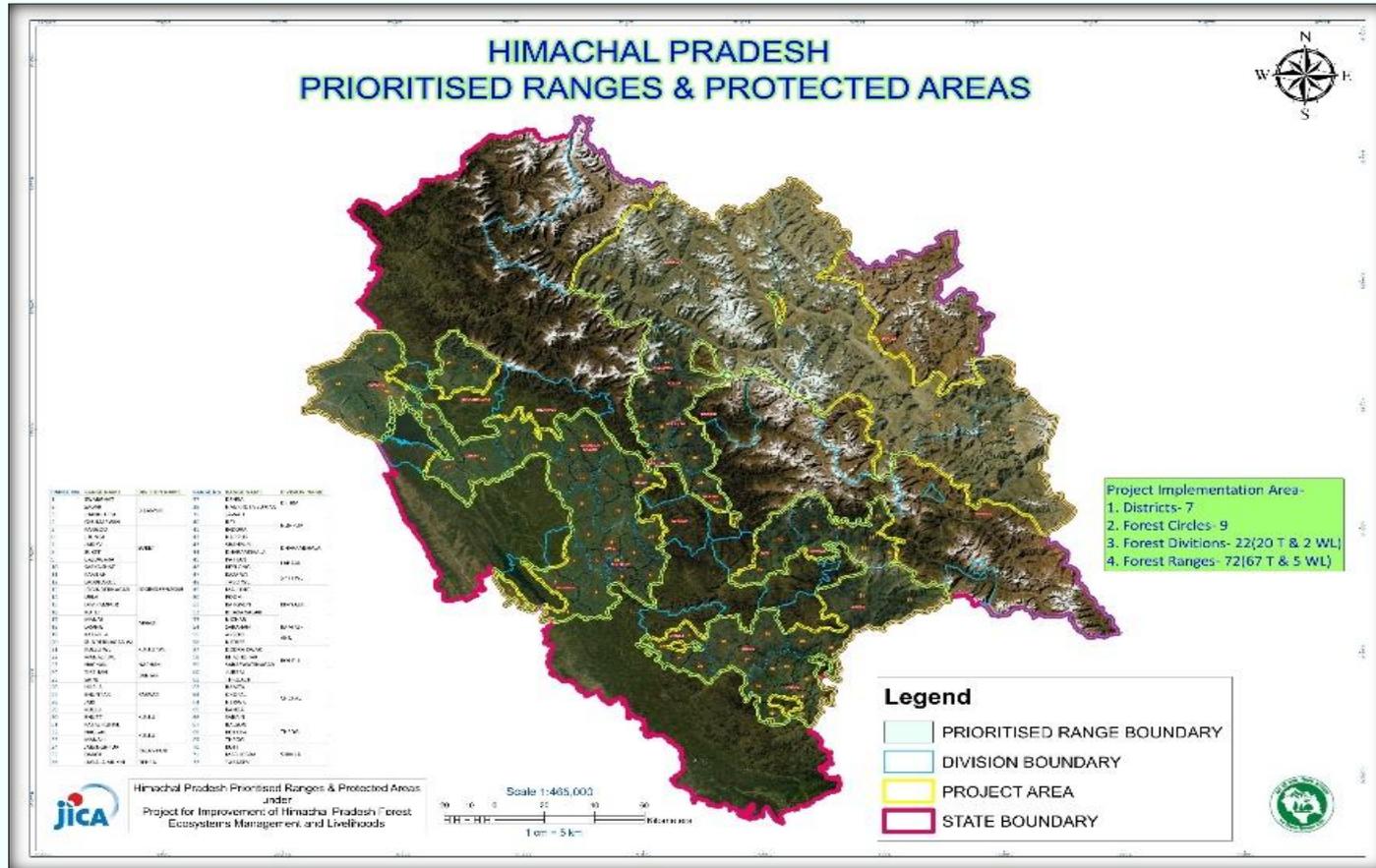# PROJECT FOR IMPROVEMENT OF HP FOREST ECOSYSTEMS MANAGEMENT & LIVELIHOODS (PIHPFEM&L) (JICA Funded)

ID-P269

Workshop on VSJS and Jadi-Buti Cell Activities
27-02-2023

Objectives of this Workshop

➢ To have better understanding about HPFD Scheme VSJS.

➢ How VSJS objectives can be inconsonance with PIHPFEM&L (JICA Funded).

➢ Areas of common goal.

➢ Sharing of the Field experiences both HPFD and PIHPFEM&L (JICA Funded).

➢ Areas in which HPFD and PIHPFEM&L (JICA Funded) need to work in future.

HP Forest Sector Medicinal Plants Policy -2006

Aims :

➢Conservation of medicinal plants in habitat.

➢Enhancing health and livelihood security .

➢Strengthening market information system.

➢Establishing models for public private community partnership for

cultivation, value addition and marketing.

➢Facilitating buy back arrangements.

Structure of Jadi Buti Cell

❖ **Director**

❖ **Manager (Enterprise Development)**

❖ **Manager (Marketing)**

❖ **MIS Associate.**

Functions of Jadi Buti Cell

- Sustainable management of medicinal plants and livelihood support.
- Cultivation of high value medicinal plants to generate mass volume of marketable produce for Industries.
- Developing agro-techniques of selected high value medicinal plants .
- Institutional development of farmer groups through various modes of capacity building.
- Carry out Market Research.
- Create a brand of products in HP and its promotion at National and International levels.
- Changes in the policies and legal framework for development of medicinal plants.

Action plan

- ✓ Selection of appropriate species through survey involving Technical Institutes

- ✓ Preparation and approval of Propagation Models.

- ✓ *In situ* conservation of medicinal plants.

- ✓ Standardization of agro-techniques of selected species.

- ✓ Research and Development on certain species.

- ✓ Branding and marketing of NTFPs.

- ✓ Policy issues related to NTFPs.

- ✓ Registration of Jadi Buti Cell under Society Act.

Present status of Activities

❖ Total 643 species of medicinal plants reported in the State.

❖ About 36 species identified for commercial cultivation through survey by technical institutes(Table 1) viz.

   ✓ IHBT Palampur

   ✓ GB NIHE Pant Kullu

   ✓ HFRI, Panthaghati,Shimla

   ✓ HPU Shimla

❖ 13 species have been standardised for commercial cultivation through propagation models.

Name of Cluster	Prioritized species
Kullu	*Angelica glauca (Chora), Berberis aristata (Daruhaldi), Trillium govanianum (Nag Chatri), Dactylorhiza hatagirea (Salam Panja), Hedychium spicatum (Kapoor kachri)*
Jari	*Aloe barbadensis (Ghritkumari), Polygonatum verticillatum (Whorled Solomon's Seal), Viola canescens (Banafsha), Bergenia ciliata(Pashaan Bhed), Withania somnifera (Ashwagandha)*
Larji	*Aconitum heterophyllum (Patish), Nardostachys jatamansi(Jatamansi), Taxus cantorta (Rakhal), Jurinea macrocephala (Dhoop), Valeriana jatamansi (Muskbala)*
Keylong	*Inula racemosa (Puskarmul), Sausurea costus (Kuth), Hippophae rhamnoides (Sea buckthorn), Bunium persicum (Kala Jeera), Aconitum heterophyllum (Patish)*
Mandi	*Matricaria chamomilla (Chamomile), Curcuma aromatic (Van Haldi), Rosa damascene (Damask rose), Rosmarinus officinalis (Rosemary), Withania somnifera (Ashwagandha), Punica granatum L. (Anaar), Aegle marmelos (Bilva), Zanthoxylum armatum (Timru), Oroxylum indicum (Shyonaak), Viola serpens (Banafsha), Terminalia chebula (Harad), Valeriana jatamansi DC (Muskbala), Hedychium spicatum (Kapoor kachri)*
Rampur and Rohru	*Valeriana jatamansi Jones (Muskbala), Podophyllum hexandrum Royle (Vankakdi), Aconitum heterophyllum Wall. Ex Royle (Patish), Angelica glauca Edgew (Chora), Picrorhiza kurroa Royle ex Benth (Karu)*
Bilaspur	*Emblica officinalis (Amla), Terminalia chebula (Harad), Ocimum sanctum (Tulsi), Tinospora cordifolia (Giloy), Terminalia arjuna (Arjun), Asparagus recemosus (Shatavari), Azadirachta indica (Neem)*

Note:- *Terminalia chebula* (Harad), *Emblica officinalis* (Amla), *Sapindus mukorossi* (Reetha), *Asparagus racemosus* (Shatavari) and *Aloe vera* (Ghritkumari) are recommended species for **Kangra.**

Table 1: Species prioritized for production in *ex situ* and *in situ*

Species under cultivation

- *Asparagus racemosus* (Shatavari)
- *Aconitum heterophyllum* (Patish)
- *Swertia cordata* and *Swertia chirayita* (Chirayita)
- *Picrorhiza kurrooa* (Kutki)
- *Terminalia chebula* (Harad)
- *Emblica officinalis* (Amla)
- *Sapindus mukorossi* (Reetha)
- *Moringa oleifera* (Drumstick tree)
- *Cinnamomum tamala* (Tej patta)
- *Bauhinia vahlii* (Taur) leaves for making plates
- *Cymbopogon martinii* (Palmarosa grass)
- *Paris polyphylla* (Satua)
- *Aloe vera* (Ghritkumari)

Models under propagation:

- Processing and sale of *Rhododendron arboreum* (Buransh)
- Propagation of *Tagetes minuta* (Wild Marigold) and extraction of its oil for sale

Models for Commercial Propagation of Medicinal Plants

➢ ***Asparagus racemosus*** **(Shatavari)**

- ✓ 50,000 *plants* planted in Mandi Forest Division under the Batch-1.
- ✓ Performance quite satisfactory. The harvesting of the crop is expected by May 2023.
- ✓ The expected yield is 8 q/ha
- ✓ The average market price for the roots is @ 26,500/q.
- ✓ Planting of 60,000 plants of this species has been done in three new areas during 2022 monsoon season in Mandi Forest Division.
- ✓ Planting of 50,000 plants each proposed in Jogindernagar and Palampur Forest Divisions during July 2023.

Cont…

➢ *Aconitum heterophyllum* **(Patish).**

✓ Cultivation proposed in Kullu Forest Division under Batch-III.

✓ 1 ha forest area has been identified for propagation in PFM mode in Kullu Wild Life Division.

✓ Sowing of seed proposed in April,2023.

✓ Alternatively procurement of seedlings and technical support from RCFC Jogindernagar.

✓ Yield (Roots) is expected is 11q/ha.

✓ Average market price is Rs. 2,00,000/- per quintal.

Cont...

➢ *Swertia cordata* **(Chirayita)**
  ✓ The cultivation of *Swertia cordata* (Chirayita) undertaken in 1.5 ha in private land by women groups consisting of 21, 25 and 17 members under Nachan Forest Division.
  ✓ The seed sowing completed in June, 2022.
  ✓ Harvesting of the crop will be done after 18 months.
  ✓ The expected yield (whole plant) is 12 q/ha
  ✓ Buyback mechanism is in place to procure the crop from the farmers @ Rs.300/kg.

➢ *Picrorhiza kurrooa* **(Kutki)**
  ✓ The cultivation of *Picrorhiza kurrooa* (Kutki) also undertaken in 1.5 ha of private land by groups consisting of 27, 26 and 14 members under Nachan Forest Division.
  ✓ The planting completed by the end of July, 2022.
  ✓ The anticipated yield (in the 4th year) is 6q/ha.
  ✓ The minimum market price is @ Rs 1000/kg.
  ✓ Buy back mechanism in place.
   Note: Implementation of the above models is in outsource mode.

Cont...

➢ ***Terminalia chebula* (Harad), *Emblica officinalis* (Amla) and *Sapindus mukorossi* (Reetha)**

- ✓ The areas identified in Suket and Jogindernagar Forest Divisions.
- ✓ In collaboration with College of Horticulture and Forestry, Neri, Hamirpur, 20 Forest Guards/Malis have been trained on grafting.
- ✓ Planting of these species got completed in July, 2022.
- ✓ *In-situ* grafting of Harad (2000 plants) is proposed in the planted area of Jogindernagar division.
- ✓ The grafted plants (700 Harad, 300 Amla, 300 Reetha) planted in the Suket Forest Division will start giving yield in the 4th year against 10 years for traditional plants.
- ✓ Further, the anticipated yield/tree (4th year) is 25kg, 30 kg and 10 kg respectively for Amla, Harad and Reetha which in turn, would increase upto 1-2 q/tree after 10 years.
- ✓ Prevailing market price is Rs 2000/q, Rs 4000/q and Rs 5000/q for Amla, Harad and Reetha respectively.
- ✓ Replication of these models is proposed in Palampur, Nurpur and Dehra Forest Divisions during 2023-24.

Cont…

➤ *Moringa oleifera* **(Drumstick tree)**

✓ Nearly, 50,000 plants of *Moringa oleifera* were raised in JICA Nursery at Kamand out of which nearly 42,500 plants got washed away in flood during rainy season of the year 2022.

✓ During July 2022, planting of about **5,000 tall plants** planted in PFM areas in Suket FD.

✓ **2,500 plants** planted in private land in Mandi FD.

✓ In addition, nearly 20,000 plants of this plant also raised in Theog FD. Planting expected by July 2023.

✓ With a minimum market price of Rs 4500/q, the expected average yield of the green biomass is 2.95 MT/ha/year.

✓ **Results in field, not satisfactory. Old areas being supplemented through seed broadcasting in Monsoon, 2023.**
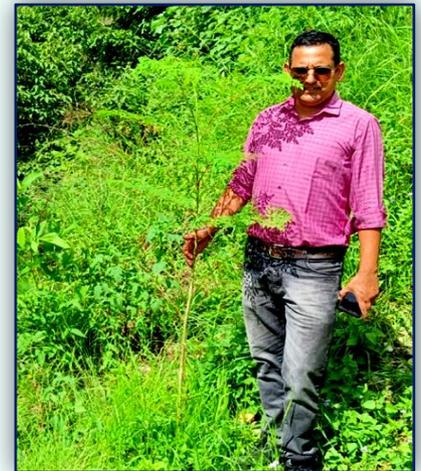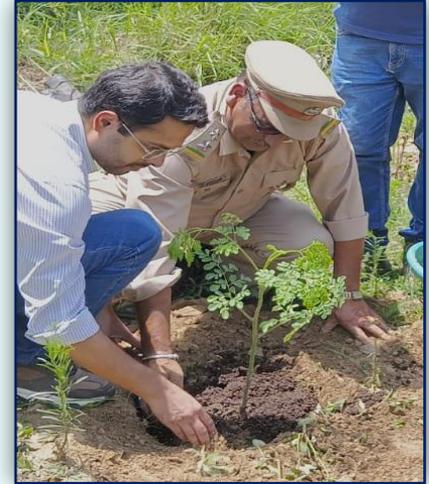
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➢ *Cinnamomum tamala* (Tej patta)

✓ During July 2022 planting season, 1100 tall plants planted in Jogindernagar Forest Division.

✓ The expected average yield is

(10-12) q/tree (from 10th year onward)

✓ Minimum market price is Rs 2400/q.

In addition, 5,000 plants are being raised in the JICA nursery for planting in July,2023 in Jogindernagar Forest Division.

Cont…

➢ *Aloe vera*
- ✓ Planting of 50,000 propagules of *Aloe vera barbadenses* done in private land in Ropri village, Suket Range of Suket Forest Division under Batch-1 VFDS during July-August, 2021. Harvesting of the crop is expected by Jul-Aug, 2023.
- ✓ In addition, planting of 50,000 *Aloe vera (AL1 sp.)* undertaken by the group on private land at Dhawal and Ropari in Suket Division during August 2022 on the advice of IHBT, Palampur.
- ✓ First harvest from the crop is expected after one and half year and subsequently, three harvests will be available every year up to 10 years.
- ✓ Annual average yield per plant from three harvests is about 9 kg.
- ✓ Expected sale rate is @ Rs.7/kg.
- ✓ Buy back mechanism is in place for AL1.
- ✓ Model being replicated in Bilaspur, Dehra and Nurpur Forest Divisions in July 2023.

Cont…

➢ *Paris polyphylla* **(Satua)**

- ✓ The rhizomes for propagation of *Paris polyphylla* (Satua) sown in Sarain Nursery in February, 2021.Results not encouraging.

- ✓ In addition , **High Altitude Plant Physiology Research Centre** (HAPPRC), H.N.B. Garhwal University, Srinagar Garhwal , Uttarakhand is being consulted for technical support as well as supply of Satua seedlings.

- ✓ Local NGO in Rohru Forest Division is also being consulted.

Cont…

➢ ***Cymbopogon martinii* (Palmarosa grass)**

✓ An MoU has been signed with IHBT, Palampur for technological support on raising and processing of Palmarosa grass.

✓ In the 2022 monsoon season, sowing of 30 kg seed done at Amarpur Dhingoo, Bilaspur Forest Division by the group for better stocking of the area as per the advice of IHBT experts.

✓ In first and second harvest, 5 and 25 quintals sample harvest were obtained, yielding 2 litre and 3 litres respectively.

✓ Sale of oil from first and second harvest is Rs. 3000/- and Rs. 8000 /- respectively and transferred to group account.

✓ 200 quintal yield expected in October,2023.

✓ The area taken over by self help group for protection, harvesting and processing through an MoU between SHG, VFDS and Forest Department.

Cont...

➤ Bauhinia *vahlii* (Taur) leaves for making plates

- ✓ Five sites i.e. one in Mandi Forest Division, one in Suket Forest Division and three in J/nagar Forest Division have been identified.
- ✓ The leaf plate making machine installed and operational at Bihan Dhar.
- ✓ One more machine installed at Bihandhar through RD Department and is operational under the Project.
- ✓ Three machines installed in J/Nagar Division on the demand of Self Help Groups, being made operational.
- ✓ One more machine is being installed in Mandi and Suket Forest Divisions shortly.
- ✓ On an average 10,000 pattals/ dunas per month are being made by one group.
- ✓ Sale rate per plate/ duna is Rs.3.5 and Rs.1.5 respectively and profit per plate/ duna comes to Rs.2 and Rs. 1 respectively.
- ✓ To ensure sustainability 50,000 plants are being raised in Suket, Mandi and J/nagar Forest Divisions.

In situ Conservation

- ❖ *In situ* planting of 50,000 plants of *Picrorhiza kurrooa* (Kutki), *Dolomiaea costus* (Kuth) and *Aconitum heterophyllum* (Patish) has been done during August, 2022 in Kullu, Banjar and Rohru Forest Divisions.

- ❖ Plants procured from RCFC Jogindernagar.
- ❖ 6000 plants of *Swertia chirayita* (Chirayita) are being raised at Pah Nala in collaboration with G.B. Pant, NIHE Kullu.
- ❖ *17,600* plants of *Taxus baccata* raised in Parvati FD for planting after 2 years.
- ❖ Raising of 50,000 *Taxus baccata plants* proposed in Parvati and Banjar Forest Divisions.
- ❖ Broadcasting of 50 Kg *Berberis aristata* seed in Jogindernagar FD.

Convergence/ Collaboration with Research Institutes

➢ **RCFC-NMPB (RIISM) Joginder Nagar**
  ✓Knowledge sharing, technological demonstration & online marketing.

➢ **COHF NERI, Hamirpur**
  ✓ Training in propagation technology
  ✓Advance training on grafting technology to master trainers at JICA nurseries.
  ✓Supply of grafted plants.

➢ **Regional Horticultural Research & Training Station Jachh, Nurpur**
  ✓Technological support
  ✓Supply of grafted plants.

➢ **IHBT, Palampur**
  ✓MoU on technology support, processing and marketing of Palmarosa grass
  ✓Use of machinery for extraction of oil of Palmarosa grass

Cont…

➢ **G. B. Pant, NIHE, Kullu**

  ✓Technology support.

➢**Himachal Pradesh University, Shimla/Himalayan Research Group**

  Shimla/Vignahar Nursing Home Pune

  ✓development of antibacterial herbal remedies for snakebite wounds

  and creation of additional value chain for Chirayita farmers.

➢ **Directorate of Mushroom Research (DMR), Solan**

  ✓ training and knowledge sharing

➢**HP Forest Department**

  ✓Van Samridhi Jan Samridhi

Distribution of Medicinal Plants collaboration with RCFC Jogindernagar

Sr. No.	Name of Division	Species Planted (No.)			Nature of Area
		Picrorhiza kurrooa (Kutki)	Dolomiaea costus (Kuth)	Aconitum heterophyllum (Patish)	
1	WL Kullu	8000			BMC
2	Banjar	17000			VFDS
3	Rohru	14000	1000	2000	VSJS
4	Kullu	8000			VFDS
	Total	47000	1000	2000	**50000**

Van Samridhi- Jan Samridhi Salient Features

❖ **Major Components**
- ✓ Identification and formation of community User groups (CUGs)
- ✓ Allocation of forest areas to CUGs
- ✓ Multilayered augmentation plantations to strengthen NTFP resource base
- ✓ Harvesting, post harvest handling and developing marketing facilities

❖ **Implementation Mechanism**
- ✓ Creation of Community Users Groups under the umbrella of BMC
- ✓ Organizing Community User Groups (CUGs)
- ✓ Allocation of Land Banks to CUGs
- ✓ Multi-layered Plantations
- ✓ Nurseries of NTFP & Medicinal Plant Species
- ✓ Collection of NTFPs & medicinal Plants by CUGs
- ✓ Procurement of NTFPs including Medicinal Plants.
- ✓ Subsidy for setting up of Processing Units.
- ✓ Capacity Building.

Jadi-Buti Cell linkage with Van Samridhi Jan Samridhi

❖ Linkage of ongoing works of Jadi Buti Cell to support objectives of VSJS

  ✓ Sharing of commercially viable prioritized species recommended by the technical institutes with HP Forest Department for VSJS.

  ✓ Techniques developed and documented for cultivation, processing, value addition, buy back arrangements and marketing in Jadi Buti Cell to be shared with HP Forest Department for VSJS.

  ✓ Marketing linkage and support to be extended to VSJS in the adjoining areas of the Project.

  ✓ Use of capital assets created under JICA Project by the adjoining CUGs under VSJS wherever required.

Future Roadmap

- ❖ Replication of successful propagation models.

- ❖ Marketing research and strategy including procurement, trade and branding.

- ❖ Standardization of agro-techniques of selected species.

- ❖ Carry out research and development on selected species in consultation with technical institutes.

- ❖ Formation of clusters and farmers groups.

- ❖ Need based setting of storage/ processing space, value addition for cluster societies/ producer groups.The maintenance of assets will be the responsibility of communities.

- ❖ Further, changes in policies and legal framework for development of medicinal plants.

- ❖ Finally, the cell will be registered as a society under the relevant act to address the different issues on medicinal plants beyond project period.

Models of commercially viable species under Jadi Buti Cell

❖Implementation through communities i.e. VFDSs, SHGs and CIGs

Sr. No.	Species/Model	Cost: Benefit ratio in approved model
1	*Asparagus racemosus* (Shatavari)	2.62
2	*Aconitum heterophyllum* (Patish)	12.33
3	*Swertia cordata* (Chirayita)	1.38
4	*Picrorhiza kurrooa* (Kutki)	3.23
5	*Terminalia chebula* (Harad)	3.93
6	*Emblica officinalis* (Amla)	1.64
7	*Sapindus mukorossi* (Reetha)	2.78
8	*Moringa oleifera* (Drumstick tree)	2.18
9	*Cinnamomum tamala* (Tej patta)	5.18
10	*Bauhinia vehlii* (Taur) leaves for making plates	6.225
11	*Cymbopogon martinii* (Palmarosa grass)	3.39
12	*Paris polyphylla* (Satua)	7.3
13	*Aloe vera* (Ghritkumari)	1.57

Abstract of Jadi But Cell Models

Sr. No.	Species/Model	Name of Groups	No. of Groups	No. of Members	Harvesting Time (in Years)	Total Plants Planted	Yield per Plant	Area in Hectare	Total Yield (in quintals)	Sale rate per Kg (in Rs.)	Net income per unit	Sale Amount (in Rs.)	Per person income	No. of Harvestings	Remarks
1	*Asparagus racemosus* (Shatavari)	Tikri	4	10	2.5	20000	80 grams	2	16	265		424000	42400	1	How ever 1 or 2 roots will be left for further grouth in first harvest
2	*Aconitum heterophyllum* (Patish)	Om Singhmal	1	10	3			1	11	2000		2200000	220000	1	
3	*Swertia cordata* (Chirayita)		3	63	1.5			1.5	18	300		540000	8571	1	
4	*Picrorhiza kurrooa* (Kutki)		3	67	3			1.5	9	1000		900000	13433	10	
5	*Terminalia chebula* (Harad)	Beh	1	14	5	700	30 kg	5	210	40		840000	60000	Plant life about 30 year	Yield indicated for first harvest which will subsequently increase

Cont…….

Sr. No.	Species/Model	Name of Groups	No. of Groups	No. of Members	Harvesting Time (in Years)	Total Plants Planted	Yield per Plant	Area in Hectare	Total Yield (in quintals)	Sale rate per Kg (in Rs.)	Net income per unit	Sale Amount (in Rs.)	Per person income	No. of Harvestings	Remarks
6	*Emblica officinalis* (Amla)	Beh	1	14	5	300	25 kg		75	20		150000	10714	Plant life 30 year	Yield indicated for first harvest which will subsequently increase
7	*Sapindus mukorossi* (Reetha)	Beh	1	14	5	300	10 kg		30	50		150000	10714	Plant life 30 year	Yield indicated for first harvest which will subsequently increase
8	*Cinnamomum tamala* (Tej patta)	Jai Maa Ambe	1	16	10	1100	10 kg	1	110	24		264000	16500	Plant life 30 year	Yield indicated for first harvest which will subsequently increase
9	*Aloe vera AL-1* (Ghritkumari)	Ropari & Dhawal	2	36	1.5	50000	9 kg	2	4500	7		3150000	87500	Plant life 10 year	Harvesting up to 10 Years. First harvesting after 1.5 years. Subsequently, three harvesting per year.

Cont……

Sr. No.	Species/Model	Name of Groups	No. of Groups	No. of Members	Harvesting Time (in Years)	Total Plants Planted	Yield per Plant	Area in Hectare	Total Yield (in quintals)	Sale rate per Kg (in Rs.)	Net income per unit	Sale Amount (in Rs.)	Per person income	No. of Harvestings	Remarks
10	Cymbopogon martinii (Palmarosa grass)	Amarpur Dhingoo	1	9	First two years sample harvest, subsequently, two harvests expected annually up to 10 years.			4	Total yield grass 100 quintal /40 kg oil	1500 per kg oil		60000	6667		In first and second harvest yield of grass 5 quintals and 26 quintals and that of oil 2&3 liter, subsequently main harvest in October 2023, expected yield of grass is 100 quintal and that of oil 40 kg.
11	Bauhinia vehlii (Taur) leaves for making plates		7	75					8000 pattals/ 2000 dunas per month	Rs. 3.5 per pattal/ Rs.1.50 per duna	Rs. 2 per pattal/ Rs.1 per duna	16000 pattals/ 2000 dunas per month	1800		1. Practically at present only one group is working. In the first week of March 2023 the remaining groups will start working. 2. Group is working 3-4 hours per day for 10-15 days.
12	Moringa oleifera (Moringa)	Dhar	1	10	1	2500	5 kg	5	125	50		625000	62500	Plant life 10 years	The figures are as per the literature and approved model. However, the results are not encouraging in the field.

THANK YOU