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# Sustainable Management of Forest Ecosystem Services

Final Project Report (2021-2024)



As a federally owned enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

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New Delhi, December 2024



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# LIST OF ABBREVIATIONS

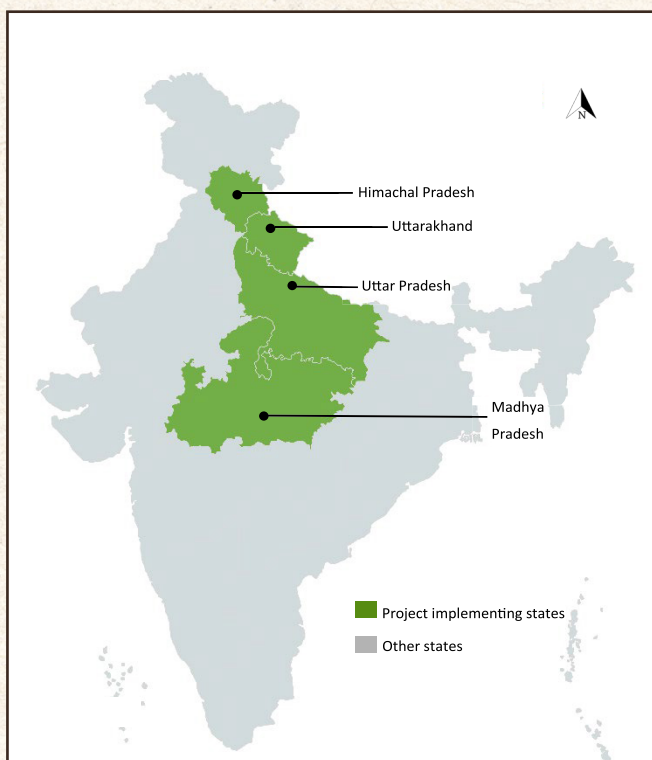
BMZ	German Federal Ministry for Economic Cooperation and Development
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CASFOS	Central Academy for State Forest Service
CAT	Catchment Area Treatment
CHIRAG	Central Himalayan Rural Action Group
eFOREST	ecological Forest Record Entry System
FAO	Food and Agriculture Organisation
FES	Forest Ecosystem Services
FPO	Farmer Producer Organisation
FTIs	Forest Training Institutes
FTAs	Forest Training Academies
GA	Grant Agreement
HoFF	Head of Forest Force
H.P.	Himachal Pradesh
HPFD	Himachal Pradesh Forest Department
IA	Implementation Agreement
IbMs	Incentive based Mechanisms
ICAR-CAFRI	Indian Council of Agricultural Research-Central Agroforestry Research Institute
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IGNFA	Indira Gandhi National Forest Academy
MoEFCC	Ministry of Environment, Forest and Climate Change
M.P.	Madhya Pradesh
MPFD	Madhya Pradesh Forest Department
NWPC	National Working Plan Code
NGO	Non Governmental Organisation
PCCF	Principal Chief Conservator of Forest
PSC	Project Steering Committee
QPM	Quality Planting Material
SARRA	Spring and River Rejuvenation Authority
SMC	Springshed Management Consortium
SDGs	Sustainable Development Goals
SRLM	State Rural Livelihood Mission
SWCWS	Shimla Water Catchment Wildlife Sanctuary
TMS	Training Management System
TNA	Training Needs Assessment
TNAU	Tamil Nadu Agricultural University
U.K.	Uttarakhand
UKFD	Uttarakhand Forest Department
U.P.	Uttar Pradesh
UPFD	Uttar Pradesh Forest Department

## Context

Forest and agroforestry ecosystems play a crucial role in our lives, far beyond providing timber. Among the myriad ecosystem services they provide, water is the most critical one for sustaining life. Forests are intrinsically linked to water as forested watersheds and provide 75 % of our accessible freshwater resources (Millennium Ecosystem Assessment, 2005).

Restoring and maintaining degraded forest and agroforestry lands to regulate the flow of streams can significantly improve the accessibility of water resources. Landscape approaches also emphasise the need to manage forests for ecosystem services to maximise their flow and ensure equitable distribution (Advancing the Forest and Water Nexus, FAO, 2019).

However, despite its importance, forest and agroforestry management is not yet sufficiently oriented to integrate the Forest Ecosystem Services (FES) approach. This approach states that the forest management focuses on the sustainable provision of a set of prioritised ecosystem services based on stakeholder choices. Integrating this approach into management decisions is essential for sustainable forest and agroforestry practices, particularly to enhance water availability and other crucial ecosystem services.



## About the Project

The Indo-German development cooperation project 'Sustainable Management of Forest Ecosystem Services (FES)' was implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in India, on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). It was executed in cooperation with the Indian Ministry of Environment, Forest and Climate Change (MoEFCC) at the national level, and the forest departments of Himachal Pradesh (HPFD), Uttarakhand (UKFD), Uttar Pradesh (UPFD), and Madhya Pradesh (MPFD) at the state level.

**The project supported the increased orientation of forest and agroforestry management towards forest ecosystem services, with focus on water availability.**

The agroforestry component was subsequently introduced into the project and implemented exclusively in the pilot sites of Madhya Pradesh and Uttar Pradesh.

## Pilot Sites

### *Himachal Pradesh:*

- Suliali, Nurpur Forest Division (District Kangra),
- Pathrevi, Karsog Forest Division (District Mandi),
- Priyungal, Dalhousie Forest Division (District Chamba)

### *Uttarakhand:*

- Okhalisirod, Civil Soyam Forest Division (District Almora/Bageshwar),
- Syat, Ramnagar Forest Division (District Nainital),
- Bhilaru-Jinsi, Mussoorie Forest Division (District Dehradun/Tehri Garhwal)

### *Uttar Pradesh:*

- Sutta Singar (District Jhansi),
- Chandrapura, Baniyatala (District Mahoba),
- Pura-Khurd, Pura Birdha, Jhawar (District Lalitpur),
- Alenabad, Gahasand, Marad, Kodri, Rakhukhor (District Gorakhpur)

### *Madhya Pradesh:*

- Etwan, Pipri (District Chhatarpur),
- Chachawali, Bamohri, Shital (District Niwari)



Community members from the Syat demonstration site, U.K.  
© GIZ/Aashima Negi

## IMPLEMENTATION APPROACH

**Target Group:** Members of marginalised and disadvantaged rural populations, particularly smallholders and farmers' associations, whose livelihoods heavily depend on FES, especially water resources. These groups are expected to benefit from improved access to these services through adapted forest management practices.

The following four output areas define the implementation approach of the project:

1. **Output 1:** Actors at national, state and local level have coordinated their efforts to implement FES management on a broad scale.
2. **Output 2:** The feasibility of cross-sectoral approaches to FES management is demonstrated.
3. **Output 3:** Experiential knowledge for a sustainable management of forest ecosystems is available.
4. **Output 4:** The operational conditions for ecologically and economically sustainable value creation from agroforestry systems have improved in M.P. and U.P.

## Major Events under the Project

- **1 September 2021:** Project launch event in Shimla.
- **22 November 2021:** Implementation Agreement (IA) signed.
- **22-24 September 2021:** First Operational Planning (OP) workshop.
- **7 October 2021:** Constitution of the Project Steering Committee (PSC).
- **19 February 2022:** OP workshop for the agroforestry component.
- **6 July 2022:** First PSC meeting.
- **April-July 2023:** Project's mid term evaluation.

# KEY ACHIEVEMENTS AND HIGHLIGHTS

01.

Inputs were provided to the revision of the **National Working Plan Code 2023** to integrate the FES approach effectively *(details mentioned on page 8)*.

02.

Inputs will be integrated in the upcoming **U.P. State 'Agroforestry and Agroforestry Produce-based Promotion Policy'** *(details mentioned on page 16)*.

03.

Recommendations for establishing a Springshed Management Consortium (SMC) to conserve springs and their catchment areas through sustainable forest ecosystem management were adopted by the **Spring and River Rejuvenation Authority (SARRA)**, enacted by the Government of U.K. *(details mentioned on page 7)*.

04.

Development of an ecological Forest Record Entry System (**eFOREST**) **Web Portal** for the HPFD to address critical challenges in forest compartment management *(details mentioned on page 14)*.

05.

Applications for funds from **CAMPA and state funds** for micro-planning activities at the three pilot sites in U.K. have been approved by the UKFD.



# Contribution to India's National and International Goals and Declarations

## Contribution to Sustainable Development Goals


 <p><b>2 ZERO HUNGER</b></p> <p>End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	 <p><b>15 LIFE ON LAND</b></p> <p>Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss</p>
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### Contribution to the Global Biodiversity Framework

<p><b>1</b></p> <p>Plan and Manage all Areas to Reduce Biodiversity Loss</p>	<p><b>8</b></p> <p>Minimize Impacts of Climate Change on Biodiversity and Build Resilience</p>	<p><b>10</b></p> <p>Enhance Biodiversity and Sustainability in Agriculture, Aquaculture, Fisheries, and Forestry</p>	<p><b>20</b></p> <p>Strengthen Capacity-Building and Scientific and Technical Cooperation for Biodiversity</p>	<p><b>21</b></p> <p>Ensure That Data and Knowledge are Available and Accessible to Guide Biodiversity Action</p>
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## Sustainable Management of Forest Ecosystem Services Project

### Efforts in line with the G20 New Delhi Leaders' Declaration



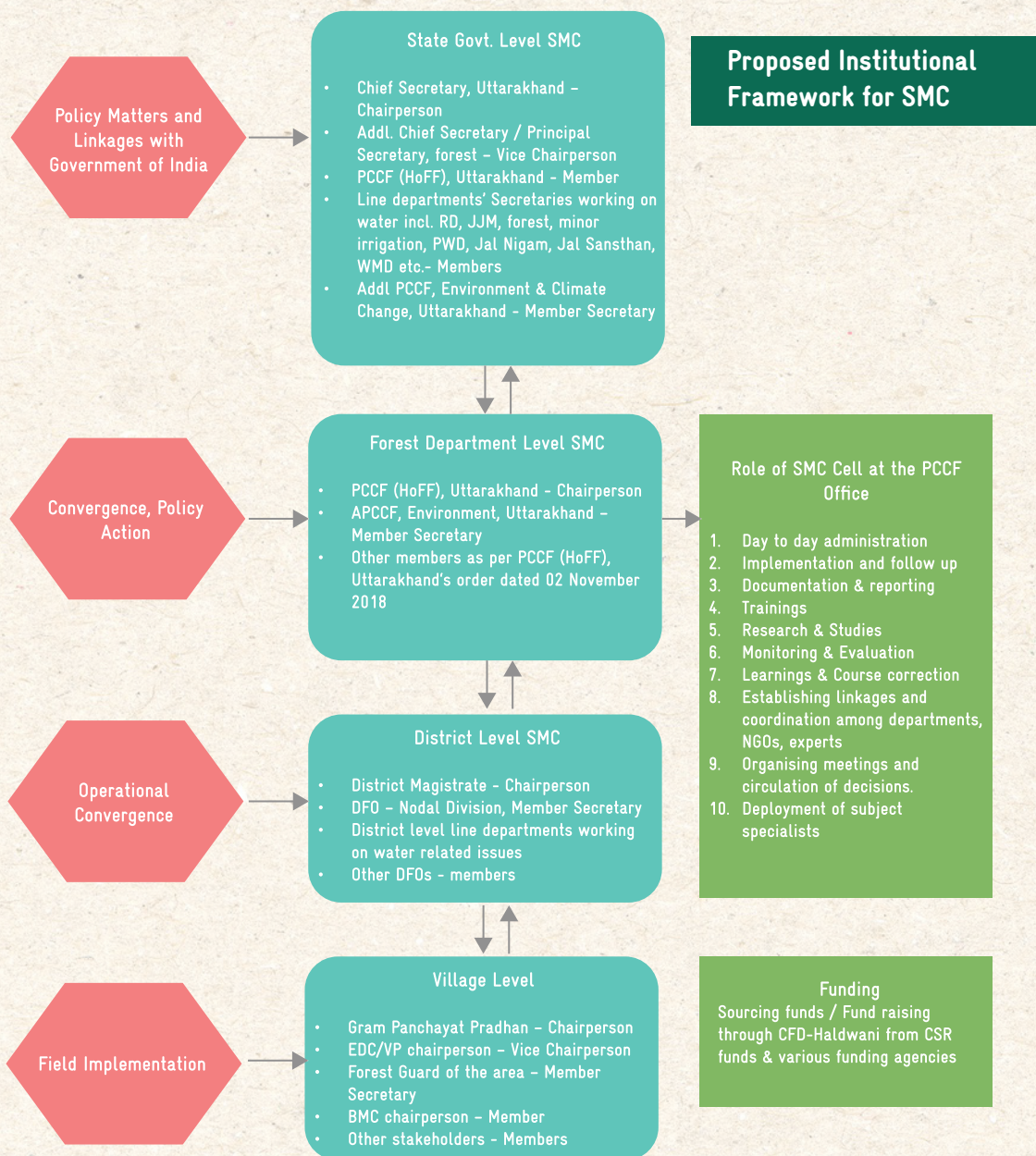
<p style="text-align: center;">Eliminating</p> <h3 style="text-align: center; background-color: #00796b; color: white; padding: 5px;">HUNGER AND MALNUTRITION</h3> <p><b>Guidelines for producing quality planting material</b> for higher yield and quality of climate resilient agroforestry species.</p> <p><b>Nursery manual</b> for farmers dedicated to the production of robust tree saplings to maximise the objective of good agroforestry cover.</p> <p><i>Inputs integrated into the U.P. State 'Agroforestry and Agroforestry Produce based Promotion Policy 2023'.</i></p>	<p style="text-align: center;">Conserving, Protecting,</p> <h3 style="text-align: center; background-color: #00796b; color: white; padding: 5px;">SUSTAINABLY USING AND RESTORING ECOSYSTEMS</h3> <p>Contributing to the sustainable planning of <b>2,71,860 ha</b> through zone wise management, under 15 FES management plans in H.P. and U.K. and formulating a chapter on integration of the FES approach in 3 forest divisional working plans of H.P.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="background-color: #fff9c4; padding: 5px;">Includes planning and field demonstration area</td> <td style="background-color: #fff9c4; padding: 5px; text-align: center;"><b>FES Management Plans Area: 7,030 ha</b></td> <td style="background-color: #fff9c4; padding: 5px; text-align: center;"><b>Working Plans Area: 2,64,830 ha</b></td> <td style="background-color: #fff9c4; padding: 5px; text-align: center;">Total working plan area of 3 forest divisions</td> </tr> </table> <p><b>Compendium of new and emerging best practices for managing forests for water availability,</b> consisting of international, regional (Himalayan Hindukush Region), state, and local level case studies.</p>	Includes planning and field demonstration area	<b>FES Management Plans Area: 7,030 ha</b>	<b>Working Plans Area: 2,64,830 ha</b>	Total working plan area of 3 forest divisions
Includes planning and field demonstration area	<b>FES Management Plans Area: 7,030 ha</b>	<b>Working Plans Area: 2,64,830 ha</b>	Total working plan area of 3 forest divisions		
<p style="text-align: center;">Fostering</p> <h3 style="text-align: center; background-color: #00796b; color: white; padding: 5px;">DIGITAL ECOSYSTEMS</h3> <p>Digital formats for knowledge exchange such as E learning modules are being integrated into the <b>iGOT Karmayogi</b> Platform.</p> <p>An <b>eFOREST</b> portal for supporting the planning and management processes within the Himachal Pradesh Forest Department.</p> <p style="color: red; text-align: center;"><b>A web portal and mobile application for inventory of springs in U.K.</b></p>	<p style="text-align: center;">E LEARNING MODULES LIST</p> <ul style="list-style-type: none"> <li>Springshed management</li> <li>Hydrological data collection,</li> <li>Upstream downstream dynamics,</li> <li>Valuation of ecosystem services,</li> <li>Riparian succession and river health,</li> <li>Development of indicators for monitoring of FES</li> </ul> <p><b>IBM MODELS</b></p> <ul style="list-style-type: none"> <li style="background-color: #f44336; color: white; padding: 5px; margin-bottom: 5px;">Enhancing local income</li> <li style="background-color: #f44336; color: white; padding: 5px; margin-bottom: 5px;">Revenue sharing, marketing of local products</li> <li style="background-color: #f44336; color: white; padding: 5px;">Climate change mitigation/adaptation</li> </ul> <p>Designing and implementing scalable and feasible gender responsive <b>Incentive based Mechanisms</b> for a sustained flow of FES, engaging multistakeholders. This involves mobilising innovative ideas to secure additional funding for forest management from diverse sources.</p> <p style="font-size: small; text-align: right;"><a href="https://indo-germanbiodiversity.com/articles-details-48.html">Link to an article: https://indo-germanbiodiversity.com/articles-details-48.html</a></p>				
<p style="text-align: right;"><b>Abbreviations</b></p> <p style="font-size: x-small;">FES: Forest Ecosystem Services H.P.: Himachal Pradesh U.K.: Uttarakhand U.P.: Uttar Pradesh M.P.: Madhya Pradesh IBMs: Incentive based Mechanisms</p>					

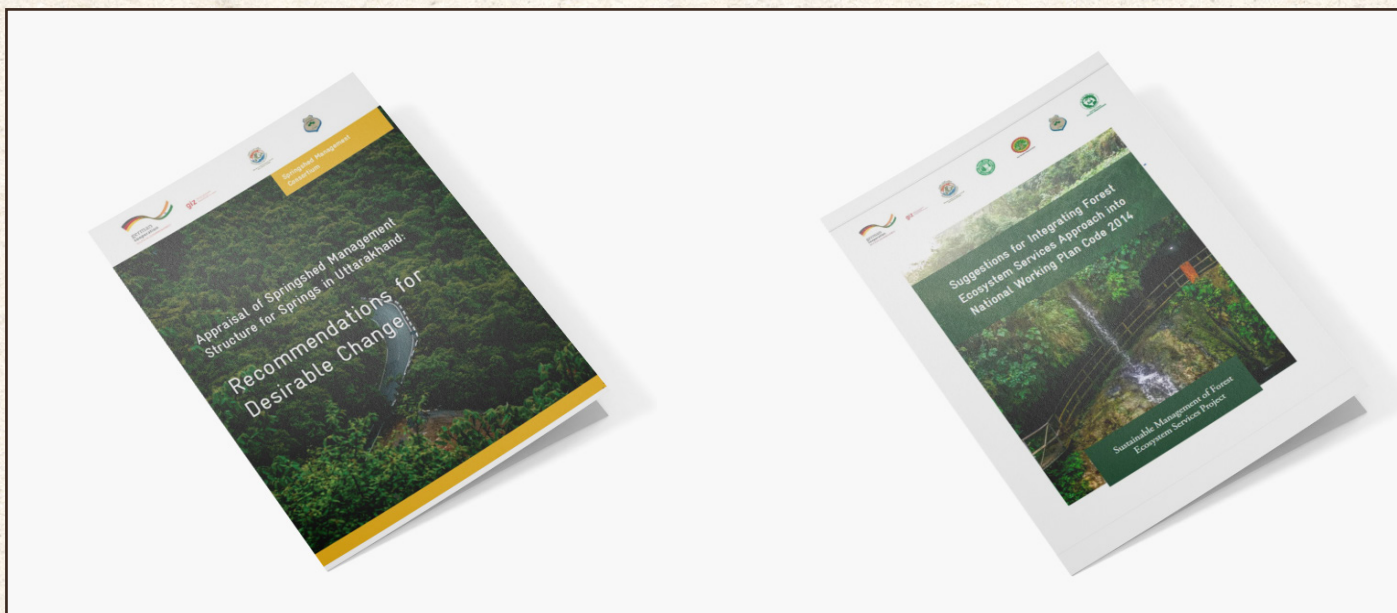
# Output 1: Actors at national, state and local level have coordinated their efforts to implement FES management on a broad scale

Output 1 aims at coordination among stakeholders at the national, state, and local levels to facilitate broad-based implementation of FES management. To achieve this, the project supported the MoEFCC and federal forest authorities in developing strategies for coordination and exchange mechanisms, emphasising approaches and best practices in forest ecosystem management.

The following interventions were implemented under this output area:

- Recommendations for establishing a **Springshed Management Consortium (SMC)** were submitted to the Government of Uttarakhand (GoUK) for adoption by the Spring and River Rejuvenation Authority (SARRA). These recommendations focused on creating an institutional structure and defining roles among the involved departments and stakeholders, leading to the development of a four-tier SMC structure, ranging from the state government level, responsible for policy decisions, to local-level bodies such as Gram Panchayats.





*Report on Appraisal of Springshed Management Structure for Springs in U.K.: Recommendations for Desirable Change*

*Report on Suggestions for Integrating the FES Approach into the National Working Plan Code 2023*

- Inputs were provided to the revised **National Working Plan Code (NWPC) 2023** to integrate the FES approach effectively. The report highlighted prioritised ecosystem services and key drivers identified for various forest ranges within the Solan Forest Division of H.P. Additionally, it included data from nine micro plans in H.P., outlining prioritised FES and their corresponding drivers. Monitoring indicators for these ecosystem services were also detailed, ensuring a robust framework for assessment. Key suggestions were offered to enhance the integration of FES into the working plan, focusing on actionable strategies and sustainable management practices. The following additions have been incorporated into the NWPC 2023: If the objective of forest management is to protect, rehabilitate, or enhance the forest to ensure the provision of ecosystem services beyond timber and fuelwood—such as water regulation and biodiversity conservation—the desired forest structure may differ from that of a productive forest. Even when a forest is managed primarily as a healthy productive forest with regeneration felling, it provides ecological services as a by-product. Similarly, when a forest is primarily managed for ecosystem services, it does provide goods such as timber and firewood as by-products.
- Working aids** were identified and developed in consultation with project partners to support the implementation-oriented management of states adopting the FES approach. These include:

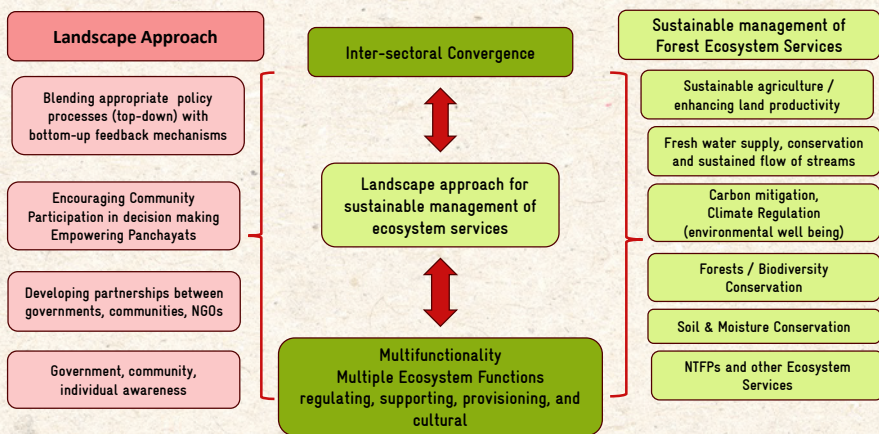
  1. Site selection criteria for micro planning: The criteria was used to identify suitable demonstration sites for zone wise management of FES by the HPFD and UKFD.
  2. Methodology for the integration of the FES approach was used in the preparation of six micro plans (in H.P. and U.K.) and two forest divisional working plans of Rohru and Dharamshala (in H.P.).
  3. An Excel-based tool designed to guide practitioners in selecting appropriate FES valuation approaches based on the intended application of the valuation.
  4. Toolkits for the institutionalisation of feasible Incentive based Mechanism (IbM) models were developed for: *'Enhancing Incomes through the Promotion of Ecotourism'* which was designed to guide field staff in implementing ecotourism as a mechanism for sustainable FES management. Recognising ecotourism as a dynamic, community-centric concept, the toolkit provides a comprehensive framework outlining the necessary conditions, policy support, and institutional arrangements for planning and executing ecotourism activities. It emphasises collaboration among key departments, including Tourism, Forest, Finance, Rural Development, Industries, Revenue, and Jal Shakti. The toolkit on *'Incentivising Forest Development and Conservation by Attracting Large Investments in Community-Based Climate Change Mitigation Actions'* was developed to simplify the implementation, outlining roles for forest department staff and stakeholders in community-based carbon forestry projects.

The MoEFCC and the FES Project jointly convened a national conference to sensitise the working plan implementing officers of all Indian states and union territories about the NWPC 2023.

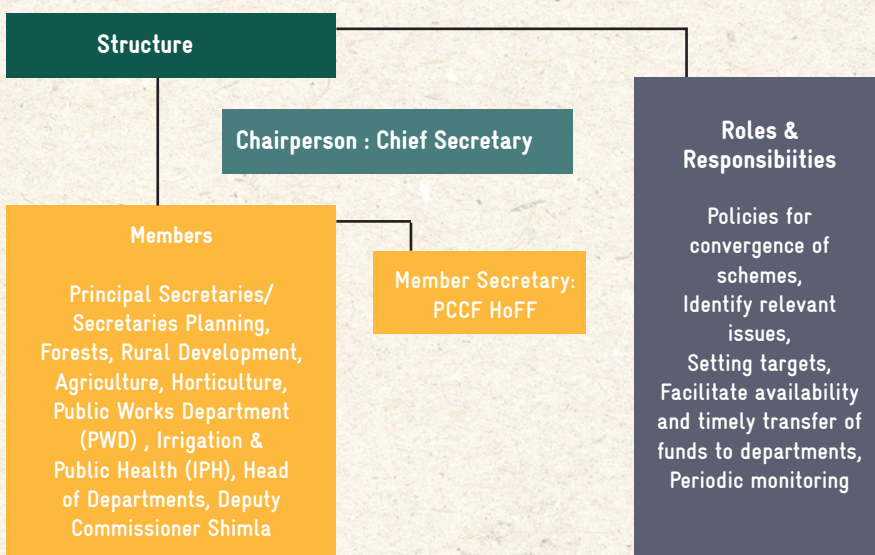


- A study titled **'Monitoring Framework for Indirect Benefits from the FES Project'** was conducted to estimate the project's indirect benefits and beneficiaries. The study was pivotal in defining the beneficiaries and developing a comprehensive methodology for estimating indirect benefits from both forests and agroforestry. It outlines a series of measurable interventions based on this methodology, aligned with 10 predefined global standard indicators assigned to the project. These indicators assess the impact of benefits on the beneficiaries effectively.
- A study to design a practical framework for the implementation of a **landscape approach** to manage forests and complementing ecosystems for ensuring a sustained flow of the prioritised ecosystem services, including water provisioning was conducted in H.P.

### Elements of Landscape approach for sustainable management of FES



### State Level Committee Structure for H.P.



To facilitate cross sectoral convergence at a landscape level, the following institutional set up was proposed and agreed upon in principle with the HPFD during a multistakeholder level consultation:

- State Level Committee – under the Chairmanship of the Chief Secretary, Government of H.P. (GoHP)
- District Level Committee – under the Chairmanship of the Deputy Commissioner
- Sub District Level Committee – under the Chairmanship of Sub-Divisional Magistrate
- Village Level Committee – under the Chairmanship of Gram Pradhan

## NAULA MANAGEMENT: The Traditional Water Harvesting System

Nakina, Pithoragarh District, Uttarakhand, India

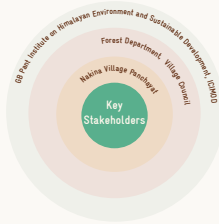
### Key Highlights

- This case study details the improvement of water discharge from three vital springs - Bhind, Hess, and Vaishnavi - in Nakina Village. This was achieved through the implementation of soil and water conservation technology by the local community.
- The Sarpanch of the Gram Panchayat, Mr. Joshi, played a key role in guiding the community to develop and implement effective strategies that ensured positive outcomes.
- The convergence of multi-agency technical and financial support enhanced ecosystem services, leading to an increase in the discharge of three main springs in Nakina Village.
- Strong inter-linkages between science, practice, and policy were established, where traditional water management was supported using hydrogeological studies and springshed management.

### Background

Naulas, essential sources of drinking water, are among the most important hydraulic structures in the hilly region of Uttarakhand. These drystone masonry structures have a four-sided shape with stairs on all sides, typically covered by stone slates and enclosed by walls on three sides. To protect them from pollution and other harmful anthropogenic activities, communities have traditionally placed idols of gods and goddesses in the naulas.

In the villages of Nakina, Digtoli, and Bharmni, traditional practices to conserve naulas and the water that flows into them are still carried out. Older community members are particularly dedicated to the conservation and management of these structures. Historically, the communities have had ownership, control, and rights over these water resources. However, the rise in non-farm employment has impacted this traditional water management system.



### Actions

- 60 trenches, 1 large, and 4 small recharge ponds were constructed at selected sites on the upper slopes to catch surface runoff, increase infiltration, enhance groundwater recharge, and assist in recharging the natural spring. To ensure long-term effectiveness, villagers perform periodic maintenance and re-digging of recharge ponds and trenches annually, before the monsoon season.
- The community forest of Nakina village, spanning 97 hectares, was protected by constructing a rubble stone wall, complemented by a firebreak with a 2-meter gap on both sides of the wall.
- Assisted natural regeneration combined with planting of broadleaved species in the field and the establishment of a fodder nursery in the village, was carried out to improve the livelihoods of land users.
- 5 check dams and 5 check walls were constructed to reduce runoff damage to settlements and to conserve the forest walking trail used by local people for fodder and grass collection.
- Community members involved in constructing the structures were incentivized with a small compensation of 5.30 USD (400 INR) per day.

### Impacts and Achievements



- The impact of flash floods has been minimized, consequently reducing downstream flooding.
- The yield of water in the springs has improved due to enhanced forest management and soil and water conservation practices. This has also led to increased growth and cover of local vegetation.
- Overall, the impact has been an increase in moisture conservation, regular groundwater recharge, enhanced water flow from springs, decreased soil erosion, improved water infiltration, and a healthier vegetation cover, particularly in the broadleaf/oak forests.

### Gaps/Shortcomings

Community-based organizations for natural resource management can be effective if they are rooted in local institutional structures, traditional norms, indigenous knowledge, and sacred belief systems. This case clearly shows the importance of policymakers acknowledging and integrating local knowledge, norms, and belief systems into decision-making processes. It demonstrates that traditional institutions can manage natural resources effectively with technical support from NGOs, scientific institutions, and the Forest Department. Furthermore, it emphasises the imperative of extending similar initiatives to all villages in the region grappling with the depletion of springs due to diverse factors.

### Success Factors

- The local leadership of the Sarpanch in mobilizing people and designing effective strategies, followed by careful implementation, significantly contributes to success.
- Incentivizing land users is essential, as demonstrated by the provision of support amounting to 5.30 USD (400 INR) provided through the joint funds of Van Panchayat and the Uttarakhand State Forest Department.
- In addition to scientific knowledge, local knowledge, cultural, and religious beliefs play a vital role in successful local implementation.
- Traditional rights over these Naulas, along with mediation and negotiation within a multi-stakeholder setting.

### Replication Potential

The adoption of sustainable land management practices in upstream catchment areas, specifically those that are intricately linked to water recharge and the spring rejuvenation, serves as a model that can be replicated in other Himalayan states of India.

### References

Budala, E., Rawal, R.S., Dhyani, P. (2017) Stories of Success: narratives from a sacred land. GIP Pant National Institute of Himalayan Environment & Sustainable Development, Almora, Uttarakhand (India) available at: [https://www.researchgate.net/publication/320254010\\_Stories\\_of\\_Success\\_narratives\\_from\\_a\\_sacred\\_land/links/594f7858946dce52acc7889/Success-narratives-from-a-sacred-land.pdf](https://www.researchgate.net/publication/320254010_Stories_of_Success_narratives_from_a_sacred_land/links/594f7858946dce52acc7889/Success-narratives-from-a-sacred-land.pdf)

WOCAT SLIM Technologies



*From the compendium of best practices for enhancing water centric ecosystem services in the Indian Western Himalayan Region*

- A **compendium of best practices** for optimising forest management to enhance water ecosystem services in the Indian Western Himalayan Region has been developed. It highlights key actions, impacts, achievements, gaps, shortcomings, and success factors of cases with high replication potential in the states of H.P. and U.K.

The following cases for best practices have been identified and documented:

- Naula management in Nakina Village: The traditional water harvesting system, U.K.
- Community based spring rejuvenation in Lambgada, Almora District, U.K.
- Transforming pine to broadleaved forests: A women led van panchayat makes it possible in Tikauri village, Nainital district, U.K.
- "I was never a Mason!": A story of how para-worker's effort is conserving landscape and taking charge of their life
- Leading a community towards water security through springshed management
- Patal Bhuvneshwar, a sacred natural site in Pithoragarh, U.K.
- Women foresters of Amboya Village, H.P.
- Palampur Water Governance Initiative-Bohal, H.P.
- From practice to policy – establishing the SARRA, U.K.
- Springshed development in Thanakasoga Gram Panchayat, Sirmour District, H.P.

*Bhilaru Jinsi in Mussoorie, U.K.*

## Output 2: The feasibility of cross-sectoral approaches to forest ecosystem services management is demonstrated

**O**utput 2 aimed to demonstrate in practice the feasibility of cross-sectoral approaches to the management of FES involving different levels of stakeholders. This was achieved through the development and demonstration of micro plans for FES management at six demonstration sites in H.P. and U.K. that include forest for water activities and IbMs.

The following interventions were carried out under this output area:

- Under a Grant Agreement (GA) with a U.K. based NGO named Central Himalayan Rural Action Group (CHIRAG), activities were identified for the development of micro plans for six demonstration sites in H.P. and U.K., covering a total planning and intervention area of **2,366 hectares (ha)**: These micro plans outline zone-wise management strategies for prioritised FESs, as identified by local communities and other stakeholders. They address specific needs and priorities, ensuring that forest management practices are aligned to enhance water availability and other critical ecosystem services. The plans highlight the development of IbM models through sustainable forest management. Applications for funds from CAMPA and state funds for micro-planning activities at the three pilot sites in U.K. have been approved by the UKFD. Additionally, applications were submitted for funds under the Catchment Area Treatment (CAT) Plan to revitalise certain activities of the Alha microplan (District Dalhousie, H.P.), which was part of the predecessor Himachal Pradesh Forest Ecosystem Services Project.
- Feasible **IbM models** for the states of H.P. and U.K. were designed based on the analysis of successful global IbM models, along with community and state-level consultations. Recommendations for their implementation and institutionalisation were developed, taking into account their operational, financial, legal, and social feasibility, as well as associated constraints. The proposed IbM models align well with the established forest governance framework and meet the expectations and capabilities of forest-dependent communities. Their practical application and potential for wider replication will largely depend on the development and operationalisation of enabling governance frameworks that emphasise cross-sectoral coordination and inter-agency cooperation. It suggests that as the primary champions of IbM implementation, state forest departments need to cultivate a “cross-sectoral mindset.” This involves translating the needs and expectations from outside the forest sector into silvicultural responses and integrating them into micro-plans and other planning tools specific to the forestry sector. At the same time, state forest departments will rely on contributions from other sectors, including the provision of baseline data and support for monitoring and evaluating FES-IbMs.



*Women community members from the Pathrevi demonstration site, H.P.*

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## Proposed IbM Models for H.P. and U.K.

H.P.	Models common for both States	U.K.
<ul style="list-style-type: none"><li>• Share in the revenues from micro-hydel projects with local communities as incentive for protection and development of forests in catchment areas.</li><li>• Creation of income and employment generation by assigning catchment area treatment and forest protection tasks to the communities.</li></ul>	<ul style="list-style-type: none"><li>• Enhancing incomes through promotion of ecotourism.</li><li>• Enabling value addition and marketing of local products.</li><li>• Incentivising forest development and conservation by attracting large investments in community-based climate change mitigation and adaptation actions.</li><li>• Sharing of revenues from bottling of spring waters.</li></ul>	<ul style="list-style-type: none"><li>• Enhancing incomes by bringing more forest resources under the control of communities through the geographical expansion of Van Panchayats.</li><li>• Enhancing incomes of communities from increased water supplies by rejuvenation and maintenance of natural springs.</li><li>• Sharing Green Energy Cess with communities.</li></ul>

## Integration of the FES Approach in Working Plans

- Dedicated chapters focusing on the integration of the FES approach into the **working plans** for the Rohru and Dharamshala Forest Divisions, in alignment with the NWPC, covering a total area of **251,630 ha** were prepared. Key elements of the chapters included :
  - Identification and prioritisation of FES within the divisions, along with the analysis of drivers affecting the prioritised FES, and conducting a trade-off analysis at the forest management unit (compartment) level.
  - Identification of areas with overlapping working circles for better management of prioritised FES.



*Consultations for integrating the FES approach into the Working Plans of Rohru and Dharamshala Forest Divisions*



**Promoting NTFP-based enterprises in Pathrevi, H.P., by training local communities in pine needle handicraft development, with a focus on value addition and creating market linkages.**

The women of Pathrevi received both basic and advanced training in creating innovative, market-driven handicrafts using **chir pine needles**. The training focused on skill enhancement, value addition, and establishing market linkages to ensure sustainable livelihoods.

An NCR-based social start-up, supporting small-scale producers, committed to purchase orders worth Rs. 50,000 (555.82 EUR) from the artisans of Pathrevi. This commitment was split into two orders, with the initial order of approximately Rs. 15,000 (166.75 EUR), aligned with the production capacities of the participating women.

To formalise and strengthen their efforts, the following three Self-Help Groups (SHGs) were formed, with their bank accounts opened at the Karsog Cooperative Bank:

- Sakhi Saheli SHG
- Lakshmi SHG
- Someshwar Mahadev SHG

These SHGs will now be linked to various government initiatives and schemes, including the State Rural Livelihoods Mission (SRLM), and will continue to benefit from capacity-building trainings organised under these programs. This integrated approach aims to ensure sustained income generation and market access for the women artisans.



*Handicrafts made from chir pine needles showcasing artistry and innovation*



## Output 3: Experiential knowledge for a sustainable management of forest ecosystems is available

Output 3 focuses on equipping stakeholders with technical expertise and experiential knowledge to enable the sustainable management of forest ecosystems. This is achieved by integrating these concepts into existing formal structures, such as forestry education and training institutions, to ensure long-term institutionalisation.

The following interventions were carried out under this output area:

- An extensive analysis of the Training Management System (TMS) of the states of H.P. and U.K. and federal training institutions was conducted in which key training needs were identified, and specialised training modules were developed. The Training Needs Analysis (TNA) involved analysing existing training curricula and assessing the training needs of master trainers, lecturers, and faculty. It included identifying best practices in both the current curricula and water management practices in the Western Himalayas. The TNA also reviewed existing monitoring and evaluation tools for training (both short-term and long-term), proposed mechanisms for collecting meaningful feedback, and suggested a range of short-term modules to complement and enhance the development of the training system.
- Development of an ecological Forest Record Entry System (**eFOREST**) Web Portal for the HPFD to address critical challenges in forest compartment management. The portal aims to track conservation efforts, record forestry operations, and monitor forest protection and restoration progress. It will be an independent web application designed for forest department personnel to manage various forestry activities in a centralised manner. This will streamline processes related to compartment information, work within compartments, forest produce removal, forest protection, and the development of working plans. The portal will later be integrated with and used alongside other web portals developed by the HPFD. The beta version of the portal was launched by the Hon'ble Chief Minister of H.P. on 30 July 2024, and is now nearing completion. Offline trainings on its use and demonstration for the field staff of the HPFD were conducted in three batches during December 2024.

Based on the findings of the TNA, the following training modules were developed for the Central Academy for State Forest Services (CASFOS), Indira Gandhi National Forest Academy (IGNFA), Forest Training Institute Chail, Forest Training Academy Sundernagar and Uttarakhand Forest Training Academy:

- Integrating FES approach in microplanning
- Springshed Management
- Hydrological Data Collection
- Upstream-downstream Dynamics
- Valuation of Ecosystem Services
- Riparian Succession and River Health
- Development of Indicators for Monitoring FES

The training modules are adapted into **e-learning formats** enabling online learning for forest officials which will be integrated on the government-based iGOT Karmayogi platform.



*Beta version of the eFOREST web portal being launched by the hon'ble Chief Minister of H.P.*



Left: Infographic board at the entrance of the Shimla Water Catchment Wildlife Sanctuary  
Right: 3D model for the Beas Bihal Nature Park, Manali

- Awareness-creation materials, including **3D models, infographics, and branding collaterals**, were designed and developed for four selected locations in Himachal Pradesh: Shimla Water Catchment Wildlife Sanctuary, Kufri Zoo, Beas Bihal Nature Park in Manali, and the Himachal Pradesh Forest Academy in Sundernagar. These models and materials were aimed at enhancing public understanding of forest conservation, ecosystem services, and sustainable management practices. The 3D models visually demonstrate key concepts related to forest ecosystems, while the infographics simplify complex data on biodiversity and conservation efforts. The branding collaterals were designed to engage visitors, promote environmental awareness, and strengthen the presence of the HPFD's initiatives at these prominent locations.



*Small scale prototypes of infographics being exhibited at the Gaiety Theatre in Shimla*

## Output 4: The operational conditions for ecologically and economically sustainable value creation from agroforestry systems have improved in M.P. and U.P.

Output 4 aims to improve the operational conditions for ecologically and economically sustainable value addition from agroforestry systems in the states of M.P. and U.P. This was achieved by demonstrating agroforestry-based cluster development, transforming degraded land into productive landscapes through the integration of land, water, tree, and crop systems based on agroecological principles. The following interventions were carried out under this output area:

- Inputs from the project were provided for the upcoming **U.P. State 'Agroforestry and Agroforestry Produce-based Promotion Policy'**. Recommendations included stronger linkages with other relevant state programmes and the establishment of an independent agroforestry mission, with collaboration and coordination among line departments for effective policy implementation. The focus was also on creating an agroforestry industry consortium, improving market linkages, enhancing planting material quality, providing community and industry-based financial support packages, developing skill-focused start-up programs, and strengthening legal frameworks and capacity-building initiatives for relevant stakeholders.





*Farmers from the project demonstration sites planting agroforestry species*

- At each selected pilot site in U.P. and M.P., agroforestry clusters spanning a total of 72 ha were established, with **47,072** multipurpose trees planted, under a GA with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). In the Jhansi cluster, farmers predominantly adopted a guava-based agroforestry model. In the Lalitpur and Mahoba clusters, a lime-based agroforestry model was preferred. In the Chhatarpur and Niwari clusters, farmers favored both lime- and guava-based models, while in the Gorakhpur cluster, mango emerged as the most preferred species among farmers. In addition, the communities were supported in switching to climate-adapted, efficient irrigation methods and agroforestry practices, especially diversification.
- The focus was also on scientific data recording for all major parameters like groundwater level, rainfall, soil moisture, water holding capacity, crop cutting, and socioeconomic status.



*Crop cutting for assessing yields*



*Water level being monitored using gauging station*

- A **demonstration farm** has been established at the Indian Council of Agricultural Research-Central Agroforestry Research Institute (ICAR-CAFRI) in Jhansi. The farm includes a variety of agroforestry species organised into a fruit block, a fodder block, and a timber block, each spanning an area of 2,500 square meters.



Demonstration farm layout at CAFRI



From the series of 'Livelihood Diversification Through Various Agroforestry Systems'

- The Project in collaboration with the ICAR-CAFRI, has documented best practices under the series **'Livelihood Diversification Through Various Agroforestry Systems.'** The compilation highlights agroforestry models such as bamboo, aonla, guava, mango, acid lime, teak, and ber that are particularly suited to Bundelkhand's semi-arid conditions. These agroforestry systems enable farmers to integrate trees and crops, increasing income through fruit sales and enhancing resilience against climate variability. By diversifying their livelihood sources, farmers can achieve year-round agricultural outputs, making their farming systems more sustainable and adaptive to climate challenges.

- The following working aids were developed under the agroforestry component:
  - Nursery management practices for a range of species such as *Ailanthus excelsa* (Ardu), *Albizia lebbeck* (Siris), *Bambusa vulgaris* L. (bamboo), *Melia dubia*, citrus, *Sesbania grandiflora* (agati), *Santalum album* (chandan), *Moringa oleifera* (moringa), *Ziziphus mauritiana* (ber), *Phyllanthus emblica* (aonla), *Mangifera indica* L. (mango), *Psidium guajava* L. (guava), *Hardwickia binata* (anjan) and *Tectona grandis* L.f. (teak) were developed. The focus was on their varieties, propagation, seed collection and storage, seed treatment and nursery raising techniques.
  - A nursery manual on agroforestry species has been developed, focusing on the types of nurseries, suitable site selection and layout, essential tools and equipment, plant propagation media, and nursery media treatment.
  - Protocols for producing Quality Planting Material (QPM) using different propagation techniques in nurseries were developed. These protocols focus on utilising mother plants with desired genetic traits to obtain pure seeds, cuttings, rootstocks, and scion material.
  - Quantification of ecosystem services from agroforestry systems.
  - Documentation of innovations for local value creation based on agroecological principles.

- A TNA was conducted for the agroforestry component in the national and state training institutes of U.P. and M.P. and the following training modules were identified:
  - Agroforestry I: Basics of Agroforestry
  - Agroforestry II: Advanced Course in Agroforestry
  - Agroforestry for Trainers
  - Forest Ecosystem Dynamics and Management in a Changing Climate
  - Nursery Management for QPM Production in Agroforestry
  - Forest Fire Management in a Changing Climate
  - Silviculture and Stand Management of Trees
  - Pedagogical approaches: Effective Design and Facilitation of Adult Learning
  - Advanced Learning Techniques
  - Effective Community and Public Engagement



*Farmers from the demonstration sites in M.P. and U.P.*



## Trainings and Exposure Visits Organised for Communities

- Community sensitisation trainings were conducted for local communities in H.P. and U.K. during 2022, with a total participation of **457 individuals**.
- In November 2022, a training program on “Conservation Agriculture Technologies for Enhancing Water Use Efficiency and Reducing Carbon Emissions” was organised for **53 farmers** from demonstration sites in U.P. and M.P.
- An exposure visit for ‘Agroforestry and Natural Resource Management Interventions in Central India’ was organised, involving **179 farmers**. A training on the same topic was also organised for **25 farmers** during November 2022.
- An exposure visit on ‘Maximising Land Use Efficiency through Tree-based Intercropping’ was organised, involving **121 farmers**.
- A training on ‘Agroforestry for Sustainable Land and Ecosystem Management’ for **7 farmers**.
- A training on ‘Promotion of Agroforestry’ was organised in Jhansi for **10 farmers**.
- A training on ‘Natural Resources Conservation and Soil Health Moderation through Agroforestry’ was organised for **25 farmers** in Jhansi.
- Trainings on ‘Best Management Practices for Different Agroforestry Systems’ were organised in different batches for **295 farmers**.
- Training on ‘Collection of soil samples for moisture depletion study under different agroforestry systems’ for **6 farmers**.
- A training on ‘Carbon Credits’ was organised for **13 farmers** in Jhansi.
- On 21 March 2023, the International Day of Forests, extempore speeches, painting and slogan writing competitions for school children at the project’s pilot sites in H.P. and U.K. were organised.
- In 2024, **19 community members** from U.K. visited H.P. to gain insights into activities related to springshed management and the concepts of FES.
- Basic-level trainings on ‘Pine Needle-Based Handicrafts’ and ‘Bamboo-Based Handicrafts’ were organised in Pathrevi and Shahpur, H.P., respectively, benefiting a total of **42 community members**.
- An advanced-level training on ‘Pine Needle-Based Handicrafts’ was conducted for communities in Pathrevi, H.P. from 4-14 November 2024, with a total participation of **24 women**.

**Total Community members trained and participated in exposure visits: 1276, out of which 395 were women.**



Participation in various community level trainings

# Trainings and Exposure Visits organised for Forest Department Officials

- A training on concepts related to FES and IbMs was organised for officials of the HPFD and UKFD in March 2022, with a total of **23 participants**.
- An exposure visit to Sikkim was conducted for HPFD officials in November 2022 and UKFD officials in November 2023, to facilitate learning on forest-water linkages, springshed management, community-based ecotourism, and oak forest conservation. A total of **33 officials** were part of the visit.
- An exposure visit for the UPFD and HPFD officials was organised in June 2023 to the Tamil Nadu Agricultural University (TNAU) to learn about agroforestry value chains, market systems, and stakeholder participation, with a focus on best practices and challenges. A total of **10 officials** participated.
- An exposure visit for UKFD officials to selected locations in H.P. was organised in October and November 2023 to share experiences on forest-based climate proofing, IbMs in the Kreditanstalt für Wiederaufbau (KfW) funded projects, FES demonstrations in pilot sites, and forest-based livelihood enterprises. The participation involved **19 officials** of the UKFD.
- Trainings on 'Springshed Management' were conducted in multiple batches for UKFD officers in Haldwani and Dehradun during September, October, and November 2024 and **230 officials** participated.
- Trainings on 'Forest Fire Management' were organised for the front-line staff of the HPFD in Palampur, Sundernagar, and Chail in different batches during October 2024 with a participation of **91 officials**.
- A 'Forest Fire Management' training for officials of the UPFD and MPFD was held at Pachmarhi and Bandhavgarh Tiger Reserve, M.P., in May 2024. A total of **48 officials** participated.
- An exposure visit for **7 HPFD officials** to Jhansi was organised during August 2024 to share experiences on project activities being implemented in the Bundelkhand region.
- A training on 'Leadership, Negotiation, and Conflict Management' was organised for UKFD officials in two batches in Haldwani and Dehradun during November 2024 with a total participation of **40 officials**.
- Trainings on the demonstration and operational use of the eFOREST Web Portal were organised in three batches for field officers, especially Divisional Forest Officers (DFOs), in Dharamshala, Sundernagar, and Shimla during December 2024. A total of **75 officials** participated.



*Exposure visit of the UKFD officials to H.P.*



*Exposure visit of the UKFD officials to Sikkim*



*Exposure visit of the officials to TNAU*



*Sustainable landscape approaches training in Jhansi*



*Forest fire management training in Pachmarhi*



*Exposure visit of the HPFD officials to Sikkim*



## Workshops Organised

- A workshop on ‘Strengthening Communication and Cooperation with Counterparts’ was held from 21-22 May 2022 to enhance collaboration among state and national partners for improved project implementation.
- A state-level workshop on ‘Agroforestry in Bundelkhand: Priorities, Challenges, and Opportunities’ was conducted in Jhansi on 17 June 2022.
- A national workshop on ‘Agroforestry for Sustainable Livelihoods: Priorities, Innovative Approaches, Challenges, and Opportunities in India’ took place in Bhopal, M.P., on 10 August 2022.
- Media workshops on ‘Forests for Future and the Future of Forests: Creating Impact with Your Reporting’ were held in H.P. on 20 January 2023 and in M.P. on 13 May 2024.
- A brainstorming workshop on ‘Integration of FES in Forest Management with a Focus on Water Availability’ was organised on 28 February 2023 to explore approaches and institutional mechanisms for rejuvenating water resources in the Indian Himalayan Region through forest management.
- A brainstorming workshop on ‘Critical Challenges and Opportunities in Forested Landscapes’ was held in Dehradun in August 2023.
- A state-level workshop on ‘Challenges and Opportunities in the Agroforestry Sector in U.P.’ was organised in Lucknow on 20 October 2023.
- Multi-stakeholder consultations on ‘Institutionalisation of IbMs’ were conducted in H.P. on 27 September 2023 and in U.K. on 31 October 2023.
- A national conference to sensitise working plan implementing officers about the NWPC 2023 was held in Srinagar on 6 November 2023.
- A state-level workshop on ‘Landscape Approach for Managing FES: Opportunities and Challenges’ took place in H.P. on 10 July 2024.
- A state-level workshop on ‘Collaborative Approaches for Sustainable Forest Management in H.P.’ was conducted in Shimla on 8 October 2024.
- A seminar on ‘Collaborative Approaches for Strengthening FES with Focus on Water’ was held in U.K. on 25 November 2024.



*Multistakeholder level consultation on IbMs in Shimla*



*National workshop on agroforestry for sustainable livelihoods*



*National workshop on the NWPC 2023 in Srinagar*



*Workshop on Agroforestry in Bundelkhand*



*Media workshop in Shimla*

# KEY CHALLENGES AND LESSONS

- While implementing project activities, efforts should be focused on a specific region or site to ensure that individual activities and studies contribute to a cumulative impact and outcome. When demonstration sites and study areas are geographically dispersed, as in this project, activities spread across multiple locations make it difficult to demonstrate significant impacts, especially within a short project duration. A more holistic approach that incorporates a landscape and integrated perspective will be adopted for future implementation.
- The activities outlined in the FES management plans for different sites spanned the domains of various line departments, including Forest, Agriculture, Horticulture, and Rural Development. Establishing a mechanism for convergence among these departments to work holistically and in an integrated manner was a significant challenge. Forming formal bodies at various levels, can effectively address this issue and facilitate better coordination.
- Diversifying sources of financial and capacity-building support is essential for achieving visible, long-term impacts. Prioritising collaboration with the private sector can provide additional resources and expertise to enhance project effectiveness.
- Strengthening the capacities of local institutions to effectively demonstrate field activities and mobilise resources.
- The IbM component was linked to microplan implementation but faced delays due to funding constraints. Only one IbM concept was submitted, as part of a microplan for the Mussoorie Forest Division, in compliance with an National Green Tribunal (NGT) order addressing risks like the Joshimath landslide. This led to the allocation of CAMPA funds to the site.

## Recommendations from the Mid Term Evaluation

- In addition to a PSC at the national level, a steering structure at the state level should be established to guide and oversee project activities. This would facilitate regular information exchange, improve progress monitoring, and promote convergence and cross-sector linkages.
- Integrating project outputs with the Forest Department's activities, such as planning, budgeting, and monitoring, requires early alignment and coordination with departmental priorities and processes.
- Reassessing the status of project sites and intensify capacity and confidence building measures prior to implementation of micro plans on challenging sites.
- The focus should be shifted from preparation and field implementation of management plans to providing technical support for anchoring the FES approach in forest and agroforestry management systems, at the state level.
- Support adequate production of QPM of suitable agroforestry species in Forest Department nurseries. Also, establish women-led SHG nurseries and support them with local marketing initiatives or buy-back assurances.
- Conduct scoping to establish a model industrial estate for value addition of select agroforestry produce. This includes setting up at least one small value addition or processing unit within an agroforestry cluster, modeled as a common facility centre.

# SUSTAINABILITY OF PROJECT INITIATIVES

- A well-defined exit strategy is essential to ensure the long-term sustainability of project outcomes. This strategy should focus on empowering local communities and institutions to become self-reliant, equipping them with the skills, knowledge, and resources needed to independently manage and sustain the activities initiated during the project. Capacity-building efforts, institutional strengthening, and the transfer of key responsibilities to local stakeholders should be prioritised to facilitate smooth transitions.
- To ensure continuity and scalability, project activities should be closely aligned with ongoing government schemes, programmes, and initiatives. This alignment enhances resource efficiency along with providing a framework for institutional support, enabling sustained efforts beyond the project's conclusion.
- Livelihood activities, such as the initiative in Pathrevi (*see details on page 13*) focused on connecting communities to markets for pine needle-based handicrafts, should be integrated with relevant government missions and schemes. By aligning these efforts with existing programmes, communities can gain access to additional funding, technical expertise, and broader market opportunities.
- Establishing simple, community-managed monitoring and feedback systems to track progress and assess the practical application of the training sessions beyond the project period.
- Best practices, lessons learned, and other knowledge products should be documented and stored in a centralised digital knowledge repository, so that the information is easily accessible, trackable, and available for use whenever needed.
- Opportunities for public-private partnerships (PPPs) to support long-term sustainability of the project initiatives should be explored.

A follow on module titled, '**Strengthening Gender Responsive Forest Ecosystems Management and Agroforestry in India**' has been commissioned by the BMZ for implementation from January 2025 to atleast 2027.

**Overall goal of the project:** The contribution of state and civil society actors to gender-responsive and climate-resilient management of forest and agroforestry ecosystems has been strengthened in selected states of India.

**Implementing States:** H.P., U.K., M.P. and U.P.

**Implementing Partners:** MoEFCC at the national level and HPFD, UKFD, UPFD, MPFD at the state level.

## Broader Output Areas and Interventions

**Output 1: Institutional framework conditions for gender-responsive forest and agroforestry management are improved.**

- Support the revision of the curricula of National and State training institutes and development of aligned e-Learning modules
  - Gender-transformative approaches
  - Agroforestry, focusing on indigenous species and NTFPs
  - Protocols on QPM and nursery management
- Support National and State institutions to roll out
  - Indian Forest and Wood Certification Scheme (e.g. via capacity development and awareness programmes,
  - Inclusion of certification protocols for NTFPs in compliance with EU Deforestation Regulations (EUDR) and the National Transit Pass System (NTPS)
  - Strengthen capacities of local organisations, research and training institutes
- Soft skill trainings, e.g. leadership, gender inclusiveness
- Technical skill trainings on e.g. NWPC 2023, nutritional value of indigenous species etc.
- Support the development of a gender communication strategy for the forestry and agroforestry sectors at different levels. Support collaboration with international institutions and experts.

**Output 2: Implementation of gender-responsive forest and agroforestry management and their participatory processes are supported.**

- Support the development of gender-action and monitoring plans as per the NWPC 2023
- Strengthen the capacities of stakeholders to create gender-responsive and climate-resilient landscape management plans, such as GDPs and block and district development plans.
- Facilitate the implementation of management plans by leveraging funding from public schemes and programmes.
- Support the implementation of gender budgeting and establish a monitoring framework to track progress and outcomes.
- Document and disseminate gender-responsive best practices in the forestry and agroforestry sectors to inform future interventions.

**Output 3: Income generation for forest and agroforestry ecosystem dependent communities / groups are improved through gender responsive / transformative measures**

- Conduct a Reach-Benefit-Empower analysis and a gender-focused participatory value chain and market analysis for forest and agroforestry products, including indigenous species and NTFPs, in selected landscapes.
- Support capacity development of community resource persons, FPOs, SHGs, and cooperatives in areas such as agroecological practices, QPM, value addition, marketing, and accessing public schemes.
- Facilitate soft skills training on topics like financial literacy, positive masculinity, and equal decision-making.
- Provide ongoing support for the implementation of gender-transformative, climate-resilient forest and agroforestry systems through FPOs, SHGs, and cooperatives.
- Identify and strengthen value chains, including those for nutrition gardens and accredited nurseries. Promote business development and link producer groups to the private sector for marketing, ensuring women's access to digital tools and enhanced market access.









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