

# A Report

on

**‘Assessment of potentiality and production of Medicinal & Aromatic Plants and development of plan for conservation, resource development and sustainable management of Medicinal & Aromatic Plants**

**Funded By**



**Himachal Pradesh Forest Department (HPSFD) under JICA-PIHPFEM&L (Project for Improvement of Himachal Pradesh Forest Ecosystem Management & Livelihoods) Shimla, (H.P.)**

**Submitted By**



**हिमालयन वन अनुसंधान संस्थान**

**HIMALAYAN FOREST RESEARCH INSTITUTE**

**भारतीय वानिकी अनुसंधान एवं शिक्षा परिषद**

**(Indian Council of Forestry Research & Education)**

**(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार का एक स्वायत्त निकाय)**

**(An Autonomous Body of the Ministry of Environment, Forest & Climate Change, Government of India)**

Conifer Campus, Pathaghati,

Shimla – 171013, Himachal Pradesh



# A Report

on

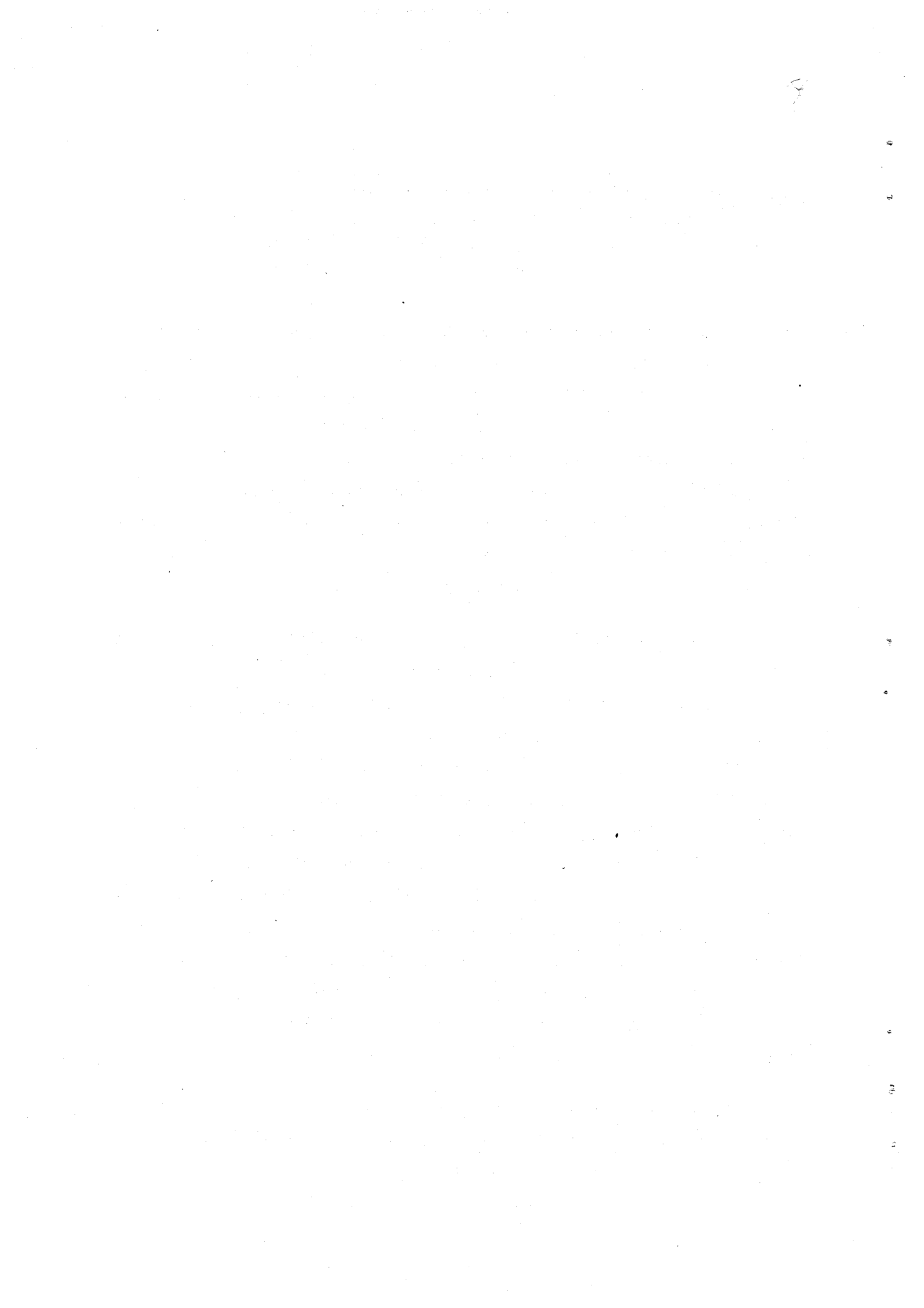
## Assessment of potentiality and production of Medicinal & Aromatic Plants and development of plan for conservation, resource development and sustainable management of Medicinal & Aromatic Plants

### 1. Background

The Himalayan Forest Research Institute, Shimla has been working on medicinal plants since last one and half decade. The Institute was mainly involved in detailed survey of cold deserts and alpine areas particularly for assessing the availability of medicinal plants and establishment of Herbarium. Recently the Institute has embarked upon collection and maintenance of germplasm of medicinal plants of economic importance of temperate Himalaya and development/improvement of agro-techniques for their commercial cultivation. The nursery and cultivation techniques of *Aconitum heterophyllum* Wall. ex Royle, *Podophyllum hexandrum* Royle, *Picrorhiza kurroa* Royle ex Benth., *Angelica glauca* Edgew. and *Valeriana jatamansi* Jones have been-developed during last 8-10 years.

The HFRI is now in a position to handle higher temperate medicinal plants project having expertise as well as field stations/ nurseries to cater the specific requirements of those species. At Shillaru near Narkanda (H.P.), the Institute has 0.5 ha nursery, presently being used extensively for various medicinal plants specific activities. Similarly, at Jagatsukh near Manali, the Institute has around 3.0 ha nursery and also at Shilly Solan has around 1.5 ha nursery mainly dedicated to medicinal plants activities. It is essential these days to establish modern nursery facilities e.g., polyhouse, shade house, composting, vermin-composting etc. in nursery not only for production of quality planting material for distribution, but for demonstration of nursery-techniques to visiting farmers/ other stakeholders. All these above mentioned medicinal plants have very good domestic as well as international market. Therefore, it is right time that Quality Planting Material (QPM) of these medicinal plants be multiplied and extended to the farming community of temperate Himalaya through active extension programmes viz., visits, training, demonstration, on-farm cultivation, etc. to incorporate these activities in hill farming system.

To take up the commercial cultivation of medicinal plants, first step is identification of superior genetic stock and their technology for mass multiplication; which the institute has



already done for important temperate medicinal plants. Subsequently, prioritization of important medicinal plants and identification of sites for their cultivation is very important.

In this regard, a contract agreement was signed between Chief Project Director, JICA-PIHPFEM&L (Project for Improvement of Himachal Pradesh Forest Ecosystem Management & Livelihoods) Shimla (H.P.) on dated 30.09.2020 with following basic objectives:

## 2. Objectives

- Identify the potential areas within the cluster for production of Medicinal & Aromatic Plants
- Estimate the current level of production of different Medicinal & Aromatic Plants
- Assess the status regeneration of different Medicinal & Aromatic Plants
- Identify the issues in conservation, regeneration, harvesting and management of Medicinal & Aromatic Plants in the cluster
- Prepare a plan for conservation, resource development and sustainable management of Medicinal & Aromatic Plants in the cluster.

**3. Institution engaged:** Himalayan Forest Research Institute (HFRI), Conifer Campus, Panthaghati, Shimla (H.P.)

## 4. Target Areas

Second phase list of VFDCs as given by JICA- PIHPFEM&L for the present study:

| Name of Cluster | Division | Range                  | VFDC             | Panchayat   |
|-----------------|----------|------------------------|------------------|-------------|
| Rampur          | Chopal   | Tharoch                | Ira              | Khund Newal |
|                 |          |                        | Pujarli          | Pujarli     |
|                 |          | Bamta                  | Jhandwa          | Galot       |
|                 |          |                        | Nao              | Mylijhejar  |
|                 |          | Sarain                 | Chila Chapandali | Rohal       |
|                 |          | Chopal                 | Choukia          | Chanju      |
|                 |          | Kanda                  | Dhar- Churiyan   | Chadoli     |
|                 |          | <del>Kulag</del> Kanda | Tikker-2         | Kulag       |
|                 |          | Chopal                 | Tipra Mashdoh    | Mashdoh     |
| Chopal          | Jubbar   | Jubbar                 |                  |             |

## Approach and Methodology

Field visits were conducted throughout the targeted VFDCs of clusters in Rampur and Rohru. This involved reconnaissance surveys and interactions with the VFDCs members,

panchayat bodies and villagers. The data on Medicinal and Aromatic Plants were recorded through semi-structured questionnaires, interviews and informal discussions. Besides that, data on local plant names, part(s) used, availability, plant uses, method(s) of collection and mode of consumption was also collected. The priority species were identified as per the preference given by people during interviews and discussions. The species preferred by maximum number of people was considered most important and was assigned rank as per their priority.

### **5.1 Potential area for Medicinal and Aromatic Plants production**

The VFDCs, panchayat bodies and villagers were consulted for the availability of the potential areas in their respective panchayat. The geo-coordinates of sites were marked with the help of Garmin GPS.

### **5.2 Current level of medicinal plants production**

To collect the data on current level of production, VFDCs committee, panchayat bodies and range offices of Forest Departments were asked and were collected.

### **5.3 Issues of conservation, regeneration, harvesting and management of Medicinal and Aromatic Plants**

Surveys of the area were carried out and observations such as geographical conditions of the region, climate, biotic pressure, etc., were recorded. Besides, discussions with VFDCs, panchayat bodies and concerned forest officials were held to identify the issues and concern.

### **5.4 Plan for conservation, resource development and sustainable management of Medicinal and Aromatic Plants**

The issues of conservation, regeneration, harvesting and management of Medicinal and Aromatic Plants were identified and accordingly, strategies and management plan are suggested.

### **6. Duration of the work:** 1<sup>st</sup> October, 2020 to 10<sup>th</sup> August, 2021.

Due to COVID-19 pandemic work could not be completed as per agreement. People in VFDCs were also reluctant to meet the outside people. Moreover, some of core members of the HFRI team constituted for the purpose were tested positive for COVID-19 and therefore quarantined for stipulated period. The survey work was also considerably hampered due to II<sup>nd</sup> wave of Covid-19 Lock down (7<sup>th</sup> May to 30<sup>th</sup> June, 2021).

### **7. Human resources involved in the work**

- i. Coordinator: Dr. S.S. Samant, Director, HFRI Shimla

- ii. Principal Investigator: Sh. Jagdish Singh, Scientist-F, HFRI, Shimla
- iii. Principal Investigator: Dr. Sandeep Sharma, Scientist-G, HFRI, Shimla
- iv. Co- Principal Investigator: Dr. Vaneet Jishtu, Scientist-D, HFRI, Shimla
- v. Co- Principal Investigator: Sh. Pitamber Singh Negi, Scientist-D, HFRI, Shimla
- vi. Project Associate: Dr. Joginder Singh, CTO, HFRI, Shimla
- vii. Project Associate: Sh Jawala Prasad, STO, HFRI, Shimla
- viii. Project Associate: Sh. Kuldes Kumar, TO, HFRI, Shimla

## 8. Outputs

After carrying out extensive surveys and interactions with targeted VFDCs; objective wise information was gathered, which is as follows:

### 8.1 IRRA VFDC

The Irra VFDC of Khoond Newal Panchayat falls in Irra cluster in Chenog beat, Tharoch forest range of Chopal forest division. The Irra village is located at 30° 55' 18.012" N latitude 77° 42' 21.348" E longitude at 1672 m amsl. The results of study on Medicinal and Aromatic Plants of the region are given below.

**8.1.1 Medicinal Plants and their Status in Irra:** A total of 9 important medicinal plants belonging to 6 families were recorded from the area. Of which, 02 species were trees, 02 shrubs and 06 herbs. The most of these medicinal plants were found in community lands, along boundaries of agricultural fields, forests, roadside, etc. The number of these medicinal species in natural habitat is moderate. The details of the important medicinal plants of the region are given in **Table 1**.

**8.1.2 Preference Priority of medicinal plants:** The data on Medicinal and Aromatic plants was collected through semi-structured questionnaire, interviews and discussions. The analysis of data shows that *Prunus armeniaca* is most preferred species followed by *Hedychium spicatum* and *Juglans regia*. The priority of the species is given in **Table 1**.

**Table 1: Medicinal Plants of Irra village of Tharoch forest range of Irra Cluster, Himachal Pradesh**

| Sr. No. | Name                           | Local Name | Priorty Rank | Habit | Family        | Habitat*   | Part(s) Used           | Uses  | Status    |
|---------|--------------------------------|------------|--------------|-------|---------------|------------|------------------------|---|-----------|
| 1.      | <i>Prunus armeniaca</i> L.     | Chulli     | 1            | Tree  | Rosaceae      | AL, CL     | Fruits and seeds       | Essential oil for body massage                            | Available |
| 2.      | <i>Hedychium spicatum</i> Sm.  | Van Haldi  | 2            | Herb  | Zingiberaceae | FL, CL, AL | Rhizome                | Stomach ache, fever and antibiotic                        | Available |
| 3.      | <i>Juglans regia</i> L.        | Akhrot     | 3            | Tree  | Juglandaceae  | AL, CL     | Fruits, leaves         | Essential oil, To clean teeth                             | Available |
| 4.      | <i>Mentha spicata</i> L.       | Pudina     | 4            | Herb  | Lamiaceae     | CL, AL     | Leaves                 | Antioxidant, Dysentery treatment                          | Available |
| 5.      | <i>Zanthoxylum armatum</i> DC. | Tirmir     | 5            | Shrub | Rutaceae      | AL, GL, CL | Stem, leaves and seeds | Toothache treatment, to treat cough and cold              | Less      |
| 6.      | <i>Curcuma longa</i> L.        | Haldi      | 6            | Herb  | Zingiberaceae | CL, AL     | Rhizome                | Cold, stomach ache and post-delivery problems, antibiotic | Less      |
| 7.      | <i>Rhus parviflora</i> Roxb.   | Ninayon    | 8            | Shrub | Anacardiaceae | FL         | Stem                   | Used as tooth brush                                       | Available |
| 8.      | <i>Artemisia</i> sp.           | Chamber    | 9            | Herb  | Asteraceae    | AL, FL, CL | Leaves                 | To heal wound.  | Available |
| 9.      | <i>Thymus serpyllum</i> L.     | Ban Ajwain | 10           | Herb  | Lamiaceae     | RS, FL     | Whole plant            | To treat stomachache                                      | Available |

\*FL: Forest Land, CL: Community Land, AL: Agricultural Land, and RS: Road Side

### 8.1.3 Potential areas within the cluster for production of Medicinal and Aromatic Plants

The discussion with VFDC members, villagers and Panchayat body was held regarding the potential area for production of the Medicinal and Aromatic Plants. Plantation areas of 17 (10+2+5) ha will be raised under JICA in the region. People are of the opinion that some medicinal plant species can be planted in this area. They are reluctant to spare additional area for the plantation of Medicinal and Aromatic Plants.

The plantation sites Shagaal, Kaphotua Nallah and Chauhan Dhar are located at N 30.929° latitude and E 077.713° longitude, N 30.928° and E 077.716°, N 30.921° and E 077.708° longitude having an altitude of 1769 m, 1772 m and 1642 m amsl, respectively falling in Chhinog beat, Tharoch forest range of Chopal forest division.

**8.1.4 Current Production:** The data on production of medicinal plants of the region is not available with villagers, VFDC, panchayat as well as Forest Department.

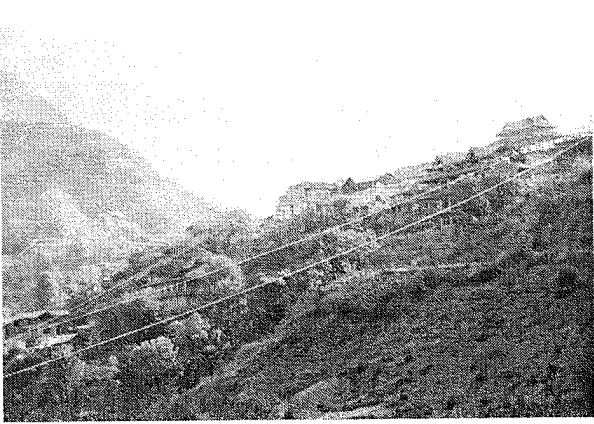
**8.1.5 Potential Production:** Species such as *Prunus armeniaca*, *Hedychium spicatum* and *Juglans regia* can be grown in the region as these species are preferred by the people.



**8.1.6 Regeneration Status:** The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was found low.

**8.1.7 Threat in Conservation:** The major threats for the conservations of the Medicinal and Aromatic Plants includes, forest fires, Lack of indigenous knowledge and not having proper management the species.

Plate 1: Glimpses of Meeting of VFDC Ira and General view of Plantation Site



## 8.2. Pujarli VFDC

The Pujarli VFDC of Pujarli Panchayat falls in Pujarli Cluster of Pujarli beat, Tharoch forest range of Chopal forest division. The Pujarli is located at N 30.938 ° latitude and latitude E 77.652 ° longitude having altitude of 1707 m amsl. The results of study on Medicinal and Aromatic Plants of the region are described below.

**8.2.1 Medicinal Plants and their Status in Badiyar Bhajanu Region:** A total of 6 important medicinal plants species belonging to 6 families were recorded from the area. Of which, 2 were trees, 1 shrub and 3 herbs. These medicinal plants species were found in scattered form in forests, agricultural field boundaries and community land. The number of these medicinal species in natural habitat was moderate. The important information on these medicinal plants are given in **Table 2**.

**Table 2: Medicinal Plants of Pujarli VFDC Area of Tharoch Range, Pujarli Cluster, Himachal Pradesh**

| Sr. No | Name                                  | Local Name       | Priority Rank | Habit | Family       | Habit at(s)*   | Part(s) Used     | Uses                                  | Status    |
|--------|---------------------------------------|------------------|---------------|-------|--------------|----------------|------------------|---------------------------------------|-----------|
| 1      | <i>Prunus armeniaca</i> L.            | Chulli           | 1             | Tree  | Rosaceae     | CL, AL         | Fruits and seeds | Essential oil used for body massage   | Available |
| 2.     | <i>Juglans regia</i> L.               | Akhrot           | 2             | Tree  | Juglandaceae | AL             | Fruits, leaves   | Essential oil, to clean teeth         | Available |
| 3.     | <i>Zanthoxylum armatum</i> DC.        | Tirmir           | 3             | Shrub | Rutaceae     | AL, FL, CL     | Stem, leaves     | Toothache treatment                   | Less      |
| 4.     | <i>Urtica dioica</i> L.               | Kunkua/Bichubuti | 4             | Herb  | Urticaceae   | AL, FL, CL, RS | Leaves           | Leaf paste used for curing of sprains | Available |
| 5.     | <i>Artemisia</i> sp.                  | Chamber          | 5             | Herb  | Asteraceae   | AL, FL, CL     | Leaves           | To heal wounds                        | Available |
| 6.     | <i>Rubia manjith</i> Roxb. ex Fleming | Manjitha         | 6             | Herb  | Rubiaceae    | AL, FL, CL, RS | Whole plant      | To heal wounds                        | Available |

\*FL: Forest Land, CL: Community Land, AL: Agricultural Land, and RS: Road Side

**8.2.2 Preference Priority of medicinal plants:** The data on Medicinal and Aromatic Plants was collected through semi-structured questionnaires and discussions interviews. The analysis of data showed that *Prunus armeniaca* was most preferred species, followed by *Juglans regia* and *Zanthoxylum armatum*. The species with different priority rank, habit, habitat(s), part(s) used, uses and status are given in **Table 2**.

### 8.2.3 Potential areas within the cluster for production of Medicinal and Aromatic Plants

The discussions with VFDC members, villagers and Panchayat body were held about the

potential area and availability of area for production of the Medicinal and Aromatic Plants. A plantation area of 20 ha will be raised under JICA in the region. People were of the opinion that some medicinal tree species can be planted in this area. The plantation site UPF-Pujarli is located at N 30.937° latitude and E 077.656° longitude having an altitude of 1563 m amsl, falling in Pujarli beat, Tharoch range of Chopal forest division. Glimpses of meeting held and site for plantation has been depicted in **Plate 2**.

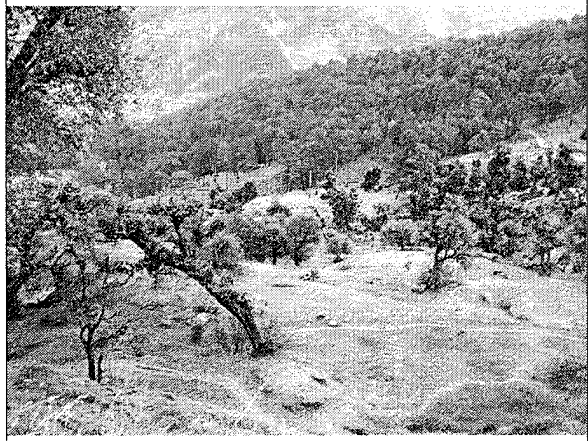
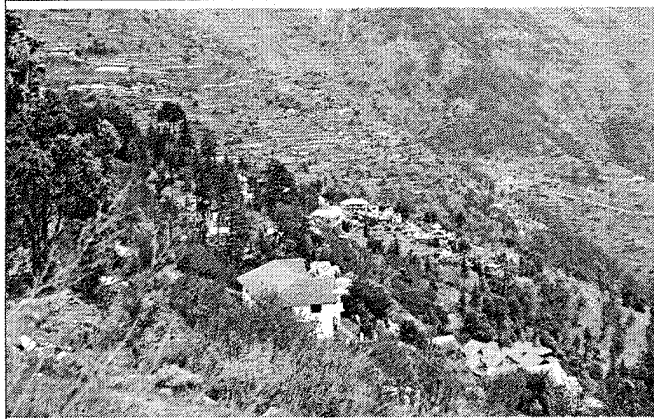
**8.2.4 Current Production:** The data on production of medicinal plants of the region was not available with villagers, VFDC, Panchayat as well as Forest Department.

**8.2.5 Potential Production:** *Prunus armeniaca* and *Juglans regia* can be grown in the region, as the people prefer these species.

**8.2.6 Regeneration Status:** The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic plants was found moderate.

**8.2.7 Threat in Conservation:** The major threats for the conservation of the Medicinal and Aromatic Plants in the area include; unethical extraction, lack of indigenous knowledge among young population and not having proper management of the species.

Plate 2: Glimpses of Meeting of VFDC Pujarli and General Plantation area



### 8.3 Jhandwa VFDC

The Jhandwa VFDC of Chanjan panchayat falls in Rampur cluster in Chinog beat, Tharoch forest range of Chopal forest division. Piplah (Jhandwa ward) is located at N 30°55.092' latitude and E 077° 43.721' longitude at 1472 m amsl. The outcomes of study on Medicinal and Aromatic Plants of the region are given below.

**8.3.1 Medicinal Plants and their Status in Jhandwa Region:** A total of 05 important medicinal plants belonging to 5 families were recorded from the area. Of which, 4 species were trees and 01 was herb. The most of these medicinal plants were found in scattered from in forests, agricultural field boundaries and community land. The number of these plant species in natural habitat was moderate. The details of the important Medicinal and Aromatic Plants of the region is given in **Table 3**.

**8.3.2 Preference Priority of medicinal plants:** The data on Medicinal and Aromatic Plants was collected through semi-structured, questionnaires, interviews and discussion. The analysis of data shows that *Prunus armeniaca* is most preferred species followed by *Juglans regia*, *Punica granatum*, *Phyllanthus emblica*, *Hedychium spicatum*, etc. The priority of the species is given in **Table 3**.

**Table 3: Medicinal Plants of Jhandwa Area of Tharoch forest range of Chopal FD of Rampur Cluster, Himachal Pradesh**

| Sr. No | Name                          | Local Name   | Preference Priority | Habit      | Family         | Habitat(s)* | Part (s) Used                         | Uses   | Status    |
|--------|-------------------------------|--------------|---------------------|------------|----------------|-------------|---------------------------------------|--|-----------|
| 1.     | <i>Prunus armeniaca</i> L.    | Chulli       | 1                   | Tree       | Rosaceae       | AFB, CL     | Fruits                                | Essential oil, Traditional/folklore                                  | Available |
| 2      | <i>Juglans regia</i> L.       | Akhrot       | 2                   | Tree       | Juglandaceae   | F, AFB, CL  | Fruits, Stem, Barks, Leaves and Roots | Essential oil, Furniture, Traditional/folklore                       | Available |
| 3.     | <i>Punica granatum</i> L.     | Daru         | 3                   | Small Tree | Lythraceae     | F, CL, AFB, | Fruits                                | Antioxidants   | Less      |
| 4.     | <i>Phyllanthus emblica</i> L. | Amla         | 4                   | Small Tree | Phyllanthaceae | AFB         | Fruits                                | Appetite, Blood purifier, Source of Vitamin C, Used in Trifla Churna | Less      |
| 5.     | <i>Hedychium spicatum</i> Sm. | Jangli Haldi | 5                   | Herb       | Zingiberaceae  | AFB,F       | Rhizome                               | Treatment of cough, hiccough, fever and asthma                       | Available |

\*F: Forest, CL: Community Land, and AFB: Agricultural Field Boundary

### 8.3.3 Potential areas within the cluster for production of Medicinal and Aromatic Plants

The discussion with VFDC members, villagers and Panchayat body was held regarding the potential area for production of the Medicinal and Aromatic Plants. Plantation areas of 20 (10+10) ha will be raised under JICA in the region. People were of the opinion that some medicinal plants can be planted in this area. However, they were reluctant to spare additional area for the plantation of Medicinal and Aromatic Plants.

The proposed plantation sites have geo-coordinates N 30°55.940' latitude and E 077°43.872' longitude having an altitude of 1770 m amsl (near Chhinoge and Manjholi villages) and N 30°54.920' latitude and E 077°43.526' longitude having an altitude of 1453 m amsl (near Piplah and Shamtha villages) falling in Chinoge beat, and Tharoch forest range of Chopal forest division.

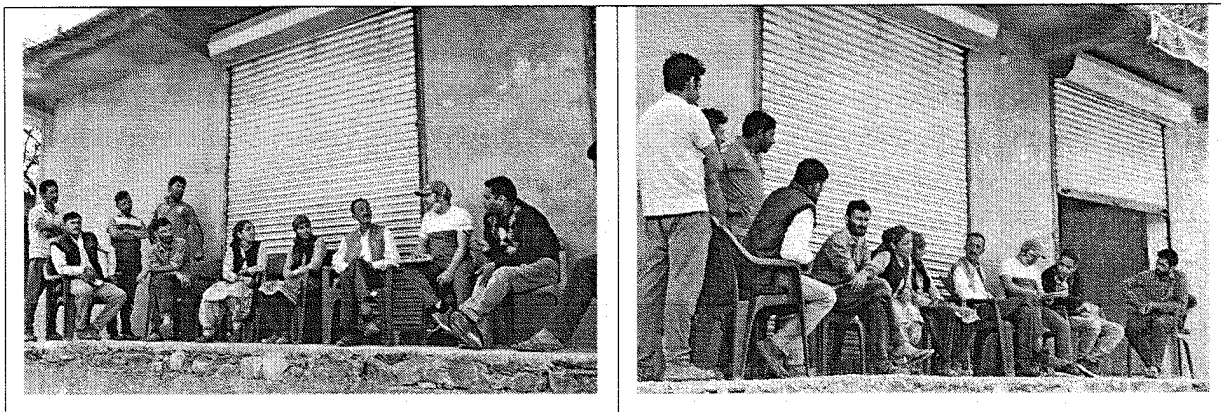
**8.3.4 Current Production:** The data on production of medicinal plants of the region was not available with villagers, VFDC, Panchayat as well as with Forest Department.

**8.3.5 Potential Production:** Species such as *Prunus armeniaca*, *Juglans regia*, *Punica granatum* and *Phyllanthus emblica*, and *Hedychium spicatum* can be grown in the region as these species are native and preferred by the local population.

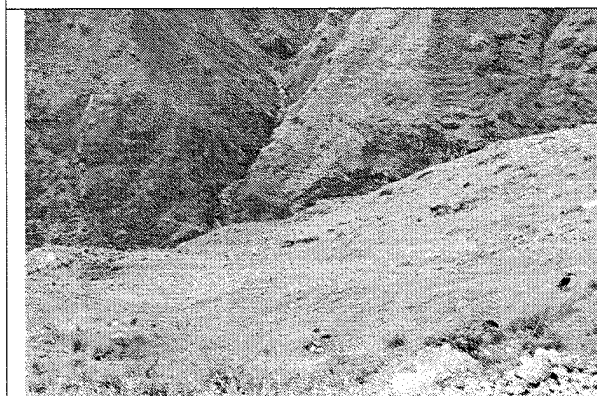
**8.3.6 Regeneration Status:** The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was found moderate.

**8.3.7 Threat in Conservation:** The major threats for the conservation of the Medicinal and Aromatic Plants species include, illicit extraction, forest fires, lack of indigenous knowledge and not having proper management of the species

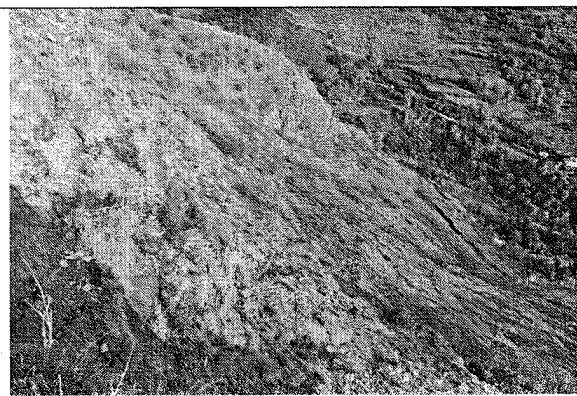
**Plate 3: Glimpses of Meeting of VFDC Jhandwa General Plantation under JICA**



**Meeting at Piplah**



**Plantation Site-1**



**Plantation Site-2**



#### 8.4. Nao VFDC

The Nao VFDC of Pujarli Panchayat falls in Rampur Cluster Pujarli beat, Tharoch forest range of Chopal forest division. The Nao is located at N 30°56'39'' latitude and longitude E 077°38'55'' longitude at 1788 m amsl. The outcomes of study on Medicinal and Aromatic Plants of the region are described below:

**8.4.1 Medicinal Plants and their Status in Nao Region:** A total of 04 important medicinal plants belonging to 03 families were recorded from the area, of which 02 were trees and 02 herbs. These medicinal plants species were found in scattered form in forests, agricultural field boundaries and community land. The number of these Medicinal and Aromatic Plants in natural habitat was very less. The important information on these medicinal plants is given in **Table 4:**

**Table 4: Medicinal Plants of Nao VFDC Area of Tharoch Range, Chopal FD of Rampur Cluster, Himachal Pradesh**

| Sr. No | Name                          | Local Name   | Priority Rank | Habit | Family        | Habitat(s)* | Part(s) Used                    | Uses                     | Status    |
|--------|-------------------------------|--------------|---------------|-------|---------------|-------------|---------------------------------|--------------------------|-----------|
| 1      | <i>Prunus armeniaca</i> L.    | Chulli       | 1             | Tree  | Rosaceae      | AFB, CL     | Fruits                          | Essential oil            | Available |
| 2.     | <i>Juglans regia</i> L.       | Akhrot       | 2             | Tree  | Juglandaceae  | F, AFB, CL  | Fruits, Barks, Leaves and Roots | Essential oil            | Available |
| 3.     | <i>Curcuma longa</i> L.       | Kachoor      | 3             | Herb  | Zingiberaceae | F, CL       | Whole plant                     | Ascariasis, febrifuge    | Less      |
| 4.     | <i>Hedychium spicatum</i> Sm. | Jangli Haldi | 4             | Herb  | Zingiberaceae | F           | Rhizome                         | To dissolve kidney stone | Less      |

**8.4.2 Preference Priority of medicinal plants species:** The data on Medicinal and Aromatic Plants was collected through interviews and discussions. The analysis of data shows that *Prunus armeniaca* is most preferred species followed by *Juglans regia* and *Curcuma longa*. The species with different priority rank, habit, habitat(s), part(s) used, uses and status are given in **Table 4.**

**8.4.3 Potential areas within the cluster for production of Medicinal and Aromatic Plants**  
The discussion with VFDC members, villagers and Panchayat body was held about the potential area and availability of area for production of the Medicinal and Aromatic Plants. A plantation area of 20 ha will be raised under JICA in the region. People were of the opinion that some medicinal tree species can be planted in this area. The plantation site is located at N 30°56.899' latitude and E 77°38.984' longitude having an altitude of 1825m amsl, falling in Pujarli beat, Tharoch range of Chopal forest division. Glimpses of meeting held and site for

plantation have been depicted in **Plate 4**.

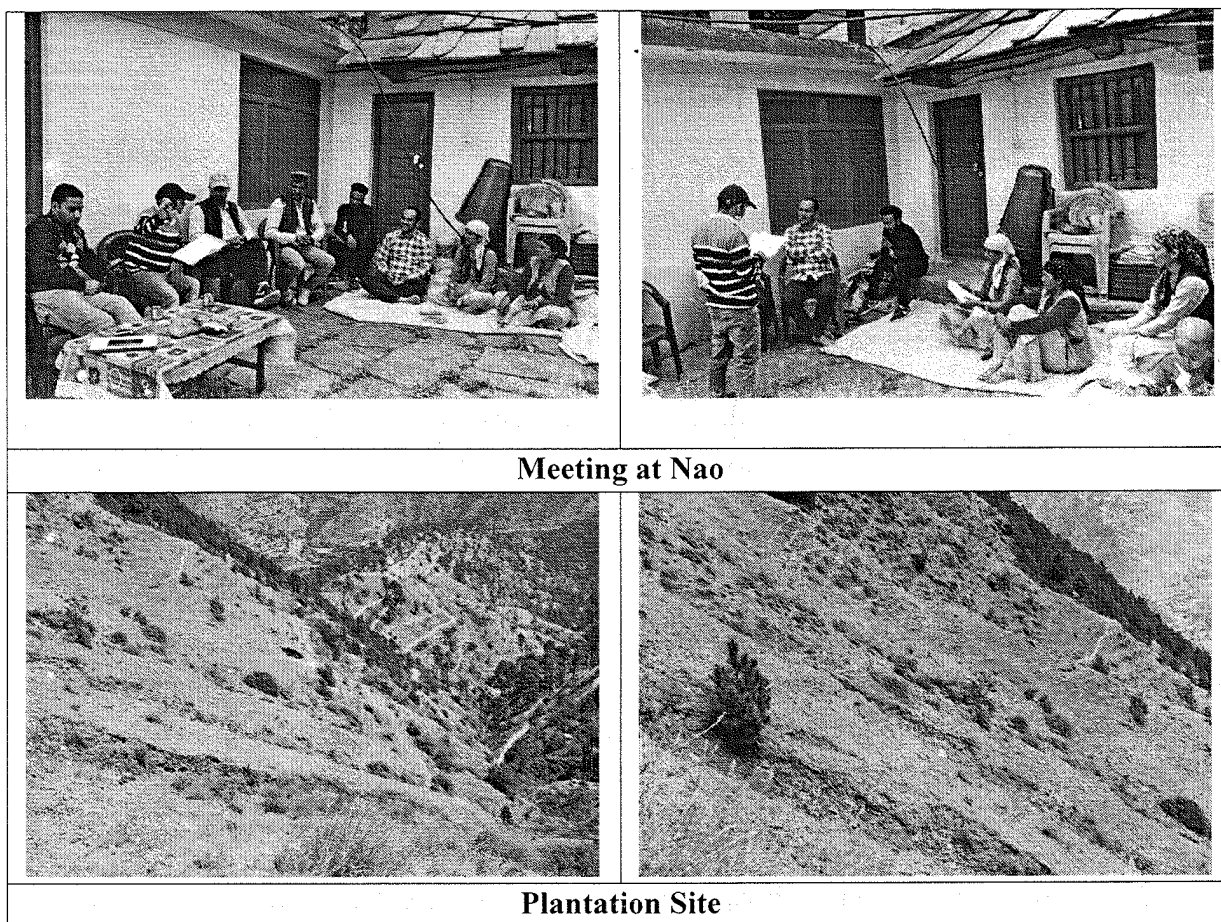
**8.4.4 Current Production:** The data on production of medicinal plants of the region is not available with villagers, VFDC, Panchayat as well as with Forest Department.

**8.4.5 Potential Production:** Species such as *Prunus armeniaca*, *Juglans regia*, *Curcuma Longa*, etc. can be grown in the region, as the people prefer these species.

**8.4.6 Regeneration Status:** The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was found to be very low.

**8.4.7 Threat in Conservation:** The major threats for the conservations of the Medicinal and Aromatic Plants in the area include unethical extraction, forest fires, lack of indigenous knowledge especially with local young generation and poor management of the species.

**Plate 4: Glimpses of Meeting of VFDC Nao and General Plantation under JICA**



## 8.5 Chilla Chapandali VFDC

The Chilla Chapandali VFDC of Thana Panchayat falls in Rampur cluster Thana beat, Chopal forest range of Chopal forest division. The Chilla Chapandali is located at N 30<sup>0</sup>56'36"

latitude and E 077°34'2" longitude at 1957 m amsl. The outcomes of study on Medicinal and Aromatic Plants of the region are described below:

**8.5.1 Medicinal Plants and their Status in Chilla Chapandali Region:** A total of 04 important Medicinal and Aromatic Plants belonging to 02 families were recorded from the area and all were trees. These Medicinal and Aromatic Plants are found in scattered form in forests, agricultural field boundaries and community land. The number of these medicinal species in natural habitat is less. The important information on these medicinal plants is given in **Table 5**.

**8.5.2 Preference Priority of medicinal plants:** The data on Medicinal and Aromatic Plants was collected through semi-structured, questionnaires, discussion and interviews. The analysis of data showed that *Prunus armeniaca* and *Juglans regia* were most preferred species, followed by *Prunus mira* and *Pyrus pashia*. The species with different priority rank, habit, habitat(s), part(s) used, uses and status are given in **Table 5**.

**Table 5: Medicinal Plants of Chilla Chapandali VFDC Area of Chopal Range, Chopal FD of Rampur Cluster, Himachal Pradesh**

| Sr. No | Name                                   | Local name | Priority Rank | Habit | Family       | Habitat(s)* | Part (s) Used                           | Uses                                | Status    |
|--------|--|------------|---------------|-------|--------------|-------------|---|-------------------------------------|-----------|
| 1      | <i>Prunus armeniaca</i> L.             | Chulli     | 1             | Tree  | Rosaceae     | AFB, CL     | Essential oil and Fruits                | Essential oil, Traditional/folklore | Available |
| 2.     | <i>Juglans regia</i> L.                | Akhrot     | 2             | Tree  | Juglandaceae | F, AFB, CL  | Essential oil, Fruits, Leaves and Roots | Essential oil, Traditional/folklore | Available |
| 3      | <i>Prunus mira</i> Koehne              | Behmi      | 3             | Tree  | Rosaceae     | F, CL       | Essential oil and Fruits                | Essential oil, fruit                | Available |
| 4      | <i>Pyrus pashia</i> Buch Ham ex D. Don | Kainth     | 4             | Tree  | Rosaceae     | F, CL       | Fruits, seeds                           | nutritional and therapeutic uses    | Available |

### 8.5.3 Potential areas within the cluster for production of Medicinal and Aromatic Plants

The discussion with VFDC members, villagers and Panchayat body was held about the potential area and availability of area for production of the Medicinal and Aromatic Plants. A plantation area of 20 ha will be raised under JICA in the region. People were of the opinion that some medicinal tree species can be planted in this area. They were enthusiastic and willing to spare additional area for the plantation of Medicinal and Aromatic Plants.

The proposed plantation sites have geo-coordinates N30°56.316' latitude and E 77°34.254' longitude having an altitude of 1844 m amsl (near Chapandali village) and N

33°56.537' latitude and E 077°34.233' longitude having an altitude of 1976 m amsl (near Thana village) falling in Thana beat, Chopal range of Chopal forest division.

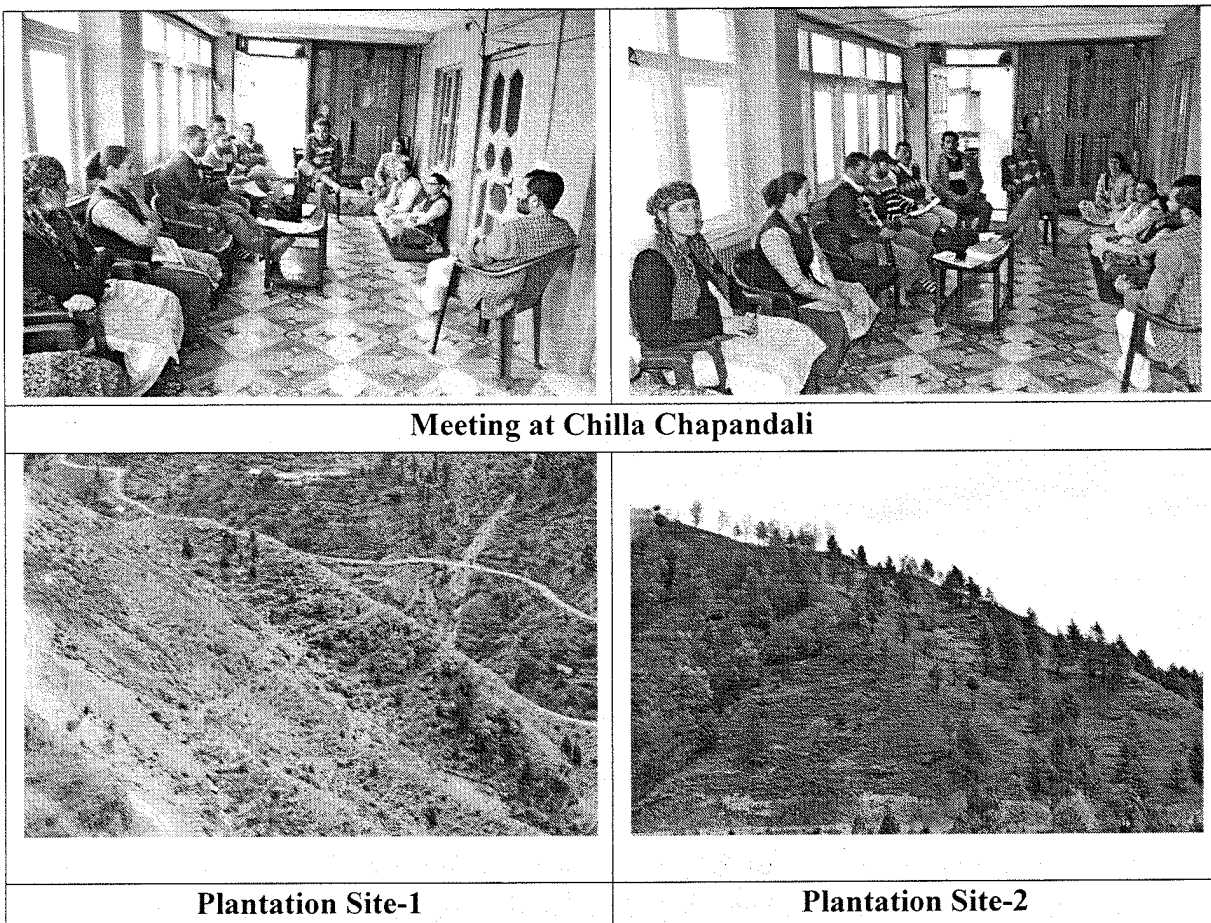
**8.5.4 Current Production:** The data on production of medicinal plants of the region is not exactly available with villagers, VFDC, Panchayat as well as with Forest Department

**8.5.5 Potential Production:** Species such as *Prunus armeniaca*, *Juglans regia* *Prunus mira*, *Pyrus pashia* etc. can be planted in the region, as the people prefer these species.

**8.5.6 Regeneration Status:** The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was found to be moderate.

**8.5.7 Threat in Conservation:** The major threats for the conservations of Medicinal and Aromatic Plants in the area include unscientific extraction, lack of nursery techniques and sustainable management practices of these species.

**Plate 5: Glimpses of Meeting of VFDC Chilla Chapandali and General Plantation under JICA**



## 8.6 Choukia VFDC

The Choukia VFDC of Chanju Chopal Panchayat falls in Rampur cluster Chopal beat, Chopal forest range of Chopal forest division. The Choukia is located at N 30°56.492' latitude and longitude E 077°34.052' longitude and 1940 m amsl.

The outcomes of study on Medicinal and Aromatic Plants of the region are described below:

**8.6.1 Medicinal Plants and their Status in Choukia Region:** A total of 04 important Medicinal and Aromatic Plants belonging to 02 families were recorded from the area of which all are trees. These Medicinal and Aromatic Plants are found in scattered form in forests, agricultural field boundaries and community land. The number of these medicinal species in natural habitat was less. The important information on these medicinal plants is given in **Table 6**.

**8.6.2 Preference Priority of medicinal plants:** The data on Medicinal and Aromatic Plants was collected through semi-structured, questionnaires, discussion and interviews. The analysis of data shows that *Prunus armeniaca* is most preferred species, followed by *Juglans regia*, *Prunus mira*, *Pyrus pashia*, etc. The species with different priority rank, habit, habitat(s), part(s) used, uses and status is given in **Table 6**.

**Table 6: Medicinal Plants of Choukia VFDC Area of Chopal Range, Chopal FD of Rampur Cluster, Himachal Pradesh**

| Sr. No | Name                                   | Local name | Priority Rank | Habit | Family       | Habitat(s)* | Part(s) Used                            | Uses                                | Status    |
|--------|--|------------|---------------|-------|--------------|-------------|---|-------------------------------------|-----------|
| 1      | <i>Prunus armeniaca</i> L.             | Chulli     | 1             | Tree  | Rosaceae     | AFB, CL     | Essential oil and Fruits                | Essential oil, Traditional/folklore | Available |
| 2.     | <i>Juglans regia</i> L.                | Akhrot     | 2             | Tree  | Juglandaceae | F, AFB, CL  | Essential oil, Fruits, Leaves and Roots | Essential oil, Traditional/folklore | Available |
| 3      | <i>Prunus mira</i> Koehne              | Behmi      | 3             | Tree  | Rosaceae     | F, CL       | Essential oil and Fruits                | Essential oil, fruit                | Available |
| 4      | <i>Pyrus pashia</i> Buch Ham ex D. Don | Kainth     | 4             | Tree  | Rosaceae     | F, CL       | Fruits, seeds                           | nutritional and therapeutic uses    | Available |

### 8.6.3 Potential areas within the cluster for production of Medicinal and Aromatic Plants

The discussion with VFDC members, villagers and Panchayat body was held about the potential area and availability of area for production of the Medicinal and Aromatic Plants. A plantation area of 15 (5+10) ha will be raised under JICA in the region. People were

unanimous in their opinion that some medicinal tree species can be planted in this area. They were enthusiast and willing to spare some additional forest and non-forest area for the plantation of Medicinal and Aromatic Plants. The proposed plantation sites have geo-coordinates N 30°57.435' latitude latitude E 77°36.066' longitude having an altitude of 1724 m amsl (near Sadronha village) and N 30°56.601' latitude and E 077°36.734' longitude having an altitude of 1862 m amsl (near Jarait) falling in Chopal beat, Chopal range of Chopal forest division. Glimpses of meeting held and site for plantation has been depicted in **Plate 6**.

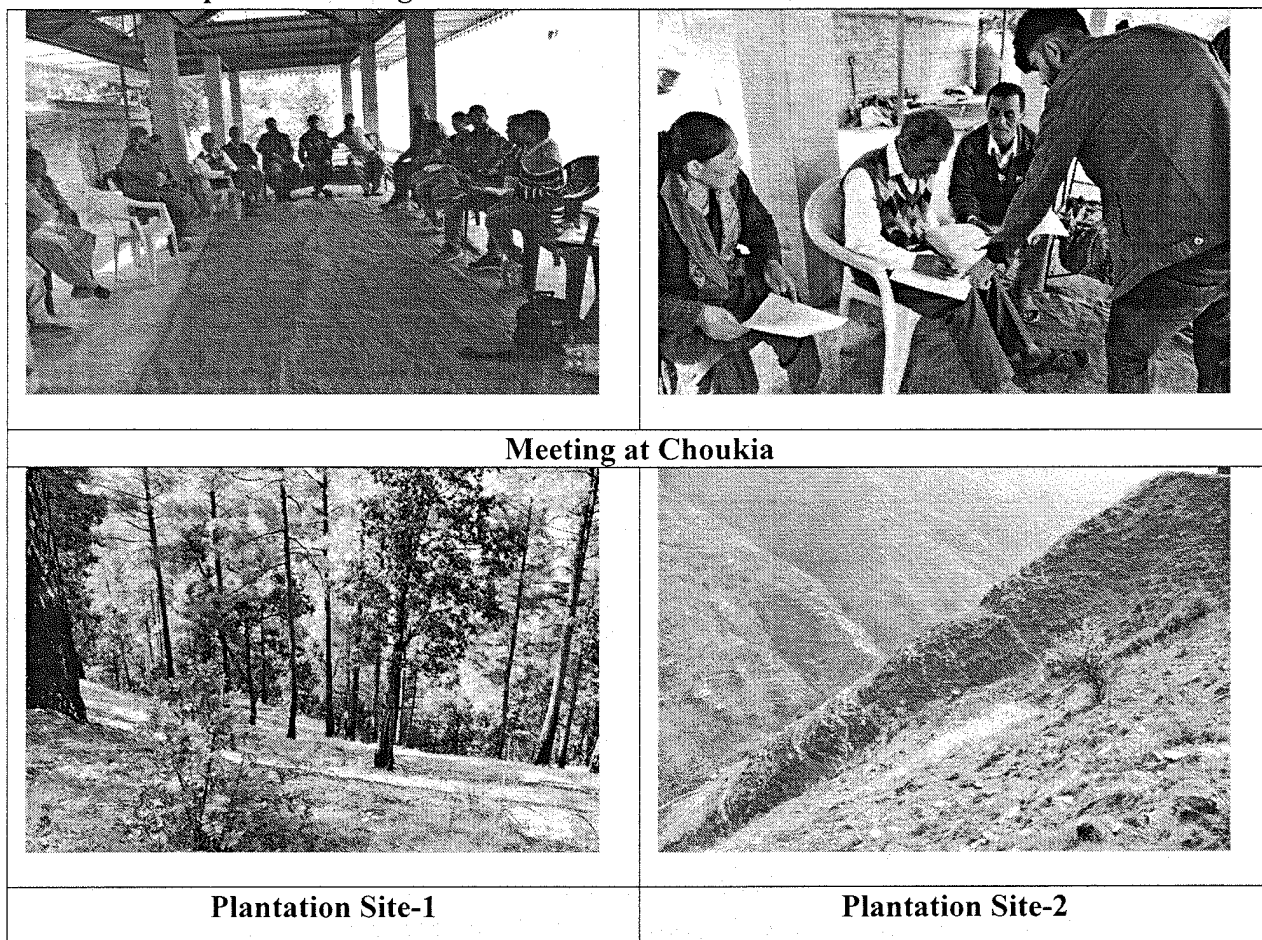
**8.6.4 Current Production:** The data on production of medicinal plants of the region is not available with villagers, VFDC, Panchayat as well as Forest Department as local people were not involved in the extraction business of the MAPs.

**8.6.5 Potential Production:** Species such as *Prunus armeniaca*, *Pyrus pashia*, *Juglans regia*, etc. should be grown in the region, as the people prefer these species due to local demands.

**8.6.6 Regeneration Status:** The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was found to be very low

**8.6.7 Threat in Conservation:** The major threats for the conservations of the Medicinal and Aromatic Plants in the area include; unscientific extraction, lack of identification, nursery techniques and sustainable management practices of these species.

**Plate 6: Glimpses of Meeting of VFDC Choukia and General Plantation under JICA**



**8.7 Dhar-Churiyan VFDC**

The Dhar Churiyan VFDC of Chadoli panchayat falls in Rampur cluster in Kanda beat, Kanda forest range of Chopal forest division. Dhar-Churiyan is located at N 30°49'.52.73" latitude, E 077° 33'.23.78" longitude and 1782 m amsl altitude. The outcomes of study on medicinal and aromatic plants of the region are given below:

**8.7.1 Medicinal Plants and their Status in Dhar-Churiyan Region:** A total of 07 important medicinal plants belonging to 7 families were recorded from the area, of which 02 species were of trees, 01 species shrub and 04 species herbs. The most of these medicinal plants were found in scattered form in forests, agricultural field boundaries, households and community land. The details of the important Medicinal and Aromatic Plants of the region is given in **Table 7**.

**8.7.2 Preference Priority of medicinal plants:** The data on Medicinal and Aromatic Plants was collected through semi-structured interviews. The analysis of data showed that *Prunus armeniaca* is most preferred species followed by *Juglans regia*, *Angelica glauca*, *Curcuma longa*, *Sinopodophyllum hexandrum*, *Ocimum tenuiflorum*, *Phyllanthus emblica* etc. The priority of the species is given in **Table 7**.

**Table 7: Medicinal Plants of Dhar-Churiyan Area of Kanda forest range of Chopal FD of Rampur Cluster, Himachal Pradesh**

| Sr. No. | Name  | Local Name | Preference Priority | Habit             | Family         | Habitat(s) * | Part(s) Used                          | Uses   | Status        |
|---------|---|------------|---------------------|-------------------|----------------|--------------|---------------------------------------|--|---------------|
| 1.      | <i>Prunus armeniaca</i> L.                        | Chulli     | 1                   | Tree              | Rosaceae       | AFB, CL      | Fruits                                | Essential oil, Traditional/folklore            | Available     |
| 2.      | <i>Juglans regia</i> L.                           | Akhrot     | 2                   | Tree              | Juglandaceae   | F, AFB, CL   | Fruits, Stem, Barks, Leaves and Roots | Essential oil, Furniture, Traditional/folklore | Available     |
| 3.      | <i>Angelica glauca</i> Edgew.                     | Chora      | 3                   | Herb              | Apiaceae       | F, CL        | Roots                                 | Stomachache, Flavoring agent                   | Not Available |
| 4.      | <i>Curcuma longa</i> L.                           | Kachoor    | 4                   | Herb              | Zingiberaceae. | CL, AFB      | Rhizome                               | Treatment of cough, hiccough, fever and asthma | Available     |
| 5.      | <i>Sinopodophyllum hexandrum</i> (Royle) T.S.Ying | Bankakri   | 5                   | Herb              | Berberidaceae  | F            | Roots                                 | Anticancer properties                          | Not Available |
| 6.      | <i>Ocimum tenuiflorum</i> L.                      | Tulsi      | 6                   | Herb              | Lamiaceae      | H            | Whole Plant                           | Cold, Cough and Headache                       | Available     |
| 7.      | <i>Phyllanthus emblica</i> L.                     | Amla       | 7                   | Small Tree/ Shrub | Phyllanthaceae | CL, AFB      | Fruits                                | Appetite, Blood purifier, Source of Vitamin C, | Less          |

|  |  |  |  |  |  |  |  |                          |
|--|--|--|--|--|--|--|--|--------------------------|
|  |  |  |  |  |  |  |  | Used in Tritel<br>Churna |
|--|--|--|--|--|--|--|--|--------------------------|

\*F: Forest, CL: Community Land, AFB: Agricultural Field Boundary, and H: Household

### 8.7.3 Potential areas within the cluster for production of Medicinal and Aromatic Plants

The discussion with VFDC members, villagers and panchayat body was held regarding the potential area for production of the Medicinal and Aromatic Plants. Plantation areas of 20 ha will be raised under JICA in the region. People were of the opinion that some medicinal plants can be planted in this area. However, they were reluctant to spare additional area for the plantation of Medicinal and Aromatic Plants. The proposed plantation sites have geo-coordinates N 30°50' .07.19" latitude and E 077° 33' .05.99" longitude having an altitude of 1846 m amsl (near Bhadiya village/ Nallah) falling in Kanda beat, Kanda forest range of Chopal forest division.

**8.7.4 Current Production:** The data on production of medicinal plants of the region is not available with villagers, VFDC, Panchayat as well as Forest Department.

**8.7.5 Potential Production:** Species such as *Prunus armeniaca*, *Juglans regia*, *Angelica glauca*, *Curcuma longa*, *Sinopodophyllum hexandrum* and *Ocimum tenuiflorum* can be grown in the region as these species are native and are preferred by the local.

**8.7.6 Regeneration Status:** The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was found moderate.

**8.7.7 Threat in Conservation:** The major threats for the conservations of the Medicinal and Aromatic Plants includes, lack of indigenous knowledge, illicit extraction, forest fires, and not having proper management the species.



**Plate 8: Glimpses of Meeting of VFDC Dhar-Churiyan General Plantation under JICA**



**Meeting at Dhar-Churiyan**



**Plantation Site**

### 8.8. Tikkar-2 VFDC

The Tikkar-2 VFDC of Kulag Panchayat falls in Rampur Cluster Shanlog beat, Kanda forest range of Chopal forest division. The Tikkar-2 is located at N 30°49'20.39" latitude and longitude E 077°34'45.72" longitude and 1605 m amsl altitude. The outcomes of study on Medicinal and Aromatic Plants of the region are described below:

**8.8.1 Medicinal Plants and their Status in Tikkar-2 Region:** A total of 11 important medicinal plants belonging to 10 families were recorded from the area of which 06 were trees, 02 shrubs and 03 herbs. These medicinal plants were found in scattered form in forests, agricultural field boundaries and community land. The number of these Medicinal and Aromatic Plants in natural habitat was found less. The important information on these medicinal plants is given in **Table 8**.

**Table 8: Medicinal Plants of Tikkar-2 VFDC Area of Kanda Forest Range, Chopal FD of Rampur Cluster, Himachal Pradesh**

| Sr. No | Name                                   | Local Name | Priority Rank | Habit | Family         | Habit at(s)* | Part(s) Used                    | Uses   | Status        |
|--------|--|------------|---------------|-------|----------------|--------------|---------------------------------|--|---------------|
| 1.     | <i>Prunus armeniaca</i> L.             | Chulli     | 1             | Tree  | Rosaceae       | AFB, CL      | Fruits                          | Oil message for arthritis                          | Available     |
| 2.     | <i>Juglans regia</i> L.                | Akhrot     | 2             | Tree  | Juglandaceae   | F, AFB, CL   | Fruits, Barks, Leaves and Roots | Essential oil and Oil message for arthritis        | Available     |
| 3.     | <i>Curcuma longa</i> L.                | Kachoor    | 3             | Herb  | Zingiberaceae  | F, CL        | Rhizome                         | Ascariasis, febrifuge                              | Available     |
| 4.     | <i>Withania somnifera</i> (L.)Dunal    | Ashwaganda | 4             | Shrub | Solanaceae     | F, AFB, CL   | Roots and Fruits                | Immunity Booster                                   | Not available |
| 5.     | <i>Zanthoxylum armatum</i> DC.         | Timber     | 5             | Shrub | Rutaceae       | F, CL        | Fruits, Leaves, and Stem        | Asthma, bronchitis, indigestion, diarrhea          | Available     |
| 6.     | <i>Pyrus pashia</i> Buch Ham ex D. Don | Kainth     | 6             | Tree  | Rosaceae       | F, AFB, CL   | Fruits, bark and Stem           | Diarrhoea, laxative, anti helmintics and febrifuge | Available     |
| 7.     | <i>Phyllanthus emblica</i> L.          | Amla       | 7             | Tree  | Phyllanthaceae | F, AFB, CL   | Fruits                          | Diarrhoea, jaundice, and inflammation.             | Not available |

|     |   |           |    |      |               |            |                                       |  |               |
|-----|---|-----------|----|------|---------------|------------|---------------------------------------|--|---------------|
| 8.  | <i>Rhododendron arboretum</i> Sm.                     | Burans    | 8  | Tree | Ericaceae     | F, AFB, CL | Flowers                               | Diarrhea, inflammation, bacterial and fungal infections      | Available     |
| 9.  | <i>Mentha piperita</i> L.                             | Pudina    | 9  | Herb | Lamiaceae     | F, CL      | Leaves, flower, stem, bark, and seeds | Essential oils, dysentery, abdominal disorders and headaches | Available     |
| 10. | <i>Bergenia ciliata</i> (Haw.) Sternb.                | Pathartod | 10 | Herb | Saxifragaceae | F, AFB, CL | Rhizome/ roots                        | Kidney stones  | Available     |
| 11. | <i>Cinnamomum tamala</i> (Buch.-Ham.) T.Nees & Eberm. | Tejpatta  | 11 | Tree | Lauraceae     | F, CL      | Leaves                                | As Spices and treatment dental caries, bad odor              | Not available |

**8.8.2 Preference Priority of medicinal plants:** The data on Medicinal and Aromatic Plants was collected through semi-structured interviews. The analysis of data showed that *Prunus armeniaca* is most preferred species, followed by *Juglans regia*, *Curcuma longa*, *Withania somnifera*, *Zanthoxylum armatum*, *Pyrus pashia*, *Phyllanthus emblica*, *Rhododendron arboreum*, *Mentha piperita*, *Bergenia ciliata*, *Cinnamomum tamala*. The species with different priority rank, habit, habitat(s), part(s) used, uses and status are given in **Table 8**.

### 8.8.3 Potential areas within the cluster for production of Medicinal and Aromatic Plants

The discussion with VFDC members, villagers and Panchayat body was held about the potential area and availability of area for production of the Medicinal and Aromatic Plants. A plantation area of 15 (5+10) ha will be raised under JICA in the region. People were of the opinion that some medicinal tree species can be planted in this area. Glimpses of meeting held and site for plantation has been depicted in **Plate 8**.

The proposed plantation sites have geo-coordinates N 30°49'.21.20" latitude and E 077°34'.52.54' longitude having an altitude of 1597m amsl (Above Samuhi village) is Site-1 and N 30°49'.17.73" latitude and E 77°34'.45.54' longitude having an altitude of 1572m amsl (Above Sheel village) is Site-2 falling in Shanlog beat, Kanda range of Chopal forest division.

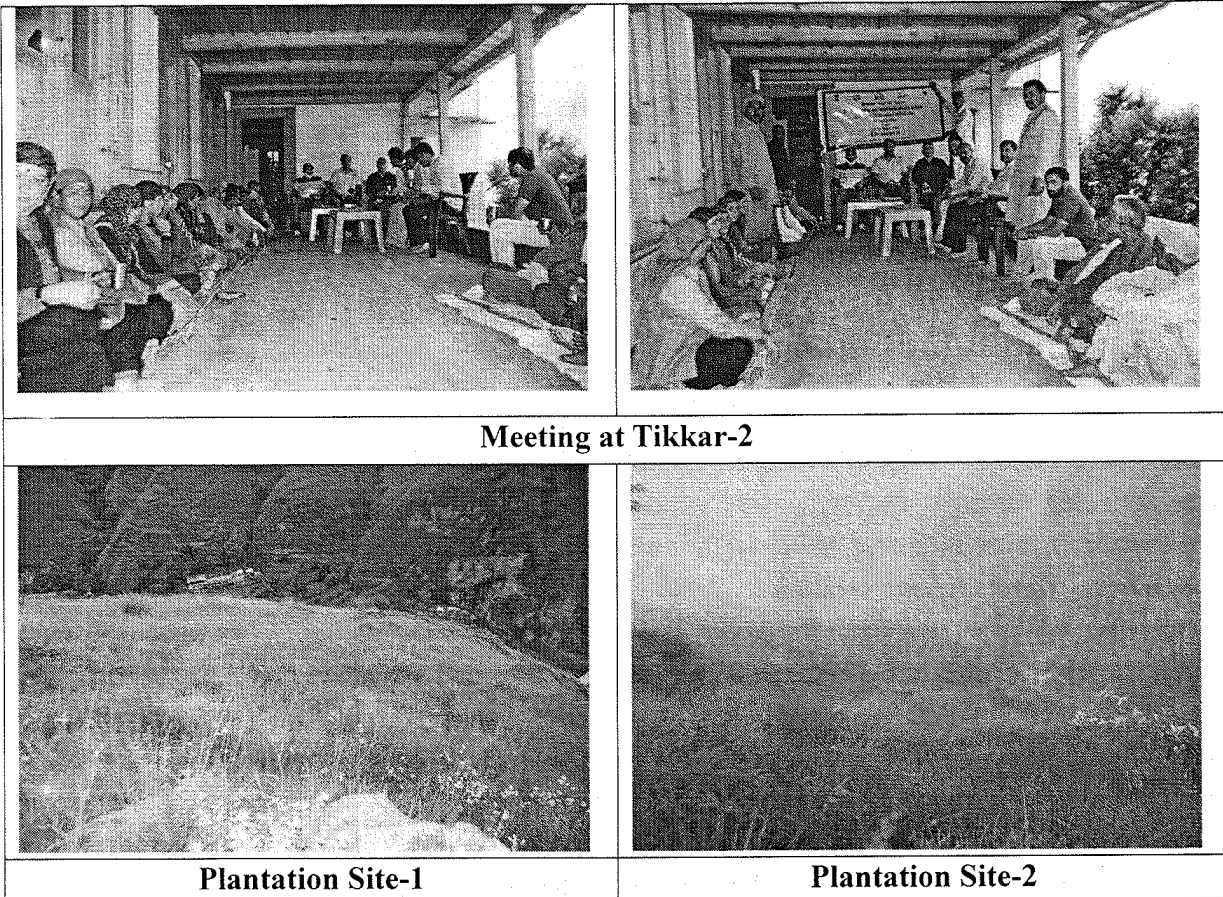
**8.8.4 Current Production:** The data on production of medicinal plants of the region is not available with villagers, VFDC, Panchayat as well as with Forest Department.

**8.8.5 Potential Production:** Species such as *Juglans regia*, *Curcuma longa*, *Zanthoxylum armatum*, *Pyrus pashia*, *Rhododendron arboreum*, *Mentha piperita* and *Bergenia ciliata* can be grown in the region, as the people prefer these species.

**8.8.6 Regeneration Status:** The forest areas were surveyed and the less natural regeneration of the Medicinal and Aromatic Plants was observed.

**8.8.7 Threat in Conservation:** The major threats for the conservations of the Medicinal and Aromatic Plants in the area include lack of indigenous knowledge, unethical extraction, forest fires, and poor management of the species.

**Plate 8: Glimpses of Meeting of VFDC Tikkar-2 and General Plantation under JICA**



**8.9 Tipra-Mashroh VFDC:** The Tipra-Mashroh VFDC of Mashroh Panchayat falls in Rampur cluster in Shilikian beat, Jhiknipul Block and Chopal forest range of Chopal forest division. The outcomes of study on Medicinal and Aromatic Plants of the region are given below:

**8.9.1 Medicinal Plants and their Status in Tipra Region:** A total of 17 important medicinal plants belong to 13 families were recorded from the area. Of which, 5 species were trees, 3 shrubs and 9 herbs. The most of these medicinal plants were found in scattered form in forests, agricultural field boundaries and community land. The number of these medicinal species in natural habitat was less. The details of the important medicinal plants species of the region is given in **Table 9**.

**8.9.2 Preference Priority of medicinal plants species:** The data on Medicinal and Aromatic Plants was collected through semi-structured interviews. The analysis of data showed that *Angelica glauca* was most preferred species, followed by *Polygonatum cirrhifolium*, *Taxus wallichiana*, *Polygonatum verticillatum*, etc. The priority of the species is given in **Table 9**.

**Table 9: Medicinal Plants of Tipra-Mashdoh Area of Chopal Range, Rampur Cluster, Himachal Pradesh**

| Sr. No. | Botanical Name                               | Preference Priority | Habit | Family         | Habitat (s)* | Part(s) Used | Uses   | Status    |
|---------|--|---------------------|-------|----------------|--------------|--------------|--|-----------|
| 1.      | <i>Angelica glauca</i> Edgew.                | 1                   | Herb  | Apiaceae       | F            | Roots        | Stomachic, carminative, stimulant, improve digestion, stomachache, and also used as spices                   | Less      |
| 2.      | <i>Polygonatum cirrhifolium</i> (Wall.)Royle | 2                   | Herb  | Asparagaceae   | F            | Rhizome      | Ingredients of Astaverga, general weakness, aphrodisiac, antispasmodic and antidiarrheal                     | Less      |
| 3.      | <i>Taxus wallichiana</i> Zucc.               | 3                   | Tree  | Taxaceae       | F            | Bark, Leaves | Anti-cancerous   | Less      |
| 4.      | <i>Polygonatum verticillatum</i> (L.)All.    | 4                   | Herb  | Asparagaceae   | F            | Rhizome      | Ingredients of Astaverga, heart problem, general weakness, aphrodisiac antispasmodic and antidiarrheal       | Less      |
| 5.      | <i>Valeriana jatamansi</i> Jones             | 5                   | Herb  | Caprifoliaceae | F, AFB, CL   | Roots        | Insect repelling, sedative, neurotoxic, cytotoxic, antidepressant, antioxidant, and antimicrobial activities | Available |
| 6.      | <i>Pistacia chinensis</i> subsp.             | 6                   | Tree  | Anacardiaceae  | F, AFB, CL   | Fruit        | Cough, asthma, dysentery, liver disorders and for  | Available |

|     |   |    |       |                   |               |                 |   |           |
|-----|---|----|-------|-------------------|---------------|-----------------|---|-----------|
|     | <i>Integerrima</i><br>(J.L. Stewart<br>ex<br>Brandis)Rech.<br>f.                                    |    |       |                   |               |                 | snake bite.   |           |
| 7.  | <i>Juglans regia</i><br>L.  | 7  | Tree  | Juglandaceae      | F, AFB,<br>CL | Leaves,<br>Stem | Constipation,<br>coughs, asthma,<br>diarrhoea   | Less      |
| 8.  | <i>Prunus</i><br><i>campanulata</i><br>( <i>Prunus</i><br><i>cerasoides</i> )Ma<br>xim.             | 8  | Tree  | Rosaceae          | F, AFB,<br>CL | Fruit, Bark     | Treat vomiting,<br>Nausea and<br>Gastritis.   | Less      |
| 9.  | <i>Ajuga</i><br><i>integrifolia</i><br>Buch.-Ham.   | 9  | Herb  | Lamiaceae         | F, CL         | Whole<br>plants | Hypertension,<br>jaundice, wounds<br>Hair loss<br>treatment, diuretic,<br>stimulant and<br>tonic                          | Available |
| 10. | <i>Ocimum</i><br><i>tenuiflorum</i> L.  | 10 | Herb  | Lamiaceae         | CL            | Whole<br>plants | Cough , cold,<br>Fever, Throat<br>infection   | Less      |
| 11. | <i>Zanthoxylum</i><br><i>armatum</i> DC.  | 11 | Shrub | Rutaceae          | F, CL         | Fruit           | Tooth brush,<br>toothache   | Available |
| 12. | <i>Pyrus pashia</i><br>Buch Ham ex<br>D. Don  | 12 | Tree  | Rosaceae          | F, CL         | Fruit           | Gastrointestinal<br>disorders, fever<br>and headache,<br>sweating of body,<br>antimicrobial,<br>antioxidant,<br>stomachic | Available |
| 13. | <i>Ricinus</i><br><i>communis</i> L.  | 13 | Shrub | Euphorbiacea<br>e | F, CL         | Fruit           | Abdominal<br>disorders, arthritis,<br>Backache, muscle<br>aches,  | Less      |
| 14. | <i>Girardinia</i><br><i>diversifolia</i><br>( <i>Urtica</i><br><i>heterophylla</i> )<br>(Link)Friis | 14 | Herb  | Urticaceae        | F, CL         | Leaves          | Asthma, gastritis,<br>headache, joint<br>pain, tuberculosis,<br>reduce nasal  | Available |
| 15. | <i>Berberis</i><br><i>aristata</i> DC.  | 15 | Shrub | Berberidacea<br>e | F, AFB,<br>CL | Root            | Medicine for eye,<br>piles, sugar,<br>antibacterial,<br>antiperiodic,<br>antidiarrheal and<br>anticancer                  | Available |
| 16. | <i>Viola odorata</i><br>L.  | 16 | Herb  | Violaceae         | F, CL         | Whole<br>Plant  | Cold, cough,<br>Fever   | Less      |
| 17. | <i>Urtica dioica</i><br>L.  | 17 | Herb  | Urticaceae        | F, CL         | Leaves          | Reduce nasal<br>inflammation and<br>ease allergy<br>symptoms,<br>hypertension   | Available |

\*F: Forest, CL: Community Land, and AFB: Agricultural Field Boundary

### 8.9.3 Potential areas within the cluster for production of Medicinal and Aromatic Plants

The discussion with VFDC members, villagers and Panchayat body was held regarding the potential area for production of the Medicinal and Aromatic Plants. Two plantations of 8 hectare and 10 hectare will be raised under JICA in the region. People were of the opinion that some medicinal tree species can be planted in this area.

First plantation site, Tipra-DPF is located at N 31°59'15.8" latitude and E 077°32'59.05" longitude having an altitude of 2364m amsl, falling in Shilikian beat, Jhiknipul Block Chopal range of Chopal forest division. The plantation area already has rich density of Deodar trees and only medicinal herbs can be planted in the open patches. Only few trees species can be planted in the open patches available if any.

Second plantation site, Tipra- UPF located at N 31°00'08.0" latitude and E 077°33'35.0" longitude having an altitude of 1930m amsl, falling in Shilikian beat, Jhiknipul Block, Chopal range of Chopal forest division.

**8.9.4 Current Production:** The data on production of medicinal plants of the region is not available with villagers, VFDC, panchayat as well as with Forest Department

**8.9.5 Potential Production:** Species such as *Angelica glauca*, *Polygonatum cirrhifolium*, *Taxus wallichiana*, *Polygonatum verticillatum*, *Pistacia chinensis* ssp. *integerrima*, *Prunus campanulata* (*Prunus cerasoides*), etc. can be grown in the region as these species are preferred by the people.

**8.9.6 Regeneration Status:** The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was found moderate.

**8.9.7 Threat in Conservation:** The major threats for the conservations of Medicinal and Aromatic Plants includes, grazing pressures, forest fires and drought.

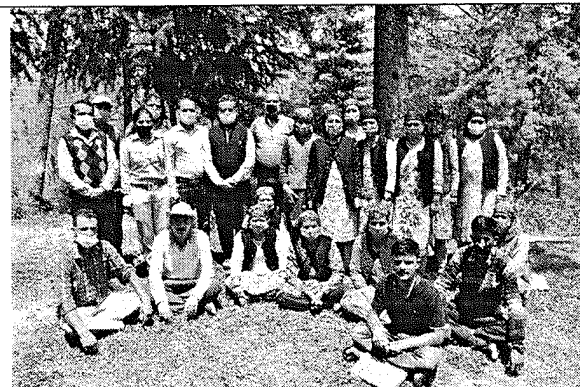
**Glimpses of the Meetings with VFDC and Plantation areas**



**Meetings with Tipra-Mashroh VFDC**



**Meetings with Tipra Mashroh VFDC**



**Meetings with Tipra-Mashroh VFDC**



**Plantation Site Tipra-UPF 10 Hectare**



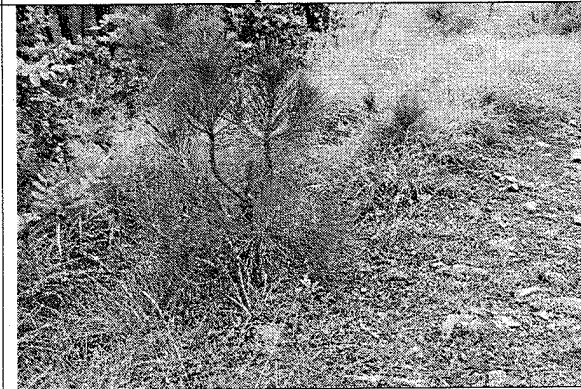
**Plantation Site Tipra-DPF 10 Hectare**



**Plantation Site Tipra-UPF 10 Hectare**



**Plantation Site Tipra-DPF 8 Hectare**



**Plantation Site Tipra-UPF 8 Hectare**



**8.10 Jubbar VFDC:** The Jubbar VFDC of Jubbar Panchayat falls in Rampur cluster in Jubbar beat, Maraog Block, Chopal forest range of Chopal forest division. The outcomes of study on Medicinal and Aromatic Plants of the region are described below:

**8.10.1 Medicinal Plants and their Status in Jubbar Region:** A total of 18 important medicinal plants belonging to 16 families were recorded from the area. Of which, 04 species were trees, 02 shrubs and 12 herbs. These medicinal plants were found in scattered form in forests, agricultural field boundaries and community land. The number of these medicinal species in natural habitat was less. The important information on these medicinal plants is given in **Table 10**.

**8.10.2 Preference Priority of medicinal plants:** The data on Medicinal and Aromatic Plants was collected through semi-structured interviews. The analysis of data showed that *Angelica glauca* and *Taxus wallichiana* were the most preferred species, followed by *Polygonatum cirrhifolium*, *Pistacia chinensis* ssp. *integerrima*, *Polygonatum verticillatum*, etc. The species with different priority rank, habit, habitat(s), part(s) used, uses and status is given in **Table 10**.

**Table 10: Medicinal Plants of Jubbar VFDC Area of Chopal Range, Rampur Cluster, Himachal Pradesh**

| Sr. No. | Botanical Name   | Preference Priority | Habit | Family          | Habit at(s)* | Part(s) Used | Uses   | Status    |
|---------|--|---------------------|-------|-----------------|--------------|--------------|--|-----------|
| 1.      | <i>Angelica glauca</i><br>Edgew.   | 1                   | Herb  | <u>Apiaceae</u> | F            | Roots        | Carminative, stimulant, improve digestion, Stomachache, and also used as spices          | Less      |
| 2.      | <i>Taxus wallichiana</i><br>Zucc.  | 2                   | Tree  | <u>Taxaceae</u> | F            | Bark, Leaves | Anti-cancerous   | Available |
| 3.      | <i>Polygonatum cirrhifolium</i><br>(Wall.)Royle                                      | 3                   | Herb  | Asparagaceae    | F            | Rhizome      | Ingredients of Astaverga, general weakness, aphrodisiac, antispasmodic and antidiarrheal | Less      |
| 4.      | <i>Pistacia chinensis</i> ssp. <i>integerrima</i> (J. L. Stewart ex Brandis)Rech. f. | 4                   | Tree  | Anacardiaceae   | F, AFB, CL   | Fruit        | Cough, asthma, dysentery, liver disorders and for snake bite.                            | Available |
| 5.      | <i>Polygonatum verticillatum</i> (L.)All.  | 5                   | Herb  | Asparagaceae    | F            | Rhizome      | Ingredients of Astaverga, Heart problem, general   | Less      |

|     |   |    |       |                |                  |                     |  |           |
|-----|---|----|-------|----------------|------------------|---------------------|--|-----------|
|     |   |    |       |                |                  |                     | weakness,<br>aphrodisiac<br>antispasmodic<br>and<br>antidiarrheal  |           |
| 6.  | <i>Dioscorea deltoidea</i><br>Wall. ex<br>Griseb.     | 6  | Herb  | Dioscoreaceae  | F                | Rhizome             | Digestive disorders, sore throat, diarrhea, abdominal pain, wounds, burns, anemia, rheumatic arthritis, preparation of sex hormones    | Very Less |
| 7.  | <i>Valeriana jatamansi</i><br>Jones                   | 7  | Herb  | Caprifoliaceae | F,<br>AFB,<br>CL | Roots               | Insect repelling, antihelmethic properties, sedative, neurotoxic, cytotoxic, antidepressant, antioxidant, and antimicrobial activities | Available |
| 8.  | <i>Zanthoxylum armatum</i> DC.                        | 8  | Shrub | Rutaceae       | F, CL            | Fruit               | Tooth brush, toothache   | Available |
| 9.  | <i>Berberis aristata</i> DC.                          | 9  | Shrub | Berberidaceae  | F,<br>AFB,<br>CL | Root                | Medicine for eye, piles, sugar, antibacterial, antiperiodic, antidiarrheal and anticancer  | Available |
| 10. | <i>Ajuga integrifolia</i><br>Buch.-Ham                | 10 | Herb  | Lamiaceae      | F, CL            | Whole plants        | Hypertension, jaundice, wounds, hair loss treatment, aromatic, astringent, depurative, diuretic, stimulant and tonic                   | Available |
| 11. | <i>Juglans regia</i><br>L.                            | 11 | Tree  | Juglandaceae   | F,<br>AFB,<br>CL | Leaves, Stem        | Constipation, coughs, asthma, diarrhoea  | Less      |
| 12. | <i>Solanum xanthocarpum</i><br>Schrad. & H.<br>Wendl. | 12 | Herb  | Solanaceae     | F, CL            | Fruit and<br>Leaves | Dental problems  | Less      |

|     |   |    |      |                |            |                   |  |           |
|-----|---|----|------|----------------|------------|-------------------|--|-----------|
| 13. | <i>Pyrus pashia</i><br>Buch Ham ex<br>D. Don                                    | 13 | Tree | Rosaceae       | F, CL      | Fruit             | Gastrointestinal disorders, Fever and headache, sweating of body, antimicrobial, antioxidant, stomachic and hypoglycemic | Available |
| 14. | <i>Rumex hastatus</i> D.<br>Don.  | 14 | Herb | Polygonaceae   | F, AFB, CL | Leaves, Roots     | Liver Tonic, Diabetes  | Available |
| 15. | <i>Girardinia diversifolia</i><br>( <i>Urtica heterophylla</i> )<br>(Link)Friis | 15 | Herb | Urticaceae     | F, CL      | Leaves            | Asthma, gastritis, headache, joint pain, tuberculosis reduce nasal inflammation and ease allergy symptoms                | Available |
| 16. | <i>Viola canescens</i><br>Wall.   | 16 | Herb | Violaceae      | F, CL      | Whole Plant       | Cold, cough, Fever   | Less      |
| 17. | <i>Arisaema</i> spp.  | 17 | Herb | <u>Araceae</u> | F, CL      | Tuber and Rhizome | Treatment of asthma, bronchitis, cold, cough Skin disease.   | Available |
| 18. | <i>Urtica dioica</i><br>L.  | 18 | Herb | Urticaceae     | F, CL      | Leaves            | Reduce nasal inflammation and ease allergy symptoms, hypertension  | Available |

\*F: Forest, CL: Community Land, and AFB: Agricultural Field Boundary

### 8.10.3 Potential areas within the cluster for production of Medicinal and Aromatic Plants

The discussion with VFDC members, villagers and Panchayat body was held about the potential area and availability of area for production of the Medicinal and Aromatic Plants. Plantation area Dhurla-DPF 16 hectare will be raised under JICA in the region. People were of the opinion that some medicinal tree species can be planted in this area. They were reluctant to spare additional area for the plantation of Medicinal and Aromatic Plants.

The plantation site Dhurla-DPF is located at N 31°01'33.7" latitude and E 077°31'55.6" longitude having an altitude of 2648m amsl, falling in Jubbar beat, Maraog block, Chopal range of Chopal forest division.

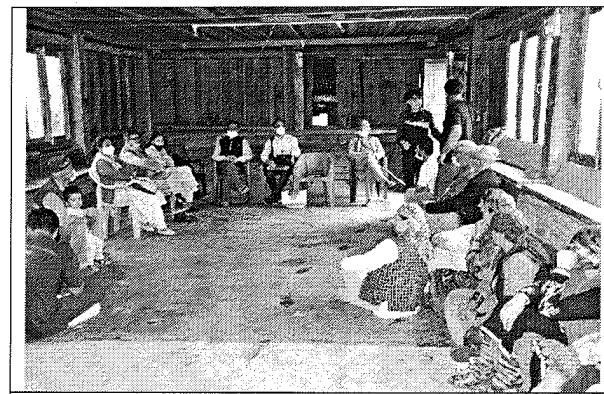
**8.10.4 Current Production:** The data on production of medicinal plants of the region is not available with villagers, VFDC, panchayat as well as with Forest Department

**8.10.5 Potential Production:** Species such as *Angelica glauca*, *Taxus wallichiana*, *Polygonatum cirrhifolium*, *Pistacia chinensis* ssp. *integerrima*, *Polygonatum verticillatum*, *Dioscorea deltoidea*, etc. can be grown in the region as these species are preferred by the people.

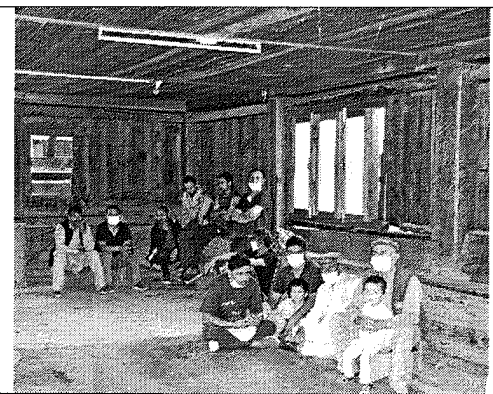
**8.10.6 Regeneration Status:** The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was found moderate.

**8.10.7 Threat in Conservation:** The major threats for the conservations of Medicinal and Aromatic Plants includes, grazing pressures, forest fires, drought, etc.

### Glimpses of the Meetings with Jubbar VFDC and Plantation areas



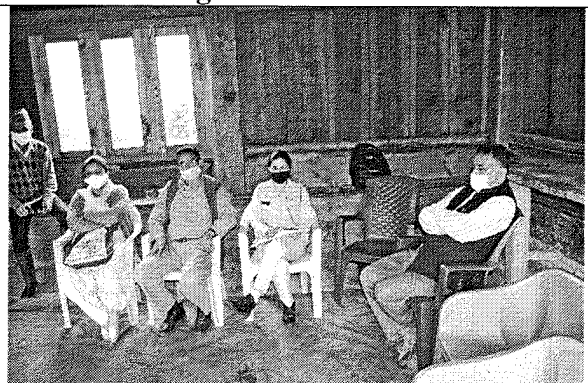
Meetings with Jubbar VFDC



Meetings with Jubbar VFDC



Meetings with Jubbar VFDC



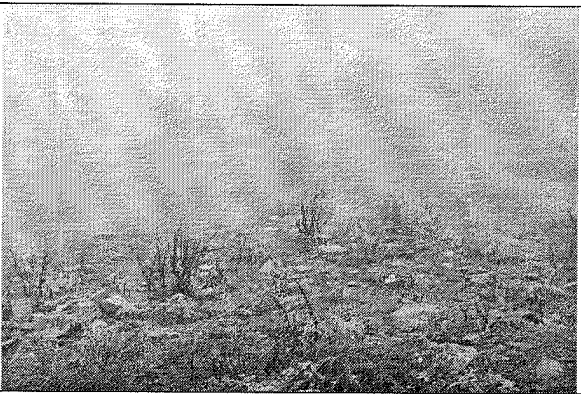
Jubbar Village



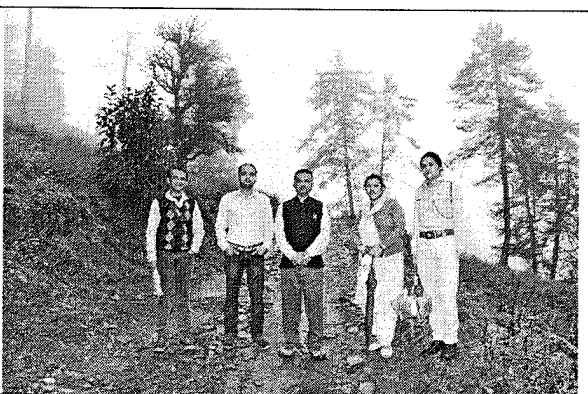
Plantation Site Dhurla-DPF 16 Hectare



Plantation Site Dhurla-DPF 16 Hectare



Plantation Site Dhurla-DPF 16 Hectare



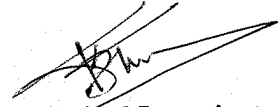
Plantation Site Dhurla-DPF 16 Hectare

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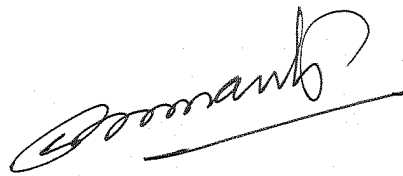
**Signature of Principal Investigator**

**Dr. Jagdish Singh, Scientist-F**



**Signature of Principal Investigator**

**Dr. Sandeep Sharma, Scientist-G**



**Signature of Project Coordinator**

**Dr. S. S. Samant, Director,  
HFRI, Shimla**