# Pathrevi Concise Micro Plan

## Himachal Pradesh Forest Ecosystem Services (HP-FES) Project

Ministry of Environment, Forest and Climate Change

Himachal Pradesh Forest Department

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
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Indo-German Biodiversity Programme
Conservation and Sustainable Use of Biodiversity in India - Himachal Pradesh
Forest Ecosystem Services Project (HP-FES)
The project aims to enable the Forest Department of Himachal Pradesh to introduce the Forest Ecosystem Services (FES) approach in the state's forest management system.
HP-FES

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On behalf of
German Federal Ministry for Economic Cooperation and Development (BMZ)

GIZ is responsible for the content of this publication.

Shimla, 2019

# Micro plan for Pathrevi

Himachal Pradesh Forest Ecosystem Services
(HP-FES) Project

PAGE NUMBER

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# CHAPTER- 1
# Introduction

## Forest Ecosystem Services Approach

Forests provide people with numerous services and goods like fuelwood, timber, fodder, fruits etc. They also regulate abundant aspects of the environment like water, air purity and micro climate which benefit people in many ways. These goods and services are together termed as "Ecosystem Services".

The ecosystem services derived from forests are referred to as "Forest Ecosystem Services" (FES). The FES approach states that forests are managed to produce services required for human well-being.

As demands and importance for these services differ much within society, a key element of the FES approach is to manage forests that enable a supply of FES prioritised by stakeholders, giving due importance to the remaining goods and services.

## HP-FES Project Background

The Indian and German Governments are working together in many areas that are important for our society. GIZ, in collaboration with the Himachal Pradesh Forest Department (HPFD), is implementing the Himachal Pradesh Forest Ecosystem Services (HP-FES) Project on behalf of BMZ (GIZ's commissioning party). The HP-FES project aims at integrating the Forest Ecosystem Services (FES) approach into the state's forest management.

Important stakeholders are consulted to identify the set of ecosystem services for which the forest is managed. Together with them, the FES that are derived from the forest are listed and prioritised. Based on this, a management plan like this one is developed.

# CHAPTER- 2

## Pathrevi Forest Ecosystem Services Vision

Forests are ecosystems that need a long time for their development. The project can guide the plan for only two years or so. This is hardly anything, considering that the forests can be hundreds of years old. Therefore, it is important that a forest management has a long term vision and that the plan of today is in line with the long term vision.

### Long Term Vision (30 years)

#### 1. Soil and Water:

a. Increased flow of water in springs is sustained despite climatic conditions.
b. Forest provides sufficient water supply for drinking and irrigation round the year.
c. Management of forest for water generation is acknowledged by end downstream users.

#### 2. Fuel and Fodder:

a. Fuel and fodder supply is sufficient to fulfil the demand of Pathrevi village.
b. Significant increase in Ban Oak fodder availability as compared to the present.
c. Composition of other broad leaved tree species for fodder and fuel to be increased.
d. Visible changes in forest species composition and structure.

#### 3. Forest:

a. Proportion of *Cedrus deodara* is increased in the forests for meeting demand for timber.
b. Forest cover under *P. wallichina* and *P. roxburghii* to be brought down considerably by replacing them with Oak, Cedar and other valuable species providing fodder and fuelwood.

#### Measures:

a. VFDS ensures equitable sharing of use rights, regulated use of forest and protection against fire, illicit felling.

### Mid Term Vision (15 years)

#### 1. Water:

a. Increased flow of water in springs is sustained.
b. Increase (number of months) in water availability round the year.

#### 2. Fuel and Fodder:

a. Regenerated areas have attained pole stage forest with moderate density.

#### 3. Forest:

a. Areas closed for water protection and have a good pole stage oak trees.
b. Decreased human disturbance results in increased saplings stage crop areas that isfenced.

#### Measures:

a. Village Forest Development Society (VFDS) strictly protects plantation against lopping/illicit cutting.
b. Investments are made in maintenance and augmentation of water and soil conservation works.
c. VFDS looks for projects/programs that undertake forest management activities in line with identified goals.

**Short Term Vision (5 years)**

**1. Water:**

a. Reduced silt load in run-off.
b. Increased water flow in targeted springs up to 10 % of base discharge.
c. Increased (number of months) availability of water in seasonal springs.

**2. Fuelwood and Fodder:**

a. Treated areas have well-grown sapling stage plantations with 70 per cent survival of plantations made under the project.
b. VFDS manages nursery of broad leaf fodder species for carrying out plantation of requisite species.

**3. Forest:**

a. Reduced silt load in run-off due to grass cover.
b. Profuse natural regeneration in areas that have been fenced.
c. Plantations have survival rate of more than 80 per cent.

**Measures:**

a. Effective protection of forest and plantation by VFDS is carried out.
b. Works for water and soil conservation carried out and fencing maintained by VFDS.
c. VFDS as an institution is capacitated to formulate and implement rules for forest management, usufruct sharing, managing conflicts and are able to get funds from donors to carry out forest management works.

**Project Period (Till 2020)**

**1. Water:**

a. Soil and water conservation works are implemented.
b. Set up a baseline system for measuring spring water flows and run off silt load.

**2. Fuelwood and Fodder:**

a. Plantation of multi-purpose fodder yielding broad leaf tree spp. (mainly Ban oak) carried out with survival percentage up to 80 percent.
b. VFDS ensures protection of plantation against grazing and fire Grass yield from treated area increased upto 50 per cent.

**3. Forest:**

a. More forest area closed for grazing.
b. Rotational lopping of fodder trees becomes a norm.

**Measures:**

a. Degraded and denuded areas are brought under regeneration and plantation.
b. Rules for protection and usufruct sharing are framed and followed.
c. Soil and water conservation measures are planned and implemented.

## Micro plan Objective

To incorporate the Forest Ecosystem Services (FES) approach into the forest management in the Demarcated Protected Forest (DPF) Pathrevi of Karsog Forest Division.

## Methodology for data collection

1. The environmental data was collected from field measurements and Working Plan of Karsog Forest Division.
2. Demographic data was collected by using **participatory rural appraisal (PRA)** approach, baseline survey report and records from other secondary sources like Gram Panchayats, Department of Animal Husbandry, anganwaris (Department of Social Justice and Empowerment) and local Revenue Office.
3. **Facilitation and matrix** were the tools used to collect information on seasonality and labour availability. Seasonality of engagement in agriculture, wage labour, migration, labour availability for project activities and rain and snowfall were recorded and information on the above was gathered by the PRA participants. The same tool was used to gather data for human wildlife conflict.

4. Facilitation and **Stakeholder map** were the tools used to collect data on various stakeholders. The participants were asked to write names of institutions falling in the three broader categories namely, civil society, private players and state actors, whom they considered potential in influencing the project.

# CHAPTER- 3
## Data Collection Results

### Environmental Data: Pathrevi

**ELEVATION RANGE: 1700m - 2280m**

#### Precipitation

| | |
|---|---|
| Annual Average Precipitation: | 1049.18 mm |
| Rain %: | 100% |
| Maximum Rainfall Recorded: | 1450 mm in 1988 |
| Minimum Rainfall Recorded: | 594 mm in 2004 |
| Period of Frost: | Nil |

#### Temperature

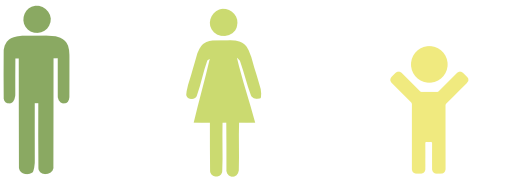
| | |
|---|---|
| Mean maximum temperature: | 8.7 - 22.4 °C |
| Mean minimum temperature: | 2.2 - 16.6 °C |
| Dry months: (with average monthly precipitation < 50 mm) | April, October, November, December |

#### Forest types and area

| Area | Forest Type |
|---|---|
| 13(i)/C1 | Dry Broadleaved and Coniferous Forest |
| 9/C1a | Lower or Shiwalik Chir Pine Forest |
| Total planning area: 171.62 ha | |

# Demographic Data (Pathrevi)

## POPULATION

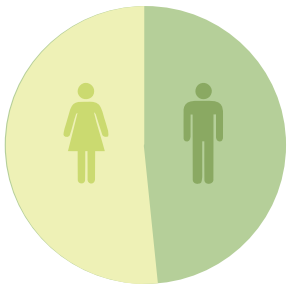


47%
192 Males

49%
194 Females

4%
23 Children

## GENDER RATIO



There are 1010 females against 1000 males

## LIVESTOCK

Sheep + Goat: 23 + 85

Cows: 133

Bullocks: 74

Horses + Mules: 0+1

Buffaloes: 0

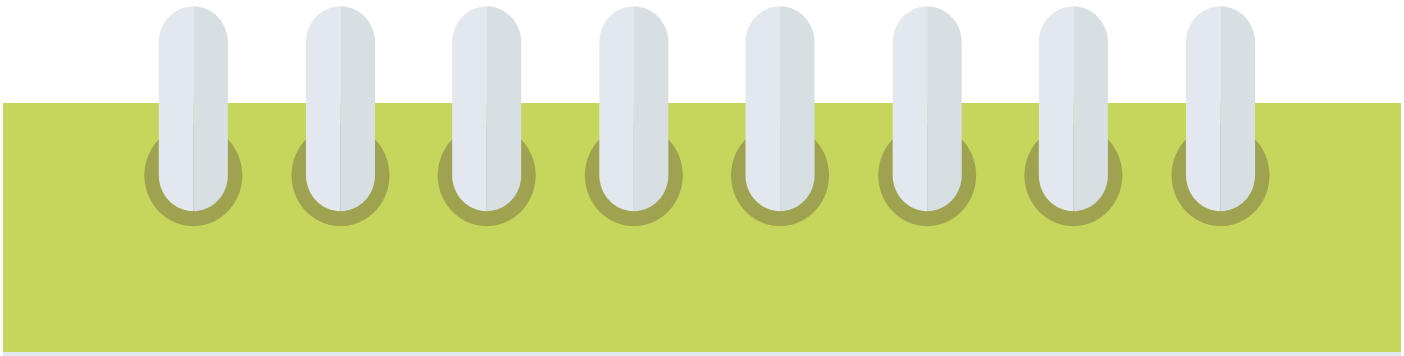
## OCCUPATION

| S.No. | Job Type | No. of Individuals |
|---|---|---|
| 1. | Government | 19 |
| 2. | Private | — |
| 3. | Self Employed | 2 |
| 4. | Agriculture/ Horticulture | 110 |
| 5. | Wage Labour | 110 |

## LAND HOLDING

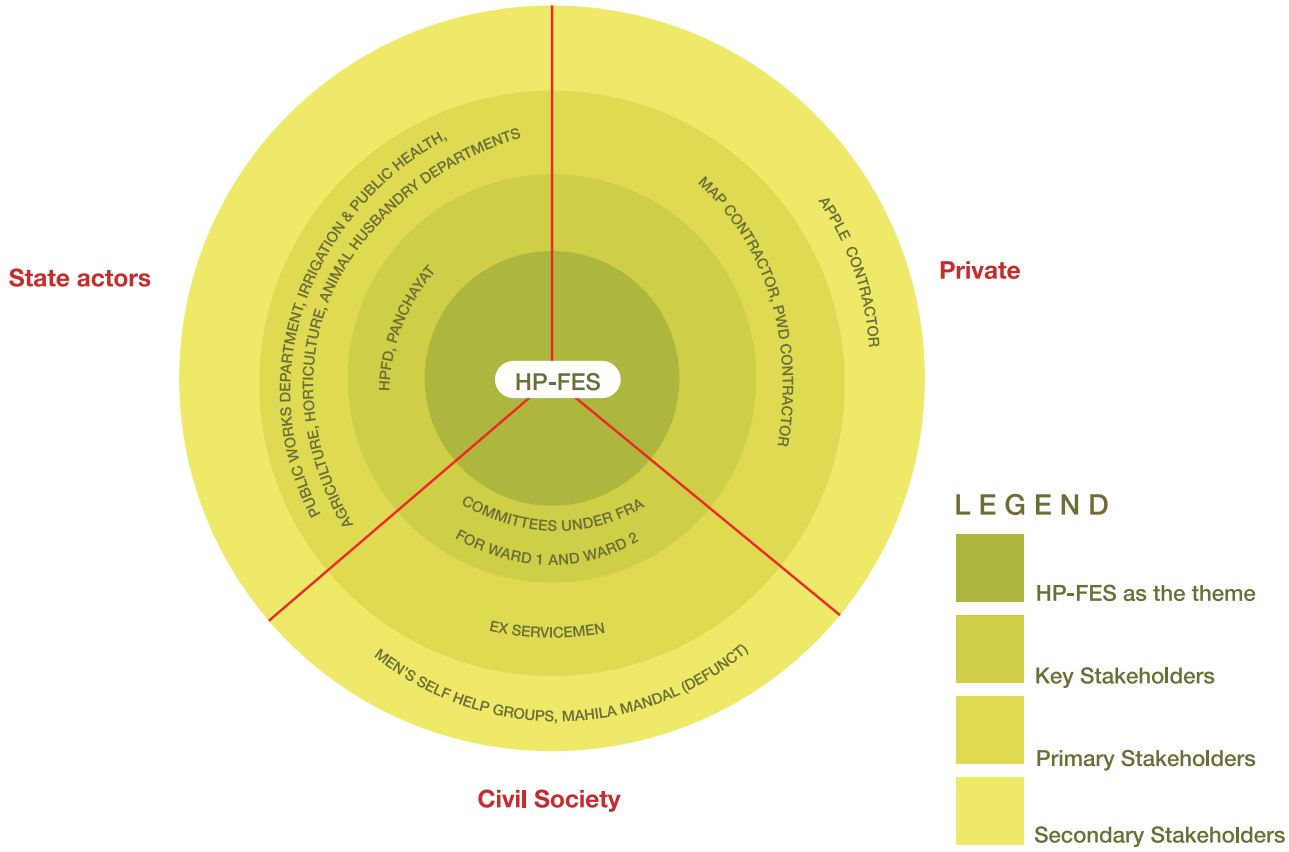
| S.No. | Land Holding Type | No. of Households |
|---|---|---|
| 1. | Marginal | 110 |
| 2. | Small | — |
| 3. | Medium | — |
| 4. | Large | — |

## Seasonality calender for Pathrevi



| Seasonal activity & climatic events | Months | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | J | F | M | A | M | J | J | A | S | O | N | D |
| Wage Labour | ■ | ■ | ■ | ■ | | | ■ | ■ | ■ | | | |
| Agri/ Horticulture | | | | | ■ | ■ | ■ | | | ■ | ■ | ■ |
| Migration | ■ | ■ | | | | | ■ | ■ | ■ | ■ | | |
| Rain | ■ | ■ | | | ■ | ■ | ■ | ■ | ■ | | | ■ |
| Snow | ■ | ■ | | | | | | | | | | |
| Frost | | | | | | | | | | | | |
| Labour Availability (No. of people) | 120 | 120 | 120 | 120 | 100 | 60 | 60 | 70 | 70 | 80 | 80 | 120 |

# Major Stakeholders




The inner most circle consists of the key stakeholders, followed by primary and seconday stakeholders with HP-FES as the theme.
The 3 categories represent as to which class does each stakeholder belong.

| Category/ Class | Key Stakeholders | Primary Stakeholders | Secondary Stakeholders |
|---|---|---|---|
| Civil Society | Committees constituted under Forest Rights Act (FRA) for Ward 1 and Ward 2 | Ex servicemen | Men's Self Help Groups, Mahila Mandal (Defunct) |
| Private | — | MAP contractor, PWD contractror | Apple contractor |
| State | HPFD, panchayat | Public Works Department, Irrigation and Public Health, Agriculture, Horticulture, Animal Husbandry Departments | — |

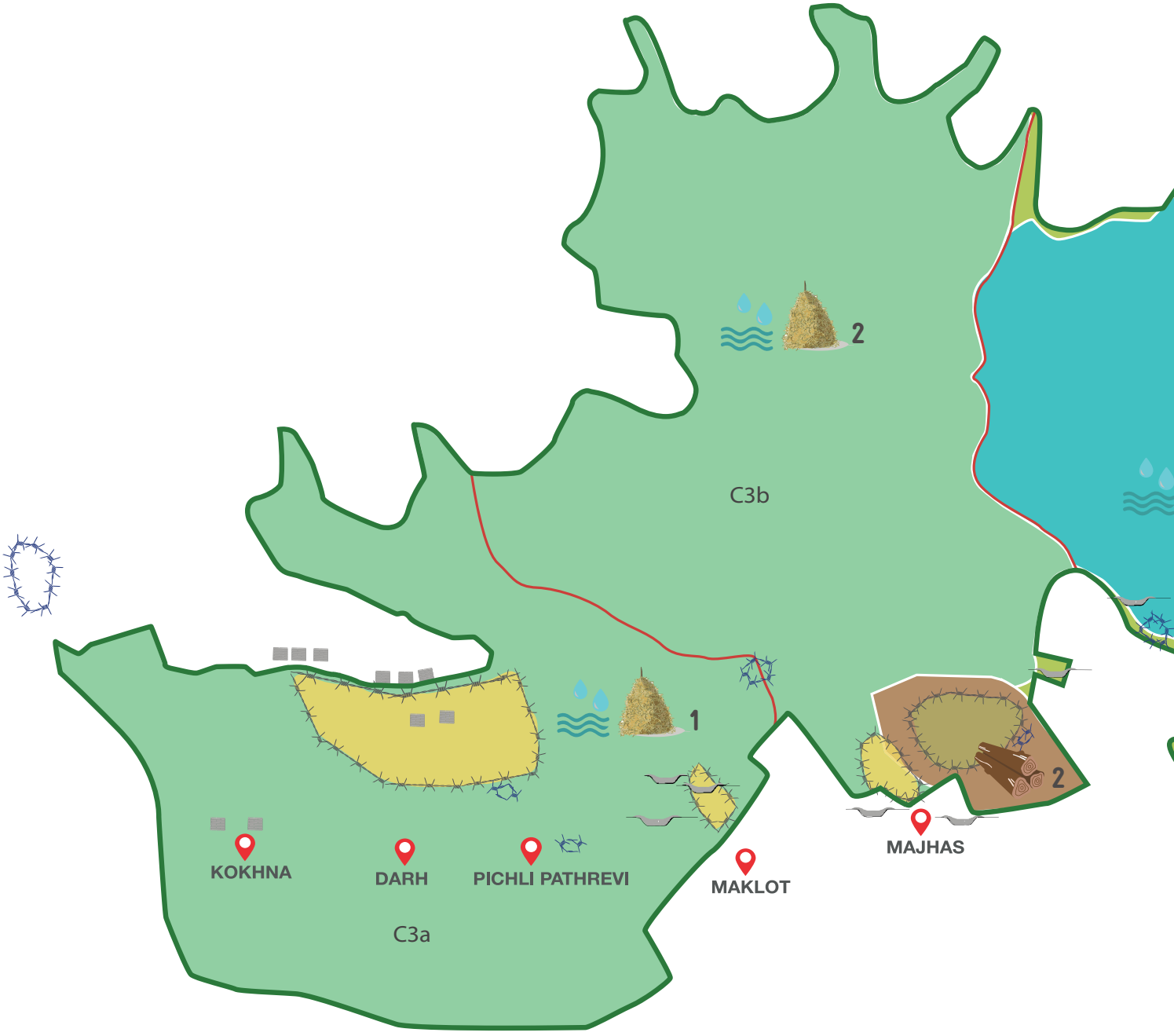
13.

# CHAPTER- 4

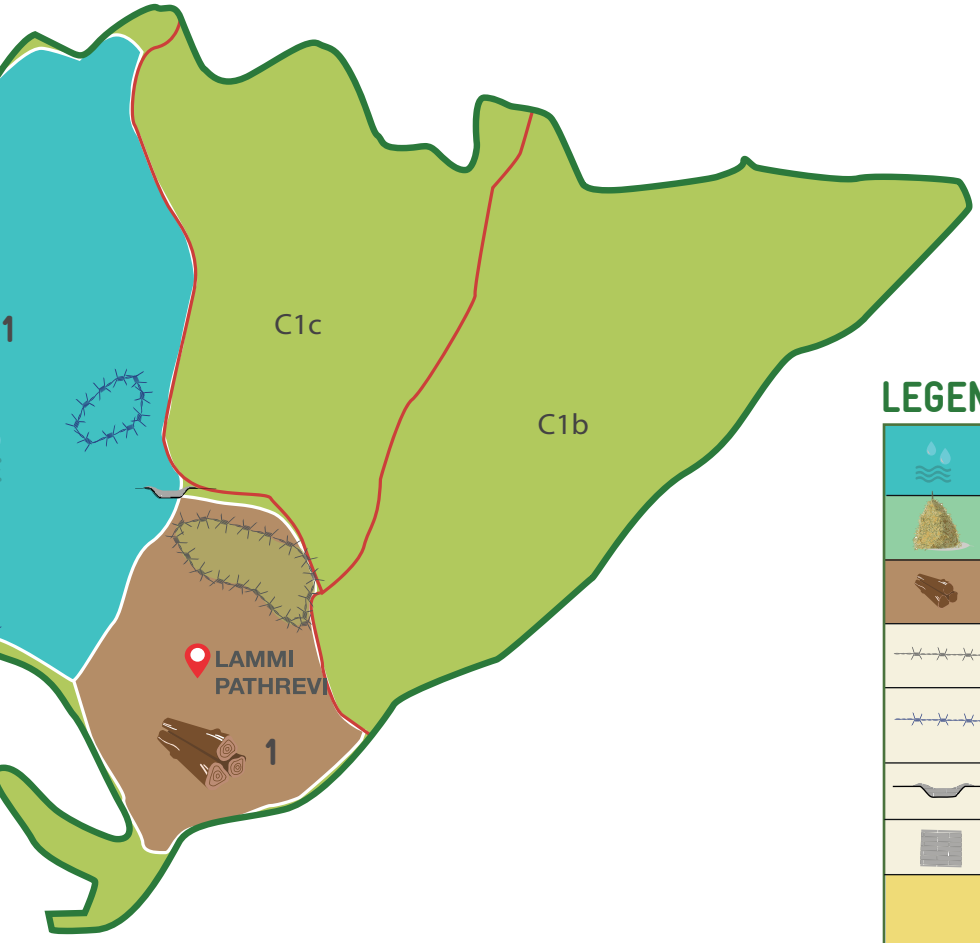
## Rankwise Priority Forest Ecosystem Services

| RANK | FOREST ECOSYSTEM SERVICE |
|---|---|
| 1. |  Soil Conservation |
| 2. |  Fodder |
| 3. |  Fuelwood |
| 4. |  Timber wood<br>(Symbol Copyright: Jan Sosse) |
| 5. |  Water |

# Priority and Intervention Map




The above map consists of the forest boundary and the areas for the prioritised Forest Ecosystem Services.



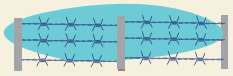

N

## LEGEND

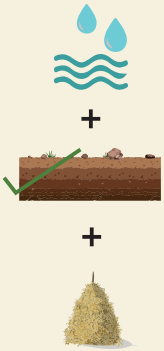
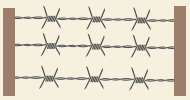
| | |
|---|---|
| | Water |
| | Fodder |
| | Timber |
| | Barbed wire fencing |
| | Barbed wire fencing for water resources |
| | Check dam |
| | Check wall |
| | Activity area for fodder & fuelwood plantation |
| | Activity area for timber plantation |
| | Villages |
| | Compartment boundary |
| C3a, C3b, C1d, C1c, C1b | Compartment numbers |
| 1,2,3,4 | FES zone numbers |

DISCLAIMER: This map is only for marking the forest boundaries and not for any legal purpose.

# COMPARTMENT C1d

| ZONES | FOREST ECOSYSTEM SERVICE | INTERVENTION AND ACTIVITY |
|---|---|---|
|  1 |  |  Deodar plantation with barbed wire fecncing using wooden poles |
| | |  Deodar introduced in deep soils, depressions in pine forest |
| | |  No Grazing |
| | |  Fire Protection |
|  1 |  +  |  Check dam on nala on the boundary between C1d and C3b |
| | |  Fencing of water sources |

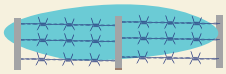
# COMPARTMENT C3a

| ZONES | FOREST ECOSYSTEM SERVICE | INTERVENTION AND ACTIVITY |
|---|---|---|
|  1 |  |  Closure water sources with barbed wire fencing and RCC poles. |
| | |  Plantation for water regulation |
| | |  Cement and stone masonry check walls. |
| | |  Oak and deodar group plantation with barbed wire fencing |
| | |  Sowing Ban oak seeds for gap filling |
| | |  Robinia plantation along nala sides to check soil erosion and to meet interim fodder requirement |
| | |  Rotational lopping of fodder in the forest area |

# COMPARTMENT C3b

| ZONES | FOREST ECOSYSTEM SERVICE | INTERVENTION AND ACTIVITY |
|---|---|---|
| 2 | + + | Contour trenching |
| | | Oak and deodar group plantation with barbed wire fencing using wooden/RCC poles |
| | | Soil conservation works including dry masonry structures. |
| | | Robinia plantation |
| 2 | | Deodar plantation with barbed wire fencing using wooden poles |

# OUTSIDE COMPARTMENT C3a

| ZONES | FOREST ECOSYSTEM SERVICE | INTERVENTION AND ACTIVITY |
|---|---|---|
| ——— | ——— |  Fencing of the water source with RCC poles and barbed wires. |

# Activity Plan and Budgeting

## Ground Water Recharge and Soil Erosion Control

| FES | C. No. | Activities | Details | First Year | Second Year | Third Year | Fourth Year | Fifth Year | Total |
|---|---|---|---|---|---|---|---|---|---|
| WTf-1 | C3a | Check walls in Dry stone masonry | 10 check walls in Majhas | 15000 | - | - | - | - | 150,000 |
| WTf-1<br>WTf-2<br>WT-1 | C3a, C3b and C1d | Check dams in cement mortar stone masonry. | 7 check dams in Majhas | 30,000 | - | - | - | - | 210,000 |
| - | - | Fencing with RCC of Water Sources | 1400 m in above road Raaj Pani | 315 per m | - | - | - | - | 4,41,280 |
| WT-1 | C1d | Check dam in RCC | One (15 m) in Lammi Pathrevi | 24993 per m | - | - | - | - | 3,74,000 |

## Fodder & Fuelwood

### Target: Increase in fodder and fuelwood availability

| FES | C. No. | Activities | Location | Details | First Year | Second Year | Third Year | Fourth Year | Fifth Year | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| WTf-1 | C3a | Forest enrichment plantations of fodder yielding BL species | Maklot | 0.51 (50 % planting) RCC Fence | 2,83,901 | - | - | - | - | 2,83,901 |
| | | | Dhar | 6.3 (50%) Wooden fence | 9,12,177 | - | - | - | - | 9,12,177 |
| WTf-2 | C3b | | Majhas | 1.97 (50%) RCC | 2,85,236 | - | - | - | - | 2,85,236 |

## Timber

| FES | C. No. | Activities | Details | First Year | Second Year | Third Year | Fourth Year | Fifth Year | Total |
|---|---|---|---|---|---|---|---|---|---|
| T-1 | C1d | Plantation of *Cedrus deodara* for timber in Lambi Pathrevi | 1.61 ha (100 %) RCC Fence | 2,83,901 | - | - | - | - | 2,83,901 |
| T-2 | C3b | Plantation of *Cedrus deodara* for timber in Hilmidhar | 0.83 (100%) wooden posts | 1,20,175 | - | - | - | - | 1,20,175 |

# CHAPTER- 5

## Monitoring and Evaluation

### 1. Improvement of water supply

a. Water flow in sources in dry seasons of the year. (April-mid June & October- mid December).
b. Measurement of run-off from the forest during rainy season.

### 2. Improvement in availability of fodder (including grass)

a. Enrichment plantation of broad-leaved species yielding fodder & grass

### 3. Timber

a. Number of Deodar plants planted and their survival.

# VISITOR'S FEEDBACK

| S. No. | Name | Address/ E-mail | Feedback |
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