



12th Annual Workshop of JICA Assisted Forestry & NRM Projects

Workshop Theme

“Optimising Synergies between Sustainable Forest Management, Biodiversity Conservation, Ecosystem Services, Livelihood Development and Digital Transformation for Contributing towards Climate Change Mitigation”

24-26 May 2023

Shimla, Himachal Pradesh, INDIA

Souvenir



Organised by:

**Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods (PIHPFEM&L), HIMACHAL PRADESH FOREST DEPARTMENT
Potters' Hill, Summer Hill, Shimla-171005**

<https://jicahpforestryproject.com>; Tel. No. : +91 177 2830217



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***Society for Improvement of Forest Ecosystems Management
and Livelihoods (SIFEM&L) in H.P.***

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SOUVENIR, 24-26 May 2023



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Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods

OVERALL GOAL:

Ecosystems services from forest areas are improved for sustainable socio-economic development in the state of Himachal Pradesh.

PROJECT IMPLEMENTATION AREA :

The project is being implemented in Seven districts of Himachal Pradesh i.e. Kullu, Bilaspur, Mandi, Shimla, Lahaul & Spiti, Kangra and Kinnaur, Covering Nine Forest Circles. Twenty Two Forest Divisions and Seventy Two Forest Ranges. This Project is being implemented by an autonomous "Society" registered under HP Societies Act, 2006 named as "*Society for Improvement of Forest Ecosystems Management & Livelihoods in Himachal Pradesh*" through HPFD, Village Forest Development Societies (VFDSs and Biodiversity Management Committees (BMCs) formed in project implementation area.

COST and DURATION :

The total project cost is approximately **INR.800 Crores**. Duration is **10 Years** (2018-2019) to 2027-28).

PROJECT OBJECTIVE :

Ecosystems of forests in the project areas are sustainably managed and enhanced by the project interventions.

PROJECT COMPONENTS :

- Component 1 : Sustainable Forest Ecosystem Management
- Component 2 : Biodiversity Conservation
- Component 3 : Livelihoods Improvement Support
- Component 4 : Institutional Capacity Strengthening

PROJECT KEY ACTIVITIES AT A GLANCE :

- 460 VFDS BMC (sub-committees) identified
- 414 Micro-Plans (for Batch-I&II) prepared
- 750 SHGs/CIGs formed, out of which 450 SHGs/CIGs are all women driven groups
- Revolving funds provided to 491 SHGs as financial support to start their livelihoods activities
- Over 569 Business Plans for various activities prepared for the SHGs/CIGs
- Multiple orientation Workshops/Skilled based trainings organised for 423 SHGs are trained in Skilled based activities
- 4594 Hac area (PFM + Dept.) covered under plantation by Batch-II of VFDSs/BMCs
- 72 Departmental Nurseries strengthened under JICA nurseries development scheme
- Promotion of commercial cultivation of Picrorhiza Kurrooa (Kutki) and Swertia cordata (Chirayita), making leaf plates, pine needle collection, the rhizomes for propagation of Paris Polyphylla (Satua), Asparagus racemosus (Shatavari) by Jadi Buti Cell

"Connecting with nature means to connect with ourselves.

If we do so, we nurture a better planet."

-Sh Narendra Modi, Hon'ble Prime Minister

Sd/-

Addl. Pr. CCF-cum-Chief Project Director and CEO,
PIHPFEM&L (JICA Funded)
Potters' Hill, Summer Hill, Shimla-5



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CONTENTS

i.	12 th JICA National Workshop 24-26 May 2-23 Programme Schedule	i
ii.	Inaugural Address by the Chief Guest, Sh Sukhvinder Singh Sukhu, Hon'ble Chief Minister, Himachal Pradesh	iii
iii	Messages	vi
1.	Community Based Forest Green Growth Model for Conservation and Utilization under JICA Forestry Project in Himachal Pradesh, <i>Nagesh Kumar Guleria, Rajesh Sharma, Kaushalya Kapoor and Arvind Kumar Verma</i>	1
2.	Community Enterprise of Leaf Plates and Bowls in H.P. - A Success Story. <i>Nagesh Kumar Guleria, Ramesh Chand Kang, and Jiten Sharma</i>	10
3.	Evolving Forest Management Concepts in India - some thoughts. <i>Arun Kumar Bansal</i>	12
4.	Strengthening Community Engagement in Prevention and Management of Forest Fires under JICA Forestry Project in Himachal Pradesh. <i>Nagesh Kumar Guleria and Rajesh Sharma</i>	18
5.	Experiences of implementing the first JICA funded forestry project in the State of West Bengal. <i>Sumana Bhattacharyya</i>	24
6.	Hazardous Pine Needles a Resource for Women Livelihood in Himachal Pradesh-A Success Story. <i>Nagesh Kumar Guleria, Vinod Sharma, Reena Sharma and Yosha Solanki</i>	29
7.	Digital Transformation in Forest Management under JICA Aided Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihood. <i>Rajneesh Kumar, Disha Sharma and Nagesh Kumar Guleria</i>	31
8.	Participatory Approach to Sustainable Forest Ecosystem Management. <i>Girish Bhardwaj and Nagesh Kumar Guleria</i>	39
9.	Heritage Handloom for Modern Day Women Livelihood in Himachal Pradesh- A Success Story. <i>Nagesh Kumar Guleria, Vinod Sharma, Padam Singh Chauhan and Jugat Ram</i>	42
10.	Strengthening Community Institutions for Livelihood and Ecosystem Management in JICA HP Forest Project. <i>Nagesh Kumar Guleria, Lal Singh, Vinod Sharma and Reena Sharma</i>	44
11.	Mushroom Cultivation a Boon for Women Livelihood in Rural Villages of H.P.- A Success Story. <i>Nagesh Kumar Guleria, V.P. Pathania, Reena Sharma and Ankur Saraswati</i>	50
12.	Implementation of JICA Assisted Forestry Projects in Tamil Nadu. <i>I. Anwardeen</i>	51
13.	Financial Incentives for Community Led Sustainable Forest Management Institutions through Carbon Credits in JICA assisted Projects. <i>Atul Jindal,</i>	58
14.	LRC and Beyond. <i>Meeta Biswal</i>	66
15.	Satoyama Initiative Programmes under PIHPFEM&L Project. <i>Pravat C. Sutar and Nagesh Kumar Guleria</i>	80
16.	Innovative Conservation and Entrepreneurship Models of NTFPs Developed under HP JICA Forest Project. <i>Ramesh Chand Kang, Nagesh Kumar Guleria, V. P. Pathania and Akhilesh Thakur</i>	87
17.	Cultivation of <i>Lentinula edodes</i> -Medicinal Mushroom in Himachal Pradesh. H.P. Crop Diversification Promotion Project JICA-ODA, Hamirpur H.P. Dr. Sunil Chauhan	94
18.	JICA in Uttarakhand - Uttarakhand Forest Resource Management Project (UFRMP) and Technical Cooperation Project (TCP). Koko Rose	97
19.	Livelihood Development under Tripura SCATFORM Project. Dr. AVINASH M. KANFADE	100
20.	Forestry Integrated Geospatial Solutions- FIGS. Anurag Gupta	102
21.	List of Participants	

List of Contributors

S No.	Name	Designation	Address
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4.	Arun Kumar Bansal, IFS (Retd)	Former Additional Director General of Forests	Department of Environment, Forest and Climate Change Govt of India New Delhi.
5.	Atul Jindal, IFS (Retd)	Former Principal Chief Conservator of Forests	Uttar Pradesh Forest Department, Lucknow, Uttar Pradesh.
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20.	Vinod Sharma	Programme Manager (Marketing and Rural Financing)	
21.	Rajneesh Kumar	Programme Manager GIS, Project Management Unit (JICA)	
22.	Dr. Akhilesh Thakur	Manger Enterprise Development Jadi Buti Cell,	
23.	Reena Sharma	Subject Matter Specialist (SMS) Training,	
24.	Disha Gautam	Subject Matter Specialist (SMS) GIS,	
25.	Jiten Sharma	Subject Matter Specialist,	
26.	Yosha Solanki	Subject Matter Specialist Forestry and Biodiversity	Division Management Unit (DMU) Shimla H.P.
27.	Jugat Ram	Master Trainer	Traditional Handloom Trainer JICA Project, Divisional Management Unit Kullu H.P.
28.	Dr. Sunil Chauhan	Chief Project Director	H.P. Crop Diversification Promotion Project JICA-ODA, Hamirpur H.P.



12th Annual Workshop of JICA Assisted Forestry & NRM Projects in India

Workshop Theme

“Optimising Synergies between Sustainable Forest Management, Biodiversity Conservation, Ecosystem Services, Livelihood Development and Digital Transformation for contributing towards Climate Change Mitigation”

24-26 May, 2023

Venue: Hotel Peter Hoff, Shimla

Programme Schedule

Day -1, 24 May 2023	
10.30 AM-11.00 AM	Reception of Guests
Inaugural Session 11.00 am to 1.15 pm	
Chief Guest: Hon'ble Chief Minister Himachal Pradesh (Virtual)	
11.00am-11.15am	Visit of HCPS to the PIHPFEM&L (JICA Funded)SHGs Exhibition
11.15am-11.20am	Lighting of Lamp
11.20am-11.25am	Honouring of the Dignitaries on the stage
11.25am-11.30am	Welcome Address by Sh. Nagesh Kumar Guleria, IFS, Addl. Pr. CCF & Chief Project Director (JICA), <i>Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods.</i>
11.30am-11.35am	Screening of Documentary on PIHPFEM&L (JICA Funded) Activities
11.35am-11.40am	Address by Sh. Raghu Prasad, IFS, Inspector General Forest, Govt of India
11.40am-11.50am	Address by Sh. Rajeev Kumar, IFS, PCCF-HoFF, H.P. Forest Department Shimla
11.50am-12.00noon	Address by Mr. SAITO Mitsunori, Chief Representative JICA India, New Delhi
12.00 noon-12.10pm	Address by Sh. Sunder Singh Thakur, Chief Parliamentary Secretary (Forests) Govt of Himachal Pradesh, Shimla
12.10pm-12.15pm	Release of Workshop Souvenir, Reports and Publications (4 Nos)
12.15pm-12.20pm	Awards to Excellently Performing VFDS of JICA Funded HP Forestry Project
12.20 pm-12.45pm	Address by the Chief Guest, Sh. Sukhwinder Singh Sukhu, Hon'ble Chief Minister, Himachal Pradesh
12.45pm-1.15pm	Introduction to the Workshop Theme by Mr. Vineet Sarin, Chief Development Specialist, JICA India, New Delhi
1.15pm-2.30 pm: Lunch Break	
Technical Session 1: 2.30 pm to 4.15 pm	
“Sustainable Forest Management, Biodiversity Conservation & Ecosystem Services”	
Chair: Mr. Rajiv Kumar Pr. Chief Conservator of Forests (HoFF), Himachal Pradesh	
Co-Chair: Dr Sushil Kapta, IFS, Additional Pr. Chief Conservator of Forests (Finance) Himachal Pradesh	
2.30 pm-3.00 pm	Keynote address: Mr. A.K. Bansal, IFS (Retd), Additional Director General of Forests
3.00pm-3.20pm	Panelist-1 Dr. Pranab Ranjan Choudhary -“Sustainable Forest Management and Climate Change mitigation”.
3.20pm-3.40pm	Panelist 2 (Speaker): Mr. Roopak De, IFS (Retd) PCCF HoFF (retd.) Uttar Pradesh, - “Biodiversity Conservation”
3.40pm-4.00pm	Panelist 3 (Speaker): Mr. Swayam Mallik, DPD (CMES), Orissa- “OFSDP” (Phase II)

4.00pm - 4.10 pm	Open Discussion and concluding remarks by the Chair and Co-Chair.
4.10pm-4.30 pm : TEA BREAK	
Technical Session2: 'Digital Transformation' Chair: Mr. SK Chaturvedi, IFS PCCF HOFF, Gujarat. Co-Chair: Mr.Brijesh Kumar, IFS APCCF Karnataka.	
4.30 pm-5.05 pm	Keynote address-Mr. Sanjay K. Srivastava, IFS Pr. Chief Conservator of Forests and HoFF, (Retd.) from Tamil Nadu, -"Digital Transformation".
5.05 pm -5.25pm	Panellist 1 (Speaker):Mr.ChisayiVadeo, IFS, Divisional Forest Officer Kiphire Forest Division, Nagaland Forest Department- Digital Transformation in "NFCLIP".
5.25 pm -5.45pm	Panellist 2 (Speaker): Ms.Sumana Bhattacharya, IFS, CCF & Project Director (Finance) - Digital Transformation in "WB-FBCCCR".
5.45 pm -6.00 pm	Open Discussion and concluding remarks by the Chair and Co-Chair.
6.00 pm -7.30 pm FREE TIME	
7.30 pm to 9.30 pm: Cultural Programme and Dinner Venue: Hotel Woodville Palace	
Day-2 : 25 May, 2023	
10.00am-11.00 am- "Stress Management and Motivation"Session: by Ms. Jyoti Rana, HAS, Additional Director HIPA, Fairlawns, Shimla Himachal Pradesh	
11.00 am-11.20 am : TEA Break	
Technical Session3: Livelihood Development Chair: Sh. Rajiv Kumar, IFS, Pr. Chief Conservator of Forests (HoFF) HP. Co-Chair: Mr. I. Anwardeen, IFS, Adl. Chief Conservator of Forests and CPD, Tamil Nadu	
11.20 am-11.50 pm	Keynote address- Mr. Prasada Rao Vaddarapu, IFS Director, SCATFORM and MD Tripura -"Promoting Sustainable Livelihoods".
11.50 noon- 12.20 pm	Panellist 1. - Dr.Tej Partap, Ex Vice Chancellor HPAU- "Changing Mountain Economy of Forest Dependent communities through Modern Practices of Forest Management"
12.20pm -12.40pm	Panellist 2 (Speaker): Mr. Koko Rose, IFS Deputy Director UFRMP Uttarakhand- "Livelihood through UFRMP" (JICA Funded).
12.40pm-1.00 pm	Panellist 3 (Speaker): Mr.Nagesh Kumar,IFS APCCF and CPD PIHPFEM&L (JICA Funded) - "Livelihood support to the SHGs of Forest Dependent Communities in HP"
1.00 pm-1.15 pm	Open Discussion and concluding remarks by the Chair and Co-Chair.
1.15 pm-2.15 : Lunch Break	
2.15 pm-3.30pm: GROUP DISCUSSION SESSION: Three Groups as per Technical Sessions. Chair: (1) Mr. AK Bansal Retd ADGF, (2) Mr. Sanjay Srivastava (Retd) PCCF & HoFF and (3) Mr. Rajiv Kumar Pr. Chief Conservator of Forests (HoFF), HP will Chair the three groups. Co-Chair/MODERATORS: Mr.Vineet Sarin, CDS JICA India/ Mr Anurag Sinha/ Mr.Shubham Srivastava and Ms.Sushama Sen Adarshi will be the moderators.	
3.30pm -3.45: TEA Break	
3.45 pm-5.15 pm: Valedictory Session Chair: Mr. WATANABE Jun, Senior Representative JICA India New Delhi Co-Chair:Mr.Vineet Sarin, Chief Development Specialist, JICA India, New Delhi	
i. Workshop Report Presentation: Mr. Anurag Sinha, Additional Chief Development Specialist, JICA India, New Delhi	
ii. Certificates distribution	
iii. Valedictory speech by Chairperson, Mr. WATANABE Jun, Senior Representative JICA India New Delhi	
iv. Vote of Thanks By Sh. Shareshtha Nand, HPFS, Project Director, PIHPFEM&L, PMU Shimla, Himachal Pradesh	
5.15 pm -7.30 pm Free Time	
7.30pm-9.30 pm: Light Music (Gazal) Programme and Dinner- Venue: Hotel Woodville Palace.	
Day 3, 26.5.2023: FIELD VISIT -OPTIONAL FOR THE PARTICIPANTS	



Address by Sh Sukhvinder Singh Sukhu, Hon'ble Chief Minister of Himachal Pradesh on the occasion of "12th Annual Workshop of JICA Assisted Forestry and NRM Projects" at Shimla on 24th May 2023.

**"Ohayō-Gozaimasu" (Good Morning in Japanese)
"Do Ita Shima Shite" ("You are Welcome" in Japanese)**

It's indeed a proud moment for my State to welcome you all at Shimla on the occasion of 12th Annual Workshop of JICA Assisted Forestry and NRM Projects in India. I warmly welcome JICA Chief Representative and his team and thank him for choosing Himachal Pradesh for holding this Annual Workshop.

At the outset, let me state my friends that my State strongly believes in green and sustainable development and one of the most important development pillars of my new government is to make Himachal a 'Green State'. We have launched a number of initiatives in this regard, which will bear fruit in the time to come. This project rightly resonates with the planning of a Green State.

Himachal Pradesh is a store house of biotic diversity with around 8% of the Country's flora found in diverse habitats ranging from sub tropical to alpine zones. Himachal Pradesh is also a rich repository of medicinal plant wealth and ancient saints like Rishi Vayasa, Charaka and others wrote volumes on herbs and herbal lore. Indira the son of Kashyap was reported to have "SOMA" in order to immortalize and rejuvenate himself here. In Ramayana there is a mention that 'Hanuman Ji' came to Himalayas to collect 'SANJEEVANI' and the famous Jakhoo temple in Shimla is immortalized as Lord Hanuman's brief resting halt during his journey with Sanjeevani Buti.

We have around 68% of geographical area as recorded Forests but the area under Green Cover is about 28% and we target to make it 30% by 2030. My state is mostly agrarian, with nearly 90% population residing in rural areas, with heavy dependence on forest produce for their biotic needs and ecosystem services. Our people have been residing in harmony with nature and wildlife, since centuries and there is no dearth of traditional wisdom.

The role of the Forests as resources for Ecosystem Services is very important particularly in the present context when entire world is looking for the environment friendly solutions for the challenge of 'Climate Change'. Unfortunately, this forest wealth and knowledge has dwindled over the years due to unscientific extraction from our ecosystems and lack of knowledge in appreciation of the intangibles received from the forest ecosystems. Many species have become extinct and many more have fallen in the threatened list.

Therefore, with this background I think there was a need of a Project funded by the JICA in this State. I will not hesitate in mentioning that this proposal was formulated in our Government during 2016 and was selected for funding by the JICA and started in 2018. This reflects our vision of developing the environment with direct benefits to the forest dependent communities in different ways with Sustainable use of Forest Ecosystems to mitigate Climate Change.

I am told that in this JICA funded Forestry Project in Himachal Pradesh 460 Village Forest Development Societies (VFDS) and more than 900 Self Help Groups (SHGs) are being organized as community institutions for strengthening joint forest management activities across 7 districts in the state. These community institutions now possess a Corpus of more than Rs. 8.00 Crore with additional investment of Capital Cost of Rs. 2.5 Crore for starting their group income generation activities. This is a sound beginning in the initial phase of the project implementation and I expect that this will grow with leaps and bounds in the coming years till project completion in 2028.

The Project is also helping to enhance green cover in the State and plantation of more than 4600 hectares has been achieved in two years. This has been possible with appropriate technological intervention and advance works including investing resources in developing nurseries and improved planting stock. The project augmented production of more than 60 Lakh quality seedlings of different useful species for the community and forestry while modernizing 72 nurseries in the State.

Special focus is being laid on water conservation and to make water available for utilization by farmers in off season vegetable cultivation. At the same time, community level rejuvenation of traditional water sources like Bauri and Ponds is also being undertaken.

One of the most important components of the project is skill up gradation and capacity building of forest dependent communities and forest field staff. I am given to understand that more than fifteen thousand individuals were trained in different activities of livelihood and forest regeneration. This activity of capacity building of the community needs to be practiced throughout the state to minimize dangers of climate change and related disasters.

I have come to know modern digital technology of geomatics and drones is being used in geo-tagging of assets and monitoring of various activities including plantations. This will go a long way in modernizing the Forest Department which otherwise used to function in a typical traditional way.

I appreciate the concerted efforts being made in developing the livelihoods, sustainability of the ecosystems with community participation through use of modern digital technologies by the project team and the Forest Department.

Employment generation in the Govt. Sector cannot provide jobs to everyone. Therefore, the efforts made under the project to develop bio-business can go a long way in augmenting the incomes of communities and also provide them employment at their doorstep.

Friends, the three day workshop being organized here in Shimla is very timely, and as I mentioned in the beginning, that projects such as these, would propel Himachal's journey towards being a **Green State**. I am sure that the delegates will be able to come up with practical and viable recommendations so that the interventions for environment, economic and employment development are implemented in the entire country.

I assure Chief Representative JICA along with State Forest Department full support of my Government in promoting Ecosystem Management and Community Livelihoods in this 21st century of knowledge.

I would suggest Forest Department should start working to develop the 2nd phase of this project in advance to all those areas which are not covered as of now and also request the JICA Authorities that the negotiations can be started for the 2nd Phase of this project in advance, so that the 2nd Phase is in place in April 2026 when the implementation phase of this ongoing Project is over.

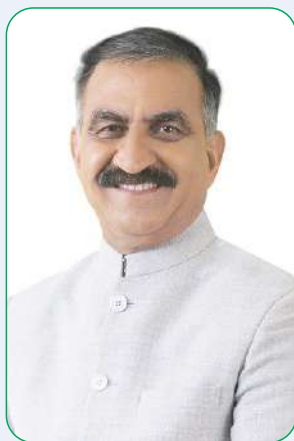
I once again thank and congratulate JICA Team for shortlisting Himachal Pradesh for organizing this prestigious 12th Annual JICA Workshop here at Shimla.

Thank you all and best wishes for the National Workshop.

Jai Hind, Jai Himachal

'Arigato gozaimasu' (Thank you)

A large, light blue watermark of the JICA logo is centered on the page. The logo consists of the letters 'JICA' in a bold, sans-serif font, with a stylized circular graphic element behind the letters.



**CHIEF MINISTER
HIMACHAL PRADESH**

SUKHVINDER SINGH SUKHU

Message

I am delighted to know that JICA National Workshop on Forestry Projects in India is scheduled to be held in Shimla from 24th May to 26th May, 2023. This workshop will focus on current topics such as Biodiversity Conservation, Ecosystem Services, Livelihood Development and Digital Information for contributing towards climate change mitigation.

Himachal Pradesh is blessed with a rich natural heritage in form of forests and the 'Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihood' (PIHPFEM&L) is making a valuable contribution to the forests and their development. The project is also working towards providing livelihood support to the forest dependent communities by forming Self Help Groups.

The Himachal Pradesh JICA Forestry Project is doing excellent work and it gives me immense pride that the National Workshop of JICA Forestry Projects in India is being organized in Shimla.

I extend my best wishes to the officers and staff of PIHPFEM&L for the success of this event.

(Sukhvinder Singh Sukhu)

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KULDEEP SINGH PATHANIA
SPEAKER

Message

I am glad to know that the “12th Annual Workshop of JICA Assisted Forestry & NRM Projects in India” is being organized at Shimla (H.P.). Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods (PIHPFEM&L) is the first JICA funded forestry project in our state that specifically focuses on enhancement and management of forest ecosystem services while contributing towards environmental and socioeconomic development of the forest fringe and dependent communities.

I am hopeful that the concerted efforts of vibrant team of “Project for Improvement of Himachal Pradesh Forest Ecosystem Management & Livelihood” (PIHPFEM&L) will enable them to achieve the envisaged objectives of sustainable environmental and social development of a wider section of forest fringe areas and local communities in Himachal Pradesh.

This workshop is an unique form for the exchange of innovative ideas on the Biodiversity Conservation, Ecosystem Services, Livelihood Development and Digital Transformation for Contributing towards Climate Change Mitigation. We are committed to protecting the rich heritage of biodiversity which is so vital to rural economy and social development.

I convey my best wishes for the success of the workshop.

(Kuldeep Singh Pathania)



Chief Parliamentary Secretary
(Tsm., MPP & Power, Forest & Tpt.)
Himachal Pradesh, Shimla-171002.

Sunder Singh Thakur

Message

It is gratifying to note that Himachal Pradesh JICA Forestry Project is hosting a National Workshop on 24th to 26th May, 2023 at Shimla.

This Workshop with the theme “Optimising Synergies between Sustainable Forest Management, Biodiversity Conservation, Ecosystem Services, Livelihood Development and Digital Transformation for contributing Towards Climate Change Mitigation” is the right platform to various Stakeholders under one roof to share their experiences.

The success of any programme depends upon its adoption by various stakeholders involved in the programme right from the conceptual to implementation stage. Japan International Cooperation Agency (JICA) also conceptualized various strategies/ programmes in a consultative process with Village Forest Development Societies (VFDSs), Self Help Groups (SHGs), Panchayats, Institutions and Research Organisations..

I am sure that the deliberations made during the workshop will help in achieving the objectives of the Workshop. I complement Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods (PIHPFEM&L) team for arranging this National Workshop and wish them all the success in their future endeavors.

(Sunder Singh Thakur)



Message from Chief Representative, JICA India

It is a matter of great pleasure for me to learn that the Forest Department, Government of Himachal Pradesh, is organizing the 12th Annual Workshop of JICA Assisted Forestry & NRM Projects in Shimla from May 24 to 26, 2023, under the *Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods*, the loan agreement for which was signed between JICA and the Government of India in March 2018.

After the 11th Annual Workshop, which was very successfully organized by Tamil Nadu Forest department in Kodaikanal in March 2019, no annual workshops could be organized due to the onset of Covid 19 pandemic in early 2020. Therefore, I am particularly pleased that the annual workshops are now resuming and I am eagerly looking forward to attending the same in Shimla.

JICA's more than three decades of collaboration with Ministry of Environment Forests and Climate Change, Government of India and 24 states has been one of the most fruitful ones. As of today, JICA's cumulative commitment to the Forestry & NRM sector in India stands at JPY 313.80 billion (approx. 19,500 crores at current exchange rates) covering 31 ODA loan projects and 2 Technical Cooperation projects.

While JICA's collaboration continues to grow in the sector, more emphasis is being given to address climate change issues by promoting sustainable forest management, biodiversity conservation, ecosystem services, livelihoods along with digital transformation in a concerted manner. Therefore, I would be looking forward to several interesting presentations and deliberations during the course of this workshop, which I am sure will culminate with a set of actionable recommendations.

Finally, but most importantly, I would also like to convey my compliments to the Government of Himachal Pradesh and the entire project team of PIHPFEM&L led by you for making great efforts even during difficult Covid times to ensure that at least some project activities were kept ongoing. The important thing was not to lose the momentum entirely and Himachal Pradesh Forest Department ensured that. I sincerely hope that project implementation will pick up full momentum now and whatever delays were caused by Covid 19 pandemic shall be covered up in a progressive but methodical manner in the future.

I convey my gratitude to all those who have been associated in organizing this workshop.

With my best wishes for a successful workshop!

SAITO Mitsunori

Chief Representative, JICA India



Prabodh Saxena, IAS
Chief Secretary to the
Government of Himachal Pradesh



Ellerslie,
Shimla-171 002

Message

It gives me immense pleasure that “12th Annual Workshop of JICA Assisted Forestry & NRM Projects in India” is being held in Himachal Pradesh.

The theme of the workshop is "Optimizing Synergies between Sustainable Forest Management, Biodiversity Conservation, Ecosystem Services, Livelihood Development and Digital Transformation for Contributing towards Climate Change Mitigation” which is actually global need to meet the challenges of climate change and to impact on our life.

I hope eminent speakers will cover the theme from different perspectives. I am privileged to say that this workshop will definitely offer suitable solutions to the global issues. I wish all the delegates, a great informative experience at the workshop.

My best wishes for success of the workshop.


(Prabodh Saxena)



Onkar Chand Sharma, IAS
Principal Secretary



Armsdale
Shimla-171002

Principal Secretary (Forests)
Govt. of Himachal Pradesh


MESSAGE

It gives me immense pleasure to know that Himachal Pradesh JICA Forestry Project is organizing National Workshop on Optimising Synergies between “Sustainable Forest Management, Biodiversity Conservation, Ecosystem Services, Livelihood Development and Digital Transformation for contributing Towards Climate Change Mitigation” from 24th to 26th May, 2023 at Peterhoff, Shimla.

The topic of workshop is of much importance and relevance. Today, the environment has been facing various challenges of Sustainable Forest Management, Biodiversity Conservation, Ecosystem Services, livelihood Development and the Digital Transformation. There is a need to evolve a viable Model to address these strategic issues in clear and comprehensive terms. The Central and State Forest Departments with the assistance of Japan International Cooperation Agency (JICA) have taken initiative in this direction.

I do hope that deliberations of this National Workshop would be able to present a definite action programme in this regard.

My sincere and best wishes for the success of this Workshop.


(Onkar Chand Sharma)

Pr. Secretary
/Forest)
Government of Himachal Pradesh



Office of
**Principal Chief Conservator of Forests
(Head of Forest Force)**

Himachal Pradesh Forest Department Headquarters, Talland, Shimla-171001

MESSAGE

It is a matter of great pleasure that JICA National Workshop of Forestry Projects in India is being held in Himachal Pradesh.

Along with increasing the green cover of Himachal Pradesh, this project focuses on improving the economy of rural communities dependent on forests. The project addresses the needs of the communities as well as that of the forests through a unique ecosystems approach. While undertaking afforestation, the project components also include managing invasive alien species, soil & moisture conservation, improving the wildlife habitats and building up capacity of individuals and intuitions. The project employs latest technological tools like geomatics and drones for planning and monitoring mission critical works.

The workshop is a platform for sharing new perspectives in the areas of Biodiversity Conservation, Ecosystem Services, Livelihood Development and Digital Transformation for Contributing towards Climate Change Mitigation.

The workshop would not have been possible without the enthusiasm and hard work of my colleagues. I hope that the JICA National Workshop will result in cross sharing of ideas & leanings and wish it grand success.

(Sh. Rajiv Kumar), IFS
Pr. Chief Conservator of Forests (HoFF)
Himachal Pradesh.



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Society for Improvement of Forest Ecosystems Management & Livelihoods in Himachal Pradesh

Nagesh Kumar Guleria, IFS

Addl. Pr.CCF & Chief Project Director (JICA-PIHPFEM&L)

Potter's Hill, Shimla, Himachal Pradesh-5

MESSAGE

It is a matter of great pride that JICA India gave this opportunity to Himachal Pradesh for hosting this prestigious “12th Annual Workshop of JICA Assisted Forestry & NRM Projects in India” at Shimla.

This is a great occasion to the State of Himachal Pradesh to showcase work carried out under the **Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods (PIHPFEM&L)** in Himachal Pradesh to the invited dignitaries and participants from different states of India. PIHPFEM&L project since its inception in 2018 developed different tools and techniques to strengthen the forest ecosystems management and community livelihood development in addition to water conservation works. PIHPFEM&L developed 72 modern nurseries, planted 4594 hectare area, empowered 417 Village Forest Development Societies (VFDSs)/Biodiversity Management Sub. Committees (BMCs) and organized 575 SHGs during these years for forest conservation and successful livelihood business models. Project contributed extensively for the training and capacity building of the frontline forest staff in modern nursery techniques, plantation, fire fighting, digital transformation and soil water conservation. I appreciate and congratulate frontline forests staff and the PIHPFEM&L staff for the achievements.

The workshop is going to have three brainstorming sessions on the theme ‘Optimising Synergies between Sustainable Forest Management, Biodiversity Conservation, Ecosystem Services, Livelihood Development and Digital Transformation for Contributing towards Climate Change Mitigation’. Keeping in view the progress made in PIHPFEM&L in last five years it was our endeavor to publish a ‘WORKSHOP SOUVENIR’ with ISBN registration so that the articles published get the recognition as published work worldwide and act as reference for future.

My best wished to the PIHPFEM&L team working day and night in organizing this workshop, compilation of Souvenir and making all logistic arrangement for this workshop.

Nagesh Kumar Guleria

Community Based Forest Green Growth Model for Conservation and Utilization under JICA Forestry Project in Himachal Pradesh

Nagesh Kumar Guleria, Rajesh Sharma, Kaushalya Kapoor and Arvind Kumar Verma
Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods
Himachal Pradesh Forest Department, Potters' Hill, Summer Hill, Shimla-171005

Introduction

Forests are the priceless treasures of the human race. They provide various ecological services like clean air, water, maintenance of soil-moisture regime by checking soil erosion etc. Forests maintain environmental stability and ecological balance. These life supporting systems are presently under great stress due to the impact of modern civilization, economic development and growth in human and cattle population. India has developed a strong legal and policy framework for the Forestry sector for sustainable forest governance through National Forest Policy, 1988, Indian Forest Act, 1927, Forest (Conservation) Act, 1980 and Wildlife (Protection) Act, 1972. National Forest Policy, 1988 sets a strategy of forest conservation with the principal aim of ensuring environmental stability and maintenance of ecological balance by bringing a minimum of one-third of total land area of the country under forest or tree cover. As per India State of Forest Report (ISFR), 2021 total forest and tree cover is 8,02,088 sq km which is 24.39% of total geographical area of India. According to National Forest Policy, 1988, at least two thirds of the geographical area should be under forests in hilly states like Himachal Pradesh. ISFR, 2021 for Himachal Pradesh area under Forest cover in Himachal Pradesh is 27.73%. The state government is aiming to increase its forest area (27.73) to 30 % by 2030 and to achieve this goal various initiatives have been taken.

The Forests in Himachal Pradesh are known for their beauty and majesty, like a green pearl in the Himalayan crown. The forests of the State have been classified on an ecological basis by Champion and Seth, broadly into Coniferous Forests and Broad-Leaved Forests.

After the JFM order of 1993 in the state, Participatory Forest Management rules were framed in 2000 further streamlining and consolidating the role of communities in the management of forests. It entitles a Village Forest Development Society (VFDS), to manage the forests under the jurisdiction of a village Panchyat ward. These rules allow 100% right to non-timber forest produce such as fallen twigs, branches, lopping, grass, fruits, flowers, seeds, leaf fodder and limited rights to timber benefits with nominal cost. These rules also define the structure and responsibilities of VFDS and same procedures and norms were adopted for the implementation of JICA funded Forestry Project in HP for PIHPFEM&L (JICA funded).

One of the initiatives of the state government to achieve the goal of 30% is to reduce the pressure on the forests by providing livelihood support to the forest dependent communities. At the same time plantation on approximately 10000 ha area with community involvement under Himachal Pradesh Forest Ecosystem Management and Livelihood Improvement project (PIHPFEM&L) of Rs. 800 Crore funded by JICA in Seven districts namely Kullu, Mandi, Lahaul-Spiti, Bilaspur, Shimla, Kinnaur and Kangra will further ensure ecosystem restoration and livelihood improvement of the inhabitants. The project period is 10 years from 2018-19 to 2027-28. It is being implemented in 72 Ranges of 22 Divisions falling in the jurisdiction of 9 Forest Circles. Activities are carried out both in Participatory Forest Management (PFM) as well as Departmental Mode through the organization of 400 VFDS, 60 BMC sub-committees and 920 SHGs.

Detail of PIHPFEM&L project coverage in HP is geographically presented in Fig- 1.

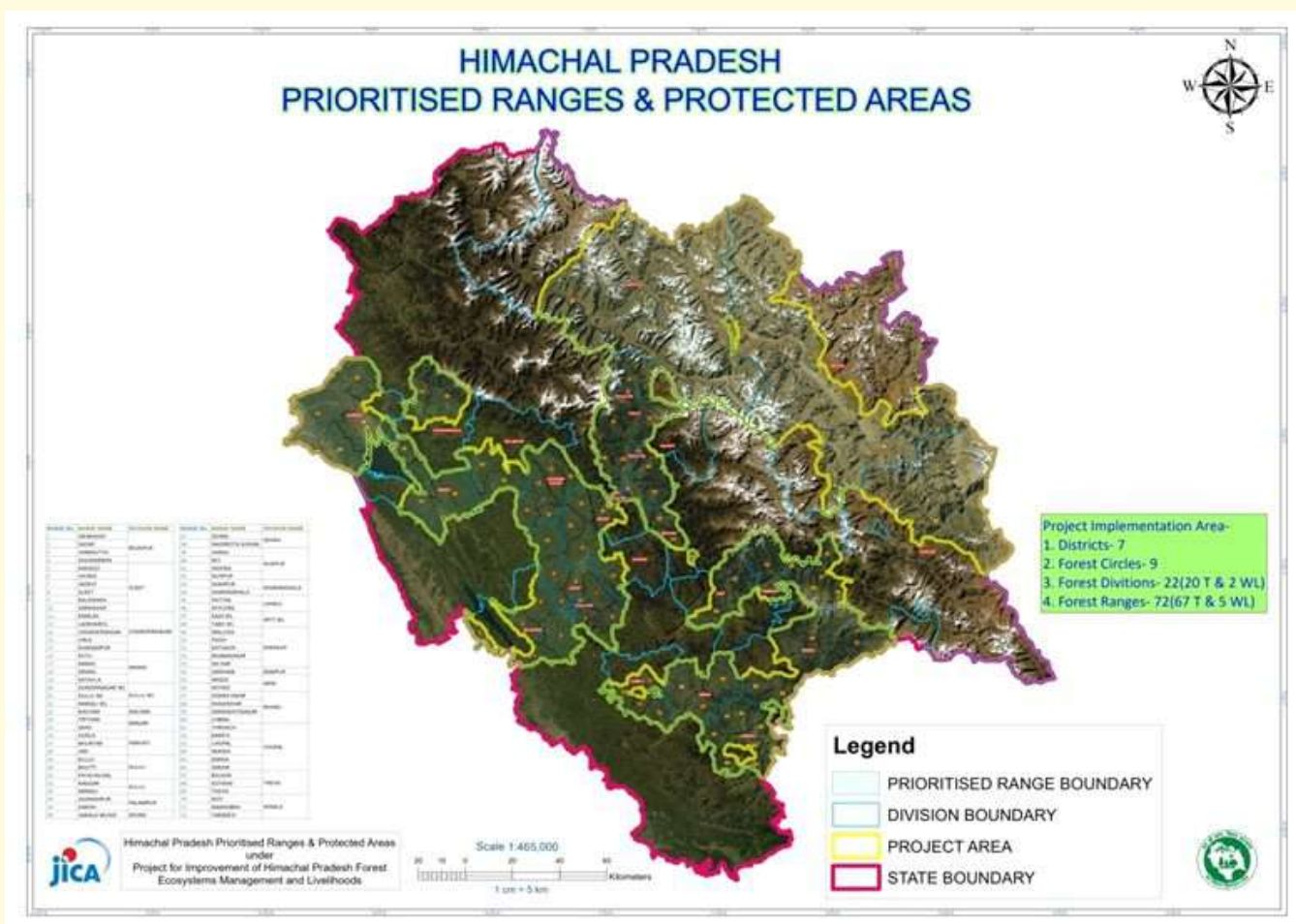


Fig.1 HP JICA Forestry Project

The article aims to analyze the innovative community based forest green growth model for conservation and utilization started in 2019 to 2022 under JICA Forestry Project in Himachal Pradesh to address the ecosystem management needs with community involvement.

Development of quality planting material

Forest restoration is a complex process that requires many steps to ensure successful forest establishment. Seedling quality is a critical component in ensuring any successful forest restoration program. Poor-quality seedlings are the foremost causes of plantation failure, influencing the plants survival and growth. To overcome this concern, there is a need for quality planting material in bulk year after year and normal practice of producing planting material in forest nursery is constrained mainly with budget and lack of technology. The quality seedlings means that it should be fit for purpose, meaning that seedlings are grown not just for the sake of producing nursery stock, but rather ensuring a successful forest restoration program. A combination of morphological and physiological attributes is required to describe seedling quality. Morphological (e.g., bud, shoot, root) and Physiological (e.g., carbohydrate reserves, dormancy, drought tolerance, freezing tolerance, nutrient status) attributes present in seedlings within the proper range of values, “enhance” seedling performance and quantify a seedling's growth potential after planting in the field. These morphological and physiological attributes can only be addressed by advanced forestry techniques and technology with modern infrastructure in nurseries.

With the limited availability of funds and use of technology, there was urgent need to popularize advanced forestry techniques such as Green Houses, Mist Chambers and Root trainers in HP Forest Department nurseries and necessary provisions for setting up of all these infrastructures were made in HP JICA Forestry Project. As on today Five (05) circle level nurseries, 58 Range level Nurseries (Fig.2), and their modernization improvement and enhancement of nursery area under this project has been done. The capacity for seedlings production has been enhanced by more than 64 Lakh plants in these nurseries which is a major contribution by the PIHPFEM&L to achieve the state's target of increasing the area under green cover from 27.73% to 30% by 2030.

Modernization of nurseries was started at circle and range level, best efforts to create and enhance the production capacity and also created additional facilities under HP JICA Forestry Project. Moreover, some of the facilities created for modernization are, Vermicompost Pit, Root Trainers and Stands, Drying Yard with seed treatment facilities, Hardening Yard for root trainer seedling, Composting Area, Water Facility with sprinklers, Green House, Mist Chamber, Germination House, Shade House, Nursery Equipments / modern tools etc.

More than 55 different tree species are being raised in these nurseries, which includes (*Cedrus deodara*, *Pinus roxburghii*, *Prunus armeniaca*, *Quercus leucotrichophora*, *Prunus pernica*, *Abies pindrow*, *Terminalia bellerica*, *Grewia optiva*, *Punica granatum*, , *Melia azadirachta*, *Terminalia chebula*, *Pyrus pashia*, *Pterospermum acerifolium*, *Aesculus indica*, *Ulmus villosa*, *Quercus floribunda*, *Morus spp.*, *Pinus gerardiana*, *Prunus cerasoides*, *Picea smithiana*, *Taxus wallichiana*, *Sapindus mukorossi*, *Robinia pseudoacacia*, *Dalbergia sissoo*, *Bauhinia vahlii*, *Juglans regia* etc.)

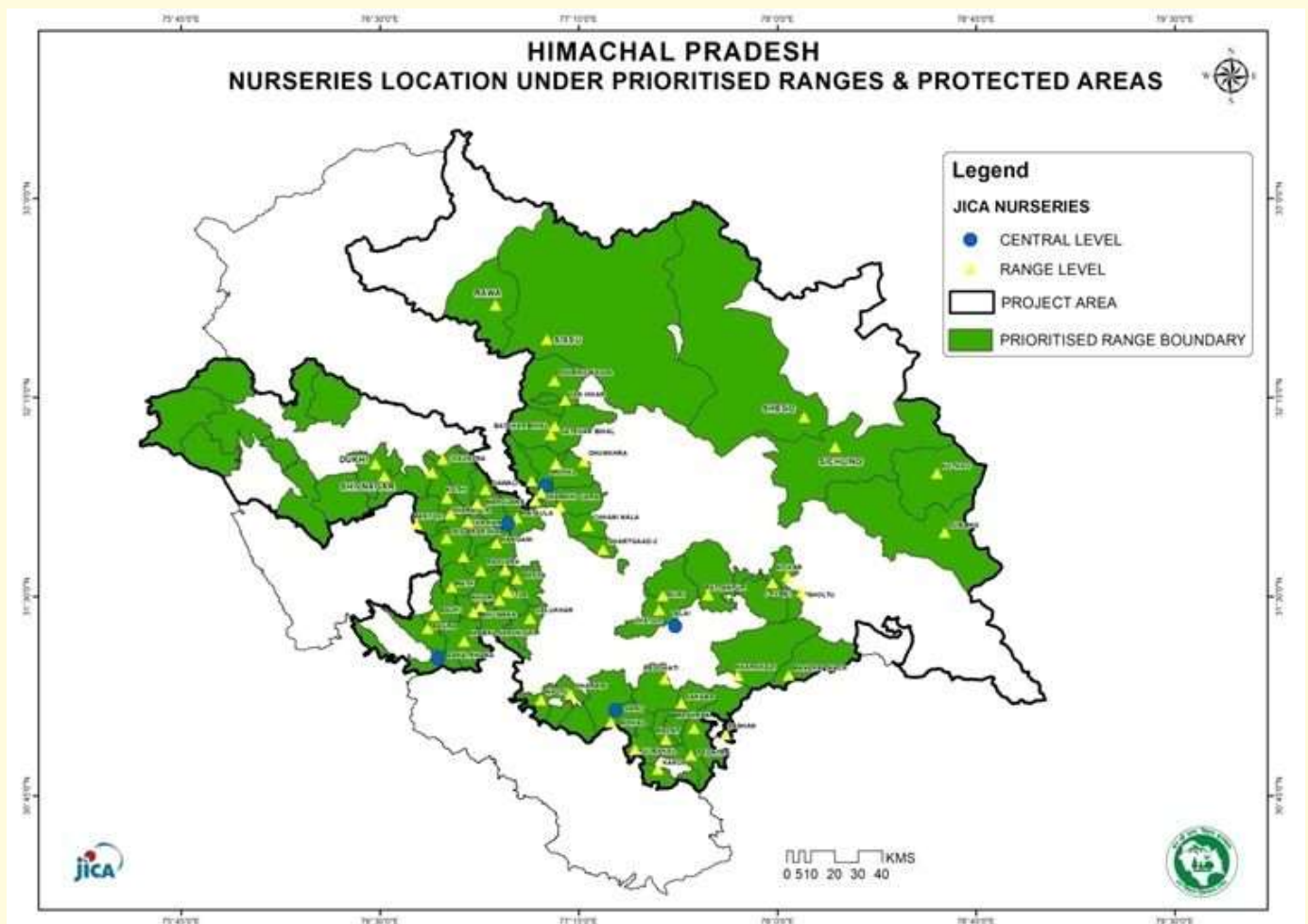


Fig.2. Nurseries locations under PIHPFEM&L (JICA, Funded)

Locations of the selected nurseries maintained under HP JICA Forestry Project in Himachal Pradesh with their physical condition is depicted in Fig.2 and 3.



Fig.3. Modern PIHP&L Nurseries Established with JICA Support

Detail of nurseries developed and maintained with detail of prominent plant species at different stages of growth produced in different forest divisions in Himachal Pradesh is presented in Table-1.

Table- 1. Status of Nursery Stock in JICA Forestry Nurseries under Different Forest Divisions wef.2018-2019 to 2022-2023							
Forest Division	0-6 Month Normal Plants	6-18 Months Normal Plants	18-30 Months (Tall, BL & Normal plants)	30-42 Months Tall Plants	Tall Plants >42 months	Plants utilized Batch-1 & 2 Plantaion and maintenance	Total
Kullu	62875	46975	109214	135932	0	131230	486226
Parvati	93880	0	171920	8340	0	74360	348500
Seraj	64000	6500	81390	0	0	74360	226250
Lahaul	0	66200	60000	0	0	0	126200
Mandi	54500	174560	124666	400	0	43340	397466
Suket	0	198620	174760	0	0	53130	426510
J/Nagar	5000	193176	131996	0	0	69740	399912
Nachan	0	0	15200	3460	0	75130	93790
WL Kullu	210230	57810	35121	0	0	82280	385441
Bilaspur	0	23045	118825	0	98000	51040	290910
Theog	33000	34100	17715	97600	0	76450	258865
Shimla	59930	0	88640	0	0	69300	217870
Rohru	74480	18200	100000	38000	15040	72490	318210
Chopal	38720	221740	38710	128320	0	72050	499540
Anni	22100	13300	99769	11800	17261	60060	224290
Rampur	0	0	43348	11243	11200	74360	140151
Kinnaur	136340	50810	93730	50400	0	74360	405640
Spiti	0	142100	0	0	0	0	142100
Grand Total	855055	1247136	1505004	485495	141501	1153680	5387871

Pace of plantation increased in the successive years with availability of planting material and will go a long way in achieving the proposed objectives of the forest ecosystem management in the state of HP.

Plantation activity

In Himachal Pradesh As per ISFR Report 2021, we have 5.59% area as Very Dense Forest, 12.80% area under Moderately Dense Forest, 9.33% as Open forest and 0.57 % area under scrub forest. For the purpose of this project the target areas are the Moderately Dense Forest and the open & scrub forest.

Areas without adequate rootstock will be brought under multipurpose tree plantations with a partnership between the Himachal Pradesh Forest Department and the Communities. In this way the forest department acts as a facilitator to provide 10 hectare land for plantation by the communities with species of their choice in participatory mode under the supervision of frontline forest staff and VFDS representatives. Forest Department plant 10 hectare where the department also involves communities for field planting operations to provide wages and livelihood with some level of community ownership for long term maintenance of plantation.

In departmental mode three types of plantation viz; a) **Tall Block Plantation (@500 plants/ha)** b) Assisted Natural Regeneration (ANR(@200 plants/ha) and (c) ANR without and with planting is being done. On the other hand the PFM mode plantation type viz; (a) **Afforestation (@1100 plants/ha)** (b) **Tall Block Plantation (@500 plants/ha)** and (c) ANR with 200 plants/ha is being done. HP JICA Forestry Project facilitate advance works activities such as pit digging, clearing of area, fencing works one year in advance, which plays an important role in increasing the survival rate of the plants.

In FY 2019-20 Advance Works in 784 ha in PFM Mode and 740 ha in Departmental Mode were completed in Batch I of VFDS. The plantation in these areas i.e 784 ha PFM and 740 ha in Departmental Mode were completed in the financial year 2020-2021 (Table 2). Similarly, in ongoing FY 2022-2023 plantation of 2950 ha was achieved till 31 March 2023 and details of PFM and Departmental achievements are presented in Table-3.

Table.2 Plantation Detail in 2020-2021 & 2021-2022 (Remaining)

	Area (in ha)	Financial Investment (in Crore)
PFM Mode –Batch I-76 VFDS		
Enrichment (@800 plants/ha)	289	1.20
Afforestation (@1100 plants/ ha)	495	2.40
Total	784	3.56
PFM Mode –Batch I-12 BMC Sub-Committees		
Enrichment (@800 plants/ha)	44	18.04
Afforestation (@1100 plants/ ha)	36	17.28
Total	120	0.3532
Departmental Mode		
ANR with Gap Planting (@200 plants/ha)	325	1.45
Tall Block Plantation (@500 plants/ha)	415	2.7
Total	740	4.15
G. Total	1604 ha	8.06

Table.3 Plantation detail in 2022-2023

PFM Mode –Batch II & III -178 (VFDS/BMCs)	Area (in ha)	Financial Investment (in Crores)
Afforestation Advance Works (@1100 plants/ha)	600	3.70
Tall Block Plantation (@500 plants/ha)	562	4.202
ANR with Gap Planting (@200 plants/ha)	386	1.80
Total	1,58348	9,7
Dep. Mode –Batch II & III -167 (VFDS/BMCs)	Area (in ha)	
TR Ranges		
ANR with Gap Planting (@200 plants/ha)	311	1.45
Tall Block Plantation (@500 plants/ha)		8.30
Total	1,428	9.75
G. Total	3,011	19.45

Under the Project for Improvement of Himachal Pradesh Forest Ecosystem & Livelihoods (PIHPFEM&L) plantation of 20 ha in each VFDS PFM and Departmental mode was planned. In 10 ha plantation in PFM mode by the VFDS of the concerned area, the plantation is done with species of their choice to meet their future demand of fuel, fodder, medicine, nutrition and timber etc. The area undertaken under PFM mode is primarily unprotected forests (UPFs) or the community lands near the habitations so that the VFDS has easy access to the areas.

It is a well known fact that to attain a common objective, the involvement of the whole community is needed. But when we talk about biodiversity conservation and sustainability it is impossible to attain this without direct involvement of the native communities. For this purpose not only commitment, dedication or determination is needed but apart from it some technical expertise is also required. Therefore, under this project a number of training programmes and awareness campaigns were undertaken and technical support was provided to make the communities equipped with knowledge and skills regarding biodiversity conservation and sustainability. The area for plantation by the departmental mode was the DPFs, RFs and also some UPFs where core forestry is practiced for scientific management of these forests.

It was the innovative planning and approach with effective community orientation and involvement of HP JICA Forestry project that in the last four years since 2018 plantation targets of 1604 Hectare and 3011 Hectare were achieved in 2020-2021 and 2022-2023 respectively. A small area of 40 ha was planted during 2021-2022 which was considered as a blank year keeping in view the advance work carried for plantation in the next year. Detail of the plantation target, target achieved, and balance target with field operations with community involvement carried out is presented in Fig. 4 and 5.

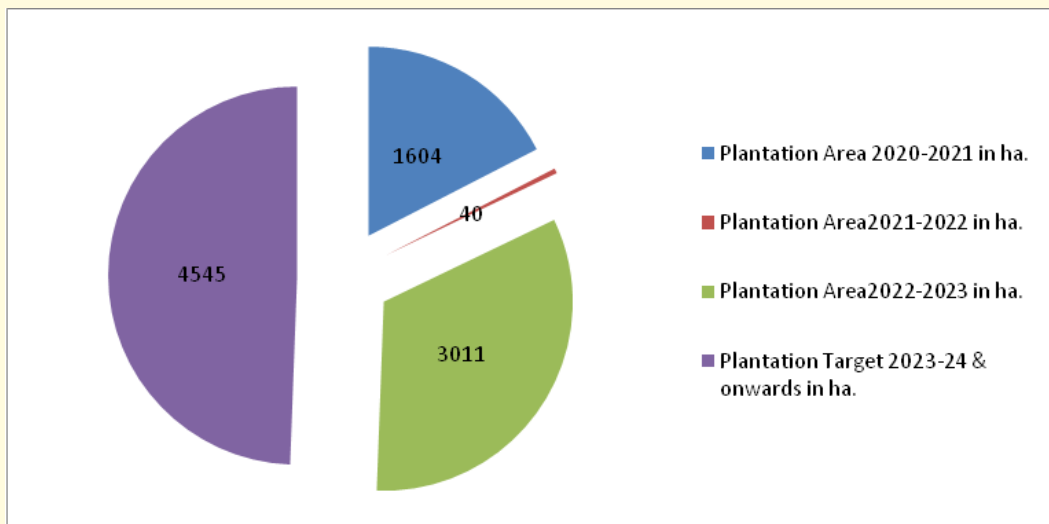
**Fig.4 Plantation in Different Year and Target for Successive Years in ha.**



Fig.5 Plantation Operations by the Community in different Methodology being followed in PIHPFEM&L

i. Micro Planning for Community Involvement

Under HP JICA Forestry Project it was ensured for the first time that community members were oriented, organized and trained systematically with financial support to VFDS for carrying out day to day operations with independence. Preparation of micro-plans of the VFDS was done with prioritization of their needs and planning for advance operations keeping in view the seasonality of different field activities.

Broadly, the Micro Plans are prepared by using Participatory Rural Appraisal (PRA) tools & techniques. PRA is an easy method to collect information about the community, their needs and knowledge. It is being extensively used in natural resource management, agriculture, health and nutrition, poverty and livelihood programmes. The philosophy behind PRA is that community members are the best experts of their own situations. To do this, facilitators must establish a good rapport, build trust and then use different tools and techniques to collect right and factual information. The role of facilitator is to guide and help the community members in tapping their own knowledge and resources for efficient and effective usage. The technique is to facilitate active community participation, transparency and increased level of accuracy in participatory information collection analysis process of different components presented in Fig.-6.

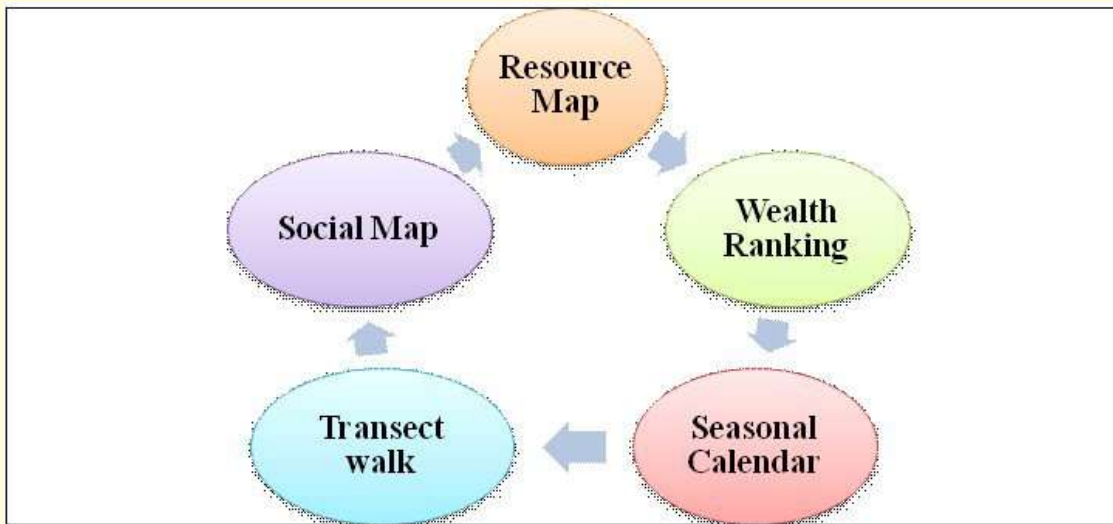


Fig.6 Participatory information collection and analysis process

PRA tools were used to collect the primary information including Social map, Resource map, wealth ranking, Seasonal Calendar and Transect walk. Micro Planning process emphasizes upon involvement of local people in identifying their resources, needs, and opportunities to overcome the gaps/issues through their active participation. It is a community based empowering process for preparing a road map for development and management of forest and livelihood enhancement of the forest dependent communities with properly defined roles and responsibilities of all stakeholders, clearly set targets and well discussed deadlines.

ii Self Help Group/ Common Interest Group Formation

The Project has one of the major components “Livelihood Improvement Support” and the objective is to improve the livelihood of the Forest Dependent Communities. The approach for the purpose in the project is the formation of SHGs/CIGs (920 No), imparting skill training to the groups, providing financial support to the SHGs for IGAs, so as to enable these SHGs to take up need based and sustainable livelihood options towards their socio-economic betterment.

The Project involves SHGs and CIGs as basic units for livelihood improvement activities in the project. In communities where SHGs or CIGs are already in operation, the Project would avoid creating new SHGs but instead help in reactivating, strengthening and providing additional support to the existing ones. In case of non existing SHGs focus has been given to formation of new SHGs. Convergence was sought when the existing SHGs fell under the intensive blocks of the SRLM or any other SHG programmes of other organizations. In these circumstances, the Project provides support to existing SHGs in terms of skill training, business planning, marketing and value addition etc. The purpose of the project is to develop community institutions in the form of SHGs, imparting skill training, providing financial support for initiation of need based income generation activities (IGAs) in groups for their sustainable livelihood. Under the Project in each VFDS two SHGs were formed which were identified during the Micro Planning Process. After identification, formation of SHG process starts by practicing “PANCHASUTRA” i.e. regular meeting, regular saving, regular inter-lending, timely repayment and up-to-date book keeping followed by monthly saving & opening of savings bank account. Opening of savings bank accounts was the first step towards financial inclusion of SHGs. Savings bank account gives recognition to the SHG as a customer of the banking system and provides potential access to different financial services.

SHGs under the Project consist of 10-20 individuals, which can be women group, mix group or purely men group. In case of special SHGs i.e. groups in the difficult areas and groups formed in remote tribal areas, this number may be a minimum of 5 persons. In the Project 920 SHGs/ CIGs are to be formed out of which as on date total 768 SHG/ CIGs has been formed. Project provides Revolving Fund (Rs) to each SHGs of Rs 1,00,000 as corpus fund to meet the members' credit needs directly and as catalytic capital for leveraging repeat bank finance. RF is given to those SHGs who have been practicing 'PANCHASUTRA’.

SHGs who start inter-lending, prepare their business plans by identifying Income Generation Activities (IGAs). As on date under the project 568 business plans are prepared by adopting different livelihood models such as Handloom, Mushroom Cultivation, Bee Keeping, Pine Needle Handicrafts, Haldi processing, Vermicompost, Dairy Farming, Food Processing, Backyard Poultry farming, Sera/Badi Making etc. Some of the Income Generation Activities are successfully started by SHGs such as Handloom in Kullu, Mushroom Cultivation in Suket, Food Processing in Mandi & Bilaspur and Pine Needle Handicrafts in Shimla.

i. Project Support to SHGs/ CIGs

Project took great initiative in providing support to SHGs in terms of capital cost, up to 75%. Project is providing 100% support in Training & Capacity building of the SHGs and providing 50% to 75% support for Machinery & Equipment procurement. One time support as a revolving fund of Rs. 1.00 lakh provided to the group is kept in the Fixed Deposit by the group as surety to generate credit from the bank to start their IGA as per approved business plan. This procedure facilitates the objective of bank linkage for the group. Further to reduce the burden of interest on credit each SHG is also eligible to get the annual subsidy of 5% on the interest amount from the project. Detail of VFDS and SHGs in different Forest Divisions is presented in Table-4.

Table.4 Detail of Forest Divisions, No of Ranges, VFDS&SHGs & Business Plans

Division	No of Forest Ranges	No. of VFDS/BMC sub Committee	MP Approved	No. of SHGs formed	No. of BP Approved
Anni	2	10	10	21	11
Banjar	2	12	12	24	23
Bilaspur	4	26	26	52	35
Chopal	6	36	35	63	60
Dehra	3	15	15	30	15
Dharamshala	2	10	10	20	7
Jogindernagar	5	33	33	64	62
Kinnaur	5	22	22	43	33
Kullu	5	33	33	55	29
Lahaul	2	14	14	24	12
Mandi	4	28	28	53	35
Nachan	1	5	5	12	12
Nurpur	4	30	22	10	10
Palampur	2	10	10	20	20
Parvati	3	16	16	33	31
Rampur	1	5	5	10	9
Rohru	4	22	21	40	26
Shimla	3	13	13	12	12
Suket	6	41	41	51	46
Theog	3	17	17	30	27
WL Kullu	3	36	34	63	45
WL Spiti	2	24	7	38	8
Gran Total	72	458	429	768	568

Way forward

- I. This is high time to learn how to protect, regenerate and grow forests at the same time which may not be practically feasible without community involvement and very aptly taken up in JICA HP Forest Project. In present time interest in forests of the communities particularly in the state like HP is limited with low economic avenues and dependence on forests for fuel, fodder and timber with availability of alternatives in the market.
- ii. We need to move beyond conservation to sustainable management of forests with growing revenue generation activities like herbs, shrubs, climbers and trees having value in the market to provide additional income to the communities. Models of planting Bay Leaf (*Cinnamomum tamala*) in Joginder Nagar Forest Division, Palmarosa (*Cymbopogon martinii*) in Bilaspur Forest Division and Shatavari (*Asparagus racemosus*) in Mandi Forest Division under JICA HP Forest Project are the efforts made in this direction.
- iii. There is a need for multi stakeholder discussions for selection of species for production of quality planting material for diversity of the species of market requirement keeping in view the agro-climatic conditions by the VFDS to generate revenue in short, mid and long term basis from the plantations.
- iv. Innovative ways and means as being implemented under JICA HP Forest Project needs to be strengthened in the state of HP to increase interest of the communities in forests which bring additional revenue to the poor.
- v. All planting operations of advance work and plantation were carried out by the community organized as VFDS and their SHGs members providing direct livelihood by way of wages. Documentation and highlighting of this kind of achievements for livelihood and ecosystem management in different platforms will generate awareness and impact about project interventions.
- vi. Three tier forestry Practices which involves planting grass, shrubs, climbers and trees, through which an actual forest can be made over a period of 10 years.
- vii. Enhance stakes of the communities in the forests to inculcate filling of ownership for protection and efficient utilization.
- viii. More awareness about the tangible and intangible benefits to the communities from the ecosystem management by way of clean air, water supply, carbon sequestration, tourism, fuel, fodder and NTFP trade.

Community Enterprise of Leaf Plates and Bowls in H.P.- A Success Story

Nagesh Kumar Guleria, Ramesh Chand Kang, and Jiten Sharma

**Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods
Himachal Pradesh Forest Department, Potters' Hill, Summer Hill, Shimla-171005**

Community groups away from the urban centers providing alternatives to banned single use plastic items such as cutlery plates and bowls with eco-friendly traditional leaf plates (pattal) and bowls (Duna) with brisk cash returns. Himachal Pradesh Forest Department Japan International Cooperation Agency (JICA) Project organized community groups specially of women in Kataula and Suket Forest Ranges for preparing leaf plates (Patal) and bowls (Duna) from forest species in a mechanized way to meet with increasing demand of leaf plate due to ban of single use plastic items since July 1, 2022 in the country. Community groups at Beindhar near IIT Mandi and Kangu between Sundernagar and Slapar prepared 8000 leaf plates and 4000 leaf bowls (Duna) and earned Rs. 38,000/- in one month. Each group was provided capital cost of Rs. 1,29,000/- for setting up of the plate making machine of 1000 plates/day (8 hours). Machine installation reduced the drudgery of women in manual making of these leaf items and improved their production capacity.

Group member

Smt Bindra Thakur of Kagoo in Sundernagar mentioned that manually they were able to make only 150-200 plates and 200-250 Dune/day with collection of leaves but with machine we as a group prepare average 1000/day. This improved our economic returns and more members of the community around are also attracted with the activities and seeking training and time to work on

machine from JICA Forestry Project.

Technically the leaves of Tor (*Bauhinia vahlii*) leaves are used for making leaf plate and bowl in H.P.

These plants are of tropical climate of lower Himachal Pradesh consisting of Mandi, Bilaspur, Hamirpur and Kangra Districts but pattal making is famous in communities of District Mandi and Hamirpur mainly. All over state fresh leaves plates are supplied from manufacturers in the villages of Mandi District. All group members are enthusiastic about the ban on single use plastic and anticipating high demand in coming wedding and festival season.

Jadi Buti Cell of JICA Project Marketing Team also reported that they have advance booking for the supply of 2.5 Lakh pattals as on today. Rate of each leaf plate is Rs. 4/- and Duna Rs. Rs. 1.5.

This activity coordinated by the JICA

Project HP Forest Department Jari Buti Cell to provide first hand market

knowledge and technical services for capacity and product building at grassroots level to develop livelihood models at community level mentioned Additional Principal Conservator of Forests (APCCF), Chief Project Director (CPD) JICA Project Sh Nagesh Kumar Guleria. Modern science validated and justified use of forest tree species leaves such as Tor (*Bauhinia vahlii*) for serving food keeping in view the antibacterial properties of leaf extract which was used traditionally for treatment of urinary tract infection, diarrhea and food poisoning. Un-knowingly, the leaf plate also serves to add antioxidants and medicinal contents of the leaves to food for health benefits to the consumers.



Leaf Bowls Prepared by Women Groups



Manufacturing of Leaf Plate in Machine

The custom of traditional food (Dham) serving on green fresh leaf plates to people sitting in systematic lines (commonly called “Gher”) irrespective of their status during marriages, family functions, local deity gathering in villages, community feasts and political rallies etc in the state of Himachal Pradesh symbolizes the universal brotherhood. In traditional Indian system eating food on clean virgin leaf plate with hands connects senses and organs with mind. Experts recommend the practice of eating with hands by sitting on the floor is only way for the present generation for controlling problems of gastritis and obesity. However the plastic disposable plates made up of plastic substances pose health risk with release of toxic compounds in contact with hot servings and after disposal in the surrounding



Traditional Food Serving in Leaf Plates

environments. After disposal consumption of these non biodegradable plastic plates by the stray cattle and wild animals like monkeys in and around urban centres create diverse disorders and threatening health hazards to them. However the leaf plate if consumed by the animals provides good nutrition and health benefits to sustain their lives as well. Composting of used leaf plate through Vermicomposting also provide additional avenues to the progressive groups to generate cash returns in eco way.

The business of making leaf plates and bowls commonly called “pattals” and “dunna” respectively in Himachal Pradesh was main profession of the poorest cum poor of SC communities in selected locations. Invasion of factory made plastic plates and bowls fascinated people due to their cheap price and long shelf life harmed the manufacturer of leaf plate the most. Many had to abandon their traditional businesses of leaf plate and related item with time. Few families without any other option could continue to do the business on order and survived this so called plastic boom which now has become a serious environmental and health problem. The ban on use of colored polythene bags manufactured from recycled plastic was initially imposed on Jan 1, 1999 in HP. Later in 2004, the ban was imposed under Section 7(h) of the State Non-Biodegradable Garbage (Control) Rules on the use of polythene bags having thickness less than 70 microns and size less than 18"x12". Govt. of Himachal Pradesh was also awarded for this important regulation by the then Centre Government. With the passage of time many state governments also brought in such regulations in the country but failed to implement the way Himachal Pradesh implemented this initial legislation for ban of plastic carry bag in the State of H.P. Situation with ban on single use plastic use from July 1, 2022 is also expected to improve environment in Himachal Pradesh better than any other states keeping in view the many traditional alternatives to replace volumes of plastic plates and bowls with leaf plates and bowls prepared by the village women groups trained under JICA projects and other department initiatives of rural women empowerment.

Biodegradable leaf plates possess potential in national and international market provided quality and standards are met. These are now available on online shopping stores like Amazon and Flifkart.

Keeping in view this JICA project planned a holistic approach of setting of mechanized facility to maintain standards in manufacturing, capacity building of the community groups and planting of more plants of the species like *Bauhinia vahlii* in the forest adjoining to villages of trained groups for regular supply of quality leaves. *Bauhinia vahlii* is a vigorous climbing shrub able to grow into the tops of the trees in the forest. Leaves are harvested for making of leaf plates and bowls. Increasing demand of leaves with ban on single use plastic plates, JICA project has started production of 6000 seedlings in nurseries this year at Kamand, near IIT Mandi and Bhawana near Sundernagar for the community plantation in forest and their private land mentioned.. Planting of these trees will not only provide leaves on sustained basis to the group making leaf plates but also help in CO₂ fixation and soil conservation with passage of time. Project further added that systemic planning in production of planting material to meet with demand of leaves and provision of providing of Rs. 1.00 Lakh revolving fund and required capital investment in the initial stages to each SHG in this project will go a long way in developing the volume of green business for the poor households in rural areas of Mandi, Bilaspur, Hamirpur and Kangra Districts in Himachal Pradesh.

Evolving Forest Management Concepts in India - some thoughts

Arun Kumar Bansal,
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The management of forest in modern India started in 1855 with the preparation of Charter of Indian Forestry primarily for regulation of the supplies of timbers for various purposes. Recognizing the long gestation period of forest resources, the system of preparation of “working plans” was initiated by Dr. Dietrich Brandis the first Inspector General of Forest. Even after achievement of independence in 1947, the forests continued to be managed under the system of Working Plans, prepared for forest areas in a district/forest division, on the basis of principles of sustainability generally for period of ten years to achieve the overarching objectives enshrined in the National Forest Policy (NFP).

Evolution of National Forest Policy

Since the Government is the trustee of bulk of the forest resources in the country their management is governed by the Principles of Doctrine of Public Trust for maximum good of not only the present but also the future generations (Upadhyay, 2011). The forest management systems have been evolving keeping pace with scientific knowledge and appreciation about the role of forests and the national socio-economic context reflected in the NFP. The first NFP of India, enunciated in 1894 during British era, provided for functional classification of forests indicating broad principles for their management but recognized the primacy of agriculture over forests. Consequent to India becoming a sovereign democratic republic in 1950, the NFP was revised in 1952 which identified six vital needs of the country including everything from conservation to supply of subsistence products to local communities. The key principles of this policy were: balance & complimentary land use requiring one third of the total land area to be maintained under forests, forest lands not to be encroached for agriculture. Forests were to be managed for sustained yield, primarily of timber, and thus the emphasis was on meeting demand of industries, that too on very concessional rates.

Experience of almost a quarter century of planned development aiming at efficient management of resources of the country, including forests, to increase production and step up economic activities to enhance the standard of living its people, resulted in greater understanding of the role of forests in Sustainable Development. This eventually led to major constitutional amendment in 1976 through which “forests” were brought onto the concurrent list in the Constitution empowering the national parliament to legislate on matters relating to “forests”. The newly inserted Article 48 requires that “the state shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country. Protection and improvement of the natural environment including lakes, rivers, wildlife were made “fundamental duties” of every citizen of India (Article 51A). Forest Conservation Act was enacted in 1980 to regulate diversion of forest lands for non-forestry purposes -requiring prior approval of the Government of India. However, the respective State/UT Governments continue to be responsible for the management of forests and related matters.

The 1952 NFP was reviewed and revised in 1988 bringing in a paradigm shift in the management forests from “production to conservation”. Recognizing that forests are very vital for environment and ecological stability, it provided for management of forests only under approved working plans, requiring industries to meet raw material requirements preferably through raising plantations in collaboration with farmers, wood substitution, community participation in protection and management of forests etc.

The current NFP of 1988 is under review and a draft NFP 2018 is in the process of consultations for finalization. The preamble of the policy draft mentions that the need to revise the NFP 1988 has arisen to “*integrate the vision of sustainable forest management by incorporating elements of ecosystem security, climate change mitigation and adaptation, forest hydrology, participatory forest management, urban forestry, robust monitoring and evaluation framework and establishment of mechanisms to oversee multi-stakeholder convergence in forest management, while building on our rich cultural heritage of co-existence and relying on our rich and diverse forest resources*”.

The overall goal, as per the draft policy, is “*to safeguard the ecological and livelihood security of people, of the present and future generations, based on sustainable management of the forests for the flow of ecosystem services*”. To achieve above policy goal (i) economic valuation of the forests, (ii) forest management for water cycling, (iii) forest certification, (iv) integration of climate change concerns, (v) development of national forest ecosystem management information system, have been identified as the new thrust areas while continuing the various strategies for SFM and management of tree outside forests.

It is significant to note that “Sustainable Development Goal (SDG) 15 – Life on Land” also aims to promote conservation, as well as biodiversity sustainably and support the health of ecosystem, which is vital for providing food, water, as well as ecosystem services, such as climate regulation and recreation. These ecosystem services are essential to the livelihoods and well-being of marginalized groups, including the communities living in the forest fringe areas.

National Working Plan Code

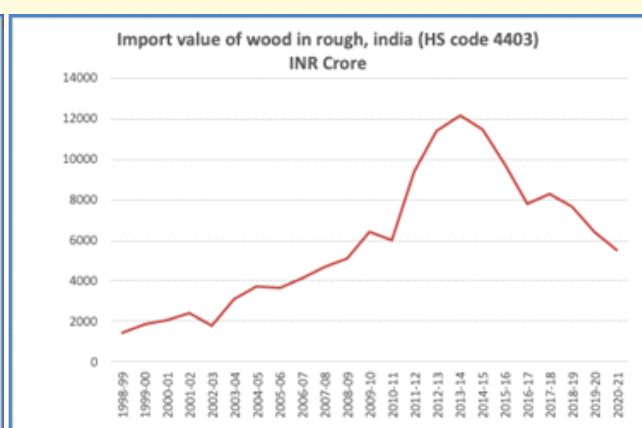
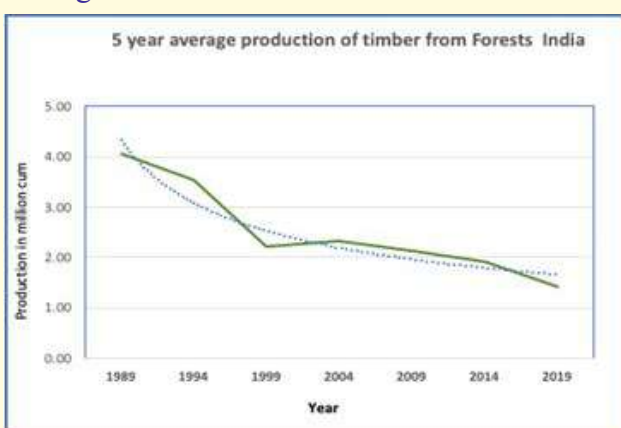
Draft NFP 2018 F. No. 1-1/2012-FP (vol.4) circulated on 13/14 March 2018 has undergone changes. MOEFCC OM dated 31.03.2022 constituting a Task Force to develop synergies between the NFP, the FCA 1980, and National Agroforestry Policy 2014 mentions about “proposed NFP 2021”. The author was a member in this Task Force.

To bring in uniformity in preparation of working plans the first National Working Plan Code (NWPC) was formulated in 2004 and the code was revised in 2014 bringing in several new dimensions such as comprehensive forest resource assessment, assessment of biodiversity, carbon measurement of carbon, carbon sequestration and mitigation, forest certification, and consultation with local stakeholders.

The NWPC is under review and revision to harmonize the working plan prescriptions with specific needs of national parks, wildlife sanctuaries, mangroves, wetlands, eco-sensitive zones, bio-diversity rich areas as also various legal instruments impacting the management of forests including The Indian Forest Act, 1927; The Forest conservation Act, 1980; The Wildlife (Protection) Act, 1972; The Environment (Protection) Act, 1986; The Panchayat (Extension to Schedule Areas) Act, 1996; The Biological Diversity Act, 2002; The Forest Rights Act 2006, and also State/Locality specific acts/rules/regulations.

Presently, the working plans are prepared by the state forest departments and are being approved by the concerned Integrated Regional Offices of the MOEFCC. However, there is no mechanism to monitor the actual and holistic implementation of the working plan prescriptions. Although India is one of the few countries in the world which have stabilised forest cover despite substantial anthropogenic pressure, it is important to underline that about one third of the recorded forest area is devoid of "forest cover" (FSI, 2021). Moreover, sizable forested areas are outside of the recorded forests whose management status requires an in-depth study.

Due to the pronounced focus on ecological functions and ecosystem services of forests production of timber (a major forest product) has declined substantially necessitating increasing import of timber (Industrial Round Wood and other Engineered Wood Products) Bansal, 2021; Bansal 2022). The decline in import values in recent year is due to ban on export of wood logs by many countries. Consequently, import of sawn timber is having an increasing trend.



With regard to the other tangible products from forests called Minor Forest Produce or Non-Timber/Wood Forest there are jurisdictional confusions created by multiplicity of acts & regulations. Lack of systematic/comprehensive data is resulting in mismanagement of the non-wood forest resources (Bansal, 2020).

Adoption of innovative approaches in management of forest

Innovations in management of a natural resource and their adoption result from ever evolving scientific understanding about the resource, its interactions with other natural resources, improved appreciation about the potentials of the resource, and aspirations of the people reflected in the national policies.

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As mentioned earlier, the scientific management of the forest resources in India was initiated in the British era primarily to regulate the production of timber and it continues to remain timber centric although 1988 NFP emphasized upon the primacy of environmental stability and maintenance of ecological balance which are vital for sustenance of all lifeforms, human, animal and plant and making derivation of direct economic benefit subordinate to the ecological functions of forests.

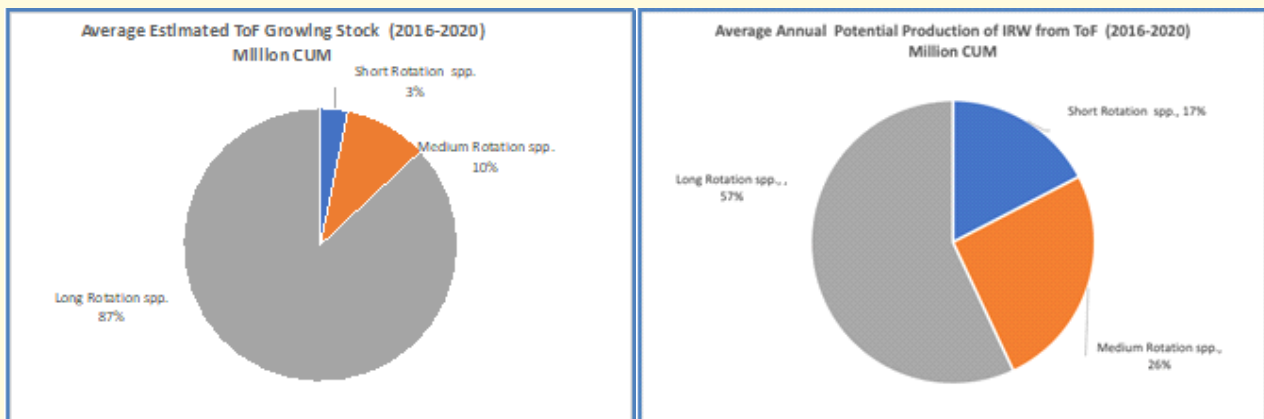
Evolution of JFM: Among others the current NFP envisages that industries should meet raw material requirements preferably through raising plantations with farmers, wood substitution, improvement in the production of Minor forest produce which provide sustenance to tribal population and to other communities residing in and around the forests, and community participation in protection and management of forests, massive people's movement for afforestation. This paved the way for Joint Forest Management approach that was initiated in 1990, and continues to evolve with inclusion of promotion of livelihoods of forest dependent communities. It may be pertinent to note that many state including Odisha, Uttar Pradesh, West Bengal were already having a very well recognized system of community participation in forest management.

The experiences under various recent forestry projects being implemented in the country with assistance from JICA indicate that for JFM to be more effective in achieving the goal of Sustainable Forest Management it is essential that the livelihood needs of the forest dependent communities are addressed positively through specific investments in community development activities and creation of additional livelihood opportunities around not only forests but also other natural resources, and enhancing the entrepreneurial capacities of communities organized as Self Help Group, Common Interest Groups comprising of forest dependent people, particularly the women. Ideally, the JFM movement should evolve into JFM-Plus whose essential elements include Empowerment, Transparency in implementation of programs and activities, Improving livelihood support base, Inter-Sectoral Convergence of various development programs related to health, sanitation, primary education, drinking water, fuel wood use efficiency etc., and supporting alternate Income Generation Activities through women SHGs. This philosophy was enshrined in the Green India Mission, one of the eight national missions under the National Action Plan for Climate Change. *However, the JFM is slated to face the challenge through recognition of Community Forest Resources as per the provisions of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.*

Promotion of Agroforestry: It is also a national imperative to promote agroforestry not only to reduce pressure on forests for production of timber and other forest products to meet their growing demand in the country but also to increase farmers income through crop diversification, insurance against failure of agriculture crops due to vagaries of nature, but also to enhance agro-biodiversity. A National Agroforestry Policy (NAfP) was enunciated during 2014 which is the first such policy in world. Based on the provisions of the NAfP a Sub-Mission on Agroforestry (SMAF), under the National Mission for Sustainable Agriculture, was set up and implemented as a centrally sponsored scheme from 2016-17 to 2021-22 in 23 States/UTs focusing on expansion of tree cover on farmlands to complement agricultural crops, with Ministry of Agriculture and Farmers' Welfare as the nodal ministry. The objectives of the SMAF included: to ensure availability of quality planting material, to popularize various Agroforestry practices/ models suitable to different agro-ecological regions and land use conditions through demonstration plots, to create database, information and knowledge support in the area of Agroforestry, to provide Research & Development (R&D), extension and capacity building support to Agroforestry sector. However, the main components of the sub mission were development of small, big, and hi-tech nurseries, (, Peripheral/boundary plantations, low/high density plantations, and capacity building. Based on an evaluation of SMAF by the NITI Aayog, it is now proposed to implement SMAF as apart of Rashtriya Krishi Vikas Yojna (RKVY) from the year 2023-24 focusing on Quality Planting Material.

A quick study of ISFRs about growing stock of timber yielding species estimated by FSI reveals that the long rotation tree species (rotation more than 20 years – including species like *Mangifera indica*, *Azadirachindica*, *Tectonagrandis*, *Madhucalatifolia*, *Hevea brasiliensis*, *Dalbergiasissoo*) form the bulk of the growing stock (87%) followed by medium rotation species (rotation 11-20 years including species like *Grewelia robusta*, *Acacia arabica*, *Acacia auriculiformis*) contributing around 10% of the total ToF growing stock. The short rotation/fast growing tree species (rotation up to 10 years - including species like Poplar, Eucalyptus)

preferred by tree grower under agroforestry contribute a mere 3%. However, the contribution to average annual potential production of IRW is 57%, 26% and 17% respectively of long, medium, and short rotation tree species. (Bansal, 2022)



Recently, the GOI has launched Tree Outside Forest India (TOFI) program – a collaborative effort of the MOEFCC and USAID in seven states (Andhra Pradesh, Assam, Haryana, Odisha, Rajasthan, Tamil Nadu and Uttar Pradesh) which provides an opportunity to coordinate/synergize the ongoing efforts by bringing together diverse stakeholders – farmers, tree growers, traders, processing industry, researchers, consumer and policy makers, for catalyzing expansion of agroforestry, and also promote use of wood and wood substitutes. Although agroforestry has taken roots in several states including Haryana, Punjab, Western UP, Telangana, Andhra Pradesh, there is no systematic periodic assessment of either the extent of agroforestry in the country or its actual benefits. There is ample scope for its growth in other states/regions and to actually integrate it with the concept of “Grow more wood use more wood” as the most suitable and environment and people friendly material.

It is necessary to prepare baskets of agroforestry models suitable for different agro-ecological regions zones, tweak the prevalent legal framework and develop financial support systems to promote cultivation of long, medium and short rotation tree species in private lands with the overall all goal of producing industrial round wood required by all categories of wood based industries to reduce dependence on imports. Focus on agroforestry in catchments of rivers can be of great help in rejuvenation of rivers and addressing the water crisis.

Way forward

It is often opined that the prescriptions of working plans are not generally implemented in totality due primarily to paucity of funds. There is therefore an urgent need to put in place a system of monitoring of the implementation of approved Working/Management Plans based on SMART indicators to identify the gaps in term of required resources and take necessary measures for augmentation of resources to ensure implementation Working/management plans to achieve the intended results. IIFM is in the process of developing national forest management standard as part of review and revision of the NWPC 2014. It would be worthwhile considering third party Certification of Forests under one of the internationally recognized Forest Certification Schemes to ensure Sustainable Forest Management, including legality of the forest products and compliance with national & international laws, conventions & treaties, and also to enhance efficiency of management and productivity of forests through systematic improvement in field operations. SDG 15.2 - promotion of sustainable forest management of all types of forests includes indicators related to measure progress towards SFM. One of the sub-indicators for this is “**forest area certified under an independently verified certification scheme**”. Considering its importance forest certification is a permitted activity under Compensatory Afforestation Fund Rules, 2018, and is also included in the draft NFP 2018.

A very crucial aspect relates to **preparation of geo-referenced boundary maps** of all types of forest lands to know the exact extent of the forests. This is very important for proper biennial assessment of forest resources being under taken by the Forest Survey of India both inside the recorded forest areas and ToF areas. This assumes even greater importance in view of the order of the Hon'ble Apex Court passed in July 2011 in Lafarge matter for identification of all types of forest land and preparation of Geo-referenced district forest maps.

Only few States/UTs have initiated the process in right earnest. MOEFCC has also constituted an Empowered Committee in June 2019 in the background of the above order of the Hon'ble Apex Court with two specific mandates namely (i) to monitor the progress of field identification and geo-referencing of forest land as per the directive of Supreme court, and (ii) to resolve the discrepancy between notified forest area and geo-referenced forest area. Odisha is perhaps the first state to have developed detailed SOP for preparation of geo-referenced maps of all types of forest lands, in pursuance of the orders of the Apex Court, and the work is in progress with the support of Circle and Division Level Technology Partners since 2019-20. The exercise would result in geo-referenced maps of forest blocks, with GCP network linked to the Survey of India Grid, and duly reconciled with revenue department maps and issuance of suitable updated notifications of boundaries of forest blocks.

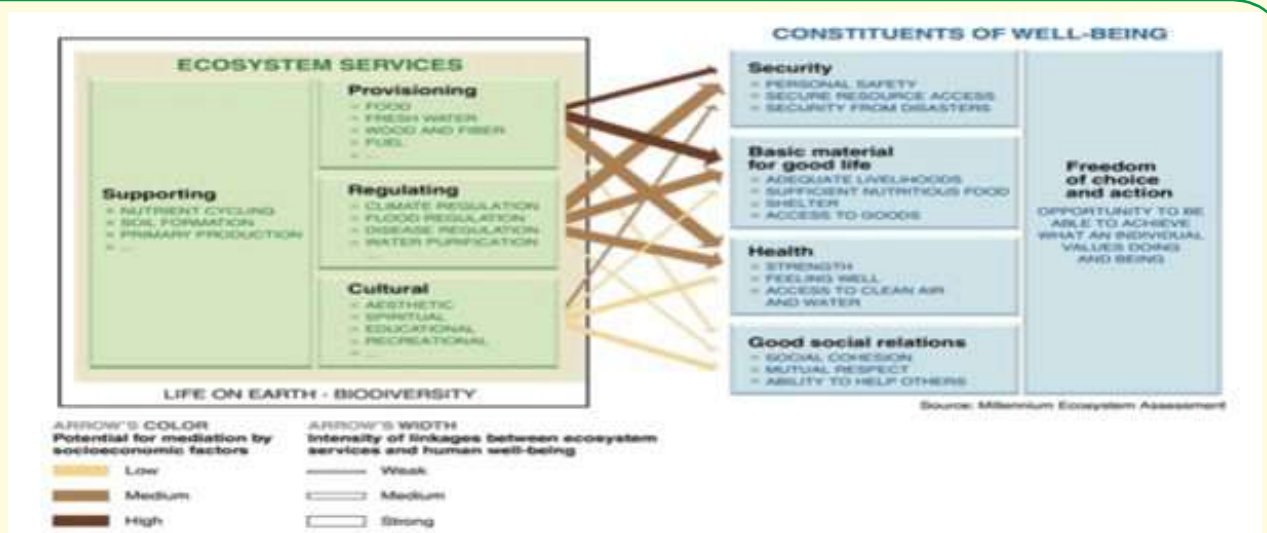
The current forest inventory methodology and assessment of growing stock in forests adopted while preparing working plans is largely **timber centric** and does not give due emphasis on **non-wood forest products** despite specific provisions in the NWPC 2014 to adopt seven step methodology (for community based NTFP management). This needs to be built into to forest management approach considering that a large section of society living in the vicinity of forests meets substantial health, nutritional and livelihood needs from NWFPs collected from the wild. For sustainable forest based livelihoods comprehensive assessment of Non wood Forest Resources, covering is done in the course of preparation/revision of working plans. Such assessment and management prescriptions *inter alia* need to cover the following aspects:

- Identifying the areas highlighting the type of NWFPs available, their potential along with NWFP rich non-forest and cultivation areas.
- Determining regeneration/replenishment rate;
- Methods for calculating sustainable collection/harvest levels;
- Estimation of current demand and its trend and need and feasibility of promotion for cultivation to bridge the gap between demand and supply.
- Monitoring protocols to determine the efficacy management and cultivation practices including harvesting methods and quantities collected/harvested.

It may also not be out of place to mention here that there is a multiplicity of acts/rules/regulations under which there are several committees at gram sabha /gram panchayat or sub-village level including the Forest Rights Committee (FRC), JFMC, BMC tasked with the management of MFPs within their jurisdictions. This has created a situation of utter confusion in the field and there are inadequate efforts to harmonize the provisions under various acts, rules, and regulations. A proper coordination mechanism at various governance levels is essential for synergy in implementation of various acts /rules / regulations / guidelines aiming at conservation and management of NWFPs and supporting sustainable livelihoods for the local communities (Bansal, 2020).

Although the NFP continues to emphasize upon ecological functions of forests but there is hardly any attempt to evolve a system to **quantify the ecosystem services** from forests and include the monetary values in **National Resource Accounting** system. At present in the National Accounts Statistics the contribution of Forests is included under “Forestry and Logging” comprises of Industrial Wood (Forests), Timber from Tree outside Forests, Firewood, and Non-Timber Forest Products (MFPs and Fodder from Forests) only and estimation is carried out by the production approach. Consequently, very large contribution of forest resources in the form of ecosystem services, and unrecorded removals, remain unaccounted. Based upon the computation of 12 ecosystem services of forests as a part of the exercise “Revision of rates of NPV applicable for different class/category of forests”, undertaken by Indian Institute of Forest Management, in 2014 (Verma et al. 2014). The economic value of provisioning services namely timber, fuel wood, NTFP including bamboos, that are

The ecosystem services from forest are classified into four major categories namely (i) provisioning services are goods that are produced by the ecosystem and used by people, such as food, water, timber, herbs; (ii) regulating services describe the way ecosystem affect the flow and functioning of larger systems which in turn impact human lives, such as climate regulation, infiltration rate of rainfall into aquifers and flows into rivers thereby influencing the timing and quantity of water availability; strips of vegetation next to waterways that absorb pollutants, providing people living downstream with improved water quality; erosion prevention to maintain arable land; carbon sequestration, (iii) cultural services – non material enjoyment and uses - such as recreation and spiritual benefits; and (iv) supporting services - background processes that people do not use directly but which sustain other services - such as nutrient cycling, soil pollination. This categorization, and how ecosystem services link to human well-being is illustrated below:



presently included in the National Resource Accounting System, is only around 15% of the total economic value of the 12 services. *If proper valuation of the forest resources is undertaken and included in the national account statistics the contribution of forest sector in GDP will get enhanced manifold which will eventually lead to augmentation of resources allotted to the forest sector. Under the second phase Capacity Development project for assistance by JICA, one of the proposed sub-pilots was to evolve a detailed methodology to identify and quantify various ecosystem services and compute their monetary*

Simultaneously, the available resources need also be utilized optimally. One of the significant uses of RS technology lies in analysis of time series satellite data for assessing of rate of change of vegetation density in forest blocks to **prioritize the areas with higher rate of degradation**. This information in conjunction with population density and dependency of local communities on forests and factors of forest degradation may then be used to optimize utilization of scarce resources through prioritizing forestry interventions in these areas along with other activities for creating additional/alternate livelihoods opportunities to reduce dependence on forests for sustenance. The model based on this approach evolved under JICA assisted forest sector development project implemented in Odisha (Odisha Forestry Sector Development Project I) has received highest score on all counts namely Relevance, Effectiveness, Impact, efficiency, and sustainability, in the post project evaluation conducted by JICA headquarters Tokyo.

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Strengthening Community Engagement in Prevention and Management of Forest Fires under JICA Forestry Project in Himachal Pradesh

Nagesh Kumar Guleria and Rajesh Sharma

**Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods
Himachal Pradesh Forest Department, Potters' Hill, Summer Hill, Shimla-171005**

Introduction

India is one of the world's mega-rich areas in biodiversity, both in terms of fauna and flora. The forests of the country are both environmentally and economically valuable. Large Forest Fires impact the climate, human health, and property, as well as resulting in danger to life. Global attention to forest fires has increased recently due to their major long-term threat to forest habitats and public safety, as well as short-term risks to property and human lives. Forest Survey of India (FSI) has been carrying out work in the country's different forest plots since 1965 in order to record fires. A total of 95% of the country's forest fires are of human origin according to FSI research and 50% of the forests are likely to be vulnerable to burning. Fire is causing major damage to the forests and destroys flora and fauna species on the one hand and emits unwanted Carbon Dioxide to facilitate climate change. According to HP Government data, during 2022 till April 28, as many as 719 incidents of forest fires have been reported across the State, affecting close to 5,662 hectares under forest circles of Shimla, Chamba, Bilaspur, Dharamshala, Hamirpur, Kullu Mandi, Rampur, Nahan and the Great Himalayan National Park at Shamshi in the Kullu region.

It is well established fact as mentioned in studies of FSI that forest fires are deliberate where extensive intervention on awareness, management, community involvement and silvicultural front is required. The other major reasons for the fire incidents are the poor management of forests from fire point of view. Neither there are any traditional methods of maintaining fire lines and other necessary silvicultural operations nor there are any planning for this. Limited staff, no equipment, acute shortage of water in fire season, poor or no participation of the community in fire fighting can be listed as major constraints in fire control.

Community is expected to play a major role in the combating fire during fire season. But change in social setup such as nuclear family concept, literacy, employment and business opportunities, employment under MGNAREGA has changed the rural scenario. Community at large look for economic benefits and does not value intangible benefits of clean air, water availability for living and sustaining agriculture with livestock for livelihood. Community took interest only where there is direct economic benefits for explanations no fire occur in agriculture field and horticulture plantation while being very close to the forests prone to fire year after year. This provides the basic clue for engaging the community in developing forests in some way or the other for generating assured income with propagation of species which are of direct market needs. Fire incidences in the forest will reduce drastically once forests are demonstrated as a source of assured economic return to the community living in the adjoining villages. In traditional way this was very well established as maximum households used to rear large population of livestock and collect NTFP for their livelihood and were heavily dependent on forests and in returns community used to take all precautions to protect forest from fire and engage in containing fire in forest.

Therefore, keeping in view this background JICA Forest Project in HP was also designed with a component of activities for forest staff and community orientation, training and empowerment of community for forest fire management. Details of achievements in last three years for forest fire management are presented in this article.

Field area and Community Organization

In Himachal Pradesh, Japan International Cooperation Agency (JICA) assisted "Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods" is implemented in seven districts i.e. Kinnaur, Shimla, Bilaspur, Mandi, Kullu, Kangra and Lahaul & Spiti. HP Forest Department identified 339 forest beats highly sensitive, 667 with medium and 1020 with low sensitivity respectively for forest fires out of total 2206 forest beats as per Forest Fire Management Plan in H.P. Detail of these fire sensitive forest beats in Himachal Pradesh is presented in Fig.-1.

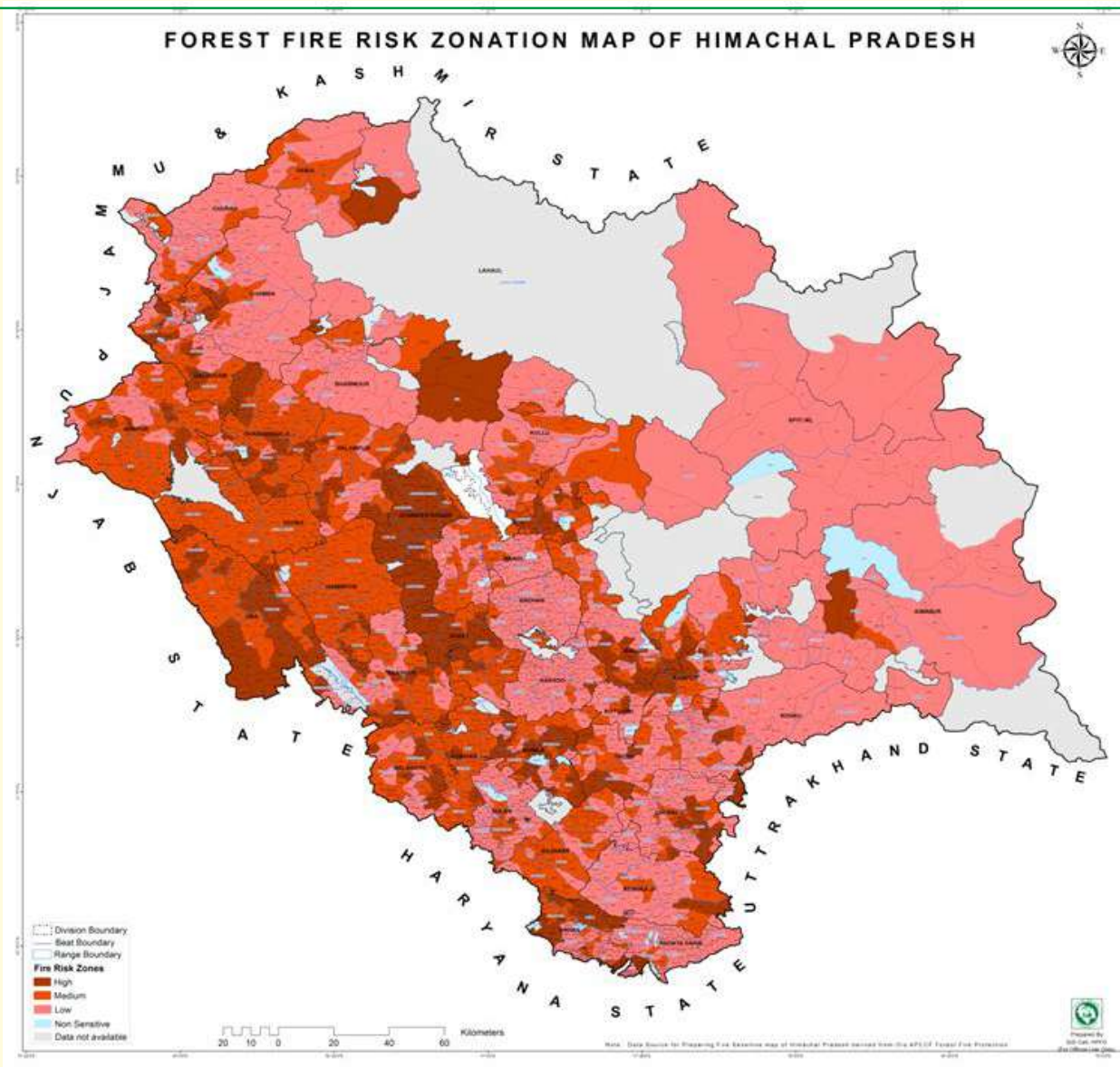


Fig.1. Map of Fire Sensitive Forests Beats of H.P

Detail of forest fires sensitive beats shows that maximum highly sensitive beats fall in districts selected for the implementation of the JICA Forestry Project. Therefore, proactive planning was done to deal with forest fire hazard with active involvement of the community to augment state planning and initiatives of the existing forest fire management strategy in Himachal Pradesh.

JICA HP Forestry Project is sanctioned for 10 years from 2018-19 to 2027-28 for implementation in 72 Ranges of 22 Divisions falling in jurisdiction of 9 Forest Circles and the activities are carried out both in Participatory Forest Management (PFM) as well as Departmental Mode through 400 VFDS and 60 BMC sub-committees.

Forest fire prevention with the help of VFDS members and forest department, project invested for in all forest ranges covered under project and also releases fund and equipment for forest fire protection for each VFDS keeping in view the deliberate 95% man made forest fires.

Forest Fire Prevention Activities of JICA HP Forestry Project

Establishment of Fire Patrol Management

PFM institutions were trained to conduct fire patrol in and around their PFM treatment areas and surrounding forest areas, especially during the dry seasons. The Project supports PFM institutions were equipped for fire patrol management by providing necessary facilities. Fire patrol mainly includes watch and ward, and reporting activities by respective VFDS. The cost for 4 years of fire patrol (starting from the planting year) was covered by the Project. The fire patrol is expected to be continuous initiative by the VFDSs with technical guidance from HPFD.

Pine Needle Collection and Utilisation

In chir pine dominated forest areas, pine needles pose a major threat of forest fires as these remain un-decomposed for longer durations and leave a thick mat of slush which is a big fire hazard. Demonstration for removing the pine needles and developing craft and facilitate sale to Cement Plants were planned and held at VFDS level with further undertake this activity involving PFM institutions with following activities:

- Identify sensitive forests to be cleared of needles;
- Identify and tie up with industry (cement plants uses needles as fuel in boilers) using the needles;
- Allocate forests sections (as per the capacity) to various PFM institutions;
- Sensitize PFM institutions about the importance of removal;
- Provide tools/ equipment (rackers, net for bundling, portable bailing/compressing machines etc) to PFM institutions.
- Conduct collection of needles

Geographically, pine needle collection and utilisation to be confined in high fires sensitive areas of Bilaspur, Mandi and Shimla district areas.

- Under JICA assisted 'Project for improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods', Taradevi Range under DMU Shimla has two self help groups namely Radhe Krishna SHG Kufridhar under VFDS Kanda and Radhe Krishan SHG Balyendri under VFDS Rangol with pine needle handicrafts as their income generating activity. Trainings for the same have been provided to the groups and they are actively doing their work together and have made various pine needle products like pen stand, chillar box, fruit tray, serving bowl, baskets, hanging bags, chapatti box, etc. The groups are working actively and have generated a good amount of revenue by selling their products.
- Similarly in Bilaspur forest division is striving to improve the livelihood of the communities dependent on forest. In Ghardir VFDS last year collection of dry fallen pine needles weighing 7.380 tons was collected by VFDS and purchased by Acc cements to use as fuel in boiler which made a revenue of Rs. 14760 to them and this amount directly credited in their account. This year too they are targeting a collection of 300 tons of dry fallen pine needles. ACC will deposit Rs. 2 per kg as collection cost in their livelihood accounts of VFDS constituted under JICA HP Forestry project. This will add a revenue of Rs. 6,00,000 to VFDS committee.

So these activity not only provide the livelihoods but also helpful for avoiding the forest fire incidence in Pine forest.

Forest Fire Management of JICA HP Forestry Project

Creation and proper and timely maintenance of fire lines can help in prevention of fires and its further spread. In the Project, fire line maintenance demonstration conducted at forest areas (reserved forest, demarcated/ un-demarcated protected forests) and their forest blocks in areas where sites have been selected for project interventions. For watch and ward and fire line tracing of PFM treated (ANR, Plantation) areas with the help of VFDSs. The activity cost was covered under respective PFM mode treatments.

i. Creation of Fire Line

- Traditional method of 10 m wide fire line was revived and demonstrated in PFM treated areas buy the VFDSs.
- The fire lines were constructed between September and December period after monsoon and before snow/dry season.
 - Identify area/ strip for creation of fire line.
 - Take GPS coordinates.

- Delineate strip area (minimum 5m – maximum 10m)
 - Remove all bushes, grasses, scrub, saplings in the delineated fire line area.
 - Remove trees (if admissible) or de-branch the trees leaving small crown at the top
- First maintenance of the fire lines is conducted in January and February for following activities and maintained on annual basis by the VFDS
- Remove of all bushes, grass, scrub, saplings from the area.
 - Sweep floor of fire line of all slash, grasses, humus etc

ii. Maintenance of Fire Line

Mainly the maintenance work indicated above as the “first maintenance of the fire lines was conducted for three years after the establishment of fire lines.

Cost of all above fire prevention and management operations were invested under JICA HP Forestry Project through concerned Forest Division for further disbursement to VFDSs under their jurisdiction. Each VFDS was provided with Rs. 1386/- ha and total Rs. 13860/- annually for carrying out the above mentioned fire prevention and management activities. Detail of the amount disbursed to the different VFDS by the JICA HP Forestry Project in FY 2020-21 and 2021-22 is presented in Table-1.

Table-1. Funds Allotted for Fire Patrol @ Rs 1,386 per Hac.			
Sr. No.	Forest Division	FY 2020-21	FY 2021-22
		Funds Allotment (In Rs)	Funds Allotment (In Rs)
1	Mandi	0	69,300
2	Nachan	0	69,300
3	Suket	0	62,256
4	J/ Nagar	97,500	69,300
5	Kullu	0	97,020
6	Banjar	0	69,300
7	Parvati	0	55,440
8	Shimla	0	69,300
9	Theog	0	69,300
10	Rohru	0	69,300
11	Chopal	0	69,300
12	Rampur	0	69,300
13	Anni	0	69,300
14	Kinnaur	0	69,300
15	Bilaspur	0	69,300
16	W.L Kullu	0	1,66,320
TOTAL		97,500	12,12,636

Awareness programme organized by VFDS/BMC under JICA HP forestry Project

For avoiding the Forest fire incidences in Himachal Pradesh, many awareness programmes were organized by maximum VFDS/BMCs (Table 1) under 16 Divisions of the 'Project for improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods. These awareness programmes were organized in the presence of DFOs, SMS, FTUs coordinators and VFDS members. At each Divisional level, the concerned DFOs with other staff shall carry out the awareness programs such as training cum awareness programs for different stakeholder groups, rallies, street plays, nukkar natak, meetings at village level involving Panchayat functionaries, training to village communities in safe handling of forest fires, distribution of leaflets, radio talks, use of local TV channels, etc. Detail of fire awareness meetings conducted in different ranges with number of VFDSs participation is presented in Table-2.

Table.2 Details of Fire Awareness Meeting					
Divisions	Ranges	VFDS wise			Total no. of VFDS
		Batch-1	Batch-2	Batch-3	
Bilaspur	Ghumarwin	05			5
	Jhunduta		07		7
	Sadar		03		3
	Swarghat		02		2
Banjar	Tirthan	05			5
	Sainj		02		2
	Tirthan		01		1
Kullu	Kullu	02			2
	Bhuti		04	04	8
	Patlikhul		03		3
	Manali			08	8
	Nagar			02	2
Parvati	Bhunter	04			4
	Hurla		06		6
	Jari			05	5
Jogindernagar	Dharampur	05			5
	Ladbhoral		06		6
	Urla		05		5
	J/Nagar		08		8
	Kamlah			06	6
Mandi	Mandi	04			4
	Drang		01		1
	Kataula		04		4
	Kotli		01		1
	Nachan	05			5
Suket	Suket	05			5
	Baldwara		07		07
	Jhungi		06		06
	Kangoo		06		06
	Sarkaghat		07		07
	Jai Devi		06		06
Anni	Nither	05			05
	Arsoo			01	01
Kinnaur	Bhabanagar	04			04
	Nichar		07		07
	Katagaon		04		04
Rampur	Sarahan	05			05

Chopal	Nerwa	02			02
	Chopal		07		07
	Kanda		07		07
	Throach		02		2
	Sarain			02	02
	Bamta			01	01
Rohru	Sarswati Nagar	05			05
	Khashdhar		07		07
	Dodra kawar			05	05
	Jubbal			04	04
Shimla	Taradevi	05			05
Theog	Balson	05	05		10
	Kotkhai		4		04
	Theog			5	05
WL Kullu	WL Kullu	06	06	06	18
	WL Manali	01	0		01
	WL Sunder Nagar		0	02	02
15	54	73	128	49	258

Way Forward:

Immediate response to forest fires after getting information is of utmost importance. HP Forest Department and Community should develop a culture of immediate response to fire and utilize all available resources at their disposal to control the fire. Some of the way forward to address the forest fire issues is summarized as follows.

- Immediate mobilization mechanism of VFDS members will be ensured with continuous motivation, training and making PFM plots more productive in economic returns with plantation of economically important species.
- Training and skill development on annual basis prior to the fire season will be planned for front line forest staff and VFDS members.
- VFDS will be guided and encouraged to develop and acquire firefighting equipment and develop related infrastructure with financial assistance provided from JICA HP Forestry Project.
- Efforts will be made to link water conservation schemes to prevent and control forest fires.
- Communication mechanism with Forest Department and VFDS related to fire prevention and control will be strengthened to minimize the loss of biodiversity and forest resources of community needs.

Experiences of implementing the first JICA funded forestry project in the State of West Bengal

Ms. Sumana Bhattacharyya

Project for Forest and Biodiversity Conservation, for Climate Change Response in West Bengal.

Based on the Exchange of Notes between the Government of Japan and Government of India (GOI), Japan International Cooperation Agency (JICA) had extended a loan to implement the “West Bengal Forest and Biodiversity Conservation Project” by signing the loan Agreement on 29th March, 2012 and the effectuation of Loan Agreement took place on 24th August, 2022. The objective of the Project was to improve forest ecosystem, conserve biodiversity and improve livelihood means by undertaking afforestation, regeneration, wildlife management and income generation activities through Joint Forest Management approach, including institutional capacity development, thereby contributing to environmental conservation and harmonised socio-economic development of West Bengal.

The Executing Agency on behalf of GOI was West Bengal Forest Department (WBFD), through the West Bengal Forest and Biodiversity Conservation Society.

The project was scheduled to start in 2011-12 and was to continue up to 2019-20. The project, which was of 8 years duration, was divided into 3 phases; Preparatory Phase-2 years(2012-13 to 2013-14), Implementation Phase-4 Years(2014-15 to 2017-18) & Consolidation (Closing) Phase -4 Years(2018-19 to 2021-22). The Project was provided a no-cost extension of two years up to March 2022. Approval from the competent authorities/agencies was obtained vide memo/letter number 3416-For/O/D/8M-29/2017 dated 22.09.2017 of Department of Forests, GoWB.

This was the first JICA aided forestry project of the State of West Bengal and the experience of implementing the project was very rewarding. Further, the third generation JICA funded forestry project are focussed on livelihood enhancement and IGA of the JFMCs etc. along with the development of forest. JICA as financier was with a very dynamic approach and in the mid-way it also came up for MTR (Mid-term review) so that the guidelines of MOD could undergo minor modifications as per field conditions/ actual requirements of the management inputs under the project. Thus JICA as a financier of the Forest Project has brought the concept of sustainability in the development of forest and wildlife. Due to this dynamics, the emphasis and the project implementation mechanism has been constantly upgraded to suit local conditions. JICA has also emphasized on the training needs of all stakeholders involved in the project including the staff of the Forest Department as well as JFMC members. JICA had laid emphasis on developing Manuals, Guidelines and Rules etc. during the preparatory phase of the project so as to standardize the implementation methodologies. The reporting mechanisms developed during the project, the field visits of JICA teams, field visits of Consultations, third party evaluation at the end has helped West Bengal Forest Department to take note of the progress of the project and its outcomes. Overall, by implementing the project the WBFD has not only benefitted in terms of the outcomes of the project but also in improving the standard of living of forest fringe population.

The Executive agency i.e. WBFD (West Bengal Forest Department) has implemented the project in accordance with the MOD (Minutes of Discussion) of the Project. This was the forest JICA aided forestry project of the State and the performance was excellent in all components. Praiseworthy mention regarding works in Nursery techniques, Community Development and Muring field visit by JICA as well as during yearly Project Directors Meets. All the terms and conditions were met including sanctioning of additional staff for the project. This was the first opportunity of Forest Department to work with Self Help Groups and enhance their livelihood via small businesses by virtue of loans. Community Development is a dedicated work and for this Extension Workers and NGOs were engaged by the Division-in-Charge for facilitating meeting, motivation, preparation of business plans, disbursement of loans, collection of EMIs and all related activities. As the project took off two years late, so during MTR (Mid Term Review) it was extended for further two years within the same cost norms, so that the works of consolidation phase of the project was taken up successfully. It was felt that the financial outlay of the project was inadequate and the future projects may broaden the project cost. This will help address the areas which are often left unattended due to lack of resources viz. Climate Change issues, River rejuvenation, Soil and Moisture Conservation works and in resurrection of highly endangered tree species.

Lessons learnt and Recommendations

Nursery:

Lessons learnt: The project allowed creation and extension/ conversion of existing old nurseries into modern nurseries. Earlier only Polypot seedlings were used, but this project compulsorily introduced hycopots with prescribed compost as medium.

Recommendations: The making of Compost was successful in most of the places. However, if the compost were produced in some specific places centrally and distributed from such central production units to all areas of seedling creation, it would be more effective. The Divisions where there is less pressure from man-animal conflict and of forest protection (e.g. Social Forestry Divisions and Non Timber Forest Produce Division), may be considered as the production units of compost on a large scale. Special funds and expert staff, manpower, and machinery may be provided for the production of compost in these Centres and its supply to all DMUs.

Improved Afforestation Practices:

Lessons learnt: The task of afforestation of degraded forests is challenging. Several technical improvements and use of QPM (Quality Planting Materials) has helped to tackle the challenges in this front successfully. Different types of Plantations along with wildlife management was taken up in the project involving JFMCs, which has enhanced the biodiversity of the treatment areas. The project has spurred extensive cover of Sal plantation, which is natural dominant forest type of South Bengal, thus improving the endemism of the tree species in South Bengal.

Recommendations: The planting of one year old seedling of Sal was highly successful in plantations. Thus planting of tall seedlings (1year to 3 years) of various species may be practiced henceforth in plantations, so that they remain above grazing height and the plantation becomes highly successful.

Micro plan:

Lessons learnt: In the MOD it was prescribed that the NGOs will be involved in the preparation of micro plan. However it was decided that the preparation of micro plan for all the 600 JFMCs would be taken up through PRA along with the staff of respective FMU/DMU after imparting suitable training. This also saved time and resources which would have been planned for the selection of the NGOs. The process of knowledge transmission of the prepared micro plans through the NGOs to the frontline staff may have delayed initiation of project. This process turned out to be an excellent decision for assessing the existing resources Vis a Vis the needs of the JFMCs. The findings were tabulated into wish list and prioritization before finalization of the micro plan. This also created harmonious relation between the frontline staff and JFMCs involved in the project. This proved to be a very useful outcome in the continuity and in the implementation of the project. Translation of Micro plan into vernacular (i.e. Bengali / Nepali) as per preferred language as per location has helped the local communities in understanding the contents of the micro plans.

Recommendations: Extensive, updated, detailed data regarding local communities is available at Block level and with Panchayat functionaries, which may be utilized for preparation of micro plan. Before finalization of activities in micro plan for the target group, all data and historical aspect of their development may be considered so that previous errors do not crept in planning. The activities recommended under the micro plan and which could not be undertaken in the project may be planned for implementation in the future through other financial resources.

Community Infrastructure Development Activities:

Lessons learnt: Villagers living in and around forest areas are mostly from poor and backward communities belonging to SC, ST and Other Backward classes. Different types of CIDA (Community Infrastructure Development Activities) like Construction of Community Hall, Solar Light, Road, Toilet, Passenger shed, Water Pump, Supply of Search Light etc. were undertaken under the project by the JFMCs in non- forest areas under the Project. This decision helped in making the JFMC members self-sufficient to a certain extent and in decreasing their dependence on the forest resources by integrating them in the mainstream economic activities. There was major paradigm shift in the project where JFMC members

were directly involved- from Planning to supervision to execution and finally payment to the Contractors, for the developmental works selected from wish list in micro plan.

Recommendation: The benefit of CIDA may be given to all JFMCs in a particular FMU/ DMU, so that all fringe area population can come under the cover of development.

Capacity Building of JFMC members:

Lessons learnt: Various training were imparted to JFMC members to enhance their skill and holistic development of the area. It has helped to reduce the dependence of forest fringe population on forest resources and has opened avenues for alternate livelihood. It has helped in developing trust between the villagers and the Department.

Recommendation: For creation of awareness about Nature and natural resources, we may include schemes like Conservation of Medicinal Plants, Native/Indigenous Species and Creation of Kitchen Gardens etc. by involving Primary School students of Forest fringe area. Bamboo is an economically important species of many parts of the State. It has a great future to develop strong economy among the people of Forest fringe area. We may consider to include the skill development projects/ Programme on Bamboo

Extending loan to SHG members:

Lessons learnt: Handholding of the communities were done during the project as new type of works with SHG members was taken for the first time by Forest Department in the State. This was done by engaging NGO and Extension Workers, who maintained regular contact with the communities for three years during implementation of Project. This has helped them to earn some money to meet their daily requirements by pursuing some economic activity. SHGs also help them to inculcate habit of savings for bad days from own savings rather than incurring loan from money lender and being in a perennial debt trap. Members of SHG including women, take charge with an objective to change their socio-economic condition with minimum external support. Extension of loan to women SHG's improved the recovery of the same. Convergence with various line departments in terms of imparting training, starting kits etc. and some marketing avenues in fairs etc. at block level has helped the SHG members in pursuing the trades.

Recommendation: Creation of further marketing avenues of the products may help the community members to harvest sustainable benefit from the various businesses undertaken.

Empowerment of Women:

Lessons learnt: Microfinance has opened up the opportunity for the rural poor for easy and cheap credit options. Especially women have made full use of micro finance extended by the project. This facility is a real boon for the people to come out from the grips of traditional money lenders. This has helped the families to revive their livelihoods and also take up new and diversified income generation activities. Under the project, the SHG members of selected JFMC have forayed into sustainable businesses from the comfort of their home by taking small loan under Income Generation Activity sub-component of Community Development under WBFBCP. Income Generation Activities was successfully implemented in 21 DMUs over 101 FMU's in 247 Beats, 556 JFMCs to 11,512 Beneficiaries belonging to 1250 Self Help Groups for a loan amount of Rs. 7.06 Crores.

Recommendation: The scheme may be extended to members of all the interested SHGs under the JFMCs selected under the Project for further extension of benefits from the Project

Capacity Building of Staff and Officers:

Lessons learnt: The Staff and Officers were trained at National level institutions as well as abroad for getting well-acquainted with latest issues/ techniques related to afforestation, biodiversity, Wildlife management and Participatory forest management. The overseas training at Albert-Ludwig's- University, Freiburg, Germany from 17th February to 9th March, 2019 on "Carbon Forestry", the participants gathered knowledge on REDD+, Design of Carbon Projects, Carbon Accounting, Carbon Markets, Carbon Change Agreements & Policies, Standards in forestry based carbon activities, Forest Carbon monitoring, Certification of forestry based carbon activities, Financing of Carbon Projects and Socio-economic dimensions of Carbon Projects. The training at South African Wildlife College, Hoedspruit, South Africa from 12th May 2017 to 29th May 2017 regarding Wildlife Management was a very unique and eye-opening experience to the team of forest officials of West Bengal regarding management of a huge and internationally acclaimed National Park (Kruger), access to a reputed wildlife college for gathering

knowledge regarding animal behaviours and viewing free-ranging wildlife roaming in complete natural condition. The recent trend in eco-tourism management, fire management, wildlife rescue and rehabilitation, dog squad management, anti-poaching measures, Park Management through GIS technology and various other aspects of wildlife management and rehabilitation have been observed from close distance, which would be much helpful to accommodate in the service life of the individual participant officers in future. The study tour at Sri Lanka from 20th January 2019 to 3rd February 2019 helped the participants to watch the management of 6000 wild elephants in an island nation of 65,610 km² geographical area with about 30% of Forest Area was wonderful through its various aspects viz. temporary electric fencing, Elephant Holding Grounds, Elephant transit Home, Elephant Corridors. The management of Protected Areas along with well-structured Interpretation Centre and Eco-tourism activities was very interesting and fit for replication here. An insight into Marine mammals and amphibians was thought provoking. Observing these from close distance would be much helpful to accommodate in the service life of the individual participant officers in future. The training on Knowledge Co-creation Program on Sustainable Forest Management and Integrated Watershed Management under Counterpart Training Program held from 19th August 2019 to 6th September, 2019 at Japan. In this training study of actual plans, organizations, systems and management practices (community participation) involved in sustainable forestry management by the national and local (Hokkaido) governments of Japan. . The model forestry activities and timber utilizations with community participation and their technologies conducted by municipal governments, private citizens, corporate organizations and forest cooperatives in Japan were also studied. The systems and model activities for nature conservation and sanctuary management with the participation of local communities in Japan were also studied. Study and discussion on the methods and activities concerning the significance of the consideration on livelihood necessities and participation of local communities towards sustainable forestry management was also learnt. Moreover excellent exposure with respect to Nature Interpretation through an observatory at Cape Erimo was done, where it was possible to see in-situ the seals through telescopes without exposing the nature lovers to the tumultuous momentum of the sea. The practical discipline of ex-situ and in-situ veterinary care of the raptors was also learnt.

Recommendation: This may be continued in the future also, at par with the objectives of the envisaged project.

Monitoring of plantations:

Lessons learnt: Already e-monitoring software for incorporation and processing of data collected by field officers of Monitoring Division in respect of Plantations raised under the project in 1st year, 3rd year and 5th year under Forest Department has been done.

Recommendation: This may extended for monitoring of all other activities taken up in the ensuing project by fixing desired indicators.

Human Elephant Conflict Mitigation:

A Tata LPT 407 vehicle was procured on 24.03.2017 and was furnished with latest combating equipment and was named as “AIRAWAT”. It has traversed the length and breadth of South West Bengal and helped in combating conflict issues.

Lessons learnt: AIRAWAT service has been very effective for the Man Animal Conflict Management and more AIRAWATs and small vehicles and also Rapid Response teams should be put to service. The system of sending Daily SMS with regard to the location of elephant herds has given very good result to minimize elephant depredation.

Recommendation: More such vehicles may be procured, remodelled with latest equipment's for combating man-animal conflict issues.

Small mammal studies: The ZSI was entrusted for conducting research study on “Distribution and population assessment of Striped Hyena (*Hyena hyena*), Indian Wolf (*Canis lupuspallipes*), Golden Jackal (*Canis aureus*), Leopard Cat (*Prionailurus bengalensis*), and Wild Boar (*Sus scrofa*) in South West Bengal for conservation and management planning”. Following were the main objectives of the study:

- To understand the current distribution and status of following species viz., Striped Hyena, Indian Wolf, Leopard Cat, Golden Jackal and Wild Boar in South and Central region of West Bengal.
- Population estimates of the study species using camera traps and DNA based analysis in the intensive study sites.

Identification of wildlife-human conflict zones in the study area with reference to the five species (Striped Hyena, Indian Wolf, Leopard Cat, Golden Jackal and Wild Boar).

- To develop management plan for each of the five species that incorporate ways to effectively address the human-wildlife conflicts, based on the study.

Lessons learnt: The study gathered ecological data on distribution and population assessment of the stated species and delineated conflict zones for each species in all the districts of South West Bengal except Sundarban region. The study also suggested management action plan for better conservation of the species. The publication has been widely circulated to the wildlife managers for helping them in taking management decisions towards overall species conservation efforts.

Recommendations: Such studies may be taken up for Gangetic dolphin, Northern river terrapin also in future projects.

MIS Component:

Under MIS component, the following works have been done viz. Web based E-plantation Journal, Tally accounting system and online budget control system.

Lessons learnt: The E-plantation journals are generating spatial dataset on plantation and Community Development using Cloud based ERP Forest Management Information System (FMIS). In Tally Accounting System and Tally based online data Synchronisation, the Tally has been customized for use in the PMU, DMU, FMU and the JFMCs under the Project. Tally Licence has been renewed. WBFBCP has taken initiative for complete set up of Tally .ERP-9 data within the DMU (34 locations), FMU locations, and JFMCs (600 locations) and PMU using Tally.NET technologies and internet. The auto-synched Tally System has been designed in such a way that all types of data entry at DMU, FMU, JFMC and PMU levels can generate separate and consolidated data in Tally and Excel format, which was accessible and used in any application. Synchronization helps to share society data on payments and receipts from DMUs, FMUs and JFMCs and also report generation. Under the online budget control system, allotment of fund to units, online requisition by unit and release of fund to units is done online.

Recommendation: A web based facility for depicting the Project activities on Google Map may also be taken up in future projects.

Operation and Maintenance

- During the implementation of WBFBCP, various training courses were provided to the Forest Staff, Officers and JFMC members for upscaling their skills so that they are able to take care of assets created under the project in accordance with MOD.
- The assets created under Community Infrastructure Development Activities (CIDA) by the JFMCs in Non-Forest areas are being maintained by the JFMC themselves.
- The loan extended under Income Generation Activities (IGA) to SHG members is acting as Seed money and once the loan has been completely repaid via scheduled EMIs by a particular SHG member into the JFMC account, it may be recycled to another interested SHG member for starting new business as per approved Business plan.
- The assets i.e. vehicles, computers and buildings have been handed over to the Forest Department of the State for further maintenance as per need in future. The assets are being maintained by the Forest Directorate from the funds being received under administrative expenses and State Development Schemes.
- The MIS platform comprising of e-plantation Journal has been mainstreamed with the Forest Department and presently e-plantation journal is being prepared for all plantation schemes undertaken by Forest Department. The web portal is currently under the Forest Directorate which is also maintaining the portal.

Hazardous Pine Needles a Resource for Women Livelihood in Himachal Pradesh -A Success Story

Nagesh Kumar Guleria, Vinod Sharma , Reena Sharma and Yosha Solanki

**Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods
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Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods (PIHPFEM&L) funded by Japan International Cooperation Agency (JICA) is under implementation in the seven districts of the H.P. Project identified 24 income generation activities for community livelihood development in Self Help Group (SHG) mode with provisions of working capital and revolving fund. Women SHGs are adopting new and innovative activities for their livelihood and engagements for earning cash returns. Radhe Krishana SHG at village Ghanahati in Taradevi Forest Range of Shimla Division is working on developing pine needle products with technical and financial support under Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods funded by Japan International Cooperation Agency (JICA). Women working on designing of different articles of dry pine needles were quite progressive and working with interest keeping in view the high demand of their products. Group prepared about 15-18 articles like pen stand, fruit serving tray, jewelry box, wall hanging, wall mirrors, bread basket, purse with string etc. Women members mentioned that their products are in high demand and sold collectively at the shop counter setup in one of the group members shop in the village at Ghanahati, Shimla. JICA funded PIHPFEM&L provided revolving fund of Rs. 1.0 Lakh and other support in the form of training cost and capital cost to these groups for establishing income generation activities by the SHGs. In Sale of Articles of Rural Artisan Society (SARAS) fair at Shimla during April 2022 articles of Rs. 45000/- were sold said Ms Sunita Sharma, Pradhan of Radhe Krishana SHG at village Ghanahati, Shimla .



SHG Members Preparing Pine Needle Handicrafts

Keeping in view the eco-friendly handmade nature of the products consumers liking of the products is very high. Group members mentioned that they prepared these pine needle products in free time individually and pool the products for collective sale by the group. Group members sell products individually when they prepare any product on order and specific demand. It was mentioned by Ms. Meena Sharma, Secretary of the Radhe Krishana SHG at village Ghanahati, Shimla that the SHG generated total revenue of Rs. 1.75 Lakh during the last one year with this pine needle article making. Our SHG also provided training of pine needle product development to Radhe Krishan SHG of Rangol VFDS under Taradevi Forest Range at Shimla for which training fee was received from the JICA project mentioned Ms Sunita Sharma, Pradhan of Radhe Krishana SHG at village Ghanahati, Shimla. Sapna Thakur Pradhan of SHG at Rangol mentioned that her group started pine needle article activity after training and sold article of Rs.6500/- in SARAS Mela at Palampur.

JICA technical team is exploring for mechanical device to make rope of pine needles which is finally used to make different products. This will enhance preparation of products to meet bulk demand. This will increase the efficiency and reduce cost of production for ensuring high returns to the group members. Area of 1,23,885 ha is estimated to be covered with Chir Pine forests in Himachal Pradesh. It was estimated that 1.2 tonnes of Chir pine needles are shed per hectare annually and possess high potential for this kind of interventions. This is highly combustible due to presence of resins and poor green growth in forests having cover of fallen leaves cause devastating loss of timber, resins, plantation, wild life and rare biodiversity worth Crore of rupees.

JICA funded PIHPFEM&L also supported collection of pine needles under Bilaspur District by the organized member of Sangam Village Forest Development Society (VFDS) for supply to ACC Cement Plant at Burmana. Sangam VFDS collected and supplied 4000 Kg of pine needles @ Rs 2/- Kg and earned Rs. 8000/-.

The Forest Department has adopted a number of methods to prevent forest fires, deployment of fire watchers, creation and maintenance of fire lines, involvement of local communities for beating of forest fires and use of water to douse the fire and use of Remote Sensing and Moderate Resolution Imaging. But in spite of all these measures fire Incidents have not significantly decreased in the state Fire is a major factor now in state of Himachal Pradesh and Uttarakhand that is responsible for the degradation of forests and pose a big challenge to the forest departments and other concerned agencies.

In view of this an attempt to find the environment-friendly use of Chir Pine leaf litter to reduce the likelihood of forest fire the JICA HP Forestry Project initiated preparation of the decorative items in 2019 to convert the pine needle into designer articles that provided them additional livelihood opportunities and also contributed to reducing the fire hazards in their vicinity.

Different options of using hazardous pine needles mainly responsible for forest fires as fuel in cement factories, making of pine needle boards, biofuel as ethanol and pine needle charcoal were tried in the past by different universities and institutes but failed to sustain after pilot scale. Making of different decorative and household usage articles of pine needles by the women SHGs showed a new way in converting the hazardous forest waste as resource for women livelihood in Himachal Pradesh.

Digital Transformation in Forest Management under JICA Aided Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihood

Rajneesh Kumar, Disha Sharma and Nagesh Kumar Guleria

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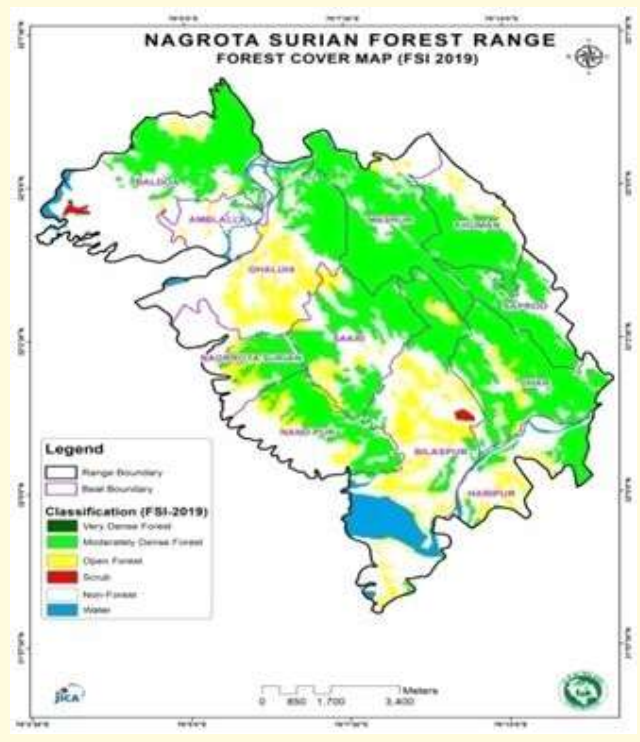
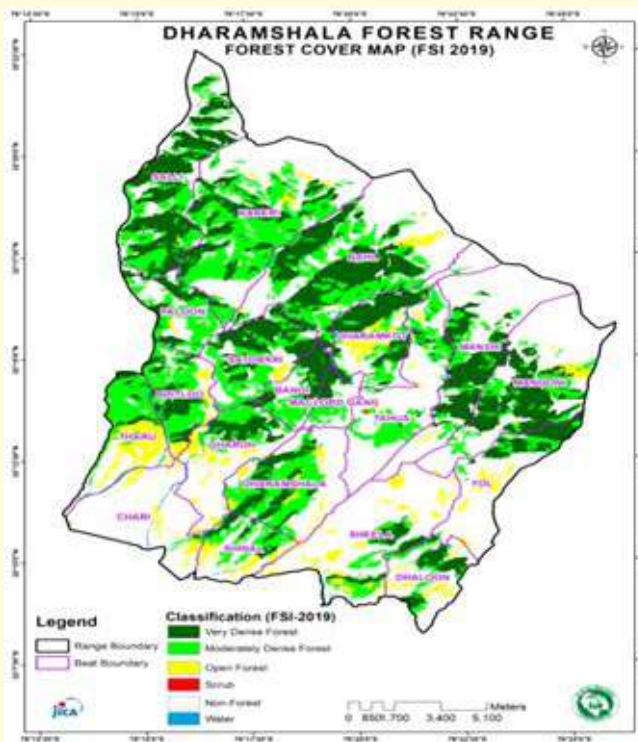
Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods (PIHPFEM&L), aims at addressing forest degradation by improving livelihoods and income generating activities of the people. The Project is being implemented in Society mode. A Society by the name, **Society for Improvement of Forest Ecosystems Management & Livelihoods in Himachal Pradesh** has been registered under Society Registration Act, 2006, with the Registrar of Societies, Himachal Pradesh. To oversee Project implementation at the State level, a Project Management Unit (PMU) has been established. The project area falls in Kinnaur, Shimla, Bilaspur, Mandi, Kullu, Kangra and Lahaul & Spiti districts covering 72 Ranges of 22 Divisions falling in jurisdiction of 9 Forest Circles of Himachal Pradesh. Project would be implemented in participatory mode by Village Forest Development Societies (VFDS) and Biodiversity Management Committees (BMC) sub-committees as well in Departmental mode.

Project for Himachal Pradesh Forest Ecosystems Management & Livelihoods (PIHPFEM&L) has established GIS Lab with a vision to use Remote Sensing, Drone technology, DGPS & GIS technology for planning the project activities as well as monitoring the project progress in future. Remote Sensing based data of FSI (2019) of all 72 Forest Range used for assessing the forest density class for prioritization and selection of VFDS area. Using these maps intervention areas have been selected where density class is low as per FSI density Classification. Forest Cover refers to the extent of land area that is covered by Forest Resources in the country. Forest Survey of India (FSI) carried out forest cover mapping using LISS-III satellite data resolution (23.5 meters). The main objectives of Forest Cover Mapping are:

- To monitor the forest cover and changes therein in national, state and district level.
 - To generate forest density class wise information about forest cover and changes therein.
- FSI as nodal agency processed and generate classified Forest Density class information on the basis of defined canopy density class and publish the information after every two years.

Forest Cover Classified in term of canopy density classes:

Class	Description
Very Dense Forest	All lands with tree canopy density of 70 percent and above
Moderately Dense Forest	All lands with tree canopy density of 40 percent and more but less 70 percent.
Open Forest	All lands with tree canopy density of 10 percent and more but less 40 percent.
Scrub	Forest Lands with canopy class less than 10 percent
Non-Forest	Land not Included in any of the above classes.(Includes water)



Range Wise Forest Density Maps of Project Area for Selection of intervention Area

Processed satellite data procured from FSI and then used for assessing density class as per area of interest. For baseline survey of existing natural resources and social environment DGPS survey was carried out in using a pair DGPS instrument. One DGPS instrument was used as base station and other DGPS instrument was working as Rover. Base station fixed at a stationary position while the Rover is moved by survey team by walking along the intervention areas to collect a survey point to create GIS layers of project intervention areas. The baseline data will serves as a benchmark for planning all the future activities under the project and also helpful to monitor and assess the progress in the intervention areas.



DGPS BASE STATION



DGPS ROVER STATION TO MARK THE BOUNDARY

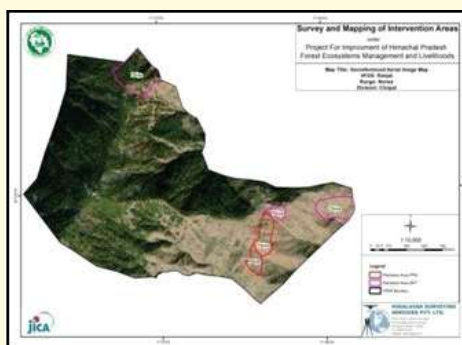
DGPS based Survey is being carried out in all the VFDS to mark the VFDS boundaries, Plantation boundaries under PFM and Department mode and other existing features within intervention areas. And then surveyed features converted into GIS layers for making different theme maps for planning and monitoring the project activities.



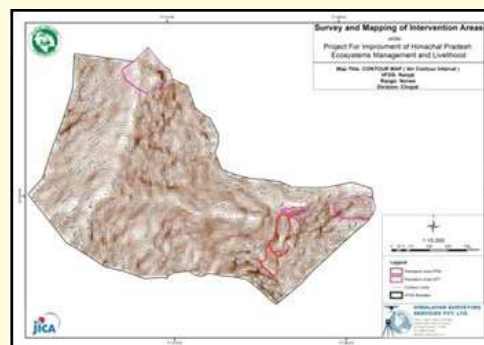
GIS Layers Generation of Intervention Areas Using DGPS Survey Points

Further more Remote sensing technology is being used to obtain information about a specific object without physically contacting it. This technology is heavily applied in Forest Management to get pictures of the interventions area, using different sensors on satellites. Using remote sensing technology, we can constantly monitor the characteristics of forests in quantitative and qualitative ways. The images collected by the satellites are being used to create spatial information of existing resources, forest cover, and measure the overall changes in the intervention areas after project intervention. Different GIS based VFDS maps has been prepared and uploaded on the project Website. The Maps of VFDS prepared includes:

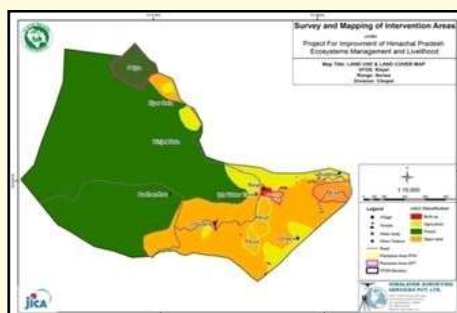
- Land Use Land Cover Map
- Forest Cover Map
- Elevation Contour Map
- Geo referenced Satellite Image Map



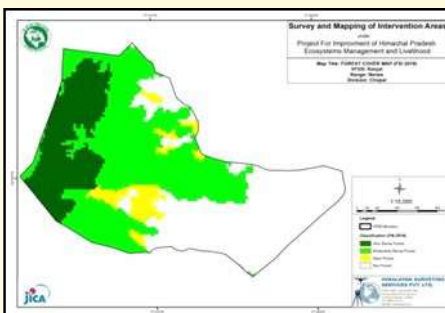
Geo-referenced Satellite Image Map



Contours Map



Land Use/Land Cover Map

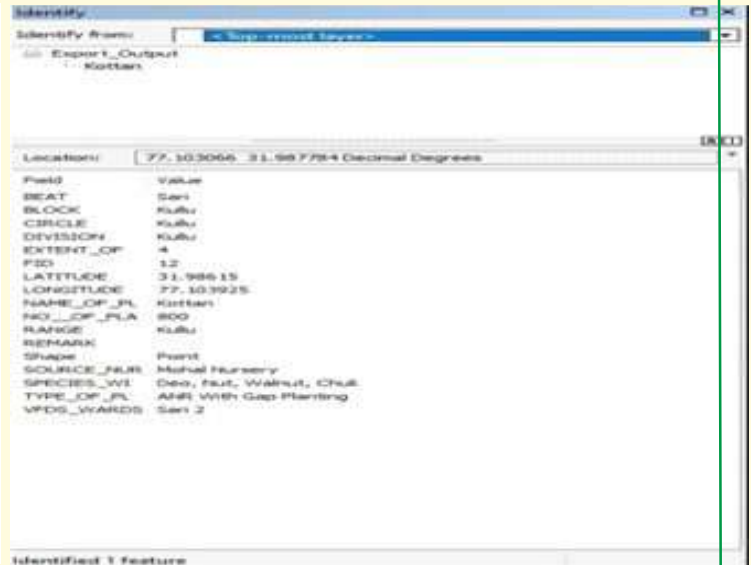


Forest Density Cover Map

Land Use/Land Cover maps provide the vital information to know the pattern of land use and changes occurred due to human involvement. And that analysis helps to plan and manage the activities especially to conserve the resources in scientific way. Forest Density maps give the picture of density class and help the forest manger to plan plantation activities accordingly to enhance the forest density. A contours map is very useful to know the elevation variation of landscape and helps to plans the plantation, soil and moisture conservation and other forestry activities in the intervention area.

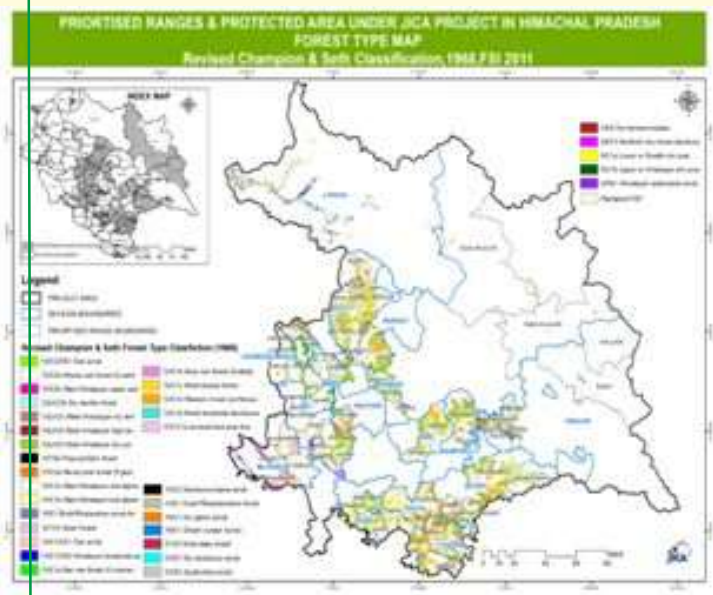
Some of other major features also created in GIS environment for planning & monitoring the Project activities. Nurseries location spatial data has been created with non spatial information i.e. species name, number of plants, categories, nursery type for planning and Monitoring the Nursery Stock.

The maps have been prepared for all the JICA funded nurseries.



Nursery location Map

Forest Administrative Boundaries and Prioritized Ranges of the Project Area have been created in GIS platform for different overlay analysis for planning and decision making process. Forest Type Map of Himachal Pradesh has been procured to analyze the forest species found in the different altitudes of the state.



Forest Type Map



Project Batch Wise Map

Use of Drone Technology:

Project for Improvement of Forest Ecosystems Management and Livelihoods is the 3rd generation project of JICA. One of the major thrust of the JICA under this Project is the 'Use of Technology' for planning and Monitoring & Evaluation purpose. Hence Drone Technology has been introduced in this Project for capturing the VFDS wise high resolutions images for planning and Monitoring & Evaluation the Project activities. So far drone survey for 100 VFDS has been completed.



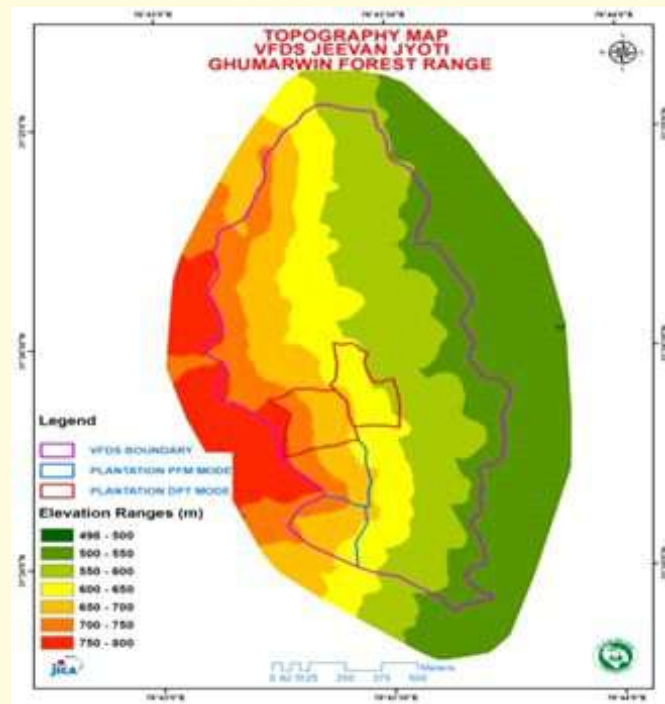
Launch of Drone Technology in JICA (PIHPFEM&L) to capture high Resolution Images

The images collected by the Drone Survey after processing can be used to see the detailed information of existing natural resources for planning the scientific forestry activities and assessing the progress of project intervention and measure the overall changes in the intervention areas at the end of the Project. Different GIS based VFDS maps have been prepared includes:

- Geo referenced Drone Ortho Images
- Elevation Contour Map
- Slope Map
- Aspect Map
- Contours Line Map
- Hill Shade Map



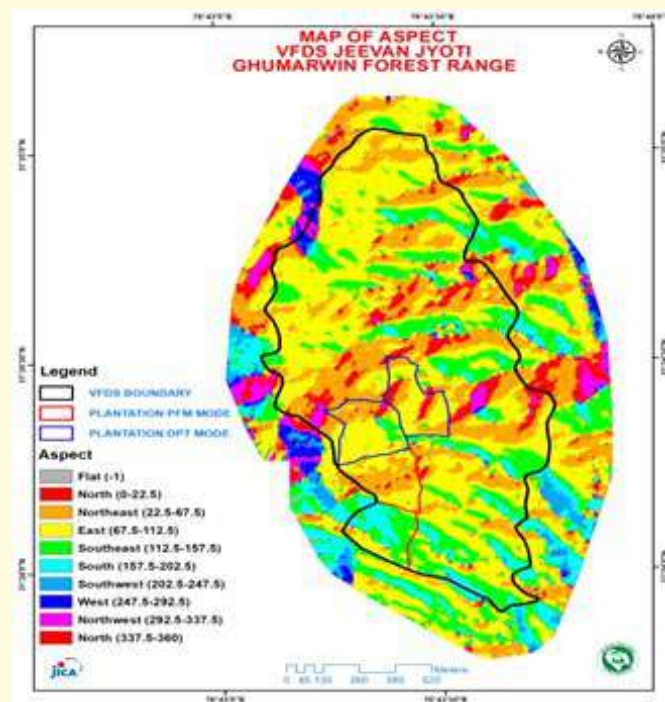
Geo-referenced Ortho Image



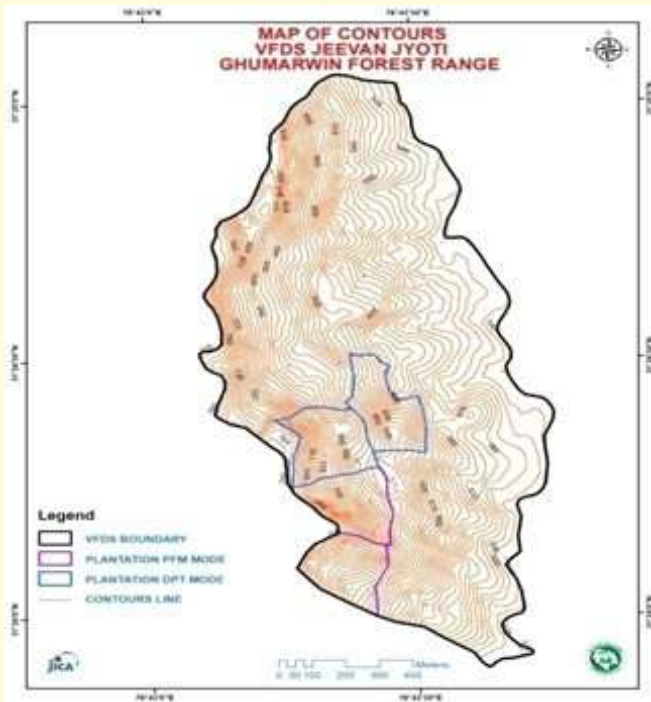
Elevation Map



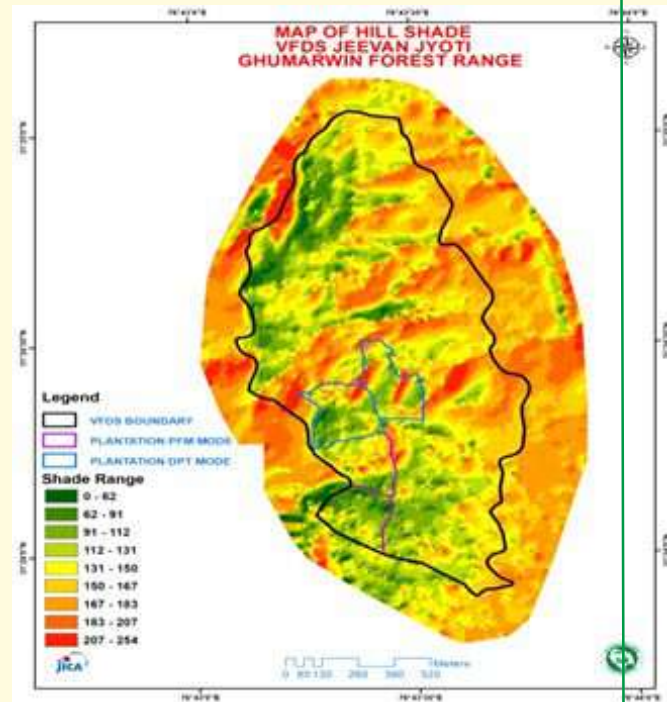
Slope Map



Aspect Map



Contours Line Map



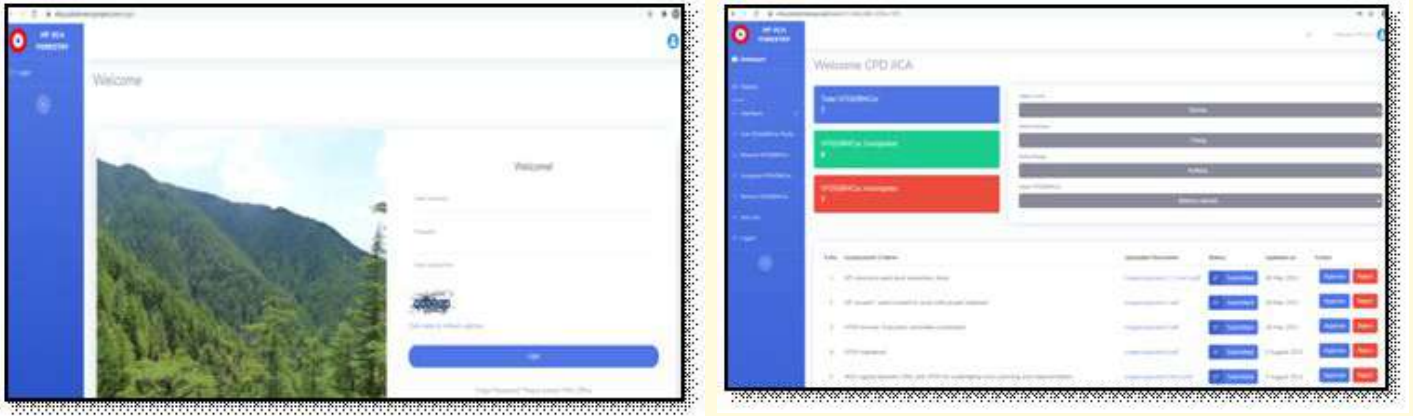
Hill Shade

Disseminating the Project Activities and GIS Based Information through Project Website: <http://jicahpforestryproject.com> : All the project related activities are updated on daily basis. It gives the overall information about the Project and activities going on in the field. All created maps in GIS environment are uploaded on the project website and available for use to plan and monitor the project activities.



Project Website

Monitoring and reviewing the progress of Micro plan Process through VFDS Portal <https://vfds.jicahpforestryproject.com/login> : Micro plan Web-Portal is customized according to 18 points to prepare the Micro Plan. Login ID created for all the selected Ranges to upload the supporting document according to the progress then this progress of Micro plan formulation can be monitored.



Conclusion: Technology has long been an important management tool used to manage the natural resources. Many technologies have been developed over the years to manage the resources scientifically. Since we all know more than 70% Govt. data is in geographically nature, and that case GIS/Remote Sensing tools are now widely used to gather geographical data for the effective management of natural resource under project area. Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods (PIHPFEM&L) is using Remote Sensing/GIS/DGPS/Drone (Space Technology) for capturing, storing and analyzed the geographical data of existing assets for planning and monitoring the project activities. Drone technology is now becoming very essentials tool to collect the real time information as when required, and PIHPFEM&L is using this technology to capture the detail information of the intervention area as bench mark data and for future usage.

Participatory Approach to Sustainable Forest Ecosystem Management

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The Indian Forest Policy of 1988 (MoEF, 1988) and the subsequent government resolution on participatory forest management (MoEF,1990) emphasize the need for people's participation in natural forest management. Accordingly, Japan International Cooperation Agency (JICA) aided “Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods(PIHPFEM&L)” has laid a due focus on Community based/Participatory Forest Management to achieve broader goal of sustainable forest ecosystem management. Participatory Forest management (PFM) approach adopted in the project focused on involvement of cross-section of the Ward/Village community collectively throughout the project cycle including planning, implementation, monitoring & evaluation and impact assessment.

PFM approach at the field level initiated in project during second half of 2019 with preparation of implementation guidelines and training & capacity building manuals for all stakeholders in project including the field staff, ward facilitator and community institutions. After identification/selection of target area (Ward) and the target community, panchayat level interaction process and their consent facilitated the project in making an entry in the village and building rapport with the community. Initial interaction process followed with the community helped them understand the project objective, implementation approach and strategies. The clarity of village community, especially the village leaders about the project motivated them to initiate formation of Village Forest Development Society (VFDS) at Ward level which was later registered under Societies Act 2006. As per the institutional design of the project, VFDS hired Ward Facilitators (one male and one female) from the Ward itself to provide initial support for 3 years.

The training cum orientation programs were organized for field staff and Ward Facilitators to capacitate them on project objective and implementation approach including PFM approach who in turn trained/oriented VFDS representatives and office bearers. The first step to PFM approach to sustainable forest ecosystem management started with preparation of Ward level perspective micro plan collectively by field staff, ward facilitators and VFDS representatives considered as micro planning team. The micro planning team at ward level was equipped with detailed guidelines to follow participatory processes and template for information collection and analysis. A detailed manual on Participatory Rural Appraisal (PRA) facilitated the micro planning team in participatory information collection, analysis and preparation of micro plan. The ward level micro plan consisted off Forest Ecosystem Management Plan (FEMP), Community Development & Livelihood Improvement Plan (CD&LIP) and Convergence plan addressing to the community needs & priorities for which there was no budgetary provision.

Two sample micro plans prepared in Rohru and Kullu Divisional Management Units (DMU) with the support of professionally trained experts were shared to all DMUs for replication as per their local context. The micro plan assessment criteria were developed for monitoring the quality of micro planning processes and micro plan as output. In addition, one micro plan from each of the DMUs on sample basis was reviewed and the changes were incorporated by the micro planning teams. The remaining micro plans were finalized on the basis of sample micro plan. The micro plans were approved in General Body Meeting (GBM) of VFDSs which were later approved the respective DMU. Process of PFM followed in the PIHPFEM&L funded by JICA in HP is as follows

Participatory Approach Sustainable Forest Ecosystem Management



The training & capacity building of different stakeholders including field staff, ward facilitators and VFDS leaders/representatives remained focused to ensure active participation of cross section of the community for planning, implementation and quality control of project interventions. Covid-19 pandemic affected in frequency of training & capacity building inputs especially the exposure visits but the project used different approaches including video-conferencing to reach out the field staff and VFDS to ensure quality processes and outputs during implementation process. The training & capacity building framework was developed based on Training Needs Assessment (TNA) of project staff and community institutions including VFDS and Self-help Groups (SHGs) to equip them with required capacities for effective implementation of planned interventions and to ensure community-based approach to PFM.

The detailed implementation strategy document was prepared incorporating VFDS Byelaws as well for effective participation of VFDS at different levels. The institutional mechanism was developed for VFDS with regard to clarity on roles & responsibilities of VFDS office bearers, meetings & decision-making system, monitoring & quality control of implementation processes & outputs, accounting & procurement mechanism, mechanism for maintaining transparency, information communication to all VFDS members and others. Field visits of project staff facilitated VFDS for effective implementation of community-based strategies along with training/orientation and handholding support.

VFDSs in the project area have implemented or are in process of implementing the micro plans based on their batch under which there were selected. They have been active in collecting membership fee, conducting periodic meetings, contributing financially to community development works, supervising activities of SHGs, implementation and quality control of project interventions, protection of plantation sites developed under PFM and departmental modes, controlling forest fire and others.

Major focus of the project at present relates to execution of convergence plan prepared as part of the micro plans. In addition to the training workshop for creating inter-sectoral convergence for the project staff, project staff and VFDS leaders have initiated interaction process with different line departments. The copies of the micro plans have been shared to the respective Deputy Commissioner (DC) and Block Development Officers (BDO) for incorporating micro plan activities in their annual plan. The Secretary, Government of HP, has also issued letter to the concerned DCs for cooperation. In some cases, VFDSs have been able to get the planned activities executed with the support of Gram Panchayat.

Institutional sustainability of VFDSs after withdrawal of the project remains a focus for the coming 2-3 years down the line. In addition to strengthening institutional aspects further, the project intends to ensure financial sustainability of VFDSs through collection & marketing of existing Non-timber Forest Produces (NTFT), propagation of commercially viable herbal species/models, collection of marginal charges on grass collection from forestlands and water use for irrigation from water conservation sites, promoting rural tourism, grant-in-aid from central/state Government schemes, creating inter-sectoral convergence and others. The sustainable VFDS will lead to Sustainable Forest Ecosystem Management contributing to the achievement of project objective.

Heritage Handloom for Modern Day Women Livelihood in Himachal Pradesh A Success Story

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Situated in the Western Himalayas, 68% of the area of Himachal Pradesh is covered by forest. Forests provide water, soil nutrients and forage for crops and livestock. They also help to reduce soil erosion and pollinate crops. In this new era of technology and development Forests are also considered a source of generating employment and livelihood. HP Forestry Project funded by JICA (Japan International Cooperation Agency) with outlay of Rs. 800 Crore for ten years from 2018-2028 with main emphasis of ecosystem conservation and livelihood development is one of the fine example of this. Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods (PIHPFEM&L) funded by Japan International Cooperation Agency (JICA) is under implementation in the seven districts of the H.P. Project identified 27 income generation activities for community livelihood development in Self Help Group (SHG) mode with provisions of working capital and revolving fund.

In addition to many other income generation activities, JICA Forestry Project in Himachal Pradesh has come as a sacred savior for the handloom sector where especially women in Kullu and Kinnaur area showing interest to develop their deep rooted thinking and practice for handloom for their livelihood. JICA Forestry Project in Himachal Pradesh organized Self Help Groups (SHGs) for implementing their community based livelihood development activities. In Kullu and Kinnaur districts mainly women participate in the SHGs selected traditional handloom weaving as their major business plan activity. These SHGs mainly of the women were trained in groups by the master trainer and facilitated to setup their individual units at their household level for weaving handloom items. Instead of sourcing materials in bulk from different market suppliers, women SHG members spin and color the yarn themselves. Spinning wool to thread is a long process and several people are required for each step and family members contribute for this in free time to increase net profit.

JICA Forestry project is promoting this environmentally conscious business and training SHG members to use local natural wool colours and prevent from using synthetic dyes. 72 SHGs comprising of about 1000 households in Kullu and Kinnaur started producing a variety of woollen handloom items like shawls, stoles, caps and muffler. A lot goes on between an project formulation idea and the production of the final product, but it's all worth as exhibited by the trained SHGs of JICA Forestry Project in Kullu where 32 SHGs sold 8,423 handloom articles with gross returns of Rs. 9,78,840/- after their training during last one year. These groups have 5193 items of worth Rs. 6,03480/- in stock for sale.

Woolen Handloom specially of Kullu and Kinnaur from Himachal Pradesh is handcrafted with love and emotions which local women and men showcase as traditional wear as well. Tourists are crazy to take pictures in locally handcrafted Kullu and Kinnaur dresses and provide opportunities of employment and livelihood to roadside vendors.

JICA Forestry Project provides free training, revolving fund of Rs. 1.00 Lakh for each SHG and Capital Cost of Rs. 50,79,272/- for the procurement of 580 looms and 140 Charka for 52 SHGs. JICA Forestry Project sale outlet was also started at Baveli between Kullu and Manali to facilitate the marketing of the SHGs products without any delay. JICA Forestry Project developed a brand “**HIMTRADITION**” for their SHG products. Setting up of four more marketing outlets at Kullu, Mandi, Rampur and Shimla is in the pipeline. Further strengthening of the SHG production all SHG members trained in handloom activities are in the process of registration as “weavers” with the District Industries Centre (DIC) for linkages with Handloom Schemes of the State and Centre Government for their sustainability. At the same time efforts are on for establishing a larger platform for JICA trained SHG members as Producer Company.

In a competitive world, developing a strategy and shape in practical manner in a rural setting is filled with roadblocks and may not give immediate returns but continuous physical and financial inputs for developing the business that of SHGs for Handloom, there is a lot of satisfaction that empowering people to become financially stable, preserving the environment and a fine art that would otherwise die a slow but sure death.

By training members of the SHGs and giving them a handloom and Charkha, with hands on training by the master trainer empower these rural women to make a living, support their families and also empower their future generation. This makes SHG women's families business stand out amongst the rest, proving that it's not just funds but teaching the art that measures how successful and long lasting a business can be.

This effort will help in addressing the burning issue of employment in difficult mountain areas of Himachal Pradesh in a eco-friendly manner with promotion of wool produced by nomads to augment their cash returns. Otherwise Himachal Pradesh is recording decrease in wool production from 1516.440 Kg in 2020 to 1,482.240 kg in 2021. The data reached an all-time high of 1,663.070 Kg in 2015 and a record low of 1,408.870 kg in 2016. Non availability of remunerative market linkages to the shepherds dispose off wool in forests and do not carry back home. Promotion of such groups and local handloom business with trained women network is expected to increase the consumption and develop a complete value chain with participation of all stakeholders.



Under HP JICA Forestry Project it was ensured for the first time that community members were oriented, organized and trained systematically in the Village Forest Development Committees (VFDS) and SHGs with financial support for carrying out day to day operations with independence. Preparation of micro-plans of the VFDS was done with prioritization of their needs of natural resource management, agriculture, health and nutrition, poverty and livelihood programmes.

More attention was needed to modernize the design, quality, packaging and marketing so that the weavers get better price for their products in the market and JICA project is working to assist the weavers for these requirements with revolving and capital investments. It was further assessed that this is high time to create a federation of Handloom SHG and is initiated for their sustainability and increase production and sale for overall development of the weavers in Kullu and Kinnaur Districts of Himachal Pradesh.

Strengthening Community Institutions for Livelihood and Ecosystem Management in JICA HP Forest Project

Nagesh Kumar Guleria, Lal Singh ,Vinod Sharma and Reena Sharma

**Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods
Himachal Pradesh Forest Department, Potters' Hill, Summer Hill, Shimla-171005**

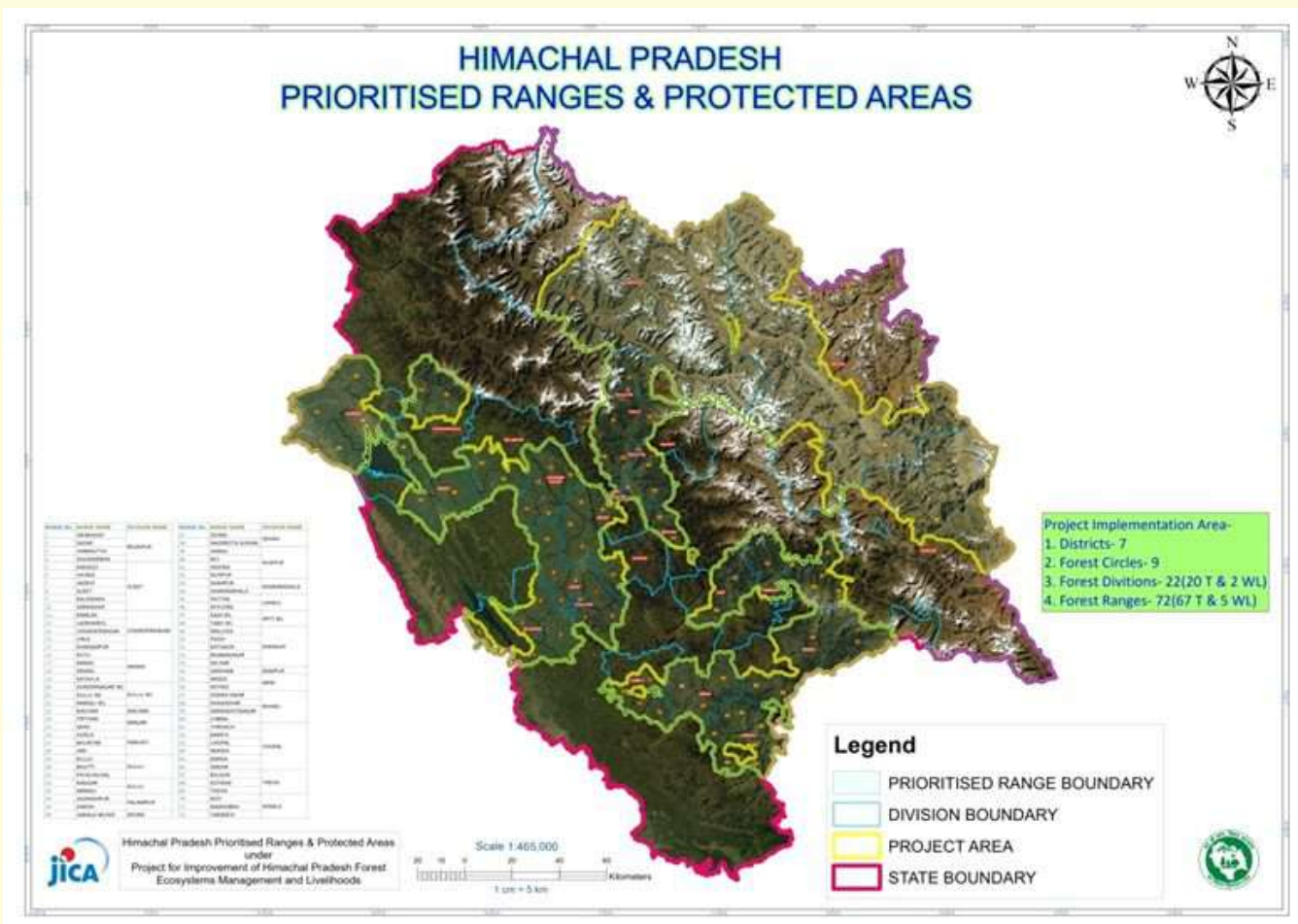
Introduction

Forests are at the centre stage in global conversations for sustainability, climate, biodiversity and community development. In India, forests were managed by the States, with the prime objective of timber production but in the new global thinking India also prioritized working in the late 1980s for community role and involvement is essential for sustainable forest management to meet with increasing demand of communities, conservation and sustainable utilization. This new concept was reflected in the revised National Forest Policy of 1988. Circular after this policy was issued by the Government of India in 1990 which was the foundation of starting the Joint Forest Management (JFM) in the country. Himachal Pradesh notified starting of the JFM in 1993 as per the notification of 1990 issued by the Govt of India. This 1993 initiative of Himachal Pradesh started constitution of village-level Joint Forest Management Committees (JFMCs) late were popular as Village Forest Development Committees (VFDCs). In 2001, Himachal Pradesh Participatory Forest Management Rules were issued for registration of Village Forest Development Societies (VFDSs) under the Societies Registration Act. Subsequently from 2002-03 onwards JFMCs were constituted and federated into Forest Development Agencies (FDAs) at the Forest Division level with support from the National Afforestation Programme (NAP). These JFMCs are registered with the Forest Department as per the provisions of the NAP guidelines, whereas FDAs are registered as Societies. The State-level FDA was constituted in 2010 in accordance with the central guidelines.

JICA HP Forest Project also planned to develop livelihood and ecosystem management with active participation of community involvement. Mode of community involvement was decided in the form of existing and new VFDSs and SHGs in the selected Forest Ranges. Planning was done with selection of the wards of the Panchyats for organizing VFDSs to involve existing and organize new SHGs for taking up different biodiversity, soil conservation, NTFP, plantation, livelihood related activities. Panchayat wards were selected since the 73rd amendment of the Constitution of India amendment strengthened and enhanced the space for the community participation through the establishment of a democratically elected three tier system of Panchyati Raj Institutions (PRIs) for local self governance and was effectively implemented in the state of HP. Linkages of PRIs at the initial level of VFDSs formation facilitates issues of land availability for plantation, involvement of community in activities and getting support from the line department to dub tale support for VFDSs and SHGs for effective field implementation. JICA HP Forest Project initiated community institution strengthening at the ward level with registration of VFDS which organized minimum 2 SHGs for taking up activities of livelihood and ecosystem management with supervision and guidance of the territorial Forest Range and Division. Detail of the community level institutions(,) project support, their roles, responsibilities and activities till March 2022 since starting of the JICA HP Forest Project are compiled in this article.

- **HP JICA Forest Project Landscape**

JICA HP Forest Department project was sanctioned for covering 16 Territorial Forest Divisions and 2 Wildlife Division(s) having protected areas covering 56 territorial forest ranges and 5 wild life ranges of 2 wildlife division in six districts of the Himachal Pradesh. However Kangra Distt is new and prioritization of ranges and protected areas selection is in progress. JICA HP Forest Project area in H.P. is presented in the Map as follows.



• Project Implementation

Overall project implementation is looked after by the Project Management Unit headed by the Chief Project Director created in the special purpose vehicle (Society for Improvement of Forest Ecosystems Management & Livelihoods in Himachal Pradesh at Shimla). In the field(,) project activities are implemented by the territorial and Wild Life Forest Division designated at DMU and Field Technical Units (FTU) at the Forest Range Level. Activities of the project are looked after by the Division Forest Officer. DMUs and FTUs are also provided with staff from the project to strengthen the frontline staff to implement proposed project activities.

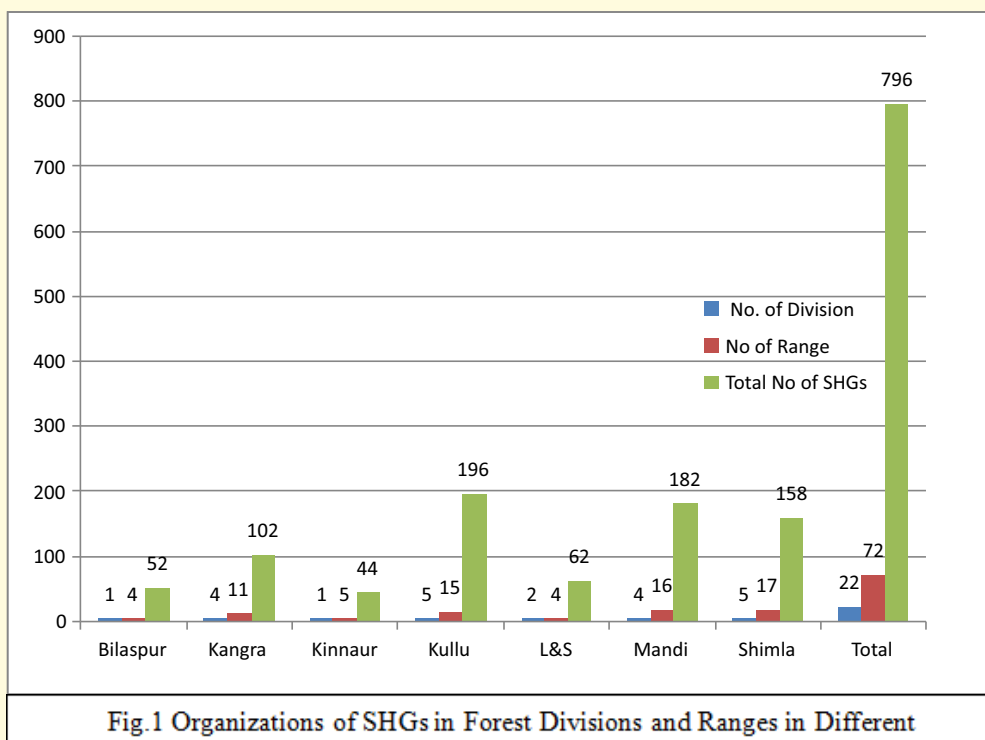
• Organization of VFDSs

Organization of VFDSs at the selected panchayat ward level was the establishment of legal body under Societies Registration Act 2006 of the HP State to carry out the project activities of the JICA HP Forest Project. Ward member of the selected panchayat is the member of VFDS and also help in motivating others to participate in the project activities and SHGs formation in the process. Each VFDS had mandate of organizing two SHGs each with guidance of the Divisional Management Unit (DMU) and Field Technical Unit (FTU) staff. VFDS level micro-plans for the ecosystem activities like plantation, fire control, water and soil conservation and livelihoods preparation is by the VFDS with support from FTU and DMU staff deputed under the Project. Detail of VFDSs organized in 429 VFDSs in 22 forest division till date in different batched for implementation of the project activities at the community level. Detail of the VFDS organized in different forest divisions are presented in Table-1.

Table 1 VFDs Organized and Micro Plan Approval Status									
Division	Batch I	Batch I(WL)	Batch II	Batch II(WL)	Batch III	Batch III(WL)	Batch IV	Batch IV(WL)	Grand Total
Anni	5				5				10
Banjar	5		3		4				12
Bilaspur	5		21						26
Chopal	5		21		9				35
Dehra							15		15
Dharamshala							10		10
Jogindernagar	5		22		6				33
Kinnaur	5		7		10				22
Kullu	7		14		12				33
Lahaul			6		8				14
Mandi	5		23						28
Nachan	5								5
Nurpur							22		22
Palampur							10		10
Parvati	5		6		5				16
Rampur	5								5
Rohru	5		7		9				21
Shimla	5						8		13
Suket	5		22		14				41
Theog	5		7		5				17
WL Kullu		6		6		12		10	34
WL Spiti								7	7
Grand Total	77	6	159	6	87	12	65	17	429

Organization of Forest-dependent Community in Self-Help Groups(SHG)

Organization of the SHGs was initiated to form a homogenous community group on voluntary basis involved in saving, inter-lending and business activity for economic development and contribute to the ecosystem management. FTUs in different districts are responsible for the formation and engagement of new and existing SHGs. FTUs brief all groups about the project plan and activities with respect to their area and involvement procedures, trainings, capacity building and development of business plan with financial support for suitable activities in consultation with the SHGs leader and members.



All SHGs identify their leader, name their group, plan monthly meetings, savings, maintain books, and collectively decide penalties for the defaulters. In these processes the FTUs (Coordinators) assist the SHGs from time to time for smooth functioning and business activities. FTUs coordinate with DMUs and PMU for any questions and guidance they lack to address the issues at the SHGs level. DMUs and FTUs staff is trained in these processes from time to time for better progress in the field. Till 31.3.2023 total 768 SHGs comprising of 7850 (7256 Female, 594 Male) members. Details of SHGs organized in Forest Divisions and Ranges under JICA HP Forest Project till 31.3.2023 are presented in the Fig.1

• **Training and Capacity Building of the Community Institutions (SHGs & VFDSs)**

Organized SHGS of the VFDs were trained in different procedures related to maintain group registers and accounts of the corpus contribution by the members with short listing of Income Generation Activities (IGAs) for starting the group business. In All about 16 activities were selected by the different organized SHGs under the project landscape in the state of HP. Till 31.3.2023 about 400 SHGs were able to develop the Group Business Plans and imparted training in the selected IGA by the staff of DMU with arrangement of activity resource persons from the concerned institutions such as KrishiVigyan Kendra (KVK), local entrepreneurs, and organizations involved in these activities. Total 127 IGAs training of 14 business trades were conducted across the selected forest ranges in six districts of the HP under JICA Forest Project. Detail of total trainings conducted in different IGAs is presented in Fig.2.

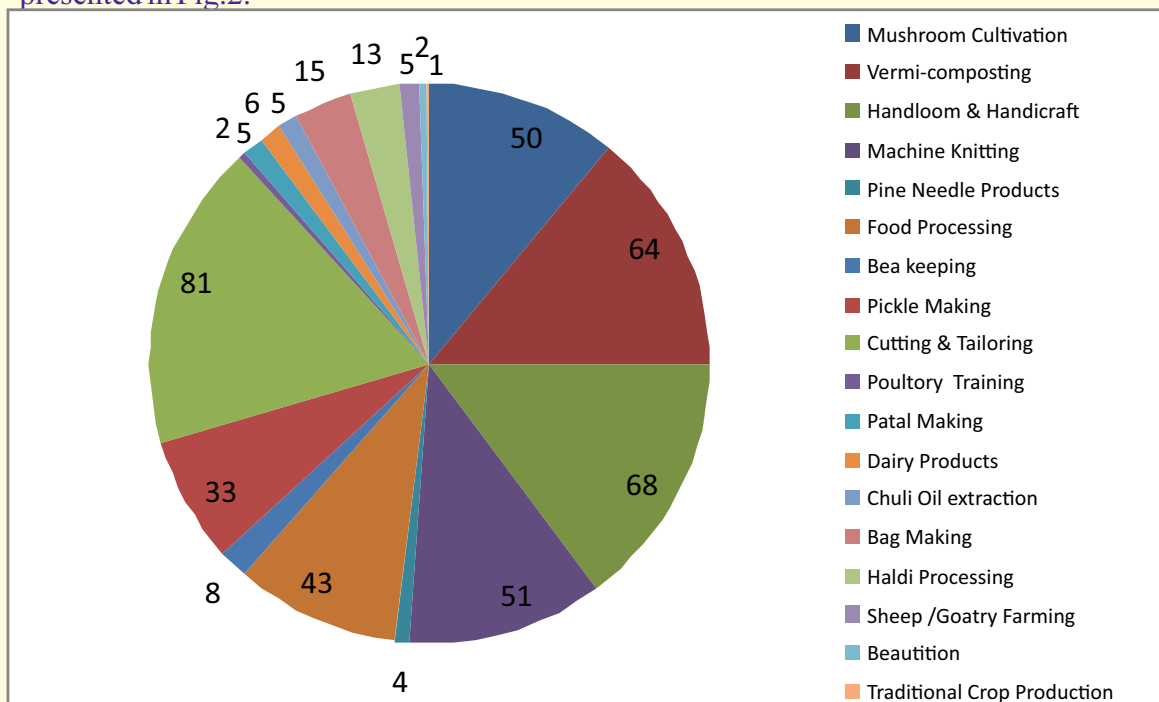
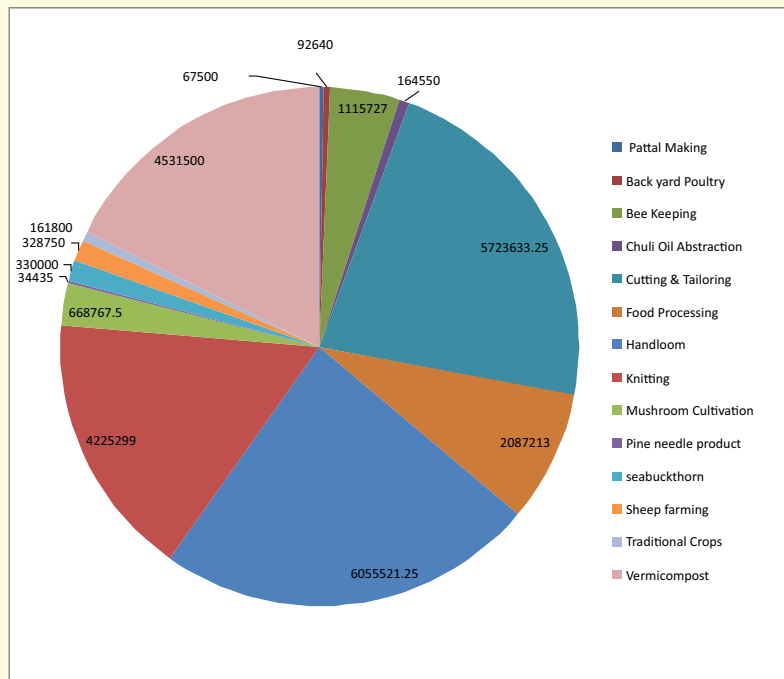


Fig.3Detail of total trainings conducted in different IGAs

• **Disbursement of Financial Capital and Working Support**

JICA HP Forest Project financial support to the strengthening of community institutions at the community level is bold and forthcoming. In previous years under different projects of the state and centre governments SHGs were asked to create their corpus to start their business activities and most of the groups failed to perform to the desired level due to liquidity. But the design of JICA HP Forest Project is altogether different and meets financial needs of the groups for capital and revolving fund right in the beginning immediately after approval of the business plan of the group. This motivate the group members to start the activity at the earliest and seek linkages with financial institution and market in shortest possible time without losing enthusiasm due to delay in arranging the initial investment as was happening in the past.

This operate with pace as the HP JICA field staff and business managers at the project management unit (PMU) at the head office continues their day to day coordination for developing the business and market support to the groups. In the initial phase of the project and due to main constraint of COVID-19 situation till date total of Rs. 60,09,801/-Capital Cost for selected 24 IGAs and Rs 5,63,00,000/-Revolving Funds was provided to the 768 SHGs for starting their business as per approved business plan. Detail of the activity wise total Capital Fund disbursement is presented in Fig. 3. Revolving fund of Rs. 1.00/- Lakh/ SHGs is provided with capital fund after approval of the business plan. This fund is mainly kept in the group account as collaterals to generate additional funds to start group activities. Some groups also invest this revolving fund to procure raw material to start the activity and deposit back after sale of product in the group account. This way group has the freedom to generate additional fund or can start the activity immediately after receiving the funds from JICA.



• Fig.3 Detail of the activity wise total Capital Fund disbursement

• Cash Flow and Economic Returns of the SHGs

This is the initial phase of the IGAs at the SHGs level and their business has started rolling despite all constraint of COVID-19 lockdown and restricted gathering and movements. During this phase SHGs IGAs out of total 24 selected 12 IGAs have started cash generations. Till date Rs. 51,75,738/- cash returns was documented in different groups across the JICA project area by the SHGs. This is encouraging since installation of machine and infrastructure was delayed due to late supply and many other reasons due to lockdown and restricted movements of technicians and supplies in last two years. Details of cash returns of different IGAs are presented in Fig. 4.

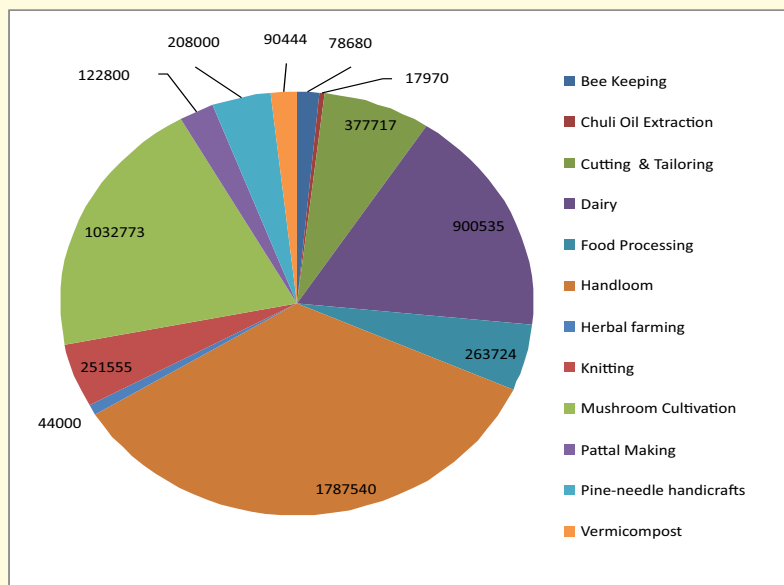


Fig.4 Details of cash returns generated from different IGAs

• Learning

- i. Working experience till now highlighted the potential of community involvement in ecosystem management and livelihood development. However, considerable financial and technical support through training, capacity building, technical and financial support as provided to the groups will help in speed up the process of transformation for ecosystems and community livelihood alike.
- ii. Organization and development of community institutions in the form of VFDSs and SHGs for their collective involvement in economic and environmental activities provided them opportunity to express their need and plans to meet with assured levels of confidence. However, this required handholding for the technical, branding and marketing assistance.
- iii. Community groups such as SHGs formation and capacity building is taken up by multiple organizations in their regular plan and project plans and is also a major activity in the state of Himachal Pradesh. Therefore, both existing and new groups were involved in JICA HP Forest Project implementation.
- iv. There is need to recognize and provide incentives to the performing VFDSs and SHGs as the same approach to the performer and non performer demoralize the progressive groups.
- v. Training and capacity building of the community institution members is observed to develop leadership qualities especially in women members. This is expected to enhance ecosystem management and livelihood at the remote forest dependent communities which is the ultimate goal of the project.
- vi. Forest Policy envisaged important role of PRIs in PFMS. Therefore VFDSs established under this JICA assisted project of HP Forest Department ensured Panchayat Ward Member is the part of VFDS compulsorily to coordinate and implement linkages developed for forest and livelihood activities in their respective area.
- vii. Trust deficit between communities and forest officials was major point of discussion in PFMS. This issue was discussed and incorporated with strong capacity building of forest officials and community members at VFDS and SHG mode through technical and financial contribution.

• Way Forward

There is greater need to further strengthen the linkages of community institutions like SHGs with financial institution for sustaining the IGAs and community enterprises. All efforts are being done in this direction at the district level. At the same time for quantity and quality of SHGs product line branding, packaging and organized marketing in local and digital platforms is the required immediately. In particular, there is need for ensuring financial sustainability and devolution of more management and decision making power to the communities, along with greater involvement and integration with the *Panchayats*. SHGs convergence to other natural resource management and livelihood schemes such as watershed development, National Rural Employment Guarantee Scheme (NREGA) and other Rural Development, Agriculture, Animal Husbandry, Industries programmes being implemented through different line departments and local Panchayats. JICA HP Forest Project is perusing all these options as per project implementation plan.

Mushroom Cultivation a Boon for Women Livelihood in Rural Villages of H.P.- A Success Story

Nagesh Kumar Guleria ,V.P. Pathania, Reena Sharma and Ankur Saraswati

**Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods
Himachal Pradesh Forest Department, Potters' Hill, Summer Hill, Shimla-171005**

Project for Improvement of Himachal Pradesh Forest Ecosystems Management & Livelihoods funded by Japan International Cooperation Agency (JICA) is under implementation in the seven districts of the H.P. Project identified 24 income generation activities for community livelihood development in Self Help Group (SHG) mode with provisions of working capital and revolving fund. Women SHGs are adopting technology driven income generation activities for their livelihood in rural areas of Himachal Pradesh. Ekta women SHG at Village Kanda, near Ghanahati in the suburbs of Shimla City was oriented for the cultivation of Button Mushroom Cultivation by the staff and experts of JICA Forestry Project in November 2022 at their village. Group established a demonstration of Button Mushroom with 245 seeded compost bag of 10 Kg each in rented room. Day to day technical backup was provided by the JICA Forestry Project Experts for the women members of the SHG in production of Button mushroom. After 25 days of growing button mushroom production started and in one week SHG marketed 200 Kg mushroom which is fetching price of Rs. 110-130/Kg with gross return of more than Rs. 20,000/- in one week. This was first success of the group in this venture for which they were not trained formally and learned while doing the day to day operations with guidance of the JICA Forestry Project experts at their demonstration site. Production will continue further for about two more months and total production of about 500 Kg of gross Rs. 50000/- market value is expected from this SHG demonstration. Women group members expressed their happiness and mentioned that this is very light activity and required only 1-2 hours daily care for picking, washing, watering and packaging. Marketing is done locally and demand is very high and selling on cash at demonstration site fresh. Local population is getting to enjoy locally grown button mushroom that has been cultivated perhaps for the first time in the village by any women groups.



SHGs were provided with Rs. 1,00,000/- Lakh as revolving fund, and technical training at their door step to start this livelihood venture. JICA project has mandate of organizing more than 700 SHG in seven districts of the State and orient them for developing and adopting innovative income generation activities for livelihood. Efforts are in progress to diversify mushroom growing in SHGs with promotion of species of Dhingri and Shiitake Mushroom keeping in view their high demand and easy marketing as dried mushroom.

Ms Puja, Pradhan of Ekta SHG, who lives near to the demo room was delighted to share along with other members of the SHGs that they were not having any practical training in growing of Button Mushroom but motivation and day to day help provided by the team of JICA Forestry Project made this possible for us. This was the first demo of the mushroom growing in the area and there are many visitors and women from different household interested in the activity.

IMPLEMENTATION OF JICA ASSISTED FORESTRY PROJECTS IN TAMIL NADU

I. Anwardeen,

Tamil Nadu Biodiversity Conservation & Greening Project, Chennai

Genesis

Tamil Nadu Forest Department has an history of 25 years of Association with JICA. During the 25 years, three JICA assisted Forestry Projects were implemented and one project is under implementation in Tamil Nadu.

First two projects viz. Tamil Nadu Afforestation Project (TAP-I) and TAP-II focussed on “Ecological restoration of forest areas through Joint Forest Management”. These two projects received the highest grading awarded for JICA projects as follows :

- TAP Phase-I from 1997 to 2004 (8 Years, Rs.688 crores, awarded **Grade-A** - Highest evaluation rating for JICA projects in India)
- TAP Phase-II from 2005 to 2013 (8 Years, Rs.567 crores, awarded **Grade-A**- Highest evaluation rating for JICA projects in India)

After working for 16 years in forest areas, the department came out of forest areas with the twin objectives of biodiversity conservation and increasing Trees Outside Forests under the 3rd Project viz. Tamil Nadu Biodiversity Conservation and Greening Project (TBGP).

- TBGP from 2011 to 2018 (2020-21) (8 Years, Rs.686 crores, Ex-post evaluation in final stages of completion)

Buoyed by the success of TBGP, the fourth project viz. Tamil Nadu Biodiversity Conservation and Greening Project for Climate Change Response (TBGPCCR) was proposed to consolidate the efforts of TBGP with focus on Climate Change Response.

Cost break-up, total cost, share of JICA funding

S. No	Project	Duration	Outlay (Rs in cr)
1	Tamil Nadu Afforestation Project (Phase I)	1997-98 to 2004-05 (8 yrs)	Total : Rs 688 cr JICA - Rs 483 cr State - Rs 205 cr
2	Tamil Nadu Afforestation Project (Phase II)	2005-06 to 2012-13 (8 yrs)	Total : Rs 567 cr JICA - Rs 409 cr State - Rs 158 cr
3	Tamil Nadu Biodiversity Conservation and Greening Project (TBGP)	2011-12 to 2018-19 (8 years)	Total : Rs 686 cr JICA - Rs 470 cr State - Rs 216 cr
4	Tamil Nadu Biodiversity Conservation and Greening Project for Climate Change Response (TBGPCCR)	2022-23 to 2029-30 (8 years)	Total : Rs 920.52 cr JICA - Rs 688.56 cr State - Rs 231.96 cr

Salient features, Project benefits and its effectiveness

Tamil Nadu Afforestation Project (Phase I and Phase II)

Confronted with a serious problem of degradation and destruction of massive forest lands in Tamil Nadu, with its adverse impact on ecosystem and bio-diversity in particular, a massive and unique afforestation programme called Tamil Nadu Afforestation Project(TAP) was undertaken with a new strategy of “Forest Management based on Nature and led by People” (FMNP).It laid the primary focus on poverty alleviation, capacity building and empowerment of local people, along with ecological restoration of forest. TAP has been considered as one of the largest afforestation programme ever undertaken successfully recently in India. It led to massive regeneration of forest and economic development of fringe villages.

By implantation of TAP has resulted in understanding the intricacies of forest management in the right perspective. Tamil Nadu Afforestation Project (TAP) has helped in restoration of more than 6880 sq. kms. of degraded forests adjoining 2317 forest fringe villages over the last 20 years through “Natural Regeneration Supporting Silvicultural System” (NRSS). Japanese International Cooperative Agency (JICA) the funding agency, conducted two ex-post evaluations of the TAP Phase-I in 2008 and TAP Phase-II in 2019 through external parties and has awarded the highest possible rating of A (Highly Satisfactory) for both the phases.

Creation of assets under TAP PHASE I & II

Activity	Indicator	TAP I	TAP II	TOTAL
Institution Building	VFC formed	1367	950	2317
	VFC Members	465588	227166	692754
	SHG formed	3891	3283	7174
Afforestation	Block Planting	480179 ha.	208550 ha.	688729 ha.
	Strip Planting	1488 km		1488 km
Watershed Development	Check dams	23454	5271	28725
	Percolation Ponds	2201	2026	4227
	Storage Capacity	817 m.cft	1024 m.cft	1841 m.cft
Micro - Credit	IGA Loan	Rs.51 cr	Rs.63 cr	Rs.114 cr
	Revolving Fund	Rs.102 cr	Rs.126.43 cr	Rs.228.43 cr



PRA Exercises



Afforestation



Check dams
(Increase in Water table, Change in Cropping)



Income generation activities



Ecological restoration
(Canopy Improvement)

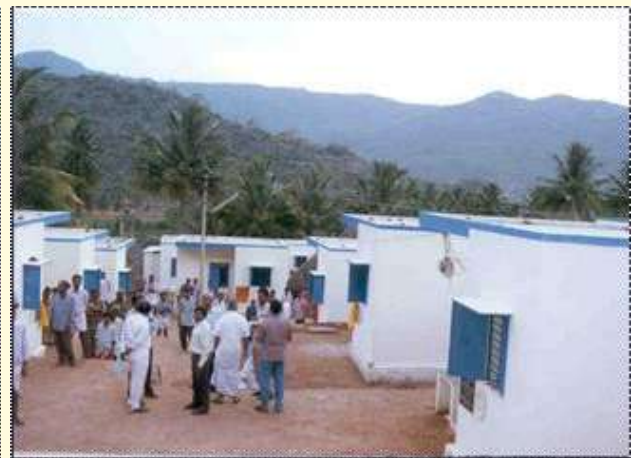


Livelihood improvement

Village development



Before implementation of TAP



After implementation of TAP

TAP & SUSTAINABILITY

- **Strong Convergence Mechanism** - Hall mark of sustainability
- Overall development of forest fringe villages – a pre-requisite for protection & local biodiversity conservation.
- Only limited village development possible due to the paucity of funds.
- Dovetailing development activities in TAP villages through convergence is vital for holistic development of Forest Fringe villages.
- State level JFM Committee headed by Chief Secretary.
- District level Committee headed by District Collector.
- Government of Tamil Nadu has formulated elaborate guidelines for implementing inter-sectoral linkage.
- Convergence works are identified in the Micro Plan and Action Plan is approved by the District Committee

Tamil Nadu Biodiversity Conservation and Greening Project

Tamil Nadu Biodiversity Conservation and Greening Project (TBGP) with financial support from JICA has been implemented as an eight year Project from 2011-12 to 2018-19. The objective of the Project was to strengthen Biodiversity Conservation as well as undertaking large scale tree planting in private lands.

During the implementation of this project the following activities were carried out.

- Participatory Wetland Conservation Action Plans for 12 Bird Sanctuaries were prepared.
- Under Biodiversity Conservation, removal of invasive Alien Species, viz Lantana, Prosopis and Wattle was carried out in 3028 ha of forest lands.
- 32 Waterholes were created and 48 existing ones were improved to increase water availability in Protected Areas / Elephant Reserves.
- Species Conservation Plan for sea turtle was prepared for 8 coastal Divisions. During the project period 393480 sea turtle eggs were collected, incubated and 3,17,734 hatchlings were released into sea.
- 60,612 boundary cairns were constructed in the identified Forest Divisions which are vulnerable to encroachment.
- 4 Mobile veterinary units in Tirunelveli, Madurai, Dharmapuri and Erode Circles were launched to rescue and offer first aid to Wildlife in distress and these units are fully operational now.
- In order to mitigate Human-Wildlife Conflict, Elephant Proof Trenches over 381 Km were dug.
- 25 Community based Eco-tourism sites were promoted successfully to enhance livelihood opportunities for local communities.
- 8.32 Crore seedlings were planted under Tree Cultivation in Private Lands. The species planted are Teak, Kumil, Malaivembu, Ailanthus, Jack etc.,
- 7805 villages covering 1.52 lakhs ha of farm lands under Tree Cultivation in Private Lands were taken up and about 1,27,000 farmers benefitted.
- To strengthen protection and conservation of Forests and Wildlife, 143 buildings were constructed and 174 motor vehicles were purchased and provided to field officers and staffs.



Sea turtle (egg collection)



Sea Turtle Hatchery



Sea grass bed



Habitat survey



Dugong



Elephant Proof Trench



Eco-huts



Pitchavaram Ecotourism site

Tree Cultivation in Private Lands (TCPL)



TCPL - Block Planting



TCPL - Bund Planting



TCPL - Intercrop Planting



Teak, Gmelina & Casuarina with banana

The impact assessment on the implementation of TBGP has been completed and as per the draft final reports deliberated, the performance of Tamil Nadu Forest Department in implementation of Tamil Nadu Biodiversity Conservation and Greening Project has been appreciated.

Tamil Nadu Biodiversity Conservation and Greening Project for Climate Change Response (TBGPCCR).

The Tamil Nadu Biodiversity Conservation and Greening Project for Climate Change Response (TBGPCCR) is proposed to be implemented as a continuation of Tamil Nadu Biodiversity Conservation and Greening Project (Tamil Nadu Biodiversity Conservation and Greening Project) with interventions and up-scaling of project components.

The implementation of Tamil Nadu Biodiversity Conservation and Greening Project for Climate Change Response (TBGPCCR) is necessitated on the following grounds.

- i. With high dependency on natural resources, Tamil Nadu is under constant threat of climate change and its negative impact (heat waves, deterioration in agriculture, droughts, cyclones, unseasonal rains, floods, deforestation, etc.)
- ii. More than 500 species / animals are on the verge of extinction.
- iii. Annually 60 people lose their lives and Rs.50 million paid as compensation due to deteriorating human-animal conflict.
- iv. Mangrove coverage decreased by 8% from 2017 to 2019 due to pressure of expanding economic activity.
- v. 5,000 households suffered wicked flood and storm tide due to intensified natural disaster.

Project Objective

“To mitigate and adapt to climate change and improve eco system by undertaking bio diversity conservation, human wildlife conflict mitigation measures, promoting supply chain development, livelihood improvement activities and management capacity development, thereby contributing to sustainable socio-economic development in Tamil Nadu.”

Major components

1. Ecosystem Based Climate Change measures: - Includes establishment of India-Japan academic consortium and Smallholder Horticulture Empowerment and Promotion (SHEP) models.
2. Human Wildlife Conflict measures:- Includes implementation of infectious disease measures since anthrozoosis are one of the major concern across the world.
3. Promoting Supply Chain development
4. Livelihood improvement activities
5. Management capacity development:- Includes Promotion of the research activities and the policy planning (action plan planning) by TNFD and strengthen implementation ability by cooperating with researches.

Project implementation schedule / Modalities

The TBGPCCR will be implemented over 8 years which includes 1 year preparatory phase, 5 years implementation phase and 2 years of wrap up phase, at an outlay of 920.52 crores. The project is proposed to be implemented through one Project Management Unit (PMU), 87 Divisional Management Units and 333 Field Management Units (FMU)

Contribution to Environment and Climate Change

The efficacy of TBGPCCR will be assessed on the following parameters:

- Increase of Carbon storage through Urban and Peri-urban Forestry (UPF) - 2.00,000 lakh MT.
- Restoration of coral reef area (blue carbon, and its carbon storage) - 3.6 ha.
- Restoration of Sea weed / Sea grass area (blue carbon, and its carbon storage) - Sea weed - 300 ha. and Sea grass - 600 ha.
- Increased area of mangroves - 1050 ha.
- Arresting the rate of increase in human wildlife conflict incidences- 10%
- Increase of annual household income of tribals in 155 ITDP villages & 4 CBET sites - 25%
- Increase in Trees Outside Forest (TOF) cover - 60,000 ha.
- Capacity Building - 5400 beneficiaries.

Conclusion

Tamil Nadu Forest Department with the support of JICA will continue to strive to achieve the objectives enshrined in the project with greater vigour and vitality in the years to come.

Financial Incentives for Community led Sustainable Forest Management Institutions through Carbon Credits in JICA assisted Projects.

Atul Jindal
Uttar Pradesh Forest Department

Introduction:

Forests are among the most important natural resources on our planet. They provide a wide range of ecosystem services, including carbon sequestration, water filtration, soil conservation, and biodiversity conservation. Forests are also a source of livelihood for millions of people around the world, particularly those who live in forest-dependent communities. These communities rely on forests for food, fuel, timber, and other forest products, and their livelihoods are closely linked to the health and well-being of the forest ecosystem. The restoration of Forest ecosystems is now a paradigm shift toward community led forest management. Sustainable Forest management with the active participation of the community is to be incentivized with mechanism of livelihood support. This will ensure the growing stock of the forests.

Addressing the deforestation and degradation of forest ecosystems and promoting their restoration has the potential to contribute is one of the major opportunities for mitigating climate change. Since forests are the main source of sustenance for the people dependent on Forest resources, the sustainable forest management with active participation of the forest dependent community is the key to address the climate change mitigation measures.

Some Facts about the Potential of the Forests for mitigation the climate change:

- As per estimates, approximately 2.6 billion tons of carbon dioxide, which is one-third of the CO₂ released from burning fossil fuels, is absorbed by forests every year.
- Estimates show that nearly two billion hectares of degraded land across the world – an area the size of South America – offer opportunities for reforestation. Increasing and maintaining forests is therefore an essential solution to climate change.
- The potential to reverse the degradation and deforestation is with SFM is about 7 million metric tons of CO₂ annually.
- The policies and the process to reach the target of reversal requires the national level and sub national implementation of the carbon reversal with carbon incentivizing process through carbon credits for the

Forest conservation, sustainable management of forests with community participation and enhancement of forest carbon stocks is the most effective tool for achieving climate change mitigation in the developing countries.

Green House Gases: Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Industrial gases: Hydrofluorocarbons (HFCs) Perfluorocarbons (PFCs) Sulphur hexafluoride, (SF₆) Nitrogen trifluoride (NF₃)

SFM managers led by forest dependent Community.

- As per estimates, approximately 2.6 billion tons of carbon dioxide, which is one-third of the CO₂ released from burning fossil fuels, is absorbed by forests every year.
- Estimates show that nearly two billion hectares of degraded land across the world – an area the size of South America – offer opportunities for restoration. Increasing and maintaining forests is therefore an essential solution to climate change

So, conservation of forest ecosystem and enhancement of Forest Stock with sustainable Forest management of the forests are the main issues to be taken up as priority to address deforestation and degradation. There by the incentive of the Sustainable Forest management with the help of community may lead to carbon financing may accrue to the community who are partners of SFM.

Deforestation - when forests are converted to non-forest uses, such as agriculture and road construction.

Forest degradation -when forest ecosystems lose their capacity to provide important goods and services to people and nature.

Financial incentivizing with REDD+ mechanism provides an opportunity for forest-dependent communities to benefit from conservation and sustainable management of their forests. Through REDD+, communities can receive payments for reducing emissions from deforestation and forest degradation, and for enhancing forest carbon stocks.

In the present context the process of carbon financing in the case of forest can be placed with the process that is REDD+ .

Concept of REDD+(Reducing Emission from Deforestation and Forest Degradation):REDD+ is a financing model negotiated under the UNFCCC to reduce greenhouse gas emissions from deforestation and forest degradation in developing countries. These emissions are mainly due to various factors like deforestation, degradation, industrialization, and various factors contributing to the greenhouse gases causing global warming.

The United Nations Program on Reducing Emissions from Deforestation and Forest Degradation (UN-REDD) is a collaborative program of various international organizations. Since the forests absorb CO₂ and thereby absorb carbon, forests are the major carbon sinks. So, climate change mitigation can be achieved by enhancing the forest stock and conserving the forests and ecosystem services with SFM and involving communities dependent on forests. In REDD plus (+) is added (*Decision 2/CP.13: "Reducing emissions from deforestation in developing countries: approaches to stimulate action"*), with the inclusion of Sustainable Forest Management (SFM) with the involvement of forest dependent Community.

The National Forest Monitoring and MRV (Measurements, Reporting, and the Verification) were introduced with the development of National strategy to establish reference levels, with participatory approach with full and effective involvement of indigenous peoples and local communities in /measurements monitoring and reporting are some of the key points of REDD + mechanism . The absorption of Carbon dia oxide is measured with preset parameter can be measures as and carbon credits can be issued by the governance body with compliances. One tone of CO₂= 1CER i.e. one carbon credit.

- REDD+ is a voluntary climate mitigation path developed by Parties (countries) to the United Nations Framework for Convention on Climate Change (UNFCCC). The primary objective of REDD is to reduce emissions from deforestation and forest degradation.
- REDD+ is to conserve forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks. main objective of mitigating
- REDD+ is an effective, efficient, and equitable mechanism for reducing emissions from deforestation and forest degradation. It is divided into three phases, which are roughly associated with readiness, implementation, and payment for results.

Scope of REDD+

In developing countries there is tremendous scope to reduce the emissions due to deforestation and forest degradation, by encouraging technical and financial interventions on the following fronts:

- Reducing emissions from deforestation
- Reducing emissions from forest degradation
- Conservation of forest carbon stock
- Sustainable management of forests and
- Enhancement of forest carbon stocks

Main Elements of REDD + (Decision 1/CP.16)

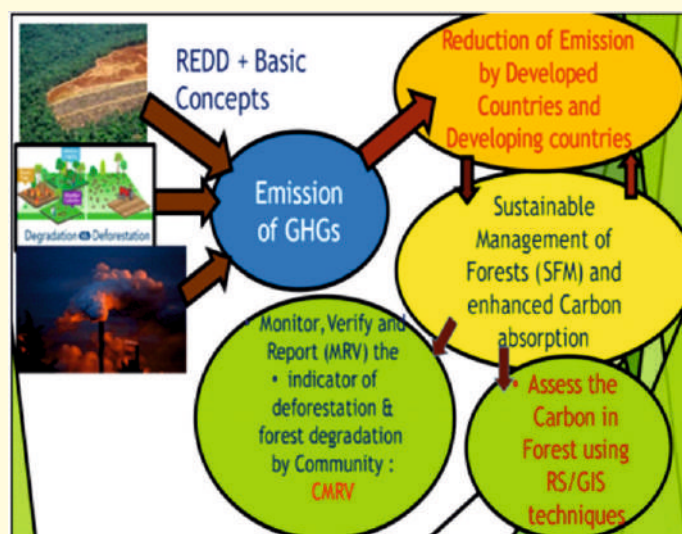
- (a) A national strategy or action plan framework
- (b) A national forest reference emission level and/or forest reference level or, if appropriate, as an interim measure, sub national forest reference emission levels and/or forest reference levels (State Level)
- (c) A robust and transparent national/Sub national forest monitoring system for the monitoring and reporting on REDD+ activities

- (d) Social and environmental safeguards while implementing the REDD + activities

It is divided into three phases,

- Beginning with the development of national strategies or action plans, policies and measures, and capacity-building (also known as the readiness phase)
- Followed by implementation of national policies and measures and national strategies or action plans that could involve further capacity-building, technology development and transfer and results-based demonstration activities,
- And evolving into results-based actions that should be fully measured, reported, and verified, allowing countries to seek and obtain results- based payments.

REDD+ is a mechanism also divides the countries in to two groups of nation under UNFCCC (The UNFCCC entered into force on 21st March 1994, and has been ratified by 197 countries) . it divides the countries into two parts
Annex I: Developed Countries
Non annex Countries: Developing Nations (India is member of Non annex countries)
To implement REDD+ mechanism the Conference Of Parties/countries is in place under UNFCCC and India is member of CoP. (COP is the apex decision-making authority of UNFCCC)
Every year the COP is held and during 2016- onwards the legal framework is defined for all country to follow REDD + on a voluntary basis.

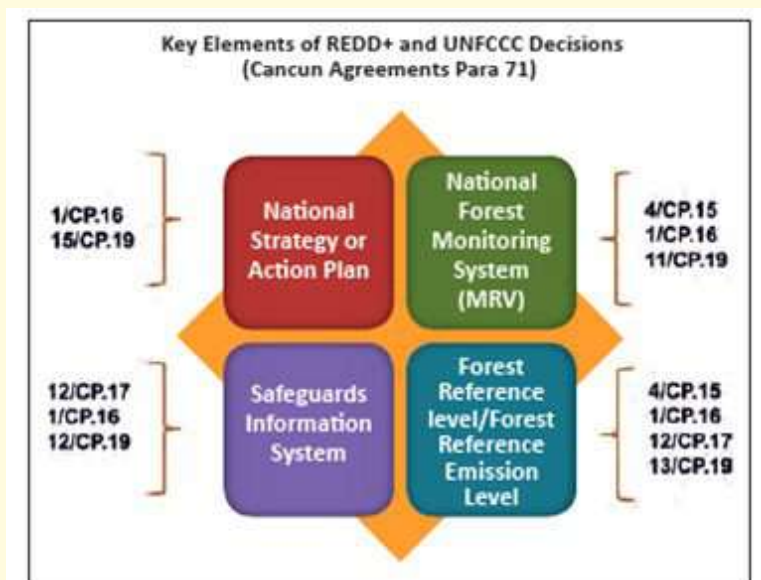


REDD+ Strategy in Indian context:

Based on the above decision Ministry of Environment and Forest and Climate Change formulated the National REDD+ strategy in 2018 and the scale of the carbon assessment with the sub national level (states) with contiguity of similar physiographic regions. Subsequent reference level from the forests was also submitted to UNFCCC by MOEFCC in 2018 and draft 2021. This was after the Cancun COP 16 agreement. India agreed in Cancun COP 2016 to reduce the emission in the policy documents. The prerequisites (COP 16 requires the developing countries aiming the REDD+ activities. The scale of the carbon assessment with the sub national level (states) with contiguity of similar physiographic regions were designed in the policy statement. Subsequent reference level from the forest was also submitted to UNFCCC by MOEFCC in 2018 and draft 2021.

Approaches in REDD +

Phase 1	Development of Policy and national Strategy
Phase 2	Implementation of national policies and Measures and action plans
Phase 3	Evolution of results Based Actions that should be Fully Measured, Reported and Verified.



After UNFCCC decisions the REDD + implementation can be at Sub National level. However, the national approach is not ruled out. The sub national approach that is State specific is to be adopted to incentivize carbon financing as an interim measure.

This is also recognized in the carbon market. **The state governments can collaborate based on the physiographic region's contiguity.** In the case of Forests the SFM interventions will be eligible for REDD + based Carbon Financing Mechanism through increasing the carbon stocks and issuance of carbon credits.

Steps to be undertaken for implementation of REDD + mechanism with SFM measures:

Identification of Drivers: The causes of deforestation and forest degradation are to be identified. These are to be addressed to control deforestation and degradation. So that the emissions generated due to deforestation and degradations could be controlled. These drivers can be many. So, the REDD+ strategy should address the drivers, land tenure issues, forest governance issues, gender considerations, safeguards, ensuring effective participation of stakeholders including indigenous peoples and local communities in controlling these drivers with sustainable Forest Management.

- Capacity building of the Forest managers and forest dependent community to address the drivers.
- Measurement of the Mitigation Measures with concurrent Measurement/Monitoring, Reporting and Verification (MRV mechanism laid by UNFCCC Good Practice Guidelines 2006 and as amended later))
- Assessment of the Carbon Stocks: When the drivers of the Deforestation and degradation are identified and addressed, the SFM with active participation of the community is implemented and the base line or reference level is assessed. This will lead to the REDD + readiness. The assessed results will be in tons CO₂ per year) for each relevant period are to be periodically monitored with the assessed forest reference level (tones CO₂ per year).
- This should also include a summary of information on how all of the REDD+ safeguards are being addressed and respected.
- Information on the national forest monitoring system.

The Detailed Steps are listed Below:

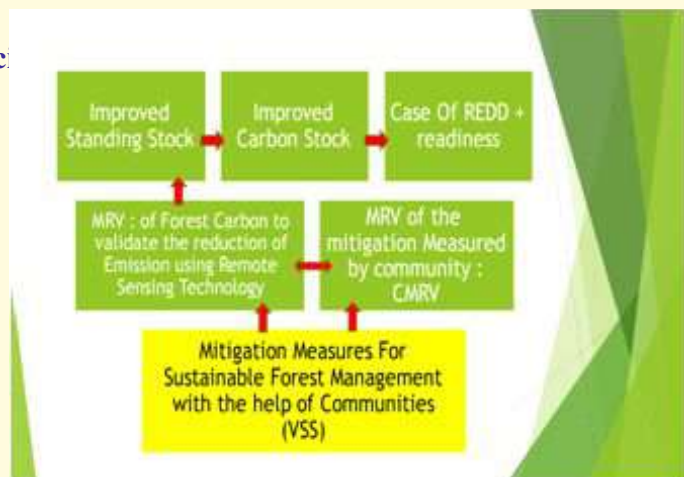
Project Development →	Validation	Verification	Issuance and transaction
Base line survey	Web Hosting of the Document on appropriate Entity	Details of the data and Information collection	Review by the Standard and issuance of the credit
Consultative Meeting	Site visit by the Auditor	Preparation of Monitoring report	Agreement with Buyer and the Project Proponent
Data and information Collection	Publication of the finding by the Auditor	Appointment of auditor and site visit by auditor	Carbon Credits are transferred and the transaction of money to Project Proponent
Preparation of Project Design Document with Use of appropriate methodology	Closure of Open issues	Publications of the findings of the auditor	Trading of the Carbon Credits
Appointment of auditor	Finalization of a report by the auditor and submission to standard	Finalization of the Verification report Auditor and Submission to standard	Revenue Sharing with Project proponent and Project development agency and Community

National REDD+ Strategy India 2018 stipulates state forest department to facilitate implementation of REDD+ strategy through preparing state REDD+ action plan, state level reference emission level, and forest monitoring and safeguard information system. The strategy also suggests overseeing REDD+ preparation by Joint Forest management Committee (JFMC) /Van Suraksha Samiti VSS

From the above it is clear that the model for developing the Project in Carbon credits through REDD + Mechanism or the voluntary mechanism (discussed further) is based on the Revenue sharing Model with the Project Proponent (The Forest Department) where a fixed revenue from the carbon credits earned would be shared with agency responsible for the development of project in REDD + mechanism. This may bring a win-win situation for the state Forest department and the compliances for development of REDD + project at state level is fulfilled.

The basic qualifications of the carbon financing REDD + mechanism:

- The role of the Community is to be ensured in SFM by the Forest Managers.
- For sustainable Management of Forests, forest dependent community rights are to be recognized.
- The externally aided projects for SFM in the project area will have advantages to have eligibility in the carbon financing mechanism in REDD + as an additionality.



REDD+ in JICA assisted Projects

In JICA assisted Sustainable Forest management projects, the basic qualifications to qualify for earning the carbon credits through REDD + mechanism is full filled in the following ways .

Additionality (“not Business as usual”), **SFM with community participation, Environmental and Social safeguards, equity** and are the basic parameters that are judged while preparing the REDD + projects. JICA assisted project could be eligible for preparing the REDD + project there by earning the carbon credits to the project and community.

The MRV is an important component of REDD + implementation. It is important to recognize the involvement of the rights of the forest dependent community and ensure the participation of Community in SFM. The **community-based Measurement / monitoring** and Reporting and **Verification** (CMRV) coupled with participatory Monitoring and Evaluation (PME) could be a high impact tool for earning the carbon credits in REDD+ mechanism This can be institutionalized in JICA assisted projects.

Since the JICA assisted projects in the country are having in house Remote sensing and GIS facility, the availability of RS/GIS data would be another incentive to implement the project

Voluntary carbon Market: The voluntary carbon market is an outside of governmental regulatory schemes. It is among the firms and individuals voluntarily buying carbon credits to offsets their carbon footprints

- It is a system of management of the GHG management with and within the framework of buyer and seller mechanism outside the government purview.
- This is one of the potential areas for emission trade off by using this mechanism there by enabling the countries to develop a sustainable model of carbon trading.
- Besides the compliance market the voluntary market can be an addition.
- Currently the voluntary carbon market (VCM) is small with demand around 95 million ton of Co2 equivalent per year, representing 0.2% of global greenhouse gas emissions.
- The growing demand for net Zero emission by corporate can provide a global market for carbon credit trade system.
- According to the latest data from Ecosystem Marketplace, which tracks voluntary carbon market trends, the average price of a carbon credit in the voluntary market in 2020 was around \$3.30 per metric ton of CO2 equivalent (tCO2e). However, prices can range from as low as \$0.10/tCO2e to as high as \$15/tCO2e or more, depending on the specific project and market conditions.
- It's worth noting that while the voluntary carbon market has grown rapidly in recent years, it remains a relatively small market compared to the compliance carbon markets, which are regulated by government policies such as cap-and-trade systems. As such, the prices of carbon credits in the voluntary market can be more volatile and less predictable than those in the compliance market.
- Various players in VCM like VERRA are contributing to issuance and further sale of carbon credits. This is outside the compliance process of UNFCCC. However, the outside compliance process follows the guidelines and process issued by UNFCCC.

VCS: Verified Carbon standard: The VCS is an international carbon accounting program that provides guidance and standards for measuring, reporting, and verifying greenhouse gas emissions reductions and removals. The VCS has been recognized by the UNFCCC as an eligible program for use by countries and companies seeking to implement emissions reduction activities that can be used to achieve their NDCs or other climate targets.

The VCS has also been designed to ensure that projects and activities certified under its program meet high standards for environmental integrity, additionality, and social and environmental co-benefits. This includes requirements for robust monitoring, reporting, and verification of emissions reductions, as well as safeguards to ensure that social and environmental co-benefits are delivered, and local communities are engaged and consulted.

Overall, the VCS is designed to support the goals of the Paris Agreement by providing a rigorous and transparent framework for emissions reductions that can be used by countries and the private sector to contribute to global efforts to address climate change.

The Voluntary Carbon offsetting program now a day is focused more on VCS. It is the most widely used program. Any project undertaken with the community participation with REDD+ decisions may qualify for VCS program. The corporate sector may be one of the buyers of the carbon credits to achieve the target of the carbon Zero emission. This will reduce their carbon footprint. This provides a scope in the voluntary market for the benefit of the SFM through community participation.

VERRA: VERRA (Verified Carbon Standard Association) is a standard-setting organization that develops and manages standards for the certification of carbon credits. While VERRA supports the goals of REDD+ (Reducing Emissions from Deforestation and Forest Degradation), it is not specifically designed to follow the REDD+ guidelines.

However, VERRA's requirements for carbon credits from forestry projects are consistent with many of the principles of REDD+, such as ensuring the permanence and additionality of emissions reductions, promoting social and environmental co-benefits, and engaging with local communities and stakeholders. In fact, VERRA has developed a specific standard for forest carbon projects, called the VCS Forests Standard, which includes requirements that are aligned with REDD+.

Overall, while VERRA does incorporate many of the same principles and guidelines in its forest carbon standards, making it a viable option for forestry projects seeking certification of their emissions reductions.

VCS and VERRA: VERRA (Verified Carbon Standard Association) and VCS (Verified Carbon Standard) are both carbon accounting programs that provide guidance and standards for measuring, reporting, and verifying greenhouse gas emissions reductions and removals. However, there are some differences between the two programs:

Scope: VCS is a global program that covers a range of project types, including renewable energy, energy efficiency, agriculture, forestry, and others, while VERRA is focused primarily on carbon offset projects in the voluntary market, with a particular emphasis on forestry and land use.

Governance: VCS is governed by a non-profit organization, while VERRA is governed by a membership-based association.

Standards: VCS has developed a range of standards for different project types, while VERRA has developed a smaller number of standards, including the Verified Carbon Standard (VCS) and the VERRA Climate, Community and Biodiversity Standards (CCB Standards).

REDD+: VERRA has developed a specific standard for forest carbon projects, called the VCS Forests Standard, which is aligned with the principles of REDD+ (Reducing Emissions from Deforestation and Forest Degradation), while VCS has developed a separate REDD+ standard.

Additionality: VCS places a strong emphasis on additionality, which refers to the requirement that a project must result in emissions reductions that would not have occurred in the absence of the project, while VERRA also includes additionality requirements, but these are not as strict as those in the VCS program.

Overall, while both VERRA and VCS are leading carbon accounting programs, they have slightly different focuses and standards, and projects may choose to participate in one or both programs depending on their specific needs and circumstances.

The VCS Jurisdictional and Nested REDD+ (VCS-JNR) approach: This framework is one of the most commonly used voluntary carbons Market. The VCS Jurisdictional and Nested REDD+ (VCS-JNR) approach is a framework developed by the Verified Carbon Standard (VCS) for implementing REDD+ (Reducing Emissions from Deforestation and Forest Degradation) programs at the jurisdictional level.

The VCS-JNR approach allows for the development of nested REDD+ programs, which are designed to work across multiple levels of governance, from national to sub-national, and to integrate the efforts of public and private entities. This approach is intended to help address the challenges of coordinating and scaling up REDD+ activities across large landscapes, while ensuring that the resulting emissions reductions are real, additional, and permanent.

Under the VCS-JNR approach, jurisdictions can establish their own emissions reduction targets, based on their specific circumstances and needs, and use a range of mechanisms to achieve those targets. These may include measures such as sustainable land use planning, improved forest governance, and the implementation of sustainable agriculture and forestry practices. The approach also includes requirements for robust monitoring, reporting, and verification of emissions reductions, as well as safeguards to ensure that social and environmental co-benefits are delivered, and local communities are engaged and consulted.

The VCS-JNR approach is designed to provide a flexible and scalable framework for implementing REDD+ programs that can be tailored to the specific needs and conditions of different jurisdictions. It aims to support the achievement of multiple sustainable development goals, including climate change mitigation, biodiversity conservation, and poverty reduction. It was designed as a market-ready accounting and crediting framework to catalyze high-impact forest conservation activities that produce important co-benefits for the communities that maintain them while also supporting national governments in reaching their long-term climate goals. The JNR framework serves as a comprehensive carbon accounting and crediting platform for governments to guide development of their REDD+ programs and help nest REDD+ projects and sub national jurisdictions within these programs. It is rigorous enough to meet the needs of market-based mechanisms around the world. This system is in conformity with the Paris agreement. (<https://verra.org>)

Conclusion:

The process of augmentation of incentivizing the community with active participation in JICAassisted projects could be achieved with the issuance of carbon credits and the converting to carbon revenue. This revenue could be shared with the project and the community-based institutions. The process could be REDD+ based compliance or the Voluntary Carbon Standard. Nowadays the industrial sector is looking forward to offsetting their carbon footprint with voluntary carbon market. This is one of the greatest opportunities for the community led SFM entity to develop the projects leading to issuance of carbon credits and providing benefits to community.

Documents/website referred.

<https://unfccc.int/>

<http://ofsds.in>

<https://www.goldstandard.org> *REDD+ cook book* : <https://redd.unfccc.int>

India REDD + strategy

https://redd.unfccc.int/files/india_national_redd_strategy.pdf

<https://verra.org/>

LRC and Beyond

Dr. Meeta Biswal

Odisha Forestry Sector Development Society

Introduction:

The state of Odisha is endowed with rich natural resources, including diverse forest resources. Out of total 1,55,707 sq.km of geographical area of state, forests occupy 61204.17 sq. km. i.e. 39.31% of the geographical area. The people living in and around forests are highly dependent on forests for their livelihood. In order to reduce their dependence on forests and to improve the health of forest ecosystems, it is necessary to enhance and strengthen their livelihood by providing them with a range of alternative options.

The major objective of the Joint Forest Management (JFM) program as envisaged in the JFM resolution passed by the Govt. of Odisha in 2011 and subsequently amended in 2015 is to mobilize the forest fringe dwelling communities for protection and conservation of forests and in turn, the government through its programs strives for augmenting their livelihood. The JFM program is being successfully implemented in the state through about 16,000 JFM Committees, known as Vana Surakshya Samitis (VSSs) and Eco-Development Committee (EDCs) in non-protected and protected forests areas respectively. The VSSs and EDCs are being strengthened through various development schemes by improving their capacities in sustainably managing their neighbourhood forests as well as in successfully taking up alternative livelihood interventions in order to reduce their dependence on forests. In this direction, the JICA supported Odisha Forestry Sector Development Project, Phase-II (OFSDP-II) implemented by Odisha Forestry Sector Development Society (OFSDS) has played a significant role.

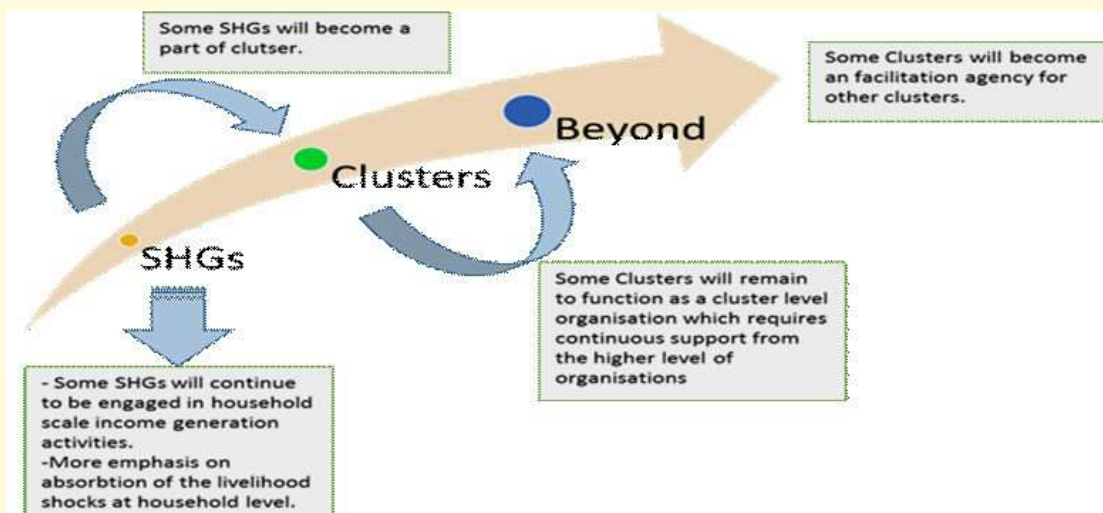
The envisaged approach to achieve the overall goal of OFSDP-II in a sustained manner includes restoration of degraded forests, securing sustainable forest management through Joint Forest Management mode and by promoting alternative Income Generation Activities for the targeted forest dependent communities for improvement in their income for sustained livelihood. Thus, one of the important components of OFSDP-II is to strengthen the livelihood options for the forest dependent communities through inter-sectoral convergence.

Augmenting alternative livelihood options through varied Income Generating Activities at the community level, helps in reducing dependence of the communities on forest resources, thereby, minimizing the anthropogenic interference for sustainable forest and Bio-diversity management.

About OFSDP II

The Department of Forests, Environment and Climate Change, Govt. of Odisha is implementing the Odisha Forestry Sector Development Project Phase-II (OFSDP-II), with the funding support of JICA since March 2017. The Project period is from 2017-18 to 2026-27 and is being implemented in 12 Forest and 02 Wildlife Divisions (viz. Dhenkanal, Athamallik, Sambalpur, Jharsuguda, Sundargarh, Baripada, Rairangpur, Karanjia, Boudh, Ghumsur North, Ghumsur South, Subarnapur, Rajnagar (WL) and Bamra (WL) Divisions covered under 10 districts viz. Dhenkanal, Angul, Sambalpur, Jharsuguda, Sundargarh, Mayurbhanj, Boudh, Ganjam, Subarnapur & Kendrapara. While the 12 Territorial Divisions implements all project components, the two the wildlife divisions implements only the specified biodiversity component. A total of 1211 VSSs and 10 EDCs have been covered under OFSDP-II.

Growing Beyond SHG/CIG



The experience of OFSDP-I revealed that insufficiency of volume and quality of products caused difficulty in taking up their processing, value addition of different kinds, bulk marketing and retailing of product at SHG level. For ensuring aggregation of the products so as to take up their value addition, bulk marketing, it was envisaged to promote a cluster level approach under OFSDP-II. Accordingly, product clusters are being formed at DMU level considering the access to raw material, infrastructure facilities available, capacity of community to take up the identified activity in a sustainable manner etc. The clusters of SHG / CIG products are formed based on one or few viable products. Each such cluster is designed to pick up livelihood options which are on farm based (agriculture, horticulture, pisciculture, apiculture, nurseries, NTFP etc.), off farm based (Dairy, poultry, goatery, piggery etc.), non-farm based (entrepreneurships such as plumbing, carpentry, mobile repair, shops, etc.) or forest based (sal & siali leaf plates, Hill brooms, Tamarind processing etc.).

Livelihood Resource Centre

The major objective of OFSDP-II is to enhance forest ecosystem along with sustainable livelihood of local people by improving sustainable forest management, sustainable biodiversity conservation and community development. In order to achieve this objective, and thereby contributing to socio-economic development and environmental conservation in the target project area (12 Forest divisions in Odisha), OFSDP-II has established the Livelihood Resource Center (LRC) under its overall administrative control.

The Livelihood Resource Centre is a cell constituted at the Project Management Unit of Odisha Forestry Sector Development Society. The LRC functions as a self- sustaining autonomous unit with project support set up for organizing and upgrading clusters through promotion of income generating activities.

Ensuring alternative livelihoods opportunities for the forest dependent communities through Inter-Sectoral Convergence have been given utmost priority in the Project design of OFSDP-II. Different committees have been constituted from State level to grass-root level to ensure optimum synergy between the line departments and the project authorities of OFSDP-II in implementing the Govt. Schemes and Programme at the community level.

The Concept of LRC

Under OFSDP-II, the promotion of sustainable livelihood has been conceptualized beyond the conventional definition and approaches of poverty eradication in forest fringe areas. While promoting community-based livelihood, more focus is being given for enhancing poor people's ability to make their living in an economically, ecologically, and socially sustainable manner. Promotion of small Income Generating Activities (IGAs) by involving women Self Help Groups (SHGs) is envisaged under OFSDP-II. The Project, through LRC would provide support for strengthening SHGs in their business planning, credits, product development including value addition and in establishing market linkages. As it would be difficult to take up processing, bulk marketing and retailing of products at SHG level, promotion of cluster level approach or formation of product clusters for aggregation of the product will be opted so as to ensure more profitable marketing and better income for the members of SHGs. LRC is to ensure continuous hand holding support to SHGs and clusters for long term sustainability.

Establishment of LRC under OFSDP-II

The LRC is a cell constituted at the Project Management Unit of Odisha Forestry Sector Development Society (OFSDS). It is functioning as a self- sustaining autonomous unit with project support. The purpose is to provide long term support for strengthening the product clusters through promotion of income generating activities. It is helping SHGs, CIGs and PoPs to traverse the business growth trajectory.

LRC has a five-member team of professionals comprising of one team leader (State Program Manager, (Livelihood, Natural Resource Management and Convergence) and four team members (Cluster Managers) related to themes like Livelihood and convergence, finance & credit, market linkage, fund raising, CSR and R & D.

The LRC ensures access to key resources, such as Business Development Services, market information, research and product development. Various thematic trainings on various on farm, off-farm and non-farm activities are being organised for being imparted by the experts.

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The LRC ensures access to key resources, such as Business Development Services, market information, research and product development. Various thematic trainings on various on farm, off-farm and non-farm activities are being organised for being imparted by the experts.

Objectives of LRC

LRC, basically aims at promoting sustainable livelihood along with community development and proper forest management, leading to socio-economic development and environmental conservation in the target project area

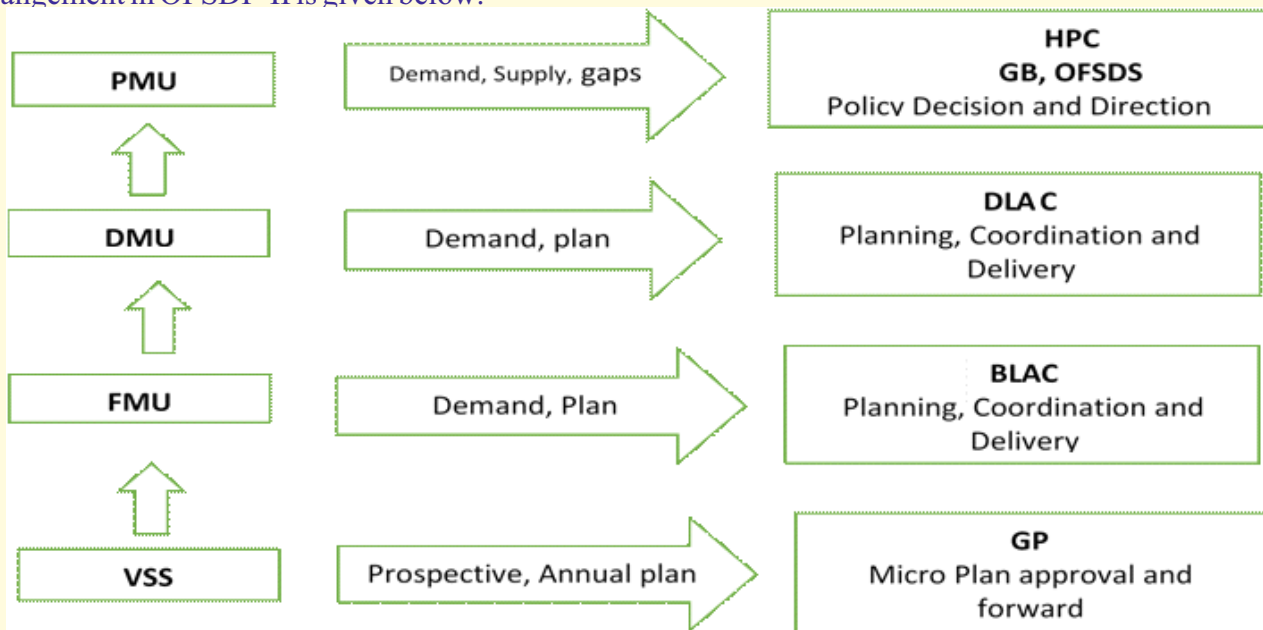
- To build the capacity of the stakeholders
- To promote vibrant product clusters
- To promote pro-poor value chain maximization
- To facilitate collective marketing and processing
- To provide Business Development Services including R&D.
- To build LRC as a self- sustainable institution in the long run (beyond the project period)

Institutional Arrangement for Convergence under LRC, OFSDP-II

A well-defined institutional framework at different level has been envisaged in the project document for effective coordination with line departments for inter-sectoral convergence. The HPC and the Governing Body of OFSDS is the apex entity, which issues appropriate directions to concerned line departments for optimal synergy with OFSDP-II and to ensure inter-sectoral convergence in the project areas of OFSDP-II.

District Level Advisory Committee (DAC) and the Block Level Advisory Committee (BLAC) have been established and are being convened regularly to facilitate the concerned line departments and the extension officers for undertaking the works / interventions identified by the communities through convergence. Issues and challenges, if any, reported by the project authorities or the authorities of other departments, are discussed for settlement by the members of DAC & BLAC regularly.

At grass-root level, the Annual Action Plan for convergence prepared at VSS level through micro plan are being approved at Pallisabha / Gram sabha. The activities, which are to be covered through convergence, are also integrated in Panchayat plan for execution through convergence mode. The outline of the institutional arrangement in OFSDP-II is given below:



Processes for Convergence:

Effectiveness of implementation of any programme / schemes or provision largely depends upon selection of right beneficiary at right time. Often it is observed that the outcome of many well- designed schemes & programme does not commensurate with the efforts due to lack of appropriate selection of beneficiaries under these schemes. Bottom- up approach of planning process is the only solution to select the most appropriate beneficiary / beneficiaries to enable successful implementation of different Govt. Schemes / provisions. The processes followed for convergence is as below:

Step-1: Selection of Schemes / Programme for Convergence through Micro Planning Process:

Micro Planning processes contributes significantly for effective convergence with other departments in the following manner:

- Identification of need-based interventions required for development.
- The interventions are prioritised in a participatory way for execution
- Identify the beneficiaries for each planned intervention.
- To map the interventions and corresponding line department for convergence.

Step: 2: Preparation Annual Action Plan for convergence:

The interventions identified during the micro planning process at VSS level is classified based on the departments / agencies, who shall be approached for convergence. Accordingly, a comprehensive a VSS-wise Annual Action Plan for Convergence is prepared by the VSS. This Annual Action Plan for Convergence plan of each VSS is consolidated at respective FMU level, so that the matter could be discussed in the Block level Advisory Committee (BLAC) Meetings under the Chairmanship of Block Development Officer for necessary execution through convergence.

Each FMU prepares a matrix of Convergence Plan for necessary follow up with appropriate authorities in the Block Level Advisory Committee (BLAC) for execution in the manner prescribed below:

Type of Interventions / Activity	Volume of Activity (Unit)	Name of the VSS	No of beneficiaries	Proposed Period	Priority level	Executing Department/ Agencies

Step: 3: Integration of Convergence Plan in the Gram Panchayat Plan:

The Annual Action Plan for convergence of each VSS, formulated based on the Micro Planning processes is presented in the Panchayat Committee Meeting for their endorsement. Moreover, the plans / interventions planned to be executed through convergence mode are appropriately integrated into the Panchayat Plan. This stimulates the Panchayat to facilitate the departments / agencies for required convergence with other departments.

Step: 4: Coordination with Line Departments through Block Level Advisory Committee (BLAC):

The Annual Action Plan for Convergence prepared for each VSS is shared in the Block level Advisory Committee Meeting in detail for appreciation of the officials of other line department. Efforts are made to workout detailed execution plan of identified interventions through convergence and to augment the commitment of respective line departments with tentative timeline. The project staff from OFSDP-II (FMU level officials, P-NGO Team members) coordinate with the officials of line department for execution of works through convergence. Necessary assistance is rendered to the extension workers / other line department staffs by the project officials for smooth execution of proposed activities under convergence. FMU Chief takes lead responsibility to ensure the optimal synergy and coordination is established with the line departments for execution of work under convergence.

Progress made in execution of the planned convergence interventions at the community level is shared in subsequent meetings and challenges, difficulties, issues etc. if any, in execution of work.

Step-5: Partner NGO Coordination Cell Meeting:

The Annual Action Plan for convergence vis-à-vis progress of execution of interventions of each VSS is presented by the P-NGO Team Leaders in the P-NGO Coordination Cell meeting held at FMU and DMU level every month.

Challenges in implementation of work under convergence, if any, are brought to the notice of DMU Chief for necessary follow up with the district level officials of respective line department and to ensure necessary steps are being taken for execution of work under convergence.

Step-6: District Advisory Committee Meeting:

District Advisory Committee (DAC) Meeting of OFSDP-II is held once in every two months, under the Chairmanship of District Collector. District level officials, particularly the departments associated in rural development are the member of the DAC. DFO cum DMU Chief of the head quarter Forest Division is the member Convener of the meeting.

This forum has been exclusively established to ensure inter-sectoral convergence under OFSDP-II. DMU Chief appraises the committee member in brief about the convergence plan vis-à-vis the achievement made. Support / assistance required to maintain optimal synergy among between the departments and the OFSDP-II is discussed in details. This enables to issue necessary instruction to concerned line departments at block level for convergence.

Progress in convergence plan vis-à-vis execution is presented in the DAC Meeting for the appraisal of the members. Further the challenges, difficulties etc., if any, observed during implementation of activities under convergence are also brought to the notice of DAC members for suitable remedial action at their level.

Step-7: Convergence at Project Management Unit Level:

Achievement of OFSDP-II in term of inter-sectoral convergence at VSS level vis-à-vis the Annual Action plan relating to inter-sectoral convergence is presented before the HPC in the form of Monthly Progress Reports and the Agenda Note at the time of meeting. Moreover, the issues and challenges etc. as regards the Inter-sectoral convergence, if any, are also discussed, so as to seek necessary direction of HPC members for the district level officials of respective line department for convergence.

Step-8: High Power Committee Meeting:

Various poverty alleviation schemes, programmes and entitlement-based programmes are being implemented by state government. These schemes / programmes are also applicable to the concerned beneficiaries of project villages of OFSDP-II. However, due to several reasons or lack of coordination among the departments, the benefits of these schemes / programmes don't optimally reach to the beneficiaries.

The High- Power Committee (HPC) of OFSDS is chaired by the Chief Secretary with the Additional Chief Secretary, Forest and Environment Department as the Vice Chairman. Development Commissioner and Principal Secretaries / Commissioner-cum-Secretaries of different Departments namely Finance, Agriculture & Farmer's Empowerment, Revenue and Disaster Management, Panchayati Raj & Drinking Water, ST&SC Development, Rural Development, Women & Child Development & Mission Shakti, Health & Family Welfare, Principal Chief Conservator of Forests & HoFF and Principal Chief Conservator of Forests (Wildlife)-cum-Chief Wildlife Warden, Odisha etc. are the member of HPC. The HPC plays a significant role in ensuring Inter-sectoral convergence under the project. The expected role of HPC for inter-sectoral convergence is stated as below:

- To take policy level decisions and direct different line departments to integrate various poverty alleviation schemes / programme for the project villages of OFSDP-II.
- To follow up with the line departments at district level to ensure optimal coordination with OFSDP-II for implementation of relevant schemes / programme on priority through inter-sectoral convergence.

Livelihood Promotion: The Multi- Product Approach of OFSDP-II

Promotion of Sustainable Livelihoods is one of the key objectives of Odisha Forestry Sector Development Project, Phase-II, which not only contributes significantly in improving the socio-economic conditions of the forest dependent communities, but also assist in reducing biotic pressure on forest significantly.

Under OFSDP-II, concept of Sustainable Livelihood has been envisaged to go beyond the conventional definitions and approaches of poverty eradication in forest fringe areas. Promotion of small Income Generating Activities (IGAs) by involving women Self Help Groups (SHGs), Common Interest Groups (CIGs) and Poorest of Poor (PoP) is envisaged under OFSDP-II. The project has developed strategies and processes to leverage resources for livelihood promotion through inter sectoral convergence.

As it would be difficult to take up processing, bulk marketing and retailing of products at Vana Surakshya Samiti (VSS) level, promotion of multi product cluster level approach or formation of Multi Product Clusters for aggregation and value addition of the product is resorted to, so as to ensure a greater remunerative marketing and improved income for the forest fringe dwelling communities.

In order to achieve the scale to run a business, product diversification, the proximity to the market, responsiveness to the market demand, risk taking capacity, management skills etc. are important. All these situations are not readily available at Vana Surakshya Samiti (VSS) level in the project areas. Yet, the potential for the product cluster formation and business opportunities do exist, which could further help the target households to uplift their economic status.

Further, income from any one activity, be it agriculture or collection of NTFPs or any other off- farm activity, can be taken up by the forest fringe dwellers for only a couple of months in a year with the remaining part of the year being unproductive. Hence, a series of income generating activities planned to fill up different parts of the year help in augmenting the family income of the forest fringe dwelling communities, thereby, improving their resilience. Therefore, OFSDP-II has strategically planned to promote multi product clusters that will pave way for aggregation, value addition and to make the products reach the remunerative markets.

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Collaboration for establishing and operationalizing Multi Product Clusters

In order, to augment the technical, managerial and implementation support in establishing and operationalising Multi Product Clusters for sustainable livelihood initiatives and to promote Income Generating activities through the Self-Help Groups (SHGs), Common Interest Groups (CIGs) and the Poorest of Poor Households (PoPs), the project is collaborating with the Consortium of Kalinga Institute of Industrial Technology and Technology Business Incubator (KIIT- TBI) Bhubaneswar, Bhubaneswar City Knowledge Innovation Cluster (BCKIC), Bhubaneswar and Indian Institute of Entrepreneurship (IIE), Guwahati for Establishing and Operationalising Multi Product Clusters in the Project Area as the Management and Marketing Support Agency (MMSA).

The key objectives of the MMSA are

1. To facilitate Cluster based multi- product aggregation, value addition, packaging, marketing and supply chain infrastructures for products to reach remunerative markets
2. To facilitate financial linkages, technological solution, quality checks, branding and market positioning of products.
3. To provide skill up gradation and capacity building trainings of various stakeholders, beneficiaries and participating agents of change towards building a culture of sustainable business and enterprise functioning with focus on conservation of ecological assets

The broad scope of work of the Management and Marketing Support Agency (MMSA) includes establishing and operationalizing the Multi-Product Clusters by providing strategic support in the areas of community and CBO mobilization, business planning, appropriate skill building, identifying and defining the multi product clusters, developing systems and processes including digital platform to operationalizing and positioning of multiple products, building strategy and plans on supply chain management, value chain maximization, market development and providing marketing and R&D support. The MMSA has to work with clusters for developing financially viable and sustainable model within the environmental guidelines of Government of Odisha and make these clusters profitable entities.

Progress So Far under LRC in Collaboration with MMSA

The major objective of the project is to ensure sustainable livelihoods for the forest fringe dwellers and augmenting their income. In order to achieve this objective, and thereby contributing to socio-economic development and environmental conservation in the target project area, primarily two approaches have been adopted. Firstly, Income Generating Activities are being facilitated through convergence with different schemes of Line Department, Corporates and Banks. Secondly, Revolving Funds have been provisioned to the SHGs/CIGs/Poorest of the Poor members through the project VSSs.

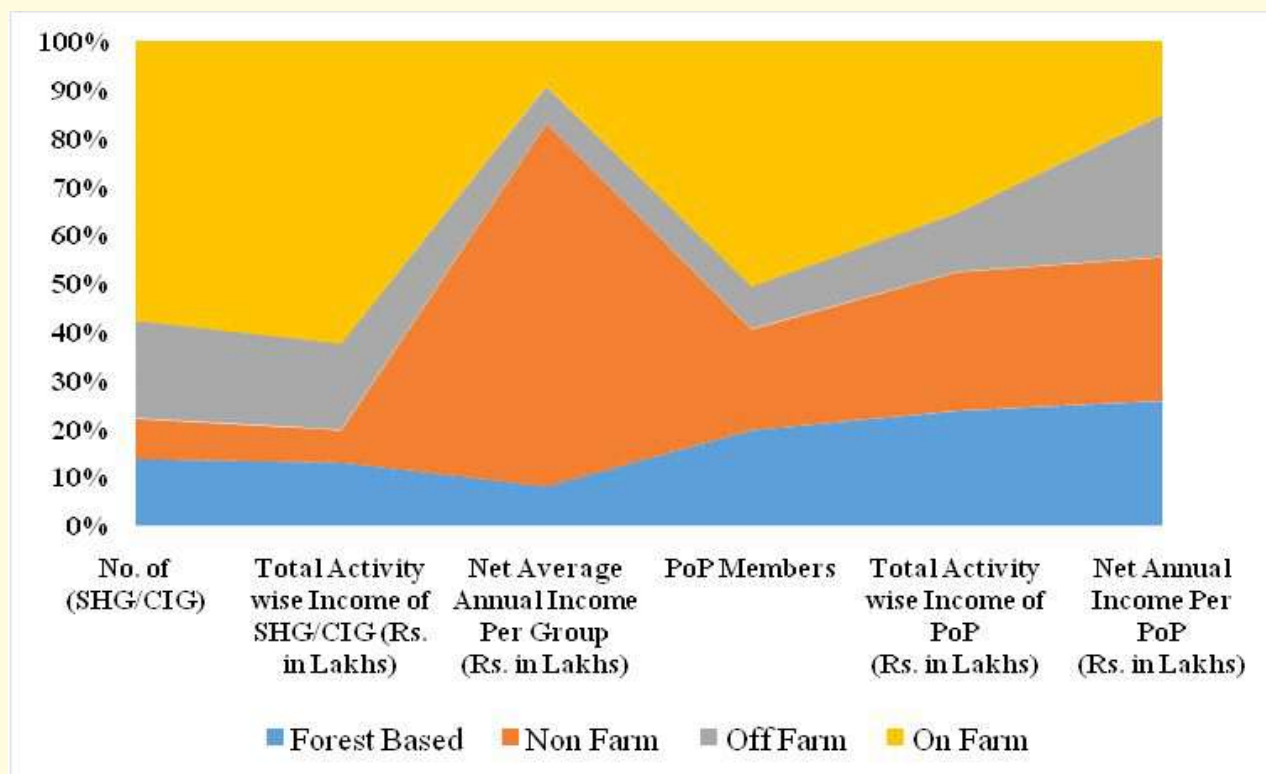
Income from Income Generating Activities

The Income Generation Activities have been categorised into four groups i.e. On Farm, Off Farm, Forest Based and Non-Farm IGAs. It is observed from the progress report that highest income has been generated through On Farm and Off Farm activities. However, it is observed that Poorest of the poor people are largely depending on Forest based produces. Till March 2023, **1811 SHGs & CIGs** have been benefitted under Livelihood promotion. Similarly, **2864 Poorest of the Poor** people of the project VSSs have been benefitted by undertaking different IGAs. On an average Net Annual Income earned per Group (CIG/SHG) is Rs. 56,000/- and an average Annual income earned by individual PoP member is Rs.26,000/-.

Net Annual Income from IGAs under OFSDP-II upto March, 2023 through Convergence and Project Revolving Fund

Sl. No.	Category of IGA	Activities undertaken	IGA by SHGs / CIGs			IGA by PoPs		
			SHGs Benefited (In Nos.)	Total Income (Rs. In Lakhs)	Net Avg. Annual Income (Rs. In Lakhs)	PoPs benefited (In Nos.)	Total Income (Rs. In Lakhs)	Net Avg. Annual Income (Rs. In Lakhs)
1	Forest Based	NTFP Collection and Marketing, Sal Leaf plates and bowl making, Bamboo Craft making, Broom collection and marketing, Mahua flower collection and selling	250	132.96	0.53	567	179.35	0.32
2	Non Farm	Grocery shop, Puffed Rice, Tiffin Stall, Shop of Garage Instruments, Pickles Making, Phenyle making, Rice Processing	151	67.90	0.45	596	215.35	0.36
3	Off Farm	Poultry, Goat rearing, Sheep rearing, Bio floc Fish farming, Dairy Farming, Piggery, Pisciculture	367	182.24	0.50	255	91.69	0.36
4	On Farm	Vegetable cultivation, Groundnut cultivation, Horticulture, Vermicompost preparation	1043	632.06	0.61	1446	267	0.18
TOTAL			1811	1015.17	0.56	2864	753.14	0.26

Net Annual Income from IGAs under OFSDP-II upto March, 2023 through Convergence and Project Revolving Fund



Utilization of Revolving Fund for Sustainable Livelihood:

Odisha Forestry Sector Development Project-II has a provision for Revolving Fund (RF) as a one-time grant to the VSS for providing loan to SHGs, CIGs and PoPs. The loan from Revolving fund is to be productively used by the Borrowing Entities for promoting viable Income Generating Activities (IGAs) and establishing community-based micro enterprises. The Revolving Fund (RF) is one of the major mechanisms of social inclusion for promoting SHGs, Common Interest Groups (CIGs) and Poorest of the Poor (PoP) forest dependants on the trajectory of economic growth.

Purpose of the Revolving Fund:

Revolving Fund under the project has been provisioned as a grant to the VSS, to provide loan to the Borrowing Entities (namely- SHGs, CIGs and Poorest of the Poor) for undertaking Income Generating Activities for supplementing the family income. The purpose of revolving fund is stated below:

- To improve access to finance required for investment towards Income Generating Activities
- To cater to the financial needs for availing loan by the Borrowing Entities for undertaking Income Generating Activities
- To revolve the fund so as to maximise the value of the fund through loan and interest recovery.
- To provide a dependable fund reserve at community level beyond the project period.
- To empower the community for adopting a sustainable mechanism for fund management and IGA beyond the project period.

Under OFSDP-II, **Rs. 24.22 Crores** have been released to 1211 VSSs in order to promote IGAs at grassroots level.

Progress of transaction under Revolving Fund up-to March, 2023:

Total No. of VSSs Received Revolving Fund	Amount disbursed to VSSs (Rs. in Crore)	No. of VSS where RF disbursed	Total Amount Disbursed to Borrowing Entities	Repayment Amount (Rs. in Crore)	No. of SHG received Loan from RF	No. of PoP received RF	No. of CIG received RF
1211	24.22 Cr.	941	10.65 Cr.	2.57 Cr.	1327	4421	183

Livelihood Initiatives in Convergence with schemes of Line Department

The major achievement under Convergence is that collaboration with schemes of **37 numbers of line Departments** have been made and **Rs. 338.18 Crore** has been mobilised benefitting more than **14.91 Lakhs people** of the project areas of OSDDP-II.

Department Wise Convergence Achieved till March, 2023			
S. No.	Departments	Beneficiaries (in No.)	Funds Mobilised (Rs. in Lakh)
1	Agriculture & Farmers' Empowerment	52658	957.33
2	Corporate & Bank	11877	880.09
3	Department of Water Resource	1036	11.75
4	Dept. of Energy & OREDA	797	52.74
5	Dept. of Industry	573	76.02
6	Dept. of Mission Shakti	7096	462.66
7	Dept. of Youth Services & Sports	901	6.20
8	District Mineral Foundation	1597	96.19
9	Finance Department	783	4.75
10	Fisheries and ARD Department	59072	1137.26
11	Forest, Environment & Climate Change	144214	1282.63
12	Health & FW Dept.	105785	289.66
13	Horticulture Dept.	52197	1249.79
14	Irrigation	9850	819.25
15	Labour Dept.	623	21.85
16	Ministry of Food Processing	268	3.56
17	Ministry of Petroleum & Natural Gases	17928	288.79
18	MSME	688	13.25
19	NABARD	2980	8.10
20	NGO	11724	53.04
21	NHAI	63	3.61
22	OLM	4598	253.39
23	Others (Municipality, CSR, MP Lad Fund etc.)	3568	33.79
24	Panchaytiraj & Drinking Water	874589	21207.53
25	PWD	3853	252.75
26	Railway Dept. (Skill Development)	24	2.40
27	Revenue & Disaster Management	213	8.21
28	Rural Development	16415	863.65
29	SC & ST Dev. Dept.	48937	1285.44
30	School & Mass Education	1274	32.56
31	Skill Development & Technical Education	4804	112.93
32	Social Security & Empowerment	145	2.11
33	Soil Conservation Dept.	21524	1653.85
34	Urban Development Department	2056	57.50
35	Western Odisha Development Council	212	5.00
36	Women and Child Development	26060	289.58
37	Handlooms, Textiles & Handicrafts Dept	50	39.30

Initiatives in Establishing Multi Product Clusters in collaboration with MMSA:

In order to enable setting up of multi product clusters in each VSS, product mapping was done and potential products were identified through “**product mapping tool**”. This tool helped to explore the potentiality, seasonality, level of value addition and engagement of households for collection of the potential products. Market potentiality of the products was also explored at different levels (Local, Block, District, State and National) through this tool.

Potential products in each project Divisions have been identified as per the data stated in the table below

List of Products identified for Multi Product Clusters

Division	Range	Name of the Proposed Cluster Location	Name of the Major Product	Name of the other Products for Multi cluster
Athamalik	Athamallik	Aida	Groundnut	Bahada, Harida, Amla & Char
Baripada	Betonoti	Baidpur, Bartana	Sal Leaf	Honey, Harida, Bahada, Mahua seeds (Tola), Bamboo.
Dhenkanal	Dhenkanal	Hi-tech Nursery,	Cashew	Mango, Sal Leaf, Jack Fruit & Honey
Subarnapur	Ullunda	Matupali	Hill Broom	Sal leaf
Karanjia	Thakurmun da	Kendumundi	Sal Leaf	Myrobalans, Lemon, Tamarind
Rairangpur	Bisoi	Bartana	Sal Leaf	Honey, Harida, Bahada, Chara and others
Boudh	Boudh	Bamanda Central Nursery	Pulses	Chara, Pulses, Tamarind
Sambalpur	Padiabahal, Dhama	Chamunda/Badmal/Bhimkhoj	Sal Leaf	Tamarind, Bahada & Harida
Ghumsur (N)	Mujagada	Bhanja Nagar (Bana Vihar)	Sal Leaf	Cashew, Tamarind, Amla, Bahada, Harida
Ghumsur (S)	Buguda	Matajhari	Pulses	Cashew, Pulses, Tamarind
Sundargarh	Ujjalpur, Hemgiri	Hi tech Nursery, Ujjalpur	Lemon	Char, Harida Bahada
Jharsuguda	Kolabira, Bagdihi	Borpain/ Ganjudihi/ Kukerama/ Bhimjore	Lemon Grass	Mango, Chilli, Harida, Bahada & Amla

Initiation of Multi Product Clusters in collaboration with MMSA:

Focused livelihood interventions through multi product clusters have been envisaged to be undertaken in the project villages through VSSs, SHGs, Common Interest Groups (CIGs) and Poorest of Poor (PoP).

Sal Leaf Plate Clusters

Three Sal Leaf Clusters with Sal leaf plate processing and value addition as a major product have been initiated at Karanjia, Rairangpur Baripada and Jharsuguda Forest Divisions of Mayurbhanj and Jharsuguda District. Cluster buildings have been provisioned along with required equipment and electricity facility at the product cluster units for higher level processing of Sal leaf plates.

Social mobilization has been completed on Sal leaf cluster operation by the LRC Cluster Managers and stitching training has been imparted to 250 women members of 60 SHGs for Sal leaf stitching and pressing plates. At present the production has started in all the three Clusters and Marketing linkage is getting established. Till date transaction of Rs.64,082/- have been done. Greater focus is given to quality production of Sal leaf plates and bowls.

Lemon Grass Oil Cluster:

Lemongrass oil extraction is a profitable IGA initiative and has been taken up under the project in Jharsuguda Division. The farmers have grown Lemon Grass on 136 Acres of private fallow land through convergence with MGNREGS and Horticulture Department. They have been provided all technical and financial supports in order to do lemon grass oil extraction. Two number of extraction units have been set up in Jharsuguda Division through convergence with District Mineral Fund. Till date, harvesting of lemon grass has been done over 8.5 Acres and 39.12 Kgs. (48.5 litres) of oil has been extracted which was sold for Rs.48,900/-.

Vegetable Cluster:

Vegetable cultivation is a remunerative activity for the forest dwellers which enables them to earn more income. Attempt has been made to link the primary producers to social enablers for developing a vegetable cluster under the project in Dhenkanal Division benefitting 34 farmers, who sold 21.90 quintals and earned Rs.44,004/-

Paddy Cluster under Satoyama Initiatives:

Under Satoyama Initiative in Badarma Wildlife Sanctuary of Bamra Wildlife Division, different IGA based activities have been promoted under the project, with promotion of indigenous paddy through natural farming as one such IGA. A paddy cluster has emerged in this area and total 63 farmers from 06 EDCs have been benefitted by this initiative. In total Rs. 3,36,728/- has been earned by the farmers by selling nearly 20 tons paddy.

Collection and sale of Other NTFPs

Collective Marketing of NTFP items has been promoted under the project in a cluster mode and Rs.7,42,206 have been earned by the beneficiaries by selling Dhatki flower, Tamarind and Bahada.

Progress of Multi Product Clusters, OFSDP-II						
S. No.	Name of the Cluster	Location	Total Quantity of Production	Unit	Type of Products	Total Amount of Transaction (In Rs)
1	Sal Leaf	Betonoti, Baripada	10219 Piece	Piece	Sal leaf Plates and Bowls	28250
2	Sal Leaf	Kendumundi, Karanjia	11000 Piece	Piece	Sal leaf Plates and Bowls	24060
3	Sal Leaf	Bisoi, Rairangpur	10000 Piece	Piece	Sal leaf Plates and Bowls	5000
4	Sal Leaf	Belpahad, Jharsuguda	4140 Pieces	Piece	Sal Leaf Plates and Bowls	6772
5	Lemon Grass Oil	Kolabira, Jharsuguda	39.12 Kgs	Kg	Lemon Grass Oil extracted	48900
6	Medicinal Produces	Bagdihi, Jharsuguda	1885.4 kgs	Kg	Dhataki Flowers	53224
			295.2 Kgs	Kg	Myrobalan (Baheda)	3542
7	Tamarind	Padiabahal, Sambalpur	19040 Kgs	Kg	Tamarind	685440
8	Indigenous Paddy	Badrama, Bamra (WL)	19808 Kgs	Kg	Indigenous Paddy	336728
9	Vegetable	Dhenkanal Sadar	1505 Kgs	Kg	Vegetables	44004
10	Pulses	Boudh & Ghumsur (S)	191 Kgs	Kg	Pulses	20040
11	Broiler Chicken	Jhakarpada/ Bijapadar, Boudh	2400 Kgs	Kg	Broiler Chicken	216000
GRAND TOTAL						14,71,960

Capacity Building Initiatives on IGA in collaboration with MMSA

IGA based skill enhancement trainings have been imparted to the VSS and SHG members in order to initiate various activities to augment their income. Till date 775 number of trainings on 42 themes has been imparted to 22,740 persons. The detail is at Annexure-I.

Further, MMSA has added technical inputs in organizing different skill-based training and community mobilization on value addition for improved market linkage to fetch remunerative price. MMSA has organised 210 number of trainings and has reached 4361 persons till date. The detail list of training is at Annexure-II.

Conclusion

The Consortium of MMSA under LRC, OFSDS is assisting in organizing tie up with social enablers who are capable of linking the value-added products to the market. The MMSA is also organizing the development of standard operating protocols for different products and rolling out of the capacity building programs and membership drive of primary producers for setting up value chains.

Annexure-I

Training and Capacity Building for IGA Based Skill Enhancement, OFSDP-II

Sl. No	Theme of the Training	No. of Training	Total Participant
1	Agricultural Promotion and Marketing	42	1369
2	Automobile Repairing	9	90
3	Backyard Poultry	5	194
4	Badi and Papad Making	13	394
5	Bamboo Craft	15	421
6	Beauty Parlour Training	7	24
7	Bee Keeping	19	362
8	Book Keeping	8	241
9	Cashew Processing & Marketing	4	133
10	Computer Training	9	40
11	Dairy Farming	19	678
12	Driving	3	12
13	EDP Training on preparation of paper plate making	21	422
14	Financial Management Training	2	57
15	Floriculture	2	30
16	Food Processing training	15	325
17	Goat Farming	23	655
18	Harvesting and Processing of Medicinal Plant Produces	15	462
19	Hydraulic Pressing Machine maintenance	3	15
20	Incense stick making & Phenyl making	28	897
21	Insect and Pest Control	9	194
22	Lemon Grass cultivation and marketing	1	11
23	Mobile Repairing Training	7	22
24	Mushroom Cultivation	95	2196
25	Natural Farming	6	32
26	Nursery management	2	6
27	Organic Farming	7	457
28	Ornamental plant	5	47
29	Paddy Cultivation	2	234
30	Pickle Making	9	217
31	Pisciculture	14	442
32	Poultry	80	2385
33	Pulp wood cultivation	5	188
34	RF Management and Preparation of BDP.	34	1488
35	Sal Leaf Plate Making	26	2016
36	Seed Treatment	11	430
37	Soft Toy Making	1	4

38	Spices processing	3	71
39	Tailoring	21	150
40	Utilisation of LPG Gas	4	369
41	Vegetable Cultivation	126	3698
42	Vermi Compost Preparation	45	1262
GRAND TOTAL		775	22,740

Annexure-II

S. No.	Themes of the Training	No. of Training	Total Participant
1	Sustainable Harvest of Sal Leaf –(Dwipatree) & Marketing	57	1813
2	Cultivation on Indigenous Aromatic Paddy and Marketing	9	237
3	Sustainable Harvest of (Pongamia Beans)Karanj Seeds and Marketing	131	5420
4	Collection, Value Addition and Marketing of Bahada	10	210
5	Collection, Value Addition and Marketing of Dhstki	10	210
TOTAL		217	7890

Satoyama Initiative Programmes under PIHPFEM&L Project

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About Satoyama Initiative

“Satoyama” – A Japanese term used for landscapes that include both human production activities and natural habitats, where human influence is an essential aspect of the local ecosystem. The term “Socio-Ecological Production Landscapes (SEPLS)” refers to all such landscapes, including Japanese Satoyama. Satoyama Initiative is based on the principle that such landscapes, when properly managed, can benefit biodiversity and human livelihoods, rather than biodiversity and human livelihoods being in a state of opposition and thus leading to “society in harmony with nature”.

Biodiversity protection entails not only preserving pristine environments, such as wilderness, but also conserving human-influenced natural environments, such as farmlands and forests, that people have developed and maintained sustainably over a long time. The biodiversity of any landscape is under threat due to urbanization, industrialization, rapid rural population increase and overexploitation of biological resources over time. To tackle this critical issue, the Ministry of the Environment of Japan and the United Nations University Institute of Advanced Studies (UNU-IAS) jointly initiated the *Satoyama* Initiative. This international effort promotes activities consistent with existing fundamental principles including the Ecosystem Approach. The core vision is to realize societies in harmony with nature, that is, built on positive human-nature relationships. An international partnership for Satoyama Initiative has been launched to carry out Satoyama activities through project holders / organisations committed towards promotion and support of socio-ecological production landscapes for the benefit of biodiversity and human well-being.

Vision of Satoyama Initiative:

The vision of the *Satoyama Initiative* is to realize societies in harmony with nature, comprising human communities where the maintenance and development of socio-economic activities (including agriculture and forestry) align with natural processes. Through this initiative the socio-ecological landscapes need to be established.

Approaches of Satoyama Initiative:

Three-fold approaches are intended to maintain and rebuild landscapes in which land and natural resources are used and managed in a more sustainable manner:

- Consolidating wisdom on securing diverse ecosystem services and values
- Integrating traditional ecological knowledge and modern science to promote innovations
- Exploring new forms of co-management systems or evolving frameworks of “commons” while respecting traditional communal land tenure

Understanding the diverse ecosystem services and values that give rise to human well-being is an indispensable aspect of this approach, as is consolidation of wisdom on securing these services. It is also critical to discuss how to create synergy between traditional knowledge and modern science to promote innovations, because without sufficient scientific corroboration, a wide range of traditional knowledge is not being used optimally. This new social mechanism would support and promote the maintenance and rebuilding of socio-ecological production landscapes.

Usual Components under Satoyama initiatives in practice:

Sustainable use and management of natural resources into practice—should entail five ecological and socio-economic perspectives:

- Resource use within the carrying capacity and resilience of the environment
- Cyclic use of natural resources
- Recognition of the value and importance of local traditions and cultures
- Multi-stakeholder participation and collaboration in sustainable and multi-functional management of natural resources and ecosystem services
- Contributions to sustainable socio-economies including poverty reduction, food security, sustainable livelihood and local community empowerment

The Initiative will target such areas as villages, farmland, and adjacent forest patches and grasslands that have been through long-term human influence.



Fig -1: Schematic diagram of Satoyama Initiative

Expected impacts:

By rebuilding harmonious relationships between humans and nature, the *Satoyama* Initiative expects to contribute towards slowing the escalating loss of biodiversity worldwide, with the dual impacts of retaining and enhancing the biodiversity found in human-induced natural environments and promoting sustainable use of natural resources.

In the process, the initiative also helps improve human well-being by enhancing stable food production and income generation by applying pluralistic land uses and betterment of living conditions by promoting environmentally friendly biomass resources. Furthermore, the initiative can also for the enjoyment of the benefits of sustainable use of genetic resources through appraisal of traditional knowledge and cultures.

International Partnership for the Satoyama initiative:

The international partnership for the *Satoyama* Initiative (IPSI) aims to carry out the activities identified by the *Satoyama* Initiative described in the Paris Declaration. The Partnership is open to all organizations committed to promote and support socio-ecological production landscapes for the benefit of biodiversity and human well-being, such as national or local governmental organizations, non-governmental or civil society organizations, indigenous or local community organizations, academic, educational and/or research institutes, industry or private sector organizations, United Nations or other international organizations, and others to foster synergies in the implementation of their respective activities.

Members of the IPSI will collaborate to promote the following highly useful activities:

- Collect, analyse, and distil lessons from case studies
- Encourage broad and effective research, including how to integrate results in policy and decision making
- Work with donor organizations on directing greater resources to and effective implementation
- Enhance the capabilities of stakeholders involved in maintaining or rebuilding socio-ecological production landscapes
- Encourage and expand networks among interested parties.

Comparison of Satoyama Initiative in Japan and Himachal Pradesh:

The reasons of adopting Satoyama Initiatives in Himachal Pradesh is to uplift the socio-economic conditions of forest dependent community by providing alternate employment opportunities, in order to check biotic pressure on forests and wildlife, thereby to conserve biodiversity.

A comparison of Satoyama initiatives in Japan and Himachal Pradesh is mentioned below:

Table -1: Comparison of rationale for Satoyama Initiatives in Himachal Pradesh

Japan	Himachal Pradesh
<ul style="list-style-type: none"> • 68% of total geographical area is under forest cover • Maximum forest land is owned privately • Natural resource depletion is due to depopulation and under use of natural resources (forests) • Migration of rural populace to urban areas • It aims to bring back people towards forests to manage forests 	<ul style="list-style-type: none"> • 27.72% of total geographical area is under forest • Maximum forest area is government owned • Natural resources depletion is because of overuse of forest resources • Trend in urbanization is on rise • It aims to enable human interface for sustainable management of forest resources and minimize migration of people from villages to urban areas.

Applicability of Satoyama Initiative in PIHPFEM&L:

One of the key mandates of Project for Improvement of Himachal Pradesh Forest Ecosystems Management and Livelihoods is conservation and scientific management of biodiversity with inputs on development of livelihood initiatives. In appreciation of the Satoyama model, which originated and being implemented in Japan, and is also implemented few other countries and in Odisha, India, it is proposed to adopt in 60 BMC sub-committees under Kullu and Spiti wildlife divisions respectively in Himachal Pradesh.

Identification of geographical areas:

The Biodiversity conservation activities are identified within / around the Wildlife Sanctuaries of the PIHPFEM&L project areas, and two WLSs were selected as tabulated below (table - 2).

Table -2: Spread of Satoyama Initiatives programmes under PIHPFEM&L in Himachal Pradesh

WL Divisions	WL Sanctuaries	No of BMCs	No of BMC Sub-Committees
Kullu WL Division	Kais	4	14
	Khokhan	2	06
	Manali	2	06
	Bandili	4	10
Spiti WL Division	Kaza	4	12
	Tabo	4	12
	Total	20	60

The indicative proposed broad activities under the sub-component are described in the following table:

Table – 3: Broad activities proposed under Satoyama initiatives under PIHPFEM&L

Category	Proposed broad activities	Responsibilities	Remarks
Satoyama based Biodiversity Conservation activities	Promotion of sustainable use and management of natural resources	WL divisions of HPFD/ State Biodiversity Board (SBB) and local communities WL divisions of HPFD	Activities has been identified after the discussions with the concerned stakeholders
	Designation of Biodiversity Heritage Sites		Activities has been identified after the discussions with the stakeholders where exclusive Biodiversity Heritage sites could not be identified as per the Biological Diversity Act, 2002. However, the Sacred Groves of the project area can be considered under this section.
	Promotion of eco-tourism	Territorial / WL divisions of HPFD/ and local communities and convergence with the Himachal Pradesh Tourism Department	Activities has been identified after the discussions with the stakeholders

Odisha Forestry Sector Development Project – II, Odisha became the pioneer in implementation of Satoyama Initiative in India

Tourism Department

These activities shall be implemented in the 60 BMC Sub-Committees under respective BMCs in both Kullu(36 BMC Sub-Committees) and spiti WL Divisions (24 BMC Sub-Committees).

Activities envisaged:

Promotion of sustainable use and management of natural resources:

At BMC Sub-Committee levels:

As per the rapport meetings and detailed discussions held with village communities a set of indicators were identified towards sustainable use and management of natural resources.

Set of indicators identified:

- Reduction of grazing pressure within the sanctuary
- Reduction of crop damages due to wildlife menace/ interfaces
- Processing of important commercial medicinal herbs such as *Dhoop*, *ShingliMingli*, and *Nihanu*
- Reduction of overexploitation and unsustainable harvesting of medicinal plants
- Promotion and marketing of hill bamboo-based handicrafts
- Conservation of *Guchhi* and its promotion
- Application of people's knowledge towards *in situ* conservation of wild animals
- Prevention of forest fire
- Minimization of human wildlife conflict
- Revival of timber species
- Revival of NTFP species
- Conservation and promotion of Alpine Pastures
- Revival of traditional crops such as *Kodra*, *Kauni*, *Chini*, *Bithu*, *Siriyara* etc.
- Promotion of organic farming

At Landscape (WLS) level:

As per the discussions held further with the DMU staffs in consonance with the village communities to undertake the activities at Wildlife Sanctuary (WLS) level, following activities are identified:

- a. Grafting of wild fruits in the within the WLS
- b. Sowing of seeds in the alpine meadows
- c. Plantation of Nirgal (Hill Bamboo)
- d. Establishment and running of Information/ Interpretation Centre
- e. Group patrolling
- f. Prohibition of animal diseases to the wildlife

Promotion of Eco-tourism

- Promotion of eco-tourism through the BMC Sub Committees in and around the WLSs
- Capacity Building of eco-tourism groups
- Business promotion

Promotion of Eco-Club

- Identification of existing Eco-Club activities at school level
- Planning of Eco-Club activities with the school children
- Documentation of Eco-Club activities.

Case Studies within the Kais WLS in Brief:

In accordance with the APO for FY 2021-22 for Satoyama Initiatives under PIHPFEM&L project in Kais WLS following achievements have been gained:

Construction and use of Water Harvesting Structures

14 small to medium sized Water Harvesting Structures (WHSs) have been constructed and the use has been as below:

- Use of WHSs for watering to nurseries at Matikochhar under Kais WLS
- Water supply to the camping sites for the trekkers within the Kais WLS
- Use of WHS for agriculture use in Seobagh
 - Membership fee is collected @ INR 200/- (one time) from the BMC Sub Committee members
 - Equitable water supply is done among the BMC Sub Committee members
 - Water is supplied to the all members free
 - All BMC Sub Committee members are expected to pay the electric bill for use of electric motor to lift water from river Beas to the WHS
 - Any outside committee member is charged @ INR 60.00 per hour water supply. This has encouraged the other non-members to get involved into the Water user's group.
 - It is expected that the water user group is expanding and there is a need of more WHSs. The BMC Sub Committee is also planning to construct more WHSs depending on the increased demand

Improvement of Socio-Economies of Women Self Help Group (WSHGs)

The WSHGs promoted with training programmes related to Khaddi works, knitting and cutting and sewing have been engaged in preparation of products related to handloom, wool and series of handmade products. Following achievements have been gained:

- Self-confidence of earning through household product preparation
- Diversification of products by the WSHGs
- Voice raising at local markets for better price while marketing
- Women members are enthused for wide spectrum and quantum of products
- Business plans are under process based on prioritisation for entire project period
- WSHGs are now demanding for better marketing platforms
- Display of Women SHG products to HPFD's outlet at Seobagh (near Children Park) for sale.
- Tagging of all Women SHG products with our trademark "Him Tradition" before selling.

Nurseries and promotion of Home Herbal Gardens

- A total of 36,000 nurseries have been raised w.r.t. APO FY 2021-22 in Matikochhar Nursery for promotion of Home Herbal Gardens within the BMC Sub-Committees
- Home Herbal Gardens to be used for availability of medicinal plants for common ailments
- More nurseries are planned for successive APOs for FYs 2022-23

Innovative Conservation and Entrepreneurship Models of NTFPs Developed under HP JICA Forest Project

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Introduction

Different civilizations in the world have utilized herbs as medicine since prehistoric period. The medicinal and aromatic plants found in Indian forests serve as raw material for manufacturing drugs and perfumery products. As per received estimates of WHO (World Health Organization), 80 per cent of people worldwide rely on herbal medicines for their primary health care needs. Being situated in the Himalayan range, Himachal Pradesh has a rich diversity of widely used medicinal plants. The medicinal plants have also been playing a significant role in the livelihood security of the people of the state in addition to health care. An analysis of the habitats of the documented medicinal plants of the State shows that majority of these are herbs (70%) followed by shrubs (15%), trees (10%) and climbers (5%). A total of 643 species of medicinal plants have been identified in the State. However, an unscientific and unregulated mode of harvesting, lack of community role in resource management, absence of any single agency to steer the sector and lack of enabling legislation have resulted in rapid depletion of the wild stock of high value medicinal plants. The trade of medicinal plants is largely unregulated and evens the post harvest handling needs intervention to augment the rural livelihood. Therefore, a comprehensive approach for long term development and utilization of medicinal plants resource is necessary to meet the NTFP requirements of the rural poor and tribal population as enshrined in National Forest Policy.

In order to resolve these issues under one umbrella vis-à-vis promoting the conservation and research and development activities of high value medicinal plants in the North Western Himalayan region, Jadi Buti Cell (JBC) has been established at PMU level under JICA funded “*Project for Improvement of Himachal Pradesh Forest Ecosystem Management and Livelihoods*”, comprising of Director, Manager (Enterprise Development), Manager (Marketing) and MIS Associate. The mandate of this cell is to provide livelihood support to the stakeholder communities, easy market access and conservation (*in situ/ex situ*) of NTFPs. The primary functions include sustainable management of medicinal plants leading to conservation; plantation/cultivation of high value medicinal plants to generate marketable volume of produce for industries/pharmaceuticals; developing agro-techniques of selected high value medicinal plants; institutional development of farmer groups through capacity building; carry out research and development activities; changes in policies, legal framework for development of medicinal plants and create & promote a brand of products in HP at different levels.

In the Project 11 clusters have been identified for NTFP Enterprise Development and each of these clusters has been further reviewed to find out the exact geography and villages to be covered. The size of cluster is based on the availability of NTFP including medicinal plants in the wild, availability of non-forest area for NTFP plantation/ cultivation, availability of forest area for NTFP plantation and willingness of the local communities and VFDS to work on NTFP resource development, cultivation, value addition and marketing. The proposed model explained in the following details also encompasses alternate income generation activities with the focus to analyze and explore possible technology multiplier effect for promoting sustainable livelihood and management of Himalayan ecosystem in selected areas of Himachal Pradesh.

Action plan and Present status of Activities of Jadi Buti Cell

As mentioned earlier, 643 species of medicinal importance have been reported in Himachal Pradesh. However, initially some priority species of commercial importance have been selected and are being cultivated on forest and private land (Table 1). These species have been assessed through survey conducted by different institutes viz. G.B. Pant National Institute of Himalayan Environment and Sustainable Development (NIHE- Amora & Kullu), Council of Scientific and Industrial Research Institute of Himalayan Bioresource Technology (CSIR-IHBT) Palampur, Himalayan Forest Research Institute (HFRI), Shimla, Himachal Pradesh University (HPU) Shimla, Dr. YS Parmar University of Horticulture and Forestry, Nauni etc.

Table 1: Species prioritized for production in *ex situ* and *in situ* conditions to develop community based enterprises

Name of Cluster	Prioritized species
Kullu	<i>Angelica glauca</i> , <i>Berberis aristata</i> , <i>Trillium govanianum</i> , <i>Dactylorhiza hatagirea</i> , <i>Hedychium spicatum</i>
Jari	<i>Aloe barbadensis</i> , <i>Polygonatum verticillatum</i> , <i>Viola canescens</i> , <i>Bergenia cil iata</i> , <i>Withania somnifera</i>
Larji	<i>Aconitum heterophyllum</i> , <i>Nardostachys jatamansi</i> , <i>Taxus cantorta</i> , <i>Jurinea macrocephala</i> , <i>Valeriana jatamansi</i>
Keylong	<i>Inula racemosa</i> , <i>Sausurea costus</i> , <i>Hippophae rhamnoides</i> , <i>Bunium persicum</i> , <i>Aconitum heterophyllum</i>
Mandi	<i>Matricaria chamomilla</i> , <i>Curcuma aromatica</i> , <i>Rosa damascena</i> , <i>Rosmarinus officinalis</i> , <i>Withania somnifera</i> , <i>Punica granatum L.</i> , <i>Aegle marmelos</i> , <i>Zanthoxylum armatum</i> , <i>Oroxylum indicum</i> , <i>Viola serpens</i> , <i>Terminalia chebula</i> , <i>Valeriana jatamansi DC</i> , <i>Hedychium spicatum</i>
Rampur and Rohru	<i>Valeriana jatamansi Jones</i> , <i>Podophyllum hexandrum Royle</i> , <i>Aconitum heterophyllum Wall. Ex Royle</i> , <i>Angelica glauca Edgew</i> , <i>Picrorhiza kurroa Royle ex Benth</i>
Bilaspur	<i>Emblica officinalis</i> , <i>Terminalia chebula</i> , <i>Ocimum sanctum</i> , <i>Tinospora cordifolia</i> , <i>Terminalia arjuna</i> , . <i>Asparagus recemosus</i> , <i>Azadirachta indica</i>

Keeping in view the list of prioritized species JBC further selected 14 NTFP species for propagation, cultivation and value addition in *ex-situ* and *in situ* plots. Details of models of these NTFP species with target and location in Himachal Pradesh is explained in following pages.

Models for Production and Marketing of NTFPs

The JBC has prepared propagation/ business models of different plant species which are being propagated/ planted as intercropping in the identified project areas. The status of implementation of these models is as under:

Asparagus racemosus (Shatavari)

The performance of *Asparagus racemosus* (Shatavari) planted at Tikri Forest, village Tikri, Sadar Range of Mandi Forest Division under the Batch-1 is quite satisfactory. The harvesting of the crop is expected by October, 2022. The average market price for the roots of this plant is @ 30,000/quintal.

Planting of 60,000 plants of this species is under progress in the current monsoon season in three new areas identified in



Fig 1. Development of *Asparagus racemosus* at Tikri Mandi Forest Division.

Aconitum heterophyllum (Patish).

The cultivation of *Aconitum heterophyllum* (Patish) is proposed in Parvati Forest Division under Batch-III. Nearly 2 ha forest area in the Roundy Bhutthi region of Jari has been identified for its propagation in consultation with GB Pant NIHE, Kullu. The Propagation will be done in PFM mode and group formation is underway. Total yield (Roots) is expected to be 11q/ha which have the average market price of Rs. 200,000/- per quintal.

***Swertia cordata* and *Swertia chirayita* (Chirayita)**

The cultivation of *Swertia cordata* (Chirayita) is being undertaken in 1.5 ha of private land by women groups consisting of 21, 25 and 15 members at Ruhai, Bukhras and Chhain Maigal under Nachan Forest Division. The seeds were distributed to the group members and its sowing got completed in June, 2022. Harvesting of the crop will be done after 18 months. The expected yield (whole plant) is 12 q/ha and more importantly, a buyback mechanism is in place to procure the crop from the farmers @ 300/kg. In addition to this, 6000 plants of *Swertia chirayita* (Chirayita) are being raised at Pah Nala nursery in collaboration with G.B. Pant, NIHE Kullu.

***Picrorhiza kurrooa* (Kutki)**

The cultivation of *Picrorhiza kurrooa* (Kutki) is also being undertaken in 1.5 ha of private land by the women groups at Ruhai, Bukhras and Chhain Maigal under Nachan Forest Division as mentioned above. The planting is completed by the end of July, 2022. The plant part used is stolon and the anticipated yield (in the 4th year) is 6q/ha. The minimum market price is @ Rs 1000/kg

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

The areas for propagation of Harad, Amla and Reetha have been identified in Suket and Jogindernagar Forest Divisions. In collaboration with College of Horticulture and Forestry, Neri, Hamirpur, selected field staff in the Project Area has been trained on grafting for raising genetically improved plants for planting of above three species.

Planting of these species got completed in July, 2022. *In-situ* grafting of Harad is proposed in the planted area of Jogindernagar division where planting of non-grafted plants has been done. The grafted plants (700 Harad, 300 Amla, 300 Reetha) planted in the Suket Forest Division will start giving yield in the 4th year against 8-10 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 obviously increase upto 1-2 q/tree after 8-10 years. As far as prevailing market price is concerned, it is Rs 2000/q, Rs 4000/q and Rs 5000/q for Amla, Harad and Reetha respectively.



Fig 2. Distribution of Amla, Harad and Reetha at Beh



Fig 3. Planting of Grafted Amla

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

Nearly, 50,000 and 20,000 plants of *Moringa oleifera* are being raised in JICA Nurseries at Kamand and Theog respectively. During current planting season, planting of about 10,000 tall plants of this species is under progress in Mandi and Suket Forest Divisions. Most importantly, *ex situ* conservation of this plant is being encouraged by means of plantation on the private land vis-à-vis PFM mode. With a minimum market price of Rs 4500/q, the expected average yield of the green biomass is 2.95 MT/ha/year.

Cinnamomum tamala (Tej patta)

During current planting season, 1100 tall plants have been planted in Jogindernagar Forest Division. The plantation has been carried out in PFM mode and members of the group selected the plants. Besides this, plantation area was also divided by members for availing the benefits on the maturity of the crop. The expected average yield is (10-12) q/tree (from 10th year onward) and the minimum market price is Rs 2400/q. In addition, 5,000 plants are being raised in the JICA nursery for planting in subsequent years.



Fig 4. Nursery raised plants of Tej Patta at Chauntara Nursery

Aloe vera (Ghritkumari) made for seed collection as well as standardization of propagation technology of these species.

The suitable area has been ear-marked for the propagation of Aloe vera at Ropri village, Suket Range of Suket Forest Division in District Mandi under Batch-1 VFDS. A women group has raised plantation in their barren land comprising of about 1 ha. During July-August, 2021, the planting material was provided to this group by DMU Suket for direct plantation in the field. Nearly 50,000 plant propagules have been planted in the field. Harvesting of the crop is expected by July-August, 2023.

One more group at Dhawal has been identified in Suket Forest Division for propagation of AL-1 variety during current financial year as per the advice of IHBT, Palampur. The planting is being undertaken by the group during the current monsoon season. The propagation of 30,000 plants/ha of AL-1 species would result in a biomass of 90 metric ton (90,000 kg) which in turn, would be sold @ Rs 5/kg. The first harvesting will be done 1.5 years after its propagation whereas, subsequently, 3 harvests/year are anticipated.

Paris polyphylla (Satua)

The rhizomes for propagation of Paris polyphylla (Satua) have been procured and supplied to DMU Chopal for raising in Sarain Nursery and sowing was done in February, 2021. This has been done on pilot basis and the results are not very encouraging. Therefore, IHBT Palampur is being consulted to explore the possibility of micro-propagation (plant tissue culture) for this plant.



Cymbopogon martinii (Palmarosa grass)

The cultivation of Palmarosa grass was taken up in area at Amarapur Dhingoo, Ghumarwin Range of Bilaspur Forest Division during financial year 2021-22 under the Batch-1 enlisted VFDS and on first harvest approx. 2300 ml of oil has been extracted from 5 quintal of obtained biomass.

An MoU has been signed with IHBT, Palampur for technological support on raising and processing of Palmarosa grass. In the current monsoon season sowing of 30kg seed has been done by the group in the blank patches for better stocking of the area as per the advice of IHBT experts. This is bound to increase the yield of biomass and the extracted oil out of it. The current market price of the oil is @ Rs. 1500/litre.

Fig 5. Palmarosa crop at Amarapur Dhingoo, Bilaspur

Bauhinia vehlii (Taur) leaves for making plates

Bihan Dhar in Kataula Forest Range of Mandi FD and Ropa in Kangoo Forest Range of Suket FD have been identified for making leaf plates by utilizing locally available Taur plants. The leaf plate making machines have been procured by DMU Mandi and Sundernagar and subsequently, installed for production by the concerned group. The production has already started at Bihan Dhar and the products prepared there were also displayed for exhibition at International Shivaratri Fair, Mandi. Recently, one more group at Banehed has been identified in Jogindernagar Forest Division. Fig 7. Taur leaf plates at Bihan Dhar Working of single machine unit results into the formation of 1500 leaf plates per day which are to be sold at a market price of Rs.4 per leaf plate. This would generate Rs.6000 per day for 300 working days and the total output will come to Rs.18 Lakh as sale price per year. The total annual cost (for first year) of machine, electricity, brown paper and shed comes equivalent to Rs. 10,27,000. Therefore, the cost:benefit ratio is 1.75 which in turn, is sustainable. The ratio would improve in the subsequent years.



Fig 7. Taur leaf plates at Bihan Dhar

Working of single machine unit results into the formation of 1500 leaf plates per day which are to be sold at a market price of Rs.4 per leaf plate. This would generate Rs.6000 per day for 300 working days and the total output will come to Rs.18 Lakh as sale price per year. The total annual cost (for first year) of machine, electricity, brown paper and shed comes equivalent to Rs. 10,27,000. Therefore, the cost:benefit ratio is 1.75 which in turn, is sustainable. The ratio would improve in the subsequent years.

To meet future demand of raw material and ensure sustainability of the activity, 6000 Taur plants have been raised in JICA nurseries for planting in the field during 2021-22 and 10,000 plants are proposed to be raised during 2022-23.

Chir pine needles into briquettes

Pine needle collection has been done by Sangam VFDS in the identified area of Jhandutta range of Bilaspur Division. Baler machine has been hired from ACC, Barmana by DMU Bilaspur. Briquette making was done by ACC. Payment to VFDS by ACC was done at the rate of Rs. 2 per Kg and Rs. 14,760 were transferred to their account. Recently, a group comprising of 10 members at Nishu under Mandi Forest Division collected 15 ton of chir pine needles and sold them for Rs 45,000 @ Rs 3/kg.



Fig 8. Collection of Chir Pine Needles

Summary of NTFP models with plantation and seedling production in nursery at different locations is presented in Table 2.

Table 2: Detail of Planting/Chir Pine Needles collection pertaining to different models and direct planting by Groups.

S. No	Name of Species	Division	Location	Area (ha)	No of plants
A. Planting of NTFPs pertaining to Models					
1	<i>Asparagus racemosus</i> (Shatavari)	Mandi	Tikri	2	20000
			Dharwahan	2	20000
			Tarnoh	2	20000
			Kharsi	2	20000
2	<i>Aconitum heterophyllum</i> (Patish)	Parvati	Roundy Bhutthi	2	
		Rohru	Khashdhar		2000
3	<i>Swertia cordata</i> (Chirayita)	Nachan	Ruhal	1.5	
			Bukhras	1.5	
			Chhain Maigal	1.5	
4	<i>Picrorhiza kurrooa</i> (Kutki)	Nachan	Ruhal	1.5	
			Bukhras	1.5	
			Chhainmaigal	1.5	
5	<i>Terminalia chebula</i> (Harad)	Suket	Beh	10	700
6	<i>Emblica officinalis</i> (Amla)	Suket	Beh	10	300
7	<i>Sapindus mukorossi</i> (Reetha)	Suket	Beh	10	300
8	<i>Moringa oleifera</i> (Drumstick tree)	Mandi	Dhar		2500
		Suket	Beh	10	5000
9	<i>Cinnamomum tamala</i> (Tej patta)	Jogindernagar	Kudnu Darkoti		1100
10	<i>Aloe vera</i> (Ghritkumari)	Suket	Dhawal	1	30000
11	<i>Paris polyphylla</i> (Satua)	Chopal			
12	<i>Cymbopogon martini</i> (Palmarosa)	Bilaspur	Amarpur Dhingoo	4	
13	<i>Bauhinia vehlii</i> (Taur)	Mandi			5000
		Suket			1000
B. Direct Planting of NTFPs by Community Groups on Private Land					
14	<i>Swertia chirayita</i> (Chirayita)	Kullu	Pahanala		6000
15	<i>Picrorhiza kurrooa</i> (Kutki)	Kullu	Kothi /Dharaghot		16000
		Banjar	Tirthan,Sainj		17000
		Rohru	Khashdhar		14000
16	<i>Dolomiaea costus</i> (Kuth)	Rohru	Khashdhar		1000
C. Chir Pine Needle Collection					
	Chir Pine Needles into briquettes	Bilaspur	Ghandhir, Sangam		11.38 ton
		Mandi	Nishu, Parnu		15 ton

Convergence and linkage activities with Institutes, Universities and Organizations

For better output and synergy conservation /collaboration with different institutes /organisations is being done:

- i. Himachal Pradesh Forest Department: Van Samridhi Jan Samridhi Yojana of HPFD
- ii. RCFC (NR-I), Research Institute in Indian Systems of Medicine (RIISM), Joginder Nagar, Distt. Mandi for knowledge sharing, technical demonstration and online marketing.
- iii. College of Horticulture and Forestry Neri, District Hamirpur for training of forest guards/gardeners on grafting techniques, advanced training on grafting techniques to 12 master trainers in JICA nurseries and supply of superior quality grafted plants for planting on forest/private lands.
- iv. CSIR - Institute of Himalayan Bioresource Technology, Palampur for propagation techniques of Palmarosa Grass, testing of oil from wild and artificially grown Palmarosa grass and machinery used to extract Palmarosa grass oil.
- iv. Directorate of Mushroom Research (DMR), Solan for training and knowledge sharing.

Way Forward

- Potential areas for propagation of these models of high value medicinal plants both in-situ/ex-situ are being identified in each VFDS. Further, a plan will be prepared in consultation with scientists on issues of conservation, regeneration, harvesting and post-harvest handling etc. of medicinal plants in cluster/VFDS areas as intercropping.
- Jodi Buti Cell in consultation with research institutes/ organisations will strengthen list of priority areas/ species for further extension of the models with related research and development for developing agro-techniques and sustainable harvesting protocols.
- The cell will also explore possibility of establishing seed banks and community nurseries to produce quality stock of different NTFPs. Jodi Buti Cell with the help of cluster societies/ producers groups will take necessary steps for Good Cultivation Practices Certification of the area under propagation/cultivation of medicinal plants.
- Need based setting of storage/ processing space, value addition etc. will be created for cluster societies/ producer groups. The responsibility of maintenance and management will lie with the cluster society/ producer groups.
- A facilitating role will be played in the procurement and trade of medicinal plants in the State so that consistent supply to the pharmaceuticals and other industries is ensured with mechanism of canalizing returns to the community.
- Efforts will be made to create a brand for the medicinal plant products in Himachal Pradesh and take up the necessary actions for brand promotion at State, National and International level. Further, changes in policies and legal framework for development of medicinal plants will be suggested.
- Finally, the cell will be registered as a society under the relevant act to address the different issues on medicinal plants beyond project period.



Fig 9. Training of Forest Guards at Neri, Hamirpur

Cultivation of *Lentinula edodes*-Medicinal Mushroom in Himachal Pradesh

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Background

Himachal Pradesh Crop Diversification Promotion Project (HPCDP) has set up Shiitake Cultivation and Training Centre (SCTC) at Palampur in collaboration with Yats Corporation, Japan at CSKHPKV Palampur with establishment cost of ₹ 3.25 Crore. The SCTC has been operationalized in the Phase-II of the HPCDP with an outlay ₹ 5.9 Crores for the total project period.

About Shiitake Mushroom

Lentinula edodes or popularly known as Shiitake Mushroom is a native to East Asia and considered as leader of mushroom which was used for edible and medicinal purposes in many Asian countries. Shiitake mushroom cultivation is gaining popularity in recent years, owing to new-found demand among the urban consumers. The bioactive compound, lentinan extracted from the fruit bodies of shiitake is reported to have several anti-tumour properties and found with therapeutic applications in various cancer treatments.

Cropping Requirements of Shiitake Mushroom: -

Cultivation of Shiitake mushroom requires an optimum temperature of 20-25°C, humidity of 80-85%, diffused light and ventilation. Cold water shock treatment is essential to induce fructification. Total cultivation cycle of this mushroom is of 120-180 days. The mushrooms can be harvested in 3-4 flushes after which the entire cycle is repeated. Shelf life of fresh Shiitake mushrooms is 2-3 days at 25-30°C and 10 - 12 days at 4°C.

Broad objectives of establishment of SCTC: -

- To popularize Shiitake mushrooms in the state through farmer trainings and supply of ready to fruit Shiitake Blocks.

- To conduct R & D activities on shiitake cultivation like: -
 - Response of different spawn strains to the local conditions and its adaptability in different agro-climatic zones of the State.
 - Research on efficacy of fruiting material (Saw Dust & Wood Chips) of different locally available wood species like poplar, mulberry, toona & pine, etc.
 - Standardization of incubation time for Shiitake mushrooms for different parameters like temperature and humidity.
 - Standardization of Cultural practices for raising Shiitake mushrooms in Polyhouses and sheds in different agro-climatic zones of the project districts.

Present Status of activities taken up at SCTC: -

- The trial cultivation at SCTC has started from July, 2022 on the Shiitake blocks prepared by using raw material *i.e.*, mixture of woodchips & sawdust of Poplar wood.
- 6,000 Sawdust blocks have been prepared till 31st March, 2023, out of which 1000 blocks are at different stages of trials in the growing chambers (Polyhouse) for the standardization of compounding pattern of raw material & adaptability under various environmental parameters like temperature, humidity & light, etc.
- The incubated blocks being shifted to the polyhouses in the batches for cultivation trials and the standardization of cultivation techniques.
- The treatment with immediate dipping of blocks in water for 24 hours immediately after opening of bags showed best results with average yield of 440 gm/ block in the first flush (2-3 cuttings only) & maintenance of temperature below 18^oC and humidity above 70% during fruiting body formation with no watering.
- This treatment was again replicated in another 50 blocks each during the first week and the third week of March, 2023 with same results.
- The compounding pattern of raw material & cultivation techniques for Shiitake mushrooms have been standardized & were again replicated with the same results during April & May, 2023 for another 100 blocks.

Way forward: -

- During the current year ten trainings will be conducted for 125 No. farmers, from the HPCDP sub projects, at the SCTC.
- SCTC will produce “Ready to fruit incubated blocks” in polypropylene bags which will be provided to the farmers for field trials after the training & also at very nominal price to farmers interested in commercial cultivation.
- On an average one sawdust block weighs 2.5 kg and can yield 600 -700 gm of fresh Shiitake mushrooms. Farmers can sell the Shiitake mushrooms through FIG/CIGs at ₹ 500-800 per Kg for fresh or ₹ 2,500-4,000 per Kg for dried ones. Total income of ₹1,40,000 (Approx.) can be generated from 300 blocks in 6 months.
- Shiitake can be marketed as fresh, dry or as mushroom powder. India at present is importing Shiitake mushroom (fresh) at a cost ranging from ₹1,200-4,500 per Kg. Average import price of Dried Shiitake is around ₹ 4,500 per Kg.
- Possibilities to integrate Shiitake farmers' groups with SPNF outlets as well as through relevant online portals shall be explored for marketing of the produce.
- Expansion of Incubation facilities and establishment of Spawn Making Lab at the SCTC during 2023-24.
- Plan to extend SCTC support to farmers from non-project areas. Dovetailing with different relevant schemes of the Line departments shall be explored.



JICA in Uttarakhand - Uttarakhand Forest Resource Management Project (UFRMP) and Technical Cooperation Project (TCP)

***Koko Rose* UFRMP Uttarakhand**

There are two JICA supported projects currently under implementation in the state of Uttarakhand. The Uttarakhand Forest Resource Management Project (UFRMP), which is an ODA loan project is one of the projects being supported by the Japanese International Cooperation Agency (JICA) in Uttarakhand. It was launched in 2014 with the goal of augmenting eco-restoration of forest areas in conformity with the improvement of rural livelihoods through community-based forest resource management by undertaking rehabilitation of degraded forests, community and institutional development.

The Objectives of the UFRMP are:

1. Arresting and reversing Forest Degradation.
2. Livelihood Development and income generation for rural communities.

The second JICA supported project is the Technical Cooperation Project (TCP) called the “Project for Slope Disaster Mitigation in Forest Areas in Uttarakhand” under which disaster mitigation works are being taken up in landslide affected areas across 7 sites in Uttarakhand.

The TCP has twin objectives:

1. Technical Assistance for execution of disaster mitigation component, which basically deals with the problem of landslides in forest areas.
2. Capacity Building of Uttarakhand Forest Department to effectively deal with the problem of landslides in future.

Uttarakhand Forest Resource Management Project (UFRMP)

The UFRMP is being implemented in a Society mode and is implemented in a participatory manner through already existing village level institutions unique to the state of Uttarakhand called Van Panchayats (Vps). The VPs are supported through the Forest Divisions (designated as Divisional Management Units or DMUs for the purposes of the project) and Forest Ranges (designated as Field Management Units or FMUs for the purposes of the project). Under the UFRMP, 13 DMUs and 35 FMUs have been instituted and 1503 SHGs have been formed in 839 Van panchayats in the DMUs for meeting the objectives of the project.

The guiding principles for implementing the project are:

- a. Empowering forest-fringe communities, particularly women, through sustainable livelihoods and ensuring positive involvement of rural people in managing their own environment and enterprises.
 - b. Strengthening community institutions such as Van Panchayats and Self-Help-Groups (SHGs).
 - c. Alleviating poverty of the rural poor through income generating interventions.
 - d. Planning and implementing site-specific technical and scientific forestry interventions, including soil and moisture conservation, restocking of degraded areas through appropriate silvicultural operations utilizing the inherent potential of available root stock and planting wherever necessary with suitable endemic species.
 - e. Promoting inter-sectoral convergence.
 - f. Involvement of the Van Panchayats in planning and implementation of the project interventions.
 - g. Capacity Development of the executing agency (Uttarakhand Forest Department) and other concerned agencies and organizations.
 - h. Promoting forest-based and non-forest-based enterprises (such as the value addition and marketing of medicinal & aromatic plants, resin, food items such as honey, spices, cereals, off-season vegetable, dairy products etc., natural fibres, natural dyes, utilization of forest biomass, ecotourism, handicrafts etc.) and generate sustainable employment, develop industries and rural entrepreneurship, enhance access to markets and ensure best possible return to the farmers in the project areas.
- I. Flow of resources for executing works to the VPs through respective forest divisions (DMUs)

and execution of the forestry works through the VPs. For the livelihood activities fund flow if channelled through the community institutions (Cluster level federations and SHGs) to the beneficiaries.

- j. Instituting Self Help Groups (SHGs) in the project villages, imparting training and equipping them for taking up livelihood development activities and managing enterprises.

Eco-restoration of Degraded Forest Component (Rehabilitation of Degraded Forests)

Under the UFRMP, for the eco-restoration of degraded forest areas, three Eco-restoration models are being implemented through the Van Panchayats. In the selected areas, the following supporting activities are also taken up:

1. Protection of the selected areas from grazing, fires and other human activities which aggravate degradation of forests.
2. Soil and moisture conservation measures like construction of check dams, gully plugging, training of streams, digging of contour furrows along with seed sowing.
3. Silvicultural operations like singling, pruning and tending of already present rootstock to augment in-situ tree growth.
4. Artificial regeneration through afforestation activities in areas, which are blanks and poorly stocked.
5. Establishment of community managed nurseries in the VP areas and strengthening of departmental nurseries for supply of quality seedlings.

The three Eco-Restoration (ER) Models areas are selected on the basis of the given criteria:

Model	Criteria
Model I	-Partially degraded -The average crown density of a forest patch is between 40% and 70% -Remaining root stock is sufficient for natural regeneration Species that are present in the forest patch are adequate, which does not require manipulation by plantation
Model II	-Degraded -The average crown density of a forest patch is between 10% and 40% - Remaining root stock is sufficient for natural regeneration with gap planting
Model III	-Degraded -The average crown density of a forest patch is below 10% - Remaining root stock is insufficient for natural regeneration, which requires block plantation

The site selection for the different Eco-restoration models is done through GIS-based mapping and survey supported by ground truthing on the field.

In the ERM I areas Singling, pruning, tending of the available root stock is done and there is no plantation involved. In the ERM II areas, planting of 500 plants per hectare is taken up whereas in ERM III, planting of 1000 plants per hectare is taken up. In all the three ERM areas construction of rough stone dry packing wall is done to protect the area from anthropogenic pressures, grazing and forest fires.

Against the project target of 36, 500 hectares in the Eco-restoration works, 34, 776 hectares have been completed (95.3 %).

Livelihood Development Activities

The project recognizes that for sustainable forest resource management, livelihood improvement of the communities living in forest-fringe areas is imperative. As the solutions to problems related to degradation of forest resources often lie in areas outside the forests, addressing livelihood problems of the area has a direct linkage with its solution.

Therefore, Livelihood activities under the project are being planned and implemented through Self Help Groups (SHGs) in selected Van Panchayats following a Value-chain based approach wherein project support are directed to finance important inputs of the production process. A value chain includes all the aspects of production right from product development inputs, training and capacity building, capital investments, hand-holding support to market support. The Project provides both technical and hand-holding support to SHGs through credible NGOs. Till date, 1503 SHGs having 15, 237 members have been formed. Priority has been given to the vulnerable sections of the community, women, SC/ST and other marginalized sections of the community within Van Panchayats. The SHGs have been federated into 20 cluster-level federations (CLFs) who are then further federated into an apex state-level federation.

The cluster-level federation facilitates the member SHGs in aggregation of marketable surplus from SHGs, and provides support in procurement of commodities, sorting, grading, storage and value addition of produce. The state-level federation supports the cluster-level federation to access larger markets at the state and national level, explore the possibility of developing new products, value addition, improvement in packaging and in establishing a strong brand presence in the market for the products. The state level federation is envisaged to serve as a vehicle for providing any other support required by cluster level federations/SHGs to achieve their objectives and to impart sustainability to livelihood activities beyond project period.

The federations have been formed under the Uttarakhand Self Reliant Co-operative Act, 2003 and support for infrastructure facilities, working capital and other administrative expenses are being provided through the project. Project support for the value chain projects are partly as grant and partly as interest-free loans depending on the type of input being supported. All the project support for value-chain development are routed through these federations in order to develop long-term organic linkages between SHGs and the federations. This fund flow mechanism is expected to facilitate post-project sustainability and foster a sense of ownership, involvement and accountability. This will also further build capacity of the federations and SHGs for managing enterprises for the sustainability of the project initiatives.

The products are currently marketed by the state level federation under the brand name “HavePure” through its dedicated “My Re-Fill store” outlets and also online through the www.Havepure.in portal.

As an incentive, a revolving fund of Rs 50,000 per SHG has been made available through the project to facilitate inter-loaning. Grading of SHGs is done based on the criteria of regularity of monthly meetings, monthly savings, inter-loaning, repayment of loans and the upkeep of account books. The project has facilitated over 600 SHGs to obtain Cash Credit Limit (CCL) from banking institutions. Currently there are 106 value chain projects related to activities like Dairy milk, spices, mushroom production, poultry and goatery, cereals, pulses, juices, processed fruit and pickles, honey, lemon grass and other aromatics etc. under implementation. Project assistance to the value chain projects is to the tune of Rs. 1577 Lakh

The turnover of the value chain activities in the CLFs was Rs. 670.59 Lakh in the Fiscal year 2022-2023 while the income accrued to SHG members stood at Rs. 4498 Lakhs in 2022-2023. It is also notable that support from the project in the form of interest-free loans are being repaid by the SHGs to the federations which reflects the robustness of the livelihood activities and their economic soundness.

To provide long term infrastructure support for the sustainability of the CLFs beyond the project period, five growth centers suitably located in different locations in the state have been constructed with the objective of providing an integrated space wherein machinery and tools for value addition and packaging would be installed. Additionally, the growth centers will also provide facilities of office room, storage, sale point, training facilities and other activities of the CLFs.

The project has designed a user-friendly Management Information System (MIS) for proper monitoring and documentation of SHGs activities.

The project has also been supporting farmers for developing alternate livelihoods by providing grafted Walnut plants in collaboration with the Central Institute of Temperate Horticulture (Srinagar). Since 2017 the project has provided a total of 37, 614 grafted Walnut plants to over 8000 farmers across the state of Uttarakhand. Similarly, the project is promoting the development of Non-Timber Forest Produce (NTFP) plantations in project areas. Till date 375 hectares of Reserved Forests (4, 12, 500 plants) and 1474 Hectares in Van Panchayat areas have been covered (1474000 plants).

Technical Cooperation Project (Project for Slope Disaster Mitigation in Forest Areas in Uttarakhand)

The Technical Cooperation Project (Project for Slope Disaster Mitigation in Forest Areas in Uttarakhand) between JICA and the Government of Uttarakhand was signed on 18th February 2016. The TCP is funded as a 100% grant from JICA. Under this project, sediment disaster treatment using Japanese know-how through planning, field survey, design and execution assisted and monitored by Japanese engineers is being done. So far about 25 officers from the State and MoEFCC have received training inputs in Japan. Sharing this knowledge and technology with other stakeholders at the State level is also going on simultaneously leading to their capacity building. JICA is providing long-term and short-term experts for field survey, design, estimation and supervision of erosion control works as well as imparting technical guidance to Indian counterparts. At present, work on slope disaster mitigation is on in 7 sites.

The JICA supported activities in Uttarakhand are impacting rural livelihoods, creating employment opportunities, enhancing incomes and capabilities.

Livelihood Development under Tripura SCATFORM Projec

Dr. Avinash M. Kanfade

Tripura JICA Project

Prudent, effective, and implementable livelihood development strategies aimed at improving the socioeconomic status of project beneficiaries on the one hand and reducing pressure on forests and natural resources on the other are essential for optimizing available resources and achieving the goals of the JICA-funded "Project for Sustainable Catchment Forest Management in Tripura - (SCATFORM)"

The livelihood development of the SCATFORM has the following objectives to reduce forest degradation by motivating them to judiciously manage forest resources and to reduce the pressure of forest degradation by unsustainable ways of resource utilization.

- Expand the opportunities of income generation for the betterment of life in Tripura.
- Divert forest-dependent living, jhum in particular, to other alternatives so as to reduce negative pressure on forest resources and vulnerability to soil erosion.

As illustrated in the Figure-1 below, SCATFORM was designed and is being implemented on the basis of a sustainable forest management plus strategy, with an emphasis on people and their ambitions, capacities, and livelihood.

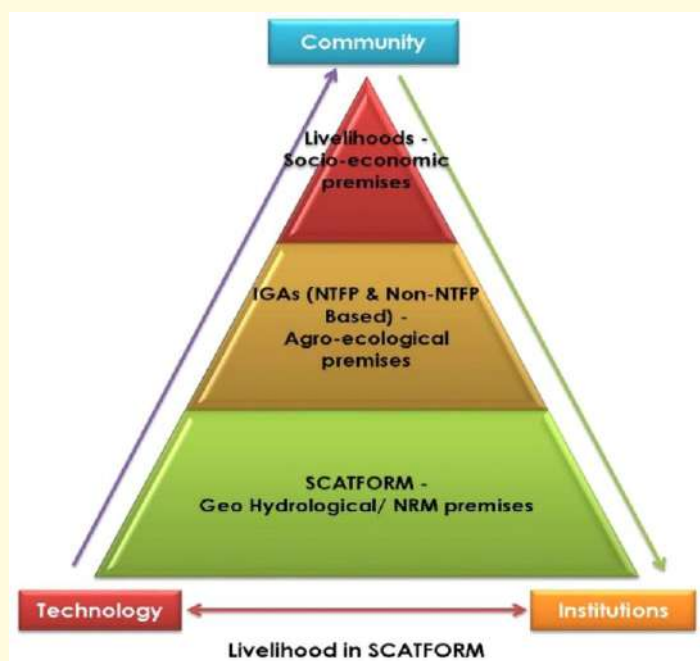


Figure-1: Livelihood Approach

The SCATFORM approach to livelihoods begins with the protection of natural resources and progressively leads to growth in certain targeted sectors/subsectors, ensuring the development of all parts of society. Figure-2 is used to assist analyse these processes further below.

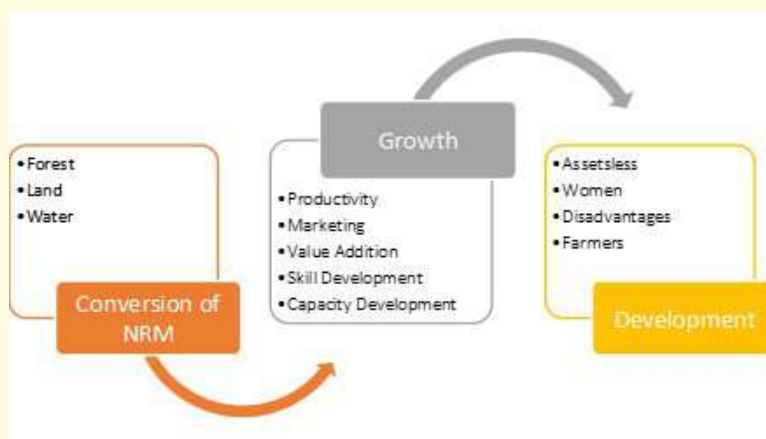


Figure-2: Livelihood Process

NTPF based livelihoods have been classified into threetiers based on willingness and capacity of SHGs/artisans from JFMCs, availability of NTFP and marketing potential;

- (i) Collection and primary processing as Tier 3 (T3)
- (ii) Secondary processing for higher value addition as Tier 2 (T2)
- (iii) Advanced processing and value addition as Tier 1 (T1)

T3 is more traditional community-based rural activities these small enterprises as group activities are being owned and managed by SHGs/JLGs/CIGs and while T2 requires technical equipment and marketing knowledge/connection and T1 requires specialized technical knowledge and niche market (specified client) by competitive business mode. These T1 & T2 will be owned by the community institutions but will be managed by the entrepreneurs and MSMEs (within or outside states) through PPP model.

Table: Three types of NTFP based processing

Level	Type of NTFP based Processing	Organized unit by SCATFORM	Typical Location/ market	Management modality	Risk and Return
Tier 3 (T3) 1350 Nos.	Collection and Primary Processing	SHG at JFMC level	Local Market/ Easy access to collectors/	Simple operation by SHGs in JFMCs	Low risk low return
Tier 2 (T2) 45 Nos.	Simple Processing with Management	Collection/Primary Processing Centre (CC)	Regional centre/ close to product market	Business operation by members (Production cooperative)	Medium risk and medium return
Tier 1 (T1) 4 Nos.	Advanced Processing for Value Addition	Advanced Value Addition Unit (AVAU)	Decided by Feasibility /Centrally located possible/ Niche market	Specialized management (Production cooperative/ company)	High risk high return

Till now, SCATFORM has supported SHGs (T3) and provided revolving funds to the JFMCs. At SHG level business plans prepared, JFMC has evaluated these business plans and provided loan to the SHGs to initiate the IGA.

The Activities which have been taken up by the SHGs are Piggery, Fishery, Pickle Making, DCPN, Handloom, Duckery, Bagmaking, Bio Flock Fish Farming, Poultry farming, Goatery, Mushroom, Candle Making, Broom Grass, E-Ricksha, Dry Fish, Water Boat, Bamboo Craft etc.

SCATFORM is working on the Ecosystem based approach where all the enabling environment are being created to initiate by the entrepreneurs or MSMEs, while the government will ensure all the support and initial invest to be provided through PPP mode.

For (T1) and (T2) Project is focusing on Bamboo (bamboo round sticks; Agarbatti; Bamboo board; mechanization of bamboo crafts etc.); Food processing (drying and freezing of different commodities e.g. Pineapple, Jackfruit etc.); Agar based industries (Oil, chips, cosmetics, perfumes, medicines etc.); Ecotourism and Adventure Sports etc.

Forestry Integrated Geospatial Solutions - FIGS

Anurag Gupta

Tripura SCATFORM Project

01 Scientific Planning at Beat Level.

02 Field Staff empowered with updated spatial information.

03 Seamless Integration of Spatial (GIS) and Non-Spatial (MIS) information with Forestry Works.

Background

The use of GIS and MIS systems in forestry sector is not new. Most of the forest departments have updated and upgraded their workflows and are using GIS and MIS on a regular basis in the department.

Use of GIS and other spatial technologies in forestry sector is an imperative considering the workflows in forest management which are inherently spatial in nature. GIS and MIS, however, were being developed separately in all the forest departments, resulting in fragmented solution and applications.

The power of GIS and MIS, comes to fore only when they are integrated right at the outset. Forestry Integrated Geospatial System – FIGS for Tripura Forestry Department under the JICA SCATFORM Project was envisaged on the premise of an integrated GIS, RS and MIS system.

FIGS ensured that the disconnect between different projects and their implementation is minimized and ensure spatial planning and implementation in the field. The FIGS system has been developed to cater to the requirements of all the projects and activities of Tripura Forest Department.

The FIGS system envisages development of end-to-end geospatial solutions for decision making to ensure improved forest quality with focus on catchment protection through afforestation, soil and moisture conservation and nature-based livelihood development. The FIGS system solutions and applications focus includes regular management and monitoring of afforestation, plantations, soil moisture conservation works, nursery management, biodiversity changes, biophysical changes, livelihood, agroforestry as well as alignment with the routine activities of the forest department for working plan management, forest fire monitoring, shifting cultivation monitoring, encroachment, and illegal felling monitoring.



FIGS: Salient Features

Forestry Integrated Geospatial Solutions (FIGS) system is an integrated system that seamlessly connect all the activities of SCATFORM Project as well as other projects and departmental activities of Forest Department on geospatial platform. With spatial data and information key to forest management, this system provides applications and decision-making solutions to ensure effective management and monitoring of project and department activities grounds up from Beat level to Range, Subdivision, District and State.

The FIGS system has built applications and decision-making solutions for the following activities:

1. Forest Management
 - a. Plantation Management
 - b. Working Plan Management
 - c. Nursery Planning and Management
2. Catchment Management
 - a. SMC Management
 - b. Watershed Management
3. JFMC Management
4. SHG Management
5. NTFP Monitoring and Management
 - a. Resource Monitoring and Management
6. Livelihood Solutions
 - a. Agroforestry Solutions
 - b. Fisheries Solutions
 - c. Livestock Solutions
 - d. Ecotourism Solutions
 - e. NTFP Solutions
7. Project Management
 - a. Asset Management
 - b. HR Management
 - c. Finance Management
8. Capacity Building

The Decision-making solutions and applications developed in FIGS ensure that all the above activities are considered and taken care of right at the outset and regularly monitored and updated from planning to implementation to impact assessment and governance for all the projects and activities of Tripura Forest Department.

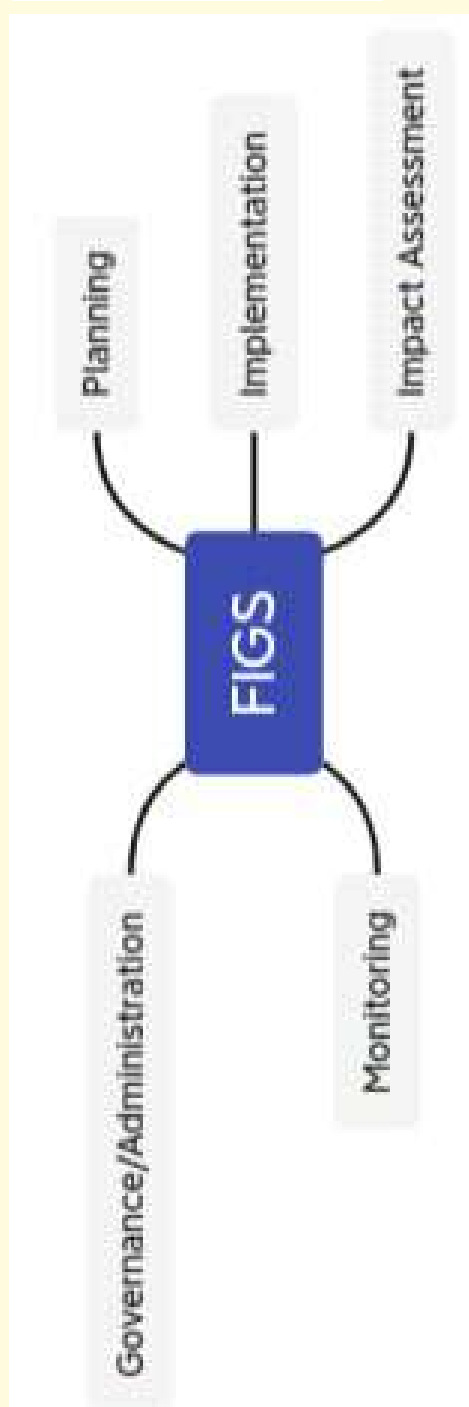
The FIGS system with shared and common database for all projects and departmental activities ensures that the data and project legacy is maintained even after the completion of the projects. The management and maintenance of single and unified spatial and non-spatial database is unique proposition through FIGS system.

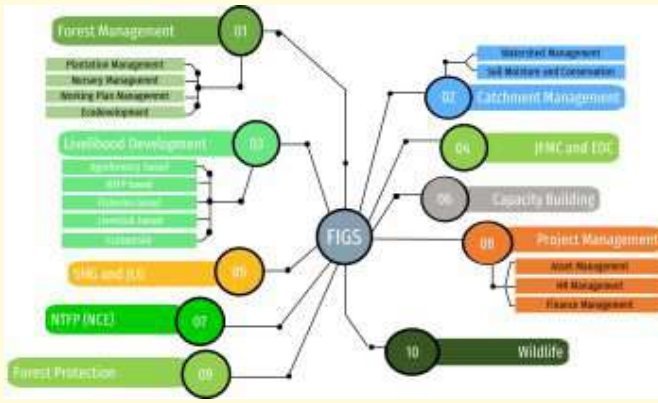
Easy to use Mobile and Web applications for forestry works embedded with spatial information.

04

Connected flow of information from planning to implementation till monitoring and evaluation.

05



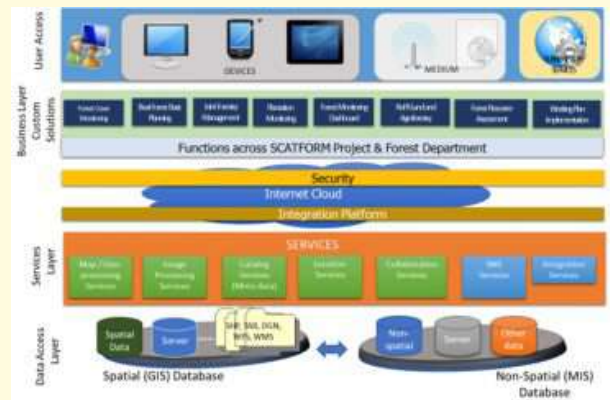


FIGS system also provides seamless linkages at different levels of forest planning and management from micro to macro, with both upstream and downstream synchronization of information. Starting from planning at JFMC through micro plans to Beat level planning as BFBP and then moving up the range, subdivision and district level planning, working plan prescriptions, FIGS connects and link planning and management of forestry and allied activities scientifically across different projects and at different administrative

IGS as a platform links spatial data and information with non-spatial data and information transformed through scientific knowledge and understanding into providing applications and solutions for informed and judicious decision making.

The applications and solutions with consolidated scientific know how as Dashboards has enabled decision making at different levels of administration from Beat to Range to Subdivision to District and then consolidated at State.

The seamless and unified flow of information and knowledge across various activities, projects and administration levels is the unique feature of FIGS.



to the working plan prescriptions and vice versa.

The use of scientific knowledge in planning and management right from Beat level up to district and state is the major innovation through FIGS.

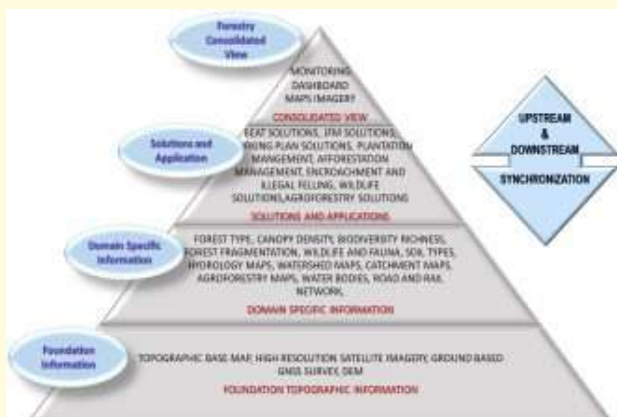
FIGS: Innovations and Breakthroughs

FIGS system provides end-to-end workflows across different forestry activities on a geospatial platform. The field staff can capture spatial details regarding the plantation and SMC activities carried out in each Beat for different projects and align it to the working plan prescriptions and vice versa.

The use of scientific knowledge in planning and management right from Beat level up to district and state is the major innovation through FIGS.

FIGS: A Unified Platform ushering Digital Transformation in Forestry

FIGS provides a unified platform for all projects and all the forestry and allied activities ushering digital transformation in forestry by getting integrated with the workflows and process flows of departmental activities. Forestry activities such as plantation and SMC as well as allied activities such as joint forest management, livelihood development, institutional strengthening and capacity building are all linked through FIGS. The linkages between the various activities and their impact on each other can also be measured and monitored using FIGS platform. The geospatial information and the associated non-spatial information are seamlessly connected to provide consolidated view of forestry and allied activities for scientific decision making. To ensure smooth functioning of the system, it needs to be constantly updated and maintained where:





Sh. Sukhwinder Singh
Hon'ble Chief Minister H.P.



Prof. Chander Kumar
Hon'ble Agriculture Minister H.P.

Himachal Pradesh Crop Diversification Promotion Project Phase-II

Department of Agriculture, Himachal Pradesh

Govt. of Himachal Pradesh implemented Himachal Pradesh Crop Diversification Promotion Project (HPCDP), Phase-I in 5 districts viz., Hamirpur, Bilaspur, Una, Kangra and Mandi that leads to the diversification of 3264 Ha. area from traditional crops like maize, wheat, etc., to commercial crops including vegetables. The success of first phase of HPCDP, lead to the approval of second phase by the Government of India and JICA in January 2021, on which ₹ 1010.60 crore would be spent.

Loan Effectuation for Phase-II of the project was accorded by JICA on 21st July 2021.

Project Description:

Project Name	Himachal Pradesh Crop Diversification Promotion Project (Phase-II)
Project Area	All 12 Districts of Himachal Pradesh
Project Duration	9 Years, (2021-2029)
Objective	To promote sustainable crop diversification to high value crops To increase agricultural productivity and To improve farmers' income.
Project Scope	To establish crop diversification model in 7 new districts, and expand the model to 5 Phase-I districts.

Implementing Agency- Himachal Pradesh Agricultural Development Society through Department of Agriculture

Project Cost:

Total project cost	₹ 1010.60 Crore
JICA Part (Loan)	₹ 807.30 Crore (1.15 percent interest rate)
State's share	₹ 203.30 Crore

NABARD in HIMACHAL PRADESH

National Bank for Agriculture and Rural Development (NABARD) is facilitating agriculture and rural development in Himachal Pradesh by providing credit support to the rural financial institutions as well as grant assistance for various development works for promoting sustainable and equitable agriculture and rural prosperity.

NABARD is providing financial assistance to banks for providing crop loans to farmers at concessional rates besides boosting investment in agriculture and diversified activities. Under the Rural Infrastructure Development Fund, NABARD is providing financial assistance to the state government for projects related to road construction, bridge construction, minor irrigation, polyhouse, rural drinking water scheme, flood protection.

Developmental initiatives of NABARD include livelihood opportunities through participatory watershed projects, development programs for tribal areas, women empowerment through self-help group bank linkage programs, farmers' club programs and various farmer centric measures are also included.

NABARD is also playing an important role in increasing the income of farmers in the agriculture sector, in which 125 Farmer Producer Organizations of farmers are being promoted in the state for activities like cultivation of vegetables, dairy, flowers and mushrooms.



← *SWAN Flood protection work, Una*

Vegetable Nursery by FPO in Sirmour →



A total of 42 watershed projects are being implemented in the State through Watershed Development Fund covering 30300 Ha. NABARD is also implementing tribal development projects for setting up of wadis i.e. fruit orchards in the Scheduled Tribes areas to generate the sustainable livelihood options to tribal population. 14 TDF projects have been sanctioned covering 2355 acres of land and benefitting 3355 families.

NABARD is also providing financial assistance for setting up of Rural Haats and Rural Marts to support to rural artisans, weavers, SHGs and other entrepreneurs to market their products effectively. In Himachal Pradesh, five Rural Haats and 22 Rural Marts have been supported by NABARD. Pangi Hills is an example of a successful Rural Mart in the State which is facilitating the sale of products made by member of SHGs and FPOs collection and sale of minor forest produce. NABARD also support Exhibitions/Melas which provide a unique platform for the beneficiaries (artisans, craftsmen, etc.) to develop direct linkages with customers, understand their needs & requirements and earn additional income through sale of their products.



← *Apple wadi under TDF Nichar (Old) Project in Kinnaur*

SHE Haat in Pachhad Block, Distt. Sirmour →





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- Project Formulation
- Program Monitoring Management
- Capacity Building
- Evaluation & Assessment
- Project Management Consultancy
- Feasibility Studies & Market Research
- Resource Support Agency
- Exposure Visits to Best Practices
- GIS-based Mapping

OUR CORE COMPETENCE

Socio-Economic Sector
Climate Change
Skill Development
Rural Infrastructure
Agriculture & Allied Sectors
Banking and Finance
Food Processing
Warehousing and Storage
Agri- Entrepreneurship
Micro and Small Enterprises
Textile Sector
Natural Resource
Water Resource
Renewable Energy
Micro Finance
Financial Inclusion

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HP State Compensatory Afforestation Fund Management And Planning Authority (CAMPA)



OVERALL GOAL:

HP compensatory afforestation funds management & planning authority (HP CAMPA) moving towards enhancing the green cover of the state, working for conserving soil & water regime; protection of wildlife & providing jobs opportunities to the locals.

HP STATE CAMPA

ROLE AND RESPONSIBILITIES

Information Technology Wing of the Forest Department is headed by an officer of the rank of Additional Principal Chief Conservator of Forests and is mandated with the automation of the businesses and processes of the Forest Department with a view to simplify and make them user friendly, and improve democratic, government and business aspects of governance. Make the department easily accessible to the public.

Information Technology Wing aspires to:

- HP STATE CAMPA, constituted vide GoHP Notification dated 03.08.2009, receives funds from Central Adhoc CAMPA.
- It functions through a Governing Body, a Steering Committee and an Executive Committee.
- The Governing Body, headed by Chief Minister, lays down broad policy framework and reviews its working from time to time.
- The Steering Committee, having Chief Secretary as its Chairperson, approves rules and procedures, monitors progress of funds utilisation, and approves APOs, reports and accounts.
- The Executive Committee, with PCCF (HoFF) as its head, prepares and submits APOs to Steering Committee for approval, supervises the implementation of works, submits reports to Steering Committee & prepares annual reports.
- The HP State CAMPA implements various schemes through the field units of HP Forest Department and provides funds by transfer to the bank accounts of respective field offices as per approved APOs.

-sd-

Chief Executive Officer,
HP State Authority CAMPA

Address: Office Of HP State Compensatory Afforestation Fund Management And Planning Authority (HP State CAMPA), Aranya-Bhawan, Talland, Shimla – 171 001 H.P.
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हमारा साझा विज़न:
2023-24 तक 5000 मेगावाट, 2030 तक 25000 मेगावाट तथा 2040 तक 50000 मेगावाट



जल विद्युत



पवन विद्युत



सौर विद्युत



विद्युत पारेषण



ताप विद्युत



पॉवर ट्रेडिंग



प्रचालनाधीन परियोजनाएं:

- 1500 मेगावाट नाथपा झाकड़ी जल विद्युत स्टेशन
- 412 मेगावाट रामपुर जल विद्युत स्टेशन
- 47.6 मेगावाट खिरवीरे पवन विद्युत स्टेशन
- 5.6 मेगावाट चारंका सौर पीवी विद्युत स्टेशन
- 50 मेगावाट साडला पवन विद्युत स्टेशन
- एनजेएचपीएस में 1.31 मेगावाट ग्रिड कनेक्टिड सौर विद्युत स्टेशन
- 75 मेगावाट परासन सौर विद्युत स्टेशन
- 400 केवी, डी/सी क्रॉस बार्डर ट्रांसमिशन लाइन (भारतीय हिस्सा)

विकासाधीन परियोजनाएं:

- भारत के विभिन्न राज्यों में जल विद्युत परियोजनाएं
- नेपाल में जल परियोजनाएं
- बिहार में ताप परियोजना
- भारत के विभिन्न राज्यों में सौर विद्युत परियोजनाएं
- ट्रांसमिशन लाइनों का निष्पादन



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Management from Wildlife Institute of India (WII), Dehradun, Uttarakhand. He prepared prestigious Working Plan of Shimla Forest Division and chapters of many new aspects of Forestry Management keeping in view the present day need e.g. of Participatory Forest Management, Wildlife Management etc. were introduced in the working plan. He conducted a short term study on impact of the Manimahesh Fair in Chamba District of HP on the Ecology of the area which was appreciated and implemented by the Govt of H.P. for management of natural landscape. As DFO Wildlife Shimla the interventions like Water Management and Bamboo plantations as replacement of Lantana had made Simbalwara Wild Life Sanctuary as a permanent home for the Elephants and occasional sightings of tigers as well. As director of the Great Himalaya National Park (GHNP) the concept of Community Participation in management of protected areas was firstly introduced under FREE Project in GHNP which is now UNESCO World Heritage Site. He is widely travelled across the world including countries like USA, UK, Germany, Sweden, Finland, USSR, Nepal, Bhutan, Thailand, China, Japan, France etc. for different official assignments.

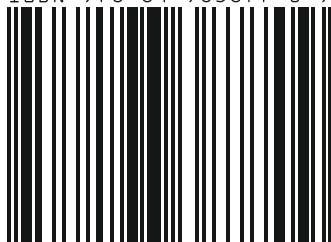


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Dr Lal Singh a Botanist by education, founder Director of the Himalayan Research Group (HRG), consultant for livelihood and gender at JICA aided HP Forestry Project is a Development Professional having more than 30 years experience of working with communities in remote and difficult mountain areas of Indian Himalayan Region. Dr Singh work to strengthen the livelihoods, biodiversity conservation, climate change resilience and overall development of communities in difficult mountains. Success and popularization of community oriented technology models of rural relevance developed with grants from national and international agencies by Dr Singh attracted his participation in different state and national level forums which includes, Steering Committee on Voluntary Sector for 12th Five Year Plan of the then Planning Commission of India, Research Policy Committee (RPC) of

Indian Council of Forestry Research and Education (ICFRE), Deharadun, Member of the NMPB Govt. of India since Oct. 2020 and in different NMPB technical committees, He is also a Member of the Committee, Mapping of Science and Technology Needs of the states, project through State Science and Technology Programme (SSTP) of the DST Govt. of India by HIMCOSTE, Shimla H.P., Member State Level Technical Committee (SLTC) 'Secure Himalayas' MoEF&CC, UNDP-GEF Project H.P. Forest Department, Govt. of H.P. Dr Singh is also a Visiting Faculty, State Institute of Rural Development (SIRD) and Himachal Institute of Public Administration (HIPA) Shimla for watershed development activities, livelihood, enterprise development, project and report writing and Sustainable Development Goals (SDGs). He delivered popular lectures and attended advanced trainings in USA, UK, Canada, Finland and Thailand. Dr Lal Singh's efforts were recognized by the state of H.P by conferring the State Innovation Award in 2018, for developing the Mountain Solar Water Heating System (Solar Hamam) and was also awarded a prestigious Jammalal Bajaj Award for Outstanding Contribution in the field of Application of Science and Technology for Rural Development -2021.

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