TRAINING WORKSHOP FOR THE OFFICERS OF INDIAN FOREST SERVICE ON PREPARATION OF ECOSYSTEM HEALTH CARD

11-13 NOVEMBER, 2024



Indian Council of Forestry Research and Education, Dehradun



BACKGROUND

The three-day training workshop on the Preparation of Ecosystem Health Cards was organized by the Indian Council of Forestry Research and Education (ICFRE) – Eco Rehabilitation Centre (ERC), Prayagraj in collaboration with IIFM Bhopal and NCSCM, Chennai with the financial support of the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India. The training aimed to equip Indian Forest Service (IFS) officers with the knowledge and skills needed to assess and monitor the health of ecosystems through the development of Ecosystem Health Cards.

The need for such a training program arose from the growing importance of ecosystem management and conservation in the context of climate change, biodiversity loss and ecosystem degradation. Ecosystem health cards serve as valuable tools for monitoring and evaluating the condition of ecosystems, enabling decision-makers to take informed actions for their preservation and restoration. This workshop was designed to provide IFS officers with hands-on experience in preparing these health cards, ensuring that they can effectively assess the health of ecosystems, identify threats and promote sustainable management practices. Throughout the workshop, participants were introduced to two different ecosystems (Triveni Sangam and Saryu) assessment frameworks, monitoring methods and management strategies. The program also incorporated practical field visits and interactive breakout sessions, allowing participants to apply the concepts learned in real-world scenarios. The training played a key role in enhancing the capacity of IFS officers to monitor, assess and manage ecosystem health in their respective states, thus contributing to the overall goal of promoting sustainable environmental governance and conservation.

ABOUT INSTITUTES

The ICFRE Eco-Rehabilitation Centre (ERC), Prayagraj, serves as a leading research and extension hub dedicated to enhancing tree cover through the development and promotion of site-specific agroforestry and plantation models. It focuses on the rehabilitation of stressed sites and mined areas across Uttar Pradesh, with particular attention to medicinal and aromatic plants. Over the past 31 years, the Centre has developed innovative technologies and technological packages that support the integration of forestry into social, farm and agroforestry systems. The Centre is managed by qualified and specialized researchers, who critically analyze the R & D problems received from stakeholders and provide their innovative solution. Various national/ international funding agencies like World Bank. UNDP, NABARD,

NITI Aayog, MoEF & CC, NOVOD Board, NTPC Ltd., NRAA, SFD Bihar, U.P. Council of Science & Technology, U.P. Council of Agricultural Research etc. have been supporting the R & D programme of the Centre.

A core focus of the Centre's activities includes the restoration of degraded lands to enhance ecological balance and improve soil health. By deploying native species and agroforestry practices, the Centre has successfully transformed barren, eroded and stress-prone lands into productive ecosystems. These plantations not only restore soil fertility but also improve water retention and contribute significantly to carbon sequestration, strengthening overall environmental health. Furthermore, the Centre promotes integrated agroforestry and forestry plantation models that combine tree crops with agricultural practices. These models deliver multiple benefits, such as enhanced agricultural productivity, increased income for farmers, improved soil fertility and strengthened biodiversity. Through these initiatives, the Centre is making significant contributions to sustainable land use, environmental conservation and the livelihoods of local communities.

The National Centre for Sustainable Coastal Management (NCSCM), established in 2011 in Chennai under the Ministry of Environment, Forest and Climate Change, focuses on the sustainable management of India's coastal and marine ecosystems. Through research, capacity building and policy advisory, NCSCM aims to balance conservation with development, addressing coastal vulnerability, biodiversity conservation and the livelihood needs of coastal communities. Collaborating with national and international partners, it supports India's commitments to global environmental goals, playing a crucial role in protecting coastal ecosystems and promoting sustainable coastal zone management.

The Indian Institute of Forest Management (IIFM) established in 1982 in Bhopal under the Ministry of Environment, Forest and Climate Change, is a premier autonomous institute dedicated to education, research and training in forest, natural resource and environmental management. Renowned for its flagship programs like the Post Graduate Diploma in Forestry Management (PGDFM) and specialized research, IIFM integrates sustainability with development to address pressing environmental challenges. With a focus on capacity building, policy support and community-centred resource management, IIFM plays a pivotal role in promoting sustainable forest management and contributing to national and global environmental goals.

About the Training

A three-day training workshop titled "Preparation of Ecosystem Health Card", organized for the officers of the Indian Forest Service (IFS) and funded by the Ministry of Environment, Forest and Climate Change (MoEFCC), was conducted from November 11 to 13, 2024. The inaugural session took place on the first day at Hotel Ajay International, Prayagraj, setting the stage for discussions on ecosystem health assessment. On the second day, participants undertook a field visit and survey of the Saryu flood-prone area in Ayodhya, providing hands-on experience in ecosystem analysis and data collection. The workshop concluded with a formal group sessions of four teams on the third day at Hotel Ajay International, Prayagraj, summarizing insights and outcomes of Sangam ecosystem, emphasizing the practical application of ecosystem health cards for sustainable management.

Objective of the Workshop:

The primary goal was to equip IFS officers with the skills to assess and manage ecosystem health effectively. By the end of the workshop, participants were expected to be proficient in using ecosystem health cards for sustainable ecosystem management, enabling them to implement innovative solutions in their respective areas.

Outline of the Training Programme

The structure and flow of the technical sessions for the workshop were designed by the ICFRE Eco-Rehabilitation Centre, Prayagraj, in consultation with the National Centre for Sustainable Coastal Management (NCSCM), Chennai and the Indian Institute of Forest Management (IIFM), Bhopal. This meticulously planned framework ensured a comprehensive approach to the topic, incorporating diverse expert inputs. The structure outlined in the design was strictly adhered to throughout the workshop, as detailed in *Annexure-I*.

Participation in Training:

The training was organized with the objective of enhancing knowledge and motivating Indian Forest Service (IFS) officers to adopt innovative approaches in ecosystem health management. A total of 8 participants and 6 resource persons actively engaged for the three days training cum workshop, contributing to its interactive and impactful sessions.

Day 1:

INAUGURAL SESSION

The training workshop on "Preparation of Ecosystem Health Card," sponsored by the Ministry of Environment, Forest and Climate Change, Government of India, for Indian Forest Service (IFS) Officers, was inaugurated at the conference hall of Hotel Ajay International, Prayagraj. The event commenced with the ceremonial lighting of the lamp by the Chief Guest, Dr. Rajeev Srivastav, IFS (Retd.) (Batch 1985), presently the Chief Advisor (Environment) at Chennai Metro Rail Limited (CMRL). The session was graced by Special Guest Shri Tulsi Das, IFS, Additional Principal Chief Conservator of Forests (APCCF), and Guest of Honour Dr. Purvaja Ramachandran, Acting Director and Scientist-G from the National Centre for Sustainable Coastal Management (NCSCM), Chennai.

Dr. Sanjay Singh, Head of ICFRE-ERC, Prayagraj, delivered the welcome address, extending warm greetings to the dignitaries and participants. He highlighted the pressing challenges faced by India's forests, including climate change, habitat degradation and the loss of biodiversity. Stressing the importance of sustainable forest management and agroforestry practices, he emphasized the need for tools like the **Ecosystem Health Card** to monitor forest conditions and promote carbon sequestration. He also lauded the collaborative efforts of NCSCM, Chennai and IIFM, Bhopal, in advancing research and contributing to sustainable ecosystem management.

Dr. Anita Tomar, Scientist F and Course Coordinator, outlined the objectives and agenda of the workshop. She explained that the workshop, organized under the aegis of the Ministry of Environment, Forest and Climate Change, aims to promote sustainable environmental management and ecosystem conservation. The initiative is a joint effort of ICFRE-ERC, IIFM Bhopal and NCSCM Chennai.

The **Chief Guest**, **Dr. Rajeev Srivastav**, Retd, IFS reflected on India's significant advancements in biodiversity conservation. He emphasized the need for targeted strategies to mitigate adverse impacts on ecosystems caused by human activities and climate change. His address underscored the role of conservation initiatives in preserving India's rich biodiversity for future generations.

The **Special Guest**, **Shri Tulsi Das**, provided valuable insights into effective ecosystem management practices. He highlighted the importance of sustainable approaches to environmental conservation, urging participants to adopt integrated strategies for preserving ecological balance while meeting developmental needs.

The **Guest of Honour, Dr. Purvaja Ramachandran**, presented a compelling overview of initiatives promoting biodiversity and wetland conservation. She elaborated on the necessity of sustainable ecosystem practices, emphasizing their critical role in maintaining environmental integrity and resilience in the face of changing climate dynamics.

The session concluded with a vote of thanks delivered by **Senior Scientist Dr. Alok Yadav**, who expressed heartfelt appreciation to the distinguished guests, participants and organizers for their valuable contributions. He acknowledged the collaborative efforts of institutions such as ICFRE, IIFM and NCSCM in creating a meaningful platform for dialogue and learning.

The inaugural session set the stage for engaging technical discussions led by renowned experts, First lecture by Dr.Rajeev Srivastav, Retd.IFS including Dr. Dhanya Bhaskar, Associate Professor, IIFM, Bhopal; Dr. Rajiv Pandey, Scientist, ICFRE, Dehradun; Dr. Deepak Samuel V., and Dr. Robin R.S., Senior Scientist of NCSCM, Chennai. Dr. Sanjay Singh , Dr Anita Tomar , Scientist of ERC, Prayagraj.

Day 1:

TECHNICAL SESSION (I)

The inaugural session transitioned seamlessly into a well-structured technical session featuring thought-provoking presentations by distinguished experts.

Dr. Rajeev Srivastav, I.F.S. (Retd.), Chief Advisor (Environment), highlighted the pressing challenges to India's biodiversity, including habitat destruction, climate change and pollution. He underscored their detrimental effects on ecosystems and stressed the importance of integrated conservation efforts to address these issues. Dr. Srivastav called for proactive measures to safeguard biodiversity, emphasizing its crucial role in maintaining ecosystem health and resilience.

Dr. Dhanya Bhaskar, Associate Professor, IIFM, Bhopal, provided insights into the methodologies for assessing ecosystem health, introducing frameworks and indicators that support sustainable management. She emphasized the importance of accurate evaluations for informed decision-making and encouraged participants to incorporate these tools into their professional roles to ensure the effective management of natural resources.

Dr. Rajeev Pandey, Scientist, ICFRE, Dehradun, focused on the ecological services provided by forests, particularly in mitigating soil erosion, enhancing water retention and

preserving land fertility. He highlighted the necessity of protecting these services and urged participants to advocate for sustainable land management practices that prioritize long-term ecosystem health.

Dr. Sanjay Singh, Head of ICFRE-ERC, Prayagraj, discussed the significance of ecosystem health in ensuring critical services like clean air, water and food. He emphasized the need for innovative forestry practices to enhance ecosystem resilience and adapt to environmental challenges. Dr. Singh urged participants to integrate ecological considerations into their work, promoting solutions that balance sustainability and development.

Dr. Anita Tomar, Scientist F and Course Coordinator, stressed the role of ecosystems in adapting to climate change and other environmental stressors. She highlighted the urgency of proactive management strategies to strengthen ecosystem resilience and sustain essential services. Dr. Tomar encouraged participants to adopt a comprehensive approach in their forestry and environmental management roles, ensuring the long-term sustainability of natural resources.

The technical session offered a valuable opportunity for participants to gain practical insights and actionable strategies for addressing ecosystem management challenges and promoting sustainable forestry practices. By drawing on the expertise of distinguished speakers, the session equipped attendees with essential tools and knowledge to support informed decision-making and implement effective conservation measures. The discussions emphasized the importance of holistic and integrated approaches to ecosystem health, ensuring that participants left with a deeper understanding of how to contribute to long-term sustainability and resilience in their professional roles.

After Technical session a field visit to Sangam ecosystem was organized for all the participants. The NCSCM and IIFM team highlighted a values and threats of ecosystem to all participants by group discussion. The physical properties of water, including temperature, turbidity and flow, were analyzed, along with chemical properties like pH, dissolved oxygen and contaminants. Biodiversity was explored by studying species variety and habitat health, while soil properties, including nutrient content and erosion, were also reviewed.

Day 2:

FIELD VISIT

A field trip was organized to the Suryu Flood Prone Area in Ayodhya, focusing on the Suryu River banks and the challenges associated with soil erosion. This trip provided participants with a practical on-ground experience of the issues faced by the river's ecosystem and the surrounding landscape, particularly soil erosion and its management.

- Venue: Suryu Flood Prone Area, Ayodhya
- Focus Area: Suryu River Banks, Soil Erosion and Its Management

Dr. Purvaja Ramachandran and her team (**Dr. Deepak Samuel V.**, Senior Scientist, NCSCM, Chennai; and **Dr. Robin R.S.**, Senior Scientist, NCSCM, Chennai) from the National Centre for Sustainable Coastal Management (NCSCM), Chennai, provided in-depth teachings on the critical issue of soil erosion along the Suryu River banks. The experts emphasized the importance of controlling soil erosion to preserve the integrity of river ecosystems. They explained that effective soil erosion management can help prevent the loss of fertile soil, protect water quality and reduce sedimentation that can negatively affect aquatic habitats. Also demonstrated various sustainable riverbank management practices, including vegetation restoration and bioengineering techniques, which are essential for mitigating erosion and enhancing ecosystem resilience. Additionally, the experts introduced methods for measuring the river's distance and changes, providing participants with practical tools and techniques to monitor riverbank dynamics.

Through this field trip, the NCSCM team successfully integrated traditional knowledge with modern scientific approaches, promoting sustainable river management and ecosystem health. This ensured that participants gained valuable insights into mitigating the impacts of soil erosion and enhancing the resilience of river ecosystems.

Day 3:

TECHNICAL SESSION (II)

Training workshop resumed by technical session

Dr. Deepak Samuel V., Scientist, delivered a lecture on "Invasive Species Indicators of Wetland Health and Ecosystem Integrity." He discussed the threats posed by invasive species to wetland ecosystems, which can disrupt native biodiversity, alter water quality and affect ecosystem services like water purification and flood regulation. Dr. Deepak explained how invasive species outcompete native species and degrade wetland health. He introduced key indicators for monitoring these impacts, such as species density, distribution and effects on native species and ecosystem functions. He also highlighted strategies for controlling invasions, including mechanical removal, chemical treatments and native species restoration.

His lecture emphasized the importance of early detection, monitoring and management to protect wetland ecosystems and ensure the continued provision of vital services.

Dr. Robin, R.S. Scientist, NCSCM delivered a presentation on the topic Preparation of Ecosystem Health Report Cards. He covered the concept of ecosystem, types, major ecosystem services and the necessity of ecosystem health report cards. Additionally, he outlined the five steps process required for the preparation of effective ecosystem health cards including identify values and threats, Developing Indicators for ecosystem health assessment, Identify Thresholds, calculating grades and scores and communication of results. The presentation concluded with an overview of the overall ecosystem health index.

CONCLUDING SESSION

In the breakout session, participants were divided into four groups (A,B,C,D) to discuss and develop the health report card for the Triveni Sangam in Prayagraj, considering various dimensions of ecosystem health. The groups examined key aspects such as the water quality, air quality, biodiversity and soil conditions in the region. They assessed the ecological health by identifying important species and their roles, as well as the impacts of human activities and pollution.

A significant part of the discussion focused on the effects of the Kumbh Mela, a major event held at the Triveni Sangam, which brings both positive and negative consequences for the ecosystem. On the positive side, the Kumbh Mela boosts the local economy by supporting businesses and encouraging conservation efforts due to increased attention on the region's cultural and environmental importance. This has led to better waste management practices and clean-up initiatives during the festival. However, the event also has negative impacts, such as water contamination from the large number of people bathing in the river, which introduces pollutants, waste and plastics that degrade water quality. The surge in human activity can also disrupt local biodiversity, putting stress on wildlife and aquatic species. Additionally, the heavy foot traffic and temporary structures erected during the festival contribute to soil erosion and land degradation. The participants highlighted the need for a balanced approach to managing such events to minimize their environmental impact while ensuring that the cultural and economic benefits are sustained.

VALEDICTORY SESSION

The three-day training workshop on 'Ecosystem Health Card', organized by ICFRE-Eco Rehabilitation Centre, Prayagraj and sponsored by the Ministry of Environment, Forest and Climate Change, Government of India, for Indian Forest Service (IFS) officers, concluded on 13th November 2024 in a ceremony marked by insightful reflections and the sharing of knowledge. The session was graced by the Chief Guest, Dr. Renu Singh, IFS, Director of the Forest Research Institute, Dehradun, whose presence added great value to the event.

Dr. Sanjay Singh, Head of the Eco Rehabilitation Centre, began the session by welcoming the Chief Guest, special guests and all participants. He then gave an engaging overview of the workshop's proceedings, highlighting the key takeaways from the insightful Day 2, field visit of Suryu Flood Prone area in Ayodhya.

In her address, Dr. Renu Singh, IFS spoke about the significant role that IFS officers play in ecological conservation. She shared her expert knowledge on research related to ecology and the pressing need for forest officers to focus their efforts on improving ecosystem health in today's rapidly changing environment. She underscored the importance of collaboration between research, practice and policy in creating meaningful impact. She noted that workshops like these are instrumental in equipping forest officers with the skills and knowledge needed to address future ecological challenges, ensuring sustainable management of ecosystems.

Dr. Purvaja Ramachandran, Director of the National Centre for Sustainable Coastal Management (NCSCM), Chennai, echoed similar sentiments, stressing the importance of conducting such training programs regularly.

In the ceremony, three books published by the Center, Green Digest-Primer for Environment Conservation, Agroforestry-Species and Management and Reclamation of Degraded Sites were released by Chief Guest Dr. Renu Singh,IFS

The feedback session from the IFS participants was an engaging part of the valedictory event, with attendees sharing their thoughts on the workshop's impact and the knowledge gained. The event concluded with the distribution of certificates to the participants, by Chief Guest recognizing their active involvement and successful completion of the training program.

The **vote of thanks** was delivered by the course coordinator, who expressed heartfelt gratitude to the **Chief Guest**, **Dr. Renu Singh**, special guests, all the resource persons and participants. The coordinator acknowledged the dedication and contributions of everyone

involved, which played a crucial role in making the workshop a resounding success. The course coordinator also thanked collaborating Institutes IIFM and NCSCM, for being so helpful in organizing the workshop and facilitating such a valuable learning experience for all participants.



1st Row (L-R): Dr. Anita Tomar, ERC; Dr. Dhanya Bhaskar, IIFM; Dr. G. Ramalingam, IFS; Sh. Mana Ram Baloch, IFS; Dr. Purvaja Ramachandran, NCSCM; Dr. Rajeev Kr. Srivastav, IFS; Sh. Arun Kumar Pandey, IFS; Dr. Sanjay Singh, ERC; Sh. P.K. Singh, IFS; Sh. Tulsidas Sharma, IFS.
 2nd Row (L-R): Sh. N. Palanikanth, IFS; Dr. Robin R.S, NCSCM; Dr. Rajeev Pandey, ICFRE; Sh. Kumili Venkata Appala Naidu, IFS; Sh. P. Sivakumar, IFS; Sh. Nitish Kumar, IFS.





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76

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<u>Annexure I</u>

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PROGRAM SCHEDULE

DAY 1 (11thNovember 2024) – MONDAY **INAUGURAL SESSION** Time (hrs.) Particulars 09:30-10:00 **Registration of Participants** Welcome Address & Workshop Overview 10:00-10:15 Dr Sanjay Singh, Head, ICFRE-ERC, Prayagraj Felicitation of the Chief Guest About the training 10:15-10:30 Dr. Anita Tomar, Scientist F, Course Coordinator, ICFRE-ERC Address by Director NCSCM 10:30-10:40 Dr.Purvaja Ramachandran, Scientist G 11:00-11:20 Address by the Chief Guest Vote of Thanks 11:20-11:25 Sh. AlokYadav, Scientist- E, ICFRE-ERC, Prayagraj 11:25-11:30 Group photograph 11:30 -12:00 **High Tea TECHNICAL SESSION** 12:00-12:30 Biodiversity of India- threats, challenges Impact on Ecosystem Dr. Rajeev Srivastav, I.F.S (Retd.) Chief Advisor (Environment) 12:30-13:00 Ecosystem health assessment- Frameworks and indicators Dr. Dhanya Bhaskar, Associate Professor, IIFM, Bhopal 13:00-14:00 Lunch Break 14:00-14:30 Soil erosion control services of forest Dr. Rajeev Pandey, Scientist, ICFRE, Dehradun 14:30-15:00 Preparation of Wetlands Health Cards-methodology Dr. Robin R.S., Scientist C, NCSCM, Chennai 15:00-15:30 Invasive Species Indicators of Wetland Health and Ecosystem Integrity Dr. Deepak Samuel V., Scientist E, NCSCM, Chennai 15:30-16:00 Information about the Field Visit to Ayodhya Tea break 16:00-16:30 Health and resilience of ecosystems for sustained services Dr. Sanjay Singh & Dr. Anita Tomar, ICFRE-ERC, Prayagraj *NOTE: Course Dinner at EL Chico Restaurant (Town Hall) Civil Lines, Prayagraj 7 pm onwards.

DAY 2 (12thNOVEMBER 2024) – TUESDAY FIELD VISIT

nt: By River Safari

• Dinner will be served in the respective hotels of the participants 7 pm onwards.

DAY 3 (13thNovember' 2024) – WEDNESDAY CONCLUDING SESSION

Time (hrs)	Particulars
07:00-07:45	Yoga session for good health
09:30-09:45	Recap of day 2 & Introduction to the breakout Session in Groups
09:45-11:00	Session I – Social skills/soft skill
	Session II - LiFe activity
	ICFRE-ERC/ NCSCM/ IIFM & Participants
11:00-11:30	Tea Break
11:30-12:00	Presentation by trainees on identified issues/problems
	VALEDICTORY SESSION
12:00-12:10	Concluding Address
	Dr Sanjay Singh, Head, ICFRE-ERC, Prayagraj
12:10-12:40	Discussion & Feedback
12:40-01:00	Distribution of Certificates
01:00-01:05	Vote of Thanks
and the second second	Dr Anita Tomar, Scientist- F, Course Coordinator
Contraction of the second	ICFRE-ERC, Prayagraj
01:05-02:15	Lunch Break
*NOTE:	and the second
a. In t	the afternoon, visit to popular historical monuments/Anand Bhawan

/Trivenisangam will be arranged. b. Visit to Varanasi or nearby cities can be arranged on payment basis.

<u>Training manual</u>



PREPARATION OF ECOSYSTEM HEALTH CARD READY RECKONER

Sanjay Singh 1 Anita Jomar

