

Report

on

‘Assessment of potentiality and production of Medicinal and 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.)

Implemented 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, Panthaghati, Shimla-171013, Himachal Pradesh

Report

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‘Assessment of potentiality and production of Medicinal and 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 surveys 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, *Sinopodophyllum hexandrum* Royle, *Picrorhiza kurroa* Royle ex Benth., *Angelica glauca* Edgew. and *Valeriana jatamansi* Jones have been improved 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. Under the proposed project, we intend to strengthen those nurseries by establishing additional facilities viz., Poly House, Shade House and strengthening irrigation facilities and modern nursery tools and implements as for raising quality planting stock, the above mentioned modern facilities in the nurseries are essentially required. The Institute has expertise in establishing such facilities as it has already established ‘Forest Model Nursery’ at Baragaon, Shimla, and ‘Technology Demonstration and Research Centre’ at Bir Plasi, Nalagarh (H.P.) with modern green houses and shade houses, etc. It is essential, to establish such facilities 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 medicinal plant species have very good regional national and international market. Therefore, it is right time that Quality Planting Material (QPM) of these medicinal plants be multiplied and distributed to the

farming community of temperate Himalaya through active extension and awareness programmes viz., visits, training, demonstration, on-farm cultivation, etc., and 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. Subsequently, prioritization of important medicinal plants for different regions and identification of specific sites in these regions 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

- To identify the potential areas within the cluster for production of Medicinal & Aromatic Plants
- To estimate the current level of production of different Medicinal & Aromatic Plants
- To assess the status regeneration of different Medicinal & Aromatic Plants
- To identify the issues in conservation, regeneration, harvesting and management of Medicinal & Aromatic Plants in the cluster
- To 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), Shimla (H.P.)

4. Target Areas

List of VFDCs as given by JICA- PIHPFEM&L for the present study:

Name of Cluster	Range	VFDC	Panchayat
Rohru	Saraswati Nagar	Chhajpur Valley	Anti
		Badiyar	Nandpur
Rampur	Balson	Dhaghli	Balag
		Lower Mundu	Mundu
	Nerwa	Dhalewna	Nerwa
		Nerwa	Khadder
Rampur	Taradevi	Panesh	Galot
		Talyal	Mylijhejar
Rohru	Khashdhar	Rohal I	Rohal
		Dali-1, Dali-2	Dhakgaon

5. Approach and Methodology

Field visits were conducted throughout the targeted VFDCs of the clusters Rampur and Rohru. This involved reconnaissance survey and interactions with the VFDCs members, panchayat bodies and villagers. The data on Medicinal and Aromatic Plants were recorded through semi-structured interviews and informal discussion. Besides that, data on local plant names, parts used, availability, traditional uses, methods of collection and mode of consumption was recorded (**Annexure 1**). The priority species were identified as per the preference given by people during semi-structured interviews. The species preferred by maximum number of the people was considered most important and was assigned first rank.

5.1 Potential area for Medicinal and Aromatic Plants production

The VFDCs committee, 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, etc. and, range offices of Forest Department were contacted and data were recorded accordingly.

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

Survey of the area was carried out and observations such as geographical conditions of the region, climate, biotic pressure, etc. were recorded. Besides, discussions with VFDCs Committee, Panchayat Bodies and concerned forest officials were held to identify the issues and concerns.

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 plans are suggested.

6. Duration of the work: 1st September, 2020 to 24th December, 2020.

Due to COVID-19 pandemic, work could not be completed within one month as per agreement. People in VFDCs were also reluctant to meet the outside people. Moreover, from constituted HFRI team, some of core members were tested positive for COVID-19

and therefore, quarantined for stipulated period.

7. Human resources involved in the work

i. Coordinator:	Dr. S.S. Samant, Director, HFRI, Shimla
ii. Nodal Officer:	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-C, HFRI, Shimla
vi. Project Associate:	Dr. Joginder Singh, CTO, HFRI, Shimla
vii. Project Associate:	Sh Jawala Prasad, TO, 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 is as follows:

8.1 Talyal VFDC

The Talayal VFDC of Mayli Jajar panchayat falls in Rampur cluster in Kalihatti Beat, Taradevi forest range of Shimla forest division. Talyal is located at 31°08'07.7" N latitude 077°02'10.8" E longitude at 1302 m amsl.

8.1.1 Medicinal Plants and their Status in Talyal Region

A total of 12 important medicinal plants species belong to nine families were recorded from the area. Of which, 4 species were trees, 4 shrubs and 4 herbs. The most of these medicinal 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 details of the important medicinal plants of the region are given in **Table 1**.

8.1.2 Priority of medicinal plants: The data on Medicinal and Aromatic Plants was collected through semi-structured questionnaires and interviews. The analysis of data showed that *Phyllanthus emblica* is most preferred species, followed by *Valeriana jatamansi*, *Acacia catechu*, etc. (**Table 1**).

Table 1: Medicinal Plants of Talyal VFDC of Tara Devi Range, Rampur Cluster, Himachal Pradesh

Sr. No.	Botanical Name	Local Name	Priority Rank	Habit	Family	Habitat*	Part Used	Uses	Status
1.	<i>Phyllanthus emblica</i>	Ambla	1	Tree	Phyllanthaceae	F, AFB, CL	Fruits	Pickle, Chutney	Less
2.	<i>Valeriana jatamansi</i>	Nihani	2	Herb	Caprifoliaceae	F, AFB, CL	Roots	Headache	Available
3.	<i>Acacia catechu</i>	Khair	3	Tree	Leguminosae	F, AFB, CL	Bark	Katha	Less
4.	<i>Aloe vera</i>	Aloevera	4	Herb	Xanthorrhoeaceae	CL	Leaves	Skin eruption cure	Less
5.	<i>Terminalia bellirica</i>	Behra	5	Tree	Combretaceae	F, AFB, CL	Fruit	<i>Trifala churn</i>	Less
6.	<i>Punica granatum</i>	Anar	6	Tree	Lythraceae	F, AFB, CL	Fruit	<i>Anardana</i>	Less
7.	<i>Berberis lycium</i>	Kashmal	7	Shrub	Berberidaceae	F, AFB, CL	Roots	Rasont for piles	Available
8.	<i>Prinsepia utilis</i>	Bekhal	8	Shrub	Rosaceae	AFB, CL	Fruits/Seeds	Oil for body massage	Less
9.	<i>Origanum vulgare</i>	Katia	9	Herb	Lamiaceae	F, AFB, CL	Leaves	Minor cut	Available
10.	<i>Viola serpens</i>	Vanaksha	10	Herb	Violaceae	F, CL	Flowers and leaves	Cough	Available
11.	<i>Zanthoxylum armatum</i>	Tirmur	11	Shrub	Rutaceae	AFB, CL	Twigs, leaves and fruits	Toothache, Cold, spices	Less
12.	<i>Vitex negundo</i>	Vana	12	Shrub	Lamiaceae	AFB, CL	Leaves	Sprain	Available

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

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. A plantation area of 10 ha has been 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 of Kalihatti is located at 31°08'08.5" N latitude and 077°02'20.1" E

longitude having an altitude of 1389 m amsl, falling in Kalihatti beat, Taradevi range of Shimla forest division. Glimpses of meeting held and site for plantation have been depicted in **Plate-1**

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

8.1.5 Potential Production: Species such as *Phyllanthus emblica*, *Valeriana jatamansi*, *Acacia catechu* and *Punica granatum* can be grown in the region as these species are preferred by the people.

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

8.2. Panesh VFDC

The Panesh VFDC of Galot Panchayat falls in Rampur cluster in Kaljun beat, Taradevi forest range of Shimla forest division. The Panesh is located at 31⁰06'52.7" N latitude and 077⁰03'47.4" E longitude at 1430 m amsl.

8.2.1 Medicinal Plants and their Status in Panesh Region: A total of 10 important medicinal plants belonging to nine families were recorded from the area. Of which, 03 species were trees, 04 shrubs and 03 herbs. These medicinal plants are found in scattered form in forests, agricultural field boundary and community land. The number of these medicinal plants in natural habitat is less. The important information on these medicinal plants is given in **Table 2**.

8.2.2 Priority of medicinal plants: The data on Medicinal and Aromatic Plant was collected through semi-structured questionnaire and interviews. The analysis of data shows that *Phyllanthus emblica* is most preferred species, followed by *Valeriana jatamansi*, *Acacia catechu*, etc. The species with different priority rank, habit, habitat, parts used, uses and status is given in **Table 2**.

Table 2: Medicinal Plants of Panesh VFDC Area of Tara Devi Range, Rampur Cluster, Himachal Pradesh

Sr. No	Botanical Name	Local Name	Priority Rank	Habit	Family	Habitat *	Part Used	Uses	Status
1	<i>Phyllanthus emblica</i>	Ambla	1	Tree	Phyllanthaceae	F, AFB, CL	Fruits	Pickle, Chutney	Less
2	<i>Valeriana jatamansi</i>	Nihani	2	Herb	Caprifoliaceae	F, AFB, CL	Roots	Headache	Available
3	<i>Acacia catechu</i>	Khair	3	Tree	Leguminosae	F, AFB, CL	Bark		Less
4	<i>Punica granatum</i>	Anar	4	Shrub	Lythraceae	F, AFB, CL	Fruit	Anardana	Less
5	<i>Terminalia ballirica</i>	Behra	5	Tree	Combretaceae	F, AFB, CL	Fruit	Trifala churn	Less
6	<i>Viola serpens</i>	Vanaksha	6	Herb	Violaceae	F, CL	Flowers and leaves	Cough	Available
7	<i>Berberis lycium</i>	Kashmal	7	Shrub	Berberidaceae	F, AFB, CL	Roots	Rasont for piles	Available
8	<i>Aloe vera</i>	Aloevera	8	Herb	Xanthorrhoeaceae	CL	Leaves	Skin eruption cure	Less
9	<i>Zanthoxylum armatum</i>	Timur	9	Shrub	Rutaceae	AFB, CL	Twigs, leaves and fruits	Toothache, Cold, spices	
10	<i>Vitex negundo</i>	Vana	10	Shrub	Lamiaceae	AFB, CL	Leaves	Sprain	Available

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

8.2.3 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 the production of Medicinal and Aromatic Plants. A plantation area of 10 ha has been 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 species.

The plantation site of Panesh is located at N 31°06'34.3" latitude and E 077°03'14.7" longitude having an altitude of 1419 m amsl, falling in Kaljun beat, Taradevi range of Shimla forest division. Glimpses of meeting held and sites for plantation have been depicted in **Plate**

2.

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

8.2.5 Potential Production: Species such as *Phyllanthus emblica*, *Valeriana jatamansi*, *Acacia catechu*, *Punica granatum*, etc. can be grown in the region as these species are preferred by the people.

8.2.6 Regeneration Status: The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was not observed.

8.2.7 Threat in Conservation: The major threats for the conservations of Medicinal and Aromatic Plants in the area include; grazing pressures, forest fires, drought and not having proper management of the species.

Plate 1: Glimpses of Meeting of VFDC Panesh and General Plantation sites under JICA



Plate 2: Glimpses of Meeting of VFDC Talayal and General Plantation sites under JICA



8.3 Lower Mundu VFDC

The Lower Mundu VFDC of Mundu panchayat falls in Rampur cluster in Balag beat, Ghorna Block, Balson forest range of Shimla forest division.

8.3.1 Medicinal Plants and their Status in Dhaghli Region: A total of 14 important medicinal plants belonging to thirteen families were recorded from the area. Of which, 5 species were trees, 4 shrubs and 5 herbs. The most of these medicinal plants species 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 details of the important medicinal plants species of the region is given in **Table 3**.

8.3.2 Priority of medicinal plants species: The data on medicinal and aromatic plant species was collected through semi-structured interviews. The analysis of data shows that *Punica granatum* is most preferred species followed by *Prunus cerasoides*, *Pistacia integerrima*, and *Aloe vera*, etc. The priority of the species is given in **Table 3**.

Table 3: Medicinal Plant Species of Lower Mundu VFDC of Balson Range, Rampur Cluster, Himachal Pradesh

Sr. No.	Name of MAPs	Local Name	Priority Rank	Habit	Family	Habitat*	Part Used	Uses	Status
1	<i>Punica granatum</i>	Anar	1	Tree	Lythraceae	F, AFB, CL	Fruit	Coughs, Urinary Infections	Less
2	<i>Prunus cerasoides</i>	Pajja	2	Tree	Rosaceae	F, AFB, CL	Fruit, Bark	Treat vomiting, Nausea and Gastritis.	Less
3	<i>Pistacia integerrima</i>	Kakkar singi	3	Tree	Anacardiaceae	F, AFB, CL	Fruit	Cough, asthma, dysentery, liver disorders and for snake bite.	Less
4	<i>Aloe vera</i>	Aloe vera	4	Herb	Xanthorrhoeaceae	F, CL	Leaves	Skin tonner	Less
5	<i>Berberis lycium</i>	Kashmal	5	Shrub	Berberidaceae	F, AFB, CL	Root	Rason for eye, piles, sugar	Available
6	<i>Juglans regia</i>	Akhrot	6	Tree	Juglandaceae	F, AFB, CL	Leaves, Stem	Constipation, Chronic Coughs, Asthma, Diarrhoea	Less
7	<i>Ocimum spp.</i>	Tulsi	7	Herb	Lamiaceae	F, CL	Whole plants	Cough, Cold, Fever, Throat infection	Less
8	<i>Valeriana jatamansi</i>	Nihani	8	Herb	Caprifoliaceae	F, AFB,	Roots	Headache	Available

						CL			
9	<i>Prinsepia utilis</i>	Bekhal	9	Shrub	Rosaceae	AFB, CL	Fruit s/Seed	Oil for body massage	Less
10	<i>Zanthoxylum armatum</i>	Timur	10	Shrub	Rutaceae	F, CL	Fruit	Toothache	Available
11	<i>Angelica glauca</i>	Chora, Choreyi	11	Herb	Apiaceae	F, AFB	Roots	Gastric problem	Available
12	<i>Pyrus pashia</i>	Kainth	12	Tree	Rosaceae	F, CL	Fruit	Gastrointestinal disorders, Fever and Headache, Sweating of body	Available
13	<i>Riscinus communis</i>	Arndi	13	Shrub	Euphorbiaceae	F, CL	Fruit	Abdominal disorders, Arthritis, Backache, Muscle aches	Less
14	<i>Urtica dioica</i>	Kikia, Karla	14	Herb	Urticaceae	F, CL	Leaves	Reduce Nasal Inflammation	Available

*F: Forest, CL: Community Land, 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. Two plantations of 4 ha and 6 ha have been 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 have been depicted in **Plate 3**.

First plantation site Dhartma is located at 31°01'32.49" N latitude and 077°23'37.30" E longitude having an altitude of 1670m amsl, falling in Balag beat, Ghorna Block Balson range of Shimla forest division. Second plantation site Lower Mundu is located at 31°02'17.31" N latitude and 077°23'27.54" E longitude having an altitude of 1694m amsl, falling in Balag beat, Ghorna Block, Balson range of Shimla forest division.

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

8.3.5 Potential Production: Species such as *Angelica glauca*, *Prunus cerasoides*, *Pistacia integerrima*, *Aloe vera*, *Berberis lycium*, *Juglans regia*, etc. can be grown in the region as these species are preferred by the people.

8.3.6 Threat in Conservation: The major threats for the conservation of Medicinal and Aromatic Plants include, grazing pressures, forest fires and drought.

Plate 8.3: Some Glimpses of the Meetings with Mundu VFDC and Plantation areas



Meetings with Lower Mundu VFDC



Meetings with Lower Mundu VFDC



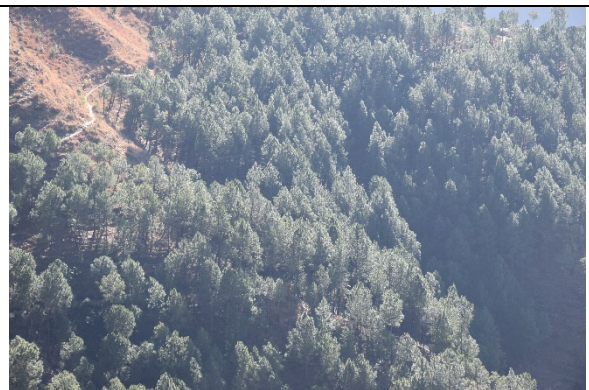
Meetings with Lower Mundu VFDC



Plantation Site Dhartma 4 ha



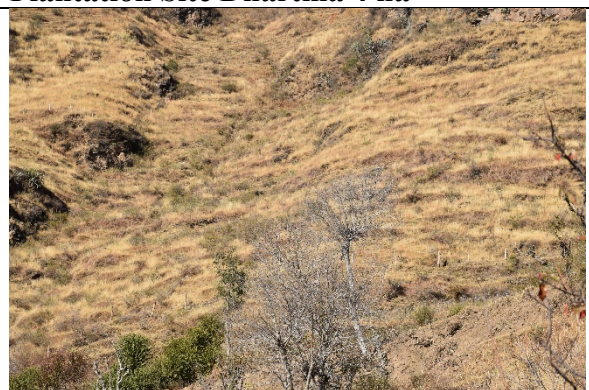
Plantation Site Dhartma 4 ha



Plantation Site Dhartma 4 ha



Plantation Site Lower Mundu 6 ha



Plantation Site Lower Mundu 6 ha

8.4. Dhaghli VFDC

The Dhaghli VFDC of Balag panchayat falls in Rampur cluster in Balag beat, Ghorna Block Balson forest range of Shimla forest division. The outcomes of study on medicinal and aromatic plants of the region are described below.

8.4.1 Medicinal Plants and their Status in Dhaghli Region: A total of 13 important medicinal plants species belonging to thirteen families were recorded from the area. Of which, 05 species were trees, 02 shrubs and 06 herbs. These medicinal plants species 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 4**.

8.4.2 Priority of medicinal plants species: The data on medicinal and aromatic plant species was collected through semi-structured interviews. The analysis of data shows that *Punica granatum* is most preferred species followed by *Berberis lycium*, *Bauhinia variegata*, *Juglans regia*, *Pistacia integerrima*, etc. The species with priority rank, habit, habitat, part used, uses and status is given in **Table 4**.

Table 4: Medicinal Plant Species of Dhaghli VFDC Area of Balson Range, Rampur Cluster, Himachal Pradesh

Sr. No	Botanical Name	Local Name	Priority Rank	Habit	Family	Habitat *	Part Used	Uses
1	<i>Punica granatum</i>	Anar	1	Tree	Lythraceae	F, CL	Fruit	Coughs, Urinary Infections
2	<i>Berberis lycium</i>	Kashamal	2	Shrub	Berberidaceae	F, CL	Root	Rason for eye, piles
3	<i>Valeriana jatamansi</i>	Nihani	3	Herb	Caprifoliaceae	F, AFB, CL	Roots	Headache
4	<i>Juglans regia</i>	Akhrot	4	Tree	Juglandaceae	F, CL	Leaves, Stem	Constipation, Chronic Coughs, Asthma
5	<i>Pistacia integerrima</i>	Kakkar singi	5	Tree	Anacardiaceae	F, CL	Fruit	Cough, asthma, dysentery, liver disorders and for snake bite.
6	<i>Aloe vera</i>	<i>Aloe vera</i>	6	Herb	Xanthorrhoeaceae	F, CL	Leaves	Skin tonner
7	<i>Angelica glauca</i>	Chora, Choreyi	7	Herb	Apiaceae	F, AFB	Roots	Gastric problem
8	<i>Ficus palmata</i>	Fegda	8	Tree	Moraceae	F, CL	Fruit, Latex	Skin Scars
9	<i>Zanthoxylum armatum</i>	Timur	9	Shrub	Rutaceae	F, CL	Fruit	Toothache

10	<i>Pyrus pashia</i>	Kainth	10	Tree	Rosaceae	F, CL	Fruit	Gastrointestinal disorders, Fever and Headache, Sweating of body
11	<i>Urtica dioica</i>	Kukua, Karla	11	Herb	Urticaceae	F, CL	Leaves	Reduce Nasal Inflammation and Ease Allergy Symptoms
12	<i>Isodon rugosus</i>	Akhrot	12	Herb	Lamiaceae	F, AFB, CL	Leaves	Fever and Headache, Sweating of body
13	<i>Rumex hastatus</i>	Almoda	13	Herb	Polygonaceae	F, AFB, CL	Leaves, Roots	Liver Tonic, Diabetes

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

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 the production of Medicinal and Aromatic Plants. Two Plantation areas U-369 and Dhaghli of 4 hectare and 6 hectare, respectively have been raised under JICA in the region. People were of the opinion that some medicinal trees, shrubs and herbs can be planted in this area. They were reluctant to spare additional area for the plantation of Medicinal and Aromatic Plants species. Glimpses of meeting held and site for plantation has been depicted in **Plate 4**.

The plantation site U-369 is located at 31°03'03.71" N latitude and 077°22'46.40" E longitude having an altitude of 1408 m amsl, falling in Balag beat, Ghorna block, Balson range of Shimla forest division. Other plantation site Dhaghli 6 Hectare is located at N 31°02'50.01" latitude and E 077°23'00.09" longitude having an altitude of 1665 m amsl, falling in Balag beat, Ghorna block, Balson range of Shimla forest division.

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 Forest Department

8.4.5 Potential Production: Species such as *Punica granatum*, *Berberis lycium*, *Angelica glauca*, *Juglans regia*, and *Pistacia integerrima* can be grown in the region as these species are preferred by the people.

8.4.6 Threat in Conservation: The major threats for the conservation of Medicinal and Aromatic Plants include, grazing pressures, forest fires and drought.

Plate 4: Some Glimpses of the Meetings with Dhaghli VFDC and Plantation areas



Meetings with Dhaghli VFDC



Meetings with Dhaghli VFDC



Dhaghli Village



Plantation Site Dhaghli 6 Hectare



Plantation Site U-369- 4 Hectare



Plantation Site U369- 4 Hectare

8.5. Dhalewana VFDC

The Dhalewana VFDC of Nerwa panchayat falls in Rampur cluster in Dhalewana beat, Khadder Block, Nerwa forest range of Chopal forest division. The outcomes of study on Medicinal and Aromatic Plants of the region are given below.

8.5.1 Medicinal Plants and their Status in Dhalewana Region: A total of 13 important medicinal plants species belonging to eleven families were recorded from the area. Of which, 5 species were trees, 2 shrubs and 6 herbs. The most of these medicinal plants are found in scattered form in forests, agricultural field boundaries and community land. The number of these medicinal plants in natural habitat was less. The details of the important medicinal plants species of the region are given in **Table 5**.

8.5.2 Priority of medicinal plants species: The data on Medicinal and Aromatic Plants was collected through semi-structured questionnaire and interviews. The analysis of data shows that *Spindus mukorossi* is most preferred species, followed by *Angelica glauca*, *Sinopodophyllum hexandrum*, *Valeriana jatamansi*, *Juglans regia*, etc. The priority of the species is given in **Table 5**.

Table 5: Medicinal Plant Species of Dhalewana VFDC of Nerwa Range, Rampur Cluster, Himachal Pradesh

Sr. No.	Botanical Name	Local Name	Priority Rank	Habit	Family	Habit at*	Part Used	Uses	Status
1	<i>Spindus mukorossi</i>	Ritha	1	Tree	Sapindaceae	F, CL	Fruit	Dandruff	Less
2	<i>Angelica glauca</i>	Chora	2	Herb	Apiaceae	F, CL	Roots, Leaves	Gastric problem	Less
3	<i>Sinopodophyllum hexandrum</i>	Bankak di	3	Herb	Berberidaceae	F	Roots	Anti-cancer	Less
4	<i>Valeriana jatamansi</i>	Nihani	4	Herb	Caprifoliaceae	F, AFB, CL	Roots	Headache	Available
5	<i>Juglans regia</i>	Akhrot	5	Tree	Juglandaceae	F, CL	Leaves, Stem	Chronic Coughs, Asthma, Diarrhea	Less
6	<i>Pistacia integerrima</i>	Kakad singi	6	Tree	Anacardiaceae	F, CL	Fruit	Cough, asthma, dysentery, liver disorders and for snake bite.	Less
7	<i>Zanthoxylum armatum</i>	Timur	7	Shurb	Rutaceae	F, CL	Fruit	Toothache	Available
8	<i>Prunus armeniaca</i>	Chuli	8	Tree	Rosaceae	F, CL	Fruit, Seed	Arthritis	Available
9	<i>Pyrus pashia</i>	Kainth	9	Tree	Rosaceae	F, CL	Fruit	Gastrointestinal disorders, Fever and Headache, Sweating of body	Available

10	<i>Viola serpanse</i>	Vanksha	10	Herb	Violaceae	F, CL	Whole Plant	Cough, Cold, Fever, Throat infection	Available
11	<i>Berberis lycium</i>	Kashmal	11	Shrub	Berberidaceae	F, CL	Root	Rason for eye, piles, sugar	Available
12	<i>Isodon rugosus</i>	Chichdi	12	Herb	Lamiaceae	F, AFB, CL	Leaves	Gastrointestinal disorders, Fever and Headache, Sweating of body	Available
13	<i>Ocimum</i> spp.	Tulsi	13	Herb	Lamiaceae	F, CL	Whole plants	Cough, Cold, Fever, Throat infection	Less

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

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 regarding the potential area for production of the Medicinal and Aromatic Plants.

Two Plantation sites of 10 and 11 Hectare, respectively has been proposed to be raised in Dhalewana VFDC under JICA in this region and work of plantation is under progress. People were of the opinion that some medicinal tree species can be planted in this area. Glimpses of meeting held and site for plantation have been depicted in **Plate 5**.

First plantation site of 10 Hectare at Dhalewana is located at 30°55'12.23" N latitude and 77°36'03.99" E longitude having an altitude of 1938 m amsl, falling in Dhalewana beat, Kahdder Block, Nerwa range of Shimla forest division. The second plantation site of 11 Hectare at Ghunsa- Dhalewana is located at 30°55'47.01" N latitude and 77°36'06.88" E longitude having an altitude of 1534 m amsl, falling in Dhalewana beat, Kahdder Block, Nerwa range of Shimla forest division

8.5.4 Current Production: The data on production of medicinal plants of the region is not available with the villagers, VFDC, panchayat as well as forest department

8.5.5 Potential Production: Species such as *Spindus mukorossi*, *Angelica glauca*, *Sinopodophyllum hexandrum*, *Valeriana jatamansi*, *Juglans regia*, *Pistacia integerrima*, etc. can be grown in the region as these species are preferred by the people.

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

Plate 5: Some Glimpses of the Meetings with Dhalewana VFDS and Plantation areas



Meetings with Dhalewana VFDS



Meetings with Dhalewana VFDS



Meetings with Dhalewana VFDS



Plantation site Dhalewana 10 hectare



Plantation site Dhalewana 10 hectare



Plantation site Dhalewana 11 hectare



Plantation site Dhalewana 11 hectare



Plantation site Dhalewana 11 hectare

8.6 Badich VFDC

The Badich VFDC of Khadder panchayat falls in Rampur cluster in Dhalewana beat, Khadder Block, Nerwa forest range of Shimla forest division. The outcomes of study on medicinal and aromatic plants of the region are given below.

8.6.1 Medicinal Plants and their Status in Badich Region: A total of 17 important medicinal plants species belong to fourteen families were recorded from the area. Of which, 7 species were trees, 02 shrubs and 08 herbs. The most of these medicinal 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 details of the important medicinal plants species of the region is given in **Table 6**.

8.6.2 Priority of medicinal plants species: The data on Medicinal and Aromatic Plant species was collected through semi-structured questionnaires and interviews. The analysis of data shows that *Spindus mukorossi* is most preferred species, followed by *Angelica glauca*, *Sinopodophyllum hexandrum*, *Valeriana jatamansi*, *Phyllanthus emblica*, *Juglans regia*, etc. The priority of the species is given in **Table 6**.

Table 6: Medicinal Plant Species of Badich VFDC of Nerwa Range, Rampur Cluster, Himachal Pradesh

Sr. No.	Botanical Name	Local Name	Priority Rank	Habit	Family	Habitat*	Part Used	Uses	Status
1	<i>Spindus mukorossi</i>	Ritha	1	Tree	Sapindaceae	F, CL	Fruit	Dandruff,	Less
2	<i>Angelica glauca</i>	Chora	2	Herb	Apiaceae	F, CL	Roots, Leaves	Gastric problem	Less
3	<i>Sinopodophyllum hexandrum</i>	Bankakdi	3	Herb	Berberidaceae	F	Roots	Anti-cancer	Less
4	<i>Valeriana jatamansi</i>	Nihani	4	Herb	Caprifoliaceae	F, AFB, CL	Roots	Headache	Available
5	<i>Phyllanthus emblica</i>	Ambla	5	Tree	Phyllanthaceae	F, CL	Fruit	Gastric, Hair oil & Pickle	Less
6	<i>Juglans regia</i>	Akhrot	6	Tree	Juglandaceae	F, CL	Leaves, Stem	Constipation, Chronic Coughs, Asthma, Diarrhea	Less
7	<i>Zanthoxylum armatum</i>	Timur	7	Shurb	Rutaceae	F, CL	Fruit	Toothache	Available

8	<i>Prunus cerasoides</i>	Pajja	8	Tree	Rosaceae	F, CL	Fruit, Bark	Treat vomiting, Nausea and Gastritis.	Less
9	<i>Prunus armeniaca</i>	Chuli	9	Tree	Rosaceae	F, CL	Fruit, Seed	Arthritis	Available
10	<i>Pyrus pashia</i>	Kainth	10	Tree	Rosaceae	F, CL	Fruit	Gastrointestinal disorders, Fever and Headache, Sweating of body	Available
11	<i>Viola serpens</i>	Vanaksh a	11	Herb	Violaceae	F, CL	Whole Plant	Cough, Cold, Fever, Throat infection	Available
12	<i>Aloe vera</i>	Aloe vera	12	Herb	Xanthorrhoeaceae	F, CL	Leaves	Skin tonner	Less
13	<i>Berberis lycium</i>	Kashmal	13	Shrub	Berberidaceae	F, CL	Root	Rason for eye, piles, sugar	Available
14	<i>Aconitum heterophyllum</i>	Patish	5	Herb	Ranunculaceae	F	Roots	Fever	Less
15	<i>Isodon rugosus</i>	Chichdi	15	Herb	Lamiaceae	F, AFB, CL	Leaves	Gastrointestinal disorders, Fever and Headache, Sweating of body	Available
16	<i>Ocimum spp.</i>	Tulsi	16	Herb	Lamiaceae	F, CL	Whole plants	Cough , Cold ,Fever, Throat infection	Less
17	<i>Picrorhiza kurroa</i>	Karu	17	Herb	Plantaginaceae	F, CL	Leaves, Roots	Liver Tonic, Diabetes	Less

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

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 regarding the potential area for production of the Medicinal and Aromatic Plants. Two Plantation sites Badich-UPF and Gyahu-Badich of 4 and 6 Hectare, respectively has been proposed to be raised under JICA in this region and work of plantation is under progress. People were of the opinion that some medicinal tree species can be planted in this area. Glimpses of meeting

held and site for plantation have been depicted in **Plate 6**.









The plantation site Badich-UPF is located at 30°55'38.09" N latitude and 77°34'49.71" E longitude having an altitude of 1892 m amsl, falling in Dhalewana beat, Khadder Bloch, Nerwa range of Shimla forest division. Other plantation site Gyahu-Badich is located at 30°55'27.30" N latitude and 77°35'06.86" E longitude having an altitude of 1859 m amsl, falling in Dhalewana beat, Khadder Bloch, Nerwa range of Shimla forest division.

8.6.4 Current Production: The data on production of medicinal plants of the region is not available with the villagers, VFDC, panchayat as well as forest department

8.6.5 Potential Production: Species such as *Sapindus mukorossi*, *Angelica glauca*, *Sinopodophyllum hexandrum*, *Valeriana jatamansi*, *Phyllanthus emblica*, *Juglans regia* etc., can be grown in the region as these species are preferred by the people.

8.6.6 Threat in Conservation: The major threats for the conservations of the medicinal and aromatic plants species includes, grazing pressures, forest fires and drought.

Plate 6: Glimpses of the Meetings held with VFDC and Plantation areas

	
<p>Meetings with Badich VFDC</p>	<p>Meetings with Badich VFDC</p>
	
<p>Meetings with Badich VFDC</p>	<p>Plantation site Badich- UPF 4 hectare</p>
	
<p>Plantation site Badich- UPF 4 hectare</p>	<p>Plantation site Badich- UPF 4 hectare</p>
	
<p>Plantation site Gyahau- Badich UPF 6 hectare</p>	<p>Plantation site Gyahau- Badich UPF 6 hectare</p>

8.7 Chhajpur Valley VFDC

The Chhajpur valley VFDC of Anti panchayat falls in Rohru cluster in Chhajpur beat, Saraswati Nagar forest range of Rohru forest division. The outcomes of study on medicinal and aromatic plants of the region are given below. Chhajpur Valley is located at 31°03'6.68" N latitude 77° 45'7.92 E longitude at 2316 m amsl.

8.7.1 Medicinal Plants and their Status in Chhajpur Region: A total of 12 important medicinal plants species belonging to 12 families were recorded from the area. Of which, 2 shrubs and 10 herbs. The most of these medicinal plants are found in scattered form in Alpine Pature, forests, agricultural field boundaries and community land. The number of these medicinal species in natural habitat is moderate. The details of the important medicinal plants species of the region is given in **Table 7**.

8.7.2 Priority of medicinal plants species: The data on medicinal and aromatic plant species was collected through semi-structured interviews. The analysis of data shows that *Curcuma longa*, *Valeriana jatamansi*, *Sinopodophyllum hexandrum* were most preferred species, followed by *Gentiana kurroo*, *Aconitum heterophyllum* etc. The priority of the species is given in **Table 7**.

Table 7: Medicinal Plant Species of Chhajpur VFDC of Saraswati Nagar forest range of Rohru Cluster, Himachal Pradesh

Sr. No.	Botanical Name	Local Name	Priority	Habit	Family	Habitat*	Part Used	Uses	Status
1	<i>Curcuma longa</i>	Haldi	1	Herb	Zingiberaceae	AFB, CL	Roots	Antibiotic	Less
2	<i>Valeriana jatamansi</i>	Nihani	2	Shrub	Caprifoliaceae	F, AFB, CL	Whole plant	Headache	Available
3	<i>Sinopodophyllum hexandrum</i>	Bankakdi	3	Herb	Berberidaceae	F	Roots	Anti-cancer	Less
4	<i>Gentiana kurroo</i>	Karu	4	Herb	Gentianaceae	AP	Roots	Appetite, stomachic, fever	Less
5	<i>Aconitum heterophyllum</i>	Patish	5	Herb	Ranunculaceae	F	Roots	Fever	Less
6	<i>Bergenia ciliata</i>	Dhaklamu	6	Herb	Saxifragaceae	F,AP	Whole plant	Stone diseases	Less
7	<i>Berberis lycium</i>	Kashmal	7	Shrub	Berberidaceae	F,CL	Roots	Eye diseases	Less
8	<i>Hedychium spicatum</i>	Kachor	8	Herb	Zingiberaceae	F,	Leaves	Antidepressant, antiviral	Less

9	<i>Viola serpens</i>	Vanksha	9	Herb	Violaceae	F, AFB,	Whole plant	Cough and Cold	Less
10	<i>Fritillaria royle</i>	Jungli lahsan	10	Herb	Liliaceae	AP	Roots	Asthma, bronchitis,	Less
11	<i>Angelica glauca</i>	Chora	11	Herb	Apiaceae	F, CL	Roots	Gastric problem	Less
12	<i>Trillium govonianum</i>	Nagchattri	12	Herb	Melanthiaceae	F	Roots	Skin diseases	Available

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

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 16 (8+8) ha shall be raised under JICA in the region. People were of the opinion that some medicinal plant species can be planted in this area. They were reluctant to spare additional area for the plantation of medicinal and aromatic plants species. Glimpses of meeting held and site for plantation have been depicted in **Plate 7**.

The plantation site C-13(b) is located at 31⁰⁰3'66.8" N latitude and 77⁰⁰45.79.2" E longitude having an altitude of 2316 m amsl, falling in Chhajpur beat, Saraswati Nagar forest range of Rohru forest division

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

8.7.5 Potential Production: Species such as *Curcuma longa*, *Valeriana jatamansi*, *Sinopodophyllum hexandrum*, *Gentiana kurroo*, *Aconitum heterophyllum*, etc. can be grown in the region as these species are preferred by the people.

8.7.6 Threat in Conservation: The major threats for the conservations of the medicinal and aromatic plants species includes, illicit extraction, forest fires, lack of indigenous knowledge and not having proper management the species

Plate 7: Glimpses of Meeting of VFDC Chhajpur and General Plantation under JICA



8.8 Badiyar Bhajanu VFDC

The Badiyar bhajanu VFDC of Nandpur Panchayat falls in Rohru Cluster Chhajpur beat, Saraswati Nagar forest range of Rohru forest division. The Badiyar bhajanu is located at 31°05.40.6' N latitude and longitude 77°45.10.3' E longitude at 1884 m amsl.

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

8.8.1 Medicinal Plants and their Status in Badiyar Bhajanu Region: A total of 13 important medicinal plants belonging to 12 families were recorded from the area. Of which 01 Tree, 02 shrubs and 10 herbs. These medicinal plants are found in scattered form in forests, agricultural field boundaries and community land. The number of these medicinal plants in natural habitat was less. The important information on these medicinal plants are given in **Table 8**.

8.8.2 Priority of medicinal plants species: The data on Medicinal and Aromatic Plant was collected through semi-structured questionnaires and interviews. The analysis of data shows that *Curcuma longa*, *Valeriana jatamansi* were most preferred species, followed by *Ajuga bracteosa*, *Angelica glauca*, *Trillium govanianum* and *Gerardiana diversifolia*, etc. The species with different priority rank, habit, habitat, parts used, uses and status is given in **Table 8**.

Table 8: Medicinal Plants of Badiyar Bhajanu, VFDC of Tara Devi Range, Rampur Cluster, Himachal Pradesh

Sr. No	Botanical Name	Local Name	Priority Rank	Habit	Family	Habitat*	Part Used	Uses	Status
1.	<i>Curcuma domestica</i>	Haldi	1	Herb	Liliaceae	AP	Root	Asthma, bronchitis,	Less
2.	<i>Valeriana jatamansi</i>	Nihani	2	Herb	Caprifoliaceae	F,	Roots	Headache	Available
3.	<i>Ajuga bracteosa</i>	Neelkanti	3	Herb	Lamiaceae	F, CL	Whole plant	Ascariasis, febrifuge	Less
4.	<i>Angelica glauca</i>	Chora	2	Herb	Apiaceae	F, CL	Roots, Leaves	Gastric problem	Less
5.	<i>Trillium govanianum</i>	Nagchatri	5	Herb	Melanthiaceae	F	Roots	Skin diseases	Available
6.	<i>Gerardiana diversifolia</i>	Bhunshi	6	Shrub	Utricaceae	F	Roots	Jaundice and Body ache	Less
7.	<i>Viola serpens</i>	Vanksha	7	Herb	Violaceae	F, AFB,	Whole plant	Cough and Cold	Less
8.	<i>Polygonatum verticillatum</i>	Salam misri	8	Herb	Asparagaceae	F, AP	Root	Appetite, nerve tonic,	Less

9.	<i>Berberis lycium</i>	Kashmal	9	Shrub	Berberidaceae	F,CL	Roots	Eye diseases	Less
10.	<i>Berginia ciliata</i>	Dhaklamu	10	Herb	Saxifragaceae	F, AP	Roots	Stone diseases	less
11.	<i>Taxus wallichiana</i>	Thuna	11	Tree	Taxaceae	F,	Bark	Tea	Available
12.	<i>Dioscorea deltoidea</i>	Shingli	12	Herb	Dioscoreaceae	F,CL	Whole plant	Fever, gout, digestive problems	Less
13.	<i>Plantago himalaica</i>	Isabgoal	13	Herb	Plantaginaceae	CL, F	Whole plant	Diarrhea, dysentery	Available

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

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 5 ha shall be raised under JICA in the region. Glimpses of meeting held and site for plantation have been depicted in **Plate 8**.

The plantation site of Cattle pond C-1 is located at 31°04'32.4" N latitude and 77°44'11.0" E longitude having an altitude of 2347 msl, falling in Nandpur beat, Saraswati Nagar range of Rohru forest division.

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

8.8.5 Potential Production: Species such as *Curcuma longa*, *Taxus wallichiana*, *Trillium govanianum*, *Dioscorea deltoidea*, *Aconitum hetreophyllum*, *Angelica glauca* and *Valeriana jatamansi*, etc. can be grown in the region.

8.8.6 Regeneration Status: The forest areas were surveyed and the natural regeneration of Medicinal and Aromatic Plants was not observed.

8.8.7 Threat in Conservation: The major threats for the conservations of Medicinal and Aromatic Plants in the area include; unethical extraction, forest fires, lack of indigenous knowledge and not having proper management of the species.

Plate 8: Glimpses of Meeting of VFDC Talayal and General Plantation under JICA



8.9 Rohal I VFDC

The Rohal VFDC of Rohal Panchayat falls in Rohru cluster Chirgaon beat, Khashdhar forest range of Rohru forest division. The Rohal is located at 31°19.85.0' N latitude and longitude 77°54.40.3' E longitude at 2622 m amsl.

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

8.9.1 Medicinal Plants and their Status in Rohal Region: A total of 13 important medicinal plants belonging to 12 families were recorded from the area. Of which, 01 tree, 01 shrubs and 11 herbs. These medicinal plants are found in scattered form in Alpine Pastures forests, agricultural field boundaries and community land. The number of these medicinal Plants in natural habitat is less. The important information on these medicinal plants is given in **Table 9**.

8.9.2 Preference Priority of medicinal plants species: The data on Medicinal and Aromatic Plant was collected through semi-structured questionnaires and interviews. The analysis of data shows that is most preferred species, followed by *Gentiana kurroo* Royle and *Fritillaria roylei*, *Valeriana jatamansi* and *Polygonatum verticillatum*, etc. The species with different priority rank, habit, habitat, parts used, uses and status is given in **Table 9**.

Table 9: Medicinal Plants Species of Rohal VFDC of Khashdhar Range, Rohru Cluster, Himachal Pradesh

Sr. No	Botanical Name	Local Name	Priority Rank	Habit	Family	Habitat*	Part Used	Uses	Status
1.	<i>Gentiana kurroo</i> Royle	Karu	1	Herb	Gentianaceae	AP	Roots	Stomache, fever,	Less
2.	<i>Fritillaria roylei</i>	Jungli lahsun	2	Herb	Liliaceae	AP	Root	Asthma, bronchitis,	Less
3.	<i>Valeriana jatamansi</i>	Nihani	3	Herb	Caprifoliaceae	F,	Roots	Essential oil	Available
4.	<i>Polygonatum verticillatum</i>	Salam misri	4	Herb	Asparagaceae	F, AP	Root	Appetite, nerve tonic,	Less
5.	<i>Ajuga bracteosa</i>	Neelk anthi	5	Herb	Lamiaceae	F, CL	Whole plant	Ascariasis, febrifuge	Less
6.	<i>Texus wallichiana</i>	Rakhal	6	Tree	Taxaceae	F,	Bark	Tea	Available
7.	<i>Viola serpens</i>	Vanaksha	7	Herb	Violaceae	F, AFB,	Whole plant	Cough and Cold	Less
8.	<i>Bergenia ciliata</i>	Pathar thod	8	Herb	Saxifragaceae	F,AP	Whole plant	Stone diseases	Less

9.	<i>Berberis lycium</i>	Kashmal	9	Shrub	Berberidaceae	F,CL	Roots	Rasont for jaundice	Less
10.	<i>Diplazium esculentum</i>	Lingdu	10	Herb	Athyriaceae	F,CL	Leaves	Energy booster	Less
11.	<i>Trillium govanianum</i>	Nagchattri	11	Herb	Melanthiaceae	F	Roots	Skin diseases	Available
12.	<i>Dioscorea deltoidea</i>	Shingli Mingli	12	Herb	Dioscoreaceae	F,CL	Whole plant	Fever, gout, digestive problems	Less
13.	<i>Urtica dioica</i>	Kukua	13	Herb	Urticaceae	F,CL	Leaves, Roots	To increasing milk production in animal	Available

*F: Forest, CL: Community Land, 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 about the potential area and availability of area for the production of Medicinal and Aromatic Plants. A plantation area of 10 ha shall 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 quite eager and willing to spare additional area for the plantation of medicinal and aromatic plants species. Glimpses of meeting held and site for plantation have been depicted in **Plate 9**.

The plantation site of Pilach near Shari Khad is located at 31°20'.30.2'' N latitude and 077°55'.22.6'' E longitude having an altitude of 2713 m amsl, falling in Chirgaon beat, Khashdhar range of Rohru forest division.

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

8.9.5 Potential Production: Species such as *Gentiana kurroo* Royle, *Trillium govanianum* and *Fritillaria roylei*, *Aconitum hetrophyllum*, *Picrorhiza kurroa*, *Angelica glauca* and *Sinopodophyllum hexandrum*, etc. can be grown in the region.

8.9.6 Regeneration Status: The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was not observed.

8.9.7 Threat in Conservation: The major threats for the conservations of the Medicinal and Aromatic Plants in the area include; heavy biotic pressure, unsustainable harvesting and lack of proper management strategies.

Plate 9: Glimpses of Meeting of VFDC Rohal and General Plantation under JICA



8.10 Dali I VFDC

The Dali-1 VFDC of Dhakgaon Panchayat falls in Rohru cluster Dali beat, Khashdhar forest range of Rohru forest division. The Dali-1 is located at 31°12'08.3'' N latitude and longitude 77°51'29.5'' E longitude at 2353m amsl.

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

8.10.1 Medicinal Plants and their Status in Dali Region: A total of 15 important medicinal plants belonging to 14 families were recorded from the area. Of which, 02 Tree, 13 herbs. These medicinal plants are found in scattered form in Alpine Pastures forests, agricultural field boundaries and community land. The number of these medicinal plants in natural habitat is less. The important information on these medicinal plants is given in **Table 10**.

8.10.2 Priority of medicinal plants: The data on Medicinal and Aromatic Plant was collected through semi-structured questionnaires and interviews. The analysis of data shows that is most preferred species, followed by *Gentiana kurroo* Royle, *Juglans regia* and *Fritillaria roylei*, etc. The species with different priority rank, habit, habitat, parts used, uses and status are given in **Table 10**.

Table 10: Medicinal Plants of Dali 1 VFDC of Khashdhar Range, Rohru Cluster, Himachal Pradesh

Sr. No	Botanical Name	Local Names	Priority Rank	Habit	Family	Habitat*	Part Used	Uses	Status
1	<i>Gentiana kurroo</i> Royle	Karu	1	Herb	Gentianaceae	AP	Roots	Stomachache, fever,	Less
2	<i>Juglans regia</i>	Akhrot	2	Tree	Juglandaceae	F,CL	Fruit	Edible Dry Fruit	Available
3	<i>Fritillaria roylei</i>	Jugli lahsun	3	Herb	Liliaceae	AP	Root	Asthma, bronchitis,	Less
4	<i>Valeriana jatamasi</i>	Nihani	4	Herb	Caprifoliaceae	F,	Roots	Essential oil	Available
5	<i>Polygonatum verticillatum</i>	Salam misri	5	Herb	Asparagaceae	F, AP	Root	Appetite, nerve tonic,	Less
6	<i>Taxus wallichiana</i>	Thuna	6	Tree	Taxaceae	F,	Bark	Cancer, aromatic,	Available
7	<i>Viola serpens</i>	Vanksha	7	Herb	Violaceae	F, AFB,	Whole plant	Cough and Cold	Less
8	<i>Bergenia ciliata</i>	Pather Thod	8	Herb	Saxifragaceae	F,AP	Whole plant	Stone diseases	Less
9	<i>Ajuga bracteosa</i>	Neelka ndhi	9	Herb	Lamiaceae	F, CL	Whole plant	Ascariasis , febrifuge	Less
10	<i>Dioscorea deltoidea</i>	Shingli Mingli	10	Herb	Dioscoreaceae	F,CL	Whole plant	Fever, gout, digestive	Less

								problems	
11	<i>Urtica dioica</i>	Kukua	11	Herb	Urticaceae	F,CL	Leaves, Roots	To increasing milk production in animal	Available
12	<i>Diplazium esculentum</i>	Lingdu	12	Herb	Athyriaceae	F,CL	Leaves	Energy booster	Less
13	<i>Trillium govanianum</i>	Nagchatri	13	Herb	Melanthiaceae	F	Roots	Skin diseases	Available
14	<i>Sinopodophyllum hexandrum</i>	Bankakadi	3	Herb	Berberidaceae	F	Roots	Anti-cancer	Less
15	<i>Plantago himalaica</i>	Isabgol	15	Herb	Plantaginaceae	CL, F	Whole plant	Diarrhoea, dysentery	Available

*F: Forest, CL: Community Land, 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. A plantation area of 5 ha shall be raised under JICA in the region. Glimpses of meeting held and site for plantation have been depicted in **Plate 10**.

The plantation site of Gallu near Nag Temple is located at 31°11.84.9' N latitude and 77°51.12.0' E longitude having an altitude of 2486 m amsl, falling in Dalli beat, Khashdhar range of Rohru forest division.

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

8.10.5 Potential Production: Species such as *Gentiana kurroo*, *Juglans regia* and *Fritillaria roylei*, *Aconitum hetrophyllum*, *Angelica glauca*, *Sinopodophyllum hexandrum* and *Picrorhiza kurroa*, etc. can be grown in the region.

8.10.6 Regeneration Status: The forest areas were surveyed and the natural regeneration of the Medicinal and Aromatic Plants was not observed.

8.10.7 Threat in Conservation: The major threats for conservations of the Medicinal and Aromatic Plants in the area include; unethical extraction and not having proper management of the species.

Plate 10: Glimpses of Meeting of VFDC Dali and General Plantation under JICA





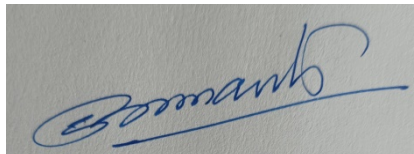
Signature of Principal Investigator

Jagdish Singh, Scientist-F



Signature of Principal Investigator

Dr. Sandeep Sharma, Scientist-G



Signature of Project Coordinator
Dr. S. S. Samant, Director,
HFRI, Shimla

Form No. _____

Format for Semi-structured Questionnaire for JICA Project

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

1. Name of Cluster..... .. VFDC.....
Panchayat.....
2. Name of the respondent: Age..... .. Gender: M / F
Education:..... Occupation:..... Contact No.(if any).....
Village:.....Long.....Lat.....Altitude (m).....
Forest
Division.....Range:.....Block:.....Beat:.....
....

3. List of Important MAP's growing in the area to which respondent possess knowledge**Habit:** Herb (hb), Shrub (Sh), Trees (T), Climber (CL), Epiphyte (E), Pteridophyte (Pt) Fungi (F)**Habitat:** Agricultural land (AL); Road-side (RS); Forests (F) ; Grassland (GL) ; Alpine pasture (AP) ; Community land (CL);Other**Part used:** Root (R); Leaves (L); Stem (Sm), Flowers (Fl); Fruits (F), Seeds (S) Bark (B); Whole Plant (WP)**Mode of utilization:** Raw (R), Powdered (P); decoction (D); Other (O)

Sr. No.	Local name & Botanical name	Habit	Habitat	Parts used	Mode of Utilization	Medicinal uses	Priority of MAP,s based on their demand and marketability (1-10 scale)
1.							
2.							
3.							

4.							
5.							
6.							
7.							
8.							
9.							
10.							

2. Current level of production of different medicinal plants

Sr. No.	Name of MAP,S	Current level Production (Quintal)	Availability of MAP,s for last 10 years	Availability of MAP,s for the last 20 years	Availability of MAP,s for last 30 years	Availability of MAP,s for last 40 years

3. Regeneration status of MAPs

4. Details of potential area within cluster for cultivation of MAPs (It may be in non-forest and forest area):

Sr. No.	Name of Area (Division, Block and Beat). <i>It may be in forest and non-forest land</i>	Geo-referencing (Log, Lat. and Altitude)	Identification land mark	Remarks

5. Major issues in regeneration, harvesting, conservation and management of MAPs

6. Suggestions for resource development, conservation and sustainable management of MAPs in the cluster

7. Sustainable harvesting method employed for conservation of MAPs

8. Post-Harvest Management methods for value addition if any and suggestions thereof

**(Name and Signature of Team Members
respondents)**

- 1.
- 2.
- 3.

(Name and Signature of the