Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

GANGA RIVER VOLUME II :

CAPACITY BUILDING OF FOREST DEPARTMENT AND OTHER STAKEHOLDERS FOR FIVE GANGA RIVER STATES

2020-2025

Engaging Stakeholders

Conserving Biodiversity

Sustaining Ecosystems

Building Skills

Reviving the ganga

(Draft)

GANGA RIVER VOLUME II :

CAPACITY BUILDING OF FOREST DEPARTMENT AND OTHER STAKEHOLDERS FOR FIVE GANGA RIVER STATES

2020-2025

Director, WII
Gobind Sagar Bhardwaj

Dean, FWS, WII
Ruchi Badola

Principal Investigators
Ruchi Badola and Syed Ainul Hussain

Coordinating Lead authors
Ruchi Badola and Syed Ainul Hussain

Lead authors
Sangeeta Angom and Soufil SM Malek

Contributing Authors
Alankrita Sharma, Rohit Kumar, Anshul Bhawsar, Danish Kaleem, Rahul Gupta, Ashmika Aggarwal, Simran Aggarwal, Aarti Chauhan, SK Pal

Photo Credits
NMCG-WII Team

Design and layout
Khyati Chauhan

Suggested Citation
WII-GACMC (2026). Ganga River Volume II: Capacity Building of Forest Department and other Stakeholders for Five Ganga River States. Ganga Aqualife Conservation Monitoring Centre, Wildlife Institute of India and National Mission for Clean Ganga. Pp. 133

ISBN: Applied For

National Mission for Clean Ganga (NMCG)
Wildlife Institute of India (WII)

ACKNOWLEDGEMENTS

This report on the “Capacity Building of Forest Department and Other Stakeholders” presents the activities undertaken across the five main states of Ganga River under the Wildlife Institute of India project titled “Planning and Management for Aquatic Species Conservation and Maintenance of Ecosystem Services in the Ganga River Basin for a Clean Ganga”. The project is being implemented with support from the National Mission for Clean Ganga under the Ministry of Jal Shakti, Government of India, as part of the Namami Gange programme.

We express our sincere thanks to Shri C. R. Patil, Hon’ble Union Cabinet Minister, Ministry of Jal Shakti; Shri V. L. Kantha Rao, Secretary, Ministry of Jal Shakti; Shri Rajeev Kumar Mittal, Director General, NMCG; and Shri Nalin Kumar Srivastava, Deputy Director General, NMCG, for their guidance and support.

We place on record our appreciation to Dr. Gobind Sagar Bhardwaj, Director, WII; Shri Maria Christu Raja, Registrar, WII; and Dr. Ruchi Badola, Dean, Faculty of Wildlife Sciences, WII and Principal Investigator of the project, for their administrative, technical, and institutional support throughout the implementation of the activities. We also acknowledge the contributions of Dr. S. A. Hussain, Former Project Manager and subject matter specialist, along with the project team members associated with the programme, for their sustained support and guidance during the preparation of this report.

The successful implementation of the activities documented in this report was made possible through the active cooperation of State Forest Departments, Irrigation Departments, Fisheries Departments, Education Departments, Veterinary Departments, district administrations, academic institutions, local governing bodies, and partner organizations across the five Ganga River states. We also acknowledge the participation of frontline staff, teachers, students, local communities, and other stakeholders whose involvement significantly contributed to strengthening conservation awareness and stakeholder engagement efforts within the five sates of Ganga River.

PREFACE

The Ganga River is one of the major river systems in Asia, originating in the Himalayas and flowing into the Bay of Bengal over a length of approximately 2,525 km. It traverses several states in India and supports a wide range of ecological, cultural, and socio-economic functions. The river is recognized for its significance in sustaining freshwater biodiversity as well as supporting the livelihoods of a large population dependent on its resources. Over time, increasing anthropogenic pressures such as pollution, habitat degradation, unsustainable resource use, and changes in river flow have affected the ecological health of the river and its associated biodiversity. Addressing these challenges requires not only policy and management interventions but also strengthening the capacities of stakeholders involved at different levels.

In this context, the Wildlife Institute of India (WII), under the National Mission for Clean Ganga (NMCG), has undertaken capacity building initiatives aimed at enhancing the knowledge and skills of stakeholders engaged in freshwater biodiversity conservation along the Ganga main stem. The capacity building component has been implemented across five Ganga main stem states Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal with a focus on equipping stakeholders with relevant knowledge and practical skills in areas such as aquatic biodiversity monitoring, wetland conservation and river management, rescue and rehabilitation of aquatic fauna, participatory approaches, and conservation education. The programmes have engaged a diverse range of stakeholders, including forest officials, enforcement agencies, veterinarians, academic institutions, students, and local communities. Through structured training programmes and workshops, the initiative aims to strengthen field level implementation and improve coordination among stakeholders involved in conservation efforts.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

SUMMARY

The capacity building component under the NMCG project focuses on strengthening the knowledge, skills, and institutional capacities of various stakeholders involved in freshwater biodiversity conservation across the five Ganga main stem states viz Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal. Adopting a multi stakeholder and participatory approach, the programme integrates technical training, community engagement, and institutional strengthening to support sustainable conservation outcomes along the Ganga River.

A total of 114 training programmes were conducted, engaging 7,582 participants across multiple stakeholder groups, including forest officials, students, researchers, enforcement agencies, and local communities. The trainings were structured around five key thematic modules, Monitoring of Aquatic Biodiversity, Wetland Conservation and River Management, Rescue and Rehabilitation, Participatory Management, and Conservation Education, ensuring a comprehensive and interdisciplinary approach to conservation capacity enhancement.

In addition, 22 specialized spearhead trainings were organized to develop a cadre of skilled professionals for advanced conservation and emergency response roles, while 42 structured training sessions on rescue and rehabilitation were conducted, including 9 specialized rescue trainings, collectively engaging 2,625 participants, of whom 528 individuals were trained under advanced specialized rescue modules strengthened frontline response mechanisms for aquatic fauna in distress. Complementing these efforts, 83 awareness and outreach programmes reached over 6,185 stakeholders, promoting conservation awareness and encouraging community participation in river conservation efforts.

The design and implementation of training programmes were guided by systematic training needs assessments were conducted, ensuring context-specific and demand-driven interventions. The initiative also contributed to the development and dissemination of training materials, educational resources, and outreach tools to support sustained learning and engagement. The programme further demonstrated a strong geographical and institutional reach, with higher participation recorded in Uttar Pradesh and Uttarakhand, reflecting targeted efforts in ecologically significant stretches of the Ganga main stem. The inclusion of a wide range of stakeholders from policy level officials to grassroots community members enabled cross sectoral collaboration.

Monitoring and evaluation mechanisms, including pre and post training assessments and follow up surveys, indicated measurable improvements in knowledge, skills, and behavioural responses among participants. The development of a trained network of first responders and conservation practitioners has enhanced preparedness for addressing challenges such as species rescue, habitat degradation, and human wildlife interactions. Overall, the capacity building component serves as a critical pillar in strengthening ecological resilience, participatory governance, and sustainable management of freshwater biodiversity along the Ganga River.

1 INTRODUCTION

Capacity building refers to a systematic approach to develop the skills, competencies, and institutional capabilities of stakeholders, to enhance their contribution to river conservation and restoration. This initiative adopts a multi stakeholder and participatory model (Carr, 2015) aimed at empowering a diverse groups like forest officials, field veterinarians, researchers, NGOs, entrepreneurs, school teachers, college professors, university students and volunteers. Together, they are positioned to serve as active, informed, and proactive contributors in the critical tasks of biodiversity monitoring, species protection, habitat management, and overall conservation efforts across the main stem of the Ganga River viz. Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal.

The approach highlights that sustainable river conservation can only be achieved when local capacities,both individual and collective are carefully built, continuously nurtured over time, and effectively retained within communities and institutions (O'Keeffe, 2018). By doing so, the programme ensures that the knowledge and skills gained do not remain temporary but become embedded in everyday practices and decision making. This model fully aligns with the broader principles of adaptive ecosystem management, which recognize the dynamic and ever-changing nature of riverine environments. It equips individuals, groups and institutions with tools and knowledge to respond to emerging conservation challenges such as habitat degradation, pollution impacts, climate variability and human wildlife conflicts (OECD, 2006; Bloomfield et al., 2018).

Freshwater biodiversity conservation in the Ganga River system requires active and sustained mobilization of a wide range of stakeholders. This is essential for the long term protection and recovery of its rich aquatic macrofauna (such as the Gangetic dolphin, gharial, otters, freshwater turtles, and native fish species). These species, along with their interconnected habitats such as wetlands and riparian zones, face multiple threats across the diverse landscapes of the five states.

1.1 Key Elements of Capacity Building

The foundational principle of this programme is that the long-term engagement with stakeholders is what ultimately leads to sustainable and lasting outcomes. As outlined by Leidel et al. (2012), effective capacity development should be iterative and need-based (precisely tailored to identify gaps and priorities rather than applied generically). The process is carefully structured in a logical, sequential manner to ensure maximum impact. It begins with the identification and active engagement of relevant stakeholder groups. This critical first step is achieved through a series of preliminary meetings, targeted outreach campaigns, and well organised consultation workshops at national, state and local levels. These interactions help map out the key actors ranging from frontline forest officials and fisheries officers to academic researchers, local NGOs, school educators and village level volunteers and build initial trust.

This is followed by a thorough assessment of their development needs. The assessment is conducted through participatory exercises such as focus group discussions, knowledge mapping sessions and structured feedback tools. The goal is to understand existing knowledge gaps, technical challenges, operational challenges in the field, resource limitations, and local priorities that influence participation. Drawing directly from these detailed findings, training modules and capacity development programs are the meticulously designed with contextual relevance. The content incorporates technical skills (e.g., rescue protocols, survey techniques etc) and soft skills (e.g., community facilitation, conflict resolution, communication, leadership, advocacy etc). This ensures the training is not only scientifically sound but also practically applicable in real world settings across diverse river Ganga states.

Finally, regular evaluation mechanisms are embedded into the programme to assess its effectiveness, record lessons learned, and refine future capacity building strategies. These interlinked stages are visually represented in Figure 1, which illustrates the core elements of capacity building adopted under the NMCG capacity building initiatives, contain elements of (i) Identification of target groups and engagement of stakeholders through meetings, correspondence, workshops etc. (ii) Identification of needs (iii) Formulation of capacity development programmes (iv) Implementation (v) Evaluation. These are the essential management skills of any capacity building programmes that allow for planning, implementation, monitoring and evaluating initiatives for conservation of freshwater biodiversity of Ganga River.

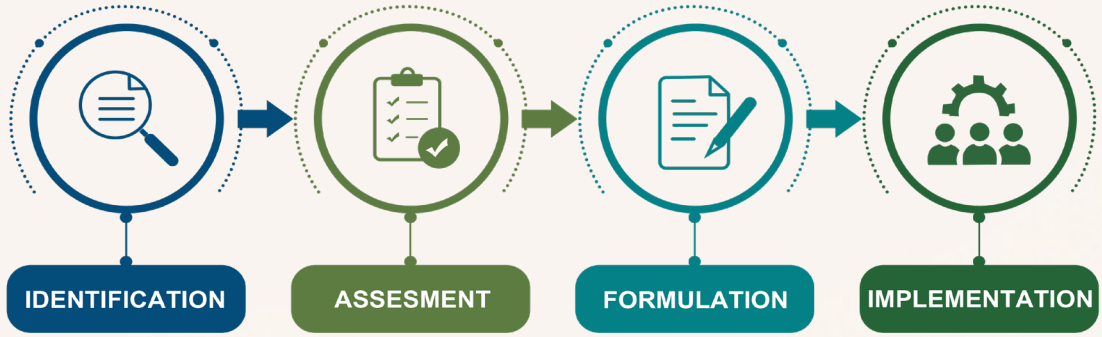

Figure 1: Core Elements of Capacity Building Programme for River Conservation

1.2 Building the base - Implementations and Logistics

As highlighted by Alaerts (2008), organizing successful training programmes requires seamless coordination, beginning right at the initial design phase and continuing through post-training follow-up process. The process involves logistical planning, communication with participants, stakeholder mapping, and onboarding resource persons. The training execution begins with identifying the role of each stakeholder group through consultative meetings and dialogue. Based on this input, training content is tailored to meet contextual needs and skill levels.

A structured checklist for training logistics and feedback is used to track progress and effectiveness. Participants are trained on diverse modules such as aquatic species documentation, monitoring, habitat restoration, community conservation strategies, and species rescue protocols. These modules help to develop a cadre of informed, skilled individuals who can act as multipliers and mentors in their respective institutions and communities. The sequential flow of training stages is shown in Figure 2, which shows the stages of capacity building initiatives from planning to delivery.

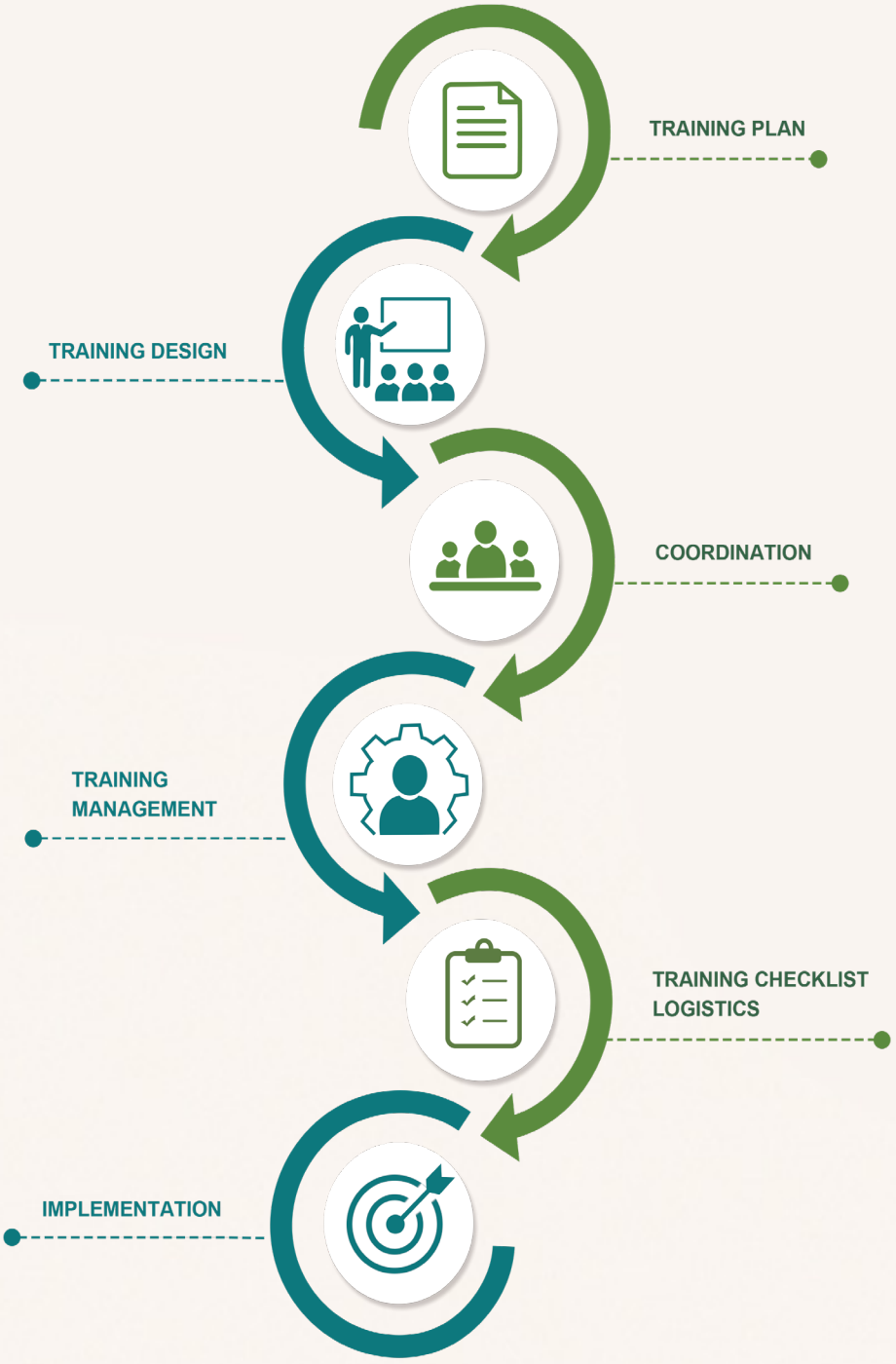

Figure 2: Stages of Capacity Building Initiative

1.3 Capacity Building Framework

The capacity building framework adopted here is a structured, multi-tiered and adaptive approach aimed at strengthening institutional and individual competencies for freshwater biodiversity conservation across the five River states. At its core, the framework aims to build three interconnected layers of capacity: technical (scientific knowledge and field skills for monitoring and management), operational (institutional processes, coordination and resource utilization) and community level (grassroots engagement, awareness and participatory action). This ensures that conservation strategies are not only scientifically sound but also practically implementable in ecologically sensitive areas and socially diverse settings where human river interactions are intense and multifaceted (Figure 3).

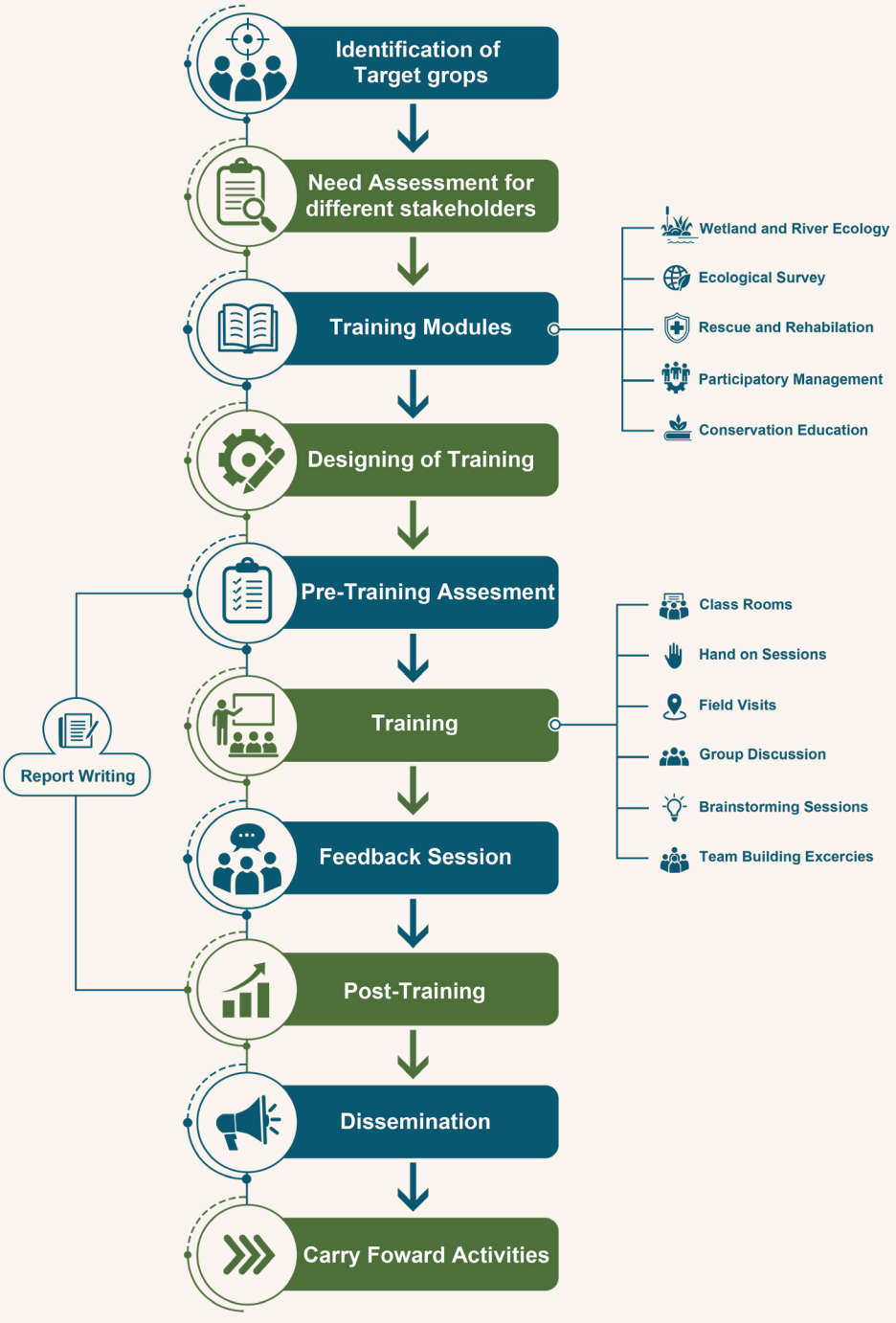

Figure 3: Stages of Capacity Building Initiative

For developing the contents of the training curriculum, a comprehensive process of literature review, consultations and communication was done with the forest department and other stakeholders of Ganga River states. Training and capacity building workshops were designed and delivered according to the constitution of target groups divided at three levels viz. policy, implementation and execution levels.

The capacity building process begins with the identification of target groups. These include a diverse range of engagement of stakeholder's field visits, official correspondence, and stakeholder meetings to understand their current involvement and assess readiness for capacity enhancement (Hamza, 2012; UNDP, 2009).

Following identification, a systematic assessment of capacity development needs is undertaken. This diagnostic phase considers factors such as participants' existing knowledge and skill levels, their operational context (e.g., field postings or academic institutions), level of access to technical resources, and their motivation and willingness to contribute to conservation outcomes. The findings inform the development of structured training objectives aligned with both institutional mandates and site-specific ecological challenges (OECD, 2006).

The design of training modules is guided by the identified needs and tailored for each stakeholder group. These modules cover key topics such as biodiversity monitoring techniques, rescue and rehabilitation protocols for aquatic fauna, ecological survey methods, wetland and riverine habitat management, community engagement strategies, and conservation-linked livelihoods. The instructional approach integrates classroom-based theoretical sessions with field-based demonstrations, case studies, simulation exercises, and participatory group discussions to ensure practical comprehension and applicability.

Implementation of the training programmes requires detailed logistical planning, especially since many training sites are located in areas with limited infrastructure. Resource persons are carefully selected for their subject expertise and field experience, and training materials are developed in multiple languages to ensure accessibility across states. Sessions are scheduled in alignment with ecological and administrative calendars, allowing field staff and community members to participate meaningfully.

A key feature of the capacity building process is the emphasis on evaluation of learning outcomes through pre- and post-training assessments. At the beginning of each programme, participants complete a pre-training questionnaire designed to gauge their baseline understanding of the subject matter, prior experience, and expectations. At the end of the training, a corresponding post-training questionnaire is administered to measure knowledge gain, shifts in attitudes, and perceived improvements in technical confidence. These assessments help determine the effectiveness of the training intervention and identify areas for future refinement. In addition to assessing individual learning outcomes, the evaluation process includes feedback forms capturing participants' views on the content relevance, delivery methods, field components, and overall quality of the programme.

1.4. Training Needs

Following the identification of diverse stakeholder groups engaged in Ganga River conservation, ranging from government officials and academic institutions to community-based volunteers and line agencies etc., it becomes critical to systematically and rigorously assess their existing capabilities, strengths, limitations and the precise competencies they require to carry out their roles effectively, efficiently and impactfully in the long run. This process, known as a training needs assessment (TNA), is the cornerstone of a well-structured capacity building initiative.

In the context of Ganga biodiversity conservation, training needs vary significantly across target groups based on their institutional mandates, levels of engagement, and technical exposure. Forest department personnel require training in ecological monitoring, species-specific rescue protocols, and integrated river management. Fisheries and irrigation officials need to understand the ecological implications of their operational activities and how these can be aligned with conservation goals. Veterinarians require exposure to wildlife health protocols for aquatic species, while academic stakeholders benefit from technical modules on field-based data collection, research methods, and biodiversity informatics. Similarly, for community groups and volunteers, the emphasis lies in building awareness, species identification, first-response reporting mechanisms, and linking conservation with sustainable livelihoods.

The training needs assessment (TNA) process was conducted through a thoughtful combination of qualitative and quantitative methods to capture a comprehensive multi-dimensional picture. These included extensive stakeholder consultations at national, state and local levels; structured and semi-structured interviews with key informants; focused group discussions; analysis of feedback from past trainings; and expert inputs. This mixed-methods approach ensured the collection of actionable insights while remaining responsive to local socio-institutional dynamics (Czabanowska et al., 2024).

Prioritization of training needs was carried out through consultative processes involving relevant departments and institutional stakeholders. This participatory prioritization ensured alignment with both field realities and policy objectives. Furthermore, the TNA served as a platform to initiate dialogue, build ownership, and refine the curriculum based on direct feedback from end users. By investing in a robust needs assessment process, the programme ensured that capacity-building interventions are not generic but tailored to the real-world functions, constraints, and expectations of each stakeholder group. The outputs of this assessment have informed the design of multi-tiered training programmes, ranging from foundational modules for volunteers to advanced thematic workshops for decision-makers and technical experts.

1.5 Training Modules

Effective conservation of aquatic biodiversity in the Ganga River requires the involvement of multiple stakeholders each equipped with enhanced knowledge and skills and a shared sense of responsibility. The river's rich and fragile ecosystem which is also home to endangered flagship species faces persistent threats from habitat alteration, pollution, overexploitation, climate variability and human pressures across the five Ganga River states. To address these existing gaps in technical expertise and institutional capacity, five comprehensive training modules were developed: (1) Biodiversity monitoring of macro aquatic species of Ganga and its tributaries Module. The module focuses on building core competencies in systematic and scientific rigorous monitoring of key aquatic macrofauna and indicator species. Participants learn field techniques such as surveys for Gangetic dolphins, basking counts for gharials and turtles, data recording using standardized formats, basic GPS applications for mapping sightings and habitats and ethical considerations in wildlife observation. Emphasis is placed on accurate species identification, population estimation basics, threat documentation and reporting mechanisms to feed into centralized databases. This module empowers stakeholders especially forest frontline staff, researchers, students and volunteers to generate reliable data essential for tracking conservation status and progress. (2) Conservation and management of Wetland and its associated habitat Module. This module provides in depth understanding of wetland ecology, functions (nutrient cycling, carbon sequestration), Ramsar criteria, legal frameworks and integrated management planning. Training covers habitat assessment techniques, restoration methods and sustainable use practices. Participants gain skills to identify degraded sites, develop site specific management plans that balance ecological integrity with local livelihoods. (3) Rescue and Rehabilitation of macro aquatic animal in distress Module. This highly practical and urgent module which equips participants with life saving protocols for responding to aquatic fauna in distress such as dolphins entangled in nets, stranded gharials during low flows, or turtles affected by pollution or predation. It includes rapid risk assessment at the field, basic first aid, transport methods, veterinary coordination, release site selection and post release monitoring. Emphasis is placed on minimizing stress to animals, legal compliance (Wildlife Protection Act), safety for responders and documentation for learning and reporting.

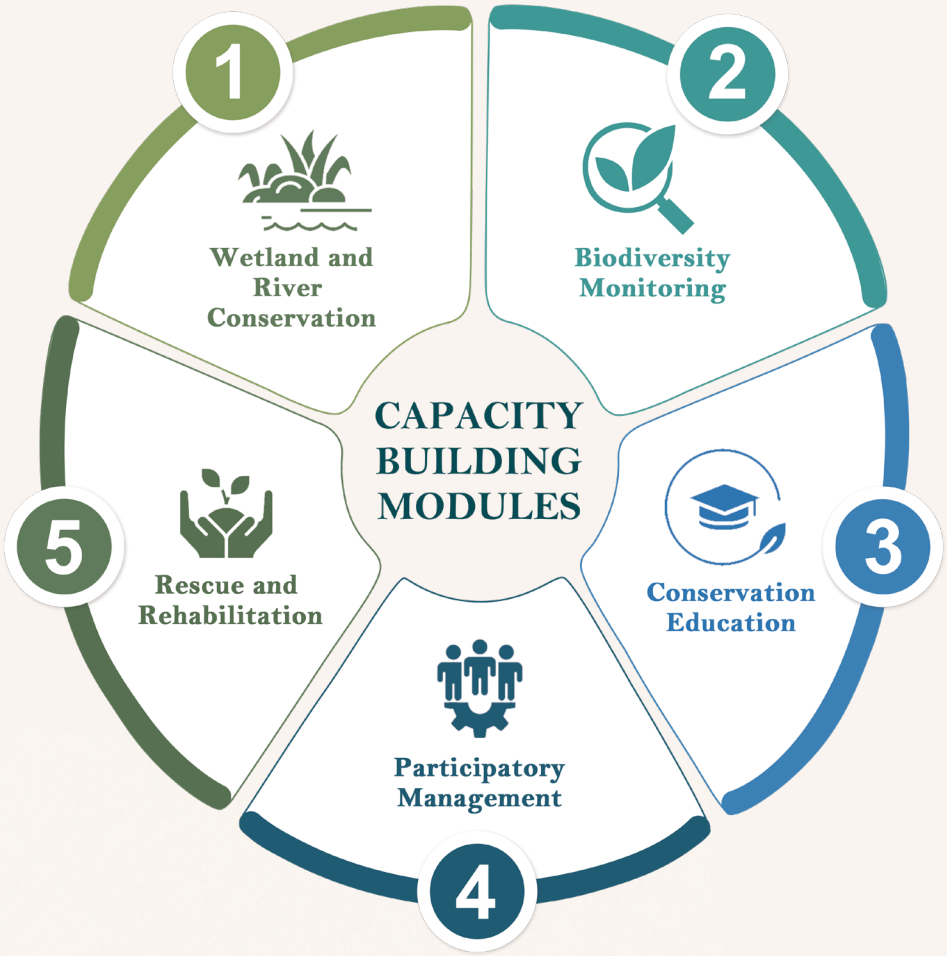

Figure 4: Stages of Capacity Building Initiative

(4) Participatory Management Module. Recognizing that top-down conservation often fails without local buy in, this module centres on community driven approaches. In this module, participants explore principles of participatory planning, stakeholder mapping, conflict resolution, awareness generation strategies and linking conservation with sustainable livelihoods. Training includes facilitation skills, group mobilization techniques, formation of local conservation committees and integration of traditional knowledge with scientific methods and (5) Conservation Education Module. This cross cutting module builds capacity to effectively communicate conservation messages and inspire behavioural change. It covers educational pedagogy meant for different audiences (school children, youth, adults, policymakers), development of awareness materials (posters, brochures, videos, nature interpretation centres), school integration (Bal Ganga Prahari Programme), media engagement and evaluation of education impact.

This module empowers teachers, professors, students and volunteers to become lifelong advocates and educators (Figure 4).development of awareness materials (posters, brochures, videos, nature interpretation centres), school integration (Bal Ganga Prahari Programme), media engagement and evaluation of education impact. This module empowers teachers, professors, students and volunteers to become lifelong advocates and educators (Figure 4).

Together, these five modules are essential and form a holistic and synergistic package for strengthening institutional roles and ensuring coordinated, informed action for long-term biodiversity conservation and ecosystem health in the Ganga River. Based on these well-defined training modules, the capacity building programmes was designed, customised and implemented for multiple stakeholders in the five Ganga River states.

2 OBJECTIVES

The aim was to enhance the institutional and individual capacities of stakeholders involved in freshwater biodiversity conservation across the Ganga River states. It focuses on equipping them with the knowledge, skills, and tools necessary for the effective implementation of conservation strategies and long-term ecological management.

1. Development of training materials targeting different stakeholder groups.
2. Expand the spearhead teams to the Ganga River states and train them in monitoring macro aquatic species of conservation significance, management planning of wetland, rescue and
3. Develop capacity of university professors and students, forest officials, local communities and other stakeholders for monitoring of aquatic species of conservation concern, management planning of rivers and wetlands, community-based conservation.
4. Enhance capacity of the personnel of the forest departments, animal husbandry departments, field veterinarians, and volunteers in rescue and rehabilitation of aquatic fauna in distress.
5. Capacity building of local communities, including the Ganga Praharis for reporting and managing emergent situations.

2 METHODOLOGY

3.1. Training Techniques

In continuation of the training needs assessment, the design and delivery of the capacity building interventions were structured using a targeted methodology that ensured both relevance and practical utility for diverse stakeholder groups involved in freshwater biodiversity conservation of Ganga River. Given their varying roles, exposure levels, and technical backgrounds, a flexible training strategy and methods of andragogy was adopted, rooted in adult learning principles and designed to meet identified knowledge and skill gaps.
To enhance participant engagement and effectiveness, the trainings were conducted using a blend of structured and interactive learning formats. These included expert lectures, group exercises, case-based discussions, participatory planning activities, field demonstrations, hands-on sessions, and exposure visits. This mix of methods catered to different learning preferences and facilitated better comprehension and retention of complex ecological and technical information.

Training was delivered in a competency-based format, with a focus on developing practical skills that could be directly applied in the participants' respective professional or community roles. Each module was designed with a specific set of learning outcomes, and content was contextualised to the local biodiversity conditions and institutional frameworks. Trainers with field expertise ensured that theoretical concepts were linked with real-world applications, making the learning process more meaningful and actionable.
To ensure inclusivity and accessibility, sessions were conducted in both Hindi and English depending on the composition of the group, and examples were drawn from site-specific case studies across the five Ganga River states. Special attention was paid to simplifying technical jargon, using visuals and locally relevant analogies, especially for field-level personnel and community participants.

3.2. Training Model

The effectiveness of the training initiatives was evaluated using the Kirkpatrick Four-Level Training Evaluation Model (Figure 5), which provided a structured approach to monitor and analyse the impact of training across various dimensions. The four levels—Reaction, Learning, Behaviour, and Results were adapted to suit the context of riverine biodiversity conservation and stakeholder engagement along the Ganga River.

The Kirkpatrick Model served as a structured framework to ensure that the training programmes were not only informative but also impactful across multiple levels of stakeholder engagement from individual learning to institutional and ecological outcomes. This model enabled continuous improvement of the capacity-building process, making it more responsive to the evolving challenges and opportunities in riverine biodiversity conservation.

At the first level, participants' immediate responses to the training programmes were collected through structured feedback forms and open-ended responses. These captured their perceptions of the content quality, delivery methods, relevance to their roles, and the overall learning environment. Special attention was paid to whether participants felt the sessions were practical, engaging, and reflective of their on-ground realities. This feedback served as a critical input for refining training modules and improving facilitation styles in future sessions.

The second level focused on assessing the extent of knowledge and skill enhancement achieved through the training. This was done through structured pre- and post-training assessments, which measured improvements in participants' understanding of key concepts, policies, species identification, ecological processes, monitoring techniques, and stakeholder roles in conservation. These assessments enabled a quantitative comparison of learning gains and helped identify areas requiring additional attention.

Figure 5: Kirkpatrick Four-Level Training Evaluation Model

Beyond knowledge acquisition, the third level assessed whether participants applied their learning in their professional or social environments. This was evaluated through follow-up interactions, observational reports from nodal officers, and feedback from institutional supervisors. Examples included forest officials initiating community engagement on riverine biodiversity, fisheries officers applying habitat assessment techniques, and volunteers organising awareness activities in schools, colleges and their surroundings in their capacity.

The final level of evaluation focused on measuring the broader outcomes of the training at the institutional and community levels. This involved analysing whether the capacity-building interventions contributed to improved conservation planning, timely response to wildlife emergencies, integration of biodiversity concerns into development schemes, and enhanced collaboration across departments. Documented instances of cross-sectoral initiatives, biodiversity documentation efforts, species rescue operations, and informed participation in conservation policy discussions reflected tangible programme-level impacts. These results demonstrated that the training programmes had not only enhanced individual competencies but also contributed to institutional readiness and multi-stakeholder collaboration in line with the objectives of the National Mission for Clean Ganga (NMCG).

3.3. Data Analysis – Monitoring and evaluation

Monitoring and evaluation of the training programmes were conducted using the Kirkpatrick's Model (Kirkpatrick, 1959), focusing on assessing the efficacy and effectiveness of trainings conducted between 2019 and 2025. A randomized follow-up E-questionnaire survey was employed to measure post-training outcomes, particularly in terms of changes in awareness, knowledge, attitude, skill, and behaviour among participants. The evaluation covered all three phases, before, during, and after the training interventions.

The respondent sample was proportionally selected based on the number of participants from different states and districts, ensuring representative coverage across the geographical span of the training programmes. Participants completed the follow-up E-questionnaire, in addition, a centralized training database, accessible through the WII-NMCG webpage, was developed to serve as a comprehensive repository of training-related information.

To gain a clear and comprehensive understanding of participant profiles, descriptive statistical methods were employed. Descriptive statistics, as foundational tools in social research, were critical in identifying trends and supporting the overall evaluation framework (Gravetter & Wallnau, 2016). Data were analysed with a focus on key variables such as gender, state and district-wise participation, and stakeholder group composition. Microsoft Excel was used for organizing the data and preparing visual representations, including charts and tables, to illustrate participation patterns. Frequency distributions and percentage analyses were performed to summarize and interpret the data effectively.

The pre- and post-training scores of all 546 participants from the five Ganga River states were subjected to paired inferential analyses to evaluate knowledge gains following the WII-NMCG training programme. Data were analyzed using RStudio 2024.04.2 (Build 764, "Chocolate Cosmos") with the packages dplyr, readxl, effsize, and rstatix. Visualizations of participant responses, demographic variables, and stakeholder composition were generated using the ggplot2 package in RStudio. Pre-training and post-training datasets were merged using participant IDs, and incomplete pairs were removed to ensure paired analysis integrity (n = 546). The Wilcoxon signed-rank test was employed to evaluate differences between pre- and post-training scores, suitable for paired, non-normally distributed data. The test was performed with the asymptotic approximation (exact = FALSE) and without continuity correction (correct = FALSE). Effect sizes were calculated to quantify the magnitude of observed changes. The Rank-Biserial Correlation was computed using wilcox_effsize() to indicate the proportion of favorable differences in paired observations. Additionally, Cohen's d for paired samples was calculated using the cohen.d() function, both with standard correction and via manual computation using the mean difference divided by the standard deviation of differences along with a 95% confidence interval.

Descriptive statistics were computed for demographic (gender, age) and stakeholder variables to contextualize participant responses. Frequencies and percentages were calculated to summarize categorical distributions. Gender distribution was quantified and age-wise representation was categorized into <20-25 years, 26-50 years, and >50 years groups. Stakeholder composition was analyzed to assess professional and institutional diversity. State-wise and district-level distributions were examined to identify geographic variability in programme reach. Chi-square tests of independence were applied to examine statistically significant differences in categorical distributions (gender, age, stakeholder groups) where relevant.

4 RESULTS

4.1 Development of training material through need assessment training workshops for different target groups

To develop context-specific training materials for the Ganga River, a focused literature review and structured training need assessment workshops were conducted to identify capacity gaps and stakeholder requirements. Based on these assessments, targeted training and information products were designed for diverse stakeholder groups. A total of sixteen training need assessment workshops were organized across five Ganga River states i.e., Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal covering thirty-eight districts and engaging 1,065 participants from multiple categories, including forest officials, college professors, ETF-GTF personnel, NCC & NSS volunteers, Ganga Praharis, zookeepers, and school students (Table 1). This wide representation ensured comprehensive coverage of policy, implementation, and execution-level stakeholders.

Table 1: Training need assessment workshops with different target groups for designing of training materials

Target Groups	States	Districts	Total Workshops	Total Participants
Forest Officials	Bihar, Jharkhand, Uttar Pradesh, Uttarakhand	West Champaran, Ambedkar Nagar, Barabanki, Pratapgarh, Ayodhya, Dehradun	7	547
College Professor	Bihar, Uttar Pradesh, Uttarakhand, West Bengal	Ara, Darbhanga, Supaul, Bulandshahr, Gautam Buddha Nagar, Kanpur Dehat, Dehradun, Haridwar, Tehri Garhwal, Hooghly	1	28
ETF-GTF	Uttar Pradesh, Uttarakhand	Prayagraj, Dehradun	2	74
NCC & NSS	Bihar, Jharkhand, Uttar Pradesh, Uttarakhand	Dehradun, Haridwar, Pauri Garhwal, Tehri Garhwal, Bareilly, Bijnor, Farrukhabad, Lucknow, Prayagraj, Kannauj,Kanpur Dehat, Varanasi, Gorakhpur, Begusarai, Bhagalpur, Gaya, Patna, Saharsa, West Champaran, Sahibganj	1	180
Ganga Prahari	Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, West Bengal	Ayodhya, Gorakhpur, Kannauj, Kanpur Dehat, Lucknow, Haridwar, Hooghly, Begusarai, Bhagalpur, Khagaria, West Champaran, Sahibganj, Bahraich, Bijnor, Bulandshahr, Farrukhabad, Kannauj, Muzaffarnagar, Prayagraj, Varanasi, Pauri Garhwal, Udham Singh Nagar, Uttarkashi, Kolkata, Nadia, North 24 Parganas	3	133
Zookeeper & Staff	Uttar Pradesh	Gorakhpur, Kanpur Dehat, Lucknow	1	55
School Students	Uttar Pradesh	Muzaffarnagar	1	48
Total	**5**	**38**	**16**	**1065**

In addition to formal training modules, a range of awareness and outreach materials was developed to support broader dissemination and public engagement. These included booklets, brochures, Poster, and allied communication products focusing on biodiversity conservation, ecosystem services, and ecological stewardship within the Ganga River (Table 2). These materials were designed to convey scientific concepts in an accessible manner while reinforcing the project's objectives, scope, and anticipated outcomes.

In addition to formal training modules, a range of awareness and outreach materials was developed to support broader dissemination and public engagement. These included booklets, brochures, Poster, and allied communication products focusing on biodiversity conservation, ecosystem services, and ecological stewardship within the Ganga River (Table 2). These materials were designed to convey scientific concepts in an accessible manner while reinforcing the project's objectives, scope, and anticipated outcomes.

Table 2: List of training materials generated for capacity building programmes in the five Ganga River States

S. No.	Training Knowledge product	Category	Significance
1	Training approach & curriculum	Book	This curriculum provides information about the syllabus and key approaches to developing and implementing training programmes for stakeholders in Freshwater Biodiversity Conservation.
2	Teachers training manual	Book	This book highlights the training practices, guidelines and hands on exercises for school teachers in River and Biodiversity conservation.
3	Brain Gym: River-Dependent Animals	Book	The "Brain Gym: River Dependent Animals" Activity book is an engaging educational resource that introduces school students to river creatures, promoting curiosity and appreciation for river ecosystems.
4	River Rhythms: Games & Exercises for School children	Book	This book highlights the outdoor games and hands on exercises designed for school children in different aquatic species of Ganga and its habitat.
5	Bal Ganga Prahari Programme: Overview	Booklet	The booklet aims to highlight the Bal Ganga Prahari programmes & involvement of school children in the initiatives of biodiversity conservation of the Ganga River.
6	Project overview: Planning and Management for Aquatic Species Conservation and Maintenance of Ecosystem Services in the Ganga River Basin	Booklet	The booklet gives the overall project overview of Freshwater Biodiversity conservation in the Ganga River.
7	Life in Ganga	Brochure	This brochure depicts the journey of Ganga River from its origin to sink.
8	Rashtriya Jal khata Abhiyan	Brochure (Hindi & English)	The 'Jal Khata Abhiyan' is a campaign aimed at engaging school children and local communities from government and private schools to conserve water. The campaign is an initiative that brings water conservation to the forefront by introducing the concepts of water budgeting and water accounting.

9	Training calendar 2025	Brochure	The Brochure highlights the training activities planned for multiple stakeholders for the financial year of 2025 to 2026 in Freshwater Biodiversity Conservation.
10	Festivals of Ganga	Brochure	The brochure highlights the different festival of Ganga River highlighting the cultural and ritual practices of people associated with rivers.
11	Stakeholder Engagement	Brochure	The brochure provides complete information regarding formulation and implementation of training programmes.
12	Floral Diversity of Ganga River: Trees (Part I, II and III)	Poster (Hindi & English)	The poster highlights the different tree diversity of Ganga River.
13	Floral Diversity of Ganga River: Shrubs	Poster (Hindi & English)	The poster highlights the different shrubs diversity of Ganga River.
14	Floral Diversity of Ganga River: Herbs	Poster (Hindi & English)	The poster highlights the different Herbs diversity of Ganga River.
15	Floral Diversity of Ganga River: Climbers	Poster (Hindi & English)	The poster highlights the different climber's diversity of Ganga River.
16	Butterflies of Ganga River	Poster (Hindi & English)	The poster highlights the different butterfly species of Ganga River.
17	Crocodiles	Poster	The poster highlights the different crocodilian species of Ganga River.
18	Otters	Poster	The poster highlights the different Otter species of Ganga River.
19	Dolphins	Poster	The poster highlights the different freshwater Dolphin species of Ganga River.
20	Bacchon ka akhbar	Bimonthly Newspaper	Children Newspaper on Ganga Biodiversity printed bimonthly.

Systematic distribution of training and awareness materials among stakeholders played a critical role in strengthening project effectiveness and impact. By clearly communicating roles, responsibilities, and implementation pathways, the materials facilitated institutional alignment, minimized operational ambiguities, and enhanced stakeholder participation. Improved access to structured information fostered collaborative engagement, promoted informed decision-making, and encouraged adaptive responses to conservation challenges. Consequently, the dissemination strategy substantially contributed to building collective ownership, reducing conflict potential, and enhancing the overall probability of successful project implementation and long-term conservation outcomes.

4.2 Comprehensive Capacity Development Initiatives for Strengthening Biodiversity Conservation Competencies among Diverse Stakeholders in the Ganga River

A total of 114 training and workshop programmes were conducted under the WII–NMCG project across five major Ganga River states i.e., i) Uttarakhand ii) Uttar Pradesh iii) Bihar, iv) Jharkhand and v) West Bengal, covering a cumulative participation of 7,582 stakeholders (Figure 6). These capacity-building interventions were designed to impart conservation initiatives, strengthen institutional collaboration, and create a trained cadre of informed personnel, first responders, and future conservation leaders across five specialized thematic modules, including Monitoring of Aquatic Biodiversity, Wetland Conservation and River Management, Rescue and Rehabilitation, Participatory Management, and Conservation Education, along with specialized rescue training components.

State-wise participation revealed that Uttar Pradesh accounted for the highest representation with 3,586 participants (47.30%), followed by Uttarakhand with 2,369 participants (31.25%), Bihar with 997 participants (13.15%), Jharkhand with 349 participants (4.60%), and West Bengal with 281 participants (3.71%) (Table 3). This distribution indicates a strong geographical focus on the central and upper stretches of the Ganga River, reflecting higher training intensity and stakeholder engagement in these regions.

Among stakeholder categories, Ganga Praharis constituted the largest participant group, with 1,947 individuals (25.68%), highlighting the strategic emphasis on developing community-based river guardians and frontline conservation workers (Table 3). This was followed by college students (1,328; 17.52%) and forest officials (1,304; 17.20%), underscoring the dual focus on academic engagement and institutional strengthening. School students accounted for 746 participants (9.84%), indicating strong outreach toward early-stage conservation education, while National Service Scheme (NSS) volunteers represented 590 participants (7.78%), reinforcing youth involvement in participatory conservation initiatives (Table 3).

Other notable stakeholder groups included local communities (308; 4.06%), religious groups (211; 2.78%), National Cadet Corps (NCC) cadets (153; 2.02%), school teachers (158; 2.08%), ETF-GTF personnel (174; 2.29%), and zookeeper staff (124; 1.64%), demonstrating broad multi-sectoral engagement (Table 3). Technical and professional stakeholders such as researchers (62; 0.82%), veterinarians (22; 0.29%), scientists (10; 0.13%), irrigation department engineers (22; 0.29%), police personnel (73; 0.96%), and tourist guides (84; 1.11%) further strengthened interdisciplinary integration across conservation, governance, enforcement, and ecotourism domains (Table 3).

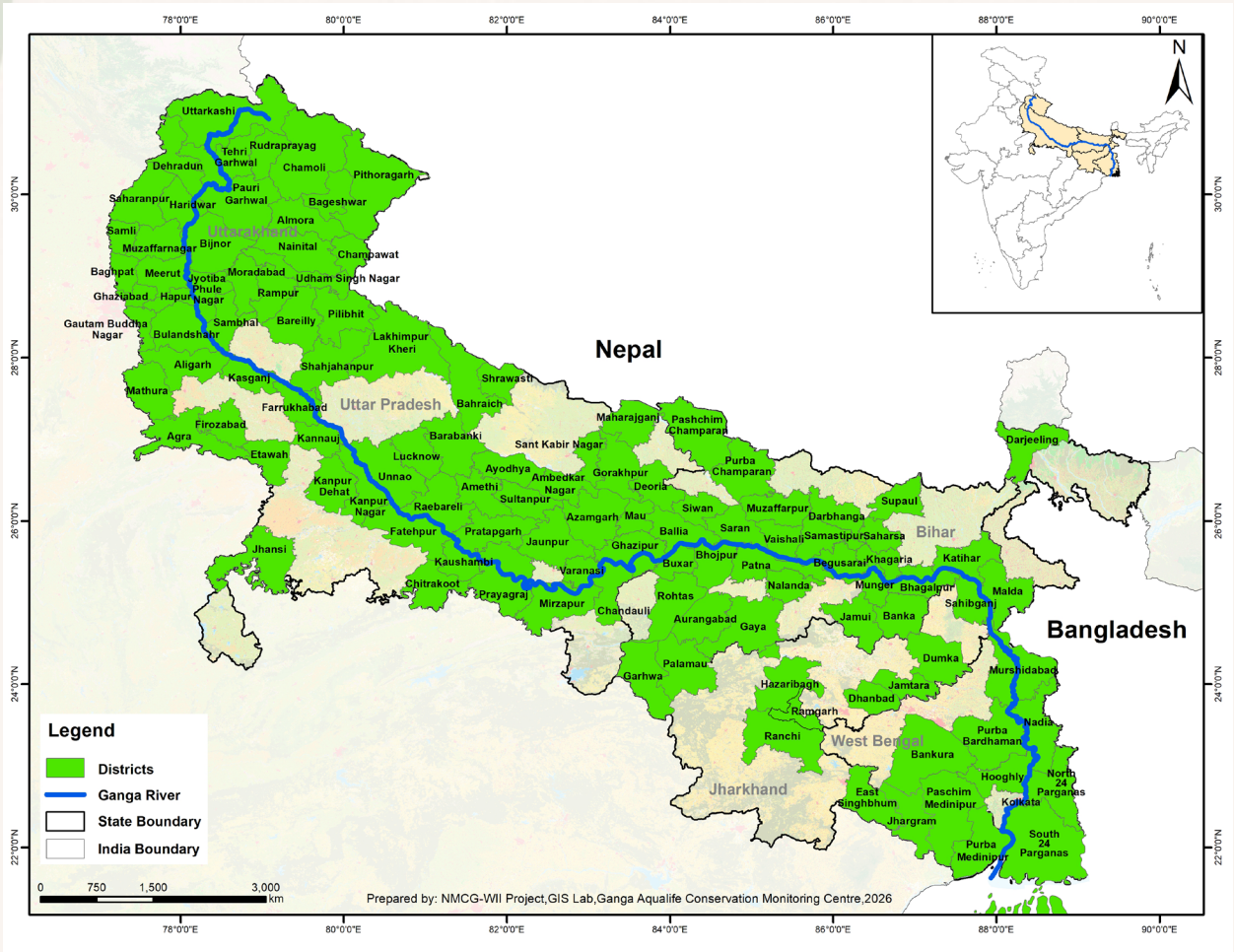

Figure 6: Overall participation in Capacity Building Programmes in the Ganga River States

The inclusion of NGOs and volunteers (81; 1.07%), media professionals (11; 0.15%), and line agencies (10; 0.13%) reflects targeted efforts toward enhancing awareness dissemination, institutional coordination, and public outreach mechanisms. Collectively, the diversified stakeholder participation highlights the program's comprehensive approach toward ecosystem-based conservation, emergency preparedness, participatory governance, and the establishment of a trained conservation workforce capable of responding to emergent ecological and wildlife rescue scenarios (Table 3).

Table 3: State-wise and stakeholder-wise distribution of training participants across five major Ganga River states

Stakeholders	Bihar	Jharkhand	Uttar Pradesh	Uttarakhand	West Bengal	Total
College Professor	8	1	54	45	5	113 (1.49%)
College Students	25		910	393		1328 (17.52%)
ETF-GTF			141	30	3	174 (2.29%)
Fisheries Officials	3	4	4	5		16 (0.21%)
Forest Officials	270	1	700	288	45	1304 (17.20%)
Ganga Prahari	454	266	527	558	142	1947 (25.68%)
Irrigation Department & Engineers			10	11	1	22 (0.29%)
Line Agencies	3		2		5	10 (0.13%)
Local Community	33	15	199	36	25	308 (4.06%)
Media	11					11 (0.15%)
NCC	15	7	45	86		153 (2.02%)
NGOs & Volunteers	20	3	17	38	3	81 (1.07%)
NSS	46	42	176	300	26	590 (7.78%)
NYKS	6		18	6	5	35 (0.46%)
Police Personnels			55	18		73 (0.96%)

Religious Group			211			211 (2.78%)
Researcher	55	1	2	4		62 (0.82%)
School Students	31	3	298	404	10	746 (9.84%)
School Teachers	7	6	27	107	11	158 (2.08%)
Scientists			6	4		10 (0.13%)
Tourist Guide			79	5		84 (1.11%)
Veterinarians	10		10	2		22 (0.29%)
Zookeeper & Staff			95	29		124 (1.64%)
Total	**997 (13.15%)**	**349 (4.60%)**	**3586 (47.30%)**	**2369 (31.25%)**	**281 (3.71)**	**7582**

4.2.1 Gender-Disaggregated Participation across Ganga River States

Gender-wise analysis of overall participation revealed a marked predominance of male stakeholders, with 5,331 male participants (70.31%) compared to 2,251 female participants (29.69%) across the five Ganga River states (Table 4). This distribution indicates a substantial gender gap in training outreach and participation, particularly within technical, enforcement, and field-based conservation domains.

Table 4: Gender Wise participation across Ganga River states

States	Female	Male	Total
Bihar	276 (27.68%)	721 (72.32%)	997
Jharkhand	146 (41.83%)	203 (58.17%)	349
Uttar Pradesh	918 (25.60%)	2668 (74.40%)	3586
Uttarakhand	805 (33.98%)	1564 (66.02 %)	2369
West Bengal	106 (37.72%)	175 (62.28%)	281
Total	**2251 (29.69%)**	**5331 (70.31%)**	**7582**

At the state level, Bihar recorded 276 female participants (27.68%) and 721 male participants (72.32%), reflecting a comparatively lower representation of women in training programmes (Table 4, Figure 7). Similarly, Uttar Pradesh exhibited a pronounced gender disparity, with 918 females (25.60%) and 2,668 males (74.40%), corresponding to the highest overall training coverage but relatively limited female inclusion.

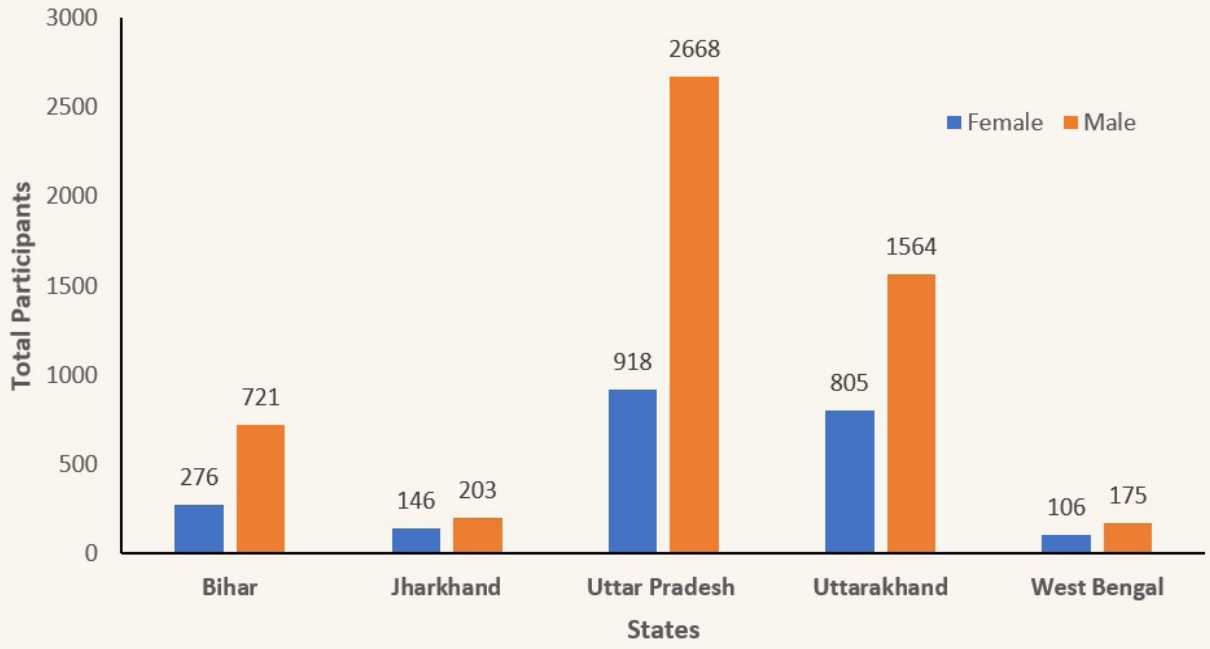

Figure 7: Gender-wise distribution of training participants across five major Ganga River states

In contrast, Jharkhand demonstrated the highest proportional representation of female participants, accounting for 146 individuals (41.83%), alongside 203 male participants (58.17%), indicating a comparatively balanced gender engagement. In Uttarakhand, female participation comprised 805 individuals (33.98%), while male participation accounted for 1,564 individuals (66.02%), suggesting moderate inclusion of women within conservation training frameworks (Table 4, Figure 7). West Bengal reported 106 female participants (37.72%) and 175 male participants (62.28%), reflecting comparatively improved female engagement relative to other states.

Overall, the aggregated gender distribution underscores the need for targeted strategies to enhance female participation, particularly in technical modules such as aquatic biodiversity monitoring, rescue and rehabilitation, and emergency response training. Strengthening gender-inclusive capacity-building frameworks is essential for fostering equitable representation, diversified perspectives, and improved community-level conservation outcomes across the Ganga River.

4.2.2 Module-Specific Participation Trends in Training Programmes

Module-wise analysis of training participation revealed substantial variation across thematic domains and states, reflecting differential training needs, stakeholder roles, and functional responsibilities. It is important to note that several participants attended multiple training modules, including full participation across all five modules in selected cases, while others attended only need-based or role-specific modules. Consequently, the cumulative module-wise participation exceeds the total number of unique participants (7,582), and the observed variation reflects overlapping enrolment rather than inflation of training coverage (Table 5; Figure 8). Across all states, Participatory Management recorded the highest overall engagement, with 2,869 participations, followed by Conservation Education with 2,784 participations, Monitoring of Aquatic Biodiversity with 2,696 participations, and Rescue and Rehabilitation with 2,625 participations, while Wetland Conservation and River Management accounted for 1,446 participations, indicating relatively lower representation within hydrological and wetland-specific modules (Table 5).

State-wise distribution demonstrated that Uttar Pradesh consistently exhibited the highest participation across all training modules, particularly in Monitoring of Aquatic Biodiversity (1,390), Rescue and Rehabilitation (1,363), and Conservation Education (1,149), reflecting extensive institutional engagement and field-level capacity development (Table 5; 8). Similarly, Uttarakhand showed strong representation in Conservation Education (1,283) and Participatory Management (857), emphasizing its strategic focus on awareness generation, community involvement, and conservation leadership development. However, in the state of Bihar, participation was predominantly concentrated in Rescue and Rehabilitation (677) and Participatory Management (591), highlighting the state's operational emphasis on wildlife rescue preparedness and stakeholder-led conservation frameworks. Jharkhand demonstrated comparatively higher engagement in Participatory Management (304) and Conservation Education (83), whereas participation in Rescue and Rehabilitation remained minimal (4), indicating scope for strengthening specialized emergency response capacity. West Bengal recorded consistent participation across all modules, with relatively higher engagement in Participatory Management (135) and Rescue and Rehabilitation (88), reflecting balanced thematic coverage (Table 5; Figure 8).

Table 5: State-wise and module-wise distribution of training participation across five major Ganga River states

Modules	Bihar	Jharkhand	Uttar Pradesh	Uttarakhand	West Bengal	Total
Monitoring of Aquatic Biodiversity	192	79	1390	929	106	2696
Wetland Conservation and River Management	123	47	403	808	65	1446
Rescue and Rehabilitation	677	4	1363	493	88	2625
Participatory Management	591	304	982	857	135	2869
Conservation Education	180	83	1149	1283	89	2784

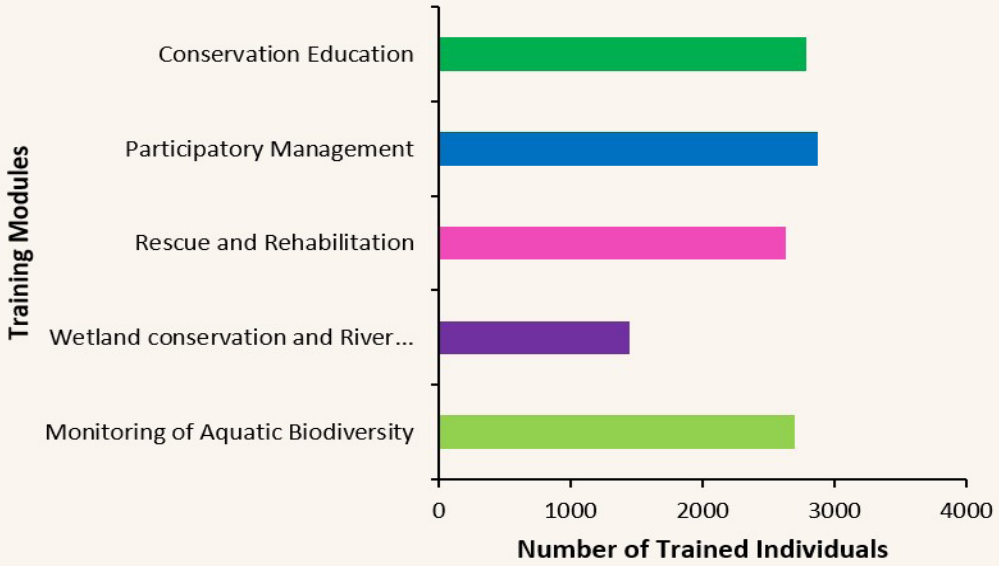

Figure 8: State and module-wise training participation across five major Ganga River states

The distribution of module-wise participation underscores the project's integrated approach, combining ecological monitoring, habitat management, emergency response, community participation, and conservation education. The observed variability across modules and states reflects adaptive training design aligned with regional conservation priorities, institutional capacities, and emergent field requirements, thereby enhancing the operational readiness and conservation leadership potential of stakeholders across the Ganga River (Table 5; Figure 8).

4.3 Targeted Spearhead Capacity-Building Interventions for Advancing Freshwater Biodiversity Conservation Catalysts for Effective Freshwater Biodiversity Conservation

A total of 22 specialized spearhead training programmes were conducted across five major Ganga River states, encompassing 869 participants, with the objective of developing a highly skilled cadre capable of responding to emergent conservation challenges, particularly in the domains of freshwater biodiversity monitoring, species rescue, rehabilitation, and frontline emergency response. These advanced trainings were strategically designed to strengthen technical competencies, inter-agency coordination, and rapid-action preparedness for aquatic fauna conservation across the Ganga River (Table 6, Figure 9).

State-wise participation indicated that Uttarakhand recorded the highest representation with 389 participants (44.76%), followed by Uttar Pradesh with 301 participants (34.64%), West Bengal with 99 participants (11.39%), Bihar with 51 participants (5.87%), and Jharkhand with 29 participants (3.34%) (Table 6). This distribution reflects the prioritization of upper and middle stretches of the Ganga River, where species richness, conservation sensitivity, and rescue intervention frequency remain comparatively high. Among stakeholder categories, forest officials constituted the largest participant group with 147 individuals (16.92%), followed by Ganga Praharis with 129 participants (14.84%), and school teachers with 83 participants (9.55%), underscoring the dual focus on institutional strengthening and grassroots conservation leadership development (Table 04). School students accounted for 78 participants (8.98%), and NSS volunteers comprised 75 participants (8.63%),

A total of 22 specialized spearhead training programmes were conducted across five major Ganga River states, encompassing 869 participants, with the objective of developing a highly skilled cadre capable of responding to emergent conservation challenges, particularly in the domains of freshwater biodiversity monitoring, species rescue, rehabilitation, and frontline emergency response. These advanced trainings were strategically designed to strengthen technical competencies, inter-agency coordination, and rapid-action preparedness for aquatic fauna conservation across the Ganga River (Table 6, Figure 9).

State-wise participation indicated that Uttarakhand recorded the highest representation with 389 participants (44.76%), followed by Uttar Pradesh with 301 participants (34.64%), West Bengal with 99 participants (11.39%), Bihar with 51 participants (5.87%), and Jharkhand with 29 participants (3.34%) (Table 6). This distribution reflects the prioritization of upper and middle stretches of the Ganga River, where species richness, conservation sensitivity, and rescue intervention frequency remain comparatively high. Among stakeholder categories, forest officials constituted the largest participant group with 147 individuals (16.92%), followed by Ganga Praharis with 129 participants (14.84%), and school teachers with 83 participants (9.55%), underscoring the dual focus on institutional strengthening and grassroots conservation leadership development (Table 04). School students accounted for 78 participants (8.98%), and NSS volunteers comprised 75 participants (8.63%), indicating substantial youth engagement in conservation capacity-building. College professors (66; 7.59%) and college students (45; 5.18%) further strengthened academic participation, fostering integration of scientific knowledge and field application (Table 6).

Technical stakeholders including fisheries officials (16; 1.84%), veterinarians (6; 0.69%), scientists (9; 1.04%), ETF-GTF personnel (44; 5.06%), and zookeeper staff (14; 1.61%) contributed to reinforcing specialized operational expertise in aquatic species handling, rescue protocols, health assessment, and post-rescue rehabilitation (Table 6). Furthermore, police personnel (18; 2.07%), irrigation department engineers (21; 2.42%), and line agencies (4; 0.46%) played a critical role in enhancing cross-sectoral coordination, enforcement mechanisms, and disaster-response preparedness (Table 6).

Table 6: Distribution of participants across stakeholder groups and states in specialized spearhad training programmes conducted in five major Ganga River states

Stakeholders	Bihar	Jharkhand	Uttar Pradesh	Uttarakhand	West Bengal	Total
College Professor	8	1	30	23	4	66 (7.59%)
College Students			10	35		45 (5.18%)
ETF-GTF			11	30	3	44 (5.06%)
Fisheries Officials	3	4	4	5		16 (1.84%)
Forest Officials			102		45	147 (16.92%)
Ganga Prahari	23	14	67	14	11	129 (14.84%)
Irrigation Department & Engineers			9	11	1	21 (2.42%)

Irrigation Department & Engineers			9	11	1	21 (2.42%)
Line Agencies					4	4 (0.46%)
NCC				41		41 (4.72%)
NGOs & Volunteers			2	38		40 (4.60%)
NSS	7	4	5	44	15	75 (8.63%)
NYKS	6		18	4	5	33 (3.80%)
Police Personnels				18		18 (2.07%)
School Students				78		78 (8.98%)
School Teachers	4	6	19	43	11	83 (9.55%)
Scientists			6	3		9 (1.04%)
Veterinarians			4	2		6 (0.69%)
Zookeeper & Staff			14			14 (1.61%)
Total	**51 (5.87%)**	**29 (3.34%)**	**301 (34.64%)**	**389 (44.76%)**	**99 (11.39)**	**869**

4.3.1 Spatial distribution of participants trained under the specialized spearhead programmes

The spatial distribution of participants trained under the specialized spearhead programmes encompassed 68 districts across five major Ganga River states, with a total of 869 trained individuals, reflecting extensive geographical outreach and targeted capacity-building interventions across the Ganga River (Table 7, Figure 9). The district-wise variation in participation highlights the adaptive and need-based deployment of advanced conservation training, aligned with regional ecological priorities, biodiversity sensitivity, and operational requirements. Among the participating states, Uttarakhand recorded the highest district-level engagement, covering 13 districts with 389 participants, representing the largest share of trained individuals. Notably, Dehradun district alone accounted for 206 participants, followed by Haridwar (58), Tehri Garhwal (47), Pauri Garhwal (22), and Uttarkashi (18), indicating a strong concentration of training efforts within the upper Ganga River and Himalayan foothill regions (Table 7, Figure 9). This spatial emphasis reflects the ecological sensitivity, high freshwater biodiversity richness, and frequent wildlife rescue and rehabilitation demands characteristic of these landscapes.

Uttar Pradesh exhibited the widest district-level coverage, spanning 29 districts with 301 participants, demonstrating extensive geographic diffusion of training across the middle and lower stretches of the Ganga River. High participation was observed in Kanpur Dehat (74), Gorakhpur (42), Varanasi (36), Prayagraj (25), Bijnor (25), and Muzaffarnagar (15), reflecting targeted engagement in regions characterized by dense human populations, elevated anthropogenic pressure, and critical aquatic biodiversity habitats (Table 7, Figure 9). The broad spatial distribution in Uttar Pradesh underscores the program's strategic intent to strengthen district-level conservation preparedness and emergency response capabilities across diverse socio-ecological settings. In West Bengal, training interventions covered nine districts with 99 participants, with the highest representation recorded in Kolkata (71), followed by Nadia (6), Purba Bardhaman (6), and South 24 Parganas (6) (Table 7, Figure 9). The concentration of participants in Kolkata likely reflects centralized institutional training hubs, while the inclusion of deltaic and estuarine districts emphasizes preparedness for conservation challenges associated with complex river estuary dynamics.

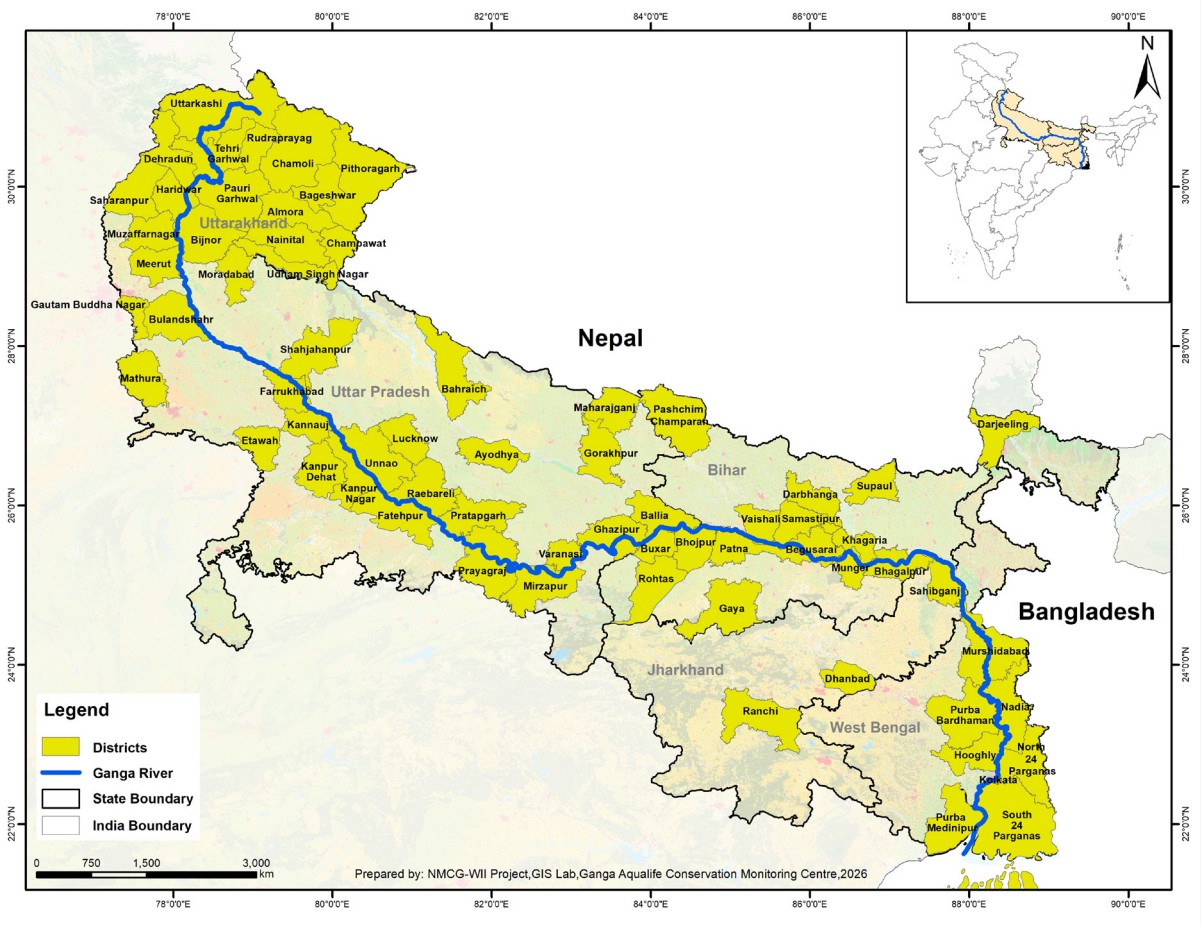

Figure 9: Specialized Spearhead Trainings in Freshwater Biodiversity Conservation in Ganga River States

Bihar accounted for 14 districts with 51 participants, with notable engagement in Bhagalpur (19), Patna (9), and Vaishali (5), whereas Jharkhand recorded participation from three districts with 29 participants, predominantly from Sahibganj (24) and Ranchi (4) (Table 7, Figure 9). Although the absolute numbers were lower in these states, the targeted district coverage highlights strategic engagement within ecologically significant riverine corridors and conservation-sensitive zones.

The observed district-wide variation reflects a spatially adaptive training deployment strategy, guided by regional conservation priorities, logistical feasibility, institutional presence, and ecological vulnerability. Concentration of training efforts in biodiversity-rich and high-risk districts indicates a deliberate focus on strengthening localized response capacity, community-based conservation stewardship, and rapid emergency intervention mechanisms. Collectively, the extensive geographic spread across 68 districts demonstrates the programme's effectiveness in establishing a decentralized conservation network, thereby enhancing the operational resilience, spatial preparedness, and ecological responsiveness of conservation stakeholders throughout the Ganga River (Table 7, Figure 9).

Table 7: Geographical distribution of district-wise participation in specialized spearhead training programmes across five major Ganga River states

States	Districts	Participants	State Total
Bihar (14 districts)	Ara	2	51
	Begusarai	1	
	Bhagalpur	19	
	Buxar	1	
	Darbhanga	1	
	Gaya	2	
	Khagaria	1	
	Munger	2	
	Patna	9	
	Rohtas	1	
	Samastipur	3	
	Supaul	1	
	Vaishali	5	
	West Champaran	3	
Jharkhand (3 districts)	Dhanbad	1	29
	Ranchi	4	
	Sahibganj	24	
Uttar Pradesh (29 districts)	Ayodhya	4	301
	Bahraich	2	
	Ballia	2	
	Bijnor	25	
	Bulandshahr	16	
	Etawah	3	
	Farrukhabad	6	
	Fatehpur	1	
	Gautam Buddha Nagar	5	
	Ghazipur	1	
	Gorakhpur	42	
	Kannauj	8	
	Kanpur Dehat	74	

	Kanpur Nagar	1	
	Lakhimpur Kheri	1	
	Lucknow	16	
	Maharajganj	4	
	Mathura	1	
	Meerut	1	
	Mirzapur	2	
	Moradabad	5	
	Muzaffarnagar	15	
	Pratapgarh	1	
	Prayagraj	25	
	Raebareli	1	
	Saharanpur	1	
	Shahjahanpur	1	
	Unnao	1	
	Varanasi	36	
UUttarakhand (13 districts)	Almora	4	389
	Bageshwar	1	
	Chamoli	5	
	Champawat	3	
	Dehradun	206	
	Haridwar	58	
	Nainital	8	
	Pauri Garhwal	22	
	Pithoragarh	2	
	Rudraprayag	9	
	Tehri Garhwal	47	
	Udham Singh Nagar	6	
	Uttarkashi	18	
West Bengal (9 districts)	Darjeeling	3	99
	Hooghly	3	
	Kolkata	71	
	Murshidabad	1	

Nadia	6
North 24 Parganas	1
Purba Bardhaman	6
Purba Medinipur	2
South 24 Parganas	6
Total Participants	869

The strategic emphasis on spearhead training holds substantial significance for freshwater biodiversity conservation, particularly in large riverine ecosystems such as the Ganga. These programmes enhance early detection of ecological stressors, rapid response to wildlife emergencies, effective rescue and rehabilitation of threatened aquatic species, and community-based surveillance mechanisms, thereby directly contributing to the reduction of species mortality and habitat degradation. The integration of frontline responders, academic institutions, enforcement agencies, and local stakeholders establishes a robust multi-tier conservation network, capable of addressing complex conservation challenges including accidental entanglement, stranding events, pollution-induced mortality, hydrological alterations, and anthropogenic disturbances. Collectively, the specialized spearhead trainings have strengthened institutional preparedness, technical competence, and participatory stewardship, thereby significantly augmenting the long-term conservation resilience of freshwater biodiversity within the Ganga River.

4.4 Capacity building of forest departments, animal husbandry departments, veterinarians, and other volunteers in rescue and rehabilitation techniques in the Ganga River States

Rescue and rehabilitation training represents a core operational pillar of freshwater biodiversity conservation, particularly within highly anthropogenically influenced riverine ecosystems such as the Ganga River. These training interventions are designed to strengthen emergency response capabilities, improve technical proficiency in wildlife handling, ensure ethical rescue practices, and enhance post-rescue rehabilitation outcomes. Under the WII–NMCG project, 42 structured training sessions on rescue and rehabilitation were conducted, including 9 specialized rescue trainings, collectively engaging 2,625 participants, of whom 528 individuals were trained under advanced specialized rescue modules aimed at frontline responders and emergency intervention personnel (Table 8, Figure 10).

State-wise analysis revealed that Uttar Pradesh accounted for the highest participation, with 1,363 participants (51.92%), followed by Bihar with 677 participants (25.79%), Uttarakhand with 493 participants (18.78%), West Bengal with 88 participants (3.35%), and Jharkhand with 4 participants (0.15%) (Table 8). This spatial distribution reflects the prioritization of training efforts in regions experiencing elevated frequencies of wildlife rescue incidents, intensive human–river interactions, dense settlement patterns, and heightened ecological vulnerability.

Across stakeholder categories, forest officials constituted the largest participant group, with 982 individuals (37.41%), highlighting the strategic emphasis on enhancing institutional preparedness and strengthening frontline operational capacity (Table 8). Ganga Praharis formed the second-largest group, with 479 participants (18.25%), underscoring the critical role of community-based first responders in localized rescue operations and surveillance networks. College students represented 392 participants (14.93%), reflecting the integration of academic institutions into practical conservation training frameworks. School students accounted for 169 participants (6.44%), reinforcing early-stage awareness and conservation capacity building. Technical

personnel such as ETF–GTF members (124; 4.72%), zookeeper and zoo staff (122; 4.65%), and police personnel (73; 2.78%) further strengthened multidisciplinary rescue preparedness, institutional coordination, and emergency response logistics (Table 8). Additional stakeholder groups included researchers (58; 2.21%), local community members (58; 2.21%), tourist guides (56; 2.13%), NCC cadets (41; 1.56%), and veterinarians (20; 0.76%), contributing to scientific integration, community surveillance, eco-tourism regulation, and clinical wildlife care. Participation from line agencies (9; 0.34%), irrigation department engineers (5; 0.19%), NGOs and volunteers (4; 0.15%), NSS volunteers (4; 0.15%), NYKS volunteers (4; 0.15%), school teachers (2; 0.08%), and scientists (1; 0.04%) further enhanced intersectoral coordination and conservation outreach.

In Bihar, training engagement was dominated by forest officials (266) and Ganga Praharis (314), collectively accounting for a substantial proportion of participants, reflecting strong institutional and community-level rescue preparedness. Uttar Pradesh exhibited extensive cross-sectoral engagement, particularly among forest officials (387), college students (367), and school students (169), highlighting comprehensive training diffusion across enforcement, academic, and youth groups. Uttarakhand demonstrated significant participation among forest officials (284), ETF–GTF personnel (30), and police personnel (18), consistent with the region's complex terrain, frequent wildlife conflict events, and logistical challenges associated with mountain rescue operations.

Table 8: State-wise and stakeholder-wise distribution of participants in rescue and rehabilitation rehabilitation training programmes, including specialized rescue modules, across five major Ganga River states.

Stakeholders	Bihar	Jharkhand	Uttar Pradesh	Uttarakhand	West Bengal	Total
College professor	4	1	10	3	4	22 (0.84%)
College Students	25		367			392 (14.93%)
ETF-GTF			91	30	3	124 (4.72%)
Forest Officials	266		387	284	45	982 (37.41%)
Ganga Prahari	314	3	63	82	17	479 (18.25%)
Irrigation Department & Engineers			5			5 (0.19%)
Line Agencies	5		1		5	9 (0.34%)
Local Community			54		4	58 (2.21%)
NCC				41		41 (1.56%)
NGOs & Volunteers			4			4 (0.15%)
NSS					4	4 (0.15%)
NYKS					4	4 (0.15%)
Police Personnels			55	18		73 (2.78%)

Researchers	55			3		58 (2.21%)
School Students			169			169 (6.44%)
School Teachers					2	2 (0.08%)
Scientists				1		1 (0.04%)
Tourist Guide			56			5 (2.13%)
Veterinarians	10		8	2		20 (0.76%)
Zookeeper & Staff			93	29		122 (4.65%)
Total	677 (25.79%)	4 (0.15%)	1363 (51.92%)	493 (18.78%)	88 (3.35%)	2625

4.4.1 Spatial distribution of participants in rescue and rehabilitation training programmes across five major Ganga River states

The spatial distribution of participants in rescue and rehabilitation training programmes encompassed 47 districts across five major Ganga River states, with a cumulative participation of 2,625 individuals, reflecting extensive geographical outreach and targeted operational capacity building within the Ganga River (Table 9, Figure 10). The district-wise variability highlights a strategic, need-based deployment of training interventions, aligned with regional ecological sensitivity, conservation urgency, and operational demand. Among the participating states, Uttar Pradesh recorded the highest district-level coverage, spanning 14 districts with 1,363 participants, followed by Bihar with 15 districts and 677 participants, Uttarakhand with 9 districts and 493 participants, West Bengal with 7 districts and 88 participants, and Jharkhand with 2 districts and 4 participants (Table 9, Figure 10). This spatial pattern reflects a prioritized focus on the middle and upper reaches of the Ganga River, characterized by high anthropogenic pressures, dense human settlements, and elevated freshwater biodiversity vulnerability.

Figure 10: Spatial distribution of participants in rescue and rehabilitation training programmes across five major Ganga River states

In Bihar, district-wise participation was concentrated in West Champaran (295), Bhagalpur (121), and Patna (104), collectively accounting for a substantial proportion of the state's trained participants. Additional engagement was observed in Begusarai (30), Vaishali (41), Katihar (21), and Siwan (18), indicating widespread training diffusion across ecologically and socio-economically significant districts (Table 9). In Uttar Pradesh, participation was highly distributed, with notable concentrations in Varanasi (563), Ayodhya (186), Kanpur Dehat (150), Gorakhpur (142), Meerut (125), and Prayagraj (94). These districts represent critical freshwater biodiversity hotspots, pilgrimage and urban centers, and regions experiencing frequent wildlife rescue interventions, emphasizing the operational relevance of focused training deployment (Table 9). Uttarakhand demonstrated strong district-wise engagement, particularly in Dehradun (341), Haridwar (75), Nainital (53), and Tehri Garhwal (17), highlighting intensive capacity building within the upper Ganga River and Himalayan foothill zones, where terrain complexity, ecological fragility, and wildlife rescue frequency remain high (Table 9).

In West Bengal, training efforts were concentrated in Kolkata (53), followed by Nadia (15), Purba Bardhaman (7), Murshidabad (6), Darjeeling (3), and Hooghly (3), reflecting targeted engagement across metropolitan, riverine, and deltaic landscapes (Table 9). Jharkhand exhibited limited participation, restricted to Dhanbad (1) and Sahibganj (3), suggesting the need for expanded rescue preparedness initiatives in the state.

Table 9: State and district wise distribution of participants in rescue and rehabilitation training programmes modules across five major Ganga River states.

Bihar	Participants	Jharkhand	Participants	Uttar Pradesh	Participants	Uttarakhand	Participants	West Bengal	Participants	Total
Banka	2	Dhanbad	1	Ayodhya	186	Champawat	1	Darjeeling	3	
Begusarai	30	Sahibganj	3	Ballia	1	Dehradun	341	Hooghly	3	
Bhagalpur	121			Bijnor	33	Haridwar	75	Kolkata	53	
East Champaran	6			Bulandshahr	2	Nainital	53	Murshidabad	6	
Gaya	2			Etawah	2	Pauri Garhwal	2	Nadia	15	
Jamui	5			Gorakhpur	142	Rudraprayag	1	Purba Bardhaman	7	
Katihar	21			Kanpur Dehat	150	Tehri Garhwal	17	South 24 Parganas	1	
Khagaria	6			Lucknow	38	Udham Singh Nagar	1			**2625**
Nalanda	2			Maharajganj	4	Uttarkashi	2			
Patna	104			Mathura	1					
Samastipur	12			Meerut	125					
Siwan	18			Muzaffarnagar	22					
Supaul	12			Prayagraj	94					
Vaishali	41			Varanasi	563					
West Champaran	295									
Districts-15	677	Districts-2	4	Districts-14	1363	Districts-9	493	Districts-7	88	

The observed district-wise heterogeneity underscores a spatially adaptive training deployment framework, guided by regional conservation priorities, frequency of rescue incidents, hydrological complexity, and institutional readiness. Concentration of training efforts within high-risk districts reflects a strategic emphasis on strengthening localized response mechanisms, inter-agency coordination, and rapid emergency preparedness, thereby enhancing the operational resilience of freshwater biodiversity conservation systems across the Ganga River (Table 9, Figure 10).

The specialized rescue trainings were specifically designed to develop high-level technical proficiency in wildlife capture, aquatic species handling, emergency veterinary care, trauma stabilization, and post-rescue rehabilitation protocols. These advanced modules significantly strengthened rapid response efficiency, inter-agency operational coherence, and field-level problem-solving capacity, thereby enhancing conservation effectiveness under high-risk and time-sensitive conditions. The extensive stakeholder participation in rescue and rehabilitation trainings substantially strengthens the operational resilience of freshwater biodiversity conservation frameworks across the Ganga River. By integrating enforcement agencies, scientific institutions, community-based actors, educators, and emergency personnel, the programme establishes a multi-tiered rescue and response network capable of addressing diverse conservation threats, including accidental entanglement, stranding events, pollution-induced morbidity, hydrological disturbances, and infrastructure-induced habitat fragmentation. Collectively, these interventions contribute to reduced wildlife mortality, improved rescue success rates, and strengthened long-term conservation outcomes for freshwater species within the Ganga River ecosystem.

4.5 Integrated Stakeholder Training and Participatory Public Awareness Frameworks for Environmental Conservation and Mobilization

In addition to spearhead and rescue and rehabilitation trainings, the WII-NMCG project implemented 83 training and awareness programmes targeting the general public and diverse stakeholder groups, with a cumulative participation of 6,185 individuals. These interventions were strategically designed to generate mass public awareness, promote conservation stewardship, foster behavioral change, and catalyze community-driven conservation action, thereby supporting the creation of a sustained social movement for freshwater biodiversity conservation across the Ganga River (Table 10, Figure 11).

State-wise, Uttar Pradesh accounted for the highest participation with 2,977 individuals (48.13%), followed by Uttarakhand with 1,924 participants (31.11%), Bihar with 783 participants (12.66%), Jharkhand with 320 participants (5.17%), and West Bengal with 181 participants (2.93%) (Table 10). This spatial pattern reflects the project's strategic prioritization of high-population-density regions, ecologically sensitive riverine landscapes, and districts experiencing elevated anthropogenic pressures on freshwater ecosystems.

Across stakeholder categories, Ganga Praharis constituted the largest participant group, with 1,795 individuals (29.02%), underscoring the central role of community-based conservation stewards in disseminating awareness, facilitating local engagement, and sustaining grassroots conservation initiatives (Table 10). College students represented the second-largest group with 1,258 participants (20.34%), highlighting strong integration of academic institutions in conservation outreach and youth mobilization. Forest officials accounted for 987 participants (15.96%), reinforcing institutional capacity and regulatory awareness across frontline enforcement agencies. School students comprised 655 participants (10.59%), followed by NSS volunteers with 515 participants (8.33%), reflecting targeted engagement of youth cohorts to cultivate early conservation values and participatory stewardship. Local community members contributed 254 participants (4.11%), emphasizing inclusive community outreach. Religious groups (211; 3.41%) formed a strategically significant cohort, facilitating value-based messaging and cultural integration of conservation ethics.

Additional stakeholder groups included ETF-GTF personnel (130; 2.10%), NCC cadets (112; 1.81%), school teachers (75; 1.21%), tourist guides (84; 1.36%), college professors (47; 0.76%), and NGOs and volunteers (37; 0.60%), each contributing to diversified dissemination networks, educational reinforcement, and ecotour ecotourism-based conservation advocacy (Table 08). Participation from media professionals (11; 0.18%), researchers (4; 0.06%), irrigation engineers (1; 0.02%), line agencies (3; 0.05%), veterinarians (2; 0.03%), zookeeper staff (2; 0.03%), and NYKS volunteers (2; 0.03%) further strengthened cross-sectoral communication, technical integration, and institutional convergence.

Table 10: Distribution of general stakeholder trainings and awareness programme participants across stakeholder groups and states in five major Ganga River states

Stakeholders	Bihar	Jharkhand	Uttar Pradesh	Uttarakhand	West Bengal	Total
College Professor			24	22	1	47 (0.76%)
College Students			900	358		1258 (20.34)
ETF-GTF			130			130 (2.10%)
Forest Officials	203	1	518	265		987 (15.96%)
Ganga Prahari	428	252	441	544	130	1795 (29.02%)
Irrigation Department & Engineers			1			1 (0.02%)
Line Agencies			2		1	3 (0.05%)
Local Community	33	15	145	36	25	254 (4.11%)
Media	11					11 (0.18%)
NCC	15	7	45	45		112 (1.81%)
NGOs & Volunteers	20	3	11		3	37 (0.60%)
NSS	39	38	171	256	11	515 (8.33%)
NYKS				2		2 (0.03%)
Religious Group			211			211 (3.41%)
Researchers		1	2	1		4 (0.06%)
School Students	31	3	285	326	10	655 (10.59%)
School Teachers	3		8	64		75 (1.21%)
Tourist Guide			79	5		84 (1.36%)
Veterinarians			2			2 (0.03%)
Zookeeper & Staff			2			2 (0.03%)
Total	**783 (12.66%)**	**320 (5.17%)**	**2977 (48.13%)**	**1924 (31.11%)**	**181 (2.93%)**	**6185**

4.5.1 The spatial distribution of general stakeholder trainings and public awareness programmes across five main stem Ganga River states

The spatial distribution of general stakeholder trainings and public awareness programmes encompassed 109 districts across five major Ganga River states, engaging a total of 6,185 participants, thereby demonstrating extensive geographical outreach and mass-scale public engagement across the Ganga River (Table 11, Figure 11). The district-wise variation in participation reflects a strategic, need-based deployment of awareness interventions, aligned with population density, ecological sensitivity, anthropogenic pressures, and institutional presence.

Uttar Pradesh exhibited the widest geographical coverage, spanning 54 districts with 2,977 participants, accounting for nearly half of the total outreach. High participation was recorded in Varanasi (642), Gorakhpur (423), Ayodhya (230), Lucknow (202), Prayagraj (209), Mathura (211), Meerut (131), Kannauj (93), Muzaffarnagar (89), and Bijnor (76) (Table 11). These districts represent major urban centers, religious and cultural hubs, and regions experiencing intense human–river interactions, thereby justifying targeted awareness initiatives. In Uttarakhand, trainings and awareness programmes were conducted across 11 districts, engaging 1,924 participants, with substantial concentrations in Dehradun (1,009), Haridwar (386), and Tehri Garhwal (379) (Table 11). The predominance of participation in these districts reflects focused engagement within upper Ganga River and Himalayan foothill regions, characterized by ecological fragility, high conservation sensitivity, and frequent tourism-driven anthropogenic pressure.

Figure 11: The spatial distribution of general stakeholder trainings and public awareness programmes across five major Ganga River states

Bihar accounted for 24 districts with 783 participants, with major contributions from West Champaran (295), Bhagalpur (186), Vaishali (51), Patna (44), Begusarai (38), and East Champaran (25) (Table 11). This distribution highlights strategic awareness generation across agriculturally intensive floodplain regions of Bihar and densely populated riverine corridors, which exert substantial pressure on freshwater ecosystems. In Jharkhand, training and awareness interventions covered nine districts with 320 participants, dominated by Sahibganj (296), followed by modest engagement across Ranchi (7), Palamu (5), and Garhwa (4) (Table 11). The strong concentration in Sahibganj reflects its ecological importance as a riverine gateway district along the Ganga corridor and a focal point for conservation awareness interventions. West Bengal recorded participation across 11 districts with 181 participants, with higher engagement in Kolkata (59), South 24 Parganas (45), Nadia (31), and Murshidabad (15) (Table 11). The spatial emphasis on metropolitan and deltaic districts highlights targeted outreach in lower Ganga and estuarine zones, where freshwater biodiversity conservation intersects with complex socio-economic and hydrological challenges.

The large-scale participation across 109 districts significantly enhanced public sensitivity toward freshwater biodiversity, river health, pollution control, and sustainable resource utilization. By engaging students, community groups, religious institutions, educators, enforcement agencies, and civil society organizations, the programme fostered multi-layered communication pathways, enabling rapid dissemination of conservation messages and strengthening grassroots participation. Collectively, these interventions contributed to the development of a socially embedded conservation ethic, reinforcing the long-term sustainability of freshwater biodiversity conservation initiatives across the Ganga River.

Table 11: State and district wise distribution of General stakeholder's trainings and awareness details

States	Districts	Participants	State Total
Bihar 24 districts	Ara	1	783
	Aurangabad	2	
	Banka	2	
	Begusarai	38	
	Bhagalpur	186	
	Bhojpur	1	
	Chapra	3	
	Darbhanga	2	
	East Champaran	25	
	Gaya	16	
	Jamui	5	
	Katihar	24	
	Khagaria	9	
	Munger	2	
	Muzzafarpur	4	
	Nalanda	2	
	Patna	44	
	Saharsa	3	
	Samastipur	22	
	Saran	2	
	Siwan	26	
	Supaul	18	
	Vaishali	51	
	West Champaran	295	
Jharkhand 9 districts	Dumka	2	320
	East Singhbhum	2	
	Garhwa	4	
	Hazaribagh	2	
	Jamtara	1	
	Palamu	5	
	Ramgarh	1	
	Ranchi	7	
	Sahibganj	296	
Uttar Pradesh 54 districts	Agra	11	2977
	Aligarh	1	
	Ambedkar Nagar	56	

Amethi	2
Amroha	7
Ayodhya	230
Azamgarh	2
Baghpat	2
Bahraich	2
Ballia	14
Barabanki	72
Bareilly	45
Bijnor	76
Bulandshahr	72
Chandauli	12
Chitrakoot	13
Deoria	5
Etawah	13
Farrukhabad	33
Firozabad	1
Gautam Buddha Nagar	5
Ghaziabad	26
Ghazipur	10
Gorakhpur	423
Hapur	8
Jaunpur	28
Jhansi	4
Kannauj	93
Kanpur Dehat	18
Kanpur Nagar	9
Kasganj	1
Kaushambi	10
Lakhimpur Kheri	47
Lucknow	202
Maharajganj	2
Mathura	211
Mau	4
Meerut	131
Mirzapur	18
Moradabad	1
Muzaffarnagar	89
Pilibhit	29
Pratapgarh	59

	Prayagraj	209	
	Rampur	3	
	Saharanpur	3	
	Sambhal	3	
	Sant Kabir Nagar	7	
	Shahjahanpur	5	
	Shamli	1	
	Shravasti	1	
	Sultanpur	5	
	Unnao	1	
	Varanasi	642	
Uttarakhand 11 districts	Chamoli	26	1924
	Champawat	15	
	Dehradun	1009	
	Haridwar	386	
	Nainital	15	
	Pauri Garhwal	40	
	Pithoragarh	1	
	Rudraprayag	4	
	Tehri Garhwal	379	
	Udham Singh Nagar	2	
	Uttarkashi	47	
West Bengal 11 districts	Bankura	1	181
	Hooghly	10	
	Jhargram	2	
	Kolkata	59	
	Malda	1	
	Murshidabad	15	
	Nadia	31	
	Paschim Medinipur	11	
	Purba Bardhaman	1	
	Purba Medinipur	5	
	South 24 Parganas	45	
		Total Participants	**6185**

The extensive engagement participants across various training and awareness programmes underscores the project's emphasis on mainstreaming freshwater biodiversity conservation through mass awareness generation and participatory governance frameworks. By integrating educational institutions, community groups, enforcement agencies, youth organizations, and cultural platforms, the programme facilitated multidirectional knowledge diffusion, attitudinal change, and social mobilization. This broad-based outreach strategy significantly enhanced public sensitivity toward aquatic biodiversity conservation, pollution mitigation, responsible resource utilization, and river stewardship, thereby contributing to the creation of an informed and proactive conservation constituency across the five Ganga River states.

4.6 Developing a network of Riverside Local Communities Capable of responding to Emergent Situation

First responders represent a trained cadre of frontline personnel equipped to deliver rapid and coordinated responses during wildlife emergencies, rescue operations, and conflict situations. These individuals undergo structured training programs that include hands-on exposure to diverse rescue techniques, simulated emergency scenarios, and standardized response protocols. Such training enhances their operational readiness, enabling swift interventions aimed at minimizing animal casualties, reducing human interference, preventing operational mismanagement, and ensuring the prioritization of animal welfare. Furthermore, the training framework emphasizes inter-agency coordination and communication pathways, ensuring that responders are fully aware of institutional contact mechanisms, escalation hierarchies, and emergency reporting structures, thereby significantly reducing confusion, response delays, and administrative bottlenecks during critical incidents.

A robust network of riverside communities has been developed, empowering them to effectively respond to various challenges through a combination of social support systems, enhanced community resilience, coordinated communication channels, and collaborative engagement with multiple stakeholders (Figure 12 & 13). Training local volunteers as first responders is a valuable strategy for enhancing community resilience in emergencies. The first responders include Local volunteers, Ganga Praharis, fishermen, boatmen, NGOs, Ganga Task Force (GTF), Eco Task Force (ETF), tourist guides etc. (Figure 13). These trained volunteers can provide immediate assistance before professional help arrives, bridging the gap during the critical initial phase of a rescue situation.

A total of 1,870 stakeholders were trained as first responders across five Ganga River states, namely Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, and West Bengal (Table 12 Figure 12), reflecting a large-scale capacity-building initiative aimed at strengthening wildlife emergency preparedness and response mechanisms. Among the trained participants, forest officials constituted the dominant group, accounting for 982 individuals (52.51%), highlighting their pivotal role as primary frontline managers responsible for wildlife protection, conflict mitigation, rescue coordination, and law enforcement. Their substantial representation underscores the strategic emphasis on empowering state forest departments as the backbone of emergency wildlife response systems.

The second-largest group comprised Ganga Praharis, with 479 participants (25.61%) (Table 12), demonstrating the critical role of community-based conservation volunteers in enhancing localized surveillance, early detection of emergencies, rapid reporting, and first-contact response. Their involvement strengthens the grassroots interface of wildlife conservation, enabling timely intervention and fostering community stewardship toward biodiversity protection.

Other key stakeholder groups included ETF-GTF personnel (124; 6.63%) and zookeepers and associated staff (122; 6.52%) (Table 12), both of which contribute specialized operational expertise, particularly in animal handling, captive wildlife management, and controlled rescue environments. Researchers and members of the local community each accounted for 58 participants (3.10%), reflecting the integration of scientific knowledge systems and community engagement into emergency preparedness strategies. Veterinarians (20; 1.07%) and college professors (22; 1.18%) (Table 12) further strengthened the technical and academic dimensions of the training framework, particularly in the areas of animal health management, ecological interpretation, and knowledge dissemination. Smaller representations from NGOs and volunteers (4; 0.21%) and scientists (1; 0.05%) contributed additional interdisciplinary perspectives to the overall training architecture (Table 12).

State-wise distribution reveals that Uttar Pradesh recorded the highest number of trained first responders (710; 37.97%), followed by Bihar (649; 34.71%) and Uttarakhand (434; 23.21%), indicating strong institutional participation and training outreach within these regions. In contrast, West Bengal (73; 3.90%) and Jharkhand (4; 0.21%) (Table 12) showed comparatively lower engagement, suggesting the need for focused training expansion and targeted capacity enhancement initiatives in these states.

Table 12: Stakeholder-wise Distribution of First Responders Trained through Capacity-Building Workshops across Ganga River States

Stakeholders	Bihar	Jharkhand	Uttar Pradesh	Uttarakhand	West Bengal	Total
College Professor	4	1	10	3	4	22 (1.18%)
ETF-GTF			91	30	3	124 (6.63%)
Forest Officials	266		387	284	45	982 (52.51%)
Ganga Prahari	314	3	63	82	17	479 (25.61%)
Local Community			54		4	58 (3.10%)
NGOs & Volunteers			4			4 (0.21%)
Researchers	55			3		58 (3.10%)
Scientists				1		1 (0.05%)
Veterinarians	10		8	2		20 (1.07%)
Zookeeper & Staff			93	29		122 (6.52%)
Total	**649 (34.71%)**	**4 (0.21%)**	**710 (37.97%)**	**434 (23.21%)**	**73 (3.90%)**	**1870**

4.6.1 The spatial distribution of trained first responders across five Ganga River states

The spatial distribution of trained first responders across 41 districts spanning five Ganga River states (Table 13, Figure 12), providing critical insights into the geographic coverage, operational outreach, and regional prioritization of capacity-building efforts. A total of 1,870 first responders were trained, ensuring multi-tiered emergency preparedness across high-risk landscapes characterized by frequent human-wildlife interactions, biodiversity hotspots, and critical riverine ecosystems.

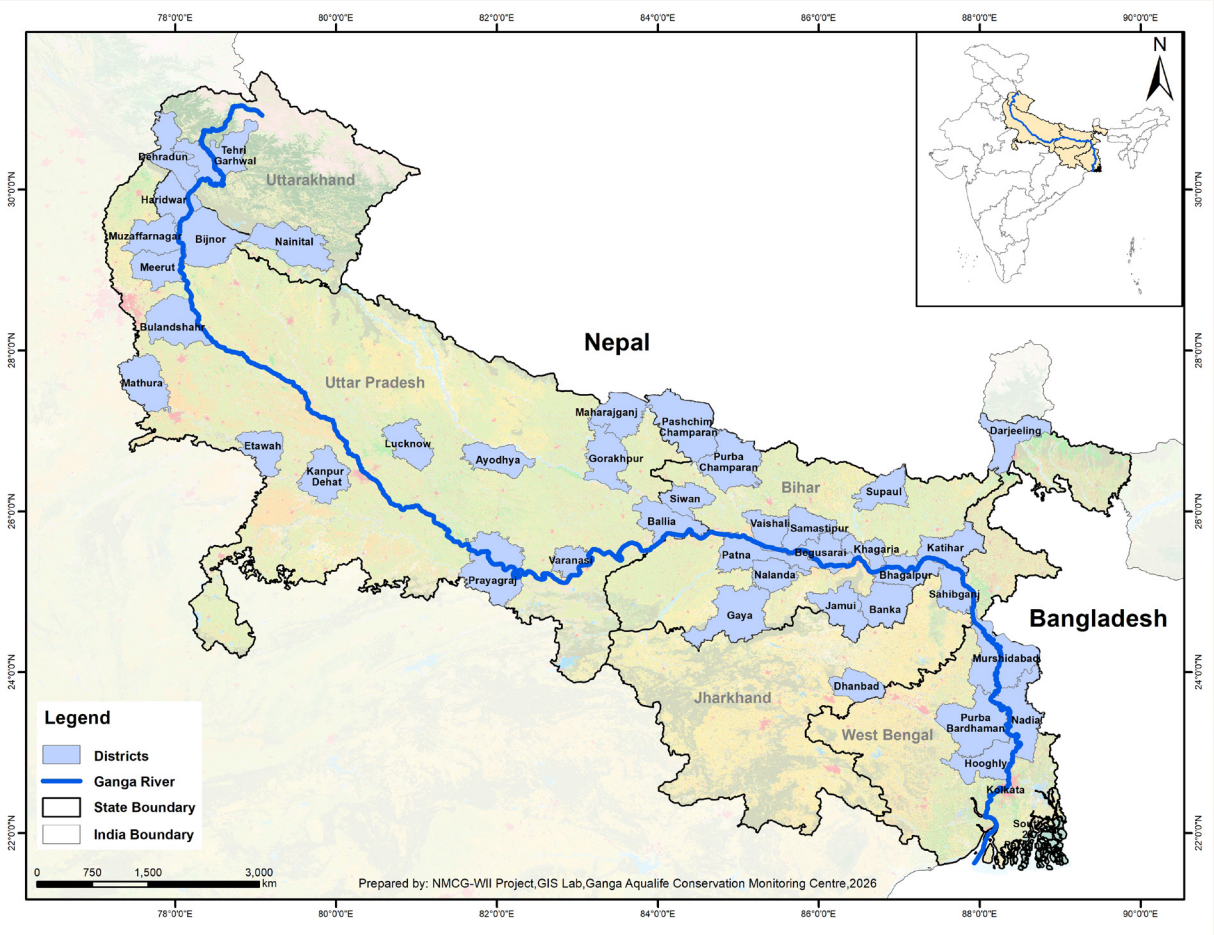

Figure 12: The spatial distribution of trained first responders across five Ganga River states

In Bihar, training activities were conducted across 15 districts, accounting for 649 trained first responders, representing 34.71% of the total cohort (Table 13, Figure 12). The highest concentrations were recorded in West Champaran (295) and Bhagalpur (121), reflecting the ecological sensitivity and high frequency of wildlife conflict incidents in these regions. Substantial participation was also observed in Patna (76), Vaishali (41), Begusarai (30), and Katihar (21), suggesting strategic prioritization of districts characterized by dense human populations and proximity to critical wildlife corridors. In Jharkhand, training outreach was limited to two districts, namely Sahibganj (3) and Dhanbad (1), with a cumulative total of 4 first responders (0.21%), indicating comparatively low program penetration (Table 13, Figure 12). This pattern highlights the need for intensified engagement, expanded training programs, and enhanced institutional participation in this state to ensure comprehensive emergency response coverage.

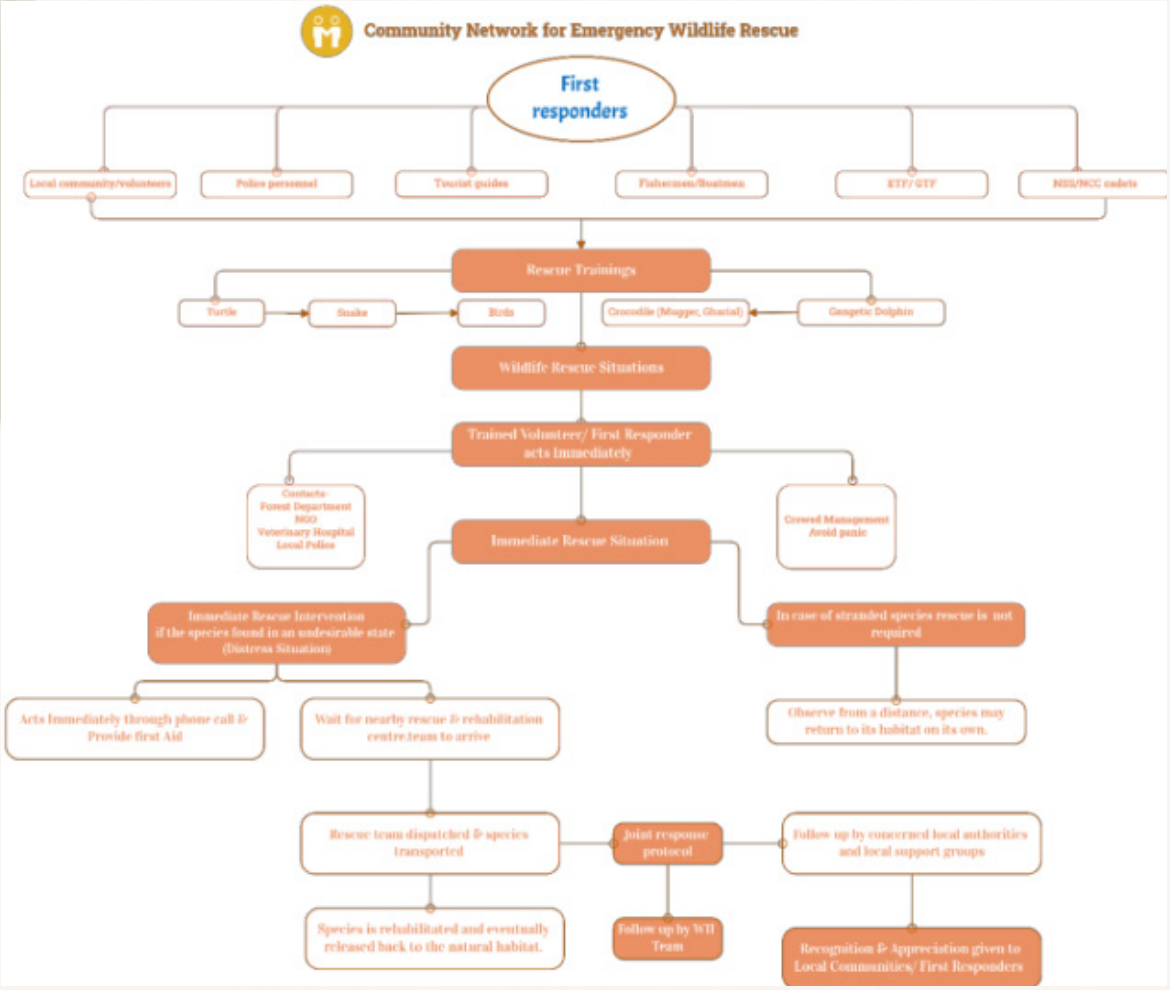

Figure 13: A Network of riverside local communities capable of responding to emergent situations

Uttar Pradesh exhibited the highest spatial and numerical coverage, with training conducted across 14 districts, resulting in 710 trained first responders (37.97%) (Table 13, Figure 12). Major concentrations were observed in Kanpur Dehat (150), Gorakhpur (129), Ayodhya (130), Prayagraj (94), and Varanasi (74). These districts are ecologically significant and demographically dense, with recurrent human–wildlife conflict scenarios and high conservation priority. Moderate representation from Lucknow (38), Meerut (35), Bijnor (28), and Muzaffarnagar (22) further reflects the strategic selection of administrative and ecological hotspots for targeted capacity development (Table 13).

In Uttarakhand, training was implemented in four districts, producing 434 trained first responders (23.21%) (Table 13, Figure 12). Dehradun (293) and Haridwar (74) emerged as principal hubs, followed by Nainital (53) and Tehri Garhwal (14). This distribution aligns with the region's high-altitude ecological sensitivity, increasing tourism-driven anthropogenic pressure, and frequent wildlife rescue operations, particularly involving elephants, leopards, and ungulate species. West Bengal recorded training coverage across six districts, with a cumulative total of 73 participants (3.90%) (Table 13). The highest engagement occurred in Kolkata (49), followed by Nadia (12), Murshidabad (5), Darjeeling (3), Hooghly (2), and Purba Bardhaman (2) (Table 13). The observed distribution indicates a predominant focus on urban and peri-urban conflict-prone zones, particularly within the lower Gangetic plains and metropolitan interface areas.

The district-wise analysis presented here demonstrates a strategic, need-based, and ecologically informed deployment of training resources, ensuring enhanced preparedness in districts with heightened vulnerability to wildlife emergencies and anthropogenic disturbances. However, uneven geographic coverage, particularly in Jharkhand and parts of West Bengal, underscores the necessity for targeted expansion strategies to achieve equitable regional representation and strengthen emergency response capacity.

Table 13: State- and District-wise Distribution of Trained First Responders across the Ganga River

States	Districts	Participants	State Total
Bihar 15 districts	Banka	2	649
	Begusarai	30	
	Bhagalpur	121	
	East Champaran	6	
	Gaya	2	
	Jamui	5	
	Katihar	21	
	Khagaria	6	
	Nalanda	2	
	Patna	76	
	Samastipur	12	
	Siwan	18	
	Supaul	12	
	Vaishali	41	
	West Champaran	295	
Jharkhand 2 districts	Dhanbad	1	4
	Sahibganj	3	
Uttar Pradesh 14 districts	Ayodhya	130	710
	Ballia	1	
	Bijnor	28	
	Bulandshahr	2	
	Etawah	2	
	Gorakhpur	129	
	Kanpur Dehat	150	
	Lucknow	38	
	Maharajganj	4	
	Mathura	1	
	Meerut	35	
	Muzaffarnagar	22	
	Prayagraj	94	
	Varanasi	74	
Uttarakhand 4 districts	Dehradun	293	434
	Haridwar	74	

	Nainital	53	434
	Tehri Garhwal	14	
West Bengal 11 districts	Darjeeling	3	73
	Hooghly	2	
	Kolkata	49	
	Murshidabad	5	
	Nadia	12	
	Purba Bardhaman	2	
		Total Participants	1870

Local communities residing along riverbanks constitute a critical frontline in the early detection and response to wildlife rescue emergencies. During incidents involving the stranding, injury, entanglement, or displacement of aquatic and semi-aquatic macrofauna, trained community members act as first responders, providing immediate on-site assistance (Figure 13). Through structured capacity-building programmes, these responders are equipped to stabilize affected species, regulate public interference, ensure safe handling following species-specific protocols, and initiate timely communication with relevant authorities. Following preliminary intervention, incidents are rapidly reported to the Forest Department, local conservation-focused NGOs, veterinary facilities, police stations (where legal or public safety concerns arise), and designated rescue and rehabilitation centres. This coordinated, multi-agency alert system enables swift mobilization of professional rescue teams. Community members further contribute by facilitating logistics, assisting transport, and coordinating field operations, thereby strengthening decentralized rescue networks and enhancing response efficiency.

The first-responder framework (Figure 13) integrates diverse stakeholder groups, including local residents, Ganga Praharis, fishermen, boatmen, tour guides, police personnel, allied forest forces (ETF/GTF), and NSS and NCC cadets. These participants receive specialized training in species-specific rescue modules, encompassing freshwater turtles, birds, snakes, crocodilians (mugger and gharial), and the Gangetic dolphin. Based on field assessment, responders determine the necessity of intervention, administer first aid when required, and support subsequent rescue, rehabilitation, and release processes. In non-critical cases, trained observers maintain passive monitoring to avoid unnecessary disturbance, allowing natural recovery. Rescue operations follow standardized joint response protocols, with follow-up monitoring conducted by the Wildlife Institute of India (WII), local authorities, and community networks. Recognition of successful interventions reinforces stewardship, fostering sustained community engagement. Collectively, this decentralized, community-driven model enhances rapid response capacity, improves conservation outcomes, and promotes long-term protection of aquatic biodiversity across the Ganga River.

Overall, the outcomes reflect the successful establishment of a multi-stakeholder, decentralized, and operationally resilient first-responder network across the Ganga River. This integrated framework is expected to significantly improve emergency response efficiency, minimize wildlife mortality, mitigate human–wildlife conflicts, and strengthen long-term conservation outcomes by embedding scientific training, community participation, and institutional coordination into a unified operational model.

4.7 Training Database Management

Management of training database is significant for networking among stakeholders for the establishment of record-keeping protocols ensuring consistency and accuracy across the training information of trainers, trainees, implementing agencies and local bodies. The training database is an online repository that provides comprehensive and compiled information of the training programmes including detailed report, programme schedule, mode of training, modules, field sessions, resource persons, number of days engaged etc. The training database can be accessed and freely download by any organizations and line agencies

from https://wii.gov.in WII-NMCG Webpage at Training database 2019 to 2025 subtabs (Figure 14) for effective implementation of training programmes and workshops with different stakeholders in their respective areas of concerns.

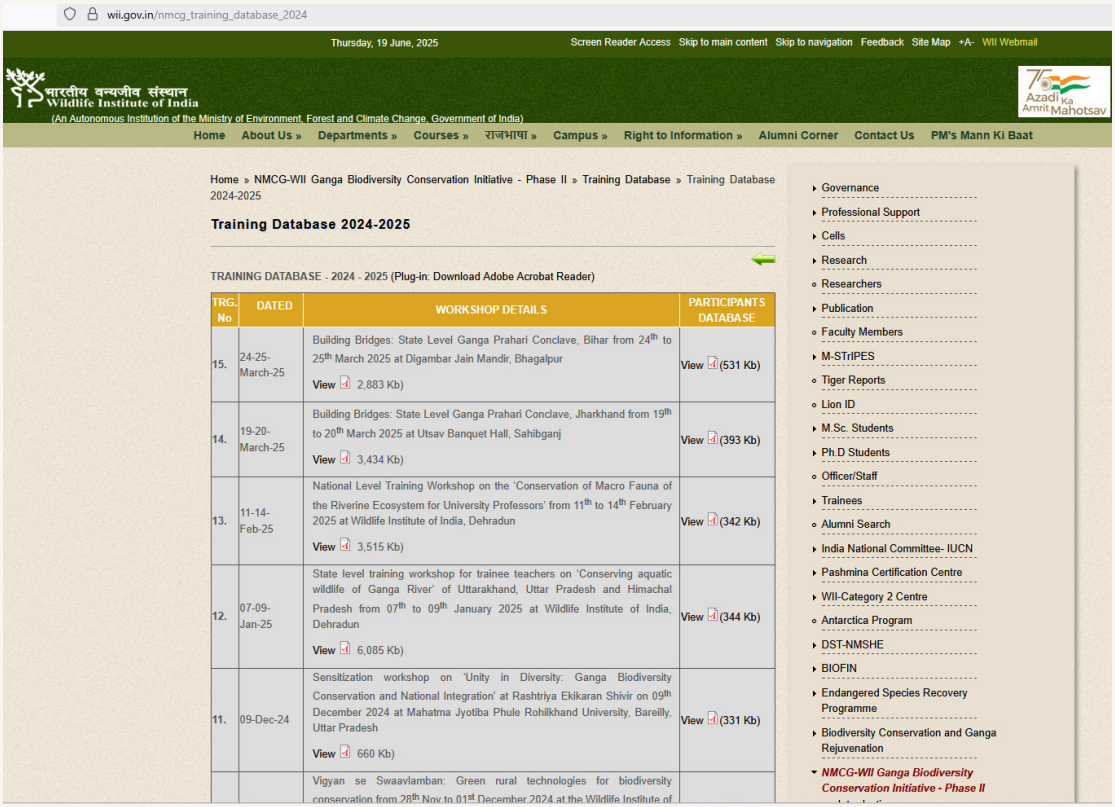

Figure 14: Training database at WII NMCG Webpage

4.7.1 Training records in print and social media

To ensure dissemination of the training information to a wider audience, details of the events were given extensive media coverage. Various forms of print media including newspapers, brochures and booklets, radio, and numerous social media platforms like facebook, instagram etc. were utilized.

Quick Links

Website: http://www.wii.gov.in/nmcg/Training (database)
http://www.wii.gov.in/nmcg/news_events
Facebook Page: http://facebook.com/glimpsesofganga
Instagram: http://instagram.com/glimpsesofganga

4.8 Carry Forward Activities conducted by trained stakeholders under Ganga River States

The quality and effectiveness of the trainings imparted to diverge stakeholders was analyzed and the outcomes of capacity building programmes were evaluated in terms of what actually happened as a result of training. This monitoring and evaluation process act as critical indicators of the past trainings while planning future activities to ensure efficacy and sustainability of the training imparted.

Following the completion of the training programmes and workshops, a carry-forward activity survey was conducted to evaluate the post-training diffusion of knowledge, behavioural uptake, and field-level implementation among participants. A total of 2,123 valid responses were received across the five Ganga River states, providing a robust basis for assessing training effectiveness, stakeholder engagement, and practical translation of acquired capacities (Table 14, Figure 15).

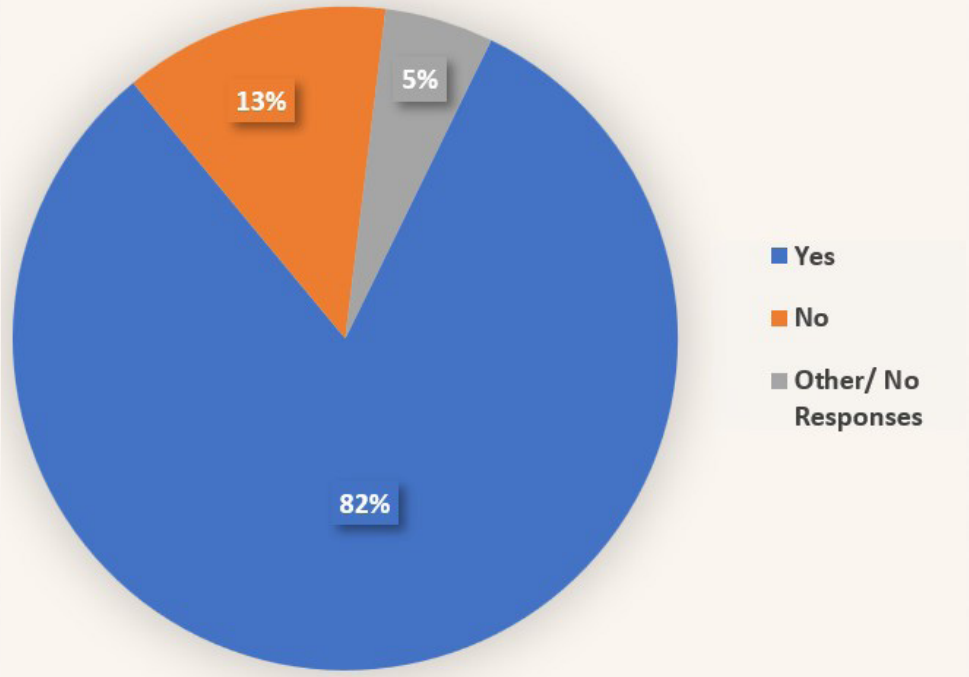

Figure 15: Post-Training Adoption and Engagement Levels among Stakeholders across the Ganga River

Table 14: Carry forward activities' responses from five Ganga River states

Responses (n=2123)			Responses (%)	% of total response
Yes	If yes (n=1736, 82%), Further actions			
	Trained more people	568	33	27
	Spread awareness	812	47	38
	Self-Implementation	356	21	17
No	If No (n=275, 13%), Reasons			
	Not Interested	36	13	2
	Inadequate Response from Target Groups	116	42	5
	Insufficient Training	25	9	1
	Lack of Resources	62	23	3
	Others Reasons for No Response	35	13	2
Other/ No Responses	112 (5%)			

Overall, the findings demonstrate a high degree of post-training engagement, with 82% of respondents (n = 1,736) reporting active involvement in at least one carry-forward activity (Table 14, Figure 15). Among these, the most prominent outcome was the dissemination of awareness, reported by 812 respondents (47% of those responding "Yes"; 38% of total responses) (Table 14, Figure 16), indicating substantial multiplier effects and horizontal knowledge transfer within local communities and institutions. Training of additional individuals was reported by 568 respondents (33% of "Yes"; 27% of total), reflecting a strong cascade effect and expansion of training outreach beyond the original participant cohort (Table 14, Figure 16). Furthermore, 356 respondents (21% of "Yes"; 17% of total) reported direct self-implementation of conservation or management actions, highlighting meaningful behavioral transformation and on-ground application of acquired skills.

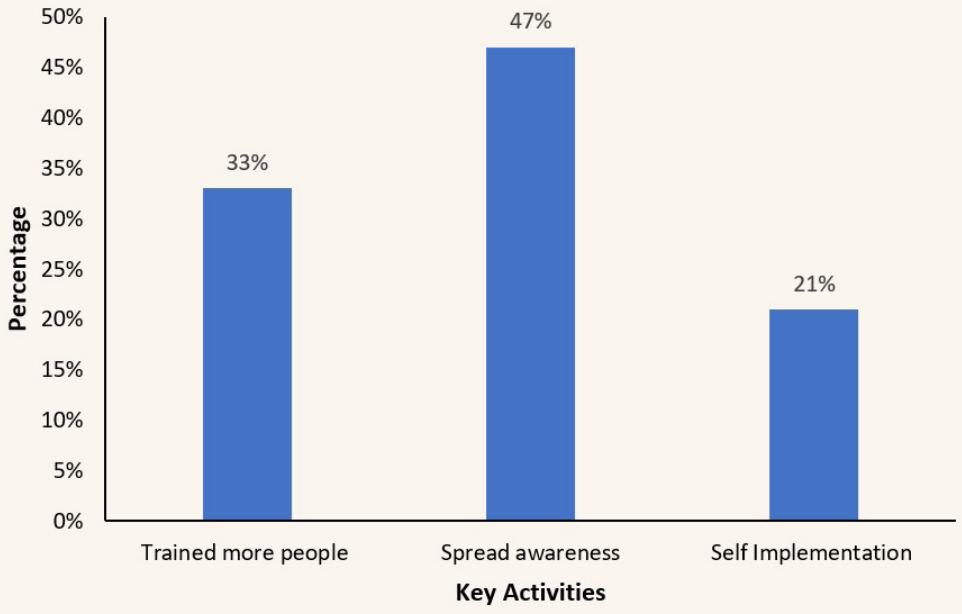

Figure 16: Distribution of Key Carry-Forward Activities Undertaken by Trained Stakeholders

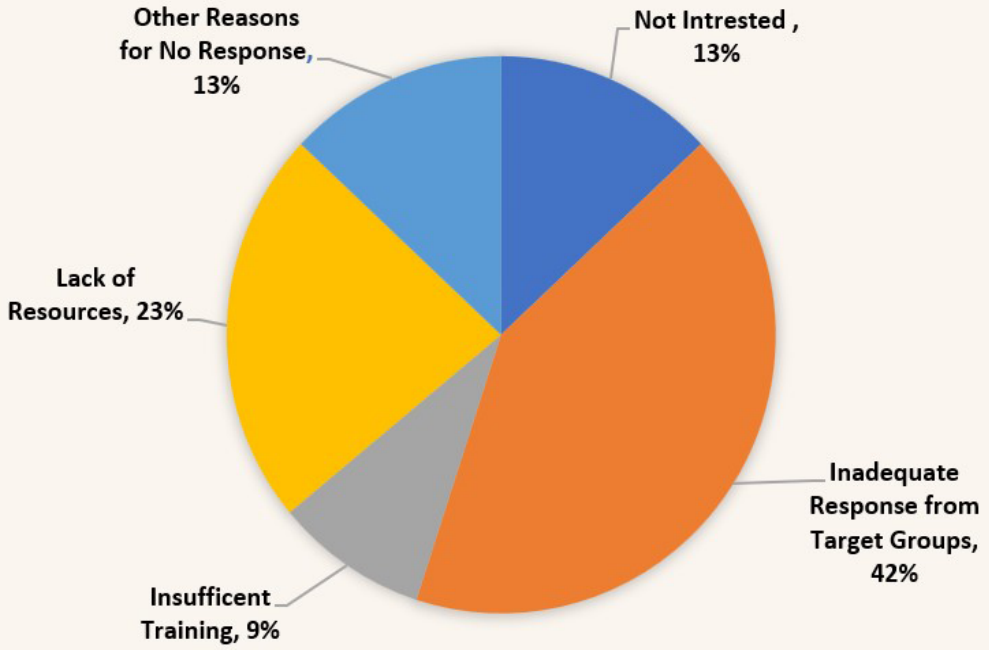

Figure 17: Primary Constraints Limiting Stakeholder Participation in Carry-Forward Activities

In contrast, 13% of respondents (n = 275) indicated non-engagement in carry-forward activities (Table 14, Figure 17). Among these, inadequate response from target groups emerged as the most frequently cited constraint (116, 42%), followed by lack of resources (62, 23%), not interest (36, 13%), insufficient training (25, 9%), and other context-specific factors (13%) (Table 14, Figure 17). These findings underscore the influence of institutional, social, and logistical barriers in constraining post-training action, particularly in resource-limited and low-motivation settings. Additionally, 5% of responses (n = 112) were categorized as other or no response, suggesting minor data gaps that do not substantially affect the overall interpretability of the results. Collectively, the survey outcomes indicate a strong positive impact of the training interventions, with a substantial majority of participants demonstrating proactive engagement through awareness dissemination, secondary training, and self-driven implementation. The dominance of awareness generation and training replication highlights the effectiveness of the programme in fostering community-level outreach and capacity diffusion. However, the identified barriers among non-respondents emphasize the need for enhanced post-training support mechanisms, resource facilitation, and targeted follow-up strategies to further strengthen adoption, sustainability, and long-term conservation outcomes across the Ganga River.

5 MONITORING AND EVALUATION

5.1 Training Impact Assessment

5.1.1 Significance and Effect Size Analysis of Training Outcomes

Based on the statistical analyses conducted on the pre- and post-training assessments of participants from five riverine states within the framework of the WII-NMCG project on freshwater and biodiversity conservation, the results indicate a significant improvement in participants' knowledge and awareness following the training interventions.

The Wilcoxon signed-rank test, a non-parametric measure for paired samples, revealed a highly significant difference between pre- and post-training scores ($V = 141{,}246$, $p < 0.001$) (Table 15), indicating that the median post-training score was substantially higher than the median pre-training score. This finding demonstrates that the training had a measurable impact on participants' understanding of freshwater ecosystems and biodiversity conservation.

Table 15. Pre- and post-training assessment outcomes for participants in WII-NMCG project

Statistic	Value
Wilcoxon signed-rank V	141,246 ($p < 2.2 \times 10^{-16}$)
Rank-Biserial Correlation (r)	0.867 (large)

Cohen's d (paired)	2.04 (95% CI: 1.91–2.17)
Manual Cohen's d	2.30
Sample size (n)	531

Effect size measures corroborated the magnitude of this improvement. The Rank-Biserial Correlation, calculated using paired data, yielded an effect size of 0.867, classified as large (Table 15). Similarly, Cohen's d for paired samples was estimated at 2.04, with a 95% confidence interval ranging from 1.91 to 2.17, further confirming the substantial educational impact of the training. A manual calculation of Cohen's d using the mean difference and standard deviation produced a slightly higher value of 2.30, reinforcing the robustness of the effect (Table 15). The results suggest that the training programme significantly enhanced the participants' competency and awareness related to freshwater biodiversity and ecosystem management.

5.1.2 Demographic composition of participants

The demographic composition of participants in the pre-training assessment indicates a pronounced gender disparity. Out of a total sample size of 546 respondents, the majority were male (n = 365, 66.84%), whereas female participants constituted a comparatively smaller proportion (n = 181, 33.15%) (Figure 18).

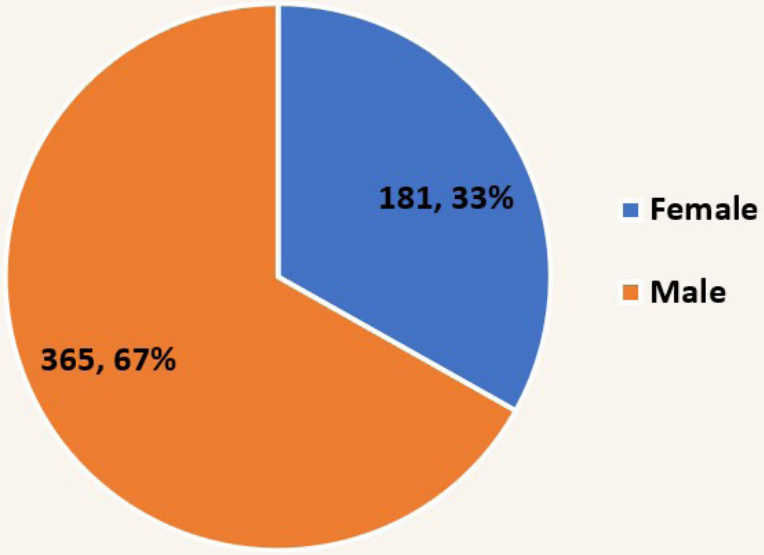

Figure 18. Gender distribution of participants in pre-training assessment

This distribution suggests that male stakeholders were more prominently represented in the training programmes conducted by the WII–NMCG team across the five Ganga River states. The observed skewness in gender participation may reflect underlying differences in accessibility, occupational engagement, or sociocultural factors influencing participation in environmental training initiatives. From an analytical standpoint, such demographic asymmetry should be considered while interpreting subsequent awareness and perception outcomes, as gender-based differences may potentially influence baseline knowledge levels and responsiveness to training interventions.

5.1.3 Participants age distribution

The age-wise distribution of participants demonstrates that the sample was predominantly composed of younger and middle-aged individuals. Nearly half of the respondents belonged to the <20–25 years age group (n = 269, 49.26%), closely followed by participants in the 26–50 years category (n = 248, 45.42%) (Figure 19). In contrast, individuals aged above 50 years constituted only a small fraction of the sample (n = 29,

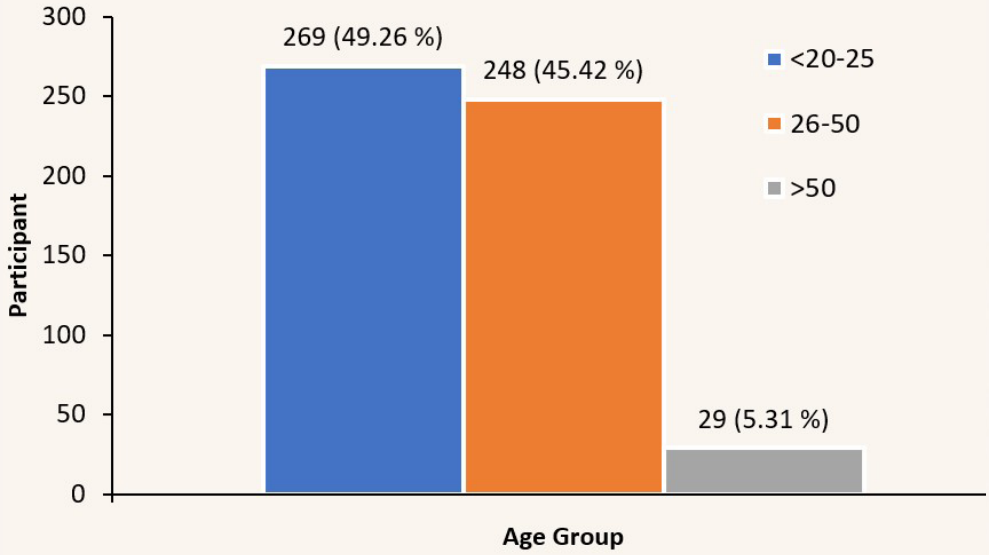

Figure 19. Age group distribution of participants in pre-training assessment

This pattern indicates that the training programmes conducted by the WII–NMCG initiative largely engaged participants from early-career and mid-career stages, with relatively limited representation from older age groups. Such a distribution may reflect greater accessibility, institutional involvement, or interest among younger stakeholders in capacity-building initiatives related to river conservation.

5.1.4 Stakeholder composition of respondents

The stakeholder composition of participants reveals a heterogeneous yet unevenly distributed representation across professional and institutional categories. The largest proportion of respondents comprised college students (n = 166, 30.40%) (Table 16), indicating a strong engagement of the academic youth demographic in the training programmes. This was followed by Ganga Praharis (n = 64, 11.72%) and school teachers (n = 55, 10.07%) (Table 2), reflecting substantial participation from community-level conservation volunteers and the education sector.

Table 16. Stakeholder group distribution of participants in pre-training assessment

S. No.	Stakeholder Group	Participants
1	Anthropologist	2 (0.37 %)
2	College Student	166 (30.40 %)
3	Diet Teachers	44 (8.06 %)

4	Eco Task Force (ETF)	9 (1.65 %)
5	Fisheries officer	10 (1.83 %)
6	Forest officials	5 (0.92 %)
7	Forest Personnels	2 (0.37 %)
8	Ganga Prahari	64 (11.72 %)
9	Ganga Task Force (GTF)	15 (2.75 %)
10	Irrigation Officer	17 (3.11 %)
11	NCC Cadet	40 (7.33 %)
12	Police Personnel	18 (3.30 %)
13	Professors	44 (8.06 %)
14	School Teacher	55 (10.07 %)
15	Scientist	6 (1.10 %)
16	Veterinarian	6 (1.10 %)
17	Zoo keeper	6 (1.10 %)
18	NCC Officer	1 (0.18 %)
19	NGO Personnels	36 (6.59 %)
	Total	**546**

Moderate representation was observed among DIET teachers and professors (each n = 44, 8.06%), along with NCC cadets (n = 40, 7.33%) and NGO personnel (n = 36, 6.59%) (Table 16). These groups collectively indicate institutional involvement spanning education, civil society, and youth engagement platforms.

In contrast, several technical and administrative stakeholder groups such as irrigation officers (3.11%), police personnel (3.30%), Ganga Task Force members (2.75%), and fisheries officers (1.83%) showed relatively lower participation (Table 16). Highly specialized roles including scientists, veterinarians, zoo keepers (each 1.10%), and forest officials (0.92%) were minimally represented. Certain categories, such as anthropologists and forest personnel (0.37% each), as well as NCC officers (0.18%) (Table 16), contributed negligibly to the overall sample.

The responses indicate that the training programmes primarily engaged participants from educational institutions and community-based groups, while representation from technical experts and enforcement agencies was relatively limited. This imbalance among stakeholders may affect the baseline variation in knowledge, practical experience, and sector-specific awareness, and should be taken into account when interpreting the outcomes and overall effectiveness of the training interventions.

5.1.5 State-wise responder distribution in training assessment

The spatial distribution of participants across the five Ganga River states demonstrates substantial heterogeneity in both state-level and district-level representation. A total of 546 respondents were recorded from 67 districts spanning Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, and West Bengal. Uttarakhand accounted

for the highest proportion of participants (n = 296, 54.21%), with representation from 13 districts. Within the state, Dehradun (n = 122) and Tehri Garhwal (n = 88) emerged as major contributing districts, collectively accounting for a large share of the state's participation. Haridwar (n = 38) and Uttarkashi (n = 12) also contributed notable proportions, while the remaining districts exhibited relatively lower participation. Uttar Pradesh represented the second-largest share (n = 194, 35.53%), with a broad geographic spread across 32 districts. Prominent contributions were observed from Varanasi (n = 34), Gorakhpur (n = 26), Muzaffarnagar (n = 19), Saharanpur (n = 17), and Bijnor (n = 12). This indicates a wide but uneven distribution of engagement, with certain districts acting as focal points of participation.

In contrast, Bihar contributed a comparatively smaller proportion (n = 24, 4.40%) despite coverage across 15 districts, suggesting low participant density per district. Participation was thinly distributed, with most districts contributing one or two respondents, except Bhagalpur (n = 4) and West Champaran (n = 3). Jharkhand exhibited limited representation (n = 13, 2.38%) from only two districts, with Sahibganj (n = 11) contributing the majority of participants, while Ranchi accounted for a minimal share (n = 2). Similarly, West Bengal contributed 19 participants (3.48%) from five districts, with Kolkata (n = 6) and Nadia (n = 5) representing the primary sources of participation.

Overall, the data indicate a strong geographic skew towards Uttarakhand and Uttar Pradesh, which together account for nearly 90% of the total sample. The uneven distribution across states and districts suggests differential programme reach, accessibility, or implementation intensity. This spatial imbalance should be carefully considered when generalizing findings, as regional overrepresentation may influence aggregated outcomes and mask localized variations in awareness and stakeholder engagement.

5.2 Pre-Training Assessment

The pre-assessment constitutes a critical diagnostic component within the training framework, serving to systematically evaluate the baseline knowledge, perceptions, and experiential background of participants prior to intervention. By establishing an empirical reference point, it enables the quantification of initial awareness levels, identification of knowledge gaps, and assessment of prevailing attitudes toward ecological processes and river management. Such baseline characterization is essential for designing context-specific training modules that are responsive to participant needs and for ensuring targeted knowledge transfer. Furthermore, the pre-assessment facilitates robust impact evaluation by providing a comparative foundation against post-training outcomes, thereby allowing for the measurement of learning gains, shifts in perception, and overall programme effectiveness. In a broader analytical context, it also aids in interpreting heterogeneity across demographic and stakeholder groups, ensuring that subsequent findings are grounded in an informed understanding of initial conditions rather than treated as isolated observations.

The following section presents a detailed question-wise analysis and interpretation of the pre-assessment responses. Each question has been examined systematically to elucidate participant knowledge, perceptions, and response patterns across different thematic domains related to the Ganga River. This analytical approach enables a nuanced understanding of baseline conditions, highlighting both areas of strength and existing gaps in awareness, thereby providing a structured foundation for subsequent evaluation of training outcomes.

Question 1. Have you ever visited the Ganga River?

The pre-training assessment reveals an overwhelmingly high level of prior exposure of participants to the Ganga River. A vast majority of respondents (n = 526, 96.34%) reported having visited the river, whereas only a marginal proportion (n = 20, 3.66%) indicated no prior visitation (Figure 20). This near-universal familiarity with the river suggests that most participants possess at least a basic experiential connection with the Ganga, which may influence their baseline perceptions, cultural associations, and environmental awareness. Such direct exposure is likely to facilitate better contextual understanding during training interventions, as participants can relate programme content to personal experiences.

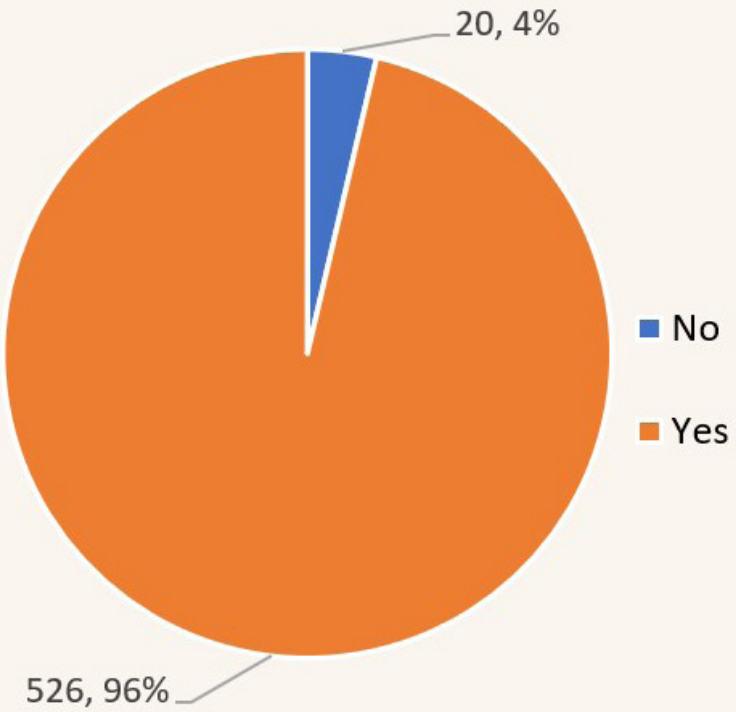

Figure 20. Participants' prior exposure to the Ganga River

From an analytical standpoint, the limited proportion of participants without prior exposure reduces variability in this parameter, indicating that subsequent differences in awareness or perception are less likely to be driven by simple familiarity with the river and more by differences in knowledge depth, stakeholder background, or training effectiveness.

Question 1A. If yes, then what was the purpose of your visit?

(a)Religious, (b)Recreational & Tourism, (c) Scientific and work-related visit

Among participants who reported having visited the Ganga River (n = 526), the predominant purpose of visitation was religious in nature (Table 17). A substantial majority (n = 371, 70.53%) indicated religious motives, underscoring the river's profound cultural and spiritual significance. In comparison, recreational and tourism-related visits were reported by 24.14% (n = 127) of respondents, while 25.48% (n = 134) cited scientific or work-related purposes (Table 17). The cumulative percentage exceeding 100% reflects the multiple-response nature of the question, indicating that participants often engaged with the river for more than one purpose. This multidimensional interaction highlights the Ganga as not only a spiritual entity but also a site of livelihood, research, and leisure activities.

Table 17. Purpose of visit to the Ganga River among participants

Purpose of Visit	Frequency (n)	Percentage (%)
Religious	371	70.53
Recreational & Tourism	127	24.14
Scientific / Work-related	134	25.48

Further examination of response patterns reveals that the majority of respondents (n = 413, 78.52%) selected only one primary purpose, suggesting a dominant singular motivation for most visits (Table 18).

Table 18. Distribution of number of responses per participant (multiple response pattern)

Number of Options Selections	Frequency (n)	Percentage (%)
0	29	5.51
1	413	78.52
2	33	6.27
3	51	9.70
Total	**526**	**100.00**

However, a notable subset reported multiple purposes, with 6.27% (n = 33) selecting two options and 9.70% (n = 51) indicating engagement across all three categories (Table 18). A small proportion (5.51%, n = 29) did not select any option despite indicating prior visitation, which may reflect response omission or ambiguity in interpretation.

Collectively, these findings indicate that while religious engagement remains the principal driver of interaction with the Ganga River, a significant proportion of participants also associate the river with professional, scientific, and recreational functions. This layered interaction is important for designing training programmes, as it suggests the need for integrative communication strategies that address cultural, ecological, and utilitarian dimensions simultaneously.

Question 2 Are you aware of the states that comprise of Ganga River?

The assessment of participants' knowledge regarding the states constituting the Ganga River indicates a moderate to high level of awareness, albeit with notable gaps. A majority of respondents (n = 351, 64.29%) (Table 19) reported that they were aware of the states, suggesting a reasonably strong baseline understanding of the river's geographical extent.

Table 19. Awareness of states comprising the Ganga River among participants (Pre-training assessment)

Response	Frequency (n)	Percentage (%)
Knows some states only	46	8.42
No	149	27.29
Yes	351	64.29
Total	**546**	**100.00**

However, a substantial proportion of participants demonstrated either incomplete or no awareness. Specifically, 8.42% (n = 46) indicated partial knowledge, being able to identify only some of the states, while 27.29% (n = 149) reported complete lack of awareness (Table 19). This distribution reflects a gradient of knowledge rather than a binary understanding, highlighting that while general awareness is present in a majority of participants, detailed geographical comprehension remains limited for a significant segment. From an analytical perspective, this partial knowledge is particularly relevant, as it may influence the accuracy of participants' perceptions regarding processes, inter-state connectivity, and integrated river management. The findings suggest that training interventions should not only reinforce awareness but also emphasize comprehensive spatial understanding of the Ganga River, particularly for participants demonstrating fragmented or absent knowledge.

Baseline responses (Question 3, 4, 5 & 6)

The analysis of baseline responses across questions Question 3 (Do you reside nearby in any of the tributaries of Ganga River?) Question 4 (Are you aware of any aquatic species found in Ganga River?), Question 5 (Have you ever seen any biodiversity in the Ganga River?) and Question 6 (Do you think that the biodiversity of Ganga River is important for the river ecosystem?) reveals consistently high levels of engagement, awareness, and positive perception toward the Ganga River and its biodiversity. A substantial proportion of participants (n = 399, 73.10%) (Table 20) reported residing near tributaries of the Ganga River (Q-3), indicating strong geographic proximity and potential direct interaction with the riverine ecosystem. Similarly, awareness regarding aquatic species (Q-4) was reported by 71.80% (n = 392) (Table 20) of respondents, suggesting a relatively high baseline ecological familiarity. Observational experience with biodiversity (Q-5) was even more pronounced, with 79.80% (n = 436) (Table 20) of participants indicating that they had encountered biodiversity within the Ganga.

Table 20. Participant responses to baseline awareness and perception questions (Pre3–Pre6)

Question	Response	Frequency (n)	Percentage (%)
Residence near Ganga tributaries	Yes	399	73.10
	No	147	26.90
Awareness of aquatic species	Yes	392	71.80
	No	154	28.20
Observation of biodiversity	Yes	436	79.80
	No	110	20.20
Perceived importance of biodiversity	Yes	523	95.80
	No	23	4.21
Total (each question)	-	**546**	**100.00**

This reflects a considerable degree of experiential knowledge, which may contribute to informed perceptions and attitudes toward conservation. The perception-based question (Q-6) demonstrated near-universal agreement regarding the importance of biodiversity for the river ecosystem, with 95.80% (n = 523) (Table 20) of participants responding affirmatively. This indicates a strong consensus on the ecological significance of biodiversity, even among those who may lack detailed scientific understanding.

Table21. Chi-squar test results for response distribution (Pre3–Pre6)

Question	Yes (n)	No (n)	Chi-square (χ^2)	p-value
3	399	147	116.31	<0.001
4	392	154	103.74	<0.001
5	436	110	194.64	<0.001
6	523	23	457.88	<0.001

Chi-square analysis further confirms that the distribution of responses for all four questions deviates significantly from a null expectation of equal proportions (χ^2 ranging from 103.74 to 457.88, df = 1, $p < 0.001$) (Table 21). These statistically significant differences indicate that the observed predominance of "Yes" responses is not due to random variation but reflects a systematic trend in participant knowledge and perception. Collectively, these findings suggest that participants possess a relatively strong foundational awareness and positive attitude toward the Ganga River and its biodiversity. However, when interpreted alongside earlier results indicating gaps in detailed geographical knowledge, it becomes evident that while general awareness and perception are high, depth and specificity of ecological understanding may still require targeted enhancement through training interventions.

Question 7 How would you rate the following options based on your preference for maintaining a healthy ecosystem from a conservation perspective?

The ranking analysis of ecosystem components reveals nuanced participant preferences regarding priorities for maintaining a healthy river ecosystem. Since ranking was based on an ordinal scale (1 = highest preference, 6 = lowest preference), lower mean scores indicate higher overall priority. Among all components, ecological balance emerged as the most preferred conservation priority, with the lowest mean rank score (2.88) (Table 22). A substantial proportion of participants assigned it high rankings, particularly in the first (20.20%) and second (28.66%) preference categories (Table 22), indicating strong recognition of its foundational role in ecosystem stability.

Table 22. Preference ranking of ecosystem components for maintaining a healthy river ecosystem

Rating	Hydropower Projects	Ecological Balance	Holiness	Ecosystem Services	Biodiversity	Water Quality
1 (Highest)	71 (35.68%)	62 (20.20%)	44 (15.55%)	22 (7.26%)	43 (15.36%)	50 (16.50%)
2	11 (5.53%)	88 (28.66%)	38 (13.43%)	25 (8.25%)	41 (14.64%)	35 (11.55%)
3	11 (5.53%)	61 (19.87%)	74 (26.15%)	61 (20.13%)	65 (23.21%)	53 (17.49%)
4	20 (10.05%)	30 (9.77%)	25 (8.83%)	105 (34.65%)	27 (9.64%)	41 (13.53%)
5	27 (13.57%)	53 (17.26%)	67 (23.67%)	54 (17.82%)	92 (32.86%)	33 (10.89%)
6 (Lowest)	59 (29.65%)	13 (4.23%)	35 (12.37%)	36 (11.88%)	12 (4.29%)	91 (30.03%)
Total Responses	199	307	283	303	280	303

Biodiversity (mean = 3.43) and holiness (mean = 3.49) occupied intermediate positions (Table 22), reflecting a balance between ecological and socio-cultural valuation of the river. Biodiversity showed a relatively distributed ranking pattern, though a notable proportion (32.86%) (Table 8) assigned it lower preference (rank 5), suggesting variability in perceived importance. Holiness, on the other hand, demonstrated moderate prioritization, reinforcing the cultural and spiritual dimensions associated with the Ganga. Hydropower projects (mean = 3.49) exhibited a polarized distribution, with a large proportion of respondents assigning both the highest rank (35.68%) and the lowest rank (29.65%) (Table 22). This bimodal pattern suggests divergent perceptions, where some participants view hydropower as beneficial for development, while others may perceive it as a potential threat to ecological integrity.

Table 16. Stakeholder group distribution of participants in pre-training assessment

Component	Mean Rank Score
Ecological Balance	2.88
Biodiversity	3.43
Holiness	3.49
Hydropower Projects	3.49
Water Quality	3.81
Ecosystem Services	3.83

Water quality (mean = 3.81) and ecosystem services (mean = 3.83) were comparatively assigned lower priority rankings (Table 8). Notably, water quality received the highest proportion of lowest-rank assignments (30.03%), while ecosystem services were most frequently ranked in the fourth position (34.65%). These findings may indicate limited conceptual clarity among participants regarding ecosystem services, or a tendency to prioritize more tangible or culturally salient aspects of the river.

It is important to note that the total number of responses varies across components, reflecting partial or multiple ranking patterns by respondents. Despite this variability, the overall trend suggests that participants prioritize ecological balance and biodiversity over utilitarian and abstract ecosystem concepts, while perceptions regarding hydropower remain divided. From a conservation planning perspective, these findings highlight the need to strengthen awareness regarding ecosystem services and water quality, while also addressing conflicting perceptions surrounding hydropower development through evidence-based sensitization.

Question 8. What are the major threats (problems) that Ganga River face today

The analysis of perceived threats to the Ganga River indicates that pollution particularly from industrial and urban sources-was identified as the most significant threat by a majority of participants (n = 279, 51.10%) (Table 24, Figure 21). This dominant response highlights a strong awareness of anthropogenic pollution as a primary driver of ecological degradation.

Sewage waste discharge emerged as the second most frequently reported threat (18.50%), reinforcing concerns regarding inadequate wastewater management and its impact on river health (Table 10, Figure 4). Human population pressure and associated living standards (15.57%) were also recognized as key stressors, reflecting an understanding of the broader socio-environmental pressures on the river system. Moderate proportions of respondents identified developmental activities (10.07%) and ritual practices (7.14%) as contributing threats (Table 24, Figure 21).

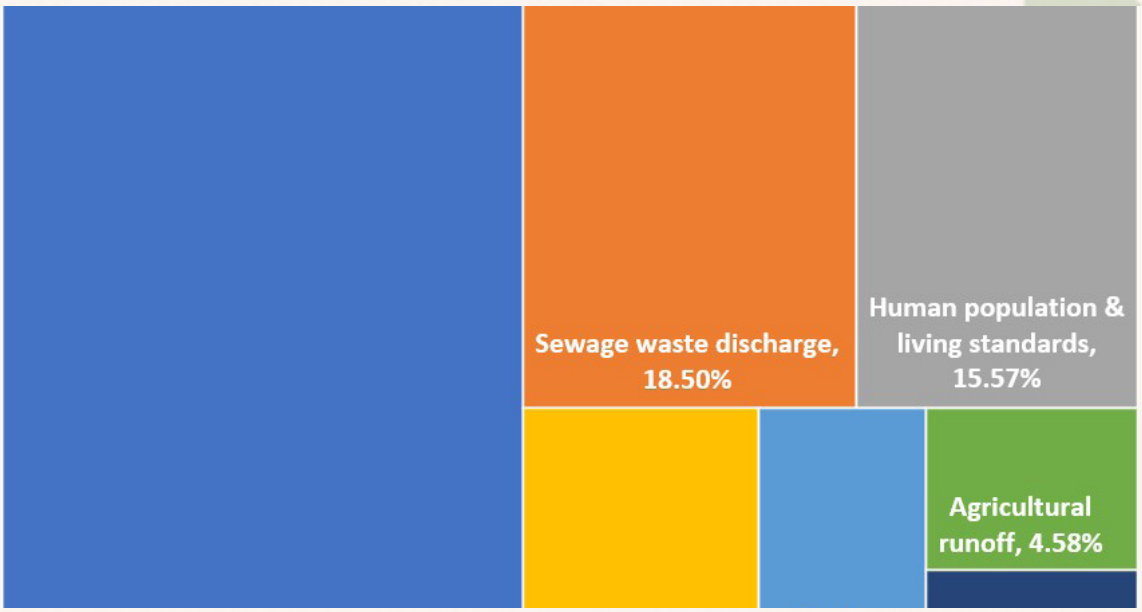

Figure 21. Perceived Major Threats to Ganga River

In contrast, relatively fewer participants reported agricultural runoff (4.58%) and climate change (4.40%) as major concerns (Table 24, Figure 21). The comparatively low recognition of climate change is notable, given its scientifically established role in altering hydrological regimes and ecosystem dynamics, suggesting a gap in awareness regarding large-scale environmental drivers.

Table 24. Perceived major threats to the Ganga River (multiple response)

Threat Category	Frequency (n)	Percentage (%)
Pollution (Industrial/Urban)	279	51.10
Sewage waste discharge	101	18.50
Human population & living standards	85	15.57
Developmental activities	55	10.07
Ritual activities	39	7.14
Agricultural runoff	25	4.58
Climate change	24	4.40

Table 25. Distribution of number of threats identified per participant

Number of Threats Selected	Frequency (n)	Percentage (%)
0	37	6.78
1	466	85.35
2	27	4.95
3	5	0.92
5	2	0.37
7	9	1.65
Total	**546**	**100.00**

The multiple-response structure of the question is further elucidated by the response intensity analysis. A substantial majority of participants (85.35%) identified only one primary threat (Table 25), indicating a tendency to associate river degradation with a single dominant factor rather than a combination of interacting pressures. Only a small fraction selected multiple threats, with 4.95% identifying two threats and less than 3% selecting three or more (Table 25). This pattern suggests a reductionist perception of environmental stressors, where complex, multi-causal processes are simplified into singular dominant issues. From a scientific and management perspective, this highlights the need for training programmes to emphasize the interconnected nature of threats affecting the Ganga River, particularly the cumulative and synergistic impacts of pollution, land-use change, and climate variability.

Question 9. What steps should be taken for cleaning Ganga River?

The analysis of participant responses regarding recommended measures for cleaning the Ganga River reveals a strong inclination toward awareness-based interventions (Table 26, Figure 22). A majority of respondents (n = 306, 56.04%) identified mass awareness programmes as the most important strategy, indicating a widespread perception that behavioral change and public engagement are central to river conservation. The adoption of sustainable practices through the 3R principle (Reduce, Reuse, Recycle) was the second most frequently reported measure (29.85%) (Table 26, Figure 22), reflecting moderate recognition of resource efficiency and waste minimization strategies. Regulatory approaches, including legal actions (24.54%) and restriction of effluents (22.53%) (Table 26, Figure 22), were also identified by a considerable proportion of participants, suggesting awareness of governance and policy mechanisms in pollution control.

Table 25. Distribution of number of threats identified per participant

Measure	Frequency (n)	Percentage (%)
Mass awareness programmes	306	56.04
3R Principle (Reduce, Reuse, Recycle)	163	29.85

Legal actions (rules & regulations)	134	24.54
Restrict effluents (industrial/agricultural/domestic)	123	22.53
Others	0	0.00

Notably, no respondents selected the "other" category, indicating that the provided options sufficiently captured the range of perceived interventions.

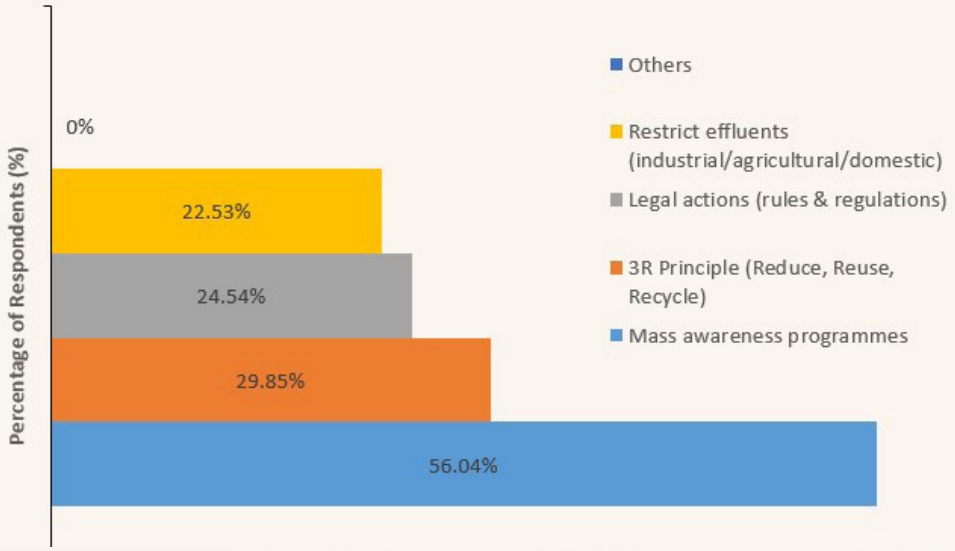

Figure 22. Preferred measures for cleaning the Ganga River

The response intensity analysis shows that the majority of participants (77.47%) selected only one measure, suggesting a tendency to prioritize a single dominant solution rather than a combination of strategies (Table 27). However, a notable subset (11.72%) selected all four measures, indicating a more comprehensive understanding of the multifactorial nature of river pollution and the need for integrated management approaches. A small proportion of respondents (7.14%) did not select any measure (Table 27), which may reflect uncertainty or lack of clarity regarding effective interventions.

Table 25. Distribution of number of threats identified per participant

Number of Measures Selected	Frequency (n)	Percentage (%)
0	39	7.14
1	423	77.47
2	13	2.38
3	7	1.28

4	64	11.72
Total	**546**	**100.00**

Overall, the participants predominantly favor awareness-driven solutions, while comparatively fewer emphasize regulatory enforcement and technical measures. From a scientific and policy perspective, this indicates a partial understanding of river management, where social interventions are prioritized over systemic and infrastructural approaches. Effective training programmes should therefore aim to bridge this gap by emphasizing the necessity of integrated strategies that combine public awareness, policy enforcement, and technological interventions for sustainable river restoration.

Question 10. Who do you think is responsible for cleaning the Ganga River?

The distribution of responses regarding responsibility for cleaning the Ganga River reflects a strong inclination toward collective accountability. Nearly half of the participants (n = 270, 49.45%) selected "all of the above" (Table 28, Figure 23), indicating recognition that river conservation requires coordinated efforts across multiple stakeholder groups, including governmental, institutional, and community actors.

Table 28. Perceived responsibility for cleaning the Ganga River

Stakeholder Category	Frequency (n)	Percentage (%)
Government	48	8.79
NGOs	30	5.49
Private Sector	17	3.11
Village Panchayat	20	3.66
Local Communities	67	12.27
Youth	31	5.68
All of the above	270	49.45

Among individual stakeholder categories, local communities were most frequently identified (12.27%) (Table 28, Figure 23), highlighting the perceived importance of grassroots participation and community-driven initiatives in maintaining river health. Government institutions were identified by 8.79% of respondents, suggesting moderate acknowledgment of regulatory and policy-level responsibility (Table 28, Figure 23).

Other stakeholders, including youth (5.68%), NGOs (5.49%), village panchayats (3.66%), and the private sector (3.11%) (Table 28, Figure 23), were less frequently selected when considered independently. This distribution indicates that while participants recognize the role of individual entities, they are less likely to attribute responsibility to any single group in isolation.

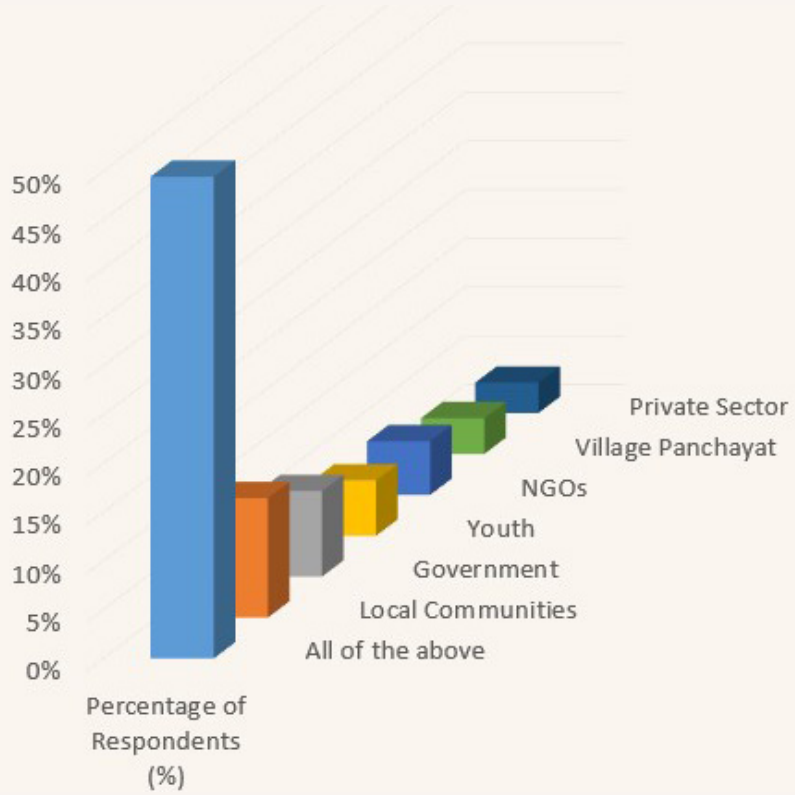

Figure 23. Perceived Responsibility for Cleaning Ganga River

Other stakeholders, including youth (5.68%), NGOs (5.49%), village panchayats (3.66%), and the private sector (3.11%) (Table 28, Figure 23), were less frequently selected when considered independently. This distribution indicates that while participants recognize the role of individual entities, they are less likely to attribute responsibility to any single group in isolation.

The predominance of the "all of the above" response suggests a systems-level perception among participants, wherein river conservation is understood as a multi-actor, interdisciplinary process. However, the relatively lower selection frequencies for specific institutional actors may also indicate limited clarity regarding the distinct roles and responsibilities of each stakeholder group. From a management perspective, these findings underscore the importance of fostering collaborative governance frameworks and clearly communicating stakeholder roles within river management strategies. Strengthening this understanding may enhance accountability and improve the effectiveness of conservation interventions.

In conclusion the pre-training assessment provides a structured baseline understanding of participant demographics, experiential exposure, and cognitive orientation toward the Ganga River and its ecological dynamics. The participant pool was demographically diverse yet unevenly distributed, with a predominance of male respondents, younger age groups, and strong representation from educational institutions and community-linked stakeholders. Spatially, participation was highly skewed toward Uttarakhand and Uttar Pradesh, indicating regionally concentrated programme reach.

A near-universal proportion of participants reported prior visitation to the Ganga River, primarily driven by religious motivations, although a notable fraction also engaged with the river for recreational and professional purposes. This indicates that the river is perceived as a multidimensional entity with cultural, ecological, and utilitarian significance. Baseline awareness levels were generally high across key indicators, including familiarity with aquatic biodiversity, observational exposure to riverine ecosystems, and recognition of the ecological importance of biodiversity. However, a measurable proportion of respondents demonstrated partial or absent knowledge regarding the geographical extent of the Ganga River, suggesting gaps in spatial and systems-level understanding.

Perception-based analyses revealed that ecological balance and biodiversity were prioritized over other ecosystem components, while concepts such as ecosystem services and water quality received comparatively lower emphasis. The perception of hydropower projects was notably polarized, reflecting divergent views on

development–conservation trade-offs. In terms of environmental threats, pollution—particularly industrial and urban—was overwhelmingly identified as the primary concern, whereas broader drivers such as climate change and agricultural runoff were under-recognized.

Participants predominantly favored awareness-based interventions for river conservation, with relatively less emphasis on regulatory, technical, and infrastructure-based measures. Similarly, while there was strong recognition of collective responsibility for river conservation, clarity regarding the specific roles of individual stakeholders appeared limited. Overall, the pre-assessment indicates that participants possess a strong foundational awareness and positive environmental disposition toward the Ganga River. However, this awareness is often generalized and lacks depth in terms of integrated ecological understanding, multi-causal threat perception, and systems-based management approaches. These findings highlight the need for training programmes to move beyond awareness generation toward enhancing conceptual clarity, interdisciplinary understanding, and evidence-based perspectives on river conservation.

5.2 Pre-Training Assessment

Post-training assessment is a critical component of evaluating the effectiveness of educational and capacity-building programs. It provides an objective measure of the knowledge, skills, and awareness gained by participants following an intervention, allowing program designers and stakeholders to determine whether learning objectives have been achieved. Such assessments typically involve comparing participants' understanding before and after the training, using quantitative or qualitative metrics, and are often complemented by statistical analyses to measure the significance and magnitude of observed changes. In the context of environmental and biodiversity awareness programs, post-training assessment helps identify the extent to which participants have acquired the knowledge necessary to implement conservation practices, apply scientific principles in the field, and contribute meaningfully to sustainable ecosystem management. This process not only validates the effectiveness of the training but also informs future program design and continuous improvement.

The following section presents a detailed, question-wise analysis of the post-training assessment responses. Each item has been examined to evaluate participants' understanding and knowledge gain in specific areas related to freshwater ecosystems and biodiversity conservation. This breakdown allows for a nuanced interpretation of how the training impacted different thematic aspects, highlighting areas of strong comprehension as well as topics that may require further reinforcement. By analyzing responses at the individual question level, the report provides a comprehensive view of the effectiveness of the training program across all key learning objectives.

Question 1. How do you like the training programme?

The post-training evaluation indicates a highly positive reception of the training programme among participants. A substantial majority rated the programme as "Excellent" (n = 357, 65.38%), followed by "Very good" (n = 162, 29.67%) (Table 29, Figure 24). Only a small proportion of respondents rated the programme as "Good" (4.40%), while negligible dissatisfaction was observed (0.55%).

Table 29. Participant feedback on overall training programme

Response	Frequency (n)	Percentage (%)
Excellent	357	65.38
Very good	162	29.67
Good	24	4.40

Not satisfied	3	0.55
Total	546	100.00

The descriptive statistics further reinforce this trend, with a low mean score of 1.40 (on a scale where 1 represents the highest rating), a median of 1, and a relatively small standard deviation (SD = 0.60). This indicates that responses were not only skewed toward the highest rating but also exhibited low variability, reflecting strong consensus among participants regarding programme quality.

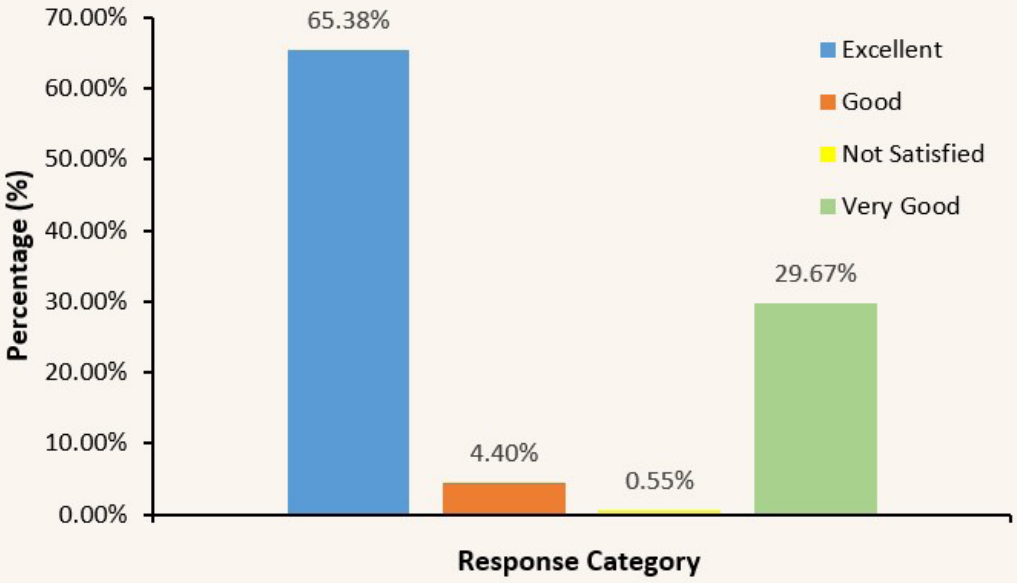

Figure 24. Participant Evaluation of Training Programme

The chi-square test demonstrates that the observed distribution of responses differs significantly from an equal distribution ($\chi^2 = 584.24$, $df = 3$, $p < 0.001$), confirming that the predominance of positive ratings is statistically significant and not attributable to random variation. Collectively, these suggest that the training programme was perceived as highly effective and well-received, with participants expressing strong satisfaction in terms of content delivery, relevance, and overall execution. The minimal proportion of negative feedback further indicates that the programme design and implementation were aligned with participant expectations and learning needs.

Question 2. Are you satisfied with the following components of the training programme?

The post-training evaluation of programme components indicates varying levels of participant satisfaction across different instructional and experiential elements. Lectures emerged as the most positively rated component, with 57.88% of participants expressing satisfaction, closely followed by activities (54.03%) (Table 30, Figure 25). These findings suggest that both theoretical and interactive components were well-received and formed the core strengths of the training programme.

Table 30. Participant satisfaction across training components

Training Component	Frequency (n)	Percentage (%)
Lectures	316	57.88
Activities	295	54.03
Field visits	241	44.14
Material provided	220	40.29
Lab visits	202	37.00

Field visits (44.14%) and material provided (40.29%) received moderate levels of satisfaction, indicating that while these components contributed meaningfully to the training experience, their perceived effectiveness was comparatively lower than that of lectures and activities (Table 30, Figure 25). Lab visits were the least positively rated component (37.00%), suggesting either limited exposure, accessibility constraints, or lower perceived relevance among participants.

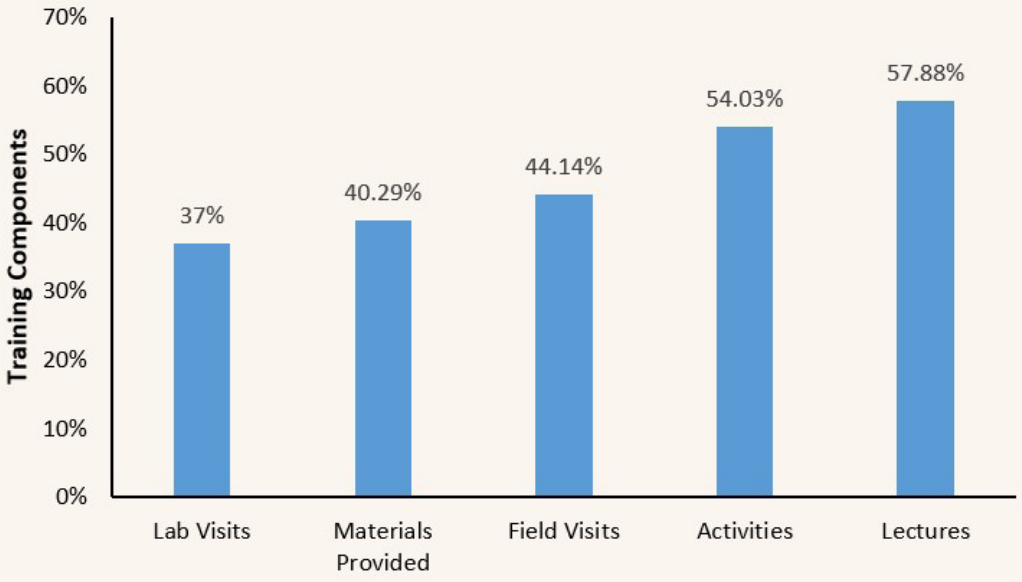

Figure 25. Participant Satisfaction Across Training Components

The response intensity analysis provides further insight into participant perceptions. A majority of respondents (57.88%) reported satisfaction with only one component, indicating a tendency to identify a single dominant strength within the programme (Table 30). In contrast, a substantial proportion (25.27%) expressed satisfaction with all five components, reflecting a more holistic appreciation of the training design. The remaining participants selected between two and four components, suggesting moderate variability in satisfaction patterns.

Table 31. Distribution of number of components participants response intensity

Number of Components Selected	Frequency (n)	Percentage (%)
0	1	0.18
1	316	57.88
2	30	5.49
3	36	6.59
4	25	4.58
5	138	25.27
Total	**546**	**100.00**

The negligible proportion of participants reporting no satisfaction (0.18%) indicates that nearly all respondents found at least one component of the training beneficial.

Overall, the findings suggest that while the programme was broadly effective, participant satisfaction was not uniformly distributed across components. The relatively lower ratings for lab visits and training materials highlight potential areas for refinement, whereas the strong performance of lectures and activities underscores their central role in effective knowledge dissemination. From an instructional design perspective, optimizing underperforming components while maintaining strengths could enhance the overall impact and coherence of future training programmes.

Question 3. Did the workshop improve your understanding about conservation of Ganga River and its biodiversity?

The assessment indicates an overwhelmingly positive perceived impact of the workshop on participants' understanding of Ganga River conservation and its biodiversity. A vast majority of respondents (n = 533, 97.62%) reported that the training improved their understanding, while only a negligible proportion indicated no improvement (1.47%) or expressed uncertainty (0.92%). This near-universal affirmation suggests that the training programme was highly effective in enhancing conceptual clarity and awareness regarding river conservation. The extremely low proportion of negative and uncertain responses further indicates that the content delivery, structure, and pedagogical approach were successful in addressing participant knowledge gaps identified during the pre-assessment.

The chi-square test confirms that the observed distribution of responses is statistically significant ($\chi^2 = 1015.40$, $df = 2$, $p < 0.001$), demonstrating that the dominance of "Yes" responses is not due to random variation but reflects a consistent and systematic improvement in perceived understanding. From an evaluative perspective, these findings provide strong evidence of the programme's effectiveness in achieving its primary educational objective. However, while self-reported improvement is a critical indicator of perceived learning, it should ideally be interpreted alongside objective measures of knowledge gain to comprehensively assess training impact.

Q4 Are you aware of Government programmes to clean Ganga River?

A high level of awareness was observed amongst the participants regarding government programmes aimed at cleaning the Ganga River during the post-training assessment. A substantial majority (n = 484, 88.64%) reported awareness of such initiatives, while a smaller proportion (n = 62, 11.36%) indicated lack of

awareness. The chi-square test confirms that the observed distribution of responses is statistically significant ($\chi^2 = 326.16$, df = 1, $p < 0.001$), indicating that the predominance of affirmative responses is not due to chance but reflects a meaningful trend in participant awareness.

This distribution suggests that the training programme was effective in disseminating information about institutional efforts and policy-level interventions related to river conservation. The relatively high awareness level is indicative of successful communication of governance frameworks and ongoing initiatives within the Ganga River. While the majority of participants demonstrated awareness, the presence of over 11% of respondents lacking such knowledge highlights the need for continued emphasis on policy literacy and programme visibility. Strengthening understanding of government-led initiatives is essential for fostering informed participation, stakeholder engagement, and effective implementation of conservation strategies at multiple levels.

Question 5. What are the key species found in Ganga River?

The assessment of participants' ability to identify key species of the Ganga River following the training programme indicates a moderate level of knowledge acquisition. A majority of respondents (n = 324, 59.34%) were able to correctly identify key species (Table 32), while a substantial proportion (n = 222, 40.66%) were unable to do so.

Table 32. Identification of key species in the Ganga River

Response	Frequency (n)	Percentage (%)
Yes (Correct identification)	324	59.34
No (No identification)	222	40.66
Total	**546**	**100.00**

Although the training programme contributed to improved species-level awareness, the extent of knowledge acquisition was not uniform across all participants. Compared to other post-training indicators that demonstrated near-universal improvement, species identification appears to represent a relatively more complex cognitive domain requiring deeper ecological understanding and retention. The chi-square test indicates that the observed distribution is statistically significant ($\chi^2 = 19.06$, df = 1, $p < 0.001$), confirming that the difference between correct and incorrect identification is not due to random variation.

These findings highlight that while general awareness and conceptual understanding can be effectively enhanced through training, more specialized knowledge such as species identification may require reinforced pedagogical approaches. These could include repeated exposure, visual aids, field-based learning, and interactive modules to improve retention and accuracy. In essence, the results point toward a partial but meaningful improvement in ecological literacy, with scope for further strengthening taxonomic and biodiversity-specific competencies in future training interventions.

Question 6 Do you know any tributaries belonging to Ganga River?

The post-training assessment demonstrates a high level of awareness among participants regarding tributaries of the Ganga River. A substantial majority (n = 489, 89.56%) reported awareness, whereas only a small proportion (n = 57, 10.44%) indicated lack of knowledge. The chi-square analysis confirms that this distribution is statistically significant ($\chi^2 = 341.80$, df = 1, $p < 0.001$), indicating that the predominance of affirmative responses is not attributable to random variation.

This provides strong evidence that participants possess a clear understanding of the tributary network associated with the Ganga River. Awareness of tributaries reflects an improved comprehension of the river hydrological connectivity, which is fundamental to integrated river management. When considered alongside pre-assessment findings that indicated partial gaps in geographical knowledge, the present results suggest a marked enhancement in spatial understanding following the training programme.

In hydrological terms, a river is not a line but it is a branching system (a dendritic network). Awareness of tributaries reflects whether participants have mentally transitioned from seeing the Ganga as a single entity to understanding it as a connected ecological system. However, the persistence of a small proportion of participants lacking awareness indicates that while the training was broadly effective, additional reinforcement may be required to achieve uniform comprehension across all participants. Strengthening this aspect is essential, as knowledge of tributary systems underpins informed decision-making in conservation planning and watershed management.

Question 7. Populations of which among the following are decreasing in River Ganga?

The participants' perceptions regarding declining faunal populations in the Ganga River reveals a broad recognition of biodiversity loss across multiple taxonomic groups. Mammals were most frequently identified as declining (n = 451, 82.60%) (Table 33, Figure 26), indicating strong awareness of conservation concerns associated with higher vertebrates, which are often more visible and receive greater public attention.

Table 33. Perceived decline in faunal groups within the Ganga River

Taxonomic Group	Frequency (n)	Percentage (%)
Mammals	451	82.60
Fishes	389	71.25
Reptiles	357	65.38
Amphibians	336	61.54
Birds	331	60.62

Fishes (71.25%) and reptiles (65.38%) were also widely recognized as declining groups (Table 33, Figure 26), reflecting an appreciable level of ecological understanding related to aquatic and semi-aquatic fauna. Amphibians (61.54%) and birds (60.62%) were comparatively less frequently selected (Table 33, Figure 26), though still identified by a majority of participants, suggesting a relatively consistent perception of biodiversity decline across taxa.

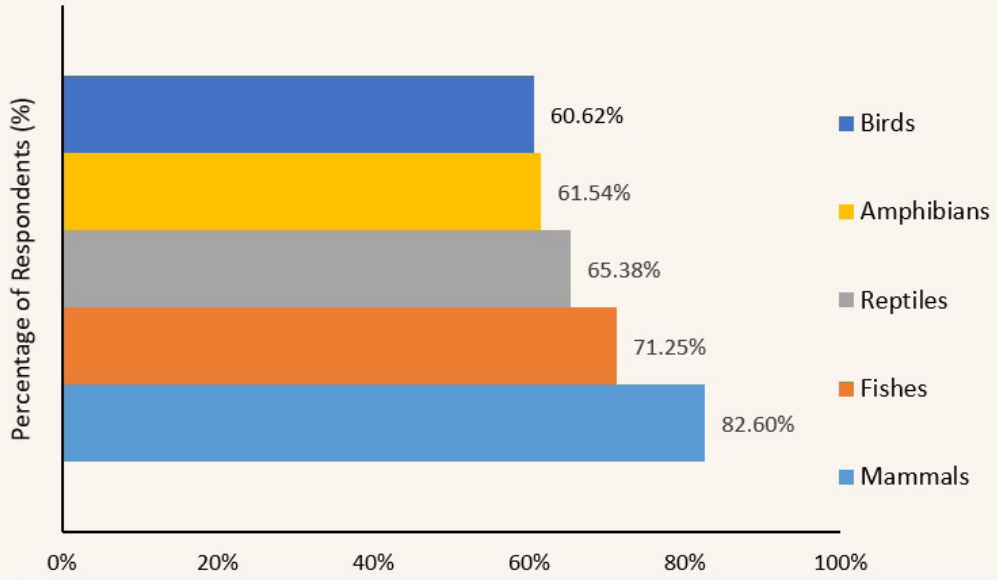

Figure 26. Perceived Decline in Faunal Groups in Ganga River

The response intensity analysis provides additional insight into participant perception patterns. Notably, over half of the respondents (50.37%) selected all five taxonomic groups (Table 34), indicating a comprehensive understanding that biodiversity decline is widespread and not restricted to a single group. Conversely, 29.85% of participants selected only one group, suggesting a more limited or focused perception of decline (Table 34). Intermediate response patterns, where participants selected two to four groups, were less common, collectively accounting for approximately 20% of responses. This distribution suggests a polarization between participants who perceive biodiversity decline as a generalized phenomenon and those who associate it with specific taxa.

Table 34. Distribution of number of taxonomic groups selected per participant

Number of Components Selected	Frequency (n)	Percentage (%)
1	163	29.85
2	32	5.86
3	42	7.69
4	34	6.23
5	275	50.37
Total	**546**	**100.00**

Overall, the training programme was effective in fostering a broad awareness of biodiversity loss across multiple faunal groups. However, the variability in response patterns also suggests differences in depth of understanding, with some participants demonstrating comprehensive ecological insight while others retain a narrower perspective. Strengthening integrative ecological knowledge across all taxonomic groups may further enhance participants' ability to conceptualize biodiversity decline as a systemic issue within the river.

Question 8 What do you think are the major threats faced by Ganga River?

The post-training assessment also indicates a comprehensive and multifaceted understanding among participants regarding the major threats affecting the Ganga River (Table 35, Figure 27). Pollution from industrial and urban sources emerged as the most prominently perceived threat (69.05%), underscoring heightened awareness of anthropogenic contamination as a primary driver of ecosystem degradation (Table 35, Figure 27). Human population growth and associated living standards (63.37%) and sewage waste discharge (59.71%) were also widely recognized, reflecting an improved understanding of the cumulative pressures exerted by demographic expansion and inadequate waste management systems.

Table 35. Post-training perception of major threats to the Ganga River

Threat Category	Frequency (n)	Percentage (%)
Pollution (Industrial/Urban)	377	69.05
Human population & living standards	346	63.37
Sewage waste discharge	326	59.71
Developmental activities	290	53.11
Ritual activities	288	52.75
Agricultural runoff	274	50.18
Climate change	267	48.90
Others	146	26.74

Developmental activities (53.11%), ritual practices (52.75%), and agricultural runoff (50.18%) were identified by approximately half of the respondents, indicating an appreciation of both cultural and economic drivers of environmental stress (Table 35, Figure 27). Climate change (48.90%), although slightly lower in frequency, was still acknowledged by nearly half of the participants, suggesting a moderate level of awareness regarding large-scale, systemic environmental processes. The “other” category (26.74%) indicates the presence of additional perceived threats, though less consistently identified.

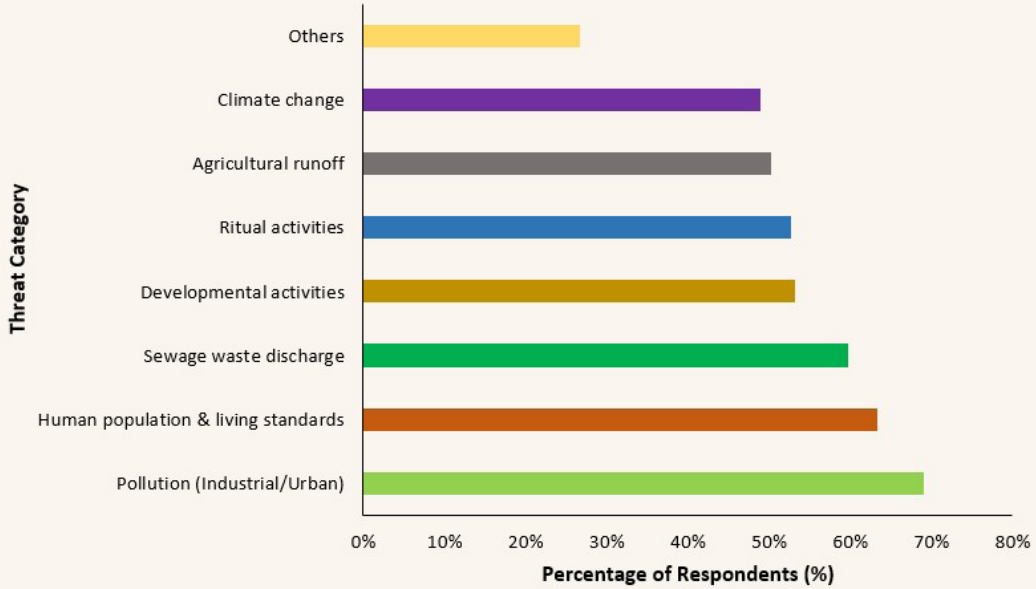

Figure 27. Post-training Perception of Threats to Ganga River

The response intensity analysis reveals a polarized pattern of perception. A substantial proportion of participants (45.60%) identified only a single threat, suggesting a focused or dominant perception of environmental issues (Table 36). In contrast, 26.74% of respondents selected all eight threat categories, demonstrating a holistic understanding of the complex and interconnected nature of pressures on the river ecosystem. Additionally, 16.12% of participants identified seven threats (Table 36), further reinforcing the presence of a considerable subgroup with comprehensive ecological awareness.

Table 36. Distribution of number of threats identified per participant

Number of Threats Selected	Frequency (n)	Percentage (%)
1	249	45.60
2	4	0.73
3	12	2.20
4	14	2.56
5	17	3.11
6	16	2.93
7	88	16.12
8	146	26.74
Total	546	100.00

Overall, the findings suggest that the training programme contributed to broadening participants' perspectives, enabling many individuals to recognize the multiplicity and interdependence of threats affecting the Ganga River. However, the coexistence of narrow and comprehensive response patterns indicates variability in the depth of understanding, highlighting the need for continued emphasis on integrated ecosystem-based education.

Question 9 What are the major environmental changes in Ganga River system observed as a result of anthropogenic (human) activities?

The post-training findings indicate that participants predominantly recognized biodiversity decline (60.99%) and water pollution (56.96%) as the principal environmental changes occurring in the Ganga River system as a consequence of anthropogenic activities (Table 37, Figure 28). These responses reflect a relatively strong awareness of direct ecological degradation and water quality deterioration, which are among the most visible and widely discussed environmental impacts.

Table 37. Post-training perception of major environmental changes in the Ganga River system

Environmental Change	Frequency (n)	Percentage (%)
Decrease in biodiversity	333	60.99
Water pollution	311	56.96
Changing river flow regime	180	32.97

In contrast, changes in river flow regime were identified by a comparatively lower proportion of respondents (32.97%), suggesting limited recognition of hydrological alterations such as flow regulation, abstraction, and channel modification (Table 37, Figure 28). This indicates that while participants demonstrate adequate awareness of biological and chemical impacts, their understanding of physical and hydrological processes remains comparatively less developed.

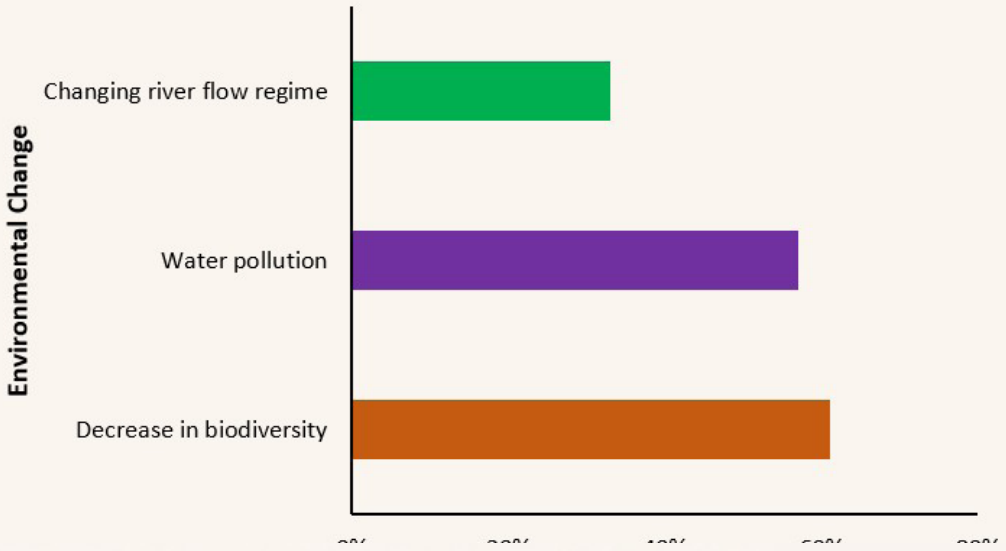

Figure 28. Perceived Environmental Changes in Ganga River States

The response intensity distribution further elucidates perception patterns (Table 38). A substantial majority of participants (65.57%) identified only one environmental change, indicating a tendency to associate anthropogenic impacts with a singular dominant outcome. Meanwhile, 18.32% of respondents selected all three changes, demonstrating a more integrated understanding of ecological, chemical, and hydrological transformations within the river system. A smaller proportion (15.20%) identified two changes, reflecting intermediate levels of comprehension.

Table 38. Distribution of number of environmental changes identified per participant

Number of Changes Selected	Frequency (n)	Percentage (%)
0	5	0.92
1	358	65.57
2	83	15.20
3	100	18.32
Total	**546**	**100.00**

Overall, the results suggest that the training programme was effective in enhancing awareness of key environmental issues, particularly biodiversity loss and pollution. However, the relatively lower recognition of changes in river flow regime and the predominance of single-response selections highlight the need for further emphasis on systemic and process-based understanding of riverine ecosystems, particularly the interlinkages between hydrology and ecological integrity.

Question 10 What are the ecosystem services provided by Ganga River?

The post-training assessment demonstrates that participants exhibited a relatively comprehensive understanding of ecosystem services provided by the Ganga River (Table 39, Figure 29). Provisioning services were most frequently identified (64.84%), indicating strong recognition of tangible benefits such as water, food resources, and livelihood support derived from the river system.

Table 39. Post-training perception of ecosystem services provided by the Ganga River

Ecosystem Service	Frequency (n)	Percentage (%)
Provisioning services	354	64.84
Supporting services	302	55.31
Regulating services	293	53.66
Cultural services	273	50.00

Supporting services (55.31%) and regulating services (53.66%) were also identified by more than half of the respondents (Table 39, Figure 29), suggesting an appreciable level of awareness regarding ecological processes such as nutrient cycling, habitat maintenance, and regulation of environmental conditions.

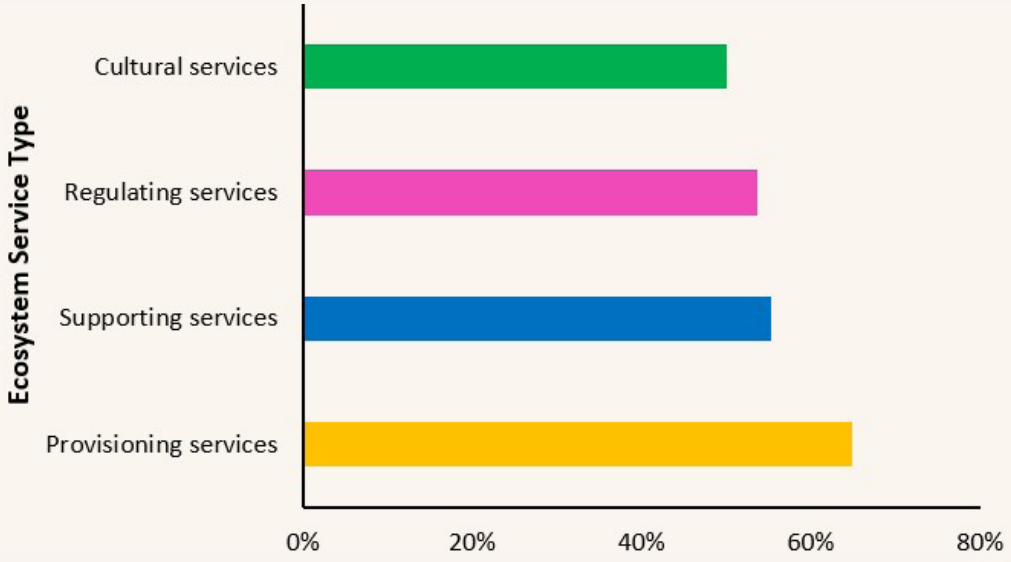

Figure 29. Recognition of Ecosystem Services of Ganga River

Cultural services, though slightly lower (50.00%) (Table 39, Figure 29), were still recognized by half of the participants, reflecting moderate awareness of the socio-cultural and spiritual significance associated with the river.

The selection pattern analysis provides further insight into the depth of understanding (Table 40). Approximately 35.35% of respondents identified all four categories of ecosystem services, indicating a holistic conceptualization of ecosystem functionality and benefits. In contrast, a small proportion of participants (3.85%) failed to identify any ecosystem services, suggesting minimal or absent understanding in this subset. The findings indicate that the training programme was effective in enhancing multidimensional awareness of ecosystem services. Nevertheless, the fact that only about one-third of participants demonstrated a fully integrated understanding highlights the need for continued emphasis on the interconnected nature of provisioning, regulating, supporting, and cultural services within riverine ecosystems.

Table 40. Overall selection pattern of ecosystem services

Category	Frequency (n)	Percentage (%)
Selected all services	193	35.35
Selected none	21	3.85
Total	**546**	**100.00**

Overall, the post-training assessment provides substantive evidence of enhanced awareness, improved conceptual understanding, and broader ecological perception among participants when compared with the pre-assessment baseline. A comparative interpretation across multiple questionnaire domains reveals both the strengths of the training intervention and the residual gaps that warrant further pedagogical attention. At the outset, participant perception of the training programme itself (Post Q1) was overwhelmingly positive, with 95.05% rating it as either “excellent” or “very good” (Mean = 1.4, SD = 0.6). This high level of satisfaction is critical, as it establishes the effectiveness of the training delivery mechanisms and provides a foundational context for interpreting subsequent knowledge-based responses. The statistically significant chi-square result ($p < 0.001$) further confirms that these responses were not randomly distributed but strongly skewed towards positive evaluation.

A key indicator of training effectiveness is the substantial improvement in conceptual understanding. In Post Q3, 97.62% of participants reported that the workshop improved their understanding of conservation in the Ganga River. This represents a marked advancement relative to pre-assessment patterns, where awareness was more fragmented and often limited to isolated aspects of the river system. Similarly, awareness of government programmes (Post Q4: 88.64%) and knowledge of tributaries (Post Q6: 89.56%) indicate a considerable strengthening of both institutional and geographical literacy, which are essential components of environmental education. When examining ecological knowledge, a meaningful progression is observed across multiple questions. In the pre-assessment (Pre Q2), although 64.29% of participants reported awareness of Ganga states, a notable proportion (35.71%) either lacked knowledge or possessed only partial understanding. In contrast, post-training responses demonstrate a more cohesive knowledge structure. For instance, identification of key species (Post Q5: 59.34% correct identification) and recognition of declining faunal groups (Post Q7: mammals 82.60%, fishes 71.25%, reptiles 65.38%) suggest improved biodiversity awareness. The high proportion of respondents (50.37%) selecting all faunal groups as declining further indicates the development of a systems-level understanding of biodiversity loss, which was less evident in pre-training responses.

Perception of environmental threats also exhibits a notable shift in both breadth and depth. In the pre-assessment (Pre Q8), pollution (51.10%) and sewage discharge (18.50%) were recognized as primary threats, but other factors such as climate change (4.40%) and agricultural runoff (4.58%) were minimally acknowledged. Post-training results (Post Q8) demonstrate a more comprehensive threat perception, with pollution (69.05%), population pressure (63.37%), sewage discharge (59.71%), and even climate change (48.90%) being widely recognized. This indicates that the training successfully expanded participant understanding from localized and visible threats to more complex and diffuse environmental stressors. A similar trend is observed in the perception of environmental changes (Post Q9), where biodiversity decline (60.99%) and water pollution (56.96%) were widely acknowledged. However, the relatively lower recognition of hydrological alterations (32.97%) suggests that while biological and chemical impacts are well understood, physical processes such as flow regime changes remain less internalized. This aligns with pre-assessment patterns, where ecosystem understanding was largely component-specific rather than process-oriented.

The analysis of ecosystem services (Post Q10) further reinforces the progression towards multidimensional ecological understanding. While pre-assessment ranking data (Pre Q7) indicated a preference-based and somewhat fragmented perception of ecosystem components often prioritizing visible or utilitarian aspects such as water quality or biodiversity the post-assessment reveals a more structured recognition of ecosystem service categories. A substantial proportion of participants identified provisioning (64.84%), supporting (55.31%), regulating (53.66%), and cultural services (50.00%). Moreover, 35.35% of respondents selected all service categories, demonstrating a shift towards integrative ecological thinking. Nevertheless, the fact that nearly two-thirds did not identify all services indicates that full conceptual integration remains incomplete. Behavioral and attitudinal dimensions also exhibit meaningful improvement. In the pre-assessment (Pre Q9), mass awareness programmes (56.04%) were the most commonly suggested intervention, with comparatively lower emphasis on regulatory or systemic approaches. Post-training responses suggest a more nuanced understanding of responsibility and governance, with 49.45% of participants in Pre Q10 already indicating “all stakeholders” as responsible. This foundational perception likely facilitated the post-training expansion of threat recognition and solution-oriented thinking, although direct post-comparison data on responsibility would further strengthen this interpretation.

An important analytical dimension across multiple questions is the pattern of response intensity. In the pre-assessment, responses often reflected limited selection breadth, with many participants identifying only one or two options (e.g., threats or solutions). In contrast, post-assessment data reveal an increase in comprehensive selections, such as 26.74% of participants identifying all threats (Post Q8) and 35.35% identifying all ecosystem services (Post Q10). This transition from singular to multiple-response patterns is indicative of cognitive expansion from reductionist to systems-based understanding.

Despite these improvements, certain limitations persist. The dominance of single-response selections in some post-training questions (e.g., 65.57% selecting only one environmental change in Post Q9) suggests that a proportion of participants still conceptualize environmental issues in isolation. Additionally, comparatively lower recognition of abstract or less visible processes, such as hydrological changes and regulating ecosystem services, highlights the need for stronger emphasis on process-based and integrative ecological education.

6 DISCUSSION

Freshwater biodiversity in the Ganga River main stem is facing escalating pressures from habitat degradation, hydrological modification, pollution, overexploitation, and increasing human-wildlife interactions. Addressing these complex challenges requires a paradigm shift from enforcement-driven conservation toward integrated, capacity-based, and participatory management frameworks. The present capacity-building interventions directly respond to this need by strengthening institutional competence, enhancing community stewardship, and improving operational preparedness across multiple governance levels.

The development of context-specific training frameworks ensures that conservation actions are scientifically informed, operationally feasible, and regionally relevant. By aligning training content with ecological priorities and stakeholder roles, the programme facilitates effective translation of policy objectives into field-level implementation. This targeted capacity development strengthens institutional responsiveness, supports adaptive river management, and promotes evidence-based conservation planning. Stakeholder integration across administrative, academic, and community domains enhances coordination, reduces sectoral fragmentation, and fosters collective ownership of conservation outcomes. The participatory approach promotes behavioural change, improves regulatory compliance, and strengthens community surveillance, thereby expanding the reach and sustainability of biodiversity protection measures beyond conventional institutional mechanisms.

Community-centred conservation strategies play a pivotal role in strengthening early detection, emergency response, and long-term ecological stewardship. Training local volunteers and frontline personnel enhances decentralized response capacity, minimizes intervention delays, and improves wildlife rescue outcomes. Such localized preparedness significantly mitigates ecological risks associated with accidental mortality, habitat disturbance, and human-wildlife conflict. The establishment of trained first-responder networks further strengthens operational resilience by embedding rapid-response capability within local governance systems. This integrated framework enhances inter-agency coordination, streamlines communication pathways, and ensures timely technical interventions, thereby improving conservation efficiency and reducing wildlife mortality. The training impact assessment indicates a substantial enhancement in participant awareness and understanding of freshwater ecology and biodiversity conservation within the Ganga River. The statistically significant difference between pre- and post-training scores, supported by a very high effect size, demonstrates that the training interventions were highly effective in achieving their intended learning outcomes. The magnitude of change suggests not only improved factual knowledge but also a meaningful shift in conceptual understanding, reflecting the efficacy of the training design, delivery, and content integration across diverse thematic areas.

At the thematic level, the responses reveal a broad-based improvement in participants' perception of ecological issues, including threats to aquatic biodiversity, environmental changes, and the recognition of ecosystem services. A higher proportion of respondents demonstrated informed awareness regarding anthropogenic pressures, conservation priorities, and the multifunctional role of riverine ecosystems. Additionally, participants exhibited a more nuanced understanding of stakeholder responsibilities and intervention strategies, indicating that the training facilitated critical thinking and systems-level comprehension rather than isolated knowledge acquisition.

However, the interpretation of these outcomes must be contextualized within the demographic and stakeholder composition of the sample. The predominance of participants from educational and community-based backgrounds, along with the geographic concentration in specific states, may influence the generalizability of the findings. While the observed improvements underscore the effectiveness of the programme, they also highlight the need for broader stakeholder inclusion, particularly technical experts and regulatory agencies, to ensure a more comprehensive and interdisciplinary impact. Future training initiatives may benefit from targeted outreach and balanced representation to enhance both the depth and applicability of conservation-oriented knowledge across sectors.

Overall, the capacity-building model offers a scalable and replicable framework for freshwater biodiversity conservation, integrating scientific training, participatory governance, and institutional coordination. This approach aligns closely with national conservation priorities under the National Mission for Clean Ganga and provides strategic guidance for implementing biodiversity management interventions across India's major river systems.

At the thematic level, the responses reveal a broad-based improvement in participants' perception of ecological issues, including threats to aquatic biodiversity, environmental changes, and the recognition of ecosystem services. A higher proportion of respondents demonstrated informed awareness regarding anthropogenic pressures, conservation priorities, and the multifunctional role of riverine ecosystems. Additionally, participants exhibited a more nuanced understanding of stakeholder responsibilities and intervention strategies, indicating that the training facilitated critical thinking and systems-level comprehension rather than isolated knowledge acquisition.

However, the interpretation of these outcomes must be contextualized within the demographic and stakeholder composition of the sample. The predominance of participants from educational and community-based backgrounds, along with the geographic concentration in specific states, may influence the generalizability of the findings. While the observed improvements underscore the effectiveness of the programme, they also highlight the need for broader stakeholder inclusion, particularly technical experts and regulatory agencies, to ensure a more comprehensive and interdisciplinary impact. Future training initiatives may benefit from targeted outreach and balanced representation to enhance both the depth and applicability of conservation-oriented knowledge across sectors.

Overall, the capacity-building model offers a scalable and replicable framework for freshwater biodiversity conservation, integrating scientific training, participatory governance, and institutional coordination. This approach aligns closely with national conservation priorities under the National Mission for Clean Ganga and provides strategic guidance for implementing biodiversity management interventions across India's major river systems.

REFERENCES

Alaerts, G.J. (2008). Knowledge and Capacity Development (KCD) as tool for institutional strengthening and change. In Water for a changing world-Developing local knowledge and capacity, CRC Press, pp. 17-38.

Bhatt, J. R., A. Das, and K. Shanker (eds.). (2018). Biodiversity and Climate Change: An Indian Perspective. New Delhi, India: Ministry of Environment, Forest and Climate Change, Government of India.

Bloomfield, G., Bucht, K., Martínez-Hernández, J. C., Ramírez-Soto, A. F., Sheseña-Hernández, I., Lucio-Palacio, C. R., & Ruelas Inzunza, E. (2018). Capacity building to advance the United Nations sustainable development goals: An overview of tools and approaches related to sustainable land management. Journal of sustainable forestry, 37(2), 157-177.

Carr, G. (2015). Stakeholder and public participation in river basin management—an introduction. Wiley Interdisciplinary Reviews: Water, 2(4), 393-405.Central Water Commission. (2020). Ramganga basin profile. Upper Ganga Basin Organisation, Ministry of Jal Shakti. https://cwc.gov.in/en/ugbo/gangabasin/ramganga

Czabanowska, K., & Rodriguez Feria, P. (2024). Training needs assessment tools for the public health workforce at an institutional and individual level: a review. European Journal of Public Health, 34(1), 59-68.

Gravetter, F. J., & Wallnau, L. B. (2016). Statistics for the behavioral sciences (10th ed.). Cengage Learning, pp: 1-690.

Hamza, M. (2012). Developing training material guide. Swedish Civil Contingencies Agency (MSB).
Kirkpatrick, D. L. (1959). Techniques for Evaluation Training Programs. Journal of the American Society of Training Directors, 13, 21-26.

Leidel M., Niemann S., Hagemann N. (2012). Capacity development as a key factor for integrated water resources management (IWRM): improving water management in the Western Bug River Basin, Ukraine. Environmental Earth Science, 65:1415–1426 DOI 10.1007/s12665-011-1223-5

NMCG, (2019). Annual Report 2018–19. National Mission for Clean Ganga, Ministry of Jal Shakti, Government of India.

OECD, (2006). The Challenge of Capacity Development: Working Towards Good Practice. Paris: Organisation for Economic Co-operation and Development.

O'Keeffe, J. H. (2018). A perspective on training methods aimed at building local capacity for the assessment and implementation of environmental flows in rivers. Frontiers in Environmental Science, 6, 125.

UNDP, (2009). Handbook on planning, monitoring and evaluating for development results. United Nation Developments programme, United States of America.

wwfIndia, (2021). Annual Report 2021-2022. World Wide Fund for Nature – India.

WWF-India. (2022). Annual report 2021-22: Rivers for life – Conservation in the Ganga basin. https://wwfin.awsassets.panda.org/downloads/annual_report_2021_22_1.pdf

Annexure I - Details of Capacity Building and Training Programmes under Ganga River (Module-wise Classification)

Module 1- Monitoring of Aquatic Biodiversity
Model 2- Wetland Conservation and River Management
Model 3- Rescue and Rehabilitation
Model 4- Participatory Management
Model 5- Conservation Education

Sr. no	Training name	Date	Total days	Total Participants	On-site/ WII	Module 1	Module 2	Module 3	Module 4	Module 5	Training Type
1	Capacity Building of Zoo Personnel in managing Rescue, Rehabilitation and release of Aquatic Macro-Fauna of Ganga River Basin	13-07-2020	2	55	Onsite			Y			Rescue and Rehabilitation
2	Online Capacity Building Program for the Stakeholders on Rescue and Rehabilitation of Aquatic Macrofauna along the Ganga River Basin	20-08-2020	2	37	WII			Y			Other Stakeholders Training
3	Capacity Building of Front-line Forest Officials on Ganga overview and basics of Rescue and Rehabilitation of Aquatic Macrofauna.	25-02-2021	1	90	Onsite			Y			Other Stakeholders Training
4	Capacity Building of Front-Line Forest Staff of Valmiki Tiger Reserve Division 1	05-04-2021	1	72	Onsite			Y			Other Stakeholders Training

5	Capacity Building of Front-Line Forest Staff of Valmiki Tiger Reserve Division 2.	07-04-2021	2	69	Onsite			Y			Rescue and Rehabilitation
6	Capacity Building Workshop for the Front-line Forest Staff about Ganga Overview and Rescue and Rehabilitation of Aquatic Macrofauna and Maintenance of Community Relationship	22-04-2021	2	60	Onsite			Y			Rescue and Rehabilitation
7	Capacity Building Workshop on Rescue and Rehabilitation of selected Aquatic Macrofauna for the Front-line Officers of Jal Police and Frontline Staff	19-07-2021	2	55	Onsite			Y			Rescue and Rehabilitation
8	Capacity Building Workshop on Rescue and Rehabilitation of Selected Aquatic Macrofauna for the Front-line Forest Officers	21-07-2021	1	45	Onsite			Y			Other Stakeholders Training
9	One Day Rescue and Rehabilitation Training for Frontline Forest Department	05-01-2022	1	41	Onsite			Y			Other Stakeholders Training

10	A Capacity-Building Workshop for Frontline Forest Officials of Uttarakhand Forest Department.	29-02-2022	1	64	WII			Y			Other Stakeholders Training
11	Capacity Building Programme for 70 Frontline Forest Trainees at FTI Asan Barrage	23-03-2022	1	70	Onsite			Y			Other Stakeholders Training
12	Three Days Training on Rescue of Aquatic Species for Frontline Staff of West Bengal Forest Department.	21-06-2022	3	49	Onsite			Y			Spearhead Training
13	Training of the Trainers on the Rescue and Rehabilitation of Aquatic Macrofauna in FTI Kanpur, UP	23-09-2022	3	70	Onsite			Y			Spearhead Training
14	Capacity-Building Workshops for Tourist Guides and E-Rickshaw Drivers as Part of the Life Program.	14-06-2023	1	56	Onsite			Y			Other Stakeholders Training
15	Three-Day Training Workshop on the Conservation of Aquatic Macrofauna on the Patna Zoo's Aquatic Conclave.	03-09-2023	2	93	Onsite			Y			Rescue and Rehabilitation

16	Capaci-ty-Building Workshop for the Frontline Forest Staff and the CCU University Students on the Rescue and Reha-bilitation of Aquatic Mac-rofauna of the Ganga River Basin.	04-10-2023	1	125	WII			Y			Other Stakeholders Training
17	Capaci-ty-Building Workshop for the School Students on the Rescue and Reha-bilitation of Aquatic Mac-rofauna of the Ganga River Basin.	09-10-2023	1	40	Onsite			Y			Other Stakeholders Training
18	Capaci-ty-Building Workshop for the School Students on the Rescue and Reha-bilitation of Aquatic Mac-rofauna of the Ganga River Basin.	25-10-2023	1	24	Onsite			Y			Other Stakeholders Training
19	Capaci-ty-Building Workshop for the Final Year Bhu Zoology Students on the Rescue and Reha-bilitation of Aquatic Mac-rofauna of the Ganga River Basin.	25-10-2023	1	65	Onsite			Y			Other Stakeholders Training

20	Rescue and Rehabilitation Training for the Ganga Task Force at Prayagraj.	01-12-2023	1	80	Onsite			Y			Other Stakeholders Training
21	Capacity-Building Workshop for the Final Year BHU Zoology Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin. (1)	03-12-2023	1	6	Onsite			Y			Other Stakeholders Training
22	Capacity-Building Workshop for the Final Year BHU Zoology Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin. (2)	09-12-2023	1	6	Onsite			Y			Other Stakeholders Training
23	Capacity-Building Workshop for the Trainee Teacher on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin.	16-12-2023	1	50	Onsite			Y			Other Stakeholders Training
24	Capacity-Building Workshop for the School Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin.	05-01-2024	1	52	Onsite			Y			Other Stakeholders Training

25	Capacity-Building Workshop for the Trainee Teacher on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin.	01-04-2024	1	150	Onsite			Y			Other Stakeholders Training
26	Capacity Building Workshop on Rescue and Rehabilitation of Aquatic Animals for Forest Officials and School Students on the Occasion of World Turtle Day.	23-05-2024	1	110	Onsite			Y			Other Stakeholders Training
27	National Training Programme for Ganga Praharis Spearhead Team	03-02-2020	8	50	WII	Y	Y		Y	Y	Spearhead Training
28	Ganga biodiversity conservation for College Students and Professors	05-05-2020	2	44	Onsite	Y				Y	Other Stakeholders Training
29	Online Training Workshop On “Bird of Ganga Basin” for Ganga Praharis	11-05-2020	3	49	WII	Y			Y		Other Stakeholders Training
30	Online Training Workshop On “Birds of Ganga Basin with Special Reference to West Bengal”	18-05-2020	3	25	WII	Y				Y	Other Stakeholders Training

31	Online Training Workshop on “Biodiversity Conservation and Monitoring of Aquatic Species of Ganga Basin” with Forest Officials of Dudhwa Tiger Reserve	21-05-2020	3	31	WII	Y					Other Stakeholders Training
32	Online Training Workshop for Naturalists of Different Protected Areas of the Ganga River Basin	10-06-2020	2	27	WII				Y		Other Stakeholders Training
33	Online Training Workshop on ‘Biodiversity Conservation and Monitoring of Aquatic Species of Ganga Basin’ with Officials from Pilibhit Tiger Reserve	16-06-2020	3	30	WII	Y					Other Stakeholders Training
34	Training Workshop for Volunteers of NCC and NSS of Ganga Basin	07-07-2020	3	180	Onsite				Y	Y	Other Stakeholders Training
35	Training Workshop on Rescue and Rehabilitation Techniques - "Basics of Reptiles"	22-07-2020	1	25	WII			Y			Other Stakeholders Training
36	Training Workshop on Rain Water Harvesting Techniques Under "Catch the Rain Campaign"	29-07-2020	2	107	Onsite		Y				Other Stakeholders Training

37	Training Workshop on Conservation of Gangetic River Dolphin for Ganga Praha-ris from Uttar Pradesh	01-09-2020	2	44	WII	Y					Other Stakehold-ers Training
38	Training Workshop on "Conservation of Gangetic Riv-er Dolphin for Ganga States"	09-09-2020	2	55	WII	Y			Y		Other Stakehold-ers Training
39	Training Workshop On “Conservation of Biodiversity and Wetland” For Youth of Bijnor and Muzaffarnagar Village Around the Haiderpur Wetland	21-09-2020	2	32	Onsite		Y				Other Stakehold-ers Training
40	Catch the Rain Webinar for Ganga Praharis of West Bengal	22-09-2020	1	25	WII		Y				Other Stakehold-ers Training
41	Training Workshop Biodiversity Consevation of Ganga River Basin for Ganga Task Force on the Ocassion of Wildlife Week	07-10-2020	3	50	Onsite	Y					Other Stakehold-ers Training
42	Training Pro-gramme on "Conservation of Gangetic Dol-phin of Ganga River Basin and Its Tributaries"	20-10-2020	2	39	WII	Y					Other Stakehold-ers Training

43	Training and Orientation Workshop for the New Recruit Project Personnel	02-12-2020	1	40	WII				Y		Other Stakeholders Training
44	Training of Ganga Prahari Mentor and Faculty Orientation Exposure Tour	05-12-2020	2	33	WII	Y	Y				Other Stakeholders Training
45	Bal Ganga Prahari Skill and Development Workshop on Quilling Techniques	28-12-2020	3	23	WII					Y	Other Stakeholders Training
46	Training Workshop for tourist guide on Conservation of Haiderpur wetland	24-09-2020	3	39	Onsite				Y		Other Stakeholders Training
47	Bal Ganga Prahari Skill and Development Workshop on Stone Painting Techniques	05-01-2021	2	29	WII					Y	Other Stakeholders Training
48	National Level Spearhead Training Programme On 'Biodiversity Conservation of Ganga River Basin' For District Project Officers & Project Assistants of Nehru Yuva Kendra Sangathan (Nyks)	05-01-2021	3	33	WII	Y	Y		Y	Y	Spearhead Training

49	Bal Ganga Prahari Skill Development Workshop on Card Making Techniques	12-01-2021	3	25	WII					Y	Other Stakeholders Training
50	Bal Ganga Prahari Skill Development Workshop on Decoupage Techniques	20-01-2021	3	30	WII					Y	Other Stakeholders Training
51	One Day Training Workshop on Wetland Conservation on the Occasion of 'World Wetland Day' (1)	02-02-2021	1	27	WII		Y				Other Stakeholders Training
52	One Day Training Workshop on Wetland Conservation on the Occasion of 'World Wetland Day' (2)	02-02-2021	1	67	WII		Y				Other Stakeholders Training
53	One Day Training Workshop on Wetland Conservation on the Occasion of 'World Wetland Day' (3)	03-02-2021	1	102	WII		Y				Other Stakeholders Training
54	National Level Spearhead training programme for Professors of Ganga River Basin “Wetland Conservation and Biodiversity Monitoring of Ganga and its tributaries	09-03-2021	3	28	WII	Y	Y		Y	Y	Spearhead Training

55	One Day Rescue and Rehabilitation Training for Frontline Forest Department	05-01-2022	1	41	Onsite		Y		Y	Y	Spearhead Training
56	A Capacity-Building Workshop for Frontline Forest Officials of Uttarakhand Forest Department.	29-02-2022	1	64	WII			Y			Other Stakeholders Training
57	Participants Database for State Level Training Programme for Stakeholders on Biodiversity Conservation, West Champaran, Bettiah, Bihar	08-03-2022	2	51	Onsite	Y		Y			Other Stakeholders Training
58	Capacity Building Programme for 70 Front-line Forest Trainees at FTI Asan Barrage	23-03-2022	1	70	Onsite						Other Stakeholders Training
59	Training Workshop on Biodiversity and Wetland Conservation	12-05-2022	1	30	Onsite	Y			Y		Other Stakeholders Training
60	Calligraphy Workshop for Bal Ganga Praharis Skill Enhancement Programme	30-05-2022	2	68	WII					Y	Other Stakeholders Training
61	National Level Spearhead Training Programme for Volunteers of NSS (National Service Scheme) On “Biodiversity Conservation of Ganga River & Its Tributaries”	14-06-2022	3	75	Onsite	Y		Y			Other Stakeholders Training
62	Three Days Training on Rescue of Aquatic Species for Frontline Staff of West Bengal Forest Department.	21-06-2022	3	49	Onsite		Y				Other Stakeholders Training
63	State Level Spearhead Training Programme for Bal Ganga Praharis	12-07-2022	3	78	WII	Y					Other Stakeholders Training

64	Training on Biodiversity Profile of Ganga River Basin	24-08-2022	2	34	Onsite	Y	Y			Y	Other Stakeholders Training
65	National Spearhead Training Workshop for Ganga Task Force & Eco Task Force on Conservation & Management of Gangetic Dolphins & Other Aquatic Macrofauna of the Ganga Basin	21-09-2022	6	46	Onsite	Y		Y			Spearhead Training
66	Training of the Trainers on the Rescue and Rehabilitation of Aquatic Macrofauna in FTI Kanpur, UP	23-09-2022	3	70	Onsite			Y			Spearhead Training
67	National Programme for Training of Women Scientists and Technologists working in Government Sectors on Biodiversity Conservation	14-11-2022	5	9	WII	Y	Y		Y		Spearhead Training
68	State Level Spearhead Training Workshop for Veterinarians, Forest Officials and Zoo Keepers on Handling of Aquatic Species in Distress	19-12-2022	3	43	Onsite	Y		Y			Spearhead Training
69	One Day Training Workshop on Rescue and Rehabilitation for First Responders of Gorakhpur, Uttar Pradesh	22-12-2022	1	46	Onsite			Y			Rescue and Rehabilitation
70	Participant Database of State Level Spearhead Training Programme for NCC (National Cadet Corps) On “Biodiversity Conservation in Ganga	18-01-2023	3	41	Onsite	Y	Y	Y	Y	Y	Spearhead Training

71	Two Day Training Workshop for College Students on Biodiversity and Water Conservation in Ganga Basin in Collaboration with Bal Ganga Degree College, Sendul Kemar, Tehri Garhwal	02-02-2023	2	94	Onsite	Y	Y		Y	Y	Other Stakeholders Training
72	Training Workshop for University Students on 'Biodiversity and Wetland Conservation' under WII-NMCG Project in Collaboration with Department of Environmental Science, Integral University, Lucknow (Uttar Pradesh)	16-02-2023	1	154	Onsite	Y			Y		Other Stakeholders Training
73	Training on Linkage Between River Conservation and Livelihood at WII	28-02-2023	4	57	WII				Y		Other Stakeholders Training
74	National Level Spearhead Training Workshop for Veterinary College Student On 'Handling of Aquatic Species in Distress'	21-03-2023	3	3	Onsite	Y	Y	Y	Y	Y	Spearhead Training
75	Training Workshop for College Students and Faculties of Govt. P.G College Maldevta, Dehradun on 'Biodiversity and Wetland Conservation'	22-05-2023	2	65	Onsite					Y	Other Stakeholders Training
76	Training Workshop for NGOs on 'Biodiversity and Community Participation' of Uttarakhand and Uttar Pradesh of Ganga River Basin	29-05-2023	3	40	WII	Y	Y		Y	Y	Spearhead Training
77	Capacity-Building Workshops for Tourist Guides and E-Rickshaw Drivers as Part of the Life Program.	14-06-2023	1	56	Onsite			Y			Other Stakeholders Training
78	State Level Spearhead Training Workshop for Police Personnel On 'Biodiversity and River Conservation – Role of Enforcement Agencies'	20-06-2023	3	18	WII	Y	Y	Y	Y	Y	Spearhead Training

79	Three-Day Training Workshop on the Conservation of Aquatic Macrofauna on the Patna Zoo's Aquatic Conclave.	03-09-2023	2	93	Onsite			Y			Rescue and Rehabilitation
80	Capacity-Building Workshop for the Frontline Forest Staff and the CCU University Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin.	04-10-2023	1	125	Onsite			Y			Other Stakeholders Training
81	Capacity-Building Workshop for the School Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin.	09-10-2023	1	40	Onsite			Y			Other Stakeholders Training
82	Capacity-Building Workshop for the School Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin.	25-10-2023	1	24	Onsite			Y			Other Stakeholders Training
83	Capacity-Building Workshop for the Final Year Bhu Zoology Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin.	25-10-2023	1	65	Onsite			Y			Other Stakeholders Training
84	National Level Training Workshop for Irrigation Department On “Harmonizing Biodiversity, Rivers & Engineering –Towards Sustainable Water Management & Biodiversity Conservation” Wildlife Institute of India, Dehradun	01-11-2023	3	16	WII	Y	Y		Y	Y	Spearhead Training

85	Two Days Training, Outreach and Awareness Programme On 'Ganga Biodiversity Conservation' With NSS Pre-Rd Campers Dev Sanskriti University, Haridwar	22-11-2023	2	154	Onsite	Y	Y		Y	Y	Other Stakeholders Training
86	Rescue and Rehabilitation Training for the Ganga Task Force at Prayagraj.	01-12-2023	1	80	Onsite			Y			Other Stakeholders Training
87	Capacity-Building Workshop for the Final Year BHU Zoology Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin. (1)	03-12-2023	1	6	Onsite			Y			Other Stakeholders Training
88	Capacity-Building Workshop for the Final Year BHU Zoology Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin. (2)	09-12-2023	1	6	Onsite			Y			Other Stakeholders Training
89	Capacity-Building Workshop for the Trainee Teacher on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin.	16-12-2023	1	50	Onsite			Y			Other Stakeholders Training
90	'Jal, Jan aur Jaiv Vividhta Sanrakshan: Capacity Building of Ganga Praharis for biodiversity Conservation'	19-12-2023	4	53	WII	Y			Y	Y	Other Stakeholders Training

91	Capacity-Building Workshop for the School Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin.	01-11-2023	1	52	Onsite			Y			Other Stakeholders Training
92	"Jal, Jan aur Jaiv Vividhta Sanrakshan: Capacity building of Ganga Praharis and other stakeholders for biodiversity Conservation" at WII, Dehradun	22-11-2023	4	66	WII	Y			Y	Y	Other Stakeholders Training
93	Two Days Training Workshop for Under Graduate and Post Graduate students on "Ganga Biodiversity Conservation" Date: 7th-8th February, 2024 Venue: Quantum University, Roorkee	19-12-2023	2	90	Onsite	Y	Y		Y	Y	Other Stakeholders Training
94	National Level Training Workshop On 'Freshwater Biodiversity Conservation' For University Teachers and Professors Venue: Auditorium, Wildlife Institute of India Date: 5th to 7th March, 2024	22-01-2024	3	10	WII	Y	Y		Y	Y	Spearhead Training
95	Safeguarding The Ganga: The Ganga Prahari Conclave National level meet of Ganga Praharis from the Ganga River Basin	07-02-2024	3	296	Onsite				Y		Other Stakeholders Training

96	Capacity-Building Workshop for the Trainee Teacher on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin.	01-04-2024	1	150	Onsite			Y			Other Stakeholders Training
97	One Day Training Workshop for University Students on “Ganga Biodiversity Conservation”	06-05-2024	1	56	Onsite					Y	Other Stakeholders Training
98	Capacity Building Workshop on Rescue and Rehabilitation of Aquatic Animals for Forest Officials and School Students on the Occasion of World Turtle Day.	23-05-2024	1	110	Onsite					Y	Other Stakeholders Training
99	Workshop for Fisheries Department on "Harmonizing Sustainable Fisheries for Freshwater Biodiversity Conservation" in Ganga River Basin	11-06-2024	3	16	WII	Y	Y		Y	Y	Spearhead Training
100	Two Days Training Workshop for Zoo Keepers and Frontline Forest Staff on ‘Ganga Biodiversity Conservation’	22-06-2024	2	52	Onsite	Y		Y			Rescue and Rehabilitation
101	National Level Training Workshop for School Teachers on "Integrating River Conservation into Education Programme"	23-07-2024	3	83	WII	Y			Y	Y	Spearhead Training

102	Sensitization of Gram Pradhans for Mainstreaming Biodiversity Conservation in Village Level Development Planning	31-07-2024	1	60	WII				Y		Other Stakeholders Training
103	National Level Ganga Grandma's Course On 'Documenting Traditional Knowledge Systems for Conservation of Freshwater Ecosystems in the Ganga River Basin'	18-09-2024	4	101	WII				Y		Other Stakeholders Training
104	Two-Day Training Workshop for University Students on 'Ganga Biodiversity and Wetland Conservation' at DDUGU, Gorakhpur, Uttar Pradesh	18-10-2024	2	367	Onsite	Y				Y	Other Stakeholders Training
105	National Level Training Workshop for Veterinarians, Veterinary College Students, Zoo Keepers & Frontline Officials On 'Handling of Aquatic Species in Distress' At Shaheed Ashfaq Ullah Khan Prani Udyan (Gorakhpur Zoo)	22-10-2024	3	66	Onsite	Y	Y	Y			Rescue and Rehabilitation
106	Vigyan se Swaavlamban: Green Rural Technologies for Biodiversity Conservation at WII Dehradun	28-11-2024	4	72	WII				Y		Other Stakeholders Training

107	Sensitization Workshop at National Integration Camp of NSS on 'Unity in Diversity: Ganga Biodiversity Conservation and National Integration'	09-12-2024	1	133	Onsite					Y	Other Stakeholders Training
108	State Level Training Workshop for Trainee Teachers on 'Conserving Aquatic Wildlife of Ganga River' of Uttarakhand, Uttar Pradesh and Himachal Pradesh	07-01-2025	3	52	WII				Y	Y	Spearhead Training
109	National Level Training Workshop on "Conservation of Macro Fauna of Riverine Ecosystem" for University Professors at WII	11-02-2025	4	21	WII	Y	Y	Y	Y	Y	Spearhead Training
110	Ganga Biodiversity Conservation for NCC cadets at HNB Garhwal University, SRT campus, Chamba	21-02-2025	2	160	Onsite					Y	Other Stakeholders Training
111	Reconnecting with Religious Roots: Bridging Science and the Vedas for River Conservation at Gauri Gopal Gurukul Vrindavan	05-03-2025	1	211	Onsite					Y	Other Stakeholders Training
112	Building Bridges: State Level Ganga Prahari Conclave, Jharkhand from 19th to 20th March 2025 at Utsav Banquet Hall, Sahibganj	19-03-2025	2	206	Onsite				Y		Other Stakeholders Training

113	Building Bridges: State Level Ganga Prahari Conclave, Bihar from 24th to 25th March 2025 at Digambar Jain Mandir, Bhagalpur	24-03-2025	2	300	Onsite			Y	Y		Other Stakeholders Training
114	Two Days Training, Outreach and Awareness Programme on 'Ganga Biodiversity Conservation' with govt. Abhinav Inter college, Kannauj, Uttar Pradesh	02-04-2025	2	52	WII					Y	Other Stakeholders Training

Annexure II- Pre training assessment questionnaire (English, Hindi and Bengali)

Pre-Training Assessment (English)

National Mission for Clean Ganga (NMCG)

Biodiversity Conservation and Ganga Rejuvenation

Questionnaire Survey

Name: ..... Age: .....

Designation: .....Male/Female: .....

Dated & Year: .....

Department/Institute/School/Others: .....

a) State: ..... b) District: .....

Tick your answer (√)

1. Have you ever visited the Ganga River? Yes/no
2. If yes then what was the purpose of your visit?
   Ganga Arti/Mundan/fair/Chhat puja/Death ritual/Official or work related visit/ other.....
3. Do you think that the Ganga River is important? Yes/no
   If yes, why.....
   If no, why not.....
4. Are there any benefits from the Ganga River? Yes/no
   If yes, what are the benefits.....
5. Have you ever seen any biodiversity in the Ganga River? Yes /No
6. What are the species that you have seen in the Ganga River?
   .....
   .....
7. Are you aware of any changes in the biodiversity of the Ganga River and what are those changes?
   .....
8. What are the species in the Ganga River which are experiencing an increase or decrease in population?
   .....
9. Do you think that the biodiversity of Ganga River is important for the river ecosystem? Yes/no
   Why.....

   .....

10. Are there any benefits for humans from the biodiversity of Ganga River?
    .....
11. Are you aware of recent decision regarding the human status of Ganga River? Yes/ No
12. Are you satisfied with the current status of the Ganga River? Yes/No
13. What are the major threats that Ganga River face today?

14. What steps should be taken for cleaning Ganga River?

    .....

15. Who do you think is responsible for cleaning the Ganga River?
    Government/NGOs/Private sector/Village Panchayat/ Local communities/Youths/all
16. Have you heard about the Ganga Action Plan? Yes/no
17. Are you aware of the National Mission for Clean Ganga and Namami Gange Programme? Yes/No
18. What are your expectations from the workshop?

    .....

प्रशिक्षण पूर्व आंकलन

राष्ट्रीय स्वच्छ गंगा मिशन के तहत 'जैव विविधता संरक्षण एवं गंगा जीर्णोद्धार' प्रशिक्षण

प्रश्नावली आंकलन प्रपत्र

नाम.....

आयु.....

पद.....

स्त्री/पुरुष.....

तिथि और वर्ष.....

क) विभाग/संस्थान /स्कूल / अन्य .....
ख) राज्य.....
ग) जिला.....

अपने उत्तर पर सही का निशान लगाए – (√)

1 – क्या आप कभी गंगा नदी देखने गये? हॉ/नही
2 – यदि हॉ तो गंगा नदी को देखने का उद्देश्य क्या था?
गंगा आरती /मुंड़न /मेला/छट पूजा /शव दाह संस्कार /विभागीय कार्य/ कार्य जिम्मेंदारी सम्बन्धित /अन्य .....
3 – क्या आप सोचते हैं कि गंगा नदी महत्वपूर्ण हैं? हॉ/नही
क – हॉ तो क्यों .....
ख – नही तो क्यों नही .....
4 – क्या गंगा नदी से कोई लाभ मिलता हैं? हॉ /नही
यदि हां, क्या लाभ मिलता है?.....
5 – क्या आपने गंगा नदी की जैवविविधता देखी हैं? हॉ /नही
6 – गंगा नदी में आपने कौन से प्रजाति के जीव देखे हैं? .....
7 – आप गंगा नदी की जैवविविधता में बदलाव से परिचित हैं? और ये बदलाव क्या है?.....
8– आपके अनुभवों के आधार पर गंगा नदी में कौन सी प्रजाति के जीवों की आबादी घट या बढ़ रही हैं?.....
9 – क्या आप सोचते है कि गंगा नदी की जैवविविधता नदी तंत्र प्रणाली के लिए महत्वपूर्ण हैं? हां/नही
क्यों .....
10 – गंगा नदी की जैवविविधता का मानवों के लिए क्या लाभ है?
.....
11 – गंगा नदी को मानव दर्जा देने के निर्णय से क्या आप परिचित हैं? हां/नहीं
12 – गंगा नदी की वर्तमान स्थिति से आप संतुष्ट हैं? नहीं/हां
13 – आज के समय में गंगा नदी कौन से मुख्य संकटों का सामना कर रही हैं?
14 – गंगा नदी को स्वच्छ करने के लिए क्या कदम उठाने चाहिए?.....
15 – आपके अनुसार गंगा नदी को स्वच्छ करने की जिम्मेंदारी किसकी हैं?
सरकार/गैर सरकारी संगठन/निजी क्षेत्र/ग्राम पंचायत/स्थानीय समुदाय/युवा/सभी की
16 – आपने गंगा एक्शन प्लान (गेप) के बारे में सुना हैं? हां/नही
17 – क्या आप राष्ट्रीय स्वच्छ गंगा मिशन और नमामि गंगे कार्यक्रम के बारे में जानते हैं? हां/नही
18 – इस प्रशिक्षण से आपकी क्या अपेक्षाएं हैं? .....

Pre-Training Assessment (Bengali)
National Mission for Clean Ganga (NMCG)
Biodiversity Conservation and Ganga Rejuvenation
Questionnaire Survey

নাম..... বয়স.....

উপাধি..... পুরুষ / মহলিা.....

তারখি এবং বছর.....

বভিাগ / ইনস্টটিউিট / স্কুল / অন্যরা.....
a) রাষ্ট্র..... b) জলো.....

আপনার উত্তর টকি করুন (√)

1. আপনকিী কখনও গঙ্গা নদীর তীরে গয়িছেনে? হ্যাঁ / না
2. যদি হ্যাঁ হয় তাহলে আপনার পরদির্শনরে উদ্দশ্যে কী ছলি? গঙ্গা আরতি / মুন্ডান / মলো / ছট পূজা / মৃত্যু অনুষ্ঠান / অফসিয়িাল বা কর্ম সম্পর্কতি ভ্রমণ / অন্যান্য.....
3. গঙ্গা নদী কে গুরুত্বপূর্ণ মনে করনে? হ্যাঁ / না
   যদি হ্যাঁ, কনে?.....
   যদি না, কনে?.....
4. গঙ্গা নদী থকেে কোন উপকারতিা আছে? হ্যাঁ / না
   যদি হ্যাঁ, উপকারতিা কী?.....
5. গঙ্গার নদীতে কী কোন জীববচৈত্রি্য আপনি দখেছেনে? হ্যাঁ / না
6. গঙ্গার নদীতে আপনি কোন কোন প্রজতী গুলো দখেছেনে? .....
7. গঙ্গার নদীতে জীবজগতরে কোনও পরবির্তন সম্পর্কে আপনি কি জানেন এবং এগুলি কী কী পরবির্তন?
   .....
8. গঙ্গা নদীতে কোন কোন প্রজাতগিুলরি সংখ্যা বৃদ্ধি বা হ্রাসরে সম্মুখীন হচ্ছে?
   .....
9. আপনকিী মনে করনে গঙ্গা নদীর সুস্থ পরবিশেরে জন্য জীববচৈত্রি্য গুরুত্বপূর্ণ?
   .....
10. গঙ্গা নদীর জীববচৈত্রি্য থকেে মানুষরে জন্য কোন উপকারতিা আছে কী?
    .....
11. মনুষ্য সম্পর্ক গঙ্গা নদীর সাম্প্রতকি সদ্ধিান্ত সম্বন্ধে আপনকিী অবগত? হ্যাঁ / না
    .....
12. আপনকিী গঙ্গা নদীর বর্তমান অবস্থা থকেে সন্তুষ্ট? হ্যাঁ / না
    .....
13. বর্তমানে গঙ্গা নদী কী কী মুল সমস্যার সম্মুখীন?
    .....
14. গঙ্গা নদী পরস্কিার করার জন্য কোন কোন পদক্ষপে নওেয়া উচতি?
    .....
15. গঙ্গার নদী পরষ্কিার করার জন্য দায়ত্বি কার?
    সরকার / এনজওি / বসেরকারী খাত / গ্রাম পঞ্চায়তে / স্থানীয় সম্প্রদায় / যুবক / সকল
    .....
16. আপনি কি গঙ্গা কর্মপরকিল্পনার কথা শুনছেনে? হ্যাঁ /না
17. আপনি কি জাতীয় পরষ্কিার গঙ্গা মশিন ও নামমি গাঙ্গে কার্যক্রম সম্বন্ধে সচতেন? হ্যাঁ /না
18. কর্মশালা থকেে আপনার প্রত্যাশা কী?

Annexure III- Post training assessment questionnaire (English, Hindi and Bengali)

Training Impact Assessment (English)

National Mission for Clean Ganga (NMCG)

Biodiversity Conservation and Ganga Rejuvenation

Questionnaire Survey

Name.....Age.....Designation.....Male/Female.....Dated & Year.....
.....
Department/Institute/School/Others.....
a) State..... b) District.....

Tick your answer (√)

1. How do you like the Workshop programme?
   (a) Excellent (b) Very good (c) Good (d) Not satisfied
2. Are you satisfied with the following components of the programme?
   (a) Talk (b) Activities (c) Course Content (d) Material provided (e) Others (f) None
3. What are your views about removing Ganga River from human status category?

   .....

4. What are the key species found in Ganga River?

   .....

5. Populations of which among the following are increasing in Ganga River?
   (a) Amphibians (b) Fishes (c) Reptiles (d) Mammals (e) Birds (f) Unaware

   Name of such species.....

6. Populations of which among the following are decreasing in River Ganga?
   (a) Amphibians (b) Fishes (c) Reptiles (d) Mammals (e) Birds

   Name of such species.....

7. What do you think are the major threats faced by Ganga River?
   a) Rapidly increasing human population and rising standards of living
   b) Pollution (Industrialization and urbanization)
   c) Developmental activities (e.g. Construction of dams and roads)
   d) Sewage waste discharge (e.g. Chemicals)
   e) Agricultural run-off
   f) Ritual activities in and around Ganga River
   g) Climate change
   h) Others, mention.....
8. What are the major environmental changes in Ganga River system has been observed as a result of anthropogenic activities
   a) Decrease in biodiversity of Ganga River
   b) Water pollution in Ganga River
   c) Changing river flow regime
   d) Others, mention.....
9. Are there any direct/indirect benefits from Ganga River? Yes/No
10. What are the ecosystem services provided by Ganga River?
    (a) Provisioning, such as the production of food and water
    (b) Regulating, such as the control of climate and disease
    (c) Supporting, such as nutrient cycles and crop pollination
    (d) Cultural, such as spiritual and recreational benefits
    (e) All of the above
    (f) None of the above

11. What do you think can be applied as mitigation measures to save Ganga?
.....

12. What do you like most about the National Mission for Clean Ganga (NMCG)?
(a) Approaches (b) Objectives (c) Goals (d) Management (e) All of these

13. Are you aware of 'Namami Gange' Programme? (a) Yes b) No

14. Are you aware of Government programmes to clean Ganga River? (a) Yes b) No

15. Should Ganga River be saved? (a)Yes (b) No (C) Not sure

16. Do you feel cleaning Ganga is the responsibility of Government? (a) Yes (b) No
If yes why?.....
If No, then whose responsibility is it (i) Private sector (ii) Village Panchayat (iii) Local communities (iv) Youth (v) NGO'S (vi) Any others.....

17. Should there be stringent punishment for the polluters of the Ganga River
(a) Yes (b) No (c) Relaxation d) Others.....

18. Did the workshop improve your understanding about conservation of Ganga River and its biodiversity?
(a)Yes (b) No (c) Not sure

19. Please rate the programme components on a scale of 1 to 10 (low to high)
Overall grading of the programme with reference to relevance of course, module/course content, benefits/ usefulness of the training in your present job and satisfaction with structure and organization of the programme?
.....

20. Your general observations/remarks about the training programme.

.....

21. Recommendations, if any for the improvement of the programme.

.....

22. Which presentation/s and presenter/s did you like the most?

(a).....(b).....

(c).....(d).....

पप्रशिक्षण प्रभाव आंकलन प्रपत्र

राष्ट्रीय स्वच्छ गंगा मिशन के तहत '' जैव विविधता संरक्षण एवं गंगा जीर्णोद्धार'' प्रशिक्षण

प्रश्नावली आंकलन प्रपत्र

नाम.....

आयु.....

पद.....

स्त्री/पुरुष.....

तिथि और वर्ष.....

क) विभाग/संस्थान /स्कूल / अन्य .....

ख) राज्य.....

ग) जिला.....

अपने उत्तर पर सही का निशान लगाए – √

1– आपको प्रशिक्षण कैसे लगता है?

क– अच्छा ख – बहुत अच्छा ग– उत्तम घ– सन्तोषजनक नही

2– आप प्रशिक्षण के निम्नलिखित घटको में से किससे संतुष्ट हैं?

क–बातें करना ख– गतिविधि ग–प्रशिक्षण की पाठ्य सामग्री

घ–सहायक सामग्री ड– परिचय च– कोई नही

3– गंगा नदी को मानव श्रेणी से हटाने पर आपका क्या विचार है?

.....

4– गंगा नदी में कौन सी प्रमुख प्रजातियां पायी जाती हैं?

.....

5– गंगा नदी में पाये जाने वाले निम्नलिखित में से कौन सी प्रजाति के जीवों की आबादी बढ़ रही है?

क– उभयचर ख– मछली ग– सरीसृप घ–स्तनपायी ड़–पक्षी च– अन्य

कुछ अन्य प्रजातियों के नाम लिखिए .....

6– आपकी जानकारी के अनुसार गंगा में कौन सी प्रजाति के जीवों की आबादी घट रही हैं?

क– उभयचर (मेंढक) ख– मछली ग– सांप घ– स्तनधारी (डॉल्फिन,उद्विलाव आदि)

ड़ – पक्षी च– अन्य जीव .....

7 – आप के अनुसार गंगा नदी के मुख्य संकट क्या है?

क– तेजी से बढती हुई जनसंख्या और बढते जीवन के मानक।

ख – प्रदूषण (औद्योगीकरण और शहरीकरण में वृद्वि)।

ग– विकासात्मक गतिविधियां (बांध और सड़क निर्माण) ।

घ – उद्योगो और सीवेज अपशिष्ट पदार्थ (रासायनिक पदार्थ)

ड़ – कृषि के अपशिष्ट पदार्थ

च– गंगा के किनारे किये जाने वाले धार्मिक अनुष्ठान

छ – मौसम परिवर्तन

ज– अन्य गतिविधियां .....

8– गंगा नदी प्रणाली में कौन से प्रमुख पर्यावरणीय परिवर्तनों को मानव जनित गतिविधियों के परिणामस्वरुप देखा गया है?

क – गंगा नदी की घटती जैवविविधता

ख – गंगा नदी में जल प्रदूषण

ग – गंगा नदी का बदलता प्रवाह

घ – अन्य गतिविधियां .....

9 – क्या आप गंगा नदी से प्रत्यक्ष /अप्रत्यक्ष लाभ लेते हैं? हां/नहीं

10– गंगा नदी से प्राप्त होने वाली पारिस्थितिकी तंत्र सेवाएं क्या है?

क– प्रावधान,जैसे कि भोजन और पानी का उत्पादन

ख – विनियमन, जैसे जलवायु और रोग के नियंत्रण

ग – समर्थन, ऐसे पोषक चक्र और फसल परागण के रुप में

घ– सांस्कृतिक, जैसे आध्यात्मिक और मनोरंजक लाभ

ड़ – उपरोक्त सभी

च – इनमें से कोई नहीं

11– क्या आपको लगता है कि गंगा नदी को बचाने के कठिन नियम लागू किये जा सकते है?

.....

12– राष्ट्रीय स्वच्छ गंगा मिशन के बारे में आपको सबसे अच्छा क्या लगता है?

क– दृष्टिकोण ख – उद्देश्य ग– लक्ष्य

घ– प्रबन्धन ड़ – उपरोक्त सभी

13– क्या आप '' नमामि गंगे'' कार्यक्रम से परिचित हैं?

क – हां ख – नहीं

14– क्या आप गंगा नदी को साफ करने वाले अन्य सरकारी कार्यक्रम के बारे में जानते है?

क–हां ख – नही

15– क्या गंगा नदी को बचाना चाहिए?

क –हां ख – नही ग – निश्चित नही

16 – क्या आप महसूस करते है कि गंगा नदी को साफ करना अकेले सरकार की जिम्मेदारी है?

क– हां ख – नही

यदि हां तो क्यों.....

यदि नही तो कौन –

क– प्राइवेट कम्पनी ख– ग्राम पंचायत ग– स्थानीय समुदाय ड़ – युवा

च – गैर सरकारी संस्था छ – अन्य .....

17 – क्या गंगा नदी को गंदा करने वालों के लिए कडी से कडी सजा का प्रावधान होना चाहिए?

क–हां ख – नही ग– ज्यादा सजा नही

घ– अन्य .....

18– क्या इस प्रशिक्षण से गंगा नदी के संरक्षण के बारे में आपकी जानकारी में वृद्वि हुई है?

क– हां ख – नही ग– कह नही सकते

19– कृपया इस प्रशिक्षण के घटको को 1 से 10 तक (कम से ज्यादा की ओर) रेटिंग दें (यानि कुल मिलाकर प्रासंगिता के संदर्भ के साथ इस कार्यक्रम के पाठ्यक्रम / मॉड्यूल/ पाठ्य सामग्री लाभ/ प्रशिक्षण की उपयोगिता के पैमाने पर अपने वर्तमान नौकरी, और संस्थान और संगठन के लिए कितना संतोषजनक है ।

.....

20– इस प्रशिक्षण के बारे में अपने अवलोकन के आधार पर टिप्पणी लिखिए? –.....

.....

.....

21– इस कार्यक्रम के लिए आपके कोई सुधारात्मक सुझाव .....

.....

.....

22– सबसे अधिक अच्छा कौन से प्रस्तुतकर्ता का प्रस्तुतीकरण आपको लगा हैं?

क–..... ख– .....

ग–..... घ–.....

Pre-Training Assessment (Bengali)
National Mission for Clean Ganga (NMCG)
Biodiversity Conservation and Ganga Rejuvenation
Questionnaire Survey

নাম..... বয়স.....
উপাধি..... পুরুষ / মহলিা.....
তারখি এবং বছর.....
বভিাগ / ইনস্টটিউিট / স্কুল / অন্যরা.....
a) রাষ্ট্র..... b) জলো.....
আপনার উত্তর টকি করুন (√)
1. এই ওয়ার্কশপ প্রোগ্রাম সম্বন্ধে আপনার মতামত কী?
a) চমৎকার (b) খুব ভাল (c) ভাল (d) সন্তুষ্ট না
2. আপনি এই প্রোগ্রামরে নম্নিলখিতি কোন উপাদানে সন্তুষ্ট?
(a) আলোচনা (b) ক্রয়িাকলাপ (c) কোর্স সামগ্রী (d) উপাদান সরবরাহ (e) অন্যান্য (f) কোনটওি নয়
3. মানুষরে অবস্থা বভিাগ থকেে গঙ্গা নদী অপসারণ সম্পর্কে আপনার মতামত কি?
.....
4. গঙ্গা নদীতে কী কী প্রজাতি পাওয়া যায়?
.....
5. গঙ্গা নদীতে নম্নিলখিতিগুলরি মধ্যে কোনটি বর্ধতি হচ্ছে?
(a) উভচর (b) মাছ (c) সরীসৃপ (d) স্তন্যপায়ী (e) পাখি (f) অজ্ঞাত

যমেন প্রজাতরি নাম.....
6. গঙ্গা নদীতে নম্নিলখিতিগুলরি মধ্যে কোনটি কিমছে?
(a) উভচর (b) মাছ (c) সরীসৃপ (d) স্তন্যপায়ী (e) পাখি (f) অজ্ঞাত

যমেন প্রজাতরি নাম.....
7. গঙ্গা নদীর বর্তমান সমস্যাগুলরি মধ্যে কোন কোনটি প্রধান বলে মনে করনে?
a) দ্রুত জনসংখ্যা বৃদ্ধি এবং জীবনযাত্রার ক্রমবর্ধমান মান
b) দূষণ (শল্পিায়ন ও নগরীকরণ)
c) উন্নয়নমূলক কার্যক্রম (যমেন বাঁধ ও সড়ক নর্মিাণ)
d) বর্জ্য নষ্কিাশন স্রাব (উদাঃ রাসায়নকি)
e) কৃষি রান অফ
f) গঙ্গা নদীতে এবং চারপাশে অনুষ্ঠান কার্যক্রম
g) জলবায়ু পরবির্তন
h) অন্যদরে, উল্লখে করুন.....
8. গঙ্গা নদী ব্যবস্থায় প্রধান পরবিশেগত পরবির্তনগুলি যা নৃতাত্ত্বকি ক্রয়িাকলাপরে ফলে দখো যায়
a) গঙ্গা নদীতে জীববচৈত্র্য হ্রাস
b) গঙ্গা নদীতে পানি দূষণ
d) নদী প্রবাহ শাসনরে পরবির্তন
e) অন্যদরে, উল্লখে করুন.....
9. গঙ্গা নদী থকেে কোন সরাসরি / পরোক্ষ উপকার আছে? হ্যাঁ /না
10. গঙ্গা নদী দ্বারা প্রদত্ত বাস্তুসংস্থানরে ব্যবস্থা কি?
(a) খাদ্য এবং পানি উৎপাদনরে মতো ব্যবস্থা
(b) জলবায়ু এবং রোগ নয়িন্ত্রণরে মতো নয়িন্ত্রক
(c) সাহায্যগত, যমেন পুষ্টকির চক্র এবং ফসল পরাগযোগ
(d) সাংস্কৃতকি, যমেন আধ্যাত্মকি এবং বনিোদনমূলক সুবধিা
(e) উপররে সমস্ত
(f) উপররে কোনটইি নয়
11. গঙ্গাকে রক্ষা করার জন্য প্রশমন ব্যবস্থা হসিাবে আপনার কি মনে হয়?
.....

12. জাতীয় পরিচ্ছন্ন গঙ্গা মিশন সম্পর্কে আপনি কি পিছন্দ করেন?
(a) দৃষ্টিভঙ্গি (b) উদ্দেশ্য (c) লক্ষ্য (d) ব্যবস্থাপনা (e) এই সব
13. আপনি কি 'নামামি গাঙ্গে' প্রোগ্রাম সম্পর্কে সচেতন?
(a) হ্যাঁ (b) না
14. গঙ্গা নদীকে পরিষ্কার করার জন্য সরকারি কর্মসূচি সম্পর্কে আপনি সচেতন?
(ক) হ্যাঁ খ) না
15. গঙ্গা নদী কী সংরক্ষিত করা উচিত?
(a) হ্যাঁ (b) না (c) নিশ্চিত না
16. আপনি কি গঙ্গাকে পরিষ্কার করতে সরকারের দায়বদ্ধতা মনে করেন?
(ক) হ্যাঁ (খ) না
যদি হ্যাঁ হয় তাহলে? ....
যদি না হয়, তাহলে এর দায়িত্ব কার?
(a) বেসরকারী খাত (b) গ্রাম পঞ্চায়েত (c) স্থানীয় সম্প্রদায় (d) যুব (e) এনজিও'স
(f) অন্য কোনও.....
17. গঙ্গা নদীর দূষণকারীদের জন্য কী কঠোর শাস্তি হওয়া উচিত?
(a) হ্যাঁ (b) না (c) ত্রাণ (d) অন্যদের
18. গঙ্গা নদী এবং এর জীববৈচিত্র্য সংরক্ষণ সম্পর্কে এই কার্যক্রম কী আপনার ধারণাকে উন্নত করেছে?
(a) হ্যাঁ (b) না (c) নিশ্চিত নন
19. অনুগ্রহ করে প্রোগ্রামের উপাদানগুলি 1 থেকে 10 স্কেলে উল্লেখ করুন (নিম্ন থেকে উচ্চ)
কোর্সের প্রাসঙ্গিকতা, মডিউল / কোর্স বিষয়বস্তুর প্রাসঙ্গিকতার রেফারেন্স, প্রোগ্রামের
কাঠামোগত এবং সংগঠনের সাথে আপনার বর্তমান চাকরির প্রশিক্ষণ এবং সুবিধার সাথে সামগ্রিকভাবে
গ্রেডিং কি?
.....

20. প্রশিক্ষণ প্রোগ্রাম সম্পর্কে আপনার সাধারণ পর্যবেক্ষণ / মন্তব্য
.....
.....
21. প্রোগ্রামের উন্নতির জন্য আপনার উপদেশ কী?
.....
.....
22. আপনি কোন উপস্থাপনা / উপস্থাপনাগুলি এবং উপস্থাপক / সবচেয়ে পছন্দ করেন?
.....
.....

Annexure IV - Details of Programme schedules for Capacity Building and Training Programmes of multiple stakeholders

NATIONAL SPEARHEAD TRAINING PROGRAMME FOR GANGA TASK FORCE ON BIODIVERSITY CONSERVATION OF GANGA RIVER & ITS TRIBUTARIES (Date: 27th Sept. 2021 - 1st Oct. 2021) Venue: Wildlife Institute of India, Dehradun		
Day 1 SEPTEMBER 2021 INAUGURAL SESSION		
TIME	SESSIONS	NMCG-WII & RESOURCE PERSON
10:00-10:30	Registration and Pre-training Assessment	Mr. Aakash Mohan Rawat, Mr. Rahul Gupta, Ms. Ashmika Aggarwal, Aarti Chauhan
10:30-10:40	Welcome Address	Dr. Sangeeta Angom, Training Coordinator, NMCG-WII Project
10:40-11:00	Role and objective of the work-shop and spearhead training	Dr. Ruchi Badola, Scientist G & PI, NMCG-WII Project
11:00-11:10	Inaugural Address	Dr. Dhananjai Mohan, Director, WII
11:10-11:15	Vote of Thanks	Mrs. Hemlata Khanduri
11:15-12:00	GROUP PHOTOGRAPH AND HIGH TEA	
TECHNICAL SESSION I		
12:00-13:00	Ganga and its tributaries	Dr. Ruchi Badola, Scientist G & PI
13:00-14:00	Lunch	
14:00-15:00	WII-NMCG Project Phase II: An Overview	Dr. SA Hussain, Project Manager, WII-NMCG Project
15:00-15:30	TEA	
15:30-16:30	Conservation Education: A tool for eliciting public support	Dr. Bitapi Sinha
16:30-17:30	Forensic Lab visit	Dr. S.K. Gupta, Scientist E, WII
DAY 2 TECHNICAL SESSION II		
07:00-11:00	Field visit to Asan Conservation Reserve	Dr. Gopi G.V., Scientist E, WII; Mr. Shreyas Khare, Mr. Aakash Mohan Rawat
13:00-14:00	LUNCH AT HESCO	
14:00-15:30	Visit at HESCO: River and streams recharge	Padma Bhusan Dr. Anil Joshi, Founder & Director, HESCO
15:00-15:30	Tea	
16:30-17:30	Visit to WII Nature Trail	Ms. Aishwarya Ramachandran, Mr. Aakash Mohan Rawat

DAY 3 TECHNICAL SESSION III		
07:00 Onwards	Visit to Ganga Avlokan, Chandi Ghat, Haridwar	Dr. Sangeeta Angom, Mr. Aakash Mohan Rawat, Mr. Rahul Gupta
	Interaction with Ganga Praharis	
13:00-14:00	LUNCH AT GANGA AVLOKAN	
14:30 Onwards	Visit to Haiderpur Wetland, Bijnor, UP	Mr. Aftab Usmani, Mr. Goura Chandra Das, Mr. Shreyas Khade
DAY 4 TECHNICAL SESSION III		
06:00-12:00	Collection and analysis of Ecotox-icological samples	Ms. Richika Sah and team
	Identification of Birds/ Reptiles/ Mammals	Mr. Goura Chandra Das
	Boat transects on Dolphin Jalaj Safari	Mr. Aftab Usmani
13:00-14:00	LUNCH	
14:00-17:00	Handling of aquatic species in distress	Dr. Gouri Mallapur
17:00-17:30	TEA AND GROUP DISCUSSION	
DAY 5 TECHNICAL SESSION IV		
10:00-11:00	Role of Ganga Praharis in Ganga Conservation	Dr. Deepika Dogra
1100-1200	Community mobilization Team Building exercise	Dr. Sandhya Joshi
Valedictory Function		
1200-1210	Welcome Address	Dr. Ruchi Badola
1210-1220	Training Report	Dr. Sangeeta Angom
1220-1230	Interaction and experience	Selected participants from GTF
1230-1240	Certificate Distribution	Dr. Ruchi Badola, Dr. Sandhya Joshi
1240-1250	Vote of Thanks	Dr. Sangeeta Angom
1250-1300	Post training assessment	WII-NMCG team
1300-1400	Course Lunch	
1430 onwards	Drop at Haridwar Railway Station	

NATIONAL LEVEL SPEARHEAD TRAINING PROGRAMME FOR PROFESSORS OF GANGA RIVER STATES ON "WETLAND CONSERVATION AND BIODIVERSITY MONITORING OF GANGA AND ITS TRIBUTARIES" FROM 9TH TO 11TH MARCH, 2021 Venue: Wildlife Institute of India, Dehradun		
INAUGURAL SESSION 9th March, 2021		RESOURCE PERSONS
1000 - 1030	Registration of the participants	Mr. Aakash Mohan Rawat, Mr. Rahul Gupta
1030-1040	Welcome address	Dr. Sangeeta Angom, Training Co-ordinator, NMCG-WII Phase II,
1040-1100	Role and vision of Wildlife Institute of India	Dr. Ruchi Badola, Scientist G & PI
	Role and objective of workshop	
1100-1115	Overview of WII-NMCG Project Phase II	Dr. S.A Hussain, Project Director, WII NMCG Project
1115-1125	Inaugural Address	Dr. Dhananjai Mohan, Director, WII
1125-1130	Vote of Thanks	Dr. Shivani Barthwal, Project Scientist, NMCG-WII Phase II, WII
1130-1200	Group Photograph & Tea Break	
TECHNICAL SESSION I		
1200 -1330	Wetlands and Climate change	Dr. S A Hussain, Project Director NMCG-WII Phase II, WII
1330 -1430	Lunch	
1430 -1530	Conservation of Ganga Biodiversity	Dr. Niladri Dasgupta, Project Co-ordinator, NMCG-WII Phase II
1530-1630	Ecosystem services of Ganga River Basin	Dr. Ruchi Badola, Scientist G & PI
1630- 1700	TEA BREAK	
1700-1800	Visit to Forensic Lab	Dr. S. K Gupta
10th March, 2021	TECHNICAL SESSION II: FIELD VISIT RAJAJI NATIONAL PARK AND GANGA AVLOKAN	
0700-1200	Field Visit to Rajaji National Park	Dr. Rahul Rana, Mr. Saurav Gawan, Mr. Sumit, Mr. Aakash Mohan Rawat, Ms. Sana Sheik, Ms. Simran Dogra
1200-1730	Visit to Ganga Avlokan, Chandi Ghat, Haridwar (Lunch at Ganga Avlokan)	
	1200-1730	
11th March, 2021	TECHNICAL SESSION III: ASAN CONSERVATION RESERVE WETLAND MONITORING & CONSERVATION EDUCATION	
0730-1030	Visit to Asan Conservation Reserve	Dr. Rahul Rana, Mr. Saurav Gawan, Mr. Aakash Mohan Rawat

1030-1100	TEA BREAK	
1100 -1230	Conservation Education: A tool for Eliciting public support	Dr. Bitapi Sinha, Ms. Tanya Trivedi, Ms. Anjali and team
1330-1430	Lunch at WII Auditorium	
	SESSION IV: VALEDICTORY FUNCTION	
1500-1600	Visit to WII Nature Trail (Vegetation Sampling)	Mr. Zeeshan Ali & Ms. Aishwarya Ramachandran
1600-1630	Valedictory Function	Dr. Dhananjai Mohan, Dr. Ruchi Badola & Dr. Sangeeta Angom
1630-1700	HIGH TEA	

ONLINE TRAINING WORKSHOP ON "BIODIVERSITY CONSERVATION AND MONITORING OF AQUATIC SPECIES OF GANGA RIVER" FROM 16TH TO 18TH JUNE, 2020 Participants: Forest officials, Pilibhit Tiger Reserve, Uttar Pradesh		
16th June 2020	Session I	Resource persons
1100-1110	Welcome of the Participants	Dr. Sangeeta Angom
1110-1120	Inaugural Address	Dr. Ruchi Badola & Dr. S. A Hussain
1120-1230	"Planning & Management for Aquatic Species Conservation & Maintenance of Ecosystem Services in the Ganga River Basin": An overview	Dr. Niladri Dasgupta
1230-1300	Monitoring of Birds of Ganga Basin	Ms. Shuchismita Das
1300-1310	Group Discussion	
17th June 2020	Session II (World Crocodile Day Celebration)	
1100-1140	Monitoring of Crocodiles	Dr. Animesh Talukdar
1140-1220	Techniques of Rescue and rehabilitation of Aquatic species (Crocodile and turtles)	Dr. Gopi G.V.
1220-1230	Group Discussion	
18th June 2020	Session III	
1100-1140	Monitoring of Gangetic River Dolphin	Mr. Goura Chandra Das
1140-1220	Monitoring of Turtles of the Ganga River	Mr. Saurav Gawan
1220-1240	Group Discussion	
1240-1250	Vote of Thanks	Ms. Monika Mehralu

STATE LEVEL TRAINING PROGRAMME FOR STAKEHOLDERS ON BIODIVERSITY CONSERVATION FROM 8TH TO 9TH MARCH 2022 Venue: Bettiah, Bihar		
SESSION I 8th March 2022		Resource persons
1000- 1030	Registration of the participants and Pre-training assessment	Mr. Mukesh Deorari, Ms. Simren Dogra, Ms. Snigdha Das
1030-1040	Welcome address	Ms. Ekta Sharma, Senior Research Fellow, NMCG-WII Phase II, WII
1040- 1130	Overview of WII-NMCG Project-Planning & Management for Aquatic Species Conservation & Maintenance of Ecosystem Services in the Ganga River	Ms. Hemlata Khanduri, Eco-Development Officer, NMCG-WII Phase II, WII
1130-1230	Ganga Biodiversity Conservation initiative: special reference to Gandhak River	Dr. Sangeeta Angom, Scientist &Training Coordinator
1230-1300	Group Photo and Discussion session	
1300-1400	LUNCH	
1400-1500	Community Participation in Ganga Biodiversity Conservation	Ms. Ekta Sharma, Senior Research Fellow, NMCG-WII Phase II, WII
1500-1700	Team Building Exercises	Dr. Sangeeta Angom, Mr. Rahul Gupta, Ms. Snigdha Das
1700-1730	Group Discussion	
SESSION II 9th March 2022		
1030-1130	Monitoring of Gangetic River Dolphin	Mr. Goura Chandra Das
1130-1300	Monitoring of Turtles of the Ganga River	Mr. Saurav Gawan
1030-1130	LUNCH	
1130-1300	Livelihood interventions for Community Participation in Ganga Biodiversity Conservation	Ms. Hemlata Khanduri
1500-1600	Suggestion & Group discussion	
1600-1700	Certificate Distribution	Dr. Sangeeta Angom & Ms. Hemlata Khanduri
1700-1720	Post-training assessment	Mr. Rahul Gupta, Ms. Simren Dogra, Ms. Snigdha Das
1720-1730	Vote of Thanks	Ms. Monika Mehralu

SKILL DEVELOPMENT TRAINING COURSE (SDTC) FOR WOMEN NCC CADETS ON ECO-TOURIST GUIDE FOR 'AQUATIC BIODIVERSITY AND RIVER CONSERVATION' FROM 25TH - 29TH JULY 2023 Venue: Auditorium, Wildlife Institute of India, Dehra Dun		
DAY 1 25th July, 2023		RESOURCE PERSONS
0900-1000	Registration of the participants (Distribution of training kit)	Mr. Rahul Gupta, Mr. S.K. Pal, Mr. Danish Kaleem
1000-1030	Pre-training Assessment	Ms. Simran Aggarwal, Ms. Ashmika Aggarwal
1030-1040	Welcome address	Dr. Sangeeta Angom, Scientist & Training Coordinator, NMCG-WII
1040-1050	About the Training Course	Dr. Ruchi Badola Dean, WII and Principal Investigator NMCG-WII
1050-1100	Workshop Address	Dr. SA Hussain Former Scientist G & Project Manager NMCG-WII
1100-1110	Address by Director, WII	Shri Virendra Tiwari Director, WII
1110-1120	Inaugural Address	TBD
1120-1125	Vote of Thanks	Ms. Ayushi Pandey
1125-1200	GROUP PHOTO & TEA BREAK	
	TECHNICAL SESSION I	
1200-1230	WII-NMCG Project - Ganga Biodiversity Conservation: An Overview	Dr. Sangeeta Angom
1230-1300	Tourism: Necessity and Scope	Dr. Ruchi Badola
1300-1400	LUNCH BREAK	
	TECHNICAL SESSION II	
1400-1500	Natural heritage of Uttarakhand: Management and Incorporation of Culture in Ecotourism	Mr. Anuranjan Roy
1430-1515	Bird Identification and Basic ornithology	Dr. Neeraj Mahar
1515-1600	Identification of Turtles and Tortoises	Mr. Saurav Gawan
1600-1630	TEA BREAK	
TECHNICAL SESSION III: LAWS AND ACT		
1630-1730	Introduction to Wildlife Protection Act	Adv. Saurabh Sharma
1730-1740	Group Discussion	
1645-1730	Ethics in tourism	IITM, Gwalior

DAY 2 26th July, 2023; Venue: Ganga Building TECHNICAL SESSION IV - (GIS Technology)		
0930-1000	Use of instruments and tools for advance eco-tourism	Mr. Zeeshan Ali
THEORY AND PRACTICAL SESSION		
1000-1130	· Google map: Use of Google map and Google my map for ecotourism	Mr. Zeeshan Ali and GIS team
	· Google earth: Use of Google earth and Google my map for ecotourism	
	· School BHUVAN portal NCERT: Use for ecotourism	
	· Geotagging of photographs: Geotagging of field photographs for citizen science with its application in ecotourism	
	· GPS instrument: Field demonstration of GPS using GPS instrument and mobile phone with its application in ecotourism	
	· Compass instrument: Field demonstration of Compass using GPS instrument and mobile phone with its application in ecotourism	
	· Drone instrument: Field demonstration of drone instrument and its application in ecotourism	
1130-1200	TEA BREAK	
TECHNICAL SESSION V		
1200-1230	Ecotourism: Role and Responsibilities of a Nature Guide	Shri Rajesh Bhatt
1300-1400	LUNCH BREAK	
	TECHNICAL SESSION VI	
1400-1600	· Nature Interpretation, three steps of interpretive experience, meet and greet, conduct tour, debrief, and conclude. · Identifying target audience, visitor characteristics, knowing the visitor needs, catering to different visitors, visitor learning styles.	Dr. Bitapi C. Sinha
1600-1630	TEA BREAK	
1630-1730	Eco Tourism for Biodiversity Conservation: A case study from Kerala	Dr. AK Bhardwaj
DAY 3 27th July, 2023 TECHNICAL SESSION VII		
0930-1030	Wildlife Ecotourism: Rules & Regulation for safe viewing of wildlife and flight distance	Shri. P. C. Tyagi, Former PCCF(HoFF) & CWLW (TN)
1030-1130	· Wildlife knowledge for Nature Guides: How Much and What kind! · Understanding tracks and signs of animals	Dr. S. P. Goyal

1130-1200	TEA BREAK	
1200-1300	Effective communication techniques: use of words, use of voice, use of body language, use of props and story telling	Dr. Bitapi C. Sinha
1300-1400	LUNCH BREAK	
1400-1530	TECHNICAL SESSION V Field Visit to Ganga Avlokan, Chandi Ghat, Haridwar	
1530-1630	Visit to Ganga Avlokan, Chandi Ghat Haridwar. Learning of Ganga Biodiversity conservation initiatives with our Ganga Praharis)	Mr. Rahul Gupta, Mr. Danish Kaleem and training team
1630-1720	Interaction with Ganga Praharis for involving communities in Ganga biodiversity conservation	Our Ganga Praharis at Ganga Avlokan: Mr. Manoj Nishad, Mr. Vikas Kumar, Mr. Aman Rawat
1720-1730	TEA BREAK	
1730 onwards	Back to WII	
DAY 4 28th July, 2023 TECHNICAL SESSION IX: Field Visit		
0800-1200	Field session at Dehradun Zoo	Mr. Vipul Maurya, Mr. Rahul Gupta, Mr. Danish Kaleem
1200-1300	Back to WII	
1300-1400	LUNCH BREAK	
	TECHNICAL SESSION X	
1400-1730	First aid training in managing field emergencies	Uttarakhand Red Cross Society
1730-1800	TEA BREAK AND Q & A Session	
DAY 5 29th July, 2023 TECHNICAL SESSION XI: Field Visit		
0800-1130	VISIT TO POLICE TRAINING ACADEMY, TEHRI	Dr. Sangeeta Angom and training team
1130-1200	TEA BREAK	
1200-1300	Valedictory Function: Certificate Distribution	TBD
1300-1400	LUNCH BREAK	
1400-1500	Post-training assessment	Mr. Rahul Gupta & Ms. Simran Aggarwal
1500-1600	Experience sharing by participants	
1600-1700	GANGA VIDEOS	
1700-1730	TEA BREAK	
1730 onwards	BACK TO WII	

National training workshop for "College and University Teachers" on Biodiversity Conservation and Ganga Rejuvenation of Ganga River States" From 14th - 18th November, 2018 Venue: Wildlife Institute of India, Dehradun		
14th Nov. 2018 Technical session I: Ecological Monitoring		Resource persons
0900-0930	Registration	Ms. Monika Mehralu, Ms. Aditi Dev, Ms. Shatakshi Sharma
0930-0940	Welcome address	Dr. G.S Rawat, Dean, WII
0940-1030	Project Biodiversity Conservation and Ganga Rejuvenation: An overview	Dr. S.A Hussain
	Workshop Objectives, Role of teachers and Expectations	Dr. Sangeeta Angom
1030 - 1100	TEA	
	Group Photo	
1100 - 1130	Ganga-The vibrant River: Social, cultural and ecological significance	Dr. Shivani Barthwal
1130 - 1230	Monitoring of Gangetic River Dolphin	Prof. Qamar Qureshi
1230 - 1330	Invertebrates as bio-indicator for ecological monitoring	Dr. V.P. Uniyal
1330 - 1430	LUNCH	
1430 - 1530	Forensic Lab: Biological Sample Collection and Genetic Monitoring	Dr. Sandeep Gupta, Dr. C.P Sharma
1530 - 1600	TEA	
1600 - 1645	Measuring and Monitoring of River Variables	Dr. Niladri Dasgupta
1645 - 1730	Monitoring of Otters	Dr. Niladri Dasgupta
15th Nov. 2018 Technical session II: Ecological Monitoring (contd.)		
0700 - 0830	WII Nature Trails - Monitoring of Aquatic and Riparian Vegetation	Dr. B. S. Adhikari, Dr. Amit Kumar, Ms. Monika Mehralu
0900 - 0930	TEA	
0930 - 1000	Monitoring of Amphibians and Snakes	Dr. Abhijit Das
1000 - 1045	Monitoring of Crocodiles	Dr. Sangeeta Angom
1045 - 1130	Role of Ganga Praharis in Biodiversity Conservation	Dr. Deepika Dogra
1130 - 1215	Monitoring of Turtles	Dr. Bivash Pandav
1215 - 1330	Monitoring of Fish Population	Dr. Rahul Rana
1330 - 1430	LUNCH	
1430 - 1530	GIS Mapping techniques with reference to Ganga Basin (at GIS LAB)	Sk. Zeeshan Ali & Ms. Aishwarya R. Chandran
1530 onwards	LOCAL VISIT (HESCO, Suklapur)	

	16th Nov. 2018 Session I: Participatory Management	
0930-1030	Community Participation in Conservation of Ganga River	Dr. Shivani Barthwal
1030-1015	TEA	
1015 -1230	Team Building of "Biodiversity Conservation and Ganga Rejuvenation"	Dr. Ruchi Badola, Dr. Sangeeta Angom, Dr. Shivani Barthwal,
1230-1300	Group activity: Community Linkages & Stakeholder analysis	Dr. Ruchi Badola, Dr. Shivani Barthwal
1330 - 1430	LUNCH	
Session II: Conservation Education		
1400 - 1500	Wildlife Movie	Dr. Niladri Dasgupta
1500 - 1530	TEA	
1530 - 1630	Group Activity I	Dr. Sangeeta Angom, Ms. Aditi Dev, Ms. Monika Mehralu
1630 - 1730	Group Activity II	Dr. Sangeeta Angom, Ms. Monika Mehralu
1730 - 1745	Wrap up session	
0630 AM (Onwards)	17th Nov. 2018 Field visit at Rajaji National Park (Lunch at GMVN, Chilla)	Dr. Niladri Dasgupta, Sk. Zeeshan Ali, Dr. Vipul Maurya,
	Ganga Arti, Parmarth Niketan Ashram, Rishikesh	Dr. Sangeeta Angom, Sk. Zeeshan Ali, Mr. Ravindra Nath Tripathi
	18th Nov. 2018 (WII, Auditorium)	
0930 - 1300	Valedictory function	
1300-1400	COURSE LUNCH	
1430 onwards	Local Visit (Optional)	

TRAINING WORKSHOP ON RESCUE AND REHABILITATIONS TECHNIQUES ON BIODIVERSITY CONSERVATION FOR GANGA TASK FORCE (GTF) AND ECO TASK FORCE (ETF) FROM 1ST TO 2ND OCTOBER 2021 Venue: Wildlife Institute of India, Dehradun		
TIME	SESSIONS	NMCG-WII & RESOURCE PERSON
0600 onwards	Registration and Pre-training Assessment	
1st October, 2021 TECHNICAL SESSION I		
1120-1230	Collection and analysis of ecotoxicological samples	Ms. Richika Sah and team
	Identification of Birds/ Reptiles/Mammals in field	Mr. Goura Chandra Das
	Promoting ecotourism through dolphin Jalaj Safari	Mr. Aftab Usmani
1300-1400	LUNCH	
1400-1700	Handling of aquatic species in distress-I	Dr. Gouri Mallapur
1700-1730	TEA & GROUP DISCUSSION	
2nd October, 2021 TECHNICAL SESSION II		
1000-1200	Monitoring of Crocodiles	Dr. Animesh Talukdar
Valedictory Function		
1200-1210	Welcome Address	Dr. Ruchi Badola Principal Investigator NMCG-WII project
1210-1220	Training Report	Dr. Sangeeta Angom Scientist & Training Coordinator NMCG-WII project
1220-1230	Interaction and experience	Selected participants from GTF & ETF
1230-1240	Certificate Distribution	Dr. Ruchi Badola, Dr. S.A. Hussain
1240-1250	Vote of Thanks	Dr. Sangeeta Angom
1250-1300	Post training assessment	WII-NMCG team
1300-1400	COURSE LUNCH	

NMCG

National Mission for Clean Ganga, Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Jal Shakti, Major Dhyan Chand Stadium,
India Gate, New Delhi - 110001

GACMC

Ganga Aqualife Conservation Monitoring Centre Wildlife Institute of India, Dehradun nmcg@wii.gov.in

Wildlife Institute Of India

Chandrabani, Dehradun - 248001,
Uttarakhand
t.: +91135 2640114-15, +91135 2646100,
f.: +91135 2640117