rank	Sub-category	% HH using FES (Approx.)	Annual amount used		Quantity sufficient (Y/N)	Trend	Driver
					Total	Avg. no. of HH using FES			
Provisioning	Fuelwood	3	Cooking & Heating	80	~120	74	N	↓	Restriction on lopping / cutting in forest
	Fodder	4	Leaf Fodder	70	~25	45	N	↑	Increase in forest density results in increase in leaf fodder & decrease in grass
			Grass	NA	~ 10 cut grass & 50 grazed	45	Y	↓	
Regulating	Example: Watershed protection	1	Moisture Conservation & Water Regeneration	100	NA	74	Y	↑	Improved forest density
		2	Soil Conservation & Nala Stabilization	35	NA	25	N	↔	
	Air	5	Clean Air, Rainfall	Oxygen for breathing	100	NA	74	↔	Locally, vegetation has increased but surrounding pollution is persisting
Cultural	Aesthetic	6	Scenic beauty	100	NA	74	Y	↑	Due to increase in vegetation cover

Note: Trend – Decreasing: ↓ Increasing: ↑ No change: ↔, ND: No Data available

While planning for continued FES, the C1 and C2 were delineated into different zones and the interventions for management of FES were discussed with the executive committee members and HPFD field staff. Subsequently, the cost estimates for interventions were prepared for implementation of works.

2.2.8 Human-Wildlife Conflict

Human-Wildlife conflicts often hamper the well-being of people and information on the issue was facilitated during the PRA exercise. Information about wild animals causing damage to crop and livestock in the project site was gathered and is given in Table 2.12.

The thickets of the invasive species for example, *Lantana* and *Eupatorium* in degraded areas between the village habitations and the forest are safe hideouts for some of the wild animals. Clearing the area off the invasive species as mentioned above has been an ongoing programme of the HPFD under various projects. Currently this activity is supported by a project commissioned by the Wildlife Institute of India (WII).

Table 2.12: Human Wildlife Conflict in Bohal

Damages to	Wild animals causing damage						
	Wild boar	Blue bull	Rabbit	Black bear	Monkey	Porcupine	Leopard
Wheat	H	M	M	N	M	N	N
Maize	H	N	N	M	M	M	N
Potato	H	N	N	N	N	M	N
Colocasia /taro root	H	N	N	N	N	N	N
Barley	N	M	N	N	N	N	N
Killing of livestock	N	N	N	N	N	N	M
Injury to humans	N	N	N	L	N	N	L
Human Casualties	N	N	N	N	N	N	N

Note: H = High, M= Medium and L= Low

2.2.9 Conflict Management

During the PRA, the conflicts in Bohal village were discussed. It became clear that during the initial years when VFDS was formed, there were several conflicts related to cutting of grass, grazing goats and lopping of fodder trees with women of Jhandarda. Currently, there are no conflicts with regards to resource management within Bohal village and with the outsiders.

3 Village Forest Development Society (VFDS) Bohal

In October 2010, VFDS Bohal was registered under the Himachal Pradesh-Participatory Forest Management Rules of 2000 with the objective of managing the Birni forest jointly with HPFD. The details of the members are given in Table 3.1.

Table 3.1: Details of Executive Members of VFDS Bohal

Designation	Name	Contact Number
President	Sh. Dagu Ram, s/o Sh. Dhani Ram, r/o Village Bohal	88940 51635
Vice President	Smt. Malka Devi w/o Sh. Ishwar Das Village Bohal	97367 77634
Secretary	Sh. Ram Lal s/o Sh. Bansi Lal Village Bohal (Odi)	88942 26983
Treasurer	Sh. Anil Kumar s/o Nand Lal village Bohal (Odi)	70181 97670
Member	Sh. Panju Ram s/o Sh. Chand Ram Village Bohal (Odi)	98161 44742
Member	Smt. Neema Devi w/o Sh. Krishan Kumar Village Bohal (Odi)	94187 15112
Member	Smt. Kashmiri Devi w/o Sh. Kishori Lal Village Bohal	98051 89174
Member	Smt. Suneeta Devi w/o Sh. Jagdish Chand Village Bohal	78075 93458
Member	Smt. Kanta Devi Devi w/o Sh. Dharam chand Village Bohal	76508 56933
Member	Sh. Kartar Chand s/o Sh. Nirta Ram Village Bohal	98170 96077
Member	Sh. Ramesh Chand s/o sh. Mahlu ram Village Bohal	98057 82696

4 Aims of the Management Plan

Based on PRA, the forest vegetation assessment and discussions with all stakeholders, the objectives for long-term, mid-term and short-term planning periods are defined (Table 4.1). The long-term and short-term planning sets the context for the orientation of this microplan and determines the measures suggested.

Table 4.1: Management Plan for Bohal

Plan Term	Water	Fuel & Fodder	Forest	Measures
Long Term (30 years)	• Increased flow of water in springs is sustained despite climate vagaries. • Increased PES incentive contributes in economic upliftment of communities of Bohal	• Fuel and fodder supply is increased to meet the demand of the Bohal village • Increase in income and employment opportunities due to enhanced availability of leaf fodder and fuel • Visible changes in forest structure	Proportion of dense forest increases up to 10 % of the base value	VFDS ensures equitable resource sharing regulated use of forest and protection against fire, illicit felling
Mid Term (15 years)	• Increased flow of water in springs is sustained • Protection incentive for PES is substantially increased	Regenerated areas have attained pole stage forest with moderate density	Proportion of dense forest increases upto 5 % of the base value	• VFDS strictly protects plantation against lopping/illicit cutting • Review of PES agreement for rational enhancement of protection incentives

Plan Term	Water	Fuel & Fodder	Forest	Measures
Short Term (5 years)	• Reduced silt load in runoff • Increased water flow in targeted springs up to 10 % of base discharge	Treated areas have well grown sapling stage plantations with 90 per cent survival	Reduced silt load in runoff due to grass cover	• Effective protection of forest and plantation by VFDS is carried out • Conflicts in usufruct sharing are resolved by VFDS • VFDS is enabled to get funds from other donors /development agencies
Project Period (till April 2020)	• Planned activities related to soil and water conservation implemented • Conduct a baseline to understand the change and a system for measuring spring water flows and runoff silt load	• Plantation of multi-purpose fodder-yielding broad leaf tree spp. carried out with survival percentage up to 80 % • VFDS ensures protection of plantation against grazing and fire • Grass yield from treated area increased up to 50 %	• More forest area closed for grazing • VFDS members are motivated for being actively involved in forest protection and management	• Degraded and denuded areas are brought under regeneration and plantation • Rules for protection and usufruct are framed and followed • Soil and water conservation measures are planned and implemented

5 The Plan (for 5 years)

5.1 FES: Increase of Water Supply (Target - Increase of Hydrological Function)

VFDS Bohal has signed a contract with the Municipal Council Palampur in 2010 for an annual income of 10,000 INR for managing the Birni forest primarily for water regeneration. This payment for ecosystem services (PES) was set up under an earlier GIZ (then GTZ) project on rural water management, popularly known as "Palampur Water Governance Initiative (PWGI)".

Under PWGI, a 20-year forest management plan was drafted for managing Birni forest for water regeneration (See Box 1 under Chapter 2). However, the "20-year forest management plan" only made recommendations for putting a ban on grazing and drafted rules for harvesting of fodder in a controlled manner. No measures for improving the vegetative cover and soil and water conservation, essential for water management, were prescribed. The current microplan acts upon the opportunity to improve the vegetative cover and undertake soil and water conservation measures in the Birni forest. This will help improve water catchment function for sustained supply of water to Palampur town.

The FES zone for water conservation is shown in Map 5.1. The measures/interventions proposed for improved water management in Birni forest is explained in Table 5.1 which has resulted in the Map 5.2.

Table 5.2, Table 5.3 and Table 5.4 provides summary of physical treatments planned for Water conservation zone.

5.2 FES: Fodder (Target - Management of Fodder through Participatory Fodder Harvest Mechanism)

VFDS Bohal controls use of forest U13P Birni. Part of this forest above village Bohal forms major part of the catchment of spring shed, which is the source of piped gravity water supply to Municipal Council Palampur. This area of the forest is closed for grazing based on a decision of VFDS Bohal. Lopping of trees for fodder is exercised in a regulated manner for a period of 15 days in a year. The VFDS convenes its General House meeting in the beginning of winter and decides the season, the days and daily time for lopping of trees for fodder and cutting grass. As per the practice, one member of each family (which is already a member of VFDS Bohal) participates in the lopping for fodder. This is done as per prescribed rules. The member has to carry home the lopped or cut material. The lopped branches are put in front of farm animals which eat the leaves and tender shoots. The left-out twigs are collected and kept in a heap for further use as fuelwood. Tops and lops of dry/fallen trees /branches are collected and used as fuelwood mainly for marriages or other functions. Grass in the forest is scanty. However, blank or degraded patches are used for grazing cattle. Grass on the slopes beyond the reach of the animals is cut and collected by villagers as per need without any control.

The society decides the harvest of grass from closed or controlled areas for a week, as per rules on similar grounds as the lopping of trees. That is one member of each family with VFDS membership is deployed on fixed days of the season for cutting and collecting grass from closed forest and has to follow the rules laid down for grass harvest.

The FES zone for the management of fodder is shown in Map 5.1. The interventions planned for the management of fodder in this zone is explained in Table 5.1 and shown in Map 5.2. Some of the measures for management of fodder in Bohal are:

- The area for fodder management will be harvested on a three-year rotation cycle. However, the people will be allowed to cut and carry grasses within the area. There will be a total ban on open grazing in these areas.
- Lopping will be undertaken selectively on 3-year rotational basis in area earmarked for water conservation. In this zone, it will be ensured that a lopping is very light and does not results in opening of canopy drastically.
- No leaf litter to be extracted from the area earmarked for water conservation.
- Communities will be encouraged to make rules for the management of oak forests. Violation of the rules will result in drawing of penalties which will be decided by the VFDS.
- Fast growing fodder tree species like Robinia, Celtis, Bauhinia, Morus will be interplanted to meet the deficit in fodder demand.
- Communities will be encouraged to plant multi-purpose fodder tree species on their lands.
- Provision for introduction of high yielding quality grasses will be made.

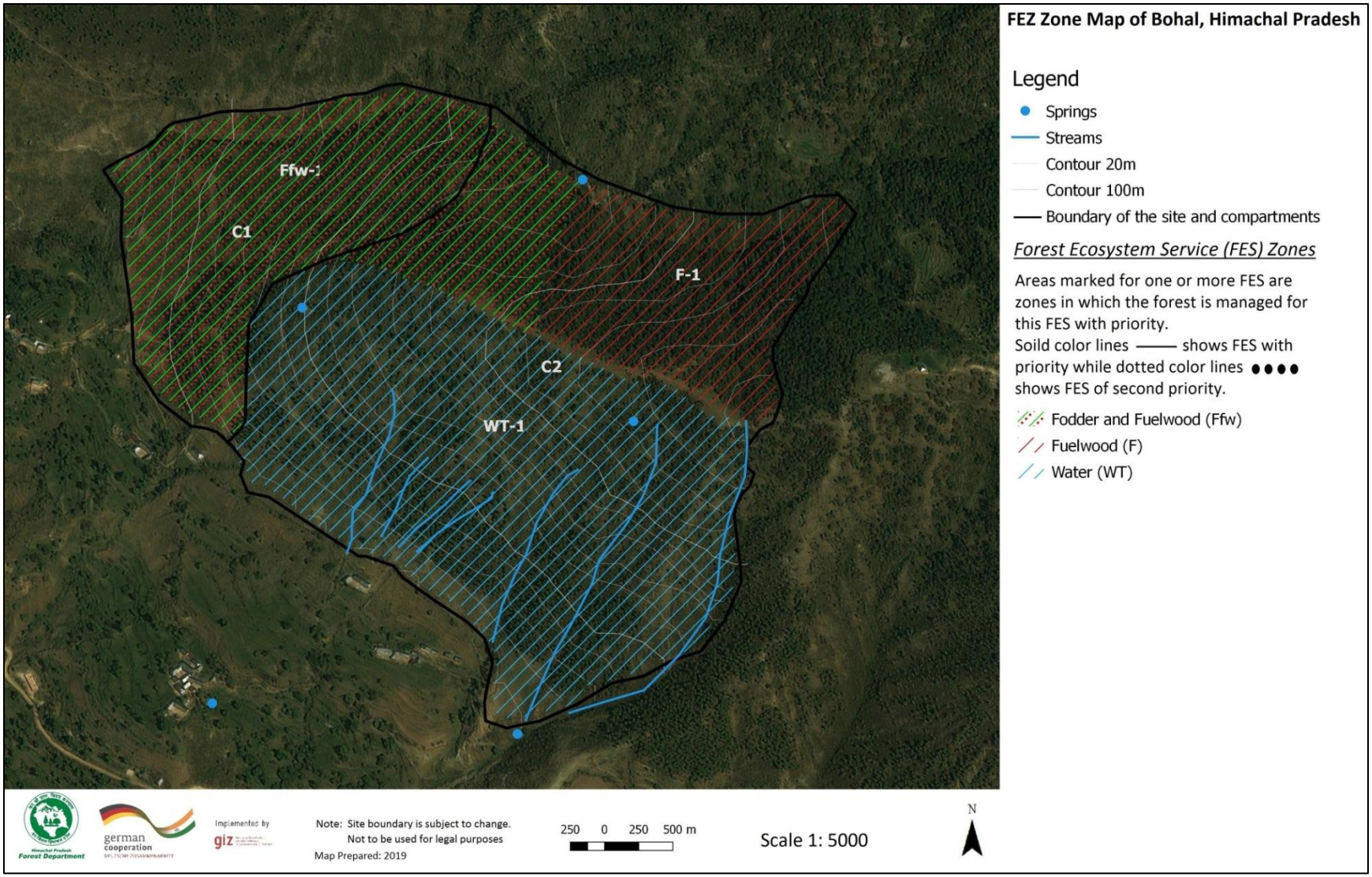
Table 5.5 provides summary of physical treatments planned for fodder zone.

Table 5.1: Zone-wise Management Plan of Bohal

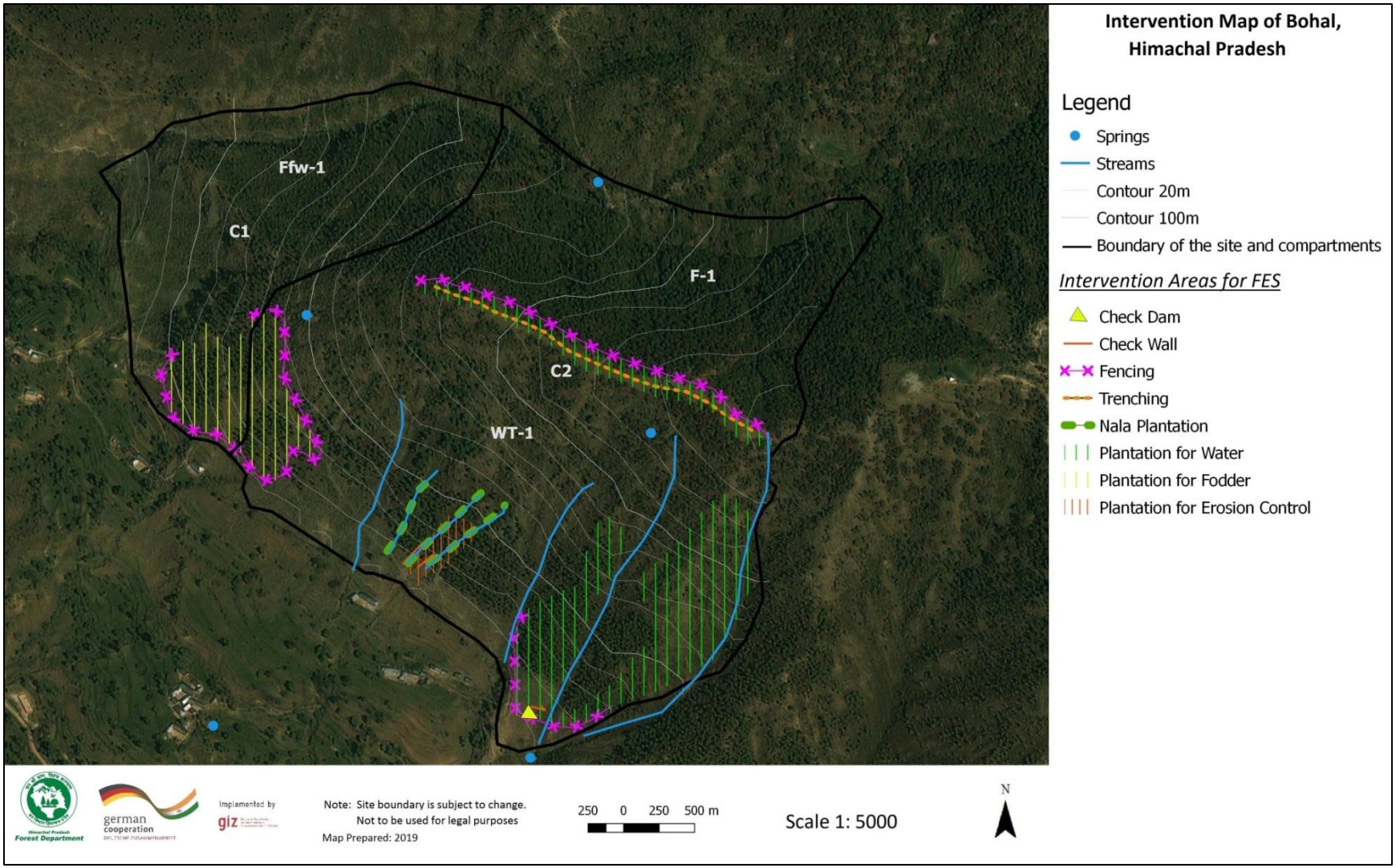
FES Zone*	Priority FES	Area (Ha)	Compartment Number	Description	Interventions
WT-1	Water	19	C2	• Largely Southern aspect • The entire micro watershed falling in C1 & C2 that forms the catchment of Bohal spring. • Young Chir Pine in south western lower part and young to mature Ban oak with Rhododendron and scattered young deodar trees	• Dry masonry check walls and check dam in cement and mortar. • Plantation of broad leave species in contour trenches to improve spring water flow. • Plantations of bamboo and other soil conserving species along the banks of streams to check soil erosion • No grazing

FES Zone*	Priority FES	Area (Ha)	Compartment Number	Description	Interventions
Ffw-1	Fodder & Fuelwood	12	C1 and C2	• South western aspect • Chir Pine, Deodar seedling / saplings & a few trees with young to middle aged scattered Ban oak trees with some blank patches.	• Enrichment plantation of Broad-leaf fodder species Ban oak (*Quercus incana*), *Robinia psudoacacia*, Khirak (*Celtis australis*) Biul (*Grewia oppositifolia*) and Kachnar (*Bauhinia variegata*) • Barbed wire fencing to check grazing
F-1	Fuelwood	6	C2	• Open patches on South Eastern part of compartment C2 • Comprise of dead Pine trees due of fire and a few scattered Pine trees	• Protection from forest fires

* Solid colour lines show the priority FES while the dotted colour lines show the FES of second priority. The combination of two lines shows that the zone has two FES, with different priorities



Map 5.1: FES Zone Map of Bohal



Map 5.2: Intervention Map of Bohal based on 5-year plan

Table 5.2: Activity Plan for Enhancing Ground Water Recharge and Control of Soil Erosion

FES Zone	C. No.	Activities	First Year	Second Year		Third Year		Fourth Year		Fifth Year		Total
WT-1	C2	Check walls in Dry stone masonry (Number - 12)	60,520	-	-	-	-	-	-	-	-	60,520
		Check Dams in Cement Mortar Stone Masonry. (Number - 1)	25,500	-	-	-	-	-	-	-	-	25,500
		Stone Paving of Natural Resource Access Path (500m)	41,560			-	-	-	-	-	-	41,560
		Rejuvenation of one water Source	8,640	-	-	-	-	-	-	-	-	8,640

Table 5.3: Activity Plan for Planting of Broad-Leaved Species to Improve Spring Water Flow

FES Zone	C. No.	Activities	Details	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
WT-1	C2	Plant cost*	6500 plants	142565	-	-	-	-	142565
		Labour Cost	Contour and Trenches (400 m)	22345	-	-	-	-	22345
			Digging and filling pits (4 ha) **	237309	-	-	-	-	237309
		Material and supply	-	121582	-	-	-	-	121582
	Total Cost of Plantation			**523801**	**-**	**-**	**-**	**-**	**523801**
	Maintenance		6500 plants in 4 ha	-	19280	10680	6400	-	36360
	Grand Total (FES Water)			**523801**	**19280**	**10680**	**6400**	**-**	**560161**

* Plants to be used for this activity: Ban oak (*Quercus incana*), Deodar (*Cedrus deodar), Robinia pseudoacacia* and *Arundinaria falcate.* ** It includes digging 60 cm^3 pits (number=1400) and 45cm^3 pits (number=5100), filling pits, planting, barbed-wire fencing and mulching

Table 5.4: Activity Plan for Nala Plantation with Erosion Controlling Species

FES Zone	C. No.	Activities	Details	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
WT-1	C2	Plant cost*	280 plants	3973	-	-	-	-	3973
		Labour Cost**		6324	-	-	-	-	6324
	Total Cost of Plantation			**10297**	**-**	**-**	**-**	**-**	**10297**
	Grand Total (Plantation for erosion control)			**10297**	**-**	**-**	**-**	**-**	**10297**
	Grand Total 5 (Plan) Hydrological functioning			**670318**	**19280**	**10680**	**6400**	**-**	**706678**

* Plant species to be used for this activity: Nirgal (*Arundinaria falcata*), Siaru (*Debregisea hypoleuca*), Williow (*Salix alba*)
** It includes Digging 280 pits 45cm3, filling, planting, carriage and mulching.

Table 5.5: Activity plan for Enrichment plantation of Broad-leaf fodder species

FES Zone	C. No.	Activities	Details	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
Ffw-1	C1 and C2	Plant cost*	1.5 ha and 2000 plants	64330	-	-	-	-	64330
		Labour Cost**		90302	-	-	-	-	90302
		Material and supply		75217	-	-	-	-	75217
	Total Cost of Plantation			**229849**	**-**	**-**	**-**	**-**	**229849**
	Maintenance		1.5 ha/2000	-	7230	4005	2400	-	13635
	Grand Total (FES Fodder)			**229849**	**7230**	**4005**	**2400**	**-**	**243484**
	Grand Total 5 (Plan) FES water & fodder			**900167**	**26510**	**14685**	**8800**	**-**	**950162 (9,50,160 INR)**

* Plant species to be used: Ban oak (*Quercus incana*), *Robinia pseudoacacia*, Khirak (*Celtis australis*) Biul (*Grewia oppositifolia*) and Kachnar (*Bauhinia variegata*). **It includes cost of digging 60 cm^3 & 45cm^3, filling pits, planting 1000 tall & 1000 normal plants of, mulching and barb wire fencing

6 Monitoring and Evaluation (M&E) Framework

A participatory framework will be set up for monitoring and evaluation of activities and process, its impacts on the flow of FES during the implementation of the microplan. It will also be used to compare the achievements with related forest management goals. The participation of stakeholders will also be covered in this framework. For effective monitoring of activities and its impacts a baseline data need to be collected.

The monitoring and evaluation of the microplan will have two components:

1. M&E undertaken by the HPFD: The inhouse monitoring of activities against physical and financial indicators as per a predefined timeline will be undertaken by the HPFD frontline staff. The work done will also be subjected to the monitoring framework used by the HPFD. This system will evaluate vegetation and other related ecosystem service flow over a period. Use of GIS-based map of JFM areas, with clearly delineated village boundaries will be undertaken by HPFD.
2. Participatory Monitoring by VFDS: This will be a group of individuals comprising a local forest guard of the Beat, one member of VFDS nominated by the VFDS Executive Committee and the President of the local Mahila Mandal. This group will provide report against indicators after ground truthing for various activities undertaken in the field.

Every two years, improvement in livelihood will be assessed through a socio-economic survey. The framework clearly mentions the agreed protocol on rights and responsibilities of all stakeholders.

Baseline Data

A baseline will be set to measure the flow of existing FES from the project area. For this, quantitative data will be collected using socio-economic survey, field exercises and observations along with the community. In addition to this, photo-documentation of works will be carried out at different stages of the project implementation.

Monitoring Plan

An elaborate monitoring plan will be prepared and will be appended to the same once it is approved and cost of works finalized. The plan will consist of clearly defined activities, the timeline against activities, the indicators, the means of verification of indicators and the responsible person/group in charge of gathering this data. The communities and frontline HPFD staff will be trained in monitoring the activities included in the microplan.

Monitoring and Evaluation Plan with Indicators are provided in Table 6.1.

Table 6.1: Monitoring and Evaluation Plan of Bohal

S. No.	FES	Measures to be monitored	Baseline value	Target value	Indicator	Means of verification	Responsibility
1	Increase of water supply.	Flow of water in sources in dry seasons of the year (April - mid June & Oct. - mid Dec.) Measurement of runoff from the forest during the rainy season.	X Litre/Sec water flow in water spring source of water supply to MC Palampur	Increase of 0.1 litre / sec. in water flow in MC water supply source in Project period. Increase of 0.05 litre / sec. in flow of water in Irrigation and Public Health (IPH) department's water source of supply to Nachher & Saan	Reduction in silt load in the runoff in Nalas originating from forest during rainy season. Increase in flow of water in source of water supply to MC Palampur. Increase in flow of water in spring-source of gravity water supply scheme of IPH dept. during Oct -Dec and April – June.	Record keeping by Participatory Monitoring Unit	Participatory Monitoring unit (part of VFDS unit)
2	Fodder: Increase in availability of fodder/Fuel from twigs	Enrichment plantation of Broad-leaved species yielding fodder & grass	27 %, 23% & 19% are the proportions of fodder supply from forest during respective seasons of winter, summer & rainy seasons respectively	3% increase in current supply proportion of fodder from forest	Quantities or Headloads more fodder from forest trees under rotational lopping. – Quantity or headloads more grass cut from forest planted / sown with broad-leaved species/ grass slips	Record keeping/Survey	Survey by VFDS

7 Recommendations

The activities in the Bohal Microplan will support the communities in preventing the collapse of the existing systems of rural economy by improving the situation of fodder, fuel and drinking water availability--the three forest ecosystem services as prioritized by the dependent community. Realization of benefits will mostly be from reduction of expenditure on fodder and energy. While some villagers will save money on purchase of fodder and energy others will earn from the sale of surplus grass. The possibility of income generation from PES area in project site of Bohal remains an issue. Systematic collection of data of spring discharge could provide basis for argument to enter renegotiation with the Palampur MC. Three options listed below to add value to the locally available NTFPs could help income generation. Therefore, this needs to be further probed.

1. The flowers of Brah (*Rhododendron*) have herbal qualities. It has high market value locally. Value added products from these flowers namely chutney, squash etc. could fetch additional income to communities. However, regulated collection on rotational basis should be ensured for sustained supply of flowers that occur only during the months of April and May.
2. The fiddle-headed fern (Lungru) can be processed into pickle.
3. Nirgal (*Arundinaria* spp.) or hill bamboo can be woven into baskets or other traded products. A few households are already into the profession of weaving baskets from hill bamboos.

For implementing options (1) and (2) capacity development of village women will be one of the project interventions. The Home Science Department of CSK HPKVV has been identified for capacity development in post-harvest management and marketing of produce.

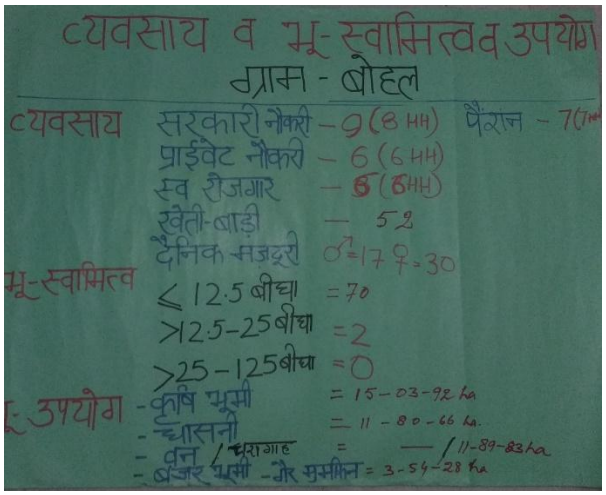
The possibility of growing medicinal plants namely Tej patta, (*Cinamom tamala*), Banafsa (*Viola canescens*) Jatamansi (*Valeriana jatamansi*) etc. need to be explored.

8 Annexures

Annexure I: Consolidated Budget of short term plan (5 years)

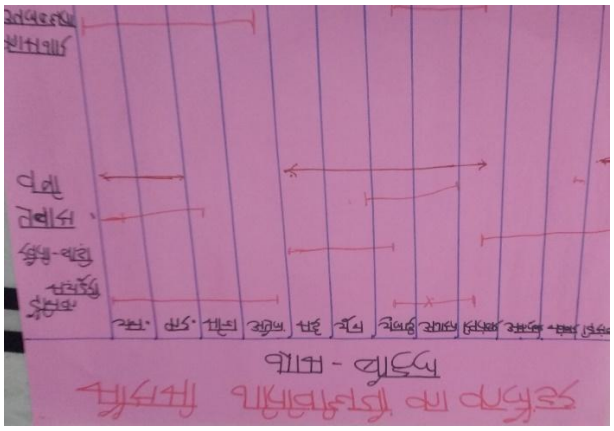
S. No.	FES	Reference Table	Activities	First Year (INR)	Source of finance
1	Water	Table 5.2	Check Walls (dry stone masonry) (Number: 12)	60,520	HP-FES
			Check dams (cement mortar stone masonry) (Number : 1)	25,500	HP-FES
			Stone Paving or natural resource access path (500 m)	41,560	HP-FES
			Rejuvenation of water source (Number: 1)	8,460	HP-FES
2	Fodder/ Fuelwood	Table 5.3	Contour Trenches & digging of trenches (including cost of planting material) (4 ha)	5,60,161	HP-FES
3	Soil Erosion	Table 5.4	Nala plantation for controlling soil erosion (280m)	10,297	HP-FES
4	Fuel /Fodder	Table 5.5	Enrichment plantation of broad-leaf fodder species (1.5 ha)	2,43,484	HP-FES
Grand Total (rounded off)				**9,50,000**	**HP-FES**

Annexure II: Photo Documentation of PRA

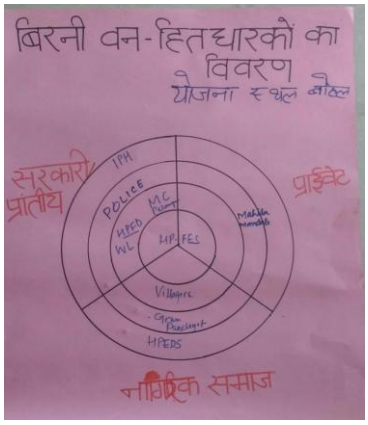


Occupation, Landholdings and Landuse

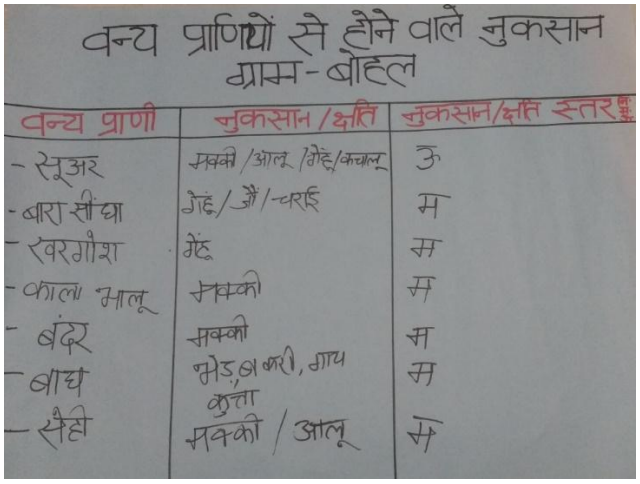
Forest User Rights



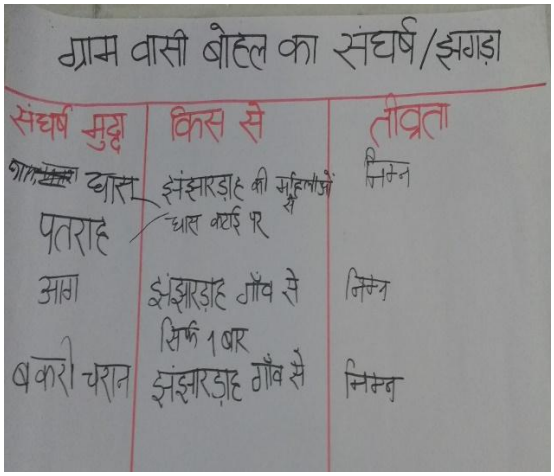
Seasonality of Labour Distribution



Stakeholder Mapping

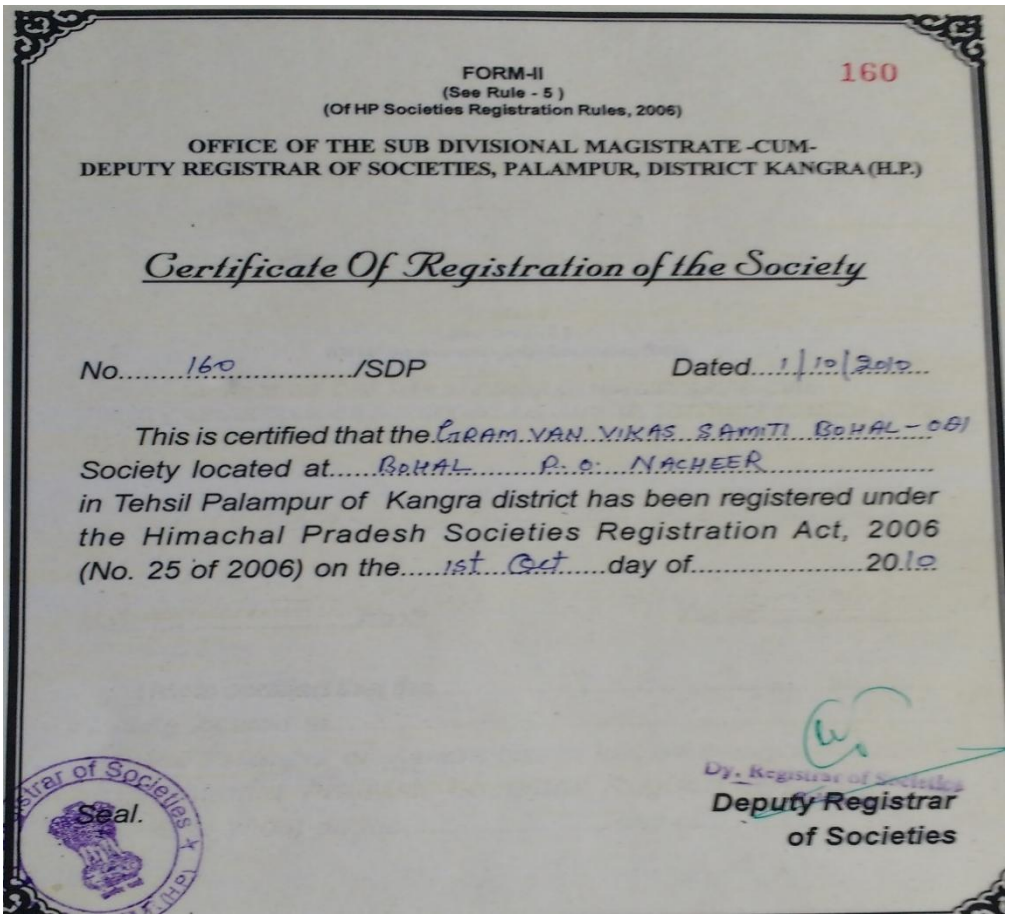


Human-Wildlife Conflict



Conflict Management

Annexure III: Society Registration Certificate



FORM-II
(See Rule - 5)
(Of HP Societies Registration Rules, 2006)

160

OFFICE OF THE SUB DIVISIONAL MAGISTRATE -CUM-
DEPUTY REGISTRAR OF SOCIETIES, PALAMPUR, DISTRICT KANGRA (H.P.)

Certificate Of Registration of the Society

No. 160 /SDP Dated 1/10/2010

This is certified that the GRAM VAN VIKAS SAMITI BOHAL-01 Society located at BOHAL P.O: NACHEER in Tehsil Palampur of Kangra district has been registered under the Himachal Pradesh Societies Registration Act, 2006 (No. 25 of 2006) on the 1st Oct day of 2010

Seal.

Dy. Registrar of Societies
Deputy Registrar
of Societies

Annexure IV: Memorandum of Understanding (MoU)/Memorandum of Agreement (MoA)*

A MoU must be signed with the stakeholders, primarily between Forest department and the community.

Rights and Responsibilities: mention arrangement of roles on various protection and regeneration works as well as benefit sharing on principle of Transparency, trust, empowerment and accountability

MoU should clearly mention:

- Short-term, long-term roles and responsibilities, powers, implementation plan, sharing usufruct rights, and conflict resolution
- Meeting local needs,
- Devising restoration plan
- Transparent accounting of seasonal, annual and periodical produce, financial accountability and distribution of sharing mechanism including flow to central funds for restoration
- Specific roles on boundary demarcation, fire prevention, grazing, encroachment, and illicit felling, non-destructive NTFP harvesting.

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Matsubara Building, Village Sargheen
(Near HFRI), Shimla - 171013
Himachal Pradesh (India)

For further Information
Principal Chief Conservator of Forest, Forest Department,
Himachal Pradesh, Talland, Shimla- 171001, India