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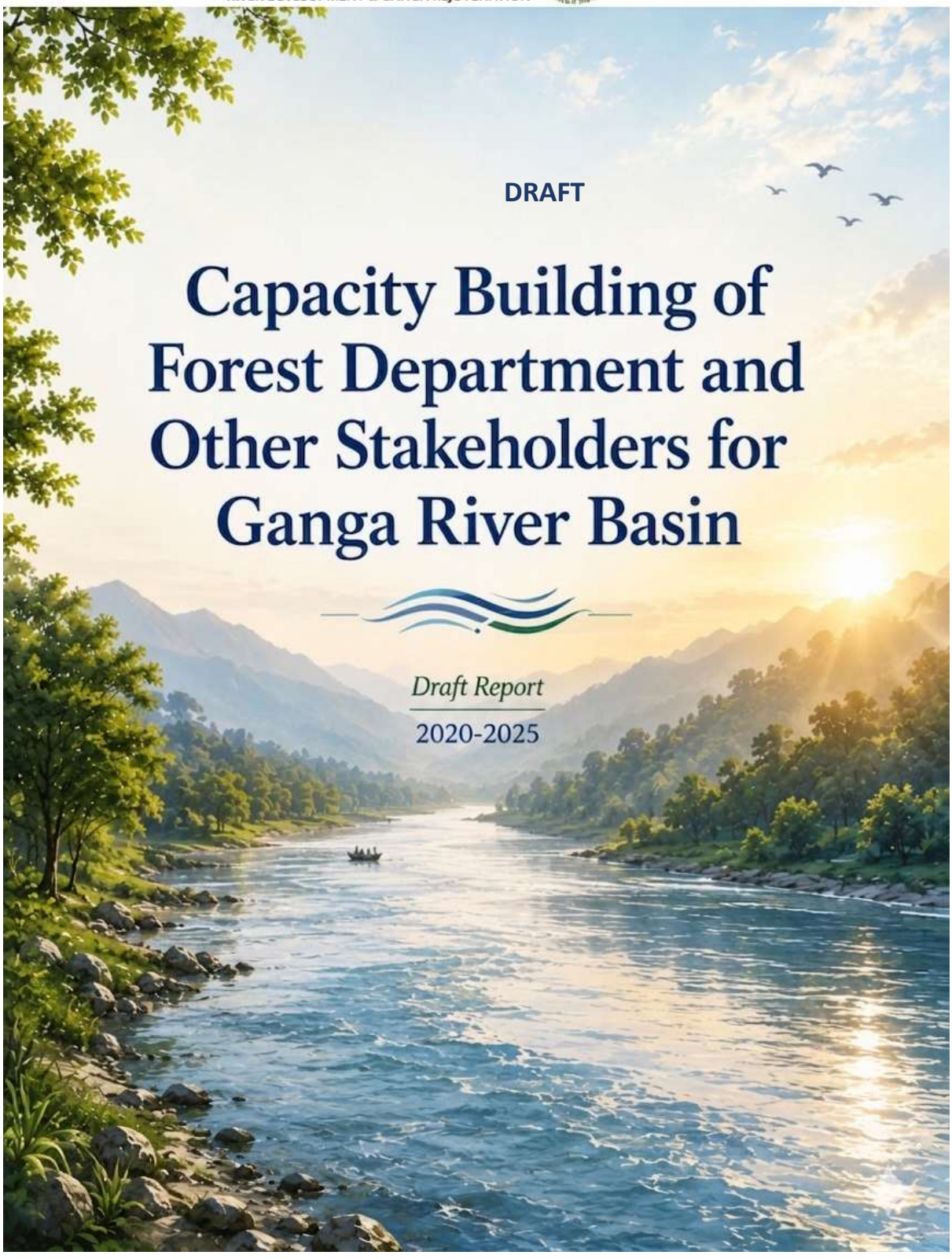

DRAFT

Capacity Building of Forest Department and Other Stakeholders for Ganga River Basin

Draft Report

2020-2025

CAPACITY BUILDING OF FOREST DEPARTMENT AND OTHER STAKEHOLDERS

FOR GANGA RIVER BASIN

2020-2025

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Preface

The Ganga River basin represents one of the most vital and complex riverine ecosystems in the world. It sustains immense ecological, cultural, economic, and spiritual values while supporting the livelihoods of millions of people across multiple states through its resources. The basin is also home to rich aquatic biodiversity, including several significant species. However, the river system continues to face serious threats from pollution, habitat degradation, altered flow regimes, unsustainable resource use, and increasing developmental pressures. In response to these challenges, the Government of India has been implementing the Namami Gange Programme through the National Mission for Clean Ganga (NMCG). The programme adopts a holistic approach that integrates infrastructure development, biodiversity conservation, afforestation, public awareness, stakeholder engagement, and capacity building measures for the long-term rejuvenation and sustainable management of the river.

Under this framework, the Wildlife Institute of India (WII) has been implementing the project titled “Planning and Management for Aquatic Species Conservation and Maintenance of Ecosystem Services in the Ganga River Basin for a Clean Ganga”. This consolidated report documents the activities and achievements under Phase 2 of the project, covering the period from 2020 to 2025, with particular emphasis on capacity building of Forest Department personnel and other key stakeholders.

The report presents a comprehensive account of the various interventions undertaken across the Ganga basin states, including training programmes, spearhead training initiatives, workshops, sensitisation campaigns, stakeholder consultations, educational outreach, and community engagement activities. These efforts were aimed at strengthening institutional capacities, promoting participatory conservation approaches, and enhancing awareness regarding the ecological significance of the Ganga River and its associated biodiversity, especially flagship species such as the Ganges River Dolphin, Gharial, Freshwater Turtles, Otters, and riverine avifauna.

The document serves as a formal record of the work carried out during the reporting period. It highlights the progress achieved through collaborative and interdisciplinary efforts and

offers valuable insights and lessons for future planning and implementation of biodiversity conservation and capacity building initiatives in the Ganga basin.

The successful implementation of these activities has been possible through the consistent support and guidance of the National Mission for Clean Ganga, active cooperation from state forest departments and other concerned departments, partner institutions, experts, frontline staff, educators, and local communities across the basin. Their dedication and participation have been central to advancing the shared vision of conserving and restoring the ecological health of the Ganga River.

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Summary

The report presents the outcomes of a comprehensive capacity-building and stakeholder sensitization programme implemented across the Ganga River Basin under the project title “Planning and Management for Aquatic Species Conservation and Maintenance of Ecosystem Services in the Ganga River Basin for a Clean Ganga” NMCG-WII Ganga Biodiversity Conservation Initiative Phase II, Wildlife Institute of India (WII), Dehradun for biodiversity conservation and river ecosystem management. A total of 24 Spearhead Trainings, 94 Other Stakeholder Trainings, 14 dedicated Rescue and Rehabilitation Trainings, and 48 spearhead-led cascading training programmes were conducted across 11 basin states, collectively covering several thousand participants from government agencies, academic institutions, community groups, enforcement agencies, youth organizations, technical institutions, and local stakeholders. The spearhead trainings alone trained 1,150 participants across 109 districts, with highest participation from Uttarakhand (389 participants) and Uttar Pradesh (301 participants). Forest officials (179 participants), Ganga Praharis (130 participants), veterinarians (119 participants), and college professors (104 participants) formed major stakeholder groups, reflecting a strategically targeted approach for strengthening institutional coordination and conservation leadership. In parallel, Other Stakeholder Trainings engaged 7,031 participants across 166 districts, with Uttar Pradesh (2,977 participants), Uttarakhand (1,924 participants), and Bihar (783 participants) contributing the highest participation. Major stakeholder categories included Ganga Praharis (1,825 participants), Forest Officials (1,238 participants), college students (1,480 participants), school students (742 participants), NSS volunteers (716 participants), and NCC cadets (112 participants), demonstrating broad-based societal outreach and strong youth engagement for long-term conservation stewardship.

The thematic distribution of trainings reflected a balanced and integrated capacity-building strategy focused on ecological monitoring, wetland conservation, rescue preparedness, participatory management, and conservation education. Under the module Monitoring of Aquatic Biodiversity 3,241 trainees participated, in Rescue and Rehabilitation module 3,368 participants participated, in Participatory Management module 3,352 participants participated, and Conservation Education module 3,463 participants participated. Uttar Pradesh and Uttarakhand consistently recorded the highest participation across most thematic modules, reflecting their ecological significance and the high anthropogenic pressures within the basin. A specialized focus was placed on strengthening rescue preparedness and emergency response systems for aquatic fauna conservation. Fourteen dedicated Rescue and Rehabilitation Trainings trained 722 stakeholders, while rescue-related modules integrated into broader programmes collectively trained 3,368 participants across 74 districts in 11 states. Forest officials constituted the largest trained stakeholder group (1,371 participants), followed

by college students (541 participants), Ganga Praharis (479 participants), veterinarians (187 participants), and zookeeper and associated staff (122 participants). In addition, a total of 2,397 first responders were established across nine states to support rapid response mechanisms for aquatic wildlife emergencies. This network included Forest Officials (1,371 participants), Ganga Praharis (295 participants), ETF-GTF personnel (125 participants), veterinarians (187 participants), police personnel (73 participants), researchers (61 participants), tourist guides (56 participants), and local community members (58 participants), thereby creating a geographically distributed and functionally diverse emergency response framework along the Ganga River Basin.

The report further demonstrates the effectiveness of the "training of trainers" and cascading outreach approach adopted under the programme. Spearhead teams trained earlier under the WII-NMCG initiative subsequently organized 48 additional training programmes covering 3,437 participants from diverse stakeholder categories. College students formed the largest participant group (1,136 participants; 33.04%), followed by Forest Officials (911 participants; 26.50%), NSS volunteers (566 participants; 16.47%), NCC cadets (153 participants), school students (130 participants), ETF-GTF personnel (130 participants), and zookeeper staff (122 participants). This multiplier effect substantially enhanced the dissemination of conservation knowledge and strengthened decentralized conservation action across the basin. The impact assessment component of the programme further confirmed the effectiveness of these interventions. Across 21 training programmes, 1,294 participants were engaged, with 697 participants completing both pre- and post-training assessments. Statistical analysis demonstrated a highly significant improvement in participant knowledge and conservation awareness following training interventions. The Wilcoxon signed-rank test yielded a highly significant result ($Z = 22.88$; $p < 0.001$), while Cohen's d effect size was estimated at 2.02 (95% CI: 1.90–2.14), indicating a very large and robust training effect. Ecological awareness among participants was also notably high, with 96.13% acknowledging the importance of biodiversity for river ecosystem health and 69.01% reporting awareness of aquatic species within the basin. Pollution from industrialization and urbanization was identified as the major threat to the Ganga River Basin by 54.70% of respondents, while mass awareness programmes (35.81%), adoption of 3R principles (22.57%), legal enforcement (20.02%), and restrictions on effluent discharge (19.62%) were recommended as key conservation measures.

Long-term post-training evaluation further demonstrated the sustainability and practical impact of the capacity-building framework. Feedback obtained from 2,608 trained participants revealed that 83% (2,165 participants) actively undertook carry-forward conservation activities after the completion of training programmes. Among these, 974 participants (45% of active respondents) trained additional people, 823 participants (38%) conducted awareness-generation activities, and 368 participants (17%)

independently implemented conservation actions at local levels, demonstrating a strong multiplier effect and sustained stakeholder engagement. Only 12% of respondents reported not undertaking post-training activities, with major constraints including inadequate response from target groups (42%), lack of resources (23%), and insufficient institutional support. Overall, the findings clearly demonstrate that the WII-NMCG capacity-building initiative successfully established a multi-stakeholder, basin-wide conservation network integrating government agencies, academic institutions, youth groups, community stakeholders, technical experts, and frontline responders. The programme significantly enhanced ecological literacy, rescue preparedness, participatory conservation approaches, and decentralized stewardship across the Ganga River Basin. At the same time, the results highlight the need for more continuous, adaptive, and comprehensive long-term training interventions, including refresher programmes, institutional mentoring, field-based practical exposure, and stronger follow-up support mechanisms to sustain conservation momentum and further strengthen biodiversity conservation and river rejuvenation efforts across the basin.

CHAPTER 1 INTRODUCTION

1.1 Background

The National Mission for Clean Ganga (NMCG), established as the implementation arm of the Government of India's flagship *Namami Gange* Programme, has taken a holistic approach towards restoring the Ganga River Basin. The mission is rooted in addressing the ecological, cultural, and economic importance of the Ganga River Basin by deploying science-based strategies and encouraging collaboration across diverse stakeholders (NMCG, 2019). The Ganga basin supports a wide range of aquatic and riparian biodiversity, including endemic and critically endangered species like the Gangetic dolphin (*Platanista gangetica*), three species of otters viz. the Smooth-coated otter (*Lutrogale perspicillata*), Eurasian otter (*Lutra lutra*) and the Small clawed otter (*Aonyx cinereus*), the critically endangered Gharial (*Gavialis gangeticus*), Mugger or Indian marsh crocodile *(Crocodylus palustris*), Estuarine crocodile *(Crocodylus porosus*), critically endangered Red-crowned Roofed Turtle *(Batagur kachuga),* Golden mahseer (*Tor putitora*), Hilsa *(Tenualosa ilisha*) etc. These species serve as indicators of river health and are integral in maintaining ecological balance. The river not only sustains these biological communities but also supports millions of people in its catchment area who depends on it for drinking water, agriculture, transportation, and livelihoods (WWF, 2021; Bhatt et al., 2018). To ensure the health of the Ganga River Basin and its dependent ecosystems, conservation interventions must go beyond scientific and technical measures and include efforts that build human capacity. The development of a knowledgeable and engaged community of stakeholders is crucial in sustaining freshwater biodiversity and environmental integrity over the long term. Hence, the Wildlife Institute of India (WII), under the National Mission for Clean Ganga (NMCG) project, has prioritized capacity building as a strategic pillar in advancing river conservation outcomes (UNDP, 2009).

The Ganga River is one of the longest rivers in Asia, with the highest human density flowing for roughly over 2,500 km, from Goumukh in Uttarakhand to the Bay of Bengal at Ganga Sagar in West Bengal. It is transboundary in nature, flowing through India and Bangladesh. The Ganga River system drains an area of approximately 1087300 km^2 in India and Nepal. Spread across 11 states, the Ganga Basin covers an area of roughly 1 million km^2. The Basin is among the most

densely populated river basins in the world, supporting more than 100 Class I and II cities and towns, and thousands of villages. Over the past few years, rapid population growth in the Ganga basin has resulted in agricultural development, urbanization and early-stage industrialization, with extensive use of water for irrigation, industry and public supply. Recognising the importance of engaging multiple stakeholders in its conservation, a series of capacity building programmes were conducted along the Ganga River and its tributaries under the ambit of the National Mission for Clean Ganga (NMCG). These programmes aimed to empower individuals and institutions with the knowledge and tools necessary for sustainable river management.

1.2 Capacity Building Approaches

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. The NMCG project adopts a multi-stakeholder and participatory model (Carr, 2015), aimed at empowering forest officials, field veterinarians, researchers, NGOs, entrepreneurs, school teachers, professors, university students, and volunteers to act as proactive contributors

in freshwater biodiversity monitoring and macro aquatic species conservation across the Ganga River Basin.

The approach emphasizes that sustainable river conservation can only be achieved when local capacities are built, nurtured, and retained (O'Keeffe, 2018). This model aligns with the broader goals of adaptive ecosystem management by equipping individuals and institutions with tools and knowledge to respond to emerging conservation challenges (OECD, 2006; Bloomfield et al., 2018). Freshwater biodiversity conservation approach requires mobilization of stakeholders for sustainable conservation of biodiversity of the Ganga River and its tributaries. The effort aims to provide different capacity building programmes which would aid in creating a cadre of trained stakeholders in various aspects of conservation of macro aquatic fauna and its habitat who would be the future trainers for successful biodiversity monitoring and restoration of the Ganga River Basin and carry forward the activities individually or at institutional level.

Figure 1.1: Stages of Capacity Building Initiative

Organizing a training course for various stakeholders at the Ganga basin requires a systematic, step-by step process, tasks and skills. Although training coordination takes place during the design phase, coordination is very important during all phases of the training process (Figure 1.1). Coordination begins at the time training is proposed and continues even after it is delivered and participants leave. In short, coordinating training requires endless management of many details that include training objectives, calls of participants, participant expectations, engagement of resource persons etc. The overall approach would assist in developing and strengthening the participant's skills, instincts, abilities, processes and resources that organizations and communities need to survive, adapt, and thrive in conserving the ecosystem of the river. Through workshops, trainings, and stakeholder engagement meetings, participants gain exposure to field-based methods, rescue and rehabilitation techniques, community mobilization, and ecological monitoring.

1.3 Key Elements of Capacity Building

The foundation principle of this programme is that the long-term engagement leads to sustainable outcomes. As outlined by Leidel et al. (2012), effective capacity development should be iterative and need-based. The process begins with the identification and engagement of relevant stakeholder groups, achieved through preliminary meetings, outreach, and consultation workshops. This is followed by an assessment of their development needs, conducted through participatory exercises and feedback tools to understand knowledge gaps, technical challenges, and local priorities. Based on the identified requirements, training modules are designed with contextual relevance, incorporating technical and soft skills necessary for freshwater biodiversity conservation. Once the programmes are formulated, they are implemented through a mix of classroom and field-based sessions, carefully aligned with the stakeholders existing roles and potential contributions.

Finally, regular evaluation mechanisms are embedded into the programme to assess its effectiveness, record lessons learned, and refine future capacity building strategies. These

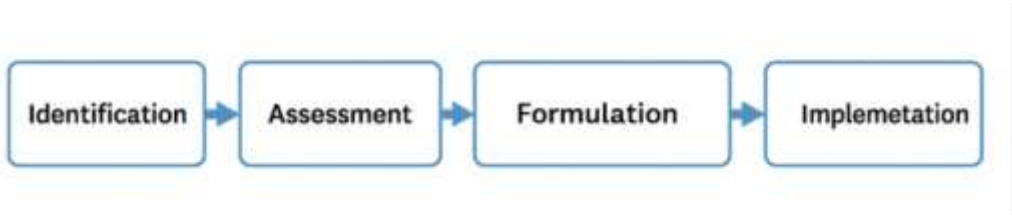

Figure 1.2: Core Elements of Capacity Building for Ganga Biodiversity Conservation

interlinked stages are visually represented in Figure 1.2, 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 Basin.

1.4 Constraint and Challenges

Phase II (2020 -2026) of the project expanded its scope significantly, reaching a wider array of stakeholders across the Ganga River Basin. Given that the Basin covers 11 states viz. Uttarakhand, Uttar Pradesh, Jharkhand, Bihar, West Bengal, Rajasthan, Madhya Pradesh, Chhattisgarh, Haryana, Himachal Pradesh, Delhi and considering it is among the most densely populated river basins in the world, supporting more than 100 Class I and II cities and towns, and thousands of villages. The major constraint in terms of engaging different stakeholders and mobilizing them for effective implementation of sustainable effort in maintaining the ecological integrity of the river, poses a limitation at times, since each stakeholder groups have specific requirements in terms of training needs and methodologies to be utilized. Stakeholders such as forest officials, professors, line agencies, community leaders, researchers, volunteers and NGOs have varying learning needs and engagement capacities, requiring the development of customized training modules. While engagement of stakeholders has improved compared to Phase I (2017 -2019), sustaining involvement and translating knowledge into action continues to require targeted follow-ups, refresher sessions, and local support systems. Additionally, logistical hurdles such as

the availability of expert trainers and consistent coordination mechanisms occasionally affect the scale and continuity of training activities.

Despite these challenges, continuous capacity building programmes presents opportunities for innovation and deeper impact. Strategic partnerships with academic institutions, local organizations, and subject experts have helped broaden the knowledge base and delivery mechanisms. Efforts were made to strengthen inter-departmental coordination, incorporate community knowledge, and consolidate existing biodiversity data for more informed decision-making. Rather than setbacks, these challenges are viewed as areas for continual learning and system improvement, supporting the overarching goal of building a resilient, inclusive, and adaptive framework for riverine biodiversity conservation along the Ganga River Basin.

Within this spectrum, earlier efforts to restore the Ganga River Basin were largely limited to installation of STPs and water quality monitoring without giving due importance to other ecological functions. Information on the outcome of the decades of studies on aquatic biodiversity are scattered and needs consolidation. Community participation was not encouraged also the perception and attitude of the local people were not built towards the restoration process. There are various other variables that faced challenges related to assignment of manpower and resource persons in the field, which is required for intensive generation of training and awareness programmes for the local communities along the entire stretches of the Ganga River and its tributaries. As an offshoot to the presence of the wide array of stakeholder, each stakeholder group has to be dealt with stakeholder-specific manner, which makes overall process complex under certain circumstances. Another constraint faced was, the stakeholder acts indifferent, antagonistic or unwilling to participate and getting involved in the conservation efforts that leads to the inability to establish a constant presence in Ganga basin states for monitoring of the events and carry-forward activities post training and sensitization workshops.

1.5 Objectives

The capacity building component aims to enhance the institutional and individual capacities of stakeholders involved in riverine biodiversity conservation across the Ganga basin. 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 other Ganga basin states and train them in monitoring aquatic species of conservation significance, ecological survey, biodiversity conservation, management planning of wetland and aquatic habitats and rescue and rehabilitation protocols.

3. Develop capacity of University Professors and Students, Forest Officers of Ganga River basin states, Ganga Praharis 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 including University Professors and Students, in rescue and rehabilitation of aquatic fauna in distress (higher vertebrate fauna).

5. Capacity building of local communities, including the Ganga Praharis for reporting and managing emergent situations.

1.5.1 Key Research Questions

To evaluate the design, implementation, and impact of the capacity-building programmes, the following research questions were proposed:

I. *What is the extent of knowledge gain among participants before and after the training interventions, and how do pre- and post-training evaluations reflect the effectiveness of the capacity-building efforts?*

This question aims to assess cognitive and skills-based improvements using structured training evaluation models.

II. *How do the training programmes contribute to enhancing inter-departmental coordination and institutional synergies between line agencies such as forest, fisheries, irrigation, and animal husbandry departments in implementing freshwater biodiversity conservation measures in the Ganga basin?*

This question explores cross-sectoral collaboration and policy coherence, in line with Integrated River Basin Management (IRBM) approaches.

III. *To what extent have citizen science platforms and community-based mechanisms like the Ganga Praharis and Bal Ganga Praharis contributed to real-time biodiversity monitoring and participatory conservation efforts at basin level?*

This seeks to evaluate local engagement and the validity of public data contributions, addressing growing interests in participatory science for environmental governance.

IV. *What are the logistical, infrastructural, and contextual challenges faced by trainees (forest officials, veterinarians, professors, and volunteers) in applying rescue and rehabilitation protocols in the field post-training?*

This question aims to assess gaps between knowledge acquisition and on-ground implementation capacities, with a focus on institutional readiness.

V. *How does the inclusion of university students and professors in conservation training influence academic engagement, field-based research, and career orientation in the domain of riverine biodiversity management?*

This question explores long-term impacts of academic inclusion, including curriculum development, student-led research, and emerging leadership in aquatic biodiversity conservation.

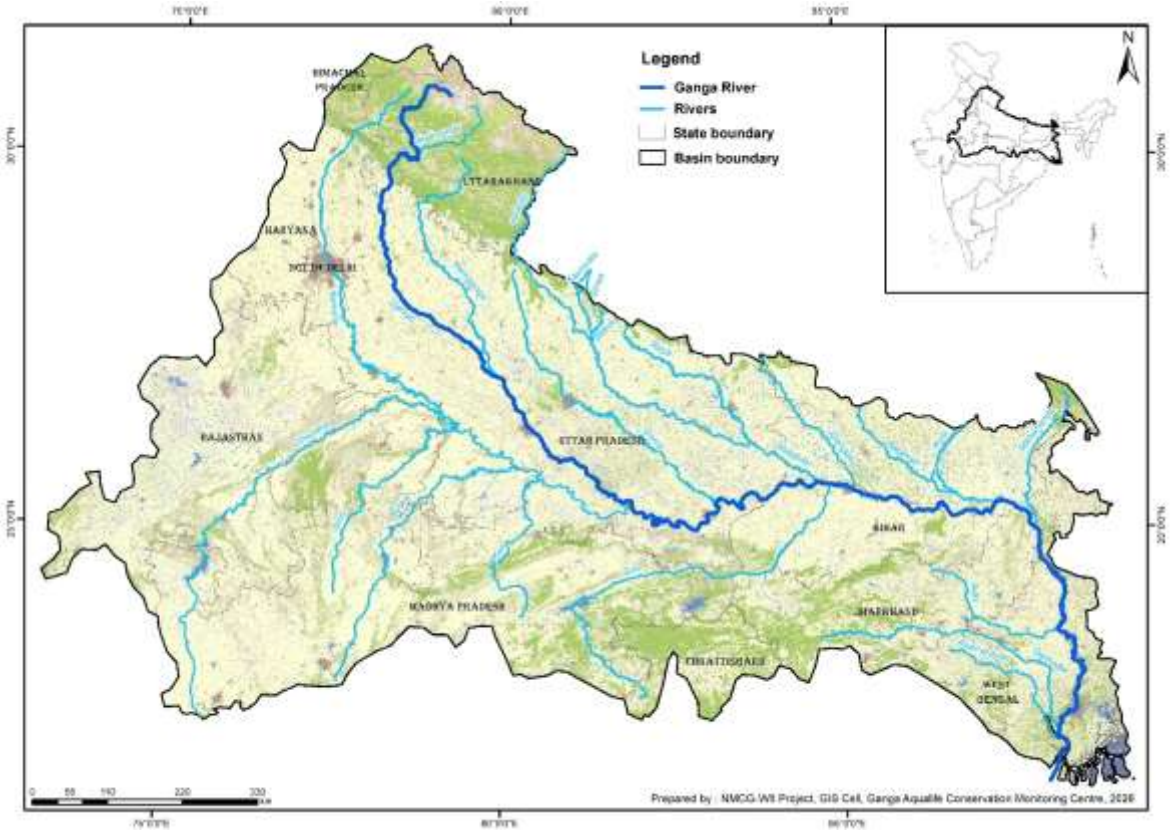

Figure 1.3: Locations of Capacity Building Programmes and Training for Ganga Biodiversity Conservation

1.6 Training Sites

The training programmes were spread across the entire stretch of the Ganga River Basin involving different stakeholders. The programmes have been implemented at 120 sites in eleven Ganga Basin states viz. Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Madhya Pradesh, Chhattisgarh, Haryana Rajasthan, Himachal Pradesh, and New Delhi respectively (Figure 1.3). A total of 136 trainings, representing multiple stakeholder groups throughout the Ganga River Basin. The MAP 1.3 marks the locations across the Ganga River basin where capacity-building programmes and trainings were conducted under Phase II of the NMCG project. These training sites reflect the geographical spread of the programme and highlight the outreach efforts undertaken to engage diverse stakeholders. Each marked location represents a centre where stakeholders such as forest officials, different line agencies, academic institutions, and community members etc. were trained in freshwater biodiversity conservation.

CHAPTER 2 CAPACITY BUILDING PROCESS

The capacity building process begins with the identification of target groups. These include a diverse range of engagement of stakeholders such as forest and fisheries department personnel, academic professionals and students, frontline staff, veterinarians, and community volunteers, line agencies etc. Selection is based on their geographic relevance, institutional responsibilities, and potential role in aquatic species conservation and habitat management. Initial engagement was carried out through field visits, 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 was 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). 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.

2.1 Capacity Building Framework

The capacity building framework adopted is a structured, multi-tiered approach aimed at strengthening institutional and individual competencies for Freshwater biodiversity conservation across the Ganga basin states. This framework is designed to build technical, operational, and community-level capacities essential for effective implementation of conservation strategies, especially in ecologically sensitive and socially complex landscapes (Figure 2.1).

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 Basin 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. Further, the training workshops were prioritized in five main modules- River Ecology, biodiversity monitoring, Rescue training, community involvement and conservation awareness. The curriculum for various levels of target groups were more or less common. However, the emphasis and objective of the programmes were different as per the requirement of each target group. While at senior level the main objective was consultation and sensitization, at the frontline and grass root level the objectives were to develop capacity for long term engagement, implementation and monitoring. Based on the developed curricula a number of capacity building programmes were organized at sites along the Ganga River Basin with different target groups. These curricula were later discussed at length with different experts in the field of Freshwater Biodiversity Conservation and used for piloting the training programmes at the eleven Ganga basin states. About 23 such training workshop for different target groups were organized in Ganga River basin for field-testing. After finalization, several training programmes based on this curriculum, have been implement for Freshwater Biodiversity Conservation of Ganga River Basin.

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.

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. In some cases, independent third-party evaluations are also conducted to validate outcomes and provide recommendations for scale-up and replication. This comprehensive monitoring and evaluation mechanism enables mid-course corrections during ongoing programmes and informs the design of subsequent training cycles (UNDP, 2009).

Capacity building in this project is viewed not as a one-time activity, but as a strategic, long-term investment in empowering institutions and individuals to address evolving conservation challenges. As training progresses across Ganga Basin states, a growing network of informed and skilled resouce persons and trainee is being developed, with the capacity to respond to emergent ecological issues, engage local communities and line agencies, and implement site-specific conservation strategies effectively. This aligns with internationally recognized definitions of capacity building, which emphasize strengthening skills, knowledge, values, relationships, and systems to enable sustained and autonomous performance over time (Bolger, 2000; O'Connell et al., 2022).

This framework is particularly important given the scale and complexity of riverine conservation efforts in India. The diversity of stakeholders, ecological zones, and species of conservation significance in the Ganga basin necessitates a robust, replicable, and adaptive training approach. Through its structured planning, targeted content delivery, and rigorous evaluation, the capacity building framework under NMCG project contributes significantly to advancing conservation action at both the grassroots and policy levels.

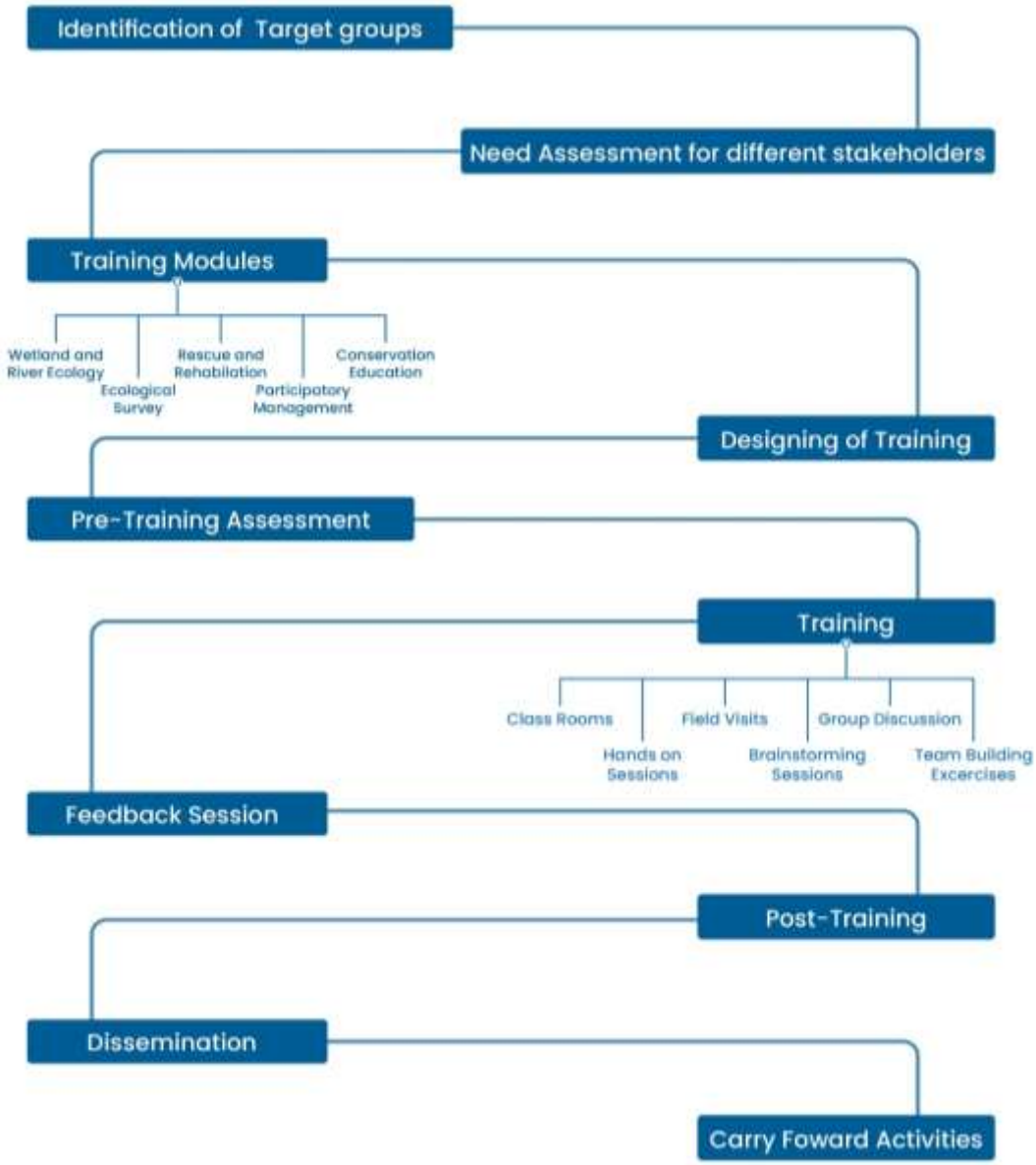

Figure 2.1: Capacity Building Framework for Freshwater Biodiversity Conservation

2.2 Target Groups

Freshwater Biodiversity conservation in the Ganga River basin requires collaboration among a diverse set of stakeholders who are directly or indirectly engaged in the planning, management, and implementation of conservation-related interventions. The capacity-building initiative has identified and trained a wide spectrum of participants representing government departments, academic institutions, civil society, and local communities. These stakeholders have been

grouped across various administrative and functional levels, depending on their role and responsibilities in riverine biodiversity conservation.

The primary target groups for capacity-building efforts include:

- Forest Department Officials: Officers across different levels—including Chief Wildlife Wardens, Divisional Forest Officers, and frontline staff—have been trained in topics such as aquatic species monitoring, rescue and rehabilitation protocols, and integrated wetland and river management planning. These officials are pivotal in executing field-based conservation actions and responding to wildlife emergencies.
- Fisheries and Irrigation Department Representatives: Officials from these departments are closely linked to riverine operations and are thus crucial for promoting sustainable water management practices that align with biodiversity conservation. Trainings for these stakeholders focus on the ecological impacts of infrastructure and flow modifications, as well as species-friendly operational strategies.
- Veterinarians and Animal Husbandry Personnel: Field veterinarians and staff from the Animal Husbandry Department are trained in the rescue, rehabilitation, and post-release care of aquatic fauna such as turtles, gharials, and river dolphins. Their role becomes critical during species stranding or distress incidents, especially in monsoon or low-flow periods.
- University Professors and Students: Faculty and students from disciplines such as ecology, wildlife science, and environmental studies are engaged through technical training programmes, exposure visits, and workshops. These academic groups are expected to contribute to long-term monitoring, research, and citizen science-based initiatives.
- Non-Governmental Organisations (NGOs): Representatives from NGOs working on river health, biodiversity conservation, and community engagement are equipped with ecological knowledge and participatory approaches. Their local presence and grassroots networks make them effective partners for awareness-building and behaviour change communication.
- National Service Scheme (NSS) and National Cadet Corps (NCC) Volunteers: These youth groups have been mobilised as part of the conservation education drive under the Bal Ganga Prahari initiative. Through orientation sessions and field activities, they are introduced to the ecological

significance of the Ganga and its species and are trained to assist in reporting and awareness activities.

- Local Communities and Ganga Praharis: Community members living along the river—including fisherfolk, boatmen, and local youth—are among the most critical stakeholders. They are often the first responders to emerging situations involving wildlife. Their training focuses on participatory monitoring, early reporting of stranded fauna, understanding of conservation regulations, and sustainable livelihood options.

This multi-tiered engagement ensures that capacity development is aligned with the functional needs and contextual realities of each stakeholder group. Moreover, by working across sectors and governance levels, the programme promotes integrated and inclusive conservation action throughout the Ganga River Basin. For the purpose of capacity building programmes, the stakeholders have been categorized into three levels viz. policy, implementation and execution levels professionals (Figure 2.2). The capacity building programmes were more or less common for various levels of target groups. However, the emphasis and objective of the programmes was different as per the requirement of each stakeholder groups (Figure 2.3).

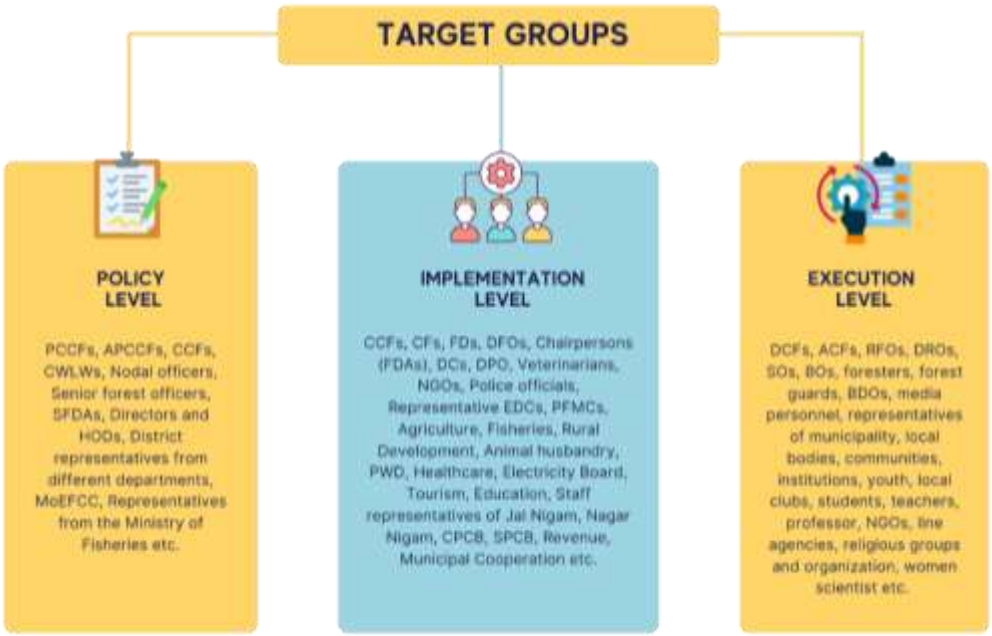

Figure 2.2: Target Groups for Freshwater Biodiversity Conservation

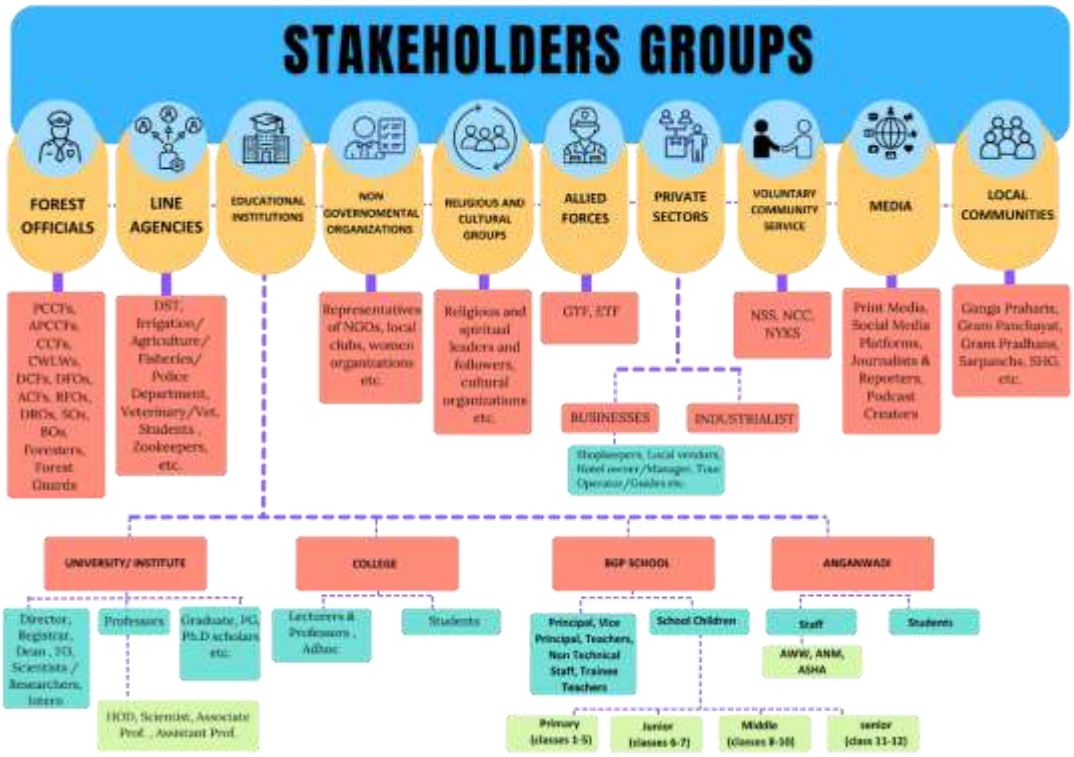

Figure 2.3: Stakeholders Groups for Freshwater Biodiversity Conservation

2.3 Training Needs

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

In the context of freshwater biodiversity conservation of Ganga River Basin, 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 basin 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 combination of qualitative and quantitative methods, including stakeholder consultations, structured and semi-structured interviews, group discussions, feedback from past trainings, expert inputs and response from a planned need assessment questionnaire from the target groups. This mixed-methods approach ensured the collection of actionable insights while remaining responsive to local socio-institutional dynamics (Czabanowska et al., 2024). A needs assessment provides a diagnostic framework to bridge the gap between current capacities and the desired performance levels across different roles (Hough, 2006). It clarifies the types of training required, identifies the participants for whom the training is essential, and supports the formulation of context-specific modules. In addition, the situational analysis undertaken during the TNA phase helps to map out

existing resources and institutional support mechanisms that can be leveraged during implementation.

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.

2.4 Training Modules

Effective conservation of aquatic biodiversity in the Ganga River Basin requires the involvement of multiple stakeholders with enhanced knowledge and skillset. To address the existing gaps in technical expertise and institutional capacity, five comprehensive training modules were developed: (1) Biodiversity monitoring of macro aquatic species of mainstem Ganga River and its tributaries (2) Conservation and management of Wetland and its associated habitat (3) Rescue and Rehabilitation of macro aquatic animal in distress (4) Participatory Management and (5) Conservation Education (Figure 2.4).

Figure 2.4: Capacity Building Modules

Together, these modules are essential for strengthening institutional roles and ensuring coordinated, informed action for long-term biodiversity conservation and ecosystem health in the Ganga River Basin. Based on these training modules, the capacity building programmes and training workshops was designed and implemented for multiple stakeholders in Ganga River Basin states.

2.4.1 Wetland and River Conservation

Article 1 of the Convention on Wetlands (Ramsar, Iran, 1971) states that "wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters as well as human-made wetlands such as dams, reservoirs, rice paddies and wastewater treatment ponds and lagoons. Adding to the definition of the Ramsar Convention, the Wetland (Conservation and Management) Rules, 2017, state that "wetlands include all inland waters such as lakes, reservoir, tanks, backwaters, lagoon, creeks,

estuaries and man-made wetlands and the zone of direct influence on wetland that is to say the drainage area or catchment region of the wetlands as determined by the authority but do not include main river channels, paddy fields, and human-made water bodies/tanks specifically constructed for drinking water purposes and structures specifically constructed for aquaculture, salt production, recreation and irrigation purposes". Wetlands have always been integral to socio-ecological systems, more so, in country like India, where lives and livelihood of millions are associated with the wetlands, spread across the various biogeographic regions of the country. The wetland wealth of the country is also important in maintaining the freshwater biodiversity of Ganga River Basin. An improved knowledge and better understanding of the characteristics of wetlands and their impacts is necessary to implement an effective capacity building programme at Ganga River Basin. Imparting trainings on module under the heads of wetland and River conservation forms a core area for freshwater biodiversity conservation.

Being among the world's most productive and dynamic ecosystems, wetlands are essential for the survival of biodiversity, including human well-being, economic growth, and mitigation and adaptation of climate change (Mitsch & Gosselink, 2000). Due to their unique energy dissipation, water holding capacity, and purification qualities, wetlands are known as "natural sinks" or "kidneys" of the planet. Wetlands provide a multitude of ecosystem services, which include provisioning services, such as food (fish) and fibre, which are essential for human sustenance. Supporting (nutrient cycling, sediment retention, soil formation) and regulating services (groundwater recharge, flood control, storm protection, water purification, carbon sequestration) are critical for sustaining vital ecosystem functions essential for the survival of biodiversity and humans. In addition, wetlands have significant aesthetic, educational, cultural, and spiritual values and provide invaluable opportunities for recreation and tourism (MEA, 2005). A major supply of renewable fresh water for human consumption comes from a diverse array of inland wetlands, including lakes, rivers, swamps, and groundwater aquifers.

Wetlands are crucial for groundwater recharge. The 2021 theme for World Wetlands Day, "Wetlands and Water", was dedicated to the 'emphasize the importance of wetlands as a source of freshwater and encourage actions to restore wetlands and prevent their loss'. An estimated 1.5–3 billion people dependent on groundwater as a source of drinking water (MEA, 2005). Rivers

have been drastically altered around the world to increase the water available for human consumption, as a consequence of which wetlands have been directly affected. With respect to carbon sequestration, wetlands are important role players in the carbon cycle. For instance, peat swamps, although covering only 3–4% of the world's land area, sequester about 1.5% of the total global carbon (MEA, 2005). Moreover, wetland plants such as Typha, Phragmites, Eichhornia, Azolla, and Lemna have been identified as having potent phytoremediation properties and are beneficial for heavy metal removal (Rai, 2008).

With a view to safeguard these unique ecosystems, an international treaty known as the Ramsar Convention, was signed in 1971 in Ramsar, Iran for national action and international cooperation for the conservation and "wise use" of wetlands and their resources. Overall, 1052 sites in Europe; 289 sites in Asia; 359 sites in Africa; 175 sites in South America; 211 sites in North America; and 79 sites in Oceania region have been identified as Ramsar sites or wetlands of international importance (Ramsar Secretariat, 2013). In India, the Convention became effective in 1982, and since then 42 Ramsar Sites have been declared, of which 32 wetlands are a part of the protected area network. As per the estimates of the National Wetland Atlas (2011), India has about the total wetland area of 15.3 million hectares, accounts for nearly 4.7% of the total geographical area of the country, of which Ramsar sites constitute approximately 0.4 % of the country's total geographical area. Inland wetlands account for 69%, coastal wetlands 27%, and remaining 4% are other wetlands that are smaller than 2.25 ha (SAC, 2011). Wetlands support nearly a fifth of the known biodiversity (SAC, 2011). The number of wetlands of national importance covered by the National Wetland Conservation Programme (NWCP) is 115 as of 2011 (MoEF, 2012). The wetlands that have lost or are losing their ecological integrity and functionality as a result of high anthropogenic influence are listed in the Montreux Record. Presently, Keoladeo National Park of Rajasthan and Loktak Lake of Manipur are listed in the Montreux Record. Most wetlands in India are subjected to immense anthropogenic pressure, due to high dependence of people on water resources.

Although, not giving wetlands their due recognition has resulted in many decision-makers and 'primary stakeholders' still thinking of them as 'wastelands' (Bassi et al., 2014). Wetland loss and degradation is directly linked to infrastructure development, land conversion, water withdrawal,

pollution, overharvesting, overexploitation of resources, and the introduction of invasive alien species. The growing demand for food supply has led to an increase in agricultural productivity, which has exerted tremendous pressure on water resources. Around 70% of water use globally is for the purpose of irrigation (MEA, 2005). The increase of paddy cultivation has led to the creation of human-made wetlands, which are not considered for conservation under the Wetland (Conservation and Management) Rules, 2017, despite paddy fields constituting around 71% of India's wetland area (MoEF, 1990). For instance, breeding populations of the vulnerable Sarus Crane (*Grus antigone*), are found in the agricultural fields of the Gangetic floodplains in northern India. Moreover, cooperation between the Ramsar Convention and the Convention on Migratory Species has been in effect since 1997 as a joint conservation action. India's critical position within the migratory bird flyways – Central Asian flyway, East Asian flyway and East Asian–Australasian flyway, necessitates the conservation of the country's wetlands that provide foraging and wintering grounds to both migratory as well as resident birds. Wetland loss has driven many species to the brink of extinction (BirdLife International, 2016).

Prioritizing wetland conservation planning to mitigate human pressures, especially in those wetlands which are severely degraded, will help revive them, to some extent, to their natural state. Furthermore, most protected areas are not designed with a focus on wetland ecosystems (Abell et al., 2007). Upstream processes, hydrological connectivity, biodiversity values need to be taken into consideration while designing protected area networks. Designating a wetland as protected or as a Ramsar Site does not necessarily mean that it will contribute towards wetland conservation. It is pertinent that local communities are involved in a holistic wetland conservation approach. Given the unsurmountable evidence of the importance of wetlands for the survival of both biodiversity and human life, it is crucial that these unique ecosystems are brought to the forefront for conservation.

2.4.2 Ecological Survey/Biodiversity Monitoring

Multiple methods have been implemented to assess freshwater ecosystems in different regions of the world (Buss et al., 2015; Ghetti, 1980; Metcalfe, 1989). Some aim at determining the quality of the water in streams and rivers, while others focus on the ecological state of river

reaches and their ability to sustain biodiversity. All have in common that they seek to determine the current state of the ecosystem, as to set a baseline against which past or future states can be compared to. Most freshwater ecosystem assessment methods evaluate local (i.e., sampling site) or reach-wide (i.e., short river segment) properties of rivers, with a focus on water quality, hydromorphology or biota, often including both aquatic and riparian habitats (e.g. Kamp et al., 2007; Wernersson et al., 2015).

Effective monitoring of aquatic biodiversity is crucial for assessing ecological health, understanding ecosystem dynamics, and informing evidence-based management and conservation practices (Salman et al). Freshwater ecosystems, despite representing a small fraction of the Earth's water, harbor a disproportionately high percentage of global biodiversity. However, freshwater fauna has experienced alarming declines due to pollution, climate change, habitat destruction, and overharvesting (Parmesan et al., 2023; Tickner et al., 2020; Cantonati et al., 2020; Fadhil et al., 2024; Rashid et al., 2024). Combating these threats requires efficient and precise monitoring of aquatic biodiversity to assess the conservation status of populations and ecosystems, identify threats, and track the effectiveness of conservation actions. Recent advances in data acquisition techniques, information technology, and computational power provide exciting opportunities to enhance biodiversity monitoring using citizen-sourced or field-collected data.

Freshwater ecosystems play a vital role in sustaining biodiversity and supporting human livelihoods. They are also under immense pressure: the rate of species loss in freshwater ecosystems is greater than that observed in terrestrial and marine systems. Critically, several major international agreements are concerned with stemming the loss of biodiversity, and the loss and degradation of habitats and species dependent on them, including for freshwater. For example, the Global Biodiversity Framework specifically contains seven targets that are relevant to freshwater ecosystems and we need to be able to monitor progress towards these targets. However, effectively monitoring and assessing the health of freshwater ecosystems at large spatial scales presents significant challenges.

Ecological assessment forms one of the basic requirements to evaluate the distribution and population status of flora and fauna. It is a repeated observation or measurement of biological diversity to determine its status and trend. The ecological survey system is a minimum starting point and helps in understating the causes for change in status and trends; biodiversity monitoring also covers measurements of environmental pressures (Nordeco and Denr, 2001). This is significant in understanding the complexity of biodiversity, incomplete taxonomic knowledge, and high cost of total biodiversity assessments, monitoring relies on indicators (Nordeco and Denr, 2001). The biodiversity indicators being monitored may be qualitative (e.g. presence or absence of an indicator species) or quantitative (abundance or population density of a species, distribution area of a habitat, number of typical species in the habitat, etc. Monitoring of water quality is an important step for the evaluation of heavy metals, pollutants, changes in the water quality that leads to loss of natural habitat, and local extinction of species. Many methods like for flora methods like quadrates and circular plots followed by line transects and for studying fauna, point count, mark recapture and line transects has been developed. Teaching and disseminating knowledge on this methodology helps other non-scientific group to understand the importance, and cause of declining in biodiversity. Further, this will help in conservation of several endangered taxa.

Ecological monitoring of aquatic and semi-aquatic biodiversity in the Ganga River Basin focuses on assessing the health, diversity, and threats to various aquatic species to support effective monitoring conservation efforts. These monitoring efforts include comprehensive surveys and research on freshwater fish species, aquatic mammals, reptiles, birds, and aquatic insects to understand their distribution, abundance, and threats caused by pollution, habitat degradation, over-exploitation, and water diversion. Simultaneously, these monitoring is integral to the capacity building programmes and training of various stakeholders, including local communities, forest department personnel, academic institutions and other relevant groups, to enable informed and participatory biodiversity management. The Ganga River Basin is vast, with area of 8,61,000 km^2, occupies approximately 26.3% of India's geographical area (Sanghi & Kaushal, 2014; Trivedi, 2010) and supporting rich aquatic biodiversity, including critically endangered species such as the Gangetic dolphin, gharial, and various freshwater turtles and fishes (e.g., golden mahseer, hilsa). The basin is spread across the 11 states viz. Himachal Pradesh,

Uttarakhand, Uttar Pradesh, Delhi, Haryana, Rajasthan, Bihar, Jharkhand, Chhattisgarh, Madhya Pradesh, and West Bengal (NGRBA, 2011). The basin shows a high degree of heterogeneity in terms of climate, geomorphology, soil, biogeography, culture and socio-economic structure.

Effective ecological monitoring combined with capacity building programmes and trainings of various stakeholders enables the maintenance of ecosystem integrity and ensures the sustainable use of aquatic resources. Trained stakeholders contribute to generating scientific data necessary for conservation planning, policy formulation, and adaptive management of the riverine biodiversity of Ganga River and its tributaries. Training and disseminating knowledge also help non-scientific groups understand the importance and cause of biodiversity decline in freshwater ecosystem. This integrated approach helps in understanding the biodiversity profile of keystone species, status of river monitoring and habitat assessment, reduce species decline, Point and non-point sources of pollution, and mitigate human-induced pressures on the aquatic ecosystem.

2.4.3 Rescue and Rehabilitation Techniques

Wildlife rescue refers to operations that usually involve saving the life of the animal, or prevention of additional injury to the animal i.e., extricating the wild animal from an undesirable state. Wildlife rehabilitation on the other hand includes restoring wild animals back to their natural state. According to National Wildlife rehabilitator's Association, USA, rehabilitation is referred as "treatment and temporary care of injured, diseased, and displaced animals, and the subsequent release of healthy animals to appropriate habitats in the wild". Rescuing wild animals and rehabilitating them back into the wild is both an art and science. A rescue operation can be successful if the team is prepared, equipped, appropriately informed and trained. The rescue operation ends when the animals is removed from distress situation. However, rescue is incomplete until the animal is rehabilitated and eventually released back to their natural habitat.

The rescue effort requires a multidisciplinary team that is prepared with standardized procedures and plans for situations encountered routinely in their area of operations. The success of efforts is dependent on their skills, knowledge of the species to be handled, and availability of adequate

infrastructure. This would ensure an informed decision-making process for deciding the fate of the animal and its placement in a suitable facility for rehabilitation or lifetime care.

Effective rescue and rehabilitation for achieving conservation goals is a participatory effort involving multiple stakeholders. A multi-disciplinary approach integrating knowledge and experiences from various disciplines can greatly enhance the efficacy of the interventions being made and facilitate proper planning and preparedness for the successful management of animals in distress. Rescue and rehabilitation additionally contribute indirectly to conservation by increasing awareness through outreach programmes and providing opportunities for understanding the biology and behavior of the species. Conventional conservation effort is focused on establishing a network of protected areas with a top-down policy approach; however, conserving the biodiversity of Ganga River Basin requires a different paradigm as the river system has limited protected area coverage and much of the biodiversity needing conservation effort lies outside this network. This would require involving multiple stakeholders that include officials of the forest department for providing the necessary legal framework for rescuing animals and their ultimate release, veterinary professionals of the state animal husbandry departments for providing the requisite veterinary health management required for restoring the sick and injured animals back to fitness to enable their ultimate release and last but not the least members of local communities residing along the river's banks.

The local communities have a traditional dependence on the river's resources for their livelihoods, social needs and beliefs. Local communities are the first responders to field rescues and crucial for protecting populations at release sites. Additionally, these communities have first-hand information of ongoing resource extraction and can serve as first responders by providing relevant information for enforcement and other governmental line agencies engaged in conserving the river and its biodiversity. The skills that can ensure their effective participation include field identification and scientific and handling of the rescued animals. Capacity building of local communities inhabiting riverfront were undertaken with a curriculum specially targeting their role in rescue and rehabilitation protocols of handling aquatic macro-fauna in distress. The other stakeholders who play a major role in rescue and rehabilitation of aquatic macro-fauna are frontline officials of the state forest departments and field veterinarians, zookeepers, Animal

handlers of the state animals husbandry departments. Curriculum based on specific needs of the two different groups were developed and capacity enhancement programmes were conducted for these stakeholders.

Thus, an integrated approach that actively involves local communities in rescue and rehabilitation of higher vertebrate fauna of Ganga River Basin would also have a higher chance of success. Various training programmes to enhance their capacities in skills needed for rescue and rehabilitation of aquatic macro-fauna were undertaken. Enhancing the capacity of personnel from forest departments, animal husbandry departments, field veterinarians, and volunteers is a crucial aspect of ensuring effective rescue and rehabilitation of aquatic fauna in distress. The conservation of biodiversity within the Ganga River Basin requires a well-trained workforce that can respond swiftly to environmental crises, safeguard vulnerable species, and contribute to the overall health of the aquatic ecosystem.

2.4.4 Participatory Management

Participatory management is the practice of empowering members of a group, or citizens of a community, to participate in organizational decision making. The terms 'community' and 'participation' are need to be analyzed separately to get clear understanding. Community participation may denote some other process like community action, consultation, and community empowerment that led the community to achieve various goals toward their betterment. Participation refers the engagement of citizens in the decision-making process during initiation of development plans (Maser, 1997). Oakely (1991) defines the term participation as joining process of rural community with current social, economic and physical resources in order to achieve the goals of community development plans and schemes. In short, community development is the process by which the efforts of the people are united with those of the governmental authorities to improve the economic, social, and cultural conditions of communities, to integrate the communities into the life of the nation, and enable them to contribute to the progress of the nation. Paul (1987) stresses that participation is the changeable and a self-transformational method and learning by practice (Oakely, 1991 & Paul, 1987; cited in Dinbabo, 2003).

Participatory management refers to the process that involves local communities in decision making, formulating, and implementing management schemes, particularly in forest management, to promote equitable benefit sharing and socio-economic development while maintaining ecological health (Jo & Nabatchi, 2021; Talley et al., 2016; Wutich et al., 2020). Participatory management can improve the effectiveness and capacity of an organisation involved in the development management thus contributing to good leadership by the management. It also contributes to an increased transparency in organisational decision making and implementation of the project activities.

The effectiveness of the participatory approach to management and development, depends on the tools we use. This process is, therefore, made up of two essential elements. Firstly, the participation by the people themselves is an effort to improve their level of living, with as much reliance as possible on their own initiatives; and secondly, the provision of technical and other services is a way that encourages initiative, self-help and mutual help and makes these more effective. It is expressed in community programmes designed to achieve a wide variety of specific improvement. Involving local communities and public will create general awareness and understating regarding the changing scenarios of environment problems emerging in different kind of ecosystems particularly in the field of freshwater biodiversity conservation.

Environmental problems are typically complex, uncertain, multi-scale and affect multiple actors and agencies. This demands transparent decision-making that is flexible to changing circumstances, and embraces a diversity of knowledges and values. To achieve this, stakeholder participation is increasingly being sought and embedded into environmental decision-making processes, from local to international scales (e.g., Stringer et al., 2007). Widespread acceptance and promotion of participation has partly been driven by increasing public scepticism about science, increasing knowledge and interest in environmental decisions (Irwin's (1995) ''citizens'science'') and ongoing policy trends that emphasise sustainable development and partnership working (Younge and Fowkes, 2003; Richards et al., 2004). Also Including the public in environmental monitoring, research and decision- making has been an area of growing research among conservation biologists (Reed, 2008) and has implications for understanding the nature of many current pressing contemporary social and ecological issues (Crain et al., 2014).

The interest in this area has given rise to several paradigms related to public participation in decision-making and more inclusive forms of conservation, including citizen science (Bonney et al., 2009) and participatory modelling (Voinov and Bousquet, 2010). Since it is different from the development work of the past, it requires other skills and tools. Participatory Rural Appraisal (PRA) and Participatory Learning and Action (PLA) are among the basic methods, which are commonly used in the participatory development and management. These methods make use of specific tools to enable people to analyse their situation. The tools of PRA and PLA come with a philosophy, which ensure that knowledge of the people is used to empower them, rather than the development worker. Both together form part of the participatory process towards involving people in their own development.

Participation is a process of consultation and willingness to share something and to do something collectively. Participation is a process, in which, everything, from the concept through planning, implementation, monitoring, evaluation, and maintenance, should be in the ownership of the people. The solutions to resolve such problems are rooted within the resource capacities and social organisational structures of the communities. The organising structure presented here to resolve the problems related to the community mobilisation is based on the concepts of self-help, encompassing various distinguishing features of community development theory, practice and ideology. While it is not assumed that all the problems of the communities can be resolved by community's efforts alone, it is seen as a means of achieving broad community participation and effort. Through this means, it is suggested that the living conditions, facilities and services of the community will improve, along with the empowerment of the community.

The bases for participatory management and development should be ‘communities first’ approach and planning/action which leads to the formation of sustainable Community Organisations (COs). The premise of participatory development is that when community members plan and act as a group, in local associations, the result is more lasting and sustainable (as compared to the results using top-down methods of development, defined and dictated by outsiders). Full participation of the community members in social organisation and mobilisation from the beginning will lead to their empowerment and self-sufficiency as members of the Community Organisations. The use of participatory tools to empower communities not only helps

them to develop sustainable associations and take action on their own behalf, but also helps field workers, agency and government workers to understand and appreciate local communities, local people and local institutions; thus, a participatory approach is many-sided. The active involvement of local people in the process is more productive, realistic, appropriate, dynamic and empowering than the questionnaire survey approach to research or the dependency-creating methods of top-down development. There are many tools for participatory development (Maser, 1997).

It is also encouraged people within their own environment to involve successfully in the decision-making process, when government allow community participation (Abott, 1995). Community development is a unique concept and a new paradigm in the development phenomena. This new strategy of development often associated with participatory procedures to ensure greater association of local community in the process of the decision making. It always improves a practical knowledge and skills of local people to involve in the development initiatives (Maser, 1997 & Hawken, 1983). This above conceptualization has given basic idea of numerous matters like community, development, participation, community participation, participatory development and community development etc.

Communities play a crucial role in conserving biodiversity in natural ecosystems. However, community-based conservation as a remedy, like government-based conservation, ignores the necessity of institutionalizing and managing common resources. Community-based conservation is generally seen as having two central objectives: to enhance conservation of biodiversity, and to provide economic, social, cultural, and political stability to dependent communities. Success of community-based conservation is often governed by the level of participation from stakeholders. Education and information, consultation, partnership, grass-root negotiation, empowerment, livelihood-conservation linkages, advocacy and community-based management to ensure and sustain the involvement of people and reinforce their participation from passive to self-mobilized, are some of the tools and approaches to mobilize the communities for their participation in conservation goals.

Ganga River is the lifeline for millions of people across the Himalayas and the Gangetic plains. The unique importance of this multifaceted Ganga basin stems from its geographical, historical, socio-cultural, environmental, and economic values. Ganga as a natural ecosystem provides numerous ecosystem services. People are dependent on its regulating, provisioning, supporting and cultural services. High dependence on river resources and lack of livelihood opportunities, and poverty have adversely affected the ability of Ganga to provide crucial ecosystem services. Socio-economic structures, resource dependencies and cultural traditions change as the river flows from the Himalayas to Ganga Sagar, resulting in multiple stakeholders with varying needs and interests. Availability, type and quality of the resources not only shape the stakeholder composition but also the socio-cultural structure of the communities residing along the river. Although people living along Ganga River and its tributaries are dependent on its resources, the association is complicated to understand and manage. However, these complexities and linkages need to be decoded to conserve Ganga River basin as an ecological, cultural and economic entity.

2.4.1.4 Conservation Education

Conservation education is the process of influencing people's attitudes, emotions, knowledge, and behaviours about wildlife and wild places. This is done through the efforts of skilled educators and interpreters, who use a variety of techniques, methods, and assessments to reconnect people with the natural world (Schultz, 2011; Gusset and Lowry, 2014). This helps people of all ages understand and appreciate our country's natural resources and learn how to conserve those resources for future generations. Through structured educational experiences and activities targeted at varying age groups and populations, conservation education enables people to realize how natural resources and ecosystems affect each other, and, how resources can be used wisely. Through conservation education, people develop the critical thinking skills they need to understand the complexities of ecological problems. It also encourages people to act on their own to conserve natural resources and use them in a responsible manner by making informed resource decisions.

Spreading knowledge about the recent changes in environment and ecosystems at grass root level will help in saving these threatened ecosystems facing problems due to both environmental

and anthropogenic pressures. Conservation awareness on important issues of environment through subjects like conservation education can help in involving multiple stakeholders. Conservation education is the process of influencing people's attitudes, emotions, knowledge, and behaviours about wildlife and wild places. This is done through the efforts of skilled educators and interpreters, who use a variety of techniques, methods, and assessments to reconnect people with the natural world (Schultz, 2011; Gusset and Lowry, 2014). This helps people of all ages understand and appreciate our country's natural resources and learn how to conserve those resources for future generations. Through structured educational experiences and activities targeted to varying age groups and populations, conservation education enables people to realize how natural resources and ecosystems affect each other and how resources can be used wisely. Through conservation education, people develop the critical thinking skills they need to understand the complexities of ecological problems. It also encourages people to act on their own to conserve natural resources and use them in a responsible manner by making informed resource decisions.

To engage stakeholders, conservation education employs several methods, including workshops and training programmes tailored to provide specific skills and knowledge. These programmes, when designed for local communities, can highlight effective practices in natural resource management, thereby strengthening local conservation efforts (Njera & Kafakoma, 2017). Community participation in hands-on conservation projects assist in enhancing the success of conservation initiatives (Adams et al., 2024; Tadesse, 2024). Collaboration with organizations such as local governments, NGOs, and educational institutions further amplifies the impact of conservation education by enabling resource sharing, knowledge transfer, and capacity building (Tadesse, 2024). Moreover, conservation education supports informed decision-making by equipping stakeholders with a better understanding of ecological processes (Baba, 2020). It also aids in conflict mitigation, as education bridges understanding among stakeholders with differing interests, thus reducing conflicts and building collaboration in conservation initiatives (Bongi et al., 2023).

Conservation awareness on important issues of environment through subjects like conservation education can help in involving multiple stakeholders. The approaches for Conservation Education are listed below:

a) Awareness Workshops - Structured workshops serve as platforms for dialogue, enabling participants to discuss local environmental issues and collaboratively devise solutions (Ortiz & Karazsia, 2013). Workshops typically include activities such as group discussions, hands-on projects, and field trips, which enhance learning retention and stimulate participant interest (Rodrigues et al. 2017).

b) School Curricular Integration - Integrating conservation education encourages critical thinking and problem-solving skills. Students learn to analyze complex issues concerning biodiversity loss, habitat destruction, and resource management. This educational approach nurtures their ability to assess information critically and make informed decisions related to environmental conservation (Tua et al. 2022). Research indicates that when students are actively involved in conservation programs, they are more likely to adopt sustainable habits (Risna & Yuriawan, 2019).

c) Teacher training - Teachers serve as role models; their attitudes and behaviours toward the environment directly influence their students, promoting a culture of sustainability (Kandir et al. 2012). Well-trained teachers are more capable of instilling a sense of responsibility and awareness about environmental conservation among students, which can lead to long-term behavioral changes (Lukas et al. 2019). Trained teachers are often more engaged with the community, facilitating partnerships between schools and local conservation organizations, which can lead to practical conservation efforts (Katz, 2019)

d) Experiential Learning - Experiential education emphasizes learning through context, allowing students to relate their experiences to abstract concepts in conservation, making the learning experience more meaningful (Franquesa et al. 2019). Learners are involved in activities like wildlife monitoring, habitat restoration, and community clean-up. By participating in projects and reflecting on their experiences, learners can evaluate the consequences of their actions and the effectiveness of different conservation strategies (Tolhurst et al. 2023).

e) Nature Interpretation - Effective nature interpretation presents the complex interactions within ecosystems in a simplified manner. For example, programs that focus on local biodiversity allow participants to recognize the importance of each species and the consequences of their loss (Costa et al. 2010). Through guided nature walks or interactive exhibits, nature interpretation cultivates emotional connections between individuals and the environment. This emotional investment can significantly influence individuals' attitudes towards conservation efforts and motivate them to take action to protect the environment (Bates et al. 2008).

f) Citizen Science and Community Participation - Citizen science and community participation are vital components in promoting conservation education. They engage the public in scientific research and decision-making processes, resulting in enhanced awareness, data collection, and community involvement. Citizen scientists not only learn about data collection methods but they contribute to a broader understanding of environmental dynamics (Barbiéri et al. 2023). This collaborative model creates a wealth of ecological data that supports conservation efforts and informs policy decisions (Roy & Doss, 2007).

g) Capacity Building Workshops - These workshops equip individuals with critical information about biodiversity, ecosystem services, and the impacts of human activities on the environment (Torre et al. 2022). Capacity building leads to a more integrated approach to conservation by equipping managers and stakeholders with the tools and methodologies necessary to address complex environmental challenges (Baral, 2014)

h) Environmental Clubs and Societies - Environmental clubs are primarily designed to develop an understanding of environmental issues among their members and the broader community. Members learn about local ecosystems, species diversity, and the importance of preserving natural habitats (Njau, 2024). Clubs often address topics such as waste management, sustainable practices in agriculture, climate change and pollution control (Njau, 2024; Kioko & Kiringe, 2010). Participation in clubs helps develop leadership and teamwork skills as members plan and execute activities collaboratively (McDuff, 2000).

i) Mass Awareness Programmes - Mass awareness initiatives reach large audiences, making conservation concepts accessible and engaging like thematic exhibitions setup that brings

interactive displays, models, and educational content directly to communities. These programs educate the public about the significance of biodiversity and the threats faced by various species and ecosystems, thereby increasing awareness of the need for conservation measures (Borromeo, 2012).

Customizing content for different audiences in conservation education is equally crucial to effectively engage and educate various stakeholders. Tailoring messages and materials ensure that participants relate better to the content, understand its relevance, and are more likely to take action. For example, using interactive and relatable content for younger audiences, such as stories or games, can make complex conservation topics more accessible. Adults may benefit more from data-driven presentations and case studies that highlight the economic and social impacts of conservation practices (Xu et al. 2014; Alier et al. 2024). By establishing relevance, the likelihood of audience participation and retention of information increases significantly (Alier et al. 2024).

CHAPTER 3 METHODOLOGY

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 Basin. 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.

It is radically different to design training programmes and material for adults than any other target group. The training programme for adults executed in an andragogy mode so as to ensure development of adequate competence among the participants. Since the training programme has to be implemented in eleven Ganga basin states, for an array of stakeholders, it is important to recognize that participants learn differently and this therefore, requires use of multiple training methods.

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.

3.1 Training Techniques

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.

The training programmes were designed in ways that address the competency of the trainees to contribute in conserving river and its biodiversity. Competency based training is designed to allow a learner to demonstrate their ability to perform a specific task by mastering a predefined set of knowledge, skills, and behaviors, rather than focusing on time spent in the classroom. We did not rely on lectures to conduct the training programmes. Rather, we used an array of techniques to ensure the retention of learning with the trainees. This involved case studies, simulated exercises, role plays etc. Learning by doing has been found to be effective in aiding retention. 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 eleven Ganga Basin states. Special attention was paid to simplifying technical jargon, using visuals and locally relevant analogies, especially for field-level personnel and community participants.

The vital step in developing a capacity-training course is to identify the actual and potential role of different target groups in the overall plan for Ganga River conservation. This is done through a process of meetings, dialogues, and workshops. This also enables us to identify their training

requirements. The training needs were identified on the premises that these depend on the following factors viz. the level at which the target groups are operating or may operate in the future, their current levels of knowledge and skill sets, location along the river, mandate, motivation levels and as well as willingness to contribute to biodiversity conservation and integrity of Ganga River Basin. Once the training needs are identified, the next step is to develop objectives to be accomplished by the training. As a result, it will be possible to determine what knowledge and skills are needed (Annexure III).

The capacity building and training programme is designed around these requirements of skills and knowledge. Program implementation requires coordination among the training team, and exhaustive planning, particularly since several of these programmes are implemented onsite were logistics maybe very poor. No plan for implementing a training programme will be complete without a mechanism to ensure regular monitoring, and evaluation. While the monitoring protocol can enable mid-course corrections, the evaluation can be important both from the point of view of trainers and trainees. Monitoring at regular intervals can enable the trainers to understand the level of comprehension of the trainees, while the evaluation by the trainees or even a third party will be important to understand the effectiveness of the programme.

3.2 Training Model

The effectiveness of the training initiatives was evaluated using the Kirkpatrick Four-Level Training Evaluation Model (Figure 3.1), 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 Basin.

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.

Level 1: Reaction

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.

Level 2: Learning

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.

Level 3: Behaviour

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.

Level 4: Results

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).

Figure 3.1: Kirkpatrick Four-Level Training Evaluation Model

3.3 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 2020 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. A total of 2608 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. Data were analyzed 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. Descriptive statistics, as foundational tools in social research, were critical in identifying trends and supporting the overall evaluation framework (Gravetter & Wallnau, 2016).

3.4 Data Analysis – Monitoring and Evaluation

To assess the retention level among the school students, a pre and post questionnaire survey was administered (Annexure II). Before starting the interactive session on river conservation with the children, a questionnaire was circulated. The questionnaire included - demographic information, knowledge about biodiversity, heritage and conservation values, Intentions and Attitude towards biodiversity conservation. Three months after the interactive session was conducted, we revisited schools and targeted the same students who had participated in the interactive session to find out about their retention.

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The pre- and post-training scores of all 697 participants from the eleven Ganga River Basin 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 = 697). 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.

CHAPTER 4 RESULT

4.1 Generation of Training Materials

To develop the training materials, extensive literature reviews were carried out and, through training need assessment workshops, various information products were generated based on the requirements of diverse stakeholder groups. A total of 23 training workshops for different target groups were organized across the Ganga River Basin for field-testing and training need assessment (Table 4.1).

Table 4.1: Training needs assessment workshops with different target groups for designing of training materials at Ganga River Basin

Stakeholders	States	Districts	Total No. of Trainings	Total No. of Participants
Forest Officials	Uttar Pradesh	Varanasi	4	139
	Uttarakhand	Uttarkashi		
	Bihar	Bhagalpur		
	West Bengal	South 24 Parganas		
Veterinarians	Uttar Pradesh	Varanasi	1	30
Zookeeper & Staff	Uttar Pradesh	Gorakhpur Kanpur Dehat Lucknow	1	55
State Program Management Group (SPMG)	Uttarakhand	Dehradun	1	33
Ganga Prahari	West Bengal	Nadia	3	97
	Bihar	Bhagalpur		
	Uttarakhand	Dehradun		
Religious Group	West Bengal	Nadia	3	75
	Uttarakhand	Dehradun		
	Uttarakhand	Haridwar		
Local Community	West Bengal	North 24 Parganas	3	125
	Uttar Pradesh	Bijnor, Chitrakoot, Ghaziabad, Muzaffarnagar, Varanasi		
	Jharkhand	Sahibganj		
NGOs	West Bengal	Hooghly	1	39
Media	Uttar Pradesh	Bulandshahr	1	14
ETF-GTF	Uttar Pradesh	Prayagraj	1	50

Researchers and Scientist	Uttarakhand	Dehradun	1	30
Tourist Guide	Uttarakhand	Dehradun	1	27
College Students	Madhya Pradesh	Morena	1	50
School Students	Bihar	Samastipur	1	200
14	**6**	**21**	**23**	**964**

The inputs, recommendations, and technical expertise received from subject experts, field practitioners, academicians, veterinarians, conservation professionals, and implementing agencies were systematically incorporated during the development and refinement of the training content. Based on these consultations and assessments, specialized training materials were generated for capacity-building programmes in the Ganga River Basin to support effective knowledge dissemination and practical skill enhancement among participants. The details of the specialized training materials developed under the programme are presented in Table 4.2.

Table 4.2: List of training materials generated for capacity building programmes in the Ganga River Basin

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 Basin.
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 Basin.
7	Life Along the Yamuna	Booklet (Hindi & English)	This booklet highlights the biodiversity of Yamuna River Basin featuring diverse flora and fauna, ecosystems, and species.
8	Life in Ganga	Brochure	This brochure depicts the journey of Ganga River from its origin to sink.
9	Floral Diversity of Yamuna River	Brochure	Discover the vibrant floral diversity of the Yamuna River. This brochure highlights the rich variety of plant species found along the river's bank, showcasing their diversity, ecological importance, and cultural significance.
10	Heritage of Yamuna	Brochure	This brochure highlights the rich heritage of the Yamuna River, which flows through some of India's most historic cities.
11	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.
12	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.
13	Festivals of Ganga	Brochure	The brochure highlights the different festival of Ganga River Basin highlighting the cultural and ritual practices of people associated with rivers.
14	Stakeholder Engagement	Brochure	The brochure provides complete information regarding formulation and implementation of training programmes.
15	Birds of Yamuna River	Poster	This poster highlights the rich diversity of avifauna along the Yamuna River.

16	Life along the Yamuna	Poster	This poster, 'Life along the Yamuna', showcases the Yamuna basin's rich biodiversity, featuring diverse flora and fauna, ecosystems, and species.
17	Yamuna ka Safar	Poster	"Yamuna ka Safar" is a captivating poster about the Journey of Yamuna River.
18	Floral Diversity of Ganga River: Trees (Part I, II and III)	Poster (Hindi & English)	The poster highlights the different tree diversity of Ganga River Basin.
19	Floral Diversity of Ganga River: Shrubs	Poster (Hindi & English)	The poster highlights the different shrubs diversity of Ganga River Basin.
20	Floral Diversity of Ganga River: Herbs	Poster (Hindi & English)	The poster highlights the different Herbs diversity of Ganga River Basin.
21	Floral Diversity of Ganga River: Climbers	Poster (Hindi & English)	The poster highlights the different climber's diversity of Ganga River Basin.
22	Butterflies of Ganga River	Poster (Hindi & English)	The poster highlights the different butterfly species of Ganga River Basin.
23	Crocodiles	Poster	The poster highlights the different crocodilian species of Ganga River Basin
24	Otters	Poster	The poster highlights the different Otter species of Ganga River Basin.
25	Dolphins	Poster	The poster highlights the different freshwater Dolphin species of Ganga River Basin.
26	*Bacchon ka Akhbar*	Newspaper Bimonthly	Children Newspaper on Ganga Biodiversity printed bimonthly.

After finalization, the training programmes were delivered according to the constitution of the target groups, categorized into policy, implementation, and execution levels, and structured under five major thematic modules. Based on these modules, diverse training programmes were organized along the Ganga River and its associated tributaries to strengthen conservation awareness, technical capacity, and stakeholder engagement across the basin.

4.2 Stakeholder Participation Detail of Capacity Building Programmes

4.2.1 Overview of the Capacity Building Programmes

The capacity-building and stakeholder sensitization programmes under the Ganga River Basin biodiversity conservation initiative were implemented at a comprehensive basin-wide scale, covering eleven states across the Ganga River Basin. This expanded geographic coverage ensured a holistic and integrated approach to riverine biodiversity conservation, addressing ecological processes that extend beyond administrative and political boundaries. A cumulative total of 8,903 participants were trained through 132 trainings including on-site (84, 63.64%) and off-site training (48, 36.36%) programmes (Figure 4.3, Annexure I), reflecting a sustained and systematic effort to strengthen conservation capacity at multiple institutional and community levels.

Participants were trained and sensitized under five thematic modules, namely biodiversity monitoring, conservation education, participatory management, rescue and rehabilitation, and conservation education. These modules were designed to address both technical and social dimensions of river conservation. The basin-wide execution of these programmes contributed to the development of a multi-tiered network of trained stakeholders, including government officials, academic institutions, frontline conservation workers, volunteers, and local communities. This extensive outreach was strategically designed to bridge the gap between policy and practice, ensuring that conservation measures are not confined to planning frameworks but are translated into effective on-ground action throughout the Ganga River Basin.

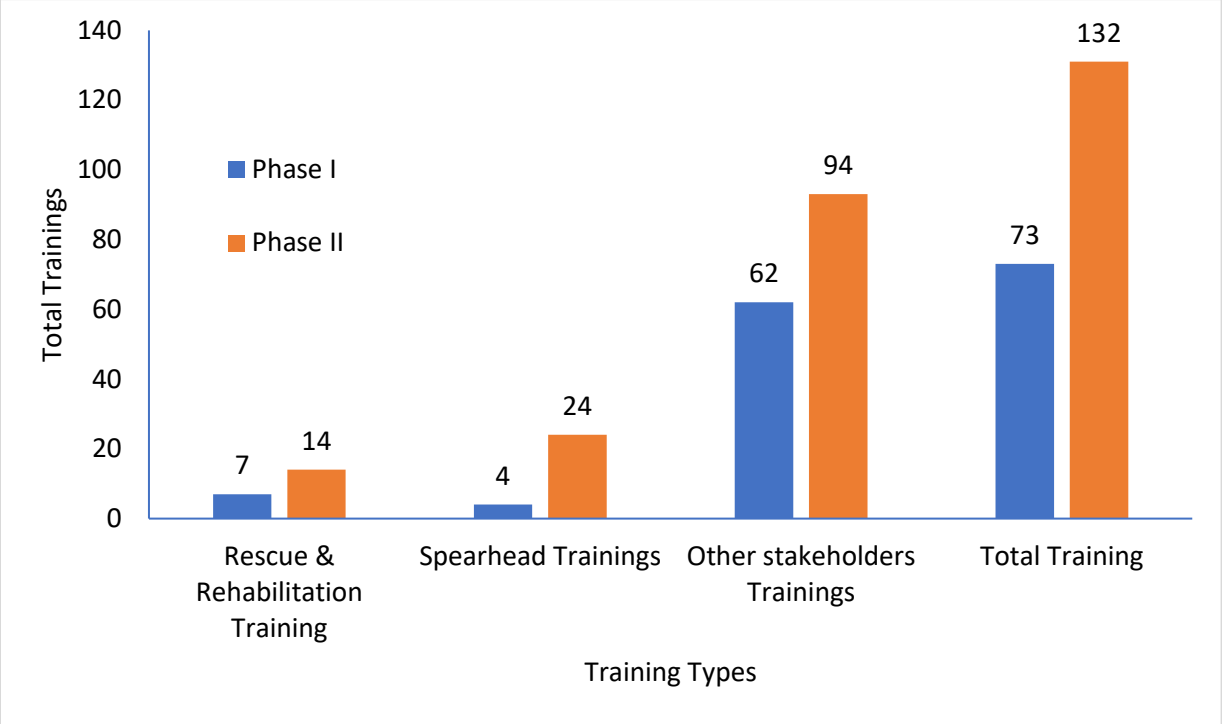


Figure 4.1: Increase in Efforts and Trainings in Phase II as Compared to Phase I Under NMCG-WII Programme

A marked increase in training efforts was observed between Phase I and Phase II of the project, corresponding with the expansion of coverage from five main stem Ganga states to eleven basin-level states. This transition reflects a strategic shift from a linear, river-stretch-focused approach to a basin-scale conservation framework, recognizing the interconnected nature of riverine ecosystems. During Phase I, a total of 73 training programmes were conducted, including 7 Rescue and Rehabilitation trainings, 4 Spearhead trainings, and 62 trainings for other stakeholder groups (Figure 4.1). In Phase II, the number of training programmes increased substantially to 132, comprising 14 Rescue and Rehabilitation trainings, 24 Spearhead trainings, and 94 trainings for other stakeholders (Figure 4.1). This represents nearly a 1.8-fold increase in overall training activities, with particularly significant growth in Spearhead trainings, indicating strengthened emphasis on developing local leadership and rapid-response conservation teams.

The expansion in both geographic scope and training intensity demonstrates the programme's adaptive and scalable design. By extending capacity-building efforts across the entire Ganga River Basin, the initiative has reinforced institutional preparedness, enhanced community

participation, and improved technical capabilities for biodiversity conservation. Collectively, these outcomes contribute to a more resilient and coordinated framework for the long-term protection and sustainable management of biodiversity within the Ganga River Basin.

4.2.2 Overall Participation in Capacity Building Programmes in the Ganga River Basin

4.2.2.1 State and Stakeholder Wise Participation

The participation data highlights significant engagement across the basin, with Uttar Pradesh recording the highest participation of 3,586 individuals, followed by Uttarakhand with 2,369 participants and Bihar with 997 participants (Table 4.3, Figure 4.2). Substantial engagement was also recorded in Rajasthan (588), Madhya Pradesh (398), and Jharkhand (349), alongside contributions from West Bengal, Delhi, Himachal Pradesh, Haryana, and Chhattisgarh (Table 4.3, Figure 4.2). This wide geographic distribution underscores the project's commitment to addressing the diverse ecological challenges present in different stretches of the river, from the upper Himalayas to the estuarine delta.

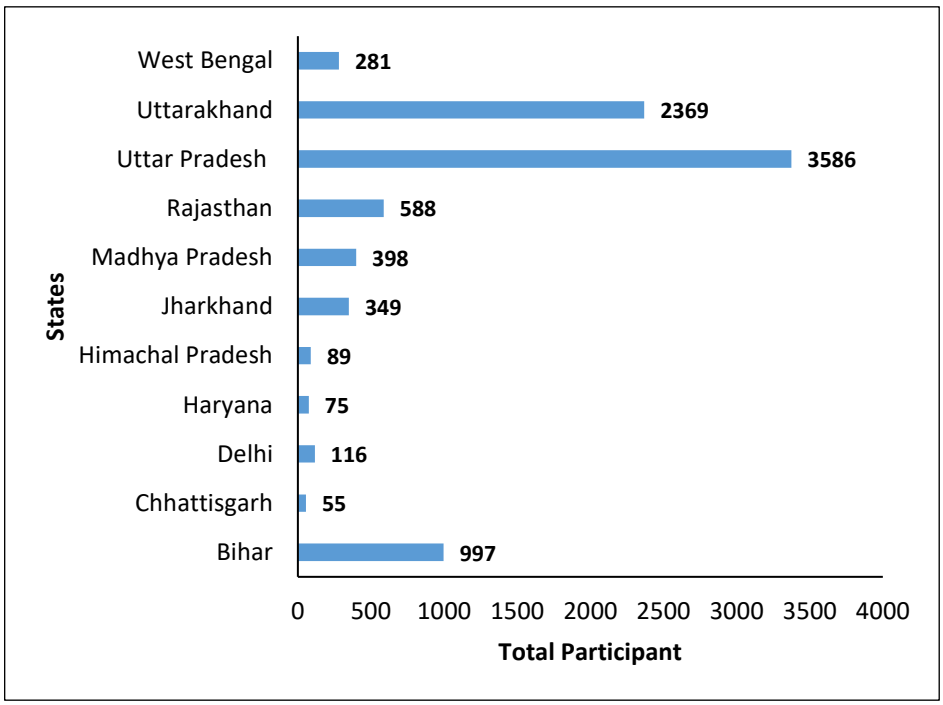


Figure 4.2: State Wise Overall Participation of Stakeholders in Capacity Building Training Programmes

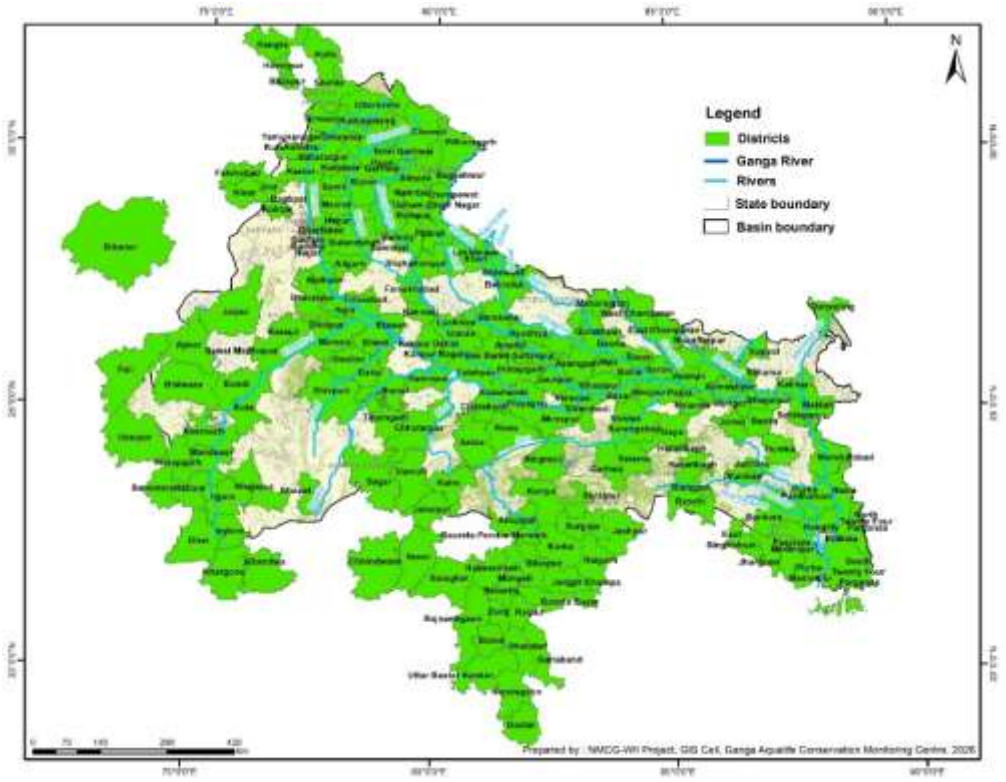


Figure 4.3: Overall Participation in Capacity Building Programmes in the Ganga River Basin

Table 4.3: Overall Participation in Capacity Building Programmes in the Ganga River Basin

States	College Professor	College Students	ETF-GTF	Fisheries Officials	Forest Officials	Ganga Prahari	Irrigation Department & Engineers	Line Agencies	Local Community	Media	NCC	NGOs & Volunteers	NSS	NYKS	Police Personnels	Religious Group	Researchers	School Students	School Teachers	Scientists	Tourist Guide	Veterinarians	Zookeeper & Staff	Total
Bihar	8	25		3	270	454		3	33	11	15	20	46	6			55	31	7			10		997
Chhattisgarh	1			6									38						10					55
Delhi	14			2				2					90						3	5				116
Haryana	6			4		8	3		6				9						11			28		75
Himachal Pradesh	5	18		2	35	10			8								1		6			4		89
Jharkhand	1			4	1	266			15		7	3	42				1	3	6					349
Madhya Pradesh	22	185		4	104	9		2	4				53				1	6	6	2				398
Rajasthan	12	37	1	6	281	4	9	5				1	11				1	81	2	1		136		588
Uttar Pradesh	54	910	141	4	700	527	10	2	199		45	17	176	18	55	211	2	298	27	6	79	10	95	3586
Uttarakhand	45	393	30	5	288	558	11		36		86	38	300	6	18		4	404	107	4	5	2	29	2369
West Bengal	5		3		45	142	1	5	25			3	26	5				10	11					281
Total	173	1568	175	40	1724	1978	34	19	326	11	153	82	791	35	73	211	65	833	196	18	84	190	124	8903

The importance of these training programmes lies in their ability to translate scientific knowledge into actionable conservation practices for a diverse array of stakeholders. Conservation of the Ganga River's biodiversity requires more than just pollution abatement; it demands active management of aquatic species, habitat restoration, and community stewardship.

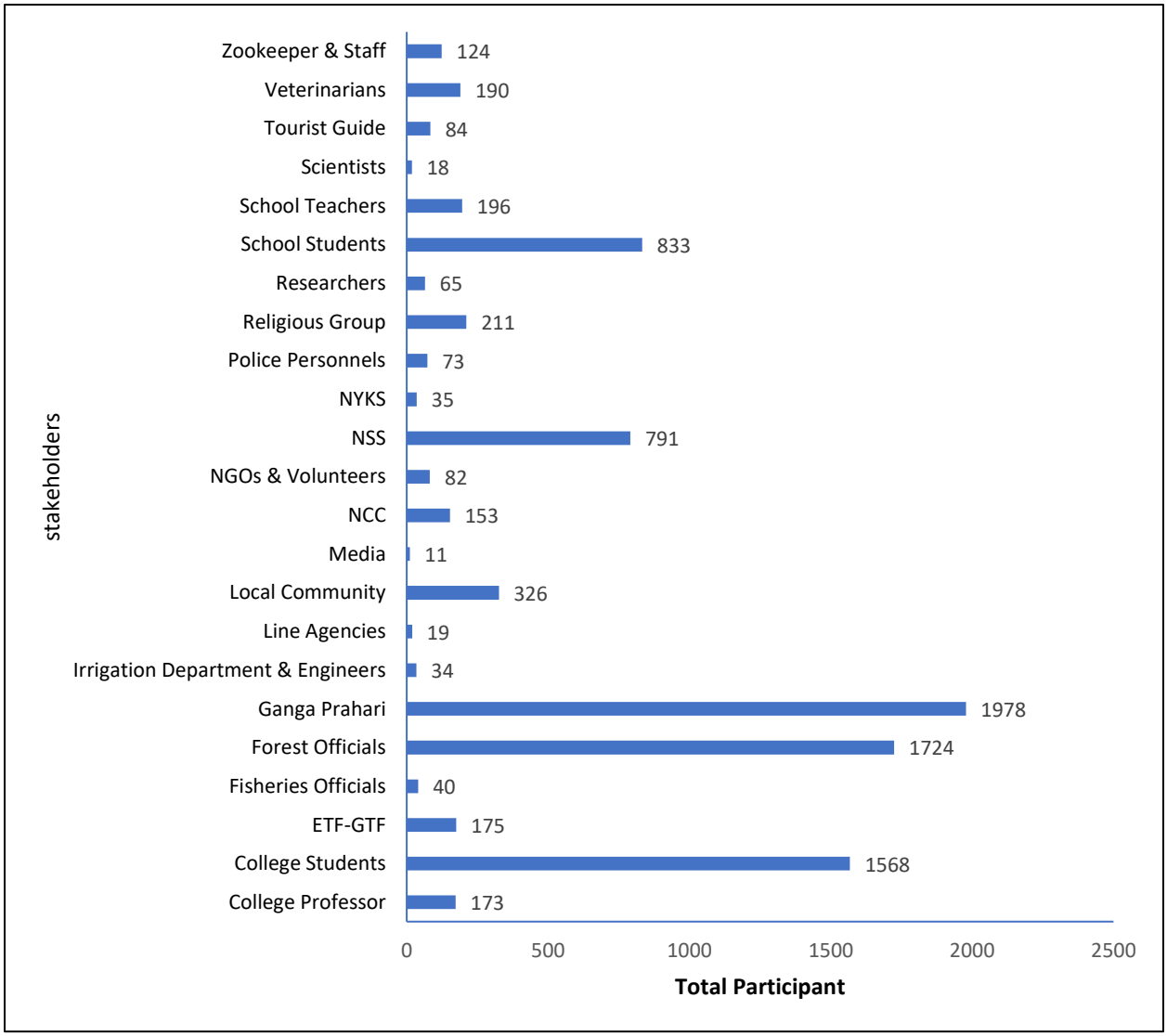


Figure 4.4: Stakeholder Wise Overall Participation in Capacity Building Training Programmes

To achieve this, the capacity building initiatives were tailored to the specific roles of different stakeholder groups. For instance, the training of 1,724 Forest Officials and 190 Veterinarians (Table 4.3, Figure 4.4) was critical for strengthening the legal enforcement and emergency

response mechanisms necessary for protecting endangered species like the Gangetic Dolphin and Gharial. These technical stakeholders act as the primary line of defense against wildlife crime and habitat degradation. By equipping them with specialized skills in aquatic monitoring and rescue protocols, the project has significantly enhanced the institutional capacity to manage the river's biological resources.

Parallel to strengthening institutional frameworks, the project placed immense importance on mobilizing community-based social capital. The engagement of 1,978 Ganga Praharis, who constitute the largest trained group, represents a paradigm shift towards decentralized conservation (Table 4.3, Figure 4.4). These community volunteers, along with 791 NSS volunteers, 153 NCC cadets, 211 religious group members and 82 NYKS members (Table 4.3, Figure 4.4), form a grassroots network capable of sustaining conservation efforts long after formal project interventions conclude.

Detailed state-wise information on the stakeholders trained under the programme is presented in Table 4.3 to facilitate a clearer understanding of the geographic distribution and extent of capacity-building efforts across the river basin. The involvement of local communities, NGOs, and volunteers ensures that the message of biodiversity conservation permeates through the social fabric of the river basin. This bottom-up approach is vital for ensuring ensuring the sustainability of river rejuvenation efforts, as these stakeholders are the permanent custodians of the riverine resources in their respective localities.

Furthermore, the programme prioritized intergenerational equity and long-term behavioral change through the involvement of the educational sector. A combined total of 2,401 students, comprising 1,568 college students and 833 school students, along with 173 college professors and 196 school teachers, were trained to act as ambassadors for the river (**Table 4.3, Figure 4.4**). Integrating conservation education into the academic ecosystem serves to inculcate a sense of environmental responsibility among the youth. This demographic is pivotal for the future of the Ganga River Basin, as their awareness and proactive engagement will determine the trajectory of environmental governance in the coming decades. By engaging such a wide spectrum of stakeholders from high-level researchers and scientists to local tourists guides and zookeepers-

the capacity building initiatives have successfully created a collaborative platform where every section of society contributes to the preservation of the Ganga's ecological heritage.

4.2.2.2 Gender Distribution of Participants in Capacity Building Programmes

A critical component of sustainable river conservation is the inclusive participation of all gender groups, recognizing that women play a pivotal role in water resource management and community mobilization. The capacity building programmes across the Ganga River Basin engaged a total of 8,903 participants, comprising 6,063 males (68.10%) and 2,840 females (31.90%) (Table 4.4, Figure 4.5).

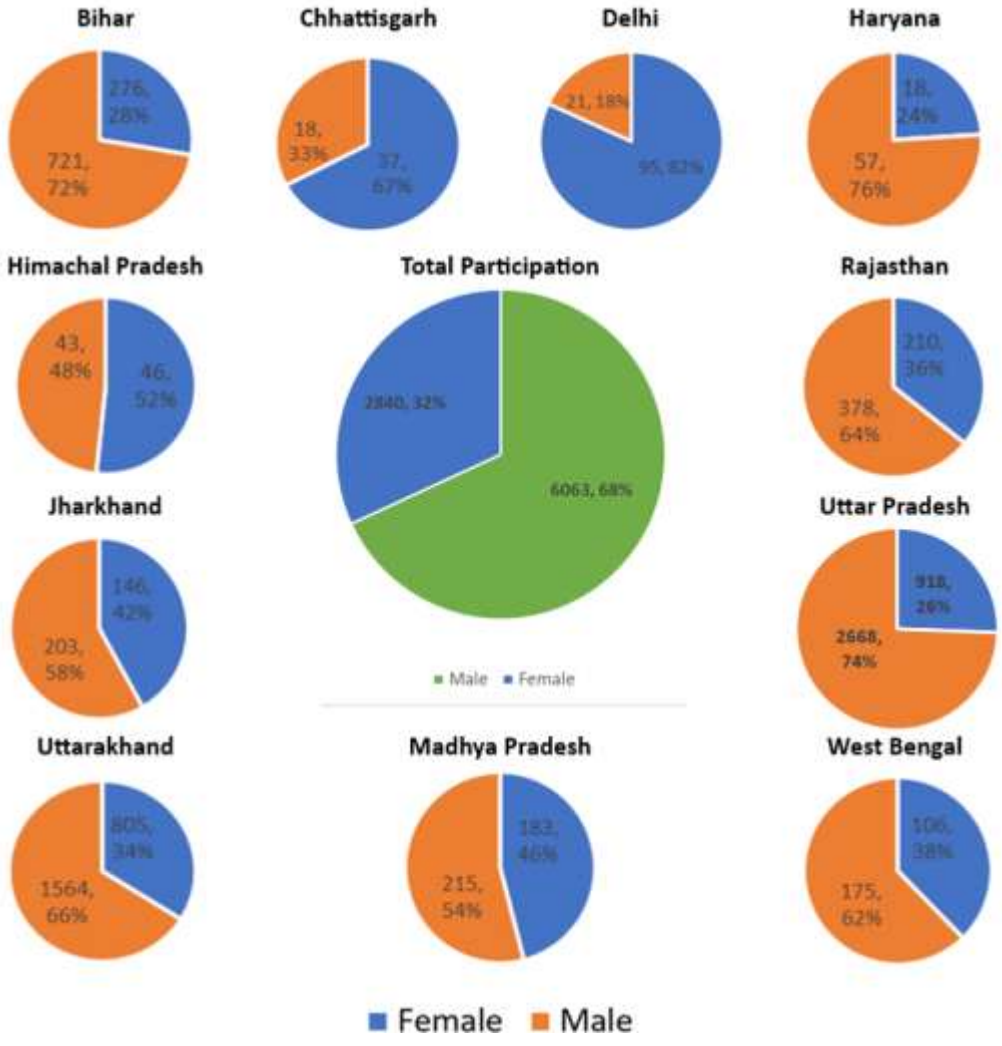


Figure 4.5: Gender-Wise Distribution of Participants Across States

While the overall data reflects a male-dominated participation trend, this is largely influenced by the nature of specific training modules, such as those for Forest Officials and enforcement agencies, which have traditionally higher male representation. However, the presence of nearly 33% female participants indicates a positive shift towards gender mainstreaming in conservation initiatives, particularly in community-centric and educational programmes.

The state-wise analysis reveals distinct variations in gender engagement, often reflecting the socio-cultural context and the target audience of the training sessions in those specific regions. Notably, Delhi emerged as a leader in inclusivity with 81.90% (95) female participation, likely driven by high engagement from educational institutions and urban-based academic workshops. Similarly, Chhattisgarh (37, 67.27%) and Himachal Pradesh (46, 51.69%) displayed exceptional gender balance, with women outnumbering or equaling men. Madhya Pradesh also demonstrated strong female engagement at 45.98% (183), suggesting that conservation efforts in the central Indian basin have successfully tapped into women's self-help groups and community networks (Table 4.4, Figure 4.5).

Table 4.4: Gender-wise Distribution of Participants Across States

State	Female	Male	Total
Bihar	276	721	997
Chhattisgarh	37	18	55
Delhi	95	21	116
Haryana	18	57	75
Himachal Pradesh	46	43	89
Jharkhand	146	203	349
Madhya Pradesh	183	215	398
Rajasthan	210	378	588
Uttar Pradesh	918	2668	3586
Uttarakhand	805	1564	2369
West Bengal	106	175	281
Total	2840	6063	8903

Conversely, states with the highest volume of participants, such as Uttar Pradesh (Male-2668, 74%) and Bihar (Male-721, 72%), recorded lower female representation at 26% (918) and 28% (276) respectively. This disparity can be attributed to the heavy concentration of technical and

enforcement-based trainings in these states, which targeted frontline forest staff and allied departments. Haryana recorded the lowest female participation at 24% (18), highlighting a specific area for future intervention (Figure 4.5). Uttarakhand and Rajasthan maintained a moderate balance with 33.98% (805) and 35.71% (210) female participation respectively, aligning closely with the basin-wide average. These findings underscore the need for continued efforts to design gender-sensitive training modules that can further enhance women's leadership in biodiversity conservation, particularly in the agrarian and rural belts of the Gangetic plains.

4.2.2.3 Yearly Trends in Capacity Building and Stakeholder Engagement

The capacity building initiative under the National Mission for Clean Ganga has demonstrated a sustained and evolving commitment to conservation education over a six-year period from 2020 to 2025 (Figure 4.6). During this timeframe, a total of 8,903 stakeholders were trained, averaging approximately 1,483 participants per year. This consistent engagement underscores the project's resilience and its ability to maintain operational momentum despite varying external challenges. The temporal analysis of the training data reveals a distinct trajectory of growth and consolidation.

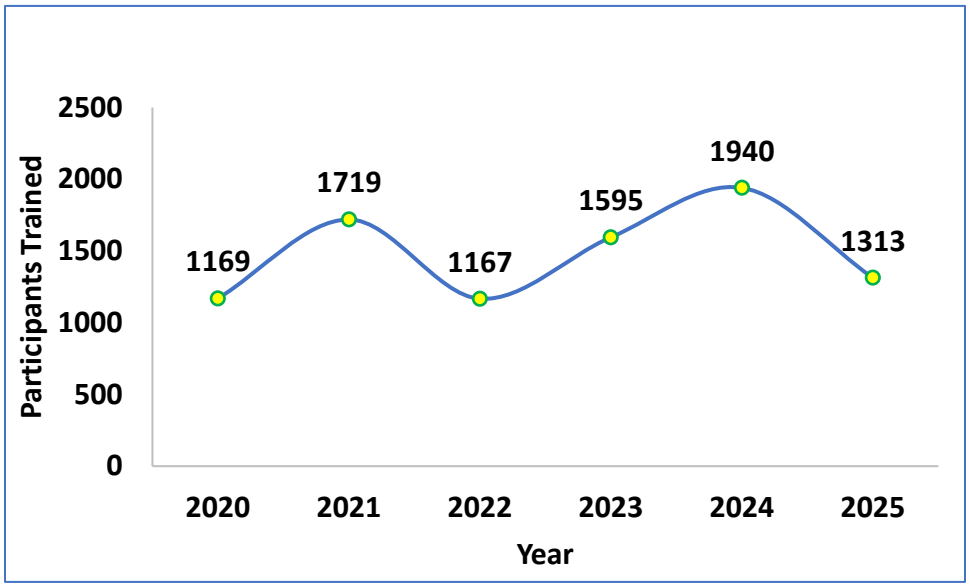


Figure 4.6: Yearly Participation in Capacity Building Programmes (2020–2025)

The programme commenced with a solid foundation in 2020, training 1,169 participants. This was followed by a significant surge in 2021, where participation rose to 1,719, likely driven by an increased emphasis on virtual engagement strategies and the scaling up of initial pilot modules. Following a brief period of calibration in 2022 (1,167 participants) (Figure 4.6), the initiative witnessed a robust upward trend, signaling the maturation of the training framework.

The years 2023 and 2024 marked the peak of the project's outreach effectiveness. In 2023, participation rebounded to 1,595, followed by the highest recorded engagement in 2024, with 1,940 individuals trained in a single year (Figure 4.6). This peak reflects the successful expansion of the stakeholder network and the simultaneous execution of multiple module-based trainings across different states. As the project moved towards its consolidation phase in 2025, the training numbers stabilized at 1,313 participants. This fluctuating yet consistent pattern highlights the dynamic nature of the capacity building efforts, which effectively adapted to the changing needs of the river basin and the availability of target groups over the project lifecycle.

4.2.2.4 Temporal Distribution of Training Programmes Based on Duration

The design of the capacity building programmes employed a flexible and adaptive duration strategy, tailored to the specific learning objectives and availability of different stakeholder groups. A total of 132 training sessions were conducted, ranging from intensive single-day workshops to extensive multi-week courses (Figure 4.7, Table 4.5). This stratified approach ensured a balance between broad-based sensitization and deep technical skill development.

The data indicates a strong preference for short-duration engagements to maximize participation without causing significant disruption to the stakeholders' professional or academic schedules. Single-day trainings were the most frequent, with 50 sessions (37.88%) conducted (Table 4.5). These were primarily utilized for mass awareness, community mobilization (such as for Ganga Praharis), and introductory sensitization for schools and colleges.

Medium-duration programmes, spanning 2 to 3 days, accounted for a substantial portion of the initiative, with 38 and 31 sessions respectively. Together, these 1-3-day programmes constitute approximately 90% of the total trainings (Table 4.5).

Table 4.5: Frequency of Training Programmes based on Duration of Engagement

Training Day	Number of trainings conducted	Primary Objective & Target Audience
1	50	**Sensitization:** Mass awareness for schools, communities, and volunteers.
2	38	**Capacity Building:** Introductory technical skills for field staff and students.
3	31	**Skill Development:** Module-based workshops (e.g., Rescue protocols).
4	5	**Advanced Training:** Specialized topics for officers and researchers.
5	2	**TOT (Train of Trainers):** Creating future resource persons.
6	3	**Field Intensive:** Practical biodiversity survey methods.
8	2	**Comprehensive Course:** In-depth ecological management.
17	1	**Specialized Certification:** Advanced research or leadership course.
	132	

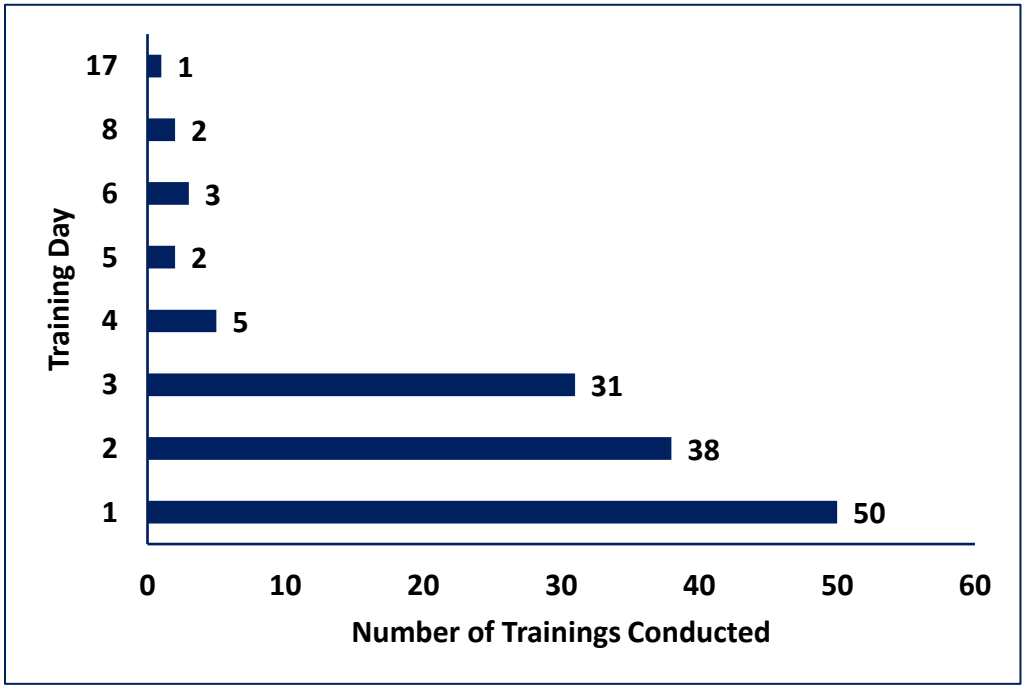


Figure 4.7: Frequency of Training Programmes Based on Duration of Engagement

This duration is ideal for technical modules such as "Wetland Conservation" or "Rescue and Rehabilitation," where participants like Forest Officials and Veterinarians require focused, hands-on instruction but cannot be away from their duties for extended periods. Longer-duration trainings, while fewer in number, played a crucial role in creating high-level expertise. The 13 sessions ranging from 4 to 17 days were likely dedicated to "Spearhead Teams" and "Master Trainers" (Table 4.5). This mix of duration ensures that the project delivers both breadth in awareness and depth in technical capability.

4.2.2.5 District-Wise Distribution of Overall Participants in the Ganga River Basin

The capacity building initiative under the National Mission for Clean Ganga achieved a comprehensive geographical footprint, extending its reach to 199 districts across 11 states of the river basin (Figure 4.3, Table 4.6). This extensive coverage demonstrates the project's commitment to a decentralized conservation strategy, ensuring that knowledge and skills are disseminated not just in state capitals but deep into the hinterlands where the river's biodiversity is most vulnerable. By engaging stakeholders across such a vast administrative landscape, the programme successfully established a contiguous corridor of trained personnel and community volunteers along the main stem of the Ganga as well as its major tributaries like the Yamuna and Chambal.

A granular analysis of the district-level data reveals that participation was highest in districts serving as institutional or ecological hubs. In Uttarakhand, Dehradun recorded the highest single-district participation in the entire basin with 1,219 individuals (Table 4.6). This high concentration is attributed to the presence of key research and training institutions, such as the Wildlife Institute of India, which served as the nodal center for many specialized courses. Similarly, Haridwar and Tehri Garhwal showed robust engagement with 444 and 426 participants respectively, reflecting the focus on managing high-tourism zones and upper-river ecosystems (Table 4.6).

In Uttar Pradesh, which covers the longest stretch of the river, participation was widely distributed across 56 districts. Varanasi emerged as a major focal point with 681 trained

stakeholders, followed by Gorakhpur with 563 participants (Table 4.6). These numbers underscore the strategic emphasis on culturally significant cities where community mobilization is essential for river rejuvenation. Other key districts in Uttar Pradesh, such as Ayodhya (291), Lucknow (254), and Prayagraj (235), also displayed high engagement, creating strong local networks capable of addressing urban river management challenges (Table 4.6).

In the middle and lower stretches of the basin, the training targeted districts with critical wildlife habitats. In Bihar, participation was recorded across 26 districts, with West Champaran leading at 366 participants, followed by Bhagalpur with 205 (Table 4.6). The high engagement in West Champaran is particularly significant for the conservation of the Gandak River's biodiversity, while Bhagalpur's involvement is crucial for the protection of the Vikramshila Gangetic Dolphin Sanctuary. Jharkhand's participation was heavily concentrated in Sahibganj, the state's only district bordering the Ganga, where 320 stakeholders were trained to manage this vital river corridor (Table 4.6). Moving downstream to West Bengal, the programme covered 13 districts, with Kolkata (131) and South 24 Parganas (51) serving as the primary centers (Table 4.6). This distribution highlights the project's attention to the unique estuarine challenges of the deltaic region, engaging urban stakeholders in Kolkata alongside rural communities in the Sundarbans biosphere.

The project also effectively covered the tributary basins, which are integral to the overall health of the Ganga system. In the Chambal region, Rajasthan's participation was anchored in Jaipur (204) and Sawai Madhopur (102), aligning with the conservation needs of the National Chambal Sanctuary (Table 4.6). Similarly, in Madhya Pradesh, Morena (155) and Anuppur (153) were the top districts, ensuring that the critical habitats for Gharials and nesting birds were well-represented. The outreach extended even to the peripheral states of the basin; in Haryana, participation was noted in 8 districts (Table 4.6) with Yamuna Nagar (28) and Hisar (26) showing active involvement. In Himachal Pradesh, Sirmaur (74) was a key district, while in Chhattisgarh, despite being a tributary catchment, participation was spread thinly but widely across 22 districts. The National Capital Territory of Delhi also contributed significantly, with 113 participants from New Delhi, focusing on urban policy and youth engagement (Table 4.6). This

wide-ranging district-level penetration confirms that the capacity building efforts have successfully transcended administrative boundaries to address the ecological continuity of the entire Ganga River Basin.

Table 4.6: State and District wise overall participation in Ganga River Basin

States	Sl. No.	District	Participants	Total
Bihar (27 Districts)	1	Ara	3	997
	2	Aurangabad	2	
	3	Banka	2	
	4	Begusarai	39	
	5	Bhagalpur	205	
	6	Bhojpur	1	
	7	Buxar	1	
	8	Chapra	3	
	9	Darbhanga	3	
	10	East Champaran	25	
	11	Gaya	18	
	12	Jamui	5	
	13	Katihar	24	
	14	Khagaria	10	
	15	Munger	4	
	16	Muzzafarpur	4	
	17	Nalanda	2	
	18	Patna	148	
	19	Rohtas	1	
	20	Saharsa	3	
	21	Samastipur	25	
	22	Saran	2	
	23	Siwan	26	
	24	Supaul	19	
	25	Vaishali	56	
	26	West Champaran	366	
Chhattisgarh (22 Districts)	1	Balod	1	55
	2	Baloda Bazar	3	
	3	Bastar	1	
	4	Bemetara	1	
	5	Bilaspur	4	
	6	Dhamtari	2	
	7	Durg	2	
	8	Gariaband	1	

	9	Gaurela-Pendra-Marwahi	4	
	10	Janjgir–Champa	1	
	11	Jashpur	2	
	12	Kabirdham	2	
	13	Kondagaon	1	
	14	Korba	1	
	15	Korea	2	
	16	Mungeli	1	
	17	Raigarh	1	
	18	Raipur	14	
	19	Rajnandgaon	6	
	20	Surajpur	1	
	21	Surguja	2	
	22	Uttar Bastar Kanker	2	
Delhi (3 Districts)	1	New Delhi	113	116
	2	South Delhi	2	
	3	South East Delhi	1	
Haryana (8 Districts)	1	Fatehabad	1	75
	2	Hisar	26	
	3	Jind	2	
	4	Kaithal	6	
	5	Karnal	1	
	6	Kurukshetra	3	
	7	Rohtak	8	
	8	Yamuna Nagar	28	
Himachal Pradesh (5 Districts)	1	Hamirpur	1	89
	2	Kangra	6	
	3	Kullu	1	
	4	Shimla	7	
	5	Sirmaur	74	
Jharkhand (10 Districts)	1	Dhanbad	1	349
	2	Dumka	2	
	3	East Singhbhum	2	
	4	Garhwa	4	
	5	Hazaribagh	2	
	6	Jamtara	1	
	7	Palamu	5	
	8	Ramgarh	1	
	9	Ranchi	11	
	10	Sahibganj	320	
Madhya Pradesh	1	Anuppur	153	398
	2	Balaghat	1	

(29 Districts)	3	Bhind	7	
	4	Bhopal	7	
	5	Chhatarpur	1	
	6	Chhindwara	1	
	7	Damoh	1	
	8	Datia	3	
	9	Dhar	4	
	10	Gwalior	20	
	11	Indore	3	
	12	Jabalpur	5	
	13	Katni	1	
	14	Khandwa	1	
	15	Khargone	1	
	16	Mandesour	1	
	17	Morena	155	
	18	Neemuch	2	
	19	Niwari	1	
	20	Ratlam	1	
	21	Rewa	1	
	22	Sagar	16	
	23	Satna	5	
	24	Seoni	2	
	25	Shajapur	1	
	26	Shivpuri	1	
	27	Singrauli	1	
	28	Tikamgarh	1	
	29	Ujjain	1	
Rajasthan (14 Districts)	1	Ajmer	1	588
	2	Banswara	1	
	3	Bharatpur	1	
	4	Bhilwara	11	
	5	Bikaner	3	
	6	Bundi	10	
	7	Dholpur	64	
	8	Jaipur	204	
	9	Karauli	65	
	10	Kota	79	
	11	Kotputli-Behror	1	
	12	Pali	1	
	13	Sawai Madhopur	102	
	14	Udaipur	45	
Uttar Pradesh	1	Agra	11	3586

(56 Districts)	2	Aligarh	1	
	3	Ambedkar Nagar	56	
	4	Amethi	2	
	5	Amroha	7	
	6	Ayodhya	291	
	7	Azamgarh	2	
	8	Baghpat	2	
	9	Bahraich	4	
	10	Ballia	16	
	11	Barabanki	72	
	12	Bareilly	45	
	13	Bijnor	117	
	14	Bulandshahr	88	
	15	Chandauli	12	
	16	Chitrakoot	13	
	17	Deoria	5	
	18	Etawah	18	
	19	Farrukhabad	39	
	20	Fatehpur	1	
	21	Firozabad	1	
	22	Gautam Buddha Nagar	10	
	23	Ghaziabad	26	
	24	Ghazipur	11	
	25	Gorakhpur	563	
	26	Hapur	8	
	27	Jaunpur	28	
	28	Jhansi	4	
	29	Kannauj	101	
	30	Kanpur Dehat	171	
	31	Kanpur Nagar	10	
	32	Kasganj	1	
	33	Kaushambi	10	
	34	Lakhimpur Kheri	48	
	35	Lucknow	254	
	36	Maharajganj	6	
	37	Mathura	212	
	38	Mau	4	
	39	Meerut	132	
	40	Mirzapur	20	
	41	Moradabad	6	
	42	Muzaffarnagar	120	
	43	Pilibhit	29	

	44	Pratapgarh	60	
	45	Prayagraj	235	
	46	Raebareli	1	
	47	Rampur	3	
	48	Saharanpur	4	
	49	Sambhal	3	
	50	Sant Kabir Nagar	7	
	51	Shahjahanpur	6	
	52	Shamli	1	
	53	Shravasti	1	
	54	Sultanpur	5	
	55	Unnao	2	
	56	Varanasi	681	
Uttarakhand (13 Districts)	1	Almora	4	2369
	2	Bageshwar	1	
	3	Chamoli	31	
	4	Champawat	18	
	5	Dehradun	1219	
	6	Haridwar	444	
	7	Nainital	75	
	8	Pauri Garhwal	62	
	9	Pithoragarh	3	
	10	Rudraprayag	13	
	11	Tehri Garhwal	426	
	12	Udham Singh Nagar	8	
	13	Uttarkashi	65	
West Bengal (13 Districts)	1	Bankura	1	281
	2	Darjeeling	3	
	3	Hooghly	13	
	4	Jhargram	2	
	5	Kolkata	131	
	6	Malda	1	
	7	Murshidabad	16	
	8	Nadia	37	
	9	North 24 Parganas	1	
	10	Paschim Medinipur	11	
	11	Purba Bardhaman	7	
	12	Purba Medinipur	7	
	13	South 24 Parganas	51	

4.3 Establishment of Spearhead Team

Establishment of spearhead team is one of the vital goals under the project "Planning and Management for Aquatic Species Conservation and Maintenance of Ecosystem Services in Ganga River Basin". The goal of establishment of spearhead team in Ganga basin states was to create an in-house capacity and master trainers for biodiversity monitoring, conservation and management of the riverine species and its habitat. The objective was to (i) train the spearhead team members of diverge stakeholder of the Ganga River Basin in the areas of aquatic biodiversity monitoring for practical and action-oriented implementation of science-based research carried out by the WII (ii) create a pool of trainers in the entire basin states who would be the future trainers for frontline staff, volunteers, youth and academicians for successful biodiversity monitoring and restoration of the Ganga River Basin and to carry forward the activities after obtaining the training programmes.

The spearhead team comprising of forest officials, veterinarians, professors and academicians, scientist, members of allied forces and other important line agencies such as irrigation and fishery department officials, volunteers of local youth club, NSS, NCC, officials of Nehru Yuwa Kendra Sangathan (NYKS), religious organization, Ganga Praharis etc. from the Ganga basin states were established. These selected departments, organizations and line agencies were requested to nominate members for the spearhead team formation. After receiving the nomination, national level spearhead team trainings were organized. The spearhead team consisting of 30-50 members, representing each department and organizations has been established through a comprehensive process of consultations, communications, meetings and need assessment trainings.

Once, the spearhead team of multiple stakeholders was established, national level training programmes were organised on different aspects of aquatic biodiversity monitoring, Wetland and River Conservation, Participatory Management and Conservation Education. The training was implemented in a decentralized manner to ensure the long-term sustainability of this effort, for which spearhead teams created shall be expanded to cover the entire basin. These trained

spearhead teams along with WII-NMCG team were coordinated the site level training and sensitization programmes in their respective states.

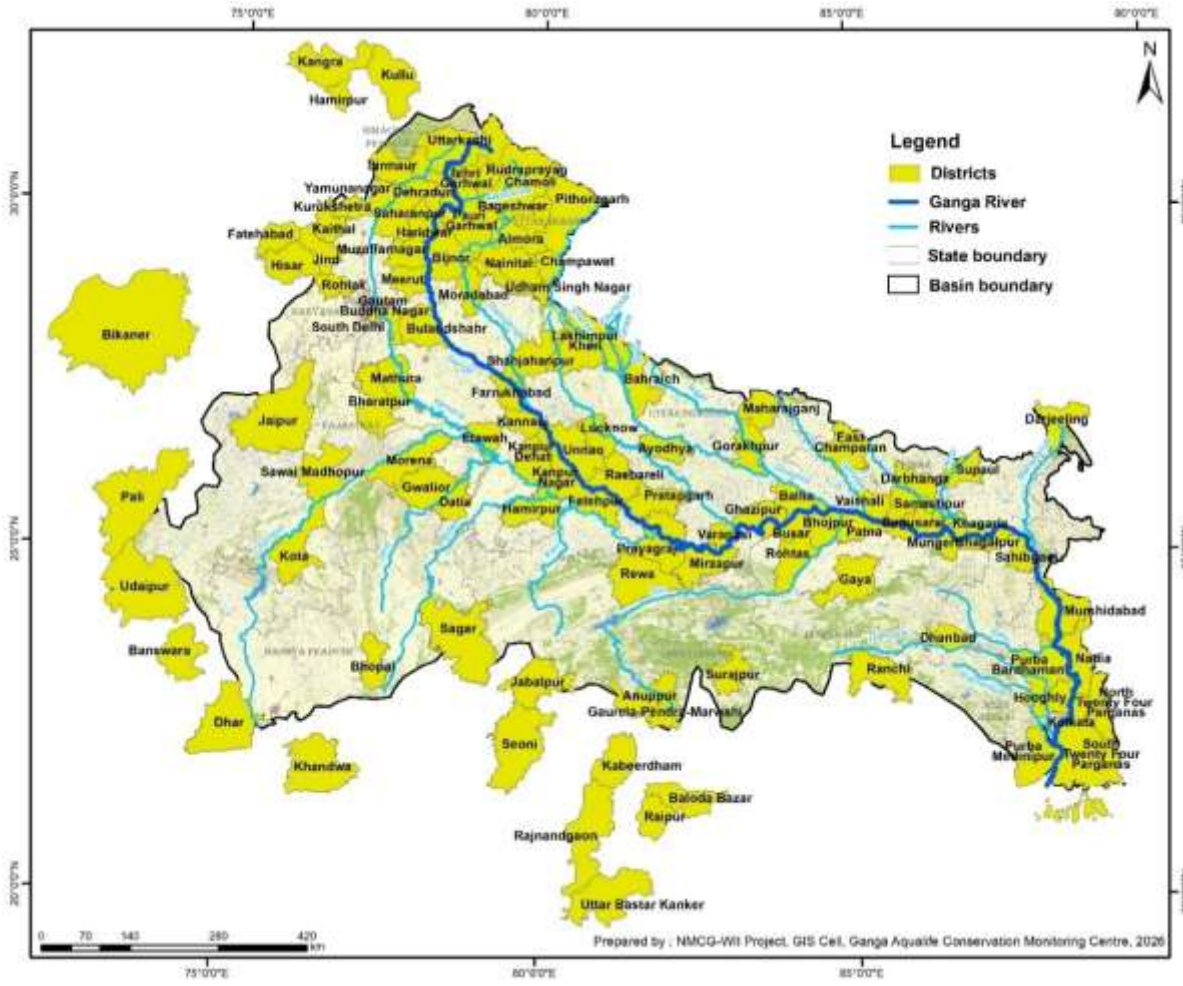


Figure 4.8: Training of Spearhead Teams in Freshwater Ecology at Basin Level

4.3.1 Training of Spearhead Teams in Freshwater Ecology at Basin Level

To strengthen and expand the existing spearhead teams at basin level a total of 24 Spearhead Trainings were conducted across the Ganga River Basin as part of the capacity-building and sensitization initiatives aimed at strengthening biodiversity conservation efforts (Annexure I). These trainings were designed as focused, high-impact programmes targeting key stakeholder groups who play a critical role in influencing conservation outcomes at community, institutional, and governance levels. The primary objective of the spearhead trainings was to create a cadre of

informed and motivated individuals capable of acting as change agents for riverine biodiversity conservation, particularly within the Ganga River Basin. The importance of spearhead trainings lies in their strategic approach. Unlike general awareness programmes, these trainings emphasized in-depth understanding of river ecology, biodiversity threats, legal and policy frameworks, community engagement mechanisms, and inter-departmental coordination. By equipping selected stakeholders with technical knowledge and leadership skills, the programme aimed to ensure that conservation messages and best practices are disseminated further within institutions, local communities, and administrative systems, thereby multiplying the impact of the interventions.

4.3.2.1 State and Stakeholder Wise Distribution Trained Participants

The state-wise and stakeholder-wise distribution of participants trained under the spearhead trainings established a total of 1,150 participants (Figure 4.8, Table 4.7) across 11 states of the Ganga River Basin, reflecting a truly basin-level outreach. Among the states, Uttarakhand (389 participants) and Uttar Pradesh (301 participants) recorded the highest participation, underscoring the intensive focus on upper and middle stretches of the basin where riverine biodiversity faces significant pressures. Rajasthan (142 participants) and West Bengal (99 participants) (Table 4.7) also showed substantial engagement, highlighting the downstream and tributary-level inclusion in the programme.

Stakeholder categories also indicate strong representation from Forest Officials (179), Ganga Praharis (130), Veterinarians (119), and College Professors (104), which is particularly significant for biodiversity conservation (Table 4.7). Forest officials and veterinarians are directly involved in habitat protection, wildlife management, and rescue operations, while Ganga Praharis serve as grassroots custodians of the river. Academic stakeholders, including college professors, scientists, and researchers, contribute to strengthening the science-policy interface and knowledge dissemination. Participation from school teachers and students further supports long-term behavioral change through environmental education. In addition, the involvement of irrigation engineers, fisheries officials, NGOs, NCC, NSS, and NYKS ensures cross-sectoral integration, which is essential for effective river basin management (Table 4.7).

Table 4.7: State-wise and stakeholder-wise distribution of participants trained under the spearhead trainings

Stakeholders	Bihar	Chhattisgarh	Delhi	Haryana	Himachal Pradesh	Jharkhand	Madhya Pradesh	Rajasthan	Uttar Pradesh	Uttarakhand	West Bengal	Total
College Professor	8	1	11	6	5	1	6	9	30	23	4	104
College Students					18				10	35		63
ETF-GTF								1	11	30	3	45
Fisheries Officials	3	6	2	4	2	4	4	5	4	5		39
Forest Officials								32	102		45	179
Ganga Prahari	23					14	1		67	14	11	130
Irrigation Department & Engineers				3				6	9	11	1	30
Line Agencies											4	4
NCC										41		41
NGOs & Volunteers									2	38		40
NSS	7					4			5	44	15	75
NYKS	6								18	4	5	33
Police Personnels										18		18
Researchers								1				1
School Students										78		78
School Teachers	4	10	3	11	6	6	6	2	19	43	11	121
Scientists			4				2	1	6	3		16
Veterinarians				25	3			85	4	2		119
Zookeeper & Staff									14			14
Total	51	17	20	49	34	29	19	142	301	389	99	1150

Overall, the spearhead trainings are expected to have a positive cascading effect from the ground level to the policy level. At the grassroots level, trained stakeholders enhance community awareness, improve reporting of biodiversity threats, and promote sustainable practices. At the institutional level, improved coordination among line departments and enforcement agencies strengthens compliance with conservation regulations. At the policy level, the engagement of academicians, scientists, and senior officials contributes to evidence-based decision-making and

adaptive management strategies. Collectively, these outcomes are likely to significantly strengthen the conservation of Ganga River biodiversity by fostering informed participation, institutional synergy, and sustained stewardship across the basin.

4.3.2.2 District-Wise Participation in Spearhead Trainings

In continuation of the spearhead training outcomes, participants were drawn from a wide geographical spread, covering 109 districts across 11 states of the Ganga River Basin through both onsite and offsite training programmes. The district-wise distribution of participants is detailed in Table 4.8, highlighting the extensive spatial reach and inclusiveness of the spearhead training initiative.

The results indicate that Uttarakhand recorded the highest district-level participation, with 389 participants from 13 districts, led by Dehradun (206 participants), followed by Haridwar (58) and Tehri Garhwal (47) (Table 4.8). This reflects a strong focus on the upper Ganga stretch, where headwater ecosystems and biodiversity are highly sensitive to anthropogenic pressures. Uttar Pradesh, representing the central stretch of the basin, contributed 301 participants from 29 districts, with notable participation from Kanpur Dehat (74), Gorakhpur (42), Varanasi (36), Bijnor (25), and Prayagraj (25), underscoring the strategic emphasis on densely populated and ecologically significant riverine districts.

Substantial participation was also observed from Rajasthan (142 participants across 9 districts) (Table 4.8), predominantly from Jaipur (91), Sawai Madhopur (22), and Kota (18), indicating successful outreach beyond the main stem into tributary-influenced regions. West Bengal, representing the lower Ganga stretch, contributed 99 participants from 9 districts, with Kolkata alone accounting for 71 participants, reflecting strong institutional and academic engagement in the deltaic region (Table 4.8).

Among other states, Bihar (51 participants from 14 districts) and Haryana (49 participants from 7 districts) (Table 4.8) demonstrated balanced district-wise representation, while Himachal Pradesh (34 participants from 4 districts) and Jharkhand (29 participants from 3 districts) showed focused participation from select districts closely associated with tributaries and catchment

areas. Madhya Pradesh (19 participants from 11 districts) and Chhattisgarh (17 participants from 7 districts) (Table 4.8) further illustrate the basin-level expansion of spearhead trainings into upstream and tributary states, reinforcing an integrated river basin management approach.

Overall, the district-wise results presented in Table 4.8 demonstrate that the spearhead trainings achieved broad geographic penetration across the Ganga River Basin. The inclusion of participants from a large number of districts ensures that conservation knowledge, technical capacity, and leadership are distributed widely, enabling context-specific action at local levels. This extensive district-level engagement is critical for translating basin-scale conservation strategies into effective on-ground interventions, while also strengthening feedback mechanisms from local realities to state and national policy frameworks for Ganga River biodiversity conservation.

Table 4.8: State and District wise spearhead participation in Ganga River Basin

State	Sl. No.	District	Participants	Total
Bihar (14 Districts)	1	Ara	2	51
	2	Begusarai	1	
	3	Bhagalpur	19	
	4	Buxar	1	
	5	Darbhanga	1	
	6	Gaya	2	
	7	Khagaria	1	
	8	Munger	2	
	9	Patna	9	
	10	Rohtas	1	
	11	Samastipur	3	
	12	Supaul	1	
	13	Vaishali	5	
	14	West Champaran	3	
Chhattisgarh (7 Districts)	1	Baloda Bazar	1	17
	2	Gaurela-Pendra-Marwahi	4	
	3	Kabirdham	2	
	4	Raipur	4	
	5	Rajnandgaon	4	
	6	Surajpur	1	

	7	Uttar Bastar Kanker	1	
Delhi (3 Districts)	1	New Delhi	17	20
	2	South Delhi	2	
	3	South East Delhi	1	
Haryana (7 Districts)	1	Fatehabad	1	49
	2	Hisar	26	
	3	Jind	2	
	4	Kaithal	6	
	5	Kurukshetra	3	
	6	Rohtak	4	
	7	Yamuna Nagar	7	
Himachal Pradesh (4 Districts)	1	Hamirpur	1	34
	2	Kangra	6	
	3	Kullu	1	
	4	Sirmaur	26	
Jharkhand (3 Districts)	1	Dhanbad	1	29
	2	Ranchi	4	
	3	Sahibganj	24	
Madhya Pradesh (11 Districts)	1	Anuppur	1	19
	2	Bhopal	1	
	3	Datia	1	
	4	Dhar	1	
	5	Gwalior	3	
	6	Jabalpur	2	
	7	Khandwa	1	
	8	Morena	5	
	9	Rewa	1	
	10	Sagar	2	
	11	Seoni	1	
Rajasthan (9 Districts)	1	Banswara	1	142
	2	Bharatpur	1	
	3	Bikaner	2	
	4	Jaipur	91	
	5	Kota	18	
	6	Kotputli-Behror	1	
	7	Pali	1	
	8	Sawai Madhopur	22	
	9	Udaipur	5	
Uttar Pradesh (29 Districts)	1	Ayodhya	4	301
	2	Bahraich	2	
	3	Ballia	2	

	4	Bijnor	25	
	5	Bulandshahr	16	
	6	Etawah	3	
	7	Farrukhabad	6	
	8	Fatehpur	1	
	9	Gautam Buddha Nagar	5	
	10	Ghazipur	1	
	11	Gorakhpur	42	
	12	Kannauj	8	
	13	Kanpur Dehat	74	
	14	Kanpur Nagar	1	
	15	Lakhimpur Kheri	1	
	16	Lucknow	16	
	17	Maharajganj	4	
	18	Mathura	1	
	19	Meerut	1	
	20	Mirzapur	2	
	21	Moradabad	5	
	22	Muzaffarnagar	15	
	23	Pratapgarh	1	
	24	Prayagraj	25	
	25	Raebareli	1	
	26	Saharanpur	1	
	27	Shahjahanpur	1	
	28	Unnao	1	
	29	Varanasi	36	
Uttarakhand (13 Districts)	1	Almora	4	389
	2	Bageshwar	1	
	3	Chamoli	5	
	4	Champawat	3	
	5	Dehradun	206	
	6	Haridwar	58	
	7	Nainital	8	
	8	Pauri Garhwal	22	
	9	Pithoragarh	2	
	10	Rudraprayag	9	
	11	Tehri Garhwal	47	
	12	Udham Singh Nagar	6	
	13	Uttarkashi	18	
West Bengal	1	Darjeeling	3	99

(9 Districts)	2	Hooghly	3	
	3	Kolkata	71	
	4	Murshidabad	1	
	5	Nadia	6	
	6	North 24 Parganas	1	
	7	Purba Bardhaman	6	
	8	Purba Medinipur	2	
	9	South 24 Parganas	6	

4.4 Training Implementation and Participation for Other Stakeholders

Other Stakeholder Trainings constituted a major component of the capacity-building framework, with 94 trainings conducted and a cumulative participation of 7,031 stakeholders across the Ganga River Basin (Annexture I, Table 4.9). These trainings were specifically designed to reach a broad and diverse stakeholder base, with the objective of enhancing awareness, fostering a positive conservation mindset, and promoting collective responsibility for Ganga River basin biodiversity conservation at the societal level.

4.4.1 State Wise Participation of Other Stakeholder Groups

State-wise participation analysis indicates that Uttar Pradesh recorded the highest engagement (2,977 participants), followed by Uttarakhand (1,924 participants) and Bihar (783 participants) (Figure 4.9, Table 4.9). These three states together accounted for a substantial proportion of total participation, reflecting both high population density along the Ganga and the strategic emphasis placed on mass awareness in ecologically critical stretches. Other notable contributions were observed from Rajasthan (396 participants), Jharkhand (320 participants), Madhya Pradesh (275 participants), and West Bengal (181 participants) (Table 4.9), demonstrating basin-wide outreach beyond the core Ganga stem.

In terms of stakeholder composition, Ganga Praharis formed the largest group with 1,825 participants, underscoring their pivotal role as community-level custodians and grassroots ambassadors for river conservation. Forest Officials (1,238 participants) also showed strong representation (Table 4.9), highlighting the importance of sensitizing frontline enforcement agencies alongside community actors. College students (1,480 participants) and school students

(742 participants) together represented a significant youth cohort, reflecting a strategic investment in long-term behavioural change and future leadership in biodiversity conservation.

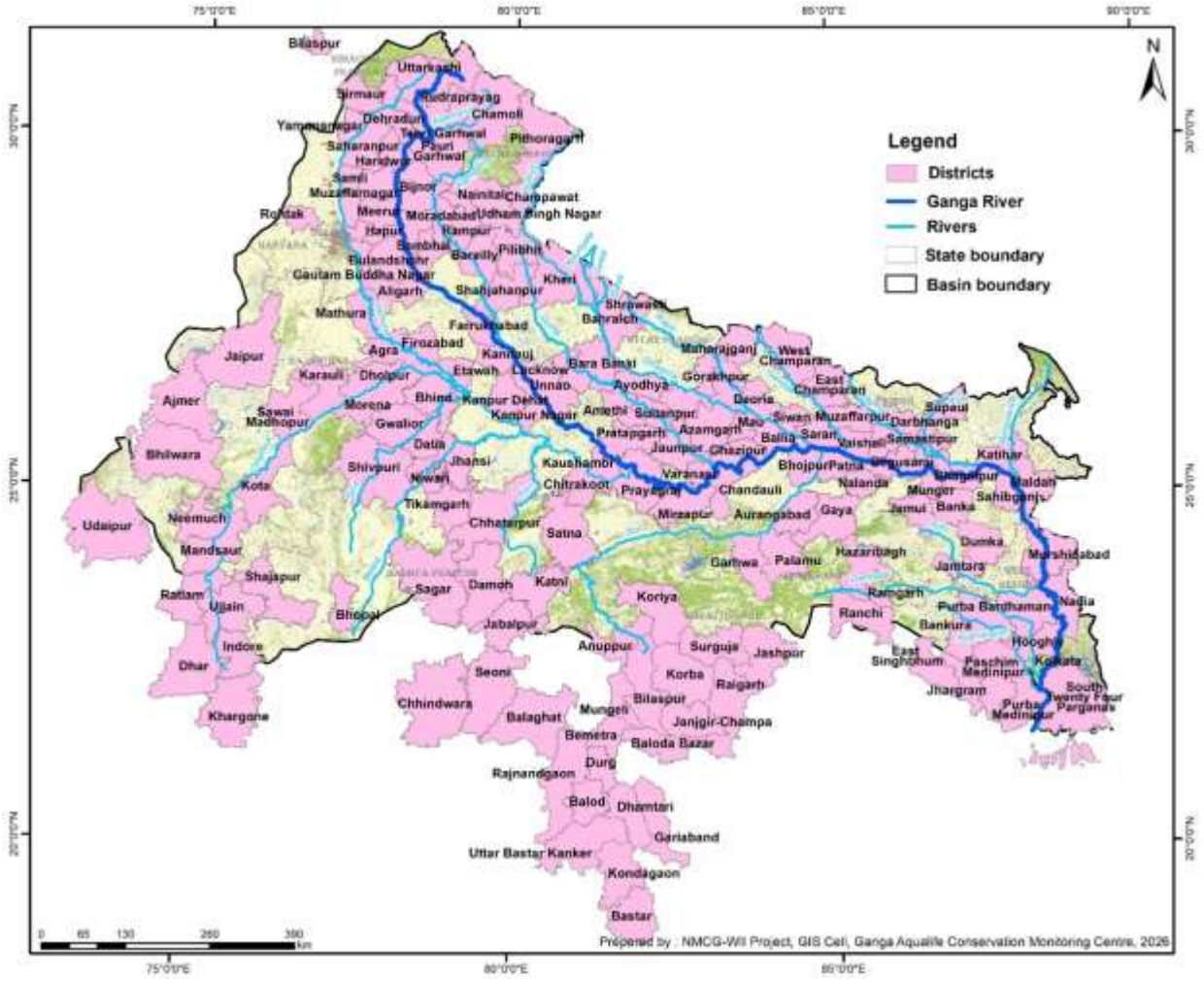


Figure 4.9: Training Implementation and Participation for Other Stakeholders

Participation from organised volunteer and institutional networks further strengthened outreach. NSS (716 participants) and NCC (112 participants) contributed substantially (Table 4.9), reinforcing the role of structured youth programmes in disseminating conservation values. Engagement of the local community (272 participants) and tourist guides (84 participants) is particularly significant, as these groups directly influence day-to-day interactions with riverine ecosystems and visitor behaviour. Additionally, participation of college professors (69

participants) and school teachers (75 participants) ensures multiplier effects through formal education systems.

Although smaller in number, the inclusion of media personnel (11 participants), scientists and researchers (5 participants combined), and technical stakeholders such as irrigation department engineers, line agencies, veterinarians, and zookeeper staff add strategic value by supporting informed communication, evidence-based decision-making, and institutional coordination (Table 4.9).

Table 4.9: State wise participation of stakeholder groups

Stakeholders	Bihar	Chhattisgarh	Delhi	Haryana	Himachal Pradesh	Jharkhand	Madhya Pradesh	Rajasthan	Uttar Pradesh	Uttarakhand	West Bengal	Total
College Professor			3				16	3	24	22	1	69
College Students							185	37	900	358		1480
ETF-GTF									130			130
Fisheries Officials								1				1
Forest Officials	203					1	2	249	518	265		1238
Ganga Prahari	428			8	10	252	8	4	441	544	130	1825
Irrigation Department & Engineers								3	1			4
Line Agencies			2				1	5	2		1	11
Local Community	33			6	8	15	4		145	36	25	272
Media	11											11
NCC	15					7			45	45		112
NGOs & Volunteers	20					3		1	11		3	38

NSS	39	38	90	9		38	53	11	171	256	11	716
NYKS										2		2
Religious Group									211			211
Researchers						1			2	1		4
School Students	31					3	6	81	285	326	10	742
School Teachers	3								8	64		75
Scientists			1									1
Tourist Guide									79	5		84
Veterinarians								1	2			3
Zookeeper & Staff									2			2
Total	783	38	96	23	18	320	275	396	2977	1924	181	7031

Overall, the results demonstrate that Other Stakeholder Trainings played a critical role in expanding conservation awareness beyond enforcement and specialist groups to the wider public domain. By engaging diverse societal segments at scale, these trainings contribute to creating an enabling social environment for Ganga River basin biodiversity conservation. This broad-based sensitization is expected to translate into improved compliance, community stewardship, and sustained public support, thereby strengthening conservation outcomes from the grassroots level to policy implementation across the basin.

4.4.2 State and District Wise Participation in Other Stakeholder Trainings

The state- and district-wise distribution of participants in Other Stakeholder Trainings across the Ganga River Basin (Table 4.10) covered 166 districts across 11 states. These trainings represent the widest outreach component of the programme, aimed at building awareness, fostering positive attitudes, and encouraging collective stewardship among diverse societal groups for Ganga River basin biodiversity conservation.

Overall, a total of 7,031 participants were trained under this component, with participation patterns reflecting both population density and ecological relevance of different river stretches (Table 4.10). Uttar Pradesh recorded the highest participation with 2,977 participants from 54

districts, underscoring the strategic emphasis on the middle Ganga stretch, which experiences intense anthropogenic pressure. Within the state, Varanasi (642 participants) and Gorakhpur (423 participants) emerged as major hubs of engagement, followed by Ayodhya (230 participants), Mathura (211), Lucknow (202 participants), Prayagraj (209 participants), and Meerut (131 participants), indicating strong penetration of awareness activities in key cultural, urban, and ecological centres (Table 4.10).

Uttarakhand contributed 1,924 participants from 11 districts, reflecting extensive engagement in the upper Ganga stretch. Dehradun alone accounted for 1,009 participants, followed by Haridwar (386 participants) and Tehri Garhwal (379 participants). This high participation highlights focused efforts to sensitize stakeholders in ecologically sensitive headwater regions critical for maintaining riverine biodiversity and hydrological integrity. In Bihar, 783 participants from 24 districts took part in the trainings, with West Champaran (295 participants) and Bhagalpur (186 participants) contributing substantially. Other districts such as Vaishali, Patna, and Begusarai also showed notable participation, indicating widespread engagement across the lower-middle Ganga stretch. Rajasthan recorded 396 participants from 8 districts, with significant contributions from Jaipur (113 participants), Sawai Madhopur (70 participants), and Karauli (55 participants), reflecting balanced outreach across basin-linked regions of the state (Table 4.10).

Jharkhand accounted for 320 participants from 9 districts, predominantly from Sahibganj (296 participants), highlighting targeted awareness efforts in this ecologically important stretch of the river. Madhya Pradesh contributed 275 participants from 26 districts, with Anuppur (152 participants) and Morena (67 participants) forming the core of participation (Table 4.10), indicating selective but strategic engagement in tributary regions. West Bengal recorded 181 participants from 11 districts, with notable representation from Kolkata (59 participants), South 24 Parganas (45 participants), and Nadia (31 participants), demonstrating outreach in the lower Ganga stretch and deltaic regions. Participation from Chhattisgarh (38 participants across 19 districts), Haryana (23 participants from 2 districts), Himachal Pradesh (18 participants from Sirmaur), and Delhi (96 participants) (Table 4.10) further illustrates basin-wide inclusivity, even in regions with smaller geographical or hydrological linkage to the main stem.

The district-wise analysis demonstrates that Other Stakeholder Trainings achieved extensive geographic coverage and successfully engaged a wide cross-section of society across the Ganga River Basin. The concentration of participants in ecologically sensitive and culturally significant districts enhances the potential for sustained community engagement, improved compliance with conservation measures, and long-term behavioral change. This large-scale sensitization effort is expected to significantly strengthen grassroots support for biodiversity conservation, thereby reinforcing policy initiatives and institutional actions aimed at restoring and sustaining the ecological health of the Ganga River Basin.

Table 4.10: State and District wise other stakeholders training participation in Ganga River Basin

State	Sl. No.	District	Participants	Total
Bihar (24 Districts)	1	Ara	1	783
	2	Aurangabad	2	
	3	Banka	2	
	4	Begusarai	38	
	5	Bhagalpur	186	
	6	Bhojpur	1	
	7	Chapra	3	
	8	Darbhanga	2	
	9	East Champaran	25	
	10	Gaya	16	
	11	Jamui	5	
	12	Katihar	24	
	13	Khagaria	9	
	14	Munger	2	
	15	Muzzafarpur	4	
	16	Nalanda	2	
	17	Patna	44	
	18	Saharsa	3	
	19	Samastipur	22	
	20	Saran	2	
	21	Siwan	26	
	22	Supaul	18	
	23	Vaishali	51	
	24	West Champaran	295	

Chhattisgarh (19 Districts)	1	Balod	1	38
	2	Baloda Bazar	2	
	3	Bastar	1	
	4	Bemetara	1	
	5	Bilaspur	4	
	6	Dhamtari	2	
	7	Durg	2	
	8	Gariaband	1	
	9	Janjgir–Champa	1	
	10	Jashpur	2	
	11	Kondagaon	1	
	12	Korba	1	
	13	Korea	2	
	14	Mungeli	1	
	15	Raigarh	1	
	16	Raipur	10	
	17	Rajnandgaon	2	
	18	Surguja	2	
	19	Uttar Bastar Kanker	1	
Delhi (1 District)	1	New Delhi	96	96
Haryana (2 Districts)	1	Rohtak	2	23
	2	Yamuna Nagar	21	
Himachal Pradesh (1 Districts)	1	Sirmaur	18	18
Jharkhand (9 Districts)	1	Dumka	2	320
	2	East Singhbhum	2	
	3	Garhwa	4	
	4	Hazaribagh	2	
	5	Jamtara	1	
	6	Palamu	5	
	7	Ramgarh	1	
	8	Ranchi	7	
	9	Sahibganj	296	
Madhya Pradesh (26 Districts)	1	Anuppur	152	275
	2	Balaghat	1	
	3	Bhind	1	
	4	Bhopal	6	
	5	Chhatarpur	1	
	6	Chhindwara	1	

	7	Damoh	1	
	8	Datia	2	
	9	Dhar	3	
	10	Gwalior	17	
	11	Indore	3	
	12	Jabalpur	3	
	13	Katni	1	
	14	Khargone	1	
	15	Mandesour	1	
	16	Morena	67	
	17	Neemuch	2	
	18	Niwari	1	
	19	Ratlam	1	
	20	Sagar	1	
	21	Satna	4	
	22	Seoni	1	
	23	Shajapur	1	
	24	Shivpuri	1	
	25	Tikamgarh	1	
	26	Ujjain	1	
Rajasthan (8 Districts)	1	Ajmer	1	396
	2	Bhilwara	11	
	3	Dholpur	54	
	4	Jaipur	113	
	5	Karauli	55	
	6	Kota	52	
	7	Sawai Madhopur	70	
	8	Udaipur	40	
Uttar Pradesh (54 Districts)	1	Agra	11	**2977**
	2	Aligarh	1	
	3	Ambedkar Nagar	56	
	4	Amethi	2	
	5	Amroha	7	
	6	Ayodhya	230	
	7	Azamgarh	2	
	8	Baghpat	2	
	9	Bahraich	2	
	10	Ballia	14	
	11	Barabanki	72	
	12	Bareilly	45	
	13	Bijnor	76	
	14	Bulandshahr	72	

	15	Chandauli	12	
	16	Chitrakoot	13	
	17	Deoria	5	
	18	Etawah	13	
	19	Farrukhabad	33	
	20	Firozabad	1	
	21	Gautam Buddha Nagar	5	
	22	Ghaziabad	26	
	23	Ghazipur	10	
	24	Gorakhpur	423	
	25	Hapur	8	
	26	Jaunpur	28	
	27	Jhansi	4	
	28	Kannauj	93	
	29	Kanpur Dehat	18	
	30	Kanpur Nagar	9	
	31	Kasganj	1	
	32	Kaushambi	10	
	33	Lakhimpur Kheri	47	
	34	Lucknow	202	
	35	Maharajganj	2	
	36	Mau	4	
	37	**Mathura**	**211**	
	38	Meerut	131	
	39	Mirzapur	18	
	40	Moradabad	1	
	41	Muzaffarnagar	89	
	42	Pilibhit	29	
	43	Pratapgarh	59	
	44	Prayagraj	209	
	45	Rampur	3	
	46	Saharanpur	3	
	47	Sambhal	3	
	48	Sant Kabir Nagar	7	
	49	Shahjahanpur	5	
	50	Shamli	1	
	51	Shravasti	1	
	52	Sultanpur	5	
	53	Unnao	1	
	54	Varanasi	642	
Uttarakhand	1	Chamoli	26	1924

(11 Districts)	2	Champawat	15	
	3	Dehradun	1009	
	4	Haridwar	386	
	5	Nainital	15	
	6	Pauri Garhwal	40	
	7	Pithoragarh	1	
	8	Rudraprayag	4	
	9	Tehri Garhwal	379	
	10	Udham Singh Nagar	2	
	11	Uttarkashi	47	
West Bengal (11 Districts)	1	Bankura	1	181
	2	Hooghly	10	
	3	Jhargram	2	
	4	Kolkata	59	
	5	Malda	1	
	6	Murshidabad	15	
	7	Nadia	31	
	8	Paschim Medinipur	11	
	9	Purba Bardhaman	1	
	10	Purba Medinipur	5	
	11	South 24 Parganas	45	

4.5 Module Wise Trained Participants Across the Ganga River Basin

The module-wise distribution of trained participants across the Ganga River Basin indicates a balanced yet purpose-driven capacity-building approach spanning ecological monitoring, governance, emergency response, and outreach. The module-wise distribution of participants highlights the thematic breadth and state-level prioritization of capacity-building interventions across the Ganga River Basin.

4.5.1 Module and State Wise Distribution of Trained Participants

Monitoring of Aquatic Biodiversity recorded the highest overall participation (3,241 participants) (Table 4.11), indicating strong emphasis on baseline data generation and long-term ecological surveillance. Uttar Pradesh dominated this module with 1,390 participants, followed by Uttarakhand (929), reflecting their extensive river stretches and biodiversity hotspots. Significant

participation was also observed in Bihar (192), Madhya Pradesh (187), and Rajasthan (186), while other states such as Jharkhand (79), Haryana (54), Himachal Pradesh (51), Chhattisgarh (46), Delhi (21), and West Bengal (106) (Table 4.11) contributed to ensuring basin-wide monitoring capacity.

The Wetland Conservation and River Management module engaged 1,820 participants (Table 4.11), underscoring growing recognition of wetlands as integral components of riverine ecosystems. Uttarakhand (808) and Uttar Pradesh (403) together accounted for the majority of trainees, reflecting active river and floodplain management initiatives. Rajasthan (179) and Bihar (123) showed notable engagement, while participation from Madhya Pradesh (55), Jharkhand (47), Himachal Pradesh (45), Haryana (41), Chhattisgarh (36), West Bengal (65), and Delhi (18) (Table 4.11) ensured representation from diverse hydrological contexts.

Table 4.11: Module and State wise distribution of trained participants across states of the Ganga River Basin

Modules	Bihar	Chhattisgarh	Delhi	Haryana	Himachal Pradesh	Jharkhand	Madhya Pradesh	Rajasthan	Uttar Pradesh	Uttarakhand	West Bengal	Total
Monitoring of Aquatic Biodiversity	192	46	21	54	51	79	187	186	1390	929	106	3241
Wetland conservation and River Management	123	36	18	41	45	47	55	179	403	808	65	1820
Rescue and Rehabilitation	677	1	7	31	43	4	269	392	1363	493	88	3368
Participatory Management	591	46	102	63	52	304	72	148	982	857	135	3352
Conservation Education	180	55	109	60	34	83	225	196	1149	1283	89	3463

The Rescue and Rehabilitation module trained 3,368 participants (Table 4.11), highlighting strong operational preparedness for aquatic fauna emergencies. Uttar Pradesh again led with 1,363 participants, followed by Uttarakhand (493) and Rajasthan (392), reflecting higher incidences of stranding and human–wildlife interactions. Substantial participation was also recorded from Bihar (677) and Madhya Pradesh (269). Other contributing states included West Bengal (88), Himachal Pradesh (43), Haryana (31), Delhi (7), Jharkhand (4), and Chhattisgarh (1) (Table 4.11), indicating targeted but essential training coverage.

The Participatory Management module involved 3,352 participants (Table 4.11), emphasizing community-led conservation and stakeholder integration. Uttar Pradesh (982) and Uttarakhand (857) showed strong uptake, reflecting active engagement of local institutions and community groups. High participation from Bihar (591) and Jharkhand (304) points to focused efforts on grassroots stewardship. Contributions from Rajasthan (148), West Bengal (135), Delhi (102), Haryana (63), Himachal Pradesh (52), Chhattisgarh (46), and Madhya Pradesh (72) (Table 4.11) further demonstrate the module's basin-wide relevance.

Conservation Education reached 3,463 participants (Table 4.11), reinforcing awareness-building and behavioral change as core conservation strategies. Uttarakhand (1,283) and Uttar Pradesh (1149) recorded the highest participation, followed by Madhya Pradesh (225) and Rajasthan (196). Bihar (180), Jharkhand (83), West Bengal (89), Delhi (109), Haryana (60), Himachal Pradesh (34), and Chhattisgarh (55) (Table 4.11) contributed to strengthening environmental literacy across institutional and community levels.

Overall, the module-wise results demonstrate a balanced and integrated training approach, with states like Uttar Pradesh and Uttarakhand consistently showing high engagement across all modules, while other basin states contributed strategically based on ecological context, stakeholder presence, and management priorities.

4.5.2 Module and Stakeholder Wise Distribution of Participants

The module and stakeholder wise distribution of participants reveals clear patterns in engagement, role alignment, and functional emphasis across the training programme, reflecting how different stakeholder groups contributed to and benefited from specific thematic modules.

In the Monitoring of Aquatic Biodiversity module (3,241 participants) (Table 4.12), participation was dominated by college students (879) and Ganga Prahari (513), highlighting strong involvement of youth and community-based conservation volunteers in biodiversity documentation and field monitoring. Forest officials (455) and NSS volunteers (300) also played a substantial role, underscoring institutional and volunteer-driven monitoring efforts. Academic stakeholders such as college professors (144) and school teachers (141) contributed to strengthening scientific rigor and educational outreach, while specialized groups including veterinarians (51), fisheries officials (40), and irrigation engineers (33) provided technical inputs.

The Wetland Conservation and River Management module engaged 1,820 participants (Table 4.12), with major contributions from Ganga Prahari (404), college students (301), and NSS volunteers (300), reflecting a strong participatory and awareness-driven focus on wetland ecosystems. Forest officials (153) and college professors (99) supported institutional and academic integration, while school students (182) and school teachers (48) indicate effective outreach at the school level. Engagement from NGOs and volunteers (59), veterinarians (46), and fisheries officials (40) further strengthened multidisciplinary understanding of river and wetland management (Table 4.12).

The Rescue and Rehabilitation module recorded the highest operational relevance with 3,368 participants (Table 4.12), strongly led by forest officials (1,371), emphasizing their central role in frontline wildlife response. College students (541) and Ganga Prahari (479) formed a significant support base, enhancing rapid response capacity at local levels.

Table 4.12: Module- and stakeholder-wise distribution of participants

Stakeholders	Training Modules				
	Monitoring of Aquatic Biodiversity	Wetland conservation and River Management	Rescue and Rehabilitation	Participatory Management	Conservation Education
College Professor	144	99	53	118	163
College Students	879	301	541	390	922
ETF-GTF	95		125		
Fisheries Officials	40	40		39	39
Forest Officials	455	153	1371	68	65
Ganga Prahari	513	404	479	1319	322
Irrigation Department & Engineers	33	28	5	26	25
Line Agencies	6	5	12	1	
Local Community	4	3	58	271	
Media	11	11		11	11
NCC	41	41	41	153	153
NGOs & Volunteers	78	59	4	59	59
NSS	300	300	4	447	791
NYKS	33	35	4	33	33
Police Personnels	18	18	73	18	18
Religious Group					211
Researchers	8	5	61	3	2
School Students	304	182	169	190	483
School Teachers	141	48	2	124	128
Scientists	18	18	1	16	
Tourist Guide			56	28	
Veterinarians	51	46	187	36	36
Zookeeper & Staff	69	24	122	2	2
Total	3241	1820	3368	3352	3463

High participation of veterinarians (187), ETF–GTF members (125), and zookeeper and staff (122) highlight the technical and animal-handling expertise essential for rescue operations. Police

personnel (73) and researchers (61) contributed to enforcement coordination and post-rescue assessment, while other groups participated in smaller but strategic numbers (Table 4.12).

The Participatory Management module involved 3,352 participants, reflecting strong emphasis on community-led conservation (Table 4.12). Ganga Prahari (1,319) emerged as the largest group, reaffirming their pivotal role in grassroots engagement and stewardship. NSS volunteers (447) and college students (390) further strengthened collective action and social mobilization. Substantial involvement of the local community (271) underscores effective inclusion of river-dependent populations in decision-making processes. Contributions from college professors (118), school teachers (124), and NGOs and volunteers (59) indicate institutional support for participatory governance frameworks.

The Conservation Education module trained 3463 participants, with particularly high participation from college students (922) and NSS volunteers (791), demonstrating the programme's strong focus on awareness generation and behavioral change among youth. School students (483) and school teachers (128) highlight the successful integration of conservation themes into formal education systems (Table 4.12). Ganga Prahari (322) and college professors (163) played key roles in knowledge dissemination, while NCC cadets (153) contributed to discipline-based environmental outreach. Support from veterinarians (36), forest officials (65), fisheries officials (39) and religious groups (211) ensured scientific accuracy and practical relevance.

Overall, the stakeholder wise results indicate a well-balanced training architecture, where technical modules such as Rescue and Rehabilitation were led by enforcement and specialist groups, while participatory and education-focused modules were driven by community volunteers, students, and academic institutions. This alignment between stakeholder roles and module objectives significantly strengthens the effectiveness and sustainability of conservation efforts across the Ganga River Basin.

4.6 Enhance Capacity of the Personnel of the Forest Department, Animal Husbandry Department, Field Veterinarians, And Volunteers in Rescue and Rehabilitation Techniques

Rescue and rehabilitation trainings play a critical role in strengthening field-level preparedness, improving inter-agency coordination, and enhancing the technical capacity required for effective wildlife rescue and biodiversity conservation within the Ganga River Basin. Increasing anthropogenic pressures, habitat degradation, accidental entanglements, strandings, and human–wildlife interactions across the basin necessitate the development of a skilled workforce capable of responding rapidly and scientifically to wildlife emergencies. These trainings are therefore essential for equipping frontline staff, veterinarians, rehabilitation personnel, community stakeholders, and associated agencies with practical knowledge on safe rescue techniques, animal handling, emergency response protocols, rehabilitation procedures, and post-release monitoring. Strengthening such capacities contributes directly to improved conservation outcomes and supports the long-term protection of aquatic and terrestrial biodiversity associated with the Ganga ecosystem.

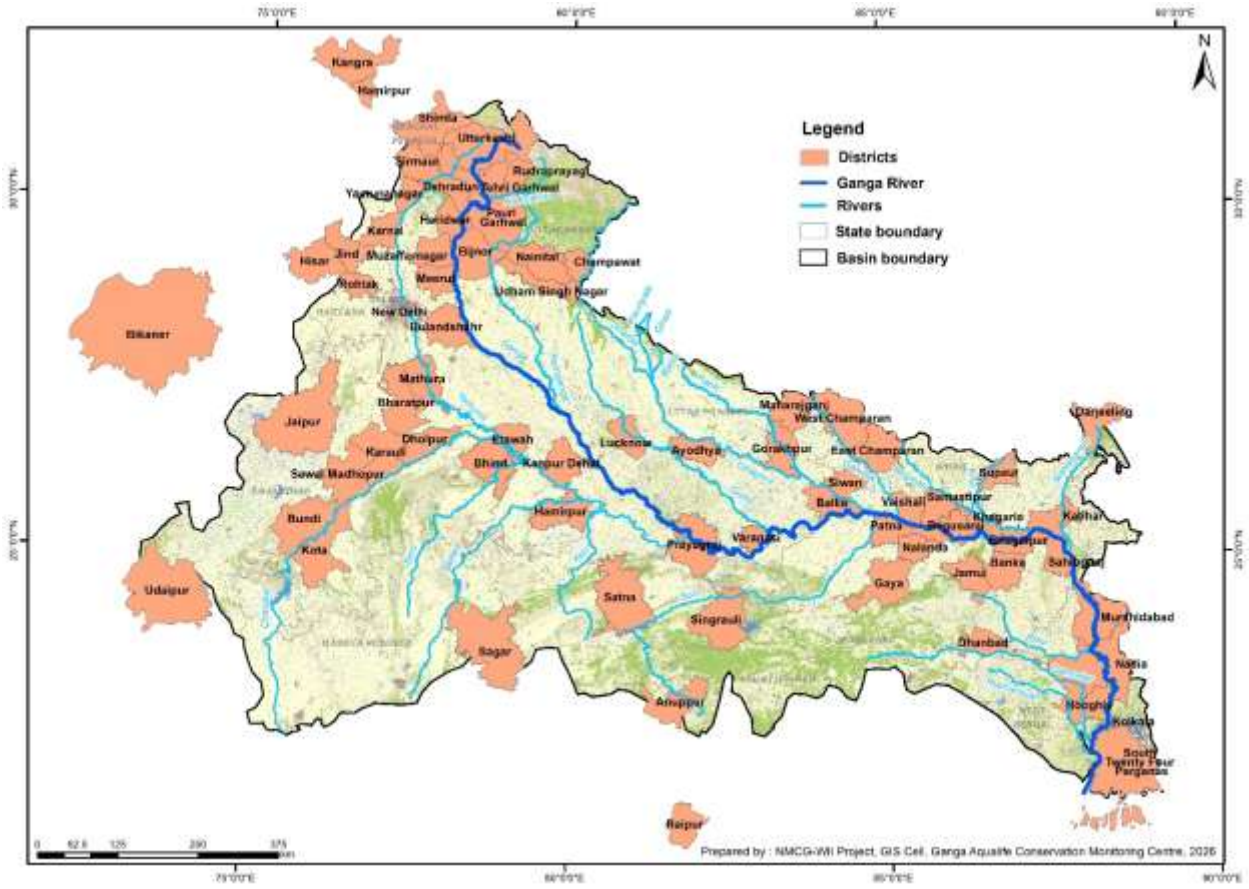


Figure 4.10: Capacity Building of The Forest Department, Animal Husbandry Department, Field Veterinarians, and Volunteers in Rescue and Rehabilitation Techniques

A total of 3,368 participants were trained under various rescue and rehabilitation techniques and capacity-building initiatives conducted across the Ganga River Basin (Annexure I). Out of these, 722 participants received training through fourteen (14) dedicated Rescue and Rehabilitation trainings specifically designed to strengthen coordinated response mechanisms, technical expertise, and operational preparedness for wildlife rescue situations. These specialized trainings focused on developing practical skills related to wildlife handling, emergency response, rehabilitation protocols, and inter-agency coordination during rescue operations. Owing to the highly specialized nature of rescue and rehabilitation training, which requires extensive logistical support, technical expertise, animal handling infrastructure, veterinary facilities, and coordinated management arrangements, the trainings were strategically organized primarily at the headquarters of the Wildlife Institute of India and at selected zoological parks across the Ganga River Basin. Conducting trainings at these institutions ensured access to appropriate facilities,

expert resource persons, rescue equipment, and live demonstration opportunities necessary for practical skill development.

However, recognizing the need for wider outreach and site-specific rescue preparedness at the local level, several rescue and rehabilitation modules were also incorporated into Spearhead Trainings and other stakeholder-oriented capacity-building programmes conducted across different states and districts of the basin. This integrated approach enabled participants from diverse stakeholder groups to receive practical exposure to rescue-related protocols within their regional ecological and operational contexts. The incorporation of rescue modules into broader trainings substantially expanded the reach of conservation capacity-building efforts and facilitated the development of localized response capabilities for biodiversity conservation and wildlife emergency management throughout the Ganga River Basin.

4.6.1 State and Stakeholder Wise Trained Participants Under Rescue and Rehabilitation Techniques

The stakeholder composition of rescue and rehabilitation–related trainings demonstrate a highly diverse and multi-sectoral participation framework, reflecting the integration of rescue preparedness components into broader conservation and capacity-building programmes across the Ganga River Basin (Figure 4.10, Table 4.13). A total of 3,368 participants representing government agencies, educational institutions, local communities, enforcement agencies, and technical experts were trained through these programmes, indicating substantial expansion in stakeholder outreach compared to the dedicated rescue and rehabilitation trainings discussed earlier.

Table 4.13 State-wise distribution of stakeholders participating in rescue and rehabilitation–related trainings under the Ganga River Basin programme

Stakeholders	Bihar	Chhattisgarh	Delhi	Haryana	Himachal Pradesh	Jharkhand	Madhya Pradesh	Rajasthan	Uttar Pradesh	Uttarakhand	West Bengal	Total value (% value)
College Professor	4	1	5	3	3	1	16	3	10	3	4	53 (1.57%)
College Students	25						149		367			541 (16.06%)
ETF-GTF								1	91	30	3	125 (3.71%)
Forest Officials	266				35		102	252	387	284	45	1371 (40.71%)
Ganga Prahari	314					3			63	82	17	479 (14.22%)
Irrigation Department & Engineers									5			5 (0.15%)
Line Agencies	3		2				1		1		5	12 (0.36%)
Local Community									54		4	58 (1.72%)
NCC										41		41 (1.22%)
NGOs & Volunteers									4			4 (0.12%)
NSS											4	4 (0.12%)
NYKS											4	4 (0.12%)
Police Personnels									55	18		73 (2.17%)
Researchers	55				1		1	1		3		61 (1.81%)
School Students									169			169 (5.02%)
School Teachers											2	2 (0.06%)

Scientists										1		1 (0.03%)
Tourist Guide									56			56 (1.66%)
Veterinarians	10			28	4			135	8	2		187 (5.55%)
Zookeeper & Staff									93	29		122 (3.62%)
Total	677	1	7	31	43	4	269	392	1363	493	88	3368

Among all stakeholder categories, Forest Officials constituted the largest participant group with 1,371 participants (40.71%), reaffirming their primary role in wildlife rescue operations, habitat protection, and emergency response management across the basin. Their highest participation was recorded in Uttar Pradesh (387 participants), followed by Uttarakhand (284 participants), Rajasthan (252 participants), Bihar (266 participants), and Madhya Pradesh (102 participants). This strong representation reflects the operational importance of frontline forest staff in addressing increasing incidences of human–wildlife interactions and biodiversity conservation challenges in riverine ecosystems.

College Students formed the second-largest stakeholder category with 541 participants (16.06%), with major participation from Uttar Pradesh (367 participants) and Madhya Pradesh (149 participants). Their inclusion demonstrates the increasing emphasis on engaging youth and higher educational institutions in conservation awareness and practical rescue preparedness. Similarly, Ganga Praharis accounted for 479 participants (14.22%), mainly from Bihar (314 participants), Uttarakhand (82 participants), and Uttar Pradesh (63 participants). The active participation of Ganga Praharis highlights the importance of community-based conservation mechanisms in monitoring river biodiversity and supporting rescue activities at the local level.

Veterinarians represented another critical stakeholder group, contributing 187 participants (5.55%). Uttar Pradesh recorded the highest veterinary participation (135 participants), followed by Haryana (28 participants) and Bihar (10 participants). Their involvement is particularly significant because veterinary expertise plays a crucial role in wildlife handling, trauma care, disease management, rehabilitation, and post-rescue recovery processes. In addition, Zookeeper and associated staff contributed 122 participants (3.62%), mainly from Uttar Pradesh (93 participants) and Uttarakhand (29 participants), emphasizing the role of zoological institutions and rehabilitation facilities in supporting rescued wildlife.

The inclusion of School Students (169 participants; 5.02%), NCC cadets (41 participants; 1.22%), NSS volunteers (4 participants), NYKS members (4 participants), and School Teachers (2 participants) demonstrates the programme's educational and awareness-building dimensions. Such participation contributes to fostering long-term environmental stewardship and developing future conservation leadership among younger generations. Tourist guides (56 participants; 1.66%) and local community members (58 participants; 1.72%) were also trained, particularly in

Uttar Pradesh and West Bengal, reflecting efforts to strengthen community-based vigilance and improve first-response capacity in ecologically sensitive and tourism-linked regions.

Participation from Police Personnel (73 participants; 2.17%) highlights the growing recognition of inter-agency coordination during rescue operations and wildlife law enforcement activities. Their representation was primarily from Uttar Pradesh (55 participants) and Uttarakhand (18 participants). Researchers (61 participants; 1.81%), scientists (1 participant), college professors (53 participants; 1.57%), and line agencies (12 participants; 0.36%) further strengthened the scientific, academic, and administrative dimensions of the training programmes by contributing technical knowledge, policy support, and evidence-based approaches to rescue and rehabilitation management.

State-wise analysis reveals that Uttar Pradesh recorded the highest overall participation with 1,363 participants, followed by Bihar (677 participants), Uttarakhand (493 participants), Rajasthan (392 participants), and Madhya Pradesh (269 participants). These states collectively accounted for a major proportion of the trained stakeholders, reflecting focused conservation outreach in ecologically sensitive stretches of the Ganga basin. Comparatively lower participation from states such as Himachal Pradesh (43 participants), Haryana (31 participants), West Bengal (88 participants), Jharkhand (4 participants), Delhi (7 participants), and Chhattisgarh (1 participant) nevertheless demonstrates the broader basin-wide inclusivity of the programme.

4.6.2 State and District-Wise Participation in Rescue and Rehabilitation Trainings

The state- and district-wise distribution of participants trained under rescue and rehabilitation–related modules across the Ganga River Basin is presented in Table 4.14 Unlike the dedicated rescue and rehabilitation trainings discussed earlier, the present dataset also includes stakeholders who received rescue and rehabilitation training components during other thematic conservation and sensitization programmes. Overall, participation was recorded from 11 states and 74 districts, with a cumulative total of 3,368 participants, indicating a substantial expansion in the geographic reach and stakeholder coverage of rescue preparedness and wildlife response capacity-building efforts across the basin.

Table 4.14: State and Stakeholder wise trained participants under rescue and rehabilitation module trainings

States	Districts	District Total	State Total
Bihar	Banka	2	677
	Begusarai	30	
	Bhagalpur	121	
	East Champaran	6	
	Gaya	2	
	Jamui	5	
	Katihar	21	
	Khagaria	6	
	Nalanda	2	
	Patna	104	
	Samastipur	12	
	Siwan	18	
	Supaul	12	
	Vaishali	41	
	West Champaran	295	
Chhattisgarh	Raipur	1	1
Delhi (2 Districts)	New Delhi	6	7
	South East Delhi	1	
Haryana (5 Districts)	Hisar	21	31
	Jind	1	
	Karnal	1	
	Rohtak	6	
	Yamuna Nagar	2	
Himachal Pradesh (4 Districts)	Hamirpur	1	43
	Kangra	5	
	Shimla	7	
	Sirmaur	30	
Jharkhand (2 Districts)	Dhanbad	1	4
	Sahibganj	3	
Madhya Pradesh	Anuppur	113	269
	Bhind	6	
	Morena	133	
	Sagar	15	
	Satna	1	
	Singrauli	1	
Rajasthan	Bharatpur	1	392
	Bikaner	3	
	Bundi	10	

	Dholpur	60	
	Jaipur	81	
	Karauli	65	
	Kota	73	
	Sawai Madhopur	96	
	Udaipur	3	
Uttar Pradesh	Ayodhya	186	1363
	Ballia	1	
	Bijnor	33	
	Bulandshahr	2	
	Etawah	2	
	Gorakhpur	142	
	Kanpur Dehat	150	
	Lucknow	38	
	Maharajganj	4	
	Mathura	1	
	Meerut	125	
	Muzaffarnagar	22	
	Prayagraj	94	
	Varanasi	563	
Uttarakhand	Champawat	1	493
	Dehradun	341	
	Haridwar	75	
	Nainital	53	
	Pauri Garhwal	2	
	Rudraprayag	1	
	Tehri Garhwal	17	
	Udham Singh Nagar	1	
	Uttarkashi	2	
West Bengal	Darjeeling	3	88
	Hooghly	3	
	Kolkata	53	
	Murshidabad	6	
	Nadia	15	
	Purba Bardhaman	7	
	South 24 Parganas	1	
Grand Total			3368

Among all states, Uttar Pradesh recorded the highest participation with 1,363 participants from 14 districts, demonstrating the state's continued prominence in conservation outreach and operational preparedness within the Ganga basin. Within the state, Varanasi emerged as the

single largest centre of participation with 563 participants, followed by Ayodhya (186 participants), Kanpur Dehat (150 participants), Gorakhpur (142 participants), and Meerut (125 participants). Significant participation was also observed from Prayagraj (94 participants) and Lucknow (38 participants). The high concentration of trainees in these districts reflects intensified efforts in regions characterized by dense human populations, high anthropogenic pressures, and frequent wildlife rescue and conflict situations along the middle Ganga stretch.

Bihar reported the second-highest participation with 677 participants distributed across 15 districts. West Champaran recorded the highest district-level participation within the state (295 participants), followed by Bhagalpur (121 participants) and Patna (104 participants). Additional representation from Vaishali (41 participants), Begusarai (30 participants), Katihar (21 participants), and other districts demonstrates a broad spatial outreach across ecologically sensitive floodplain and tributary regions. The substantial participation from Bihar highlights the growing emphasis on strengthening rescue response mechanisms in densely populated riverine landscapes.

Uttarakhand contributed 493 participants from nine districts, reflecting strong engagement from the upper Ganga region. Dehradun accounted for the majority of participants (341 participants), followed by Haridwar (75 participants) and Nainital (53 participants). Smaller yet important participation from Tehri Garhwal, Champawat, Rudraprayag, Uttarkashi, and Udham Singh Nagar indicate expanding outreach to hill districts and upper catchment areas. The concentration of participants in Dehradun also reflects the importance of institutional and administrative centres in facilitating conservation-oriented training programmes.

Rajasthan recorded 392 participants from nine districts, indicating extensive outreach across the state's Ganga basin–linked regions. Sawai Madhopur emerged as the highest contributing district (96 participants), followed by Jaipur (81 participants), Kota (73 participants), Karauli (65 participants), and Dholpur (60 participants). The relatively balanced distribution across multiple districts demonstrates a decentralized and regionally inclusive approach to rescue and rehabilitation capacity building.

Madhya Pradesh reported a total of 269 participants across six districts. Morena contributed the largest share (133 participants), followed closely by Anuppur (113 participants), while smaller participation was recorded from Sagar, Bhind, Satna, and Singrauli. The concentration in Morena and Anuppur suggests targeted interventions in districts with significant riverine ecosystems and wildlife interaction zones.

West Bengal recorded 88 participants from seven districts, with Kolkata contributing the majority (53 participants), followed by Nadia (15 participants) and Purba Bardhaman (7 participants). Participation from Murshidabad, Hooghly, Darjeeling, and South 24 Parganas indicates representation from both urban and ecologically important lower Ganga regions. Himachal Pradesh contributed 43 participants, primarily from Sirmaur (30 participants), with additional participation from Shimla, Kangra, and Hamirpur, reflecting continued inclusion of upper catchment states in basin-level conservation capacity-building efforts.

Participation from Haryana totaled 31 participants across five districts, led by Hisar (21 participants), while Jharkhand contributed four participants from Sahibganj and Dhanbad. Delhi recorded seven participants from New Delhi and South East Delhi, whereas Chhattisgarh recorded a single participant from Raipur. Although participation from these states remained comparatively limited, their inclusion demonstrates the expanding inter-state outreach of rescue and rehabilitation–related conservation programmes.

Overall, the stakeholder and district-wise distributions presented in Tables 4.13 and 4.14 demonstrate that rescue and rehabilitation modules were effectively mainstreamed across a wide range of conservation, sensitization, and capacity-building programmes throughout the Ganga River Basin. The integration of these modules into broader stakeholder trainings substantially expanded the scale and geographic reach of capacity-building efforts beyond dedicated rescue and rehabilitation programmes alone. Trainings successfully reached frontline agencies, technical experts, educational institutions, volunteers, local communities, and stakeholders from ecologically sensitive, administratively important, and operationally significant districts across multiple states. The observed variation in participation across states and districts reflects differing regional conservation priorities, institutional capacities, ecological

sensitivities, and training requirements within the basin. Importantly, this multi-stakeholder and geographically inclusive approach strengthens institutional and inter-agency coordination, enhances local preparedness and operational efficiency during wildlife emergencies, promotes scientific and community-based conservation practices, and contributes toward the development of a more resilient, participatory, and basin-wide conservation response framework for the long-term protection of Ganga River biodiversity.

4.7 Developing A Network of Riverside Local Communities Capable of Responding to the Emergent Situation

The composition and distribution of first responder groups trained across the Ganga River Basin demonstrate the establishment of a robust frontline response system for addressing urgent situations involving aquatic animals in distress. These first responders serve as the critical initial link in rescue operations, responsible for rapid intervention, preliminary assessment, site safety, and coordination with relevant agencies, thereby reducing response time and minimizing mortality risks. By integrating technical experts, enforcement agencies, and community-based stakeholders, the programme ensures both operational efficiency and local responsiveness. This multi-tiered and well-distributed first responder network strengthens rescue preparedness, enhances inter-agency coordination, and supports systematic, science-based conservation actions, contributing significantly to improved survival outcomes and long-term biodiversity conservation in the Ganga River Basin.

4.7.1 First Responder Group Along the Ganga River Basin

A total of 2,397 first responders were engaged across nine basin states (Figure 4.11), reflecting a strong emphasis on operational preparedness (Table 4.15). Forest Officials constituted the largest first responder group with 1,371 participants, underscoring their central responsibility in wildlife rescue, enforcement, and coordination of emergency responses. Their widespread presence across states such as Uttar Pradesh (387 participants), Uttarakhand (284 participants), Rajasthan (252 participants), and Bihar (266 participants) highlights the strategic deployment of trained personnel in high-risk and ecologically sensitive stretches of the river (Table 4.15).

The ETF-GTF network accounted for 125 participants, with major representation from Uttar Pradesh (91 participants) and Uttarakhand (30 participants) (Table 4.15), reinforcing their role as specialised technical teams supporting rapid response and on-ground interventions. Ganga Praharis (295 participants) emerged as a key community-based first responder group, particularly in Bihar, Uttar Pradesh, Uttarakhand, and West Bengal (Table 4.15), demonstrating the effectiveness of community stewardship models in early detection and reporting of distressed aquatic fauna.

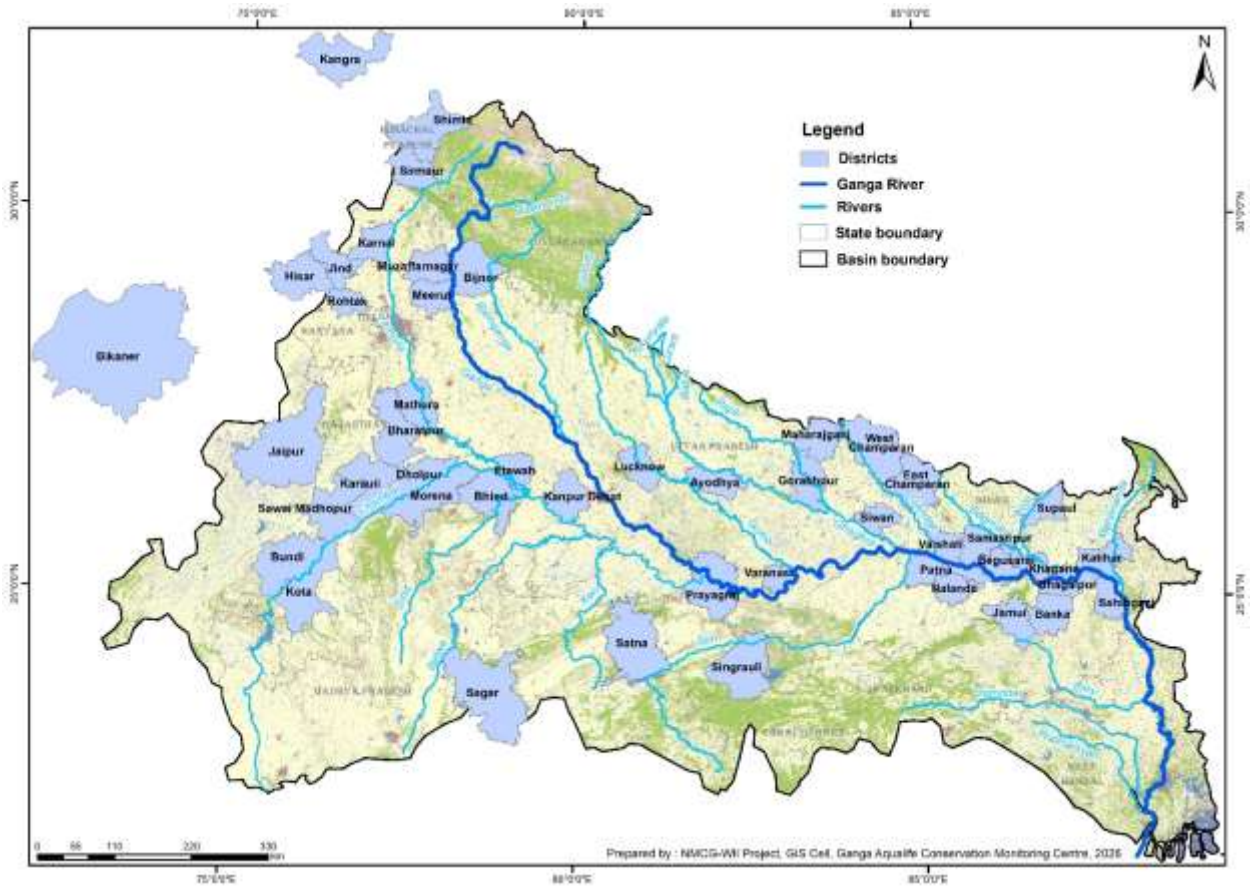


Figure 4.11: Network of Riverside Local Communities Capable of Responding to The Emergent Situation

Table 4.15: First Responder Group along the Ganga River Basin

Stakeholders	Bihar	Haryana	Himachal Pradesh	Jharkhand	Madhya Pradesh	Rajasthan	Uttar Pradesh	Uttarakhand	West Bengal	Total
ETF-GTF						1	91	30	3	125
Forest Officials	266		35		102	252	387	284	45	1371
Ganga Prahari	144			3			57	74	17	295
Local Community							54		4	58
NCC								41		41
NGOs & Volunteers							8			8
Police Personnels							55	18		73
Researchers	55		1		1	1		3		61
Tourist Guide							56			56
Veterinarians	10	28	4			135	8	2		187
Zookeeper & Staff							93	29		122
Total	475	28	40	3	103	389	809	481	69	2397

Technical and professional expertise was further strengthened through the inclusion of veterinarians (187 participants) and zookeeper and associated staff (122 participants), who are essential for animal handling, emergency treatment, and post-rescue care (Table 4.15). Their substantial presence in Uttar Pradesh and Rajasthan reflects focused capacity building in regions with higher incidence of rescue events. The participation of police personnel (73 participants) enhances inter-agency coordination, crowd management, and legal enforcement during rescue operations, while researchers (61 participants) contribute scientific inputs and documentation critical for improving rescue protocols (Table 4.15).

Community-based and auxiliary support groups also formed an important component of the first responder network. Local community members (58 participants), tourist guides (56 participants), NCC cadets (41 participants), and NGOs and volunteers (8 participants) (Table 4.15) play a vital role in early reporting, site-level assistance, and public sensitisation during emergencies. Their engagement ensures timely response, especially in remote or high-tourism zones along the river.

State-wise analysis indicates that Uttar Pradesh recorded the highest number of first responders (809 participants), followed by Uttarakhand (481 participants) and Rajasthan (389 participants). This distribution aligns with the intensity of human–river interactions and the frequency of rescue incidents in these states (Table 4.15). Moderate representation from Bihar (475 participants) and Madhya Pradesh (103 participants) further supports basin-wide preparedness, while participation from Haryana, Himachal Pradesh, Jharkhand, and West Bengal reflects inclusive coverage across the basin (Table 4.15).

Overall, the results demonstrate the establishment of a robust, multi-layered first responder network along the Ganga River Basin. By integrating government agencies, technical experts, community groups, and volunteer networks, the programme significantly enhances the speed, effectiveness, and coordination of responses to aquatic wildlife emergencies. This strengthened first-response mechanism is expected to lead to improved survival outcomes for distressed aquatic fauna and contribute substantially to the long-term conservation of Ganga River basin biodiversity.

4.7.2 State and District Wise Distribution of First Responders

The state- and district-wise distribution of first responders trained across the Ganga River Basin is presented in Table 4.16, illustrating the presence of a diverse and functionally specialized frontline network capable of responding to aquatic wildlife emergencies. The table highlights not only the geographic spread of responders but also the specific categories of stakeholders who act as the first point of response during incidents involving aquatic animals in distress.

Specialised technical responders such as ETF-GTF members were trained primarily in Uttar Pradesh, with major representation from Prayagraj (89 responders) and Muzaffarnagar (2 responders), supported by additional participation from Uttarakhand (Dehradun and Haridwar), Rajasthan (Bharatpur), and West Bengal (Darjeeling) (Figure 4.12). Their role is critical in providing rapid technical support and facilitating coordinated rescue actions. NCC cadets, trained exclusively in Dehradun, Uttarakhand (41 responders), strengthen youth-based emergency assistance and public engagement during rescue operations (Table 4.16).

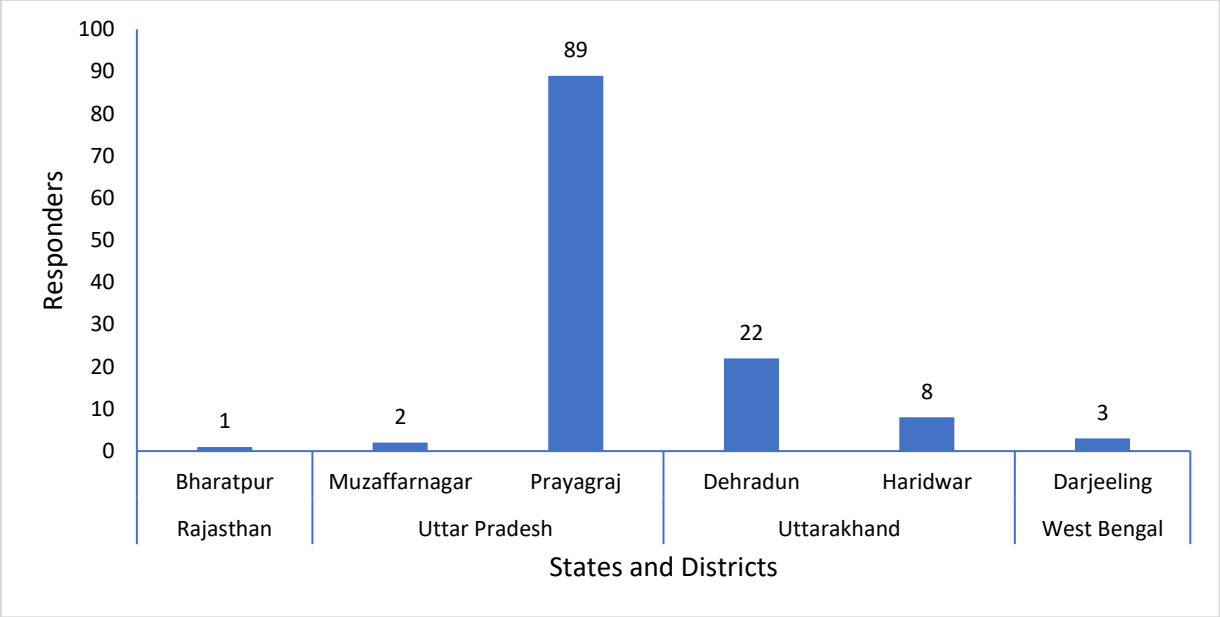


Figure 4.12: Eco Task Force-Ganga Task Force (ETF-GTF) Trained as First Responder Group Across Ganga River Basin

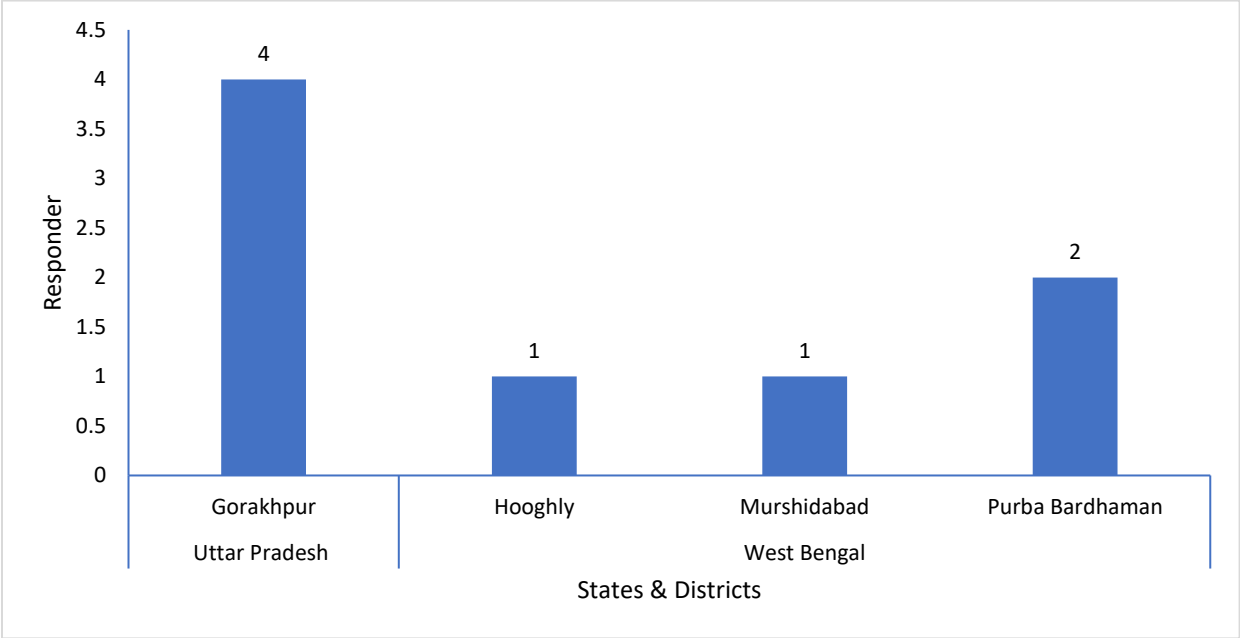


Figure 4.13: NGOs & Volunteers Trained as First Responder Group Across Ganga River Basin

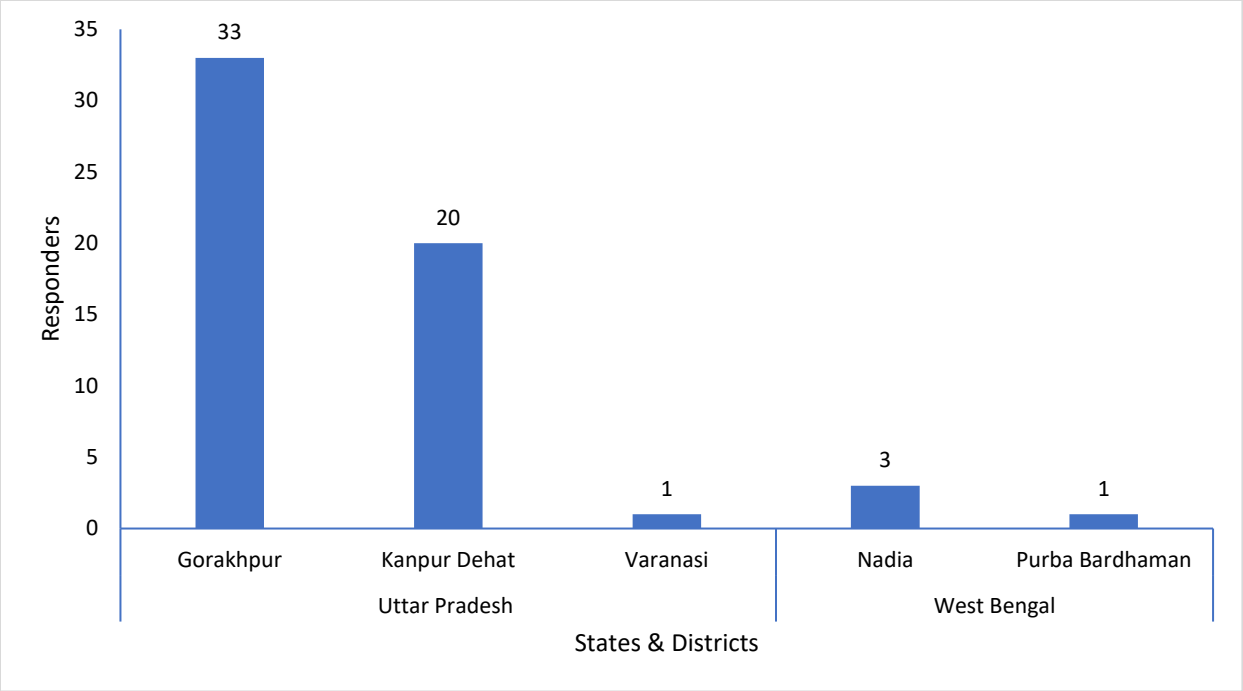


Figure 4.14: Local Communities Trained as First Responder Group Across Ganga River Basin

Community-oriented and support-based responders also show strong district-level presence. **NGOs and volunteers** were trained in Gorakhpur (Uttar Pradesh) and select districts of West Bengal, while tourist guides, concentrated in Varanasi (56 responders), are strategically positioned to act as first informants and facilitators in high-footfall riverfront areas (Figure 4.13). **Local community** members, particularly from Gorakhpur, Kanpur Dehat, and Varanasi in Uttar Pradesh, and Nadia and Purba Bardhaman in West Bengal, further strengthen early detection and on-site response capacity (Figure 4.14).

Among institutional responders, Forest Officials (Figure 4.15) represent the largest and most widely distributed group, with substantial numbers trained in Patna and West Champaran (Bihar), Shimla and Sirmaur (Himachal Pradesh), Morena and adjoining districts in Madhya Pradesh, multiple districts in Rajasthan, and key districts across Uttar Pradesh and Uttarakhand, including Ayodhya, Kanpur Dehat, Dehradun, and Haridwar. Their widespread distribution ensures regulatory authority and operational leadership during rescue situations.

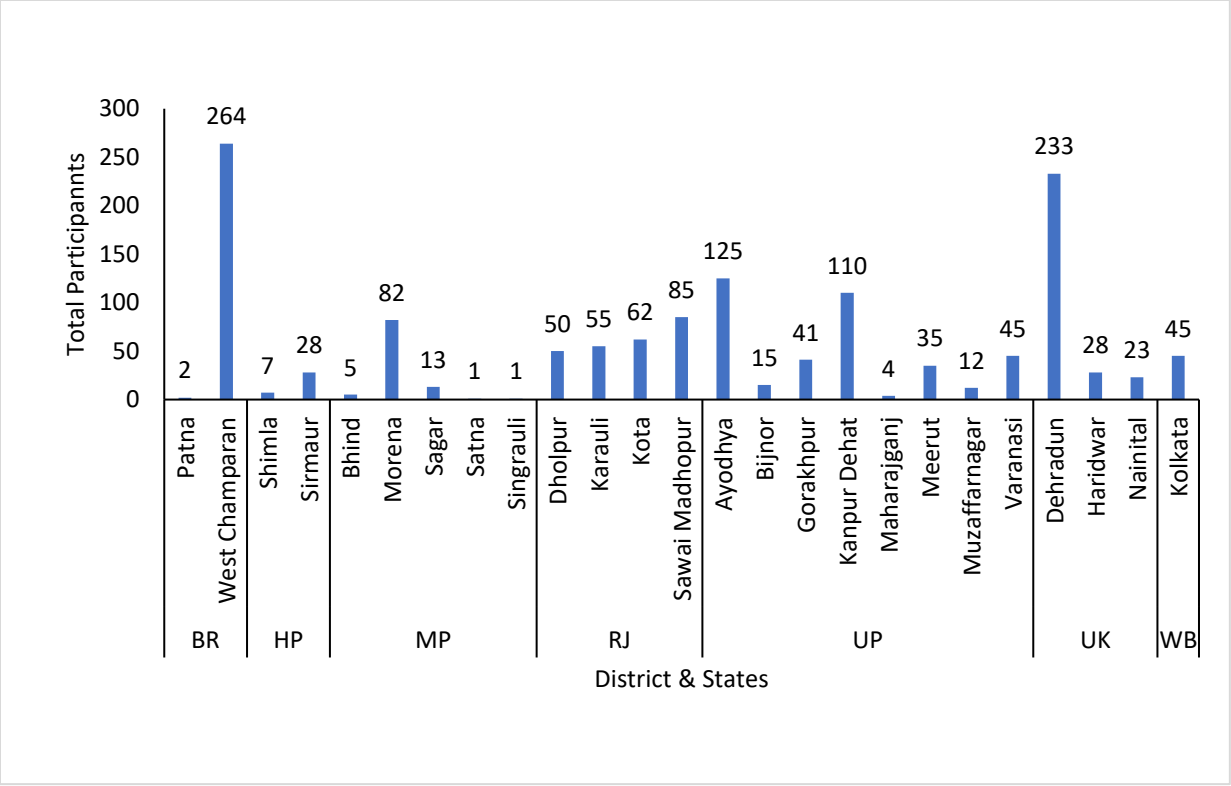


Figure 4.15: Forest Officials Trained as First Responder Group Across Ganga River Basin

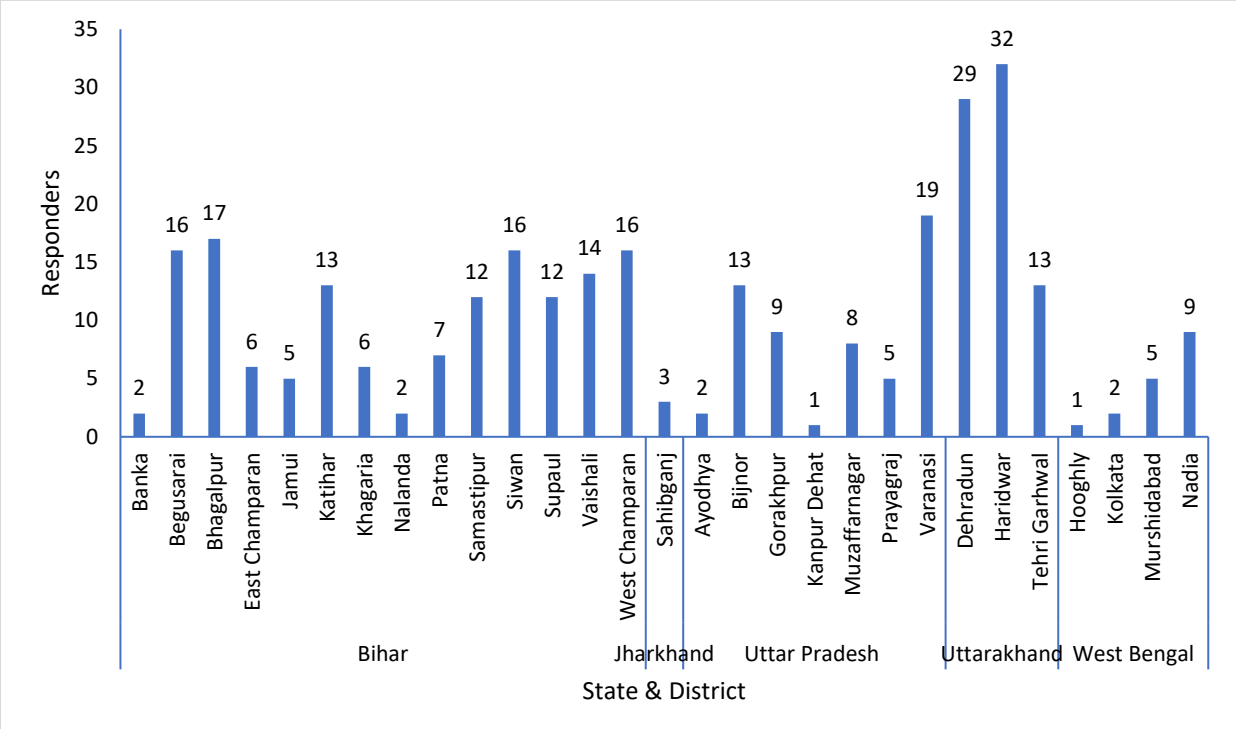


Figure 4.16: Ganga Prahari Trained as First Responder Group Across Ganga River Basin

Ganga Praharis (Figure 4.16), as grassroots conservation stewards, were trained across multiple districts in Bihar, Uttar Pradesh, Uttarakhand, Jharkhand, and West Bengal, with notable concentrations in West Champaran, Bhagalpur, Ayodhya, Varanasi, Dehradun, and Haridwar. Their proximity to riverine communities enables rapid reporting and mobilisation during emergencies. Similarly, zookeeper and allied staff (Figure 4.17), concentrated in districts such as Gorakhpur, Lucknow, Kanpur Dehat, and Nainital, play a crucial role in animal handling and rehabilitation support.

Law enforcement and technical expertise are further strengthened through police personnel, trained primarily in Ayodhya (Uttar Pradesh) and several districts of Uttarakhand, ensuring crowd control, legal compliance, and safety during rescue operations. Veterinarians (Figure 4.18), a critical component of the first responder network, were trained across Bihar, Haryana, Himachal Pradesh, Rajasthan, Uttar Pradesh, and Uttarakhand, with particularly high representation in Rajasthan, ensuring availability of emergency medical care for rescued animals. Researchers (Figure 4.19), though fewer in number, were strategically trained in Patna, Dehradun, and select districts, contributing scientific inputs and documentation during rescue events.

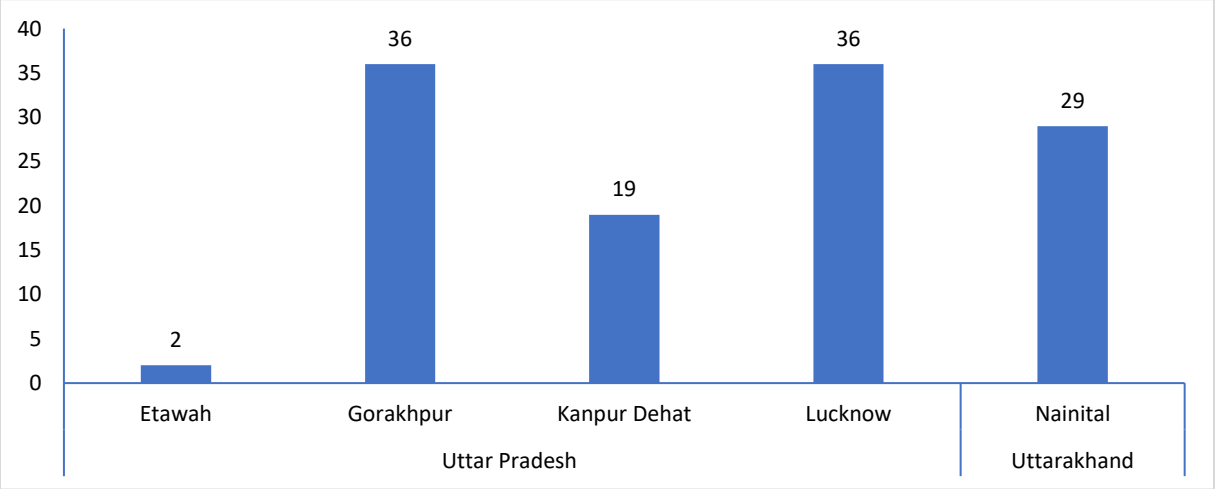


Figure 4.17 Zookeepers and Staff Trained as First Responder Group Across Ganga River Basin

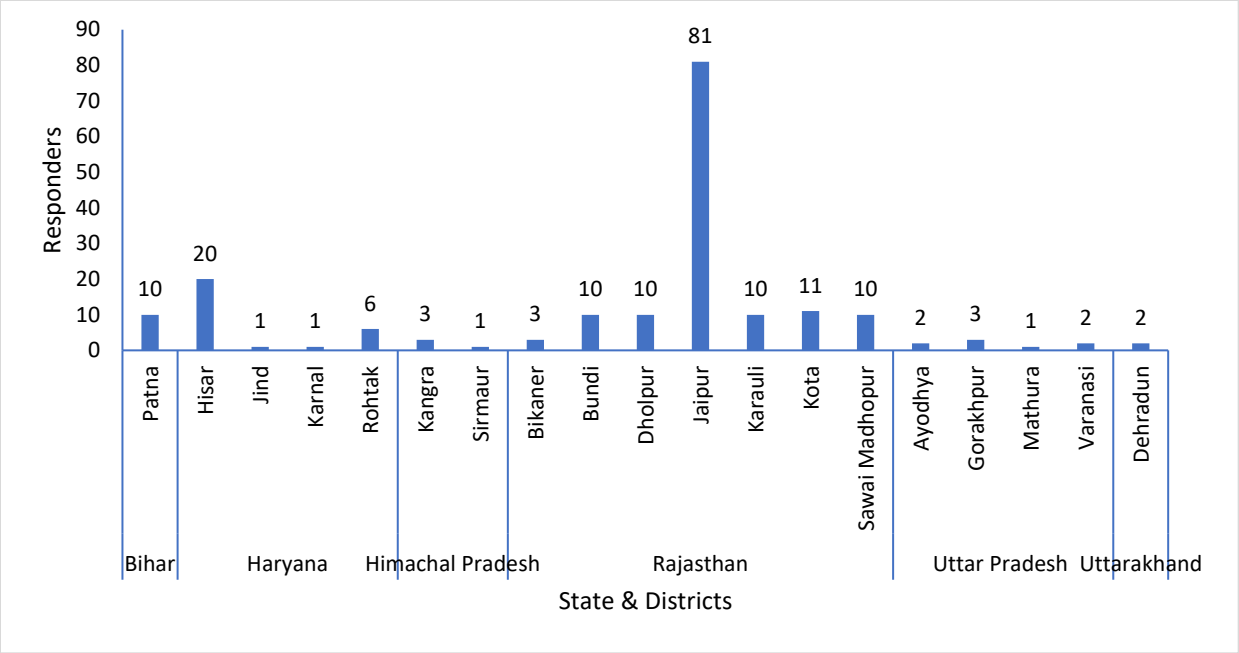


Figure 4.18 Veterinarians Trained as First Responder Group Across Ganga River Basin

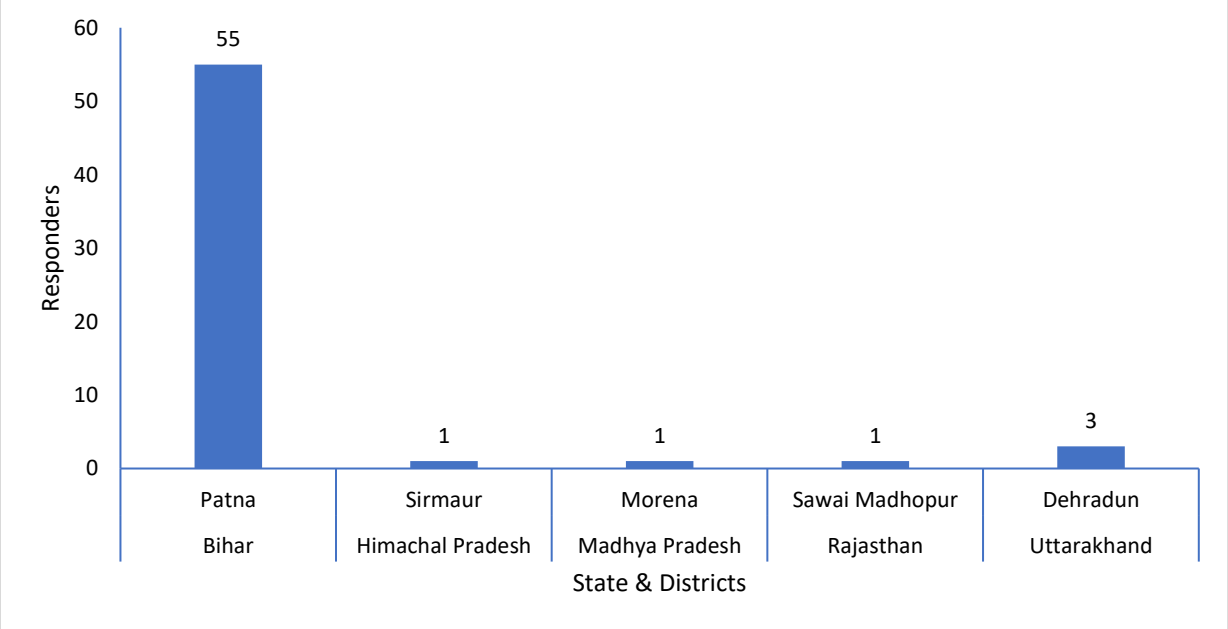


Figure 4.19: Researchers Trained as First Responder Group Across Ganga River Basin

Overall, the distribution demonstrates that first responder capacity has been systematically embedded across states and districts, integrating enforcement agencies, technical experts, community groups, and support personnel. This spatially distributed and functionally diverse

network significantly enhances rapid response capability, inter-agency coordination, and on-ground effectiveness of rescue and rehabilitation efforts, thereby strengthening aquatic biodiversity conservation across the Ganga River Basin.

Table 4.16: State and district wise distribution of first responders' group across Ganga River Basin

States	Districts	First Responders	State total	Total
ETF-GTF				
Rajasthan	Bharatpur	1	1	125
Uttar Pradesh	Muzaffarnagar	2	91	
	Prayagraj	89		
Uttarakhand	Dehradun	22	30	
	Haridwar	8		
West Bengal	Darjeeling	3	3	
NCC				
Uttarakhand	Dehradun	41	41	41
NGOs & Volunteers				
Uttar Pradesh	Gorakhpur	4	4	**8**
West Bengal	Hooghly	1	4	
	Murshidabad	1		
	Purba Bardhaman	2		
Tourist Guide				
Uttar Pradesh	Varanasi	56	56	**56**
Forest Officials				
Bihar	Patna	2	266	**1371**
	West Champaran	264		
Himachal Pradesh	Shimla	7	35	
	Sirmaur	28		
Madhya Pradesh	Bhind	5	102	
	Morena	82		
	Sagar	13		
	Satna	1		
	Singrauli	1		
Rajasthan	Dholpur	50	252	
	Karauli	55		
	Kota	62		
	Sawai Madhopur	85		
Uttar Pradesh	Ayodhya	125	387	
	Bijnor	15		
	Gorakhpur	41		

	Kanpur Dehat	110		
	Maharajganj	4		
	Meerut	35		
	Muzaffarnagar	12		
	Varanasi	45		
Uttarakhand	Dehradun	233	284	
	Haridwar	28		
	Nainital	23		
West Bengal	Kolkata	45	45	
Ganga Prahari				
Bihar	Banka	2	144	**295**
	Begusarai	16		
	Bhagalpur	17		
	East Champaran	6		
	Jamui	5		
	Katihar	13		
	Khagaria	6		
	Nalanda	2		
	Patna	7		
	Samastipur	12		
	Siwan	16		
	Supaul	12		
	Vaishali	14		
	West Champaran	16		
Jharkhand	Sahibganj	3	3	
Uttar Pradesh	Ayodhya	2	57	
	Bijnor	13		
	Gorakhpur	9		
	Kanpur Dehat	1		
	Muzaffarnagar	8		
	Prayagraj	5		
	Varanasi	19		
Uttarakhand	Dehradun	29	74	
	Haridwar	32		
	Tehri Garhwal	13		
West Bengal	Hooghly	1	17	
	Kolkata	2		
	Murshidabad	5		
	Nadia	9		
Zookeeper & Staff				
Uttar Pradesh	Etawah	2	93	**122**
	Gorakhpur	36		

	Kanpur Dehat	19		
	Lucknow	36		
Uttarakhand	Nainital	29	29	
Police Personnels				
Uttar Pradesh	Ayodhya	55	55	**73**
Uttarakhand	Champawat	1	18	
	Dehradun	7		
	Haridwar	1		
	Pauri Garhwal	2		
	Rudraprayag	1		
	Tehri Garhwal	3		
	Udham Singh Nagar	1		
	Uttarkashi	2		
Veterinarians				
Bihar	Patna	10	10	**187**
Haryana	Hisar	20	28	
	Jind	1		
	Karnal	1		
	Rohtak	6		
Himachal Pradesh	Kangra	3	4	
	Sirmaur	1		
Rajasthan	Bikaner	3	135	
	Bundi	10		
	Dholpur	10		
	Jaipur	81		
	Karauli	10		
	Kota	11		
	Sawai Madhopur	10		
Uttar Pradesh	Ayodhya	2	8	
	Gorakhpur	3		
	Mathura	1		
	Varanasi	2		
Uttarakhand	Dehradun	2	2	
Researchers				
Bihar	Patna	55	55	**61**
Himachal Pradesh	Sirmaur	1	1	
Madhya Pradesh	Morena	1	1	
Rajasthan	Sawai Madhopur	1	1	
Uttarakhand	Dehradun	3	3	
Local Community				
Uttar Pradesh	Gorakhpur	33	54	**58**
	Kanpur Dehat	20		

	Varanasi	1		
West Bengal	Nadia	3	4	
	Purba Bardhaman	1		

4.8 Training of Volunteers Using Expertise of Spearhead Teams

Under the WII-NMCG programme, spearhead groups that had previously undergone intensive training by the Wildlife Institute of India (WII) under the National Mission for Clean Ganga (NMCG) subsequently initiated and facilitated a series of capacity-building programmes across the Ganga River Basin states. These trainings represent a direct outcome of the spearhead teams' own training and skill enhancement, demonstrating effective knowledge transfer and field-level application of the capacity-building framework (Table 4.17, Figure 4.20).

A total of 48 training programmes were conducted by these trained spearhead groups, collectively covering 3,437 participants from diverse stakeholder categories. The largest share of participants comprised college students, with 1,136 individuals, accounting for 33.04% of the total. This highlights the strategic emphasis on youth engagement and higher-education institutions to cultivate long-term conservation awareness and environmentally responsible attitudes.

Table 4.17: Stakeholder-wise distribution of participants trained through spearhead group led programmes under the WII–NMCG initiative across the Ganga River Basin states (n = 3,437; 48 trainings)

Stakeholders	Total Participants
College Professor	59 (1.72 %)
College Students	1136 (33.05 %)
ETF-GTF	130 (3.78 %)
Fisheries Officials	1 (0.03 %)
Forest Officials	911 (26.51 %)
Ganga Prahari	53 (1.54 %)
Irrigation Department & Engineers	4 (0.12 %)
Line Agencies	10 (0.29 %)
Local Community	75 (2.18 %)
Media	11 (0.32 %)
NCC	153 (4.45 %)
NGOs & Volunteers	21 (0.61 %)
NSS	566 (16.47 %)

Researchers	4 (0.12 %)
School Students	130 (3.78 %)
School Teachers	1 (0.03 %)
Scientists	2 (0.06 %)
Tourist Guide	1 (0.03 %)
Veterinarians	47 (1.37 %)
Zookeeper & Staff	122 (3.55 %)

Forest officials formed the second largest stakeholder group, with 911 participants (26.50%), reflecting strong institutional participation and reinforcement of conservation practices among frontline government agencies directly involved in river and wildlife management. NSS volunteers constituted 566 participants (16.47%), demonstrating the effective utilization of national volunteer networks by spearhead teams to expand conservation outreach. Participation from NCC cadets (153; 4.45%) and school students (130; 3.78%) further indicates the programme's contribution to shaping conservation-oriented values among younger age groups, thereby strengthening the foundation for future river stewardship (Table 4.17, Figure 4.20).

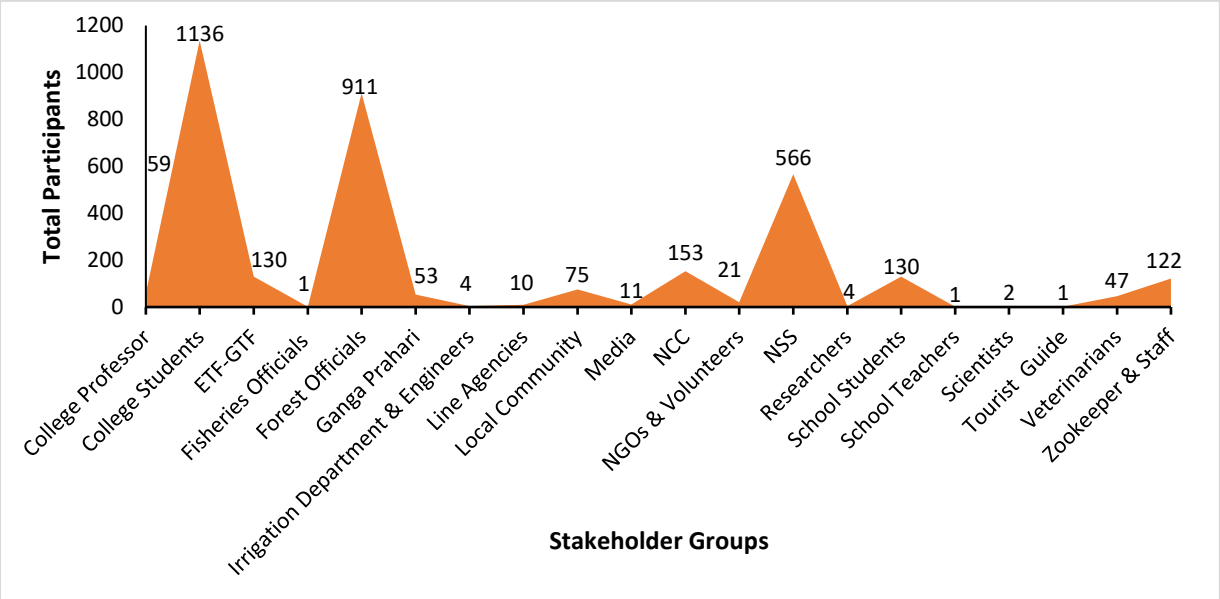


Figure 4.20: Percentage-Wise Representation of Stakeholder Groups Trained Through Trainings Facilitated By WII–NMCG–Trained Spearhead Teams Across the Ganga River Basin States

The spearhead-facilitated trainings also engaged a range of specialized and community-level stakeholders. ETF-GTF personnel accounted for 130 participants (3.78%), while zookeeper and zoo staff represented 122 participants (3.55%), strengthening species-specific conservation and

wildlife management capacities. Local community members (75; 2.18%) and Ganga Praharis (53; 1.54%) reflect community-based conservation and river-guardian approaches embedded within the programme design.

Additional participation was recorded among college professors (59; 1.72%), veterinarians (47; 1.37%), NGOs and volunteers (21; 0.61%), and media professionals (11; 0.32%), contributing to interdisciplinary knowledge exchange and public communication. Smaller yet strategically important participation from line agencies, irrigation engineers, researchers, scientists, fisheries officials, school teachers, and tourist guides ensured multi-sectoral sensitization and reinforced the integrated river basin management perspective promoted under the WII-NMCG framework (Figure 4.20).

The initiation of these trainings by already trained spearhead groups clearly demonstrates the multiplier effect envisioned under this initiative. Acting as local resource persons and facilitators, spearhead teams created a cascading chain of capacity building, enabling wider dissemination of scientific knowledge, conservation ethics, and best practices related to river ecosystems and freshwater biodiversity. By prioritizing students, youth volunteers, government officials, and community stakeholders, the spearhead-led trainings play a critical role in shaping the environmental mindset of future generations. This conservation initiative, through its trained spearhead teams, is thus not only addressing immediate conservation needs but also building long-term human capital essential for river rejuvenation and freshwater biodiversity conservation. Overall, the corrected data clearly indicate that the WII-NMCG spearhead training model has successfully translated institutional training into on-ground conservation action, positioning it as a flagship government-funded initiative shaping the future of river conservation across the Ganga River Basin.

CHAPTER 5 TRAINING DATABASE MANAGEMENT

A reliable database is a key input to the capacity building of stakeholder's process. Development of an appropriate database for each training programme conducted is significant to keep track of the progress of the effort and in turn maintaining a consistent track of the status of the Ganga River Basin and its biodiversity. 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, institutions and local bodies. This stakeholder database is more than just a tool for future reference of multiple target groups engaged in conserving the freshwater ecology of Ganga River Basin and also a strong source of data for future analysis of stakeholder engagement, and a long-term efficiency. For such an effort, it is important to develop a database for networking between the trainers, trained individuals, layman and citizen. The training database can be easily accessible by a different organization and line agencies for effective implementation and to ensure the long-term sustainability of these programmess.

5.1 Overview of Training Database

A training database is a centralized repository for managing and tracking the participants information and resource persons can be scanned under which modules and sessions as they were trained. It also helps the organizations to organize, store, and analyse information about course content, budget, participants, and training outcomes. Ultimately, training Databases are storage systems comprised of information regarding training, certifications, and information of training of trainers (ToTs) as a way to stay up-to-date on training information. The online repository is essential to maintain the robustness of the available data. The database also allows ease of availability and access to the details of capacity building trainings and workshops of multiple stakeholders on a public forum.

Training database is necessary to ensure the creation of a comprehensive database of each training programmes, participant qualifications, gender, status including their contact details, training schedules, training modules, training budget, mode of training, field sessions, number of

days engaged, training feedback, details of WII team and resource persons, detailed reports, event photographs, GPS locations of the onsite and offsite training programme, media coverages etc. This ensures transparency and accountability on every front. The training team of WII-NMCG project conducts regular sensitization and training workshops with the identified stakeholders to build their capacities. The database includes all the required information such as compilation of reports and feedbacks sessions, entry of participants details, management of training database and website, etc. of the stakeholders such as the Forest officials, Professors, Teachers, Scientist, Entrepreneurs, Local villagers, Ganga Praharis students, line agencies and youth from the onsite locations to disseminate the motto of Ganga biodiversity conservation.

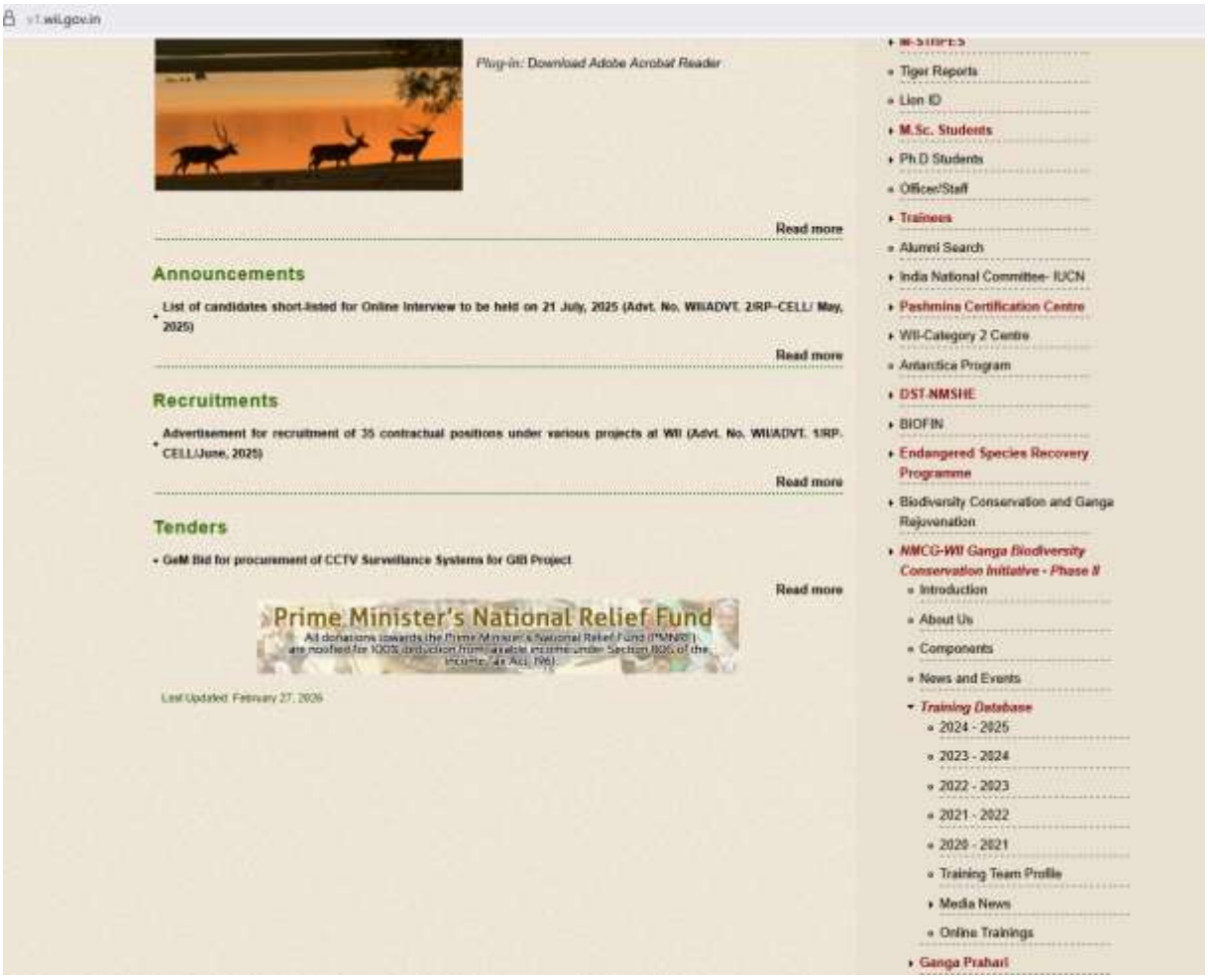
The training database provides stakeholders engaged since 2020 to 2025 with their qualification, gender, contact details, E-Mails and complete information of a particular target groups for quick reference. The training database can be accessed and freely download by any organizations and line agencies for effective implementation of training programmes and workshops with different stakeholders in their respective areas of concerns to ensure the long-term sustainability of these efforts.

5.2 Maintenance of Proper Training Records

Training records can be used as a basis for goal setting or aid in selecting target groups by matching competencies with the required skills. Extensive records of the aforementioned are maintained to provide the data needed to make decisions based on actual performance after specific training programmes. Records provide an easy method to identify training gaps that direct future subject matter. Further, the training gap assesses the needs of the organization and the knowledge, skills, attitudes, and abilities of the staff in relation to the task they perform. To ensure maximum widespread awareness, details of the events are given extensive media coverage. This ensures widespread dissemination of the information and knowledge distributed in these training sessions.

5.3 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. The database acts as a comprehensive central information repository for the pertinent details of all given trainings and workshops conducted from 2020 to 2025 under 'Capacity building of forest department and other stakeholders' at http://www.wii.gov.in/ganga_training. Various forms of print media including newspapers, brochures and booklets, radio, and social media platforms like facebook, YouTube, Instagram, X account etc. were utilized.

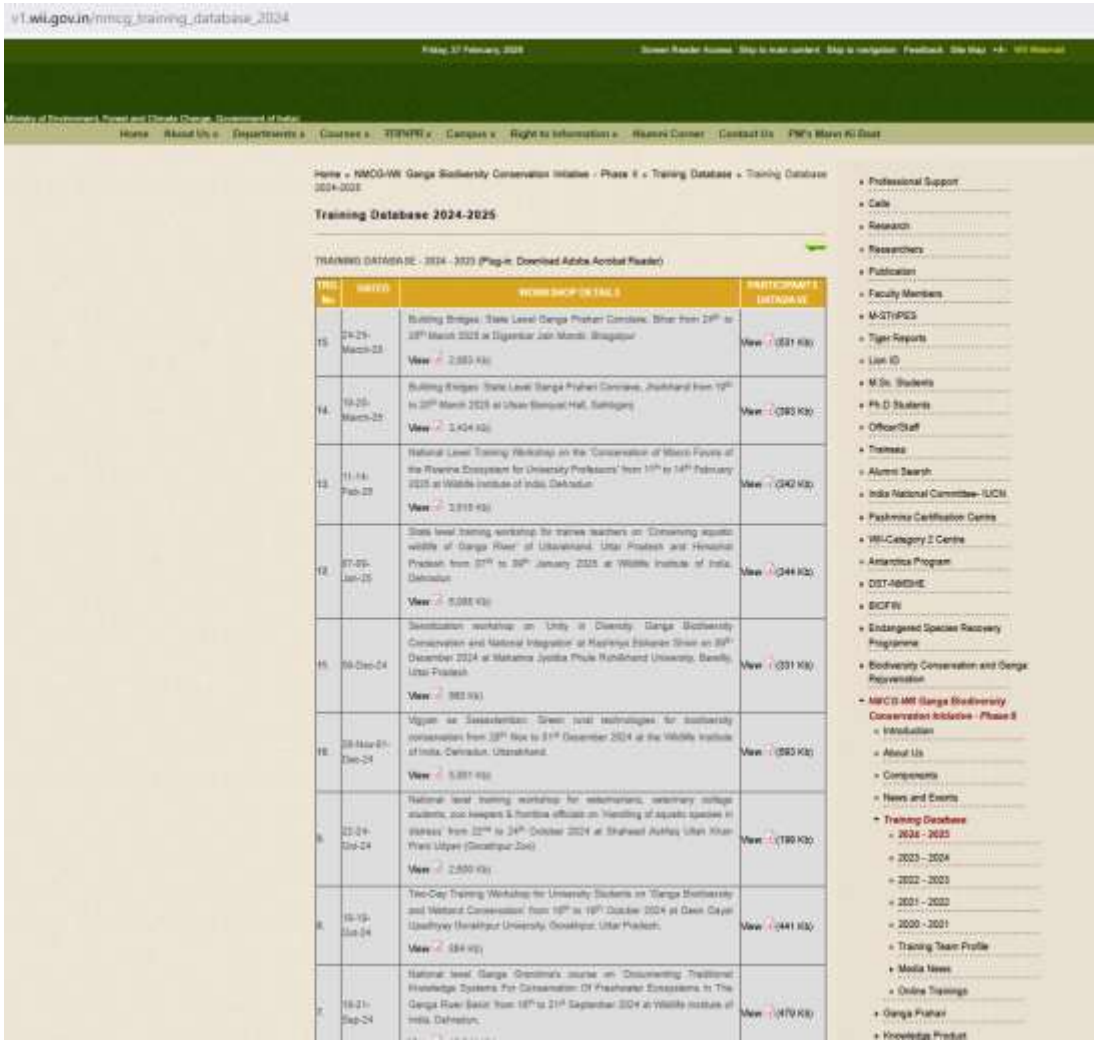


Quick Links

- 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
- https://youtube.com/@glimpsesofgangawii9778?si=ATiDAnjZ7fFFPNZg

This training database (**Figure 5.1**) is a single point source to spread training information and awareness masses. The formulation of an online database was vital to keep track of the progress made in the capacity building of various stakeholders involved in the conservation of biodiversity of Ganga River and its tributaries.



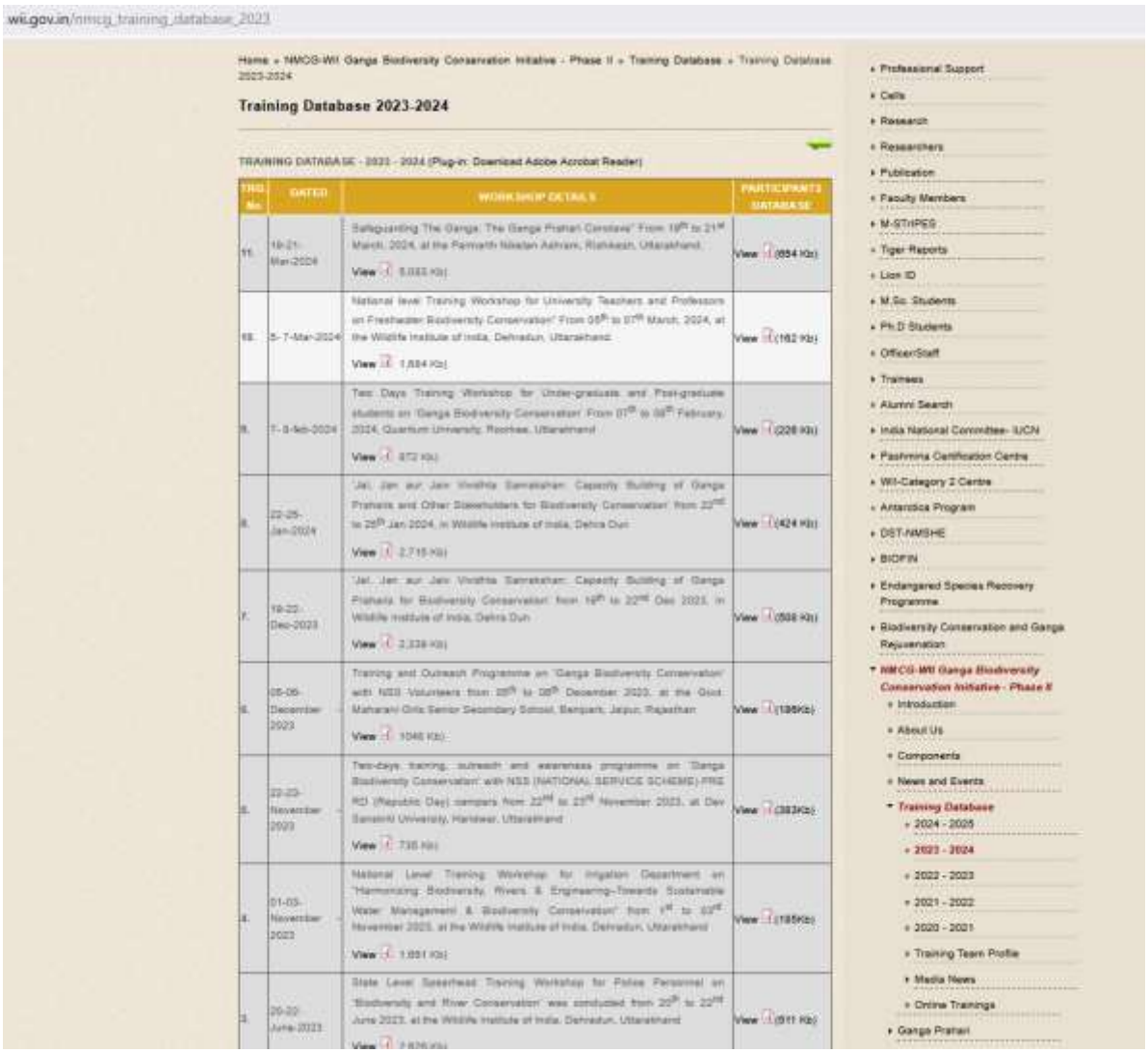


Figure 5.1: Training Database on wii.gov.in

CHAPTER 6 MONITORING AND EVALUATION

6.1 Training Impact Assessment

As a part of the capacity-building initiative under the National Mission for Clean Ganga (NMCG), a structured questionnaire-based survey was conducted to evaluate stakeholder knowledge, perceptions, and behavioral tendencies related to the conservation of the Ganga River Basin and its biodiversity. This assessment was implemented in two distinct phases i.e. pre-training and post-training to establish a baseline of understanding and to measure the effectiveness of the training intervention.

6.2 Results and Discussion

6.2.1 Overview of Training Programmes

Across the 21 trainings, a total of 1,294 participants were engaged, of whom 697 individuals (53.86%) completed both pre- and post-training questionnaires. The response rates varied by programme, ranging from full participation (100%) to partial responses in larger or more logistically dispersed trainings. For instance, 100% response was recorded in select programmes for Ganga Praharis, NCC cadets, and police personnel, while response rates were lower in mass-scale student trainings, such as those held at Gorakhpur and Roorkee.

Each training programme contributed to the overarching goal of strengthening the human resource base for Ganga River Basin conservation, with an emphasis on equipping stakeholders with both theoretical understanding and practical skills. The diversity in participant profiles and geographic representation further enhanced the depth and relevance of the pre- and post-survey analysis, allowing meaningful comparisons across knowledge domains and stakeholder categories.

By comparing the data collected from both the pre- and post-training assessments, the study effectively captured changes in stakeholder knowledge, attitudes, and capacity for biodiversity conservation. The findings provide evidence of the training programme’s impact, identify areas requiring further attention, and offer actionable insights for refining future capacity-building

efforts, outreach strategies, and policy interventions aimed at ensuring the sustainable conservation of the Ganga River and its biodiversity.

6.2.2 Demographic Particulars

A total of 697 individuals participated in the survey, representing a diverse group of stakeholders from across the Ganga River Basin. The gender distribution among participants showed that 477 were male (68.44%) and 220 were female (31.56%) (**Table 6.1, Figure 6.1**), indicating a higher male representation in the study. This disparity may reflect institutional participation trends or accessibility variations during field engagement.

Table 6.1: Gender-wise Distribution of Survey Participants

Genders	Participants
Female	220 (31.56%)
Male	477 (68.44%)
Grand Total	**697**

Geographically, the participants belonged to 107 districts across 11 Indian states. The majority were from Uttarakhand, accounting for 42.47% (n=296) of the total respondents, followed by Uttar Pradesh with 27.83% (n=194), and Himachal Pradesh with 7.89% (n=55) (**Table 6.2, Figure 6.2**). States like Bihar, Haryana, and West Bengal also had notable representation, while states such as Madhya Pradesh (1.15%), Chhattisgarh (1.72%), and Delhi (1.72%) (**Table 6.2, Figure 6.2**) contributed smaller shares to the total sample. This distribution suggests strong outreach in the upper and central stretches of the Ganga River Basin. The highest representation was from Uttarakhand, which contributed 296 participants (42.47%), spanning 13 districts (**Table 6.2**). This high participation reflects the state's geographical and ecological proximity to the upper reaches of the Ganga River, as well as active involvement in river conservation initiatives. Uttar Pradesh had the second-highest number of participants, with 194 individuals (27.83%) from 32 districts (**Table 6.2, Figure 6.2**), indicating widespread engagement across the state, which lies along the mid-section of the river basin.

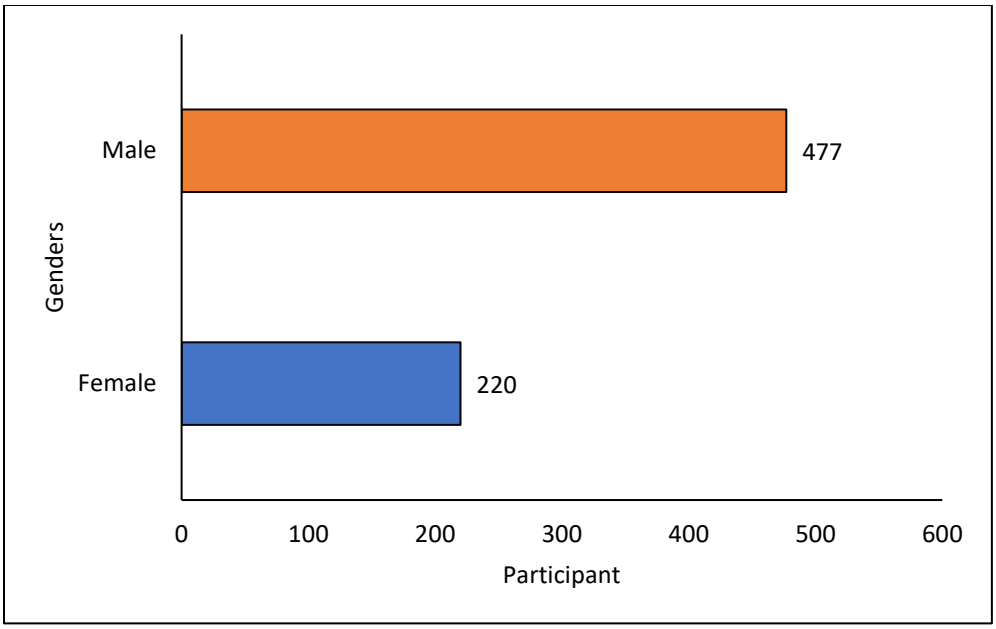


Figure 6.1: Gender Composition of Survey Respondents

The gender distribution within states showed that Uttarakhand had the highest number of female participants (n = 117), followed by Uttar Pradesh (n = 58) and Himachal Pradesh (n = 18). Male participants were dominant in all states, particularly in Uttar Pradesh (n = 136), Uttarakhand (n = 179), and Haryana (n = 38) (**Table 6.2**), reflecting both broader participation and possible gendered dynamics of stakeholder roles in conservation and governance.

Table 6.2: Gender wise participation from different Ganga River basin states

States	Female	Male	Total
Bihar	2 (0.29%)	22 (3.16%)	24 (3.44%)
Chhattisgarh	-	12 (1.72%)	12 (1.72%)
Delhi	8 (1.15%)	4 (0.57%)	12 (1.72%)
Haryana	5 (0.72%)	38 (5.45%)	43 (6.17%)
Himachal Pradesh	18 (2.58%)	37 (5.31%)	55 (7.89%)
Jharkhand	1 (0.14%)	12 (1.72%)	13 (1.87%)
Madhya Pradesh	3 (0.43%)	5 (0.72%)	8 (1.15%)

Rajasthan	5 (0.72%)	16 (2.30%)	21 (3.01%)
Uttar Pradesh	58 (8.32%)	136 (19.51%)	194 (27.83%)
Uttarakhand	117 (16.79%)	179 (25.68%)	296 (42.47%)
West Bengal	3 (0.43%)	16 (2.30%)	19 (2.73%)
Total	220 (31.56%)	477 (68.44%)	697 (100.00%)

Himachal Pradesh contributed 55 participants (7.89%) from 4 districts, while Haryana accounted for 43 participants (6.17%) from 10 districts, both reflecting moderate representations (**Table 6.3, Figure 6.2**). Bihar had 24 participants (3.44%) from 15 districts, suggesting a relatively broad yet shallow distribution. Other states such as West Bengal (19 participants, 2.73%, 5 districts), Jharkhand (13 participants, 1.87%, 2 districts), Delhi (12 participants, 1.72%, 4 districts), and Chhattisgarh (12 participants, (1.72%), 7 districts) (**Table 6.3, Figure 6.2**) had lower representation. Rajasthan and Madhya Pradesh had the least number of participants, contributing 21 (3.01%) and 8 (1.15%) respondents, respectively, covering 8 and 7 districts.

The variation in participant numbers across states reflects differences in geographic coverage, institutional collaboration, and the demographic focus of the awareness program. Overall, the inclusion of a wide range of districts enhances the spatial representativeness of the dataset, allowing for a more comprehensive understanding of regional awareness and stakeholder engagement across the Ganga River Basin.

Table 6.3: Geographic Distribution of Participants by State and District

States	Districts	Total Participants
Bihar	15	24 (3.44%)
Chhattisgarh	7	12 (1.72%)
Delhi	4	12 (1.72%)
Haryana	10	43 (6.17%)
Himachal Pradesh	4	55 (7.89%)
Jharkhand	2	13 (1.87%)
Madhya Pradesh	7	8 (1.15%)
Rajasthan	8	21 (3.01%)
Uttar Pradesh	32	194 (27.83%)

Uttarakhand	13	296 (42.47%)
West Bengal	5	19 (2.73%)
Total	**107**	**697**

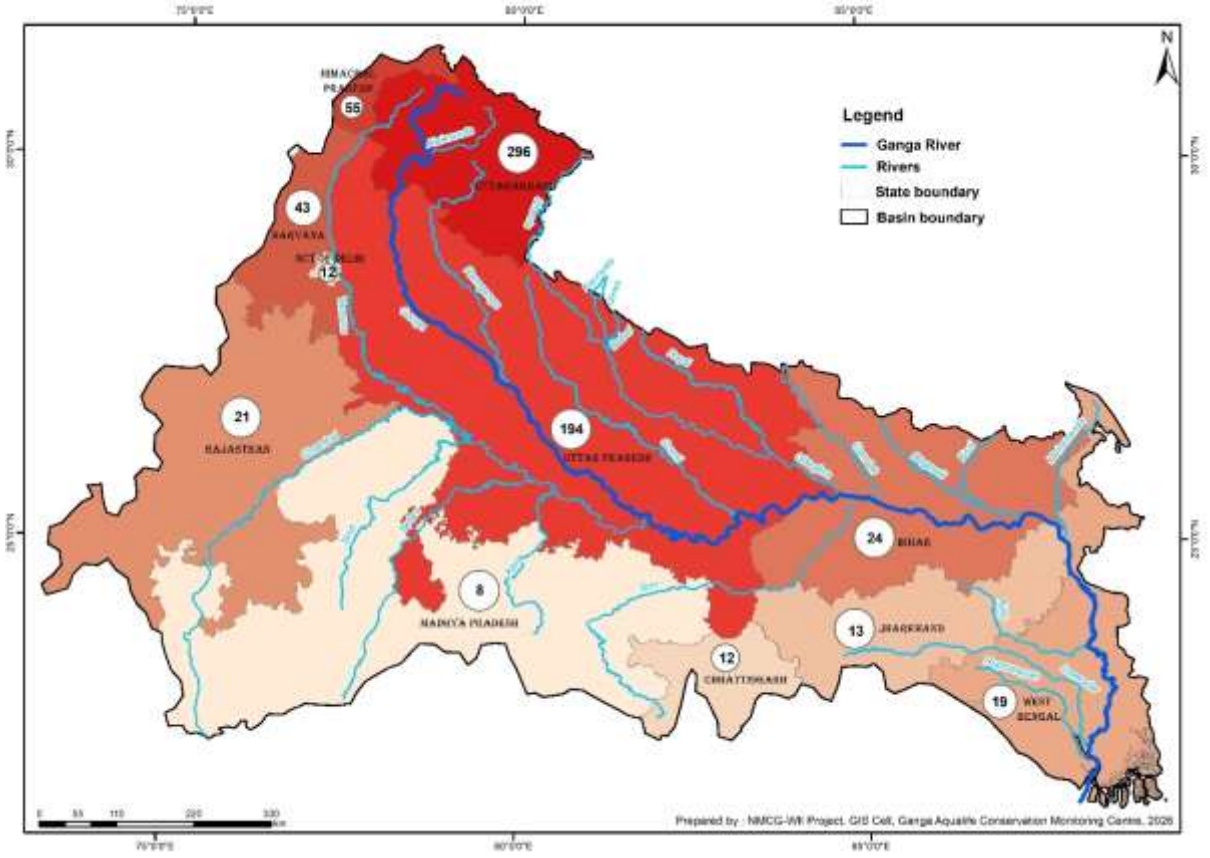


Figure 6.2: Geographic Spread of Survey Participants by Ganga River Basin State

The occupational profile of the respondents revealed representation from a wide array of stakeholder groups relevant to riverine and biodiversity conservation. Students constituted the largest group (16.79%), followed by school teachers (11.05%), Ganga Prahari (9.33%), professors (8.03%), and DIET teachers (7.75%) (**Table 6.4, Figure 6.3**). College students also made up a considerable proportion (7.32%), indicating substantial youth engagement (**Table 6.4, Figure 6.3**). Other categories included government professionals such as forest officials, fisheries officers, irrigation officers, and members of the Eco Task Force and Ganga Task Force. Additional representation came from veterinarians, scientists, police personnel, NGO staff, anthropologists, and zoo keepers (**Table 6.4, Figure 6.3**).

Table 6.4: List of stakeholders participated in survey

Stakeholders	Responses
Anthropologist	2 (0.29%)
Assistant Zoologist	1 (0.14%)
College Student	51 (7.32%)
Diet Teachers	54 (7.75%)
Eco Task Force (ETF)	9 (1.29%)
Executive Engineer (Irrigation & Water Resources)	1 (0.14%)
Fisheries officer	31 (4.45%)
Forest officials	13 (1.87%)
Forest Personnels	27 (3.87%)
Ganga Prahari	65 (9.33%)
Ganga Task Force (GTF)	15 (2.15%)
Irrigation Officer	26 (3.73%)
NCC Cadet	40 (5.74%)
NCC (Officer)	1 (0.14%)
NGO personnels	37 (5.31%)
Police Personnel	18 (2.58%)
Professors	56 (8.03%)
School Teacher	77 (11.05%)
Scientist	9 (1.29%)
Senior Research officer	2 (0.29%)
Students	117 (16.79%)
Veterinarian	39 (5.60%)
Zoo keeper	6 (0.86%)
Total	697

This diversity of backgrounds underscores the multi-sectoral involvement in the Ganga River conservation efforts and suggests the potential for integrated, community-based action supported by institutional networks.

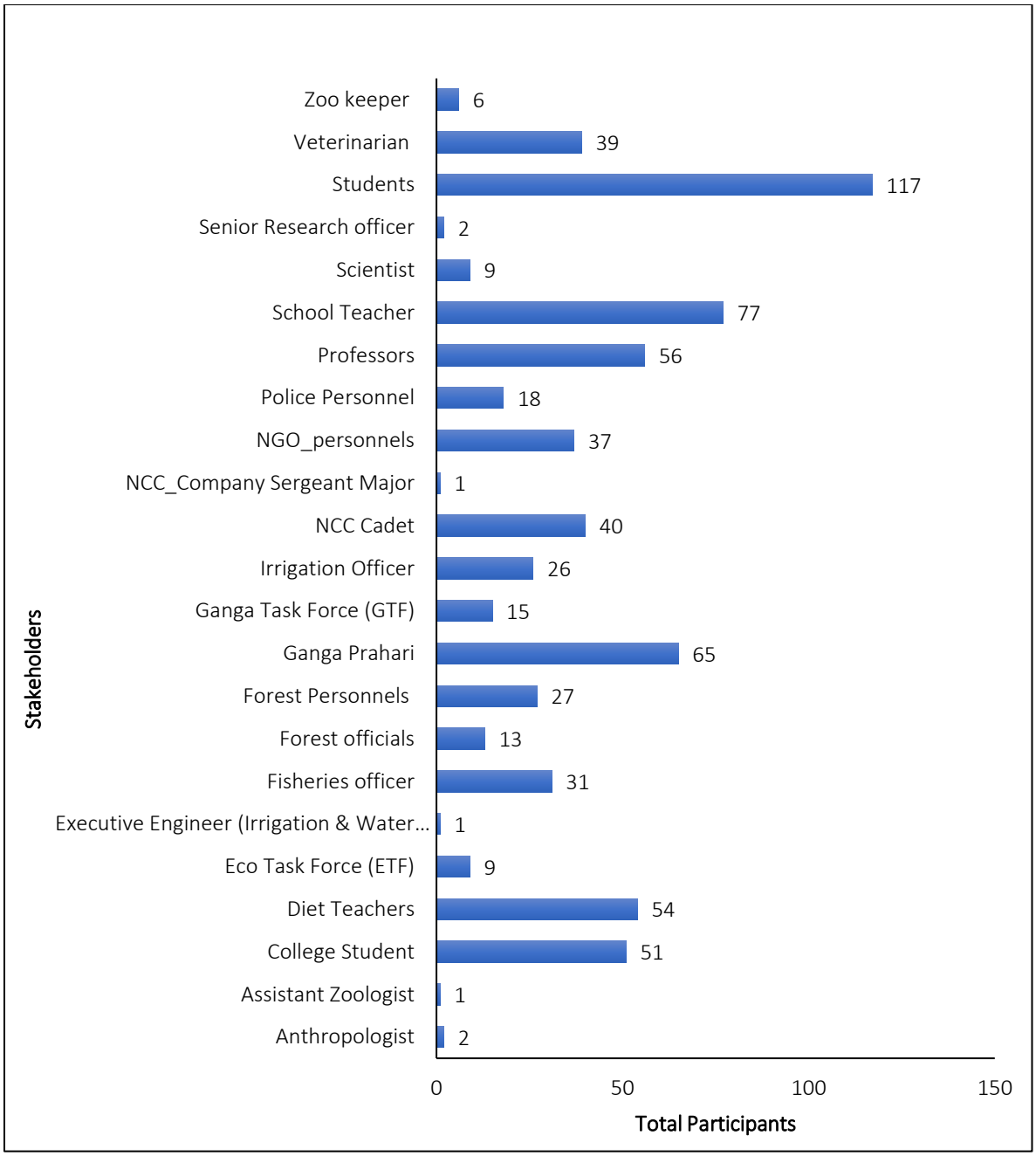


Figure 6.3: Stakeholder wise participants responded to questioner

Given the paired structure of the data-consisting of pre- and post-training scores from the same participants and the potential for non-normal distributions, the Wilcoxon Signed-Rank Test (Wilcoxon-Pratt version) was selected as the primary statistical test to evaluate changes in performance. To complement this test, the rank-biserial correlation was calculated as a non-parametric measure of effect size, and Cohen's d was estimated to provide a standardized,

parametric interpretation of the magnitude of the observed change. Together, these three statistical approaches offer a robust and multidimensional analysis of the training intervention's impact.

6.2.3 Wilcoxon Signed-Rank Test (Wilcoxon-Pratt version)

The summary statistics demonstrate a substantial change in assessment scores between the pre-training and post-training phases. The pre-training assessment showed a mean score of 11.7, a median of 12, and a standard deviation of 3.97, whereas the post-training assessment recorded a mean score of 20.5, with a median of 21 and a standard deviation of 4.67 (Table 6.5). The increase in both mean and median scores following the training programme indicates a significant improvement in participant knowledge and performance. Furthermore, the slightly higher standard deviation in the post-training phase suggests greater dispersion in participant scores after the intervention, possibly reflecting variations in the extent of learning gains among participants. Overall, the observed increase in scores provides strong evidence of the effectiveness of the training intervention.

Table 6.5: Summary statistics of overall pre post analysis

Assessment Phase	Mean	Median	SD
Pre-Training	11.7	12	3.97
Post-Training	20.5	21	4.67

The statistical analysis indicates a statistically significant improvement in participant scores following the training intervention. The Wilcoxon signed-rank test yielded a test statistic of $Z = 22.88$ with a lower p-value ($p < 0.001$) **(Figure 6.4)**. The large Z value ($Z = 22.88$) from the Wilcoxon signed-rank test is a result of the substantial sample size and the consistently strong positive changes in participant scores.

Such a high Z value indicates an extremely strong signal in the data, reinforcing the conclusion that the training intervention had a highly significant impact on participant knowledge and awareness regarding Ganga River conservation. This result strongly supports the conclusion that the observed differences in responses between the pre- and post-training assessments are not attributable to random variation. Rather, they reflect a substantive and measurable impact of

the training programme on participant knowledge and awareness related to Ganga River conservation. Since the training specifically focused on increasing knowledge and fostering a positive attitude toward Ganga River conservation, these results demonstrate the intervention's success in achieving its objectives.

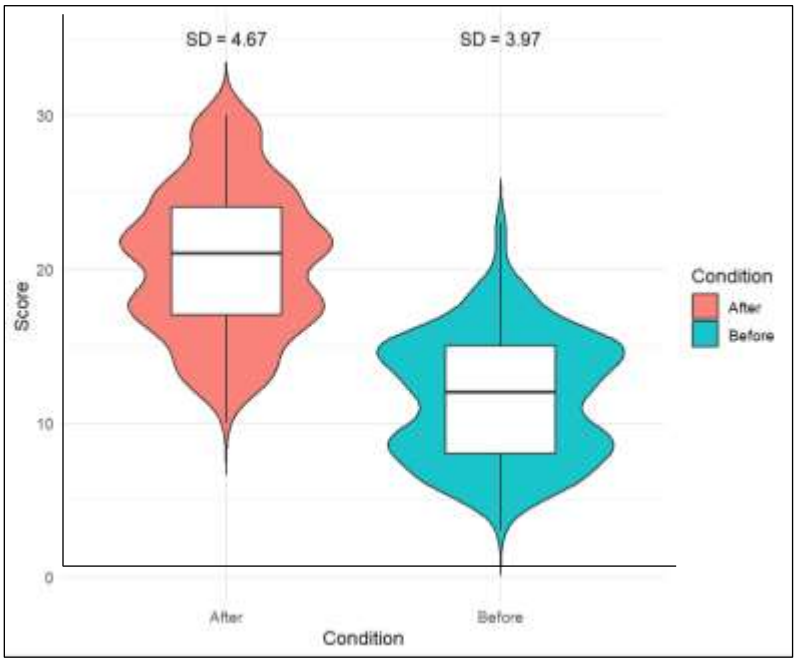


Figure 6.4: Violin plot Scores Pre & Post Training Assessment

6.2.4 Rank-Biserial Correlation (Effect Size r)

To further quantify the magnitude and direction of change observed, the rank-biserial correlation coefficient was calculated. This measure of effect size is particularly appropriate for non-parametric tests such as the Wilcoxon Signed-Rank Test, as it captures the proportion of paired observations in which post-training scores exceeded pre-training scores.

The analysis yielded a rank-biserial correlation of r = 0.867, which, according to Cohen's (1988) guidelines, represents a very large effect size. This substantial value indicates that in the vast majority of cases, participants demonstrated significant improvement in their post-training scores. The results thus confirm a consistent and robust positive impact of the training programme on stakeholder knowledge and awareness.

6.2.5 Cohen's d (Paired Samples)

To complement the non-parametric effect size and offer a standardized metric widely recognized across educational and behavioral research domains, Cohen's *d* was also calculated for the paired data. This statistic expresses the magnitude of change in terms of standard deviation units, facilitating a clearer interpretation of practical significance. The analysis yielded a Cohen's *d* estimate of 2.02, indicating a very large effect size according to established benchmarks. The 95% confidence interval for Cohen's *d* ranged from 1.90 to 2.14, which does not overlap with lower effect size categories and therefore confirms the robustness and consistency of the observed effect. This result further corroborates the significant impact of the training intervention, indicating a substantial and meaningful improvement in participants' ecological knowledge, environmental awareness, and conservation-related attitudes.

The combined evidence from the Wilcoxon Signed-Rank Test, rank-biserial correlation, and Cohen's d clearly demonstrates that the training programmes conducted were highly effective. The statistically significant improvement in scores, coupled with large effect sizes, supports the conclusion that the training interventions substantially enhanced participant capacity in areas such as aquatic biodiversity conservation, wetland management, and community engagement. These findings highlight the value of structured, targeted training as a tool for empowering stakeholders and fostering long-term conservation outcomes across the Ganga River Basin.

To build on these overall findings, a detailed question-wise analysis was conducted to examine specific areas of change in participant responses before and after the training programme. While the statistical tests confirmed a significant overall improvement, this granular analysis provides deeper insights into which aspects of ecological knowledge, awareness, and conservation attitudes were most positively influenced. By evaluating individual questionnaire items, the analysis highlights key thematic areas where learning outcomes were particularly strong, as well as those where further reinforcement may be beneficial. The following section presents a comparative breakdown of pre- and post-training responses to each question, offering a comprehensive view of the training programme's targeted impact.

6.3 Pre- and Post-Assessment Analysis

6.3.1 Pre-Training Assessment

6.3.1.1 Have You Ever Visited the Ganga River? Yes/No

In response to the first question, “Have you ever visited the Ganga River?”, a significant majority of participants (652 out of 697 respondents (93.54%)) reported that they had visited the river at some point in their lives (**Table 6.6)**. This high percentage reflects the widespread personal, cultural, or professional interaction with the river among the surveyed population. The remaining 6.46% (n = 45) (**Figure 6.5**) indicated that they had never visited the Ganga River, representing a small minority. The high visitation rate suggests that for most participants, the Ganga River is not just an abstract environmental feature but a place they have physically encountered, whether for religious rituals, recreation, education, or professional duties.

Table 6.6: Proportion of Respondents Who Have Visited the Ganga River

Responses	Participants responded
No	45 (6.46%)
Yes	652 (93.54%)
Total	**697**

This direct exposure to the river likely contributes to their awareness of its ecological significance and the issues affecting its health, as reflected in subsequent questions regarding biodiversity, pollution, and conservation. The small proportion of respondents who have not visited the river may include individuals from distant geographic regions or those involved in non-field-based roles.

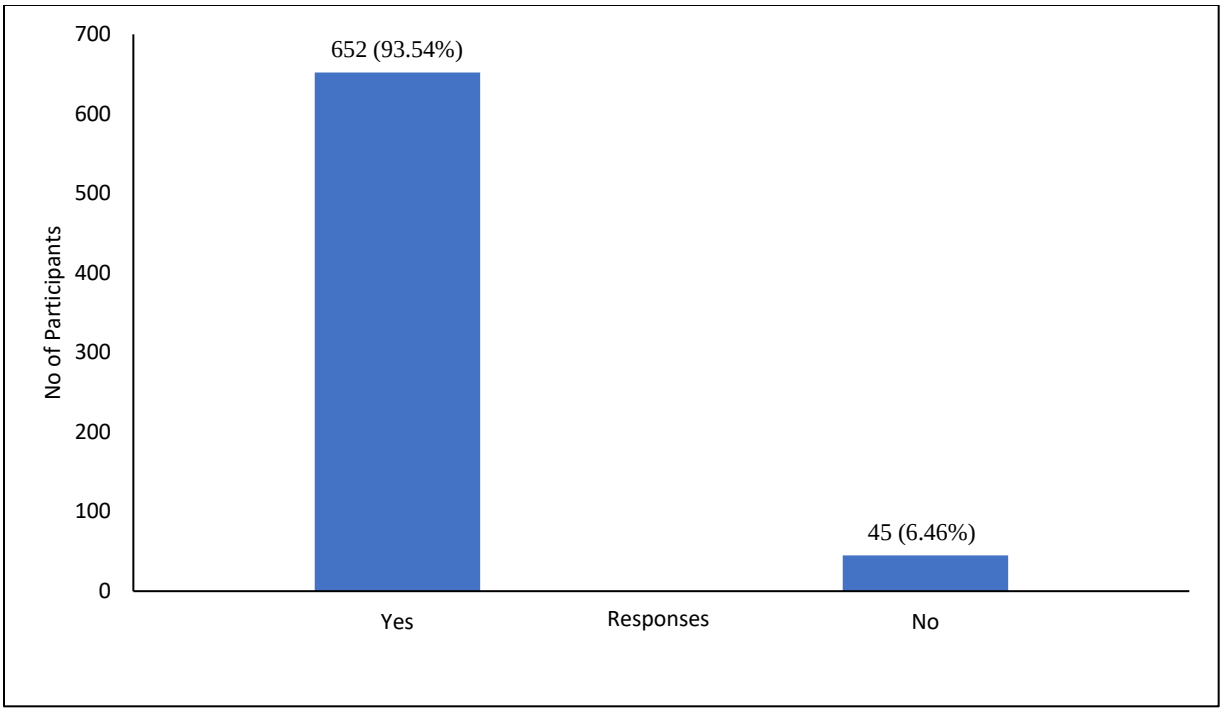


Figure 6.5: Proportion of Respondents Who Have Visited the Ganga River

6.3.1.1.1 If Yes, then what was the purpose of your visit?

Participants who reported visiting the Ganga River were asked to specify the purpose of their visit, and the responses revealed a wide range of motivations, reflecting the river's multifaceted significance. The most commonly cited reason was for religious purposes, with 468 responses (42.62%) out of a total of 1,098, highlighting the Ganga's deep-rooted spiritual and cultural importance (**Table 6.7**). This was followed by recreational and tourism-related visits (29.96%) and scientific or work-related purposes (27.41%), indicating that the river is also valued as a site for leisure and professional engagement.

Table 6.7: Purpose of Visit Among Respondents Who Have Visited the Ganga River

Responses	**Participants responded**
(a)Religious	468 (42.62%)
(b)Recreational & Tourism	329 (29.96%)
(c)Scientific and work-related visit	301 (27.41%)
Total	**1098**

When analyzed at the individual level using categorized response codes, the data showed that 52.22% of participants had visited the Ganga River exclusively for religious reasons. Another 15.78% reported visiting solely for scientific or work-related activities, while 12.91% had visited for recreational or tourism purposes alone. A smaller proportion of respondents indicated multiple overlapping reasons for their visit (**Table 6.8**). Specifically, 4.59% visited for both religious and recreational purposes, 0.57% for religious and scientific purposes, and 0.29% for both recreational and scientific reasons. Notably, 9.76% of participants reported visiting the Ganga for all three reasons i.e., religious, recreational, and scientific demonstrating the diverse and interconnected ways people engage with the river. A small portion, 3.87%, did not respond to this question.

Table 6.8: Purpose of Visit Among Respondents Who Have Visited the Ganga River

Responses	Participants responded
1	364 (52.22%)
2	90 (12.91%)
3	110 (15.78%)
4	32 (4.59%)
5	4 (0.57%)
6	2 (0.29%)
7	68 (9.76%)
8	27 (3.87%)
Total	697 (100.00%)

((a)Religious, (b)Recreational & Tourism, (c)Scientific and work-related visit, 1-a, 2-b, 3-c, 4-a&b, 5-a&c, 6-b&c, 7-a, b, c, 8- No Response)

These findings highlight that the Ganga River holds not just spiritual and cultural value but also serves as an important ecological and educational space. The data reflect a complex and evolving relationship between people and the river, where traditional reverence coexists with contemporary recreational interests and scientific inquiry. This multiplicity underscores the need for holistic conservation strategies that recognize and integrate the religious, recreational, and professional dimensions of human-river interaction. Such inclusive approaches are essential for

building broad-based support for sustainable river management across different stakeholder groups.

Overall, these findings reflect the Ganga River's role not only as a sacred and cultural landmark but also as a space for education, scientific exploration, and recreation. The diversity in visitation purposes underscores the importance of adopting a holistic and inclusive approach in conservation planning and stakeholder engagement efforts.

6.3.1.2 Are you aware of the states that comprise of Ganga River Basin?

A majority (451, 64.71%) of participants affirmed awareness of the states within the Ganga Basin (**Table 6.9**). However, 26.40% (184) were unaware, and 8.90% (62) had only partial knowledge, indicating a need for further geographic sensitization (**Figure 6.6**).

Table 6.9: Awareness of States Comprising the Ganga River Basin Among Respondents

Responses	Participants responded
Knows some states only	62 (8.90%)
No	184 (26.40%)
Yes	451 (64.71%)
Total	**697**

When asked whether they were aware of the states that comprise the Ganga River Basin, 64.71% of participants responded affirmatively, indicating a reasonable level of geographic awareness among the majority of respondents. This level of understanding is essential for effective participation in conservation efforts, as knowledge of the basin's geographic spread contributes to a holistic appreciation of the ecological and socio-political complexities involved in managing such a vast river system.

However, 26.40% of participants reported having no knowledge of the states falling within the basin, while an additional 8.90% indicated partial awareness—meaning they could identify only some of the states correctly. This combined group of 35.30% reflects a significant proportion of stakeholders with limited or incomplete understanding of the Ganga Basin's full spatial extent.

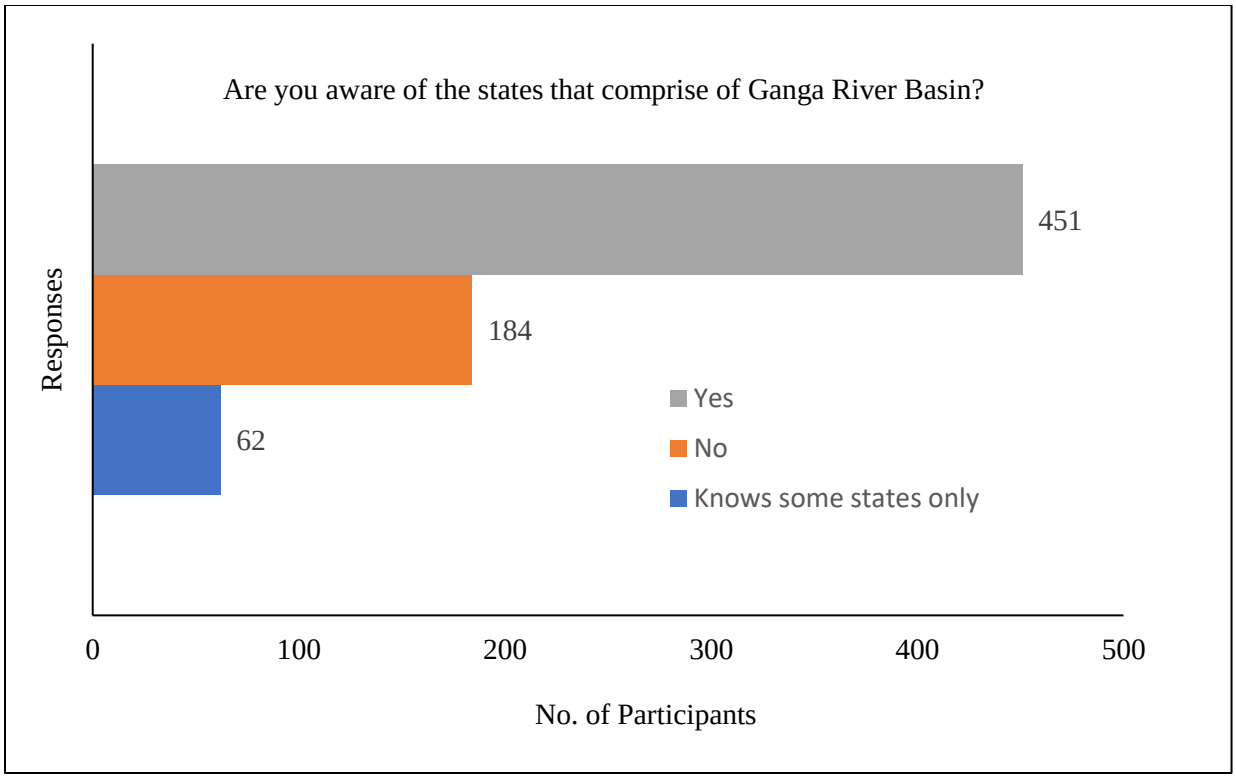


Figure 6.6: Awareness of States Comprising the Ganga River Basin Among Respondents

These findings suggest that while there is a foundational level of awareness among participants, a considerable knowledge gap remains, particularly regarding the comprehensive geographical distribution of the basin. This is especially important given that the Ganga River Basin spans 11 states in India, affecting numerous ecological zones, governance structures, and stakeholder groups. A lack of understanding of this spatial dimension may hinder effective stakeholder collaboration, limit cross-regional engagement, and reduce the impact of conservation interventions.

The presence of such knowledge gaps, even among engaged stakeholders, highlights the need for strengthened geographic sensitization efforts. Integrating maps, visual tools, and region-specific data in training programs and awareness campaigns could enhance spatial literacy. Improved geographic awareness will empower both local and external stakeholders to better understand their role and responsibility within the larger context of basin-wide conservation planning.

6.3.1.3 Do you reside nearby in any of the tributaries of Ganga Basin?

In response to the question regarding proximity to the Ganga River Basin or its tributaries, a substantial proportion of participants (67.43%) indicated that they reside near one of the tributaries of the Ganga River **(Table 6.10, Figure 6.7)**.

This majority reflects strong local representation from individuals living in direct association with the riverine ecosystem, including communities who may depend on the Ganga and its tributaries for livelihood, water supply, agriculture, or cultural practices. The high percentage of local residents is significant as it highlights the presence of first-hand experience and traditional knowledge regarding the river's ecological health and socio-environmental dynamics.

Table 6.10: Residence Proximity to Tributaries of the Ganga River Basin Among Respondents

Responses	Participants responded
No	227 (32.57%)
Yes	470 (67.43%)
Total	**697**

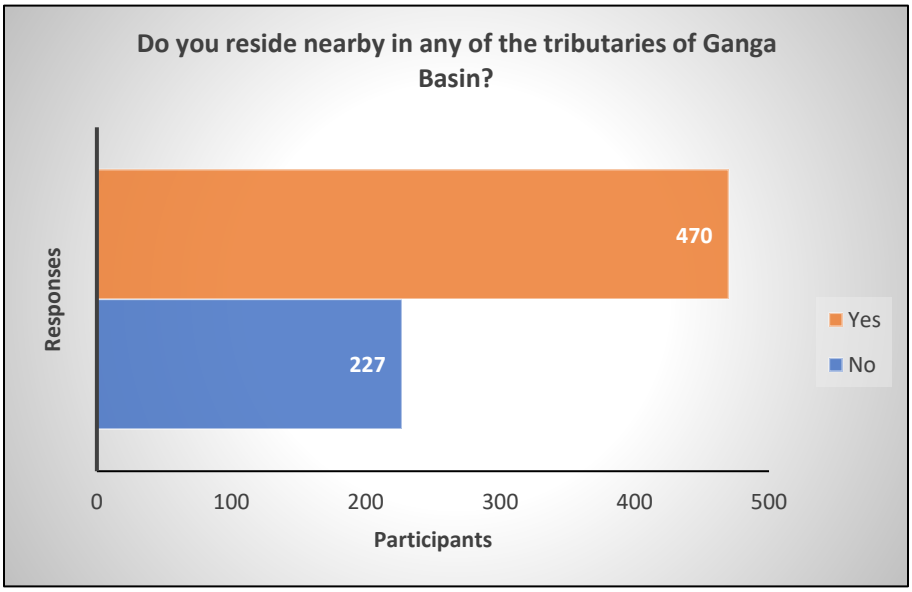


Figure 6.7: Residence Proximity to Tributaries of the Ganga River Basin Among Respondents

Conversely, 32.57% **(Table 6.10, Figure 6.7)** of respondents reported not residing near the Ganga River or any of its tributaries. This group includes participants from regions located outside the immediate basin area or urban centers with indirect connections to the river system. Importantly,

many of these individuals represent institutional stakeholders such as researchers, government officials, NGO personnel, and educators, who, despite geographic distance, are actively involved in conservation, policy-making, or awareness activities related to the Ganga River Basin. Their inclusion adds valuable external perspectives and expertise to the discourse on Ganga biodiversity and river health.

The diversity in residency among participants enriches the dataset by balancing local ecological observations with broader systemic and policy-level insights. It also emphasizes the importance of fostering collaboration between river-adjacent communities and stakeholders from outside the basin, ensuring a more integrated and multi-scalar approach to the management and conservation of the Ganga River ecosystem.

6.3.1.4 Are you aware of any aquatic species found in Ganga River Basin?

When participants were asked whether they were aware of aquatic species present in the Ganga River Basin, 481 (69.01%) responded affirmatively (**Table 6.11, Figure 6.8**), indicating a generally high level of ecological awareness among the surveyed population.

Table 6.11: Awareness of Aquatic Species in the Ganga River Basin Among Respondents

Responses	**Participants responded**
No	216 (30.99%)
Yes	481 (69.01%)
Total	**697**

This result suggests that a majority of the participants possess at least basic familiarity with the biodiversity of the Ganga River system, which may stem from direct observation, educational exposure, or involvement in conservation-related activities.

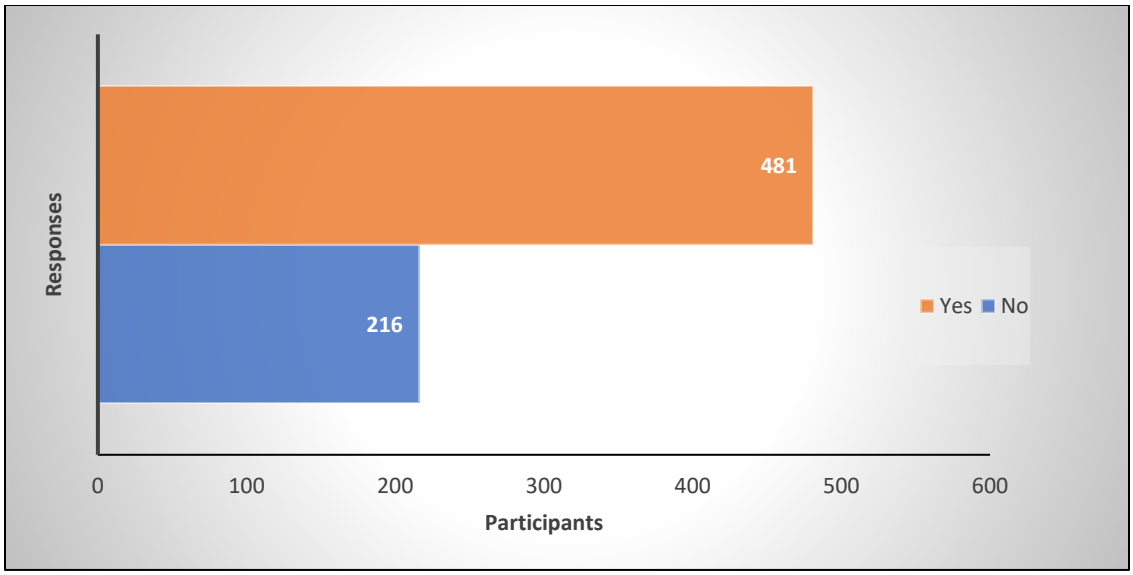


Figure 6.8: Awareness of Aquatic Species in the Ganga River Basin Among Respondents

However, a notable 216 (30.99%) (**Table 6.11, Figure 6.8**) of respondents reported that they were unaware of any aquatic species in the basin. This substantial minority highlights the presence of significant knowledge gaps, even among stakeholders and community members participating in environmental programs. Such lack of awareness may limit public support for conservation initiatives, as individuals unfamiliar with the river's biodiversity may not fully understand the ecological significance or the urgency of protecting these species. This finding underscores the need for targeted educational and outreach efforts aimed at improving species-level awareness, especially in regions or among groups less directly connected to river ecosystems.

6.3.1.4.1 Can you name species found in Ganga River Basin?

Participants who acknowledged awareness of aquatic species were asked to list specific organisms they could name from the Ganga River Basin. This open-ended question resulted in 830 total responses, as many participants mentioned more than one species. The Gangetic dolphin (*Platanista gangetica*) emerged as the most frequently identified species, cited by 217 respondents (26.14%) (**Table 6.12**). Its iconic status as a flagship species for Ganga conservation efforts often featured in awareness campaigns likely contributed to its widespread recognition. Fish species were collectively mentioned by 151 participants (18.19%), who identified a diverse range of both commercially and ecologically important taxa. Named species included Hilsa, Trout

trout, Mahseer, Labeo calbasu, Catla, Rohu, Mrigal, Wallago attu, Snow trout, and Tor tor. These species represent a mix of native and culturally significant fish, underscoring the link between aquatic biodiversity, fisheries, and livelihoods.

Table 6.12: Species Identified by Respondents in the Ganga River Basin

Species	**No. of Responses**
Gangetic Dolphin	217 (26.14%)
Turtle	149 (17.95%)
otter	48 (5.78%)
Crocodile	120 (14.46%)
Ghariyal	104 (12.53%)
birds	41 (4.94%)
Fish	151 (18.19%)
Total	**830**

Turtles were cited by 149 respondents (17.95%), with mentions including generic terms like *tortoise*, *turtle*, and *turtle found in India*. While responses did not always specify species, they suggest familiarity with these reptiles as an important component of the basin's aquatic fauna (**Table 6.12**). Crocodiles (14.46%) and gharial (Gavialis gangeticus) (12.53%) were also reported, though with lower frequency. Their mention reflects some public awareness of large aquatic reptiles, though perhaps less so compared to fish and dolphins.

Otters, which play a crucial ecological role in river ecosystems, were named by only 48 respondents (5.78%), indicating relatively low public recognition. Similarly, birds were mentioned by 41 participants (4.94%) (**Table 6.12**), but within this category, respondents identified a number of key river-associated species, including the Saras crane, Indian skimmer, River tern, Yellow-wattled lapwing, Egret, White-throated kingfisher, and duck species. This indicates that while overall bird awareness was low, those who responded had specific knowledge of significant riparian birdlife.

Overall, these findings highlight that while participants show considerable awareness of high-profile or economically important species (such as dolphins and fish), knowledge of lesser-known or less visible taxa like otters and aquatic birds remains limited. These insights point to a need for

more inclusive and comprehensive biodiversity education, which equally emphasizes the ecological roles of underrepresented species groups. Strengthening such awareness can foster a broader conservation ethic and support ecosystem-wide protection strategies in the Ganga River Basin.

6.3.1.5 Have you ever seen any biodiversity in the Ganga basin?

In continuation of the previous findings on awareness and identification of aquatic species within the Ganga River Basin, participants were asked whether they had ever personally observed any form of biodiversity in the basin. A significant 75.47% of respondents affirmed that they had indeed seen biodiversity in the region (**Table 6.13, Figure 6.9**). This strong response complements the earlier data, where 69.01% of participants indicated awareness of aquatic species, and many could name specific organisms such as the Gangetic dolphin, Hilsa, Mahseer, Gharial, and aquatic birds like the Indian skimmer and River tern.

Table 6.13: Observation of Biodiversity in the Ganga River Basin Among Respondents

Responses	**Participants responded**
No	171 (24.53%)
Yes	526 (75.47%)
Total	**697**

The high percentage of participants reporting direct observation of biodiversity suggests substantial ecological exposure and lived experience with the river system. This is particularly relevant for stakeholders residing near the river or its tributaries, who may interact with the aquatic and riparian environment in their daily lives, whether through livelihood activities, recreational use, or conservation work. It also reinforces the reliability of species identification responses in Question 4a, as many respondents likely named species they had personally encountered or seen in their natural habitat.

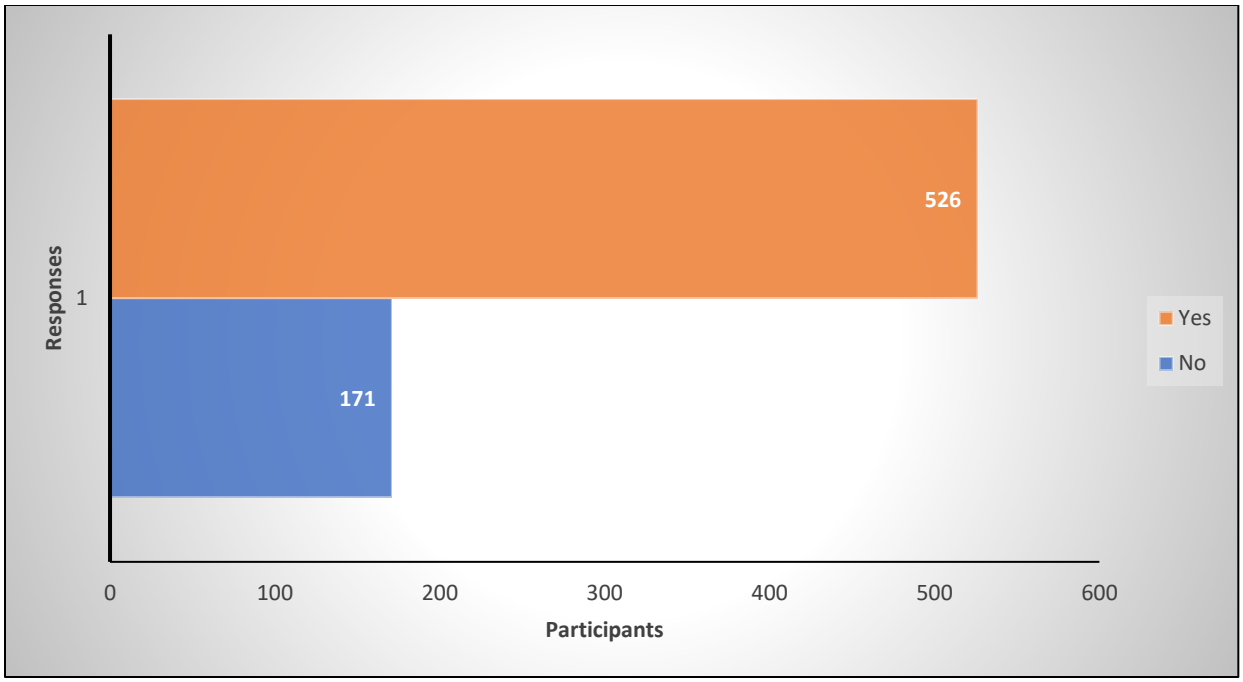


Figure 6.9: Observation of Biodiversity in the Ganga River Basin Among Respondents

Conversely, 24.53% of respondents stated that they had never seen any biodiversity in the Ganga basin. This finding aligns with the earlier 30.99% who were unaware of aquatic species (**Table 6.13, Figure 6.9**), indicating a subset of participants who may be geographically removed from the river or less exposed to ecological education. This group may include individuals from non-riparian areas or those working in administrative, academic, or support roles where direct engagement with the river ecosystem is limited. Their inclusion is still crucial, as effective river basin management relies not only on local actors but also on informed institutional stakeholders who can contribute through policy, education, and planning.

The combination of these responses highlights a meaningful relationship between awareness, observation, and identification. Those who have seen biodiversity are more likely to recognize and name species, while those without such exposure may benefit from enhanced experiential learning opportunities such as field visits, visual media, and participatory biodiversity monitoring. Bridging this experiential gap is essential for strengthening community-wide support for conservation and fostering a deeper, more personal connection to the Ganga River ecosystem.

6.3.1.6 Do you think that the biodiversity of Ganga River basin is important for the river ecosystem?

Following the questions on awareness and observation of biodiversity in the Ganga River Basin, participants were asked whether they believed that biodiversity in the basin is important for the river ecosystem. An overwhelming 96.13% of respondents answered "Yes," demonstrating a near-universal acknowledgment of biodiversity's ecological value (**Table 6.14, Figure 6.10**). This strong consensus suggests a high level of conceptual understanding among participants regarding the interdependence between biodiversity and ecosystem health.

Table 6.14: Perception of the Importance of Biodiversity for the Ganga River Basin Ecosystem

Responses	**Participants responded**
No	27 (3.87%)
Yes	670 (96.13%)
Total	**697**

The findings are consistent with previous responses where a majority of participants not only recognized aquatic species such as the Gangetic dolphin, Hilsa, Mahseer, Gharial, and various riverine birds but also reported having personally observed biodiversity in the basin. Such awareness and lived experience likely contribute to participants' recognition of biodiversity's role in maintaining ecological balance, supporting ecosystem functions such as nutrient cycling, water purification, and food web stability.

Furthermore, this result reflects the effectiveness of ongoing awareness programs, community sensitization initiatives, and environmental education efforts, which have likely reinforced the link between biodiversity and river sustainability in the public discourse. Importantly, the consensus observed here spans a broad cross-section of stakeholders, including local residents, students, teachers, government personnel, and NGO representatives, indicating that the message of biodiversity conservation is being internalized across diverse sectors. Only a very small proportion of respondents (3.87%) did not affirm the importance of biodiversity for the river ecosystem (**Table 6.14, Figure 6.10**). While this number is marginal, it points to the need for

continued educational efforts targeting specific gaps perhaps among participants with limited environmental exposure or technical background.

Overall, the responses to this question confirm a solid foundation of ecological literacy among participants and provide a positive outlook for future conservation action. When communities and stakeholders widely recognize the importance of biodiversity, it becomes more feasible to mobilize support for river restoration, policy advocacy, and sustainable resource management across the Ganga River Basin.

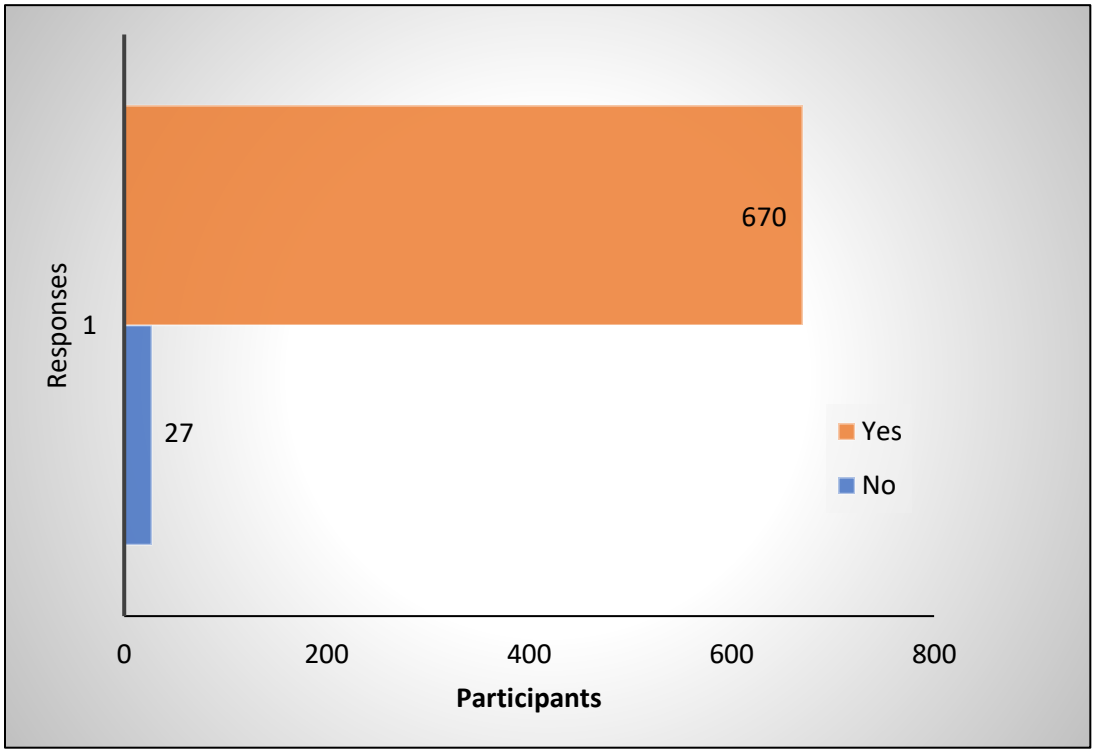


Figure 6.10: Perception of the Importance of Biodiversity for the Ganga River Basin Ecosystem

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

When participants were asked to rank (1 = highest priority, 6 = lowest) six key elements influencing the health of the Ganga River ecosystem hydropower projects, ecological balance, holiness, ecosystem services, biodiversity, and water quality a strong and revealing pattern emerged. The responses provide more than just rankings; they reflect a deeply rooted

conservation ethic and an evolving perspective among stakeholders, who are increasingly aware of the complex interdependence between natural systems and human well-being.

Ecological balance and water quality received the highest number of first-rank preferences, with 22.63% and 20.16% respectively. This prioritization aligns well with previous findings where an overwhelming 96.13% of participants affirmed the importance of biodiversity for the river ecosystem, and 69.01% demonstrated awareness of aquatic species (**Table 6.15**). Participants' recognition of the need to protect ecological integrity suggests a strong understanding of how balanced biotic interactions and clean water are fundamental to sustaining riverine health. It also implies that stakeholders are increasingly thinking beyond just symbolic or cultural values and acknowledging tangible ecological functions.

Biodiversity too received significant top-rank votes (19.68%), reinforcing the insight that participants not only value biodiversity abstractly but also prioritize its protection when envisioning a healthy Ganga ecosystem. This is further supported by previous responses, where 75.47% (**Table 6.15**) of participants reported direct observation of biodiversity, and many could name specific aquatic species such as the Gangetic dolphin, Hilsa, Mahseer, gharial, and various turtles and birds.

Table 6.15: Respondents' Ratings of Options for Maintaining a Healthy Ganga River Basin Ecosystem

Rating (1-highest, 6-lowest)	Hydropower Projects	Ecological Balance	Holiness	Ecosystem Services	Biodiversity	Water Quality
1	86 (30.71%)	93 (22.63%)	58 (15.47%)	35 (8.79%)	73 (19.68%)	78 (20.16%)
2	18 (6.43%)	116 (28.22%)	54 (14.40%)	39 (9.80%)	54 (14.56%)	45 (11.63%)
3	17 (6.07%)	79 (19.22%)	94 (25.07%)	81 (20.35%)	81 (21.83%)	67 (17.31%)
4	26 (9.29%)	42 (10.22%)	34 (9.07%)	131 (32.91%)	37 (9.97%)	53 (13.70%)
5	38 (13.57%)	60 (14.60%)	85 (22.67%)	69 (17.34%)	109 (29.38%)	39 (10.08%)
6	95 (33.93%)	21 (5.11%)	50 (13.33%)	43 (10.80%)	17 (4.58%)	105 (27.13%)
Grand Total	**280**	**411**	**375**	**398**	**371**	**387**

On the contrary, hydropower projects were consistently rated the lowest, with 33.93% of respondents placing them at rank 6 the lowest possible rating. While 30.71% did rank them first (**Table 6.15**), suggesting some recognition of their importance for development and energy generation, the large proportion ranking them last indicates a growing public skepticism toward infrastructure-led interventions that may disrupt natural river flows, affect species migration, and degrade ecological balance. This sentiment is particularly noteworthy given the context of India's historical emphasis on dam-based development and signals a shift toward more ecologically sensitive planning.

Ecosystem services such as nutrient cycling, flood regulation, and provisioning of resources were generally ranked in the mid-range (32.91% placed it at rank 4) (**Table 6.15**), indicating an understanding of their relevance but perhaps less direct familiarity compared to visible aspects like water quality or biodiversity. Similarly, the holiness of the river while culturally significant was not rated as a primary factor for maintaining ecosystem health by most respondents. Only

15.47% placed it at rank 1 (**Table 6.15**), and it had a wide distribution across the ranks. This reflects a maturing perspective, where participants are beginning to differentiate between spiritual reverence and ecological necessity.

Taken together, these preferences portray a meaningful transition in public and stakeholder consciousness. No longer is the Ganga viewed solely through the lens of religious symbolism or utilitarian development. Instead, participants demonstrate a nuanced understanding that ecological processes such as water quality, biodiversity, and balance must be prioritized to ensure long-term sustainability. This shift in values, especially among such a diverse respondent group (students, teachers, scientists, forest officials, and NGO personnel), provides fertile ground for advancing community-based and science-led conservation efforts throughout the Ganga River Basin.

The ranking of ecosystem components by participants revealed clear priorities rooted in ecological awareness and conservation values. Ecological balance and water quality emerged as the most highly valued elements for maintaining a healthy river ecosystem, reflecting strong alignment with earlier responses that emphasized the importance of biodiversity and direct observations of aquatic life in the Ganga River Basin. Biodiversity itself also received high preference rankings, underscoring participants' recognition of its ecological importance. In contrast, hydropower projects were most frequently rated as the lowest priority, suggesting growing concerns over the environmental impacts of large-scale infrastructure on riverine health. While ecosystem services and holiness were acknowledged, they were ranked lower, indicating that participants are increasingly prioritizing tangible ecological functions over symbolic or developmental considerations. Overall, these results reflect a thoughtful and conservation-oriented mindset among stakeholders, favoring nature-based solutions and ecosystem integrity in the stewardship of the Ganga River.

6.3.1.8 What are the major threats (problems) that Ganga River Basin face today?

When participants were asked to identify the major threats facing the Ganga River Basin today, the responses revealed a strong consensus around anthropogenic pressures, particularly those

linked to urban and industrial development. The most frequently cited threat was pollution resulting from industrialization and urbanization, identified by 54.70% (361) of respondents (**Table 6.16, Figure 6.11**). This aligns closely with the earlier finding that water quality was one of the most highly prioritized components for ecosystem health (20.16% ranked it as top priority in 6.3.1.7). The concern for pollution is further supported by the high levels of awareness regarding biodiversity (69.01%) and the direct observation of aquatic species by 75.47% (**Table 6.16, Figure 6.11**) of participants indicating that respondents are not only aware of the richness of the riverine ecosystem but also of the growing threats it faces from unchecked development.

The second most cited threat was sewage discharge (116, 17.58%) (**Table 6.16, Figure 6.11**), reflecting concerns over the direct entry of untreated waste particularly chemical and organic pollutants into the river system. This is consistent with the broader public discourse around the need for improved sewage management under programs such as *Namami Gange*, which were recognized by participants in later responses. It also reinforces earlier calls by participants for stricter legal enforcement and regulation, highlighting that awareness of the problem is accompanied by a demand for institutional accountability and systemic action.

Table 6.16: Perceived Major Threats to the Ganga River Basin According to Respondents

Responses	Participants responded
Rapidly increasing human population and rising standards of living	48 (7.27%)
Pollution (Industrialization/Urbanization)	361 (54.70%)
Developmental Activities (Construction of dams & roads)	53 (8.03%)
Sewage waste discharge (chemicals)	116 (17.58%)
Agricultural Runoff	18 (2.73%)
Ritual activities in and around Ganga River	40 (6.06%)
Climate Change	24 (3.64%)
Total responses	**660**

Developmental activities, such as dam and road construction, were identified by 53 (8.03%) of respondents as a threat. Although this figure is lower than for pollution-related threats, it complements the insight from previous question, where hydropower projects were most

frequently rated as the lowest priority for ecosystem conservation (33.93% ranked them 6th (**Table 6.15**). Together, these responses indicate a growing public scepticism about infrastructure projects that may fragment river systems, alter flow regimes, and disrupt aquatic habitats.

Interestingly, only 48 (7.27%) of participants highlighted rapid population growth and rising living standards as a threat (**Table 6.16, Figure 6.11**). While population pressure is a well-documented driver of environmental degradation, its lower ranking here may reflect either normalization of this factor or a greater perceived immediacy of point-source pollutants like industrial effluents and sewage. Similarly, ritual activities around the river were identified as threats by 6.06% (40), and climate change was mentioned by only 3.64% (**Table 6.16, Figure 6.11**), despite being a critical long-term stressor. The relatively low awareness of climate-related threats suggests a need to strengthen environmental education on broader, less visible processes impacting the river, such as changing rainfall patterns, glacial melt, and rising temperatures.

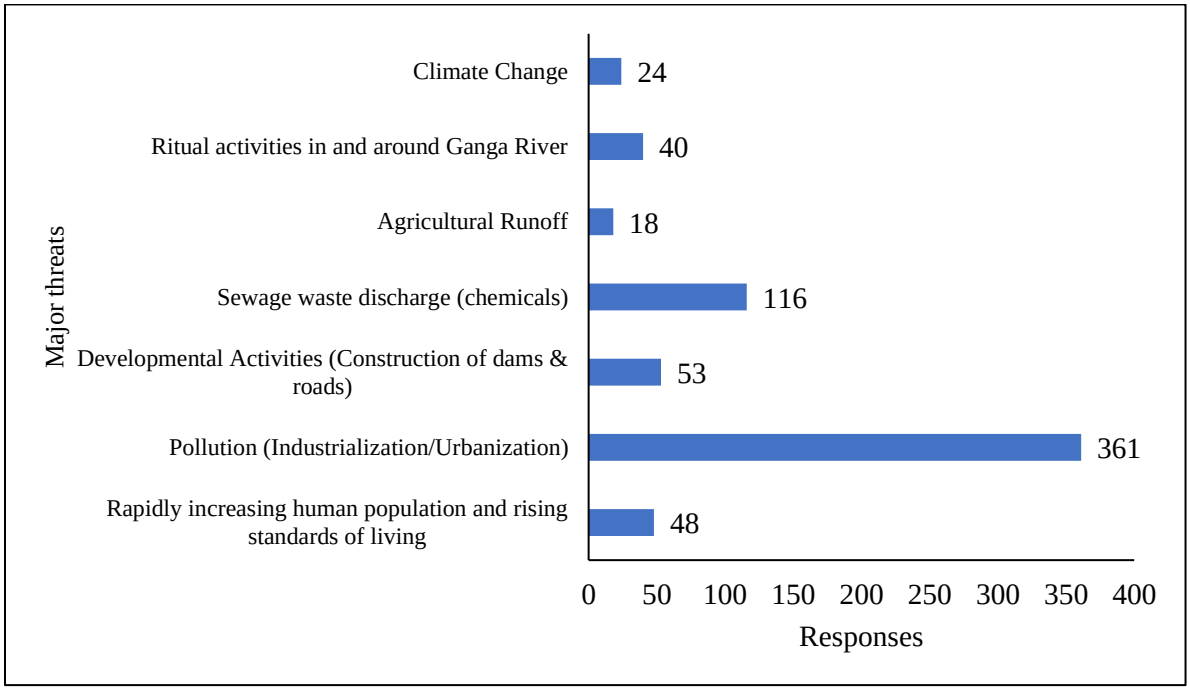


Figure 6.11: Perceived Major Threats to the Ganga River Basin According to Respondents

Agricultural runoff, though ecologically significant due to pesticide and fertilizer contamination, was cited by only 2.73% (18) of participants (**Table 6.16, Figure 6.11**). This suggests that diffuse sources of pollution are less understood by the general public compared to more visible and

direct forms of degradation. This gap underscores the importance of incorporating scientific communication into public outreach, helping stakeholders understand how agricultural practices upstream can have far-reaching impacts on aquatic health downstream.

In summary, the response pattern to this question reinforces earlier insights into stakeholder values: there is a clear emphasis on pollution control and ecological preservation over development-oriented or symbolic concerns. The data reflect a mature understanding of the immediate, tangible threats to the river, while also revealing areas such as climate change and non-point source pollution where further awareness-building is essential. Addressing these threats in a holistic manner will require not only strong regulatory frameworks but also active community participation and cross-sectoral collaboration, both of which were highlighted as necessary steps in responses to later questions about solutions and shared responsibility for river conservation.

6.3.1.9 What steps should be taken for cleaning Ganga River Basin?

When participants were asked to suggest effective strategies for cleaning the Ganga River Basin, the most frequently recommended solution was the implementation of mass awareness programmes and sensitization efforts, receiving 449 (35.81%) of the total responses (**Table 6.17, Figure 6.12**). This strong support for educational outreach reflects participants' recognition that lasting environmental change requires an informed and engaged public. The emphasis on awareness also aligns with earlier findings from Question 6, where nearly all respondents (96.13%) acknowledged the ecological importance of biodiversity, and from Question 7, where water quality and ecological balance were prioritized for conservation. These insights together suggest that respondents view public understanding and behavioral change as foundational components in achieving long-term river health.

Table 6.17: Recommended Measures for Cleaning and Conserving the Ganga River Basin

Steps should be taken for cleaning Ganga River Basin	Responses
a. Mass awareness programmes /sensitizations among people	449 (35.81%)
b. Legal Actions (Implementation of rules and regulations)	251 (20.02%)

c. Apply 3R (Reuse, Reduce, Recycle) Principle	283 (22.57%)
d. Effluents from different sources (Industrial, Agricultural, domestic etc.) should be restricted	246 (19.62%)
e. Community Participation	25 (1.99%)
Total no of responses	1254

The second most favoured response (283, 22.57%) was the application of the 3R principle Reduce, Reuse, Recycle (**Table 6.17, Figure 6.12**). This choice reflects an increasingly sustainability-oriented mindset among participants and demonstrates their awareness of practical, individual-level contributions to pollution reduction. The 3R principle complements the broader goals of minimizing waste generation and controlling non-point source pollution, which are often overlooked in river management strategies dominated by infrastructural or engineering solutions.

Stricter legal actions and regulatory enforcement were supported by 20.02% (251) of the respondents (**Table 6.17, Figure 6.12**). This preference is consistent with earlier concerns raised in Question 8, where pollution from industrialization and urbanization was identified as the most pressing threat to the Ganga River. Participants appear to advocate for a robust governance framework that can ensure compliance with environmental laws, monitor effluent discharge, and penalize violations especially those from industrial and municipal sources.

Similarly, 19.62% (246) of responses called for restrictions on effluents from diverse sources such as industrial, agricultural, and domestic activities (**Table 6.17, Figure 6.12**). This suggests that participants recognize the multifaceted nature of pollution inputs and support targeted interventions to control contamination at its source. The inclusion of agricultural runoff and domestic waste among these concerns is particularly noteworthy, as these are often less regulated yet highly impactful contributors to riverine degradation.

Interestingly, only 1.99% (25) of the responses highlighted community participation as a key step (**Table 6.17, Figure 6.12**). This comparatively low figure may indicate that while participants value education and policy, they may underestimate the power of localized, grassroots involvement in achieving cleaner rivers. Alternatively, it could suggest a lack of awareness or trust in current

models of participatory governance. This presents a critical opportunity for strengthening community-based initiatives like *Ganga Prahari* and *Eco Task Forces*, which aim to empower local stakeholders in monitoring and stewardship roles.

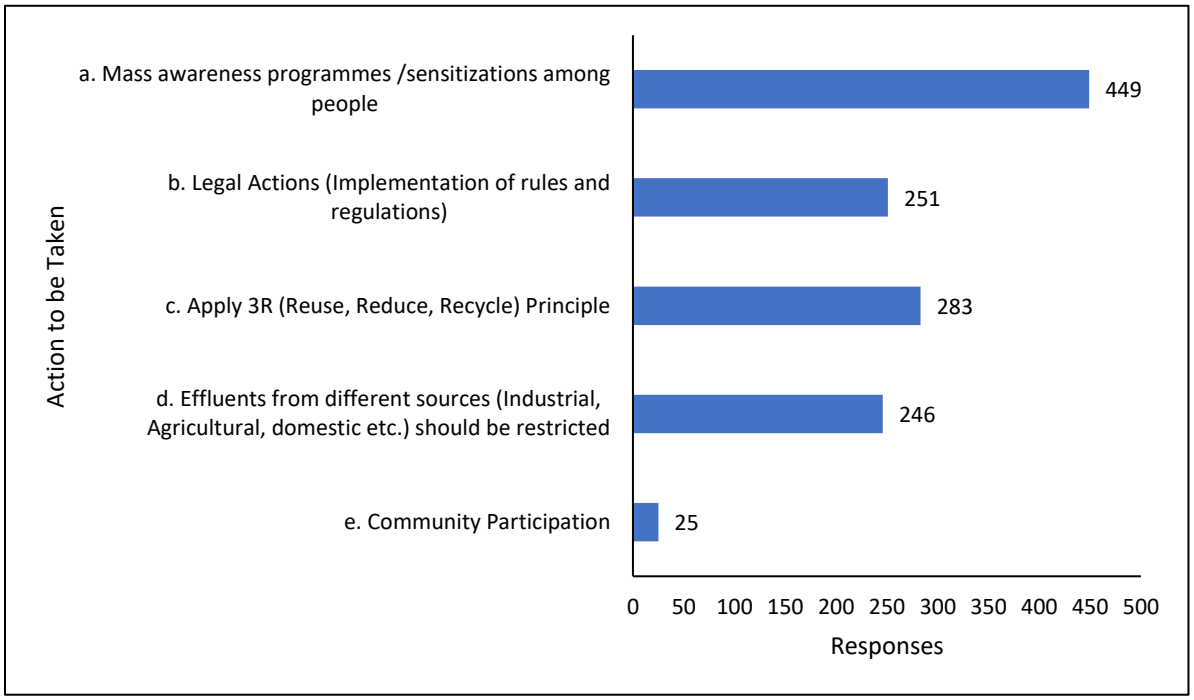


Figure 6.12: Recommended Measures for Cleaning and Conserving the Ganga River Basin

Overall, the response to this question paints a picture of multi-level thinking among stakeholders: one that emphasizes awareness-building, policy enforcement, individual responsibility, and systemic control of pollutants. While institutional and behavioral strategies are clearly prioritized, the results also signal the need for greater emphasis on inclusive, bottom-up participation, which can ensure long-term commitment and ownership at the community level. To be effective, future river basin management must therefore combine top-down regulation with bottom-up engagement anchored by a strong foundation of environmental literacy.

6.3.1.10 Who do you think is responsible for cleaning the Ganga River Basin?

a. Government, b. NGOs, c. Private sector, d. Village Panchayat, e. Local Communities, f. Youth, g. All

When participants were asked to identify who holds responsibility for cleaning the Ganga River Basin, a majority (381, 58.26%) (**Table 6.18, Figure 6.13**) indicated that the responsibility lies collectively with all stakeholders including government, NGOs, private sector, local communities, youth, and village institutions. This broad-based consensus suggests a strong public understanding of the multi-dimensional nature of river conservation, where no single actor alone can ensure the restoration and sustainability of such a complex ecosystem. The recognition of shared responsibility aligns well with previous findings particularly the high priority given to mass awareness programs (35.81%) and legal enforcement (20.02%) highlighting the belief that both systemic interventions and collective civic engagement are essential for meaningful change.

Table 6.18: Perceived Responsibility for Cleaning the Ganga River Basin Among Respondents

Perceived Responsibility for Cleaning the Ganga River Basin	Responses
Government	69 (10.55%)
NGOs	41 (6.27%)
Private sector	27 (4.13%)
Village Panchayat	29 (4.43%)
Local Communities	76 (11.62%)
Youth	31 (4.74%)
All	381 (58.26%)
Total Responses	654

Among individual actors, local communities were most frequently identified (76, 11.62%), followed by the government (69, 10.55%) (**Table 6.18, Figure 6.13**). This reflects the dual expectation placed on communities for stewardship and on authorities for regulation, infrastructure, and enforcement. It also resonates with earlier responses, where 75.47% of participants reported direct observation of biodiversity and 67.43% resided near the river or its tributaries, suggesting that many respondents see themselves and their neighbours as active participants in the river's fate. At the same time, the emphasis on government responsibility underscores public demand for strong leadership, accountability, and policy-level action to support clean-up and restoration efforts.

On the other hand, relatively fewer participants assigned responsibility to NGOs (41, 6.27%), the private sector (27, 4.13%), village panchayats (29, 4.43%), or youth (31, 4.74%) (**Table 6.18, Figure 6.13**). This suggests that while these groups play vital roles in implementation, innovation, and community mobilization, their contributions may be underrecognized or poorly understood by the general public. The low visibility of the private sector, despite its potential role in funding, innovation, and corporate responsibility, highlights a missed opportunity for partnership. Similarly, the modest recognition of youth contrasts with their active involvement in awareness campaigns, education, and volunteering areas that participants themselves valued in earlier responses.

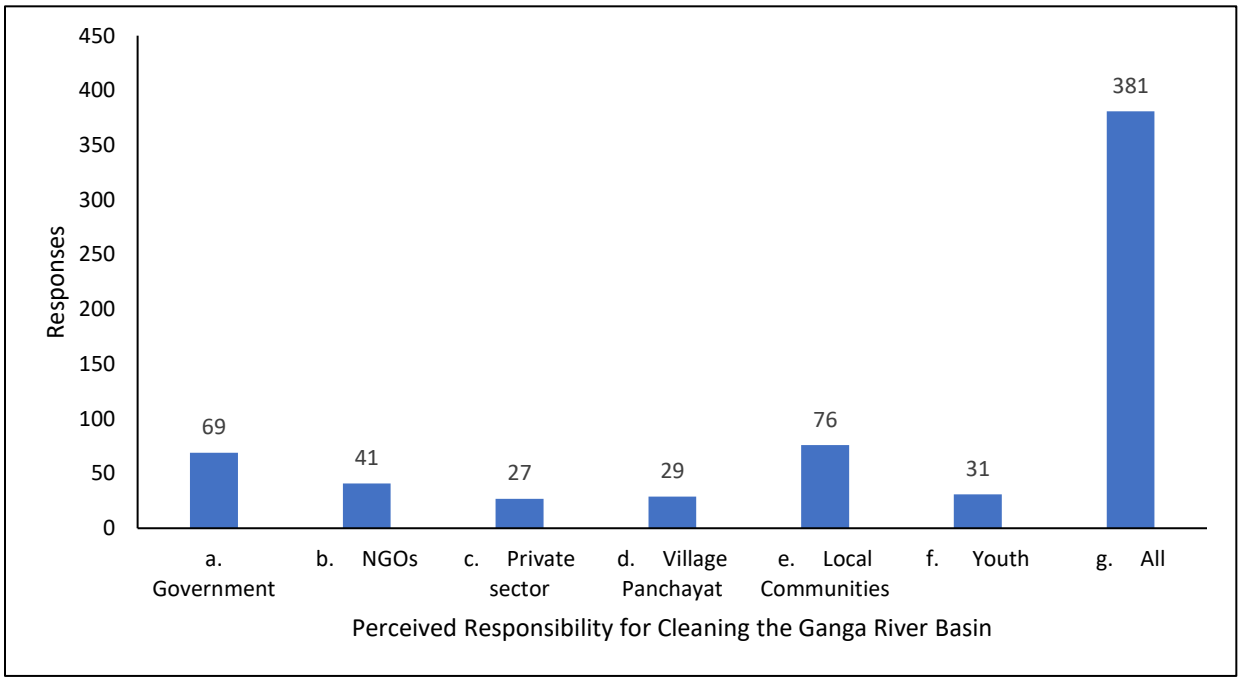


Figure 6.13: Perceived Responsibility for Cleaning the Ganga River Basin Among Respondents

In summary, the data reflect an encouraging shift toward collective ownership of river conservation, with the public calling for inclusive, cross-sectoral action. However, the undervaluation of certain groups, particularly NGOs, youth, and local governance bodies, signals a need to increase their visibility, clarify their roles, and strengthen their engagement in Ganga rejuvenation efforts. Empowering all stakeholders through better coordination and

communication will be key to sustaining long-term, community-driven solutions for a clean and resilient Ganga River Basin.

6.3.2 POST TRAINING ASSESSMENT

6.3.2.1 How do you like the training programme?

(a) Excellent (b) Very good (c) Good(d) Not satisfied

Feedback from participants regarding the training programme was overwhelmingly positive, indicating strong satisfaction with both the content and delivery. A majority of respondents (454, 65.14%) rated the programme as "Excellent" (**Table 6.19, Figure 6.14**), suggesting that the sessions were perceived as highly informative, engaging, and relevant to the participants' needs and expectations. An additional 29.70% (207) of participants rated the programme as "Very Good", reinforcing the perception of quality and effectiveness. Together, these ratings reflect that nearly 95% of participants found the training to be of high or very high quality (**Table 6.19, Figure 6.14**).

Table 6.19: Respondents' Feedback on the Training Programme

Responses	Participants responded
Excellent	454 (65.14%)
Very good	207 (29.70%)
Good	32 (4.59%)
Not satisfied	4 (0.57%)
Total	697

Only a small proportion of respondents (32, 4.59%) rated the training as merely "Good", and an even smaller percentage (4, 0.57%) reported that they were "Not satisfied" (**Table 6.19, Figure 6.14**). This negligible dissatisfaction rate points to the overall success of the training in meeting its intended objectives, which likely included raising awareness about the biodiversity of the Ganga River Basin, enhancing stakeholder engagement, and promoting sustainable conservation practices.

The overwhelmingly positive reception of the training aligns well with other indicators from the survey. For instance, 97.27% of participants reported an improved understanding of Ganga River biodiversity, and a significant majority demonstrated awareness of aquatic species and ecosystem threats. This suggests that the training was not only well-received on a subjective level but also effective in delivering measurable knowledge outcomes. Overall, these findings underscore the value of well-designed environmental education programmes and highlight their role in fostering conservation-oriented mindsets among diverse stakeholder groups. Continued investment in such capacity-building efforts, particularly through participatory and locally contextualized training modules, can play a pivotal role in supporting long-term ecological stewardship in the Ganga River Basin.

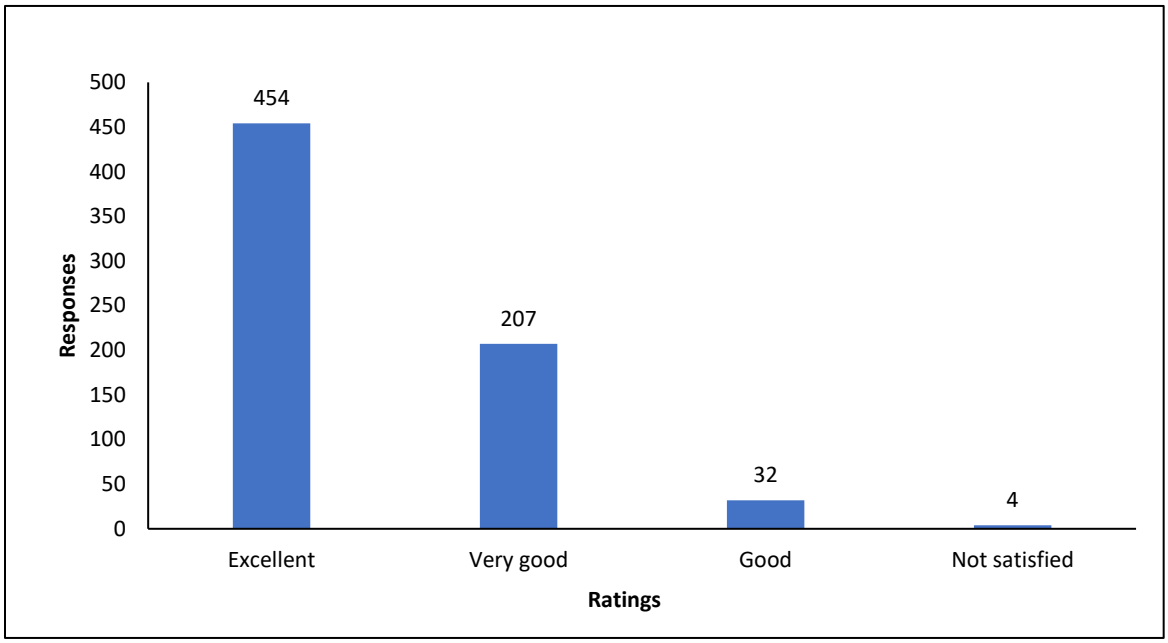


Figure 6.14: Respondents' Feedback on the Training Programme

6.3.2.2 Are you satisfied with the following components of the training programme? Yes/No

(b) Lectures (b) Activities (c) Material provided (d) Field visits (e) Lab Visits

Y/N Y/N Y/N Y/N Y/N

Participants were asked to indicate their level of satisfaction with five key components of the training programme: lectures, activities, material provided, field visits, and laboratory visits. A total of 1,585 responses were recorded, reflecting individual assessments of each component by the 697 participants. The component that received the highest number of satisfied responses was lectures, with 416 responses (26.25%) (**Table 6.20, Figure 6.15**), suggesting that the theoretical and conceptual content delivered during the training was highly appreciated by participants. This is consistent with earlier findings where 97.27% of respondents reported improved understanding of Ganga River biodiversity and conservation, indicating that lectures played a pivotal role in building foundational knowledge.

Activities ranked second in terms of satisfaction, with 367 responses (23.15%) (**Table 6.20, Figure 6.15**), demonstrating that interactive and participatory methods were also well received. These likely included group discussions, hands-on exercises, or simulation-based learning, which help reinforce theoretical content and encourage active involvement. Field visits, which accounted for 292 responses (18.42%), also received a strong positive response (**Table 6.20, Figure 6.15**), highlighting the importance of experiential learning. Exposure to on-site conservation efforts, river ecosystems, or local community initiatives may have provided participants with a more tangible understanding of the challenges and solutions associated with river basin management.

Table 6.20: Respondents' Satisfaction with Components of the Training Programme

Responses	Participants responded
Lectures	416 (6.25%)
Activities	367 (3.15%)
Material provided	270 (17.03%)
Field visits	292 (18.42%)
Lab Visits	240 (15.14%)
Total	**1585**

The material provided which may have included handouts, booklets, or digital resources was appreciated by 270 participants (17.03%) (**Table 6.20, Figure 6.15**), suggesting its usefulness in supplementing in-class learning. However, its relatively lower rank compared to lectures and activities may reflect either content limitations or a preference among participants for more

interactive forms of learning. Lab visits received the fewest satisfied responses (240; 15.14%), which could be attributed to either limited exposure to laboratory sessions during the training or lower perceived relevance, especially among participants with non-scientific backgrounds.

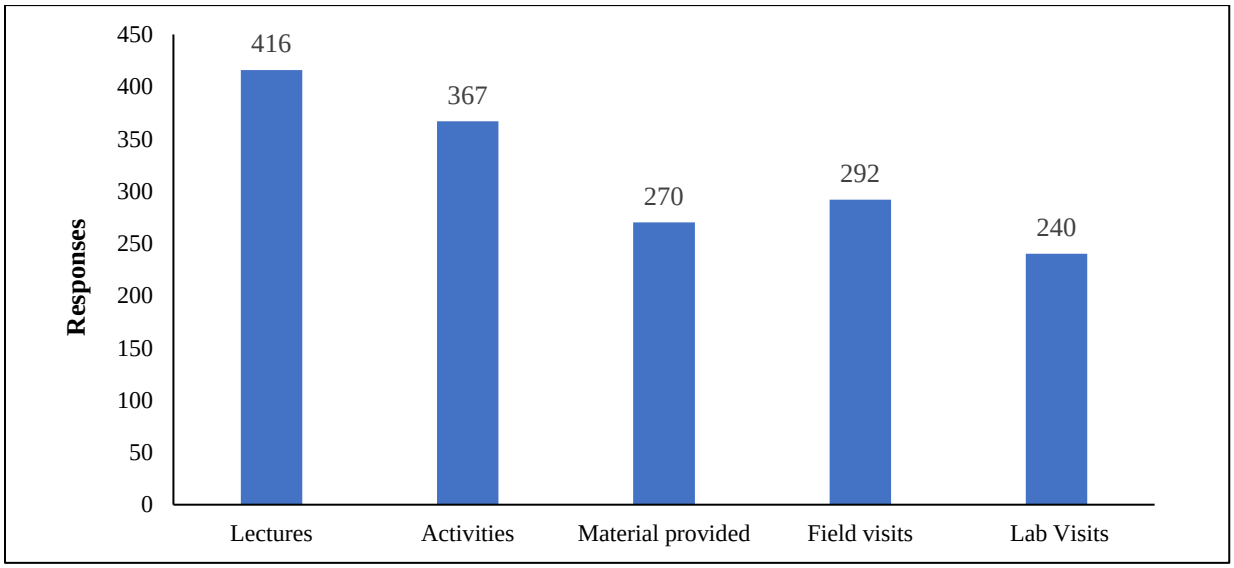


Figure 6.15: Respondents' Satisfaction with Components of the Training Programme

Overall, the distribution of satisfaction responses indicates that the training programme successfully employed a blend of pedagogical methods, with theoretical, practical, and experiential components contributing to a well-rounded learning experience. The high satisfaction with lectures, activities, and field visits points to an effective training design that catered to diverse learning preferences and helped reinforce the programme's core messages related to Ganga River conservation and biodiversity awareness.

6.3.2.3 Did the workshop improve your understanding about conservation of Ganga River Basin and its biodiversity?

(a)Yes (b) No (c) Not sure

Participants were asked whether the workshop improved their understanding of the conservation of the Ganga River Basin and its biodiversity. The response was overwhelmingly positive, with 678 out of 697 participants (97.27%) (**Table 6.21, Figure 6.16**) indicating that their understanding had improved as a result of the training. This high percentage is a strong indicator of the workshop's effectiveness in achieving its educational objectives. The training content,

which included lectures, field visits, and hands-on activities, appears to have successfully conveyed the importance of biodiversity, ecosystem services, and conservation strategies within the context of the Ganga River Basin. A small number of participants 10 (1.43%) responded with "Not sure," and only 9 participants (1.29%) (**Table 6.21, Figure 6.16**) reported no improvement in understanding. These minimal numbers of uncertain or negative responses suggest that the training was broadly accessible and comprehensible to a wide range of participants, including those from diverse educational, professional, and regional backgrounds.

Table 6.21: Impact of the Workshop on Respondents' Understanding of Ganga River Basin Conservation and Biodiversity

Responses	Participants responded
Yes	678 (97.27%)
Not sure	10 (1.43%)
No	9 (1.29%)
Total	697

The reported learning outcomes are also consistent with other findings. For instance, high satisfaction levels with lectures (26.25%) and field visits (18.42%) reflect the value of both theoretical and experiential learning in facilitating knowledge retention.

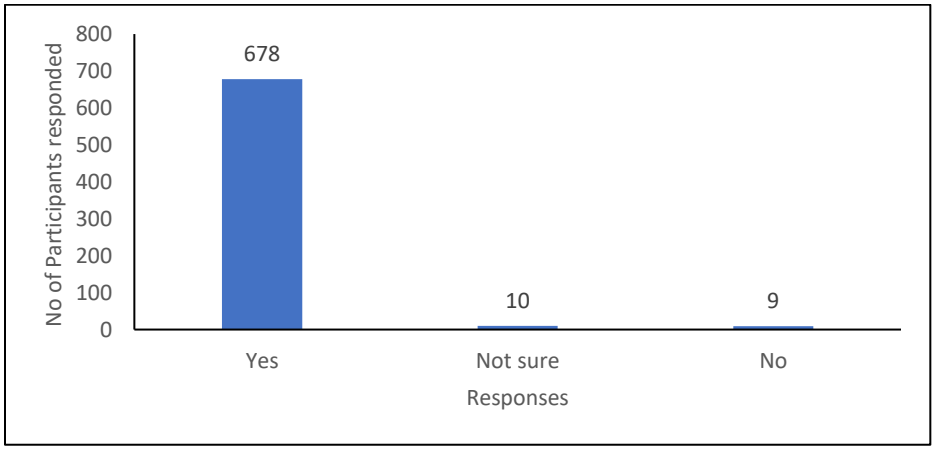


Figure 6.16: Impact of the Workshop on Respondents' Understanding of Ganga River Basin Conservation and Biodiversity

Moreover, increased awareness of aquatic species, threats to the river, and preference for conservation priorities seen in other parts of the survey; further corroborate the effectiveness of the workshop in deepening ecological understanding. Overall, the near-universal positive response reinforces the conclusion that capacity-building programmes such as this one play a critical role in fostering informed and active participation in river conservation initiatives.

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

(a) Yes b) No

Participants were asked whether they were aware of any government programmes aimed at cleaning the Ganga River, and a substantial 89.81% (n = 626) (**Table 6.22, Figure 6.17**) responded affirmatively. This high level of awareness reflects strong policy literacy among participants, many of whom are likely to have encountered government-led initiatives such as Namami Gange, which has been prominently promoted as a flagship national programme for river rejuvenation. The widespread recognition of such programmes suggests that government outreach and visibility around Ganga conservation have been largely successful in reaching both local communities and institutional stakeholders.

Table 6.22: Awareness of Government Programmes for Cleaning the Ganga River Among Respondents

Responses	Participants responded
No	71 (10.19%)
Yes	626 (89.81%)
Total	697

Only 10.19% (n = 71) (**Table 6.22, Figure 6.17**) of respondents reported not being aware of these initiatives, which could include individuals from non-riparian areas, those with limited access to media, or participants from non-technical backgrounds. This modest percentage of unawareness highlights the need for continued and inclusive dissemination strategies, especially through localized awareness campaigns, educational institutions, and community outreach efforts.

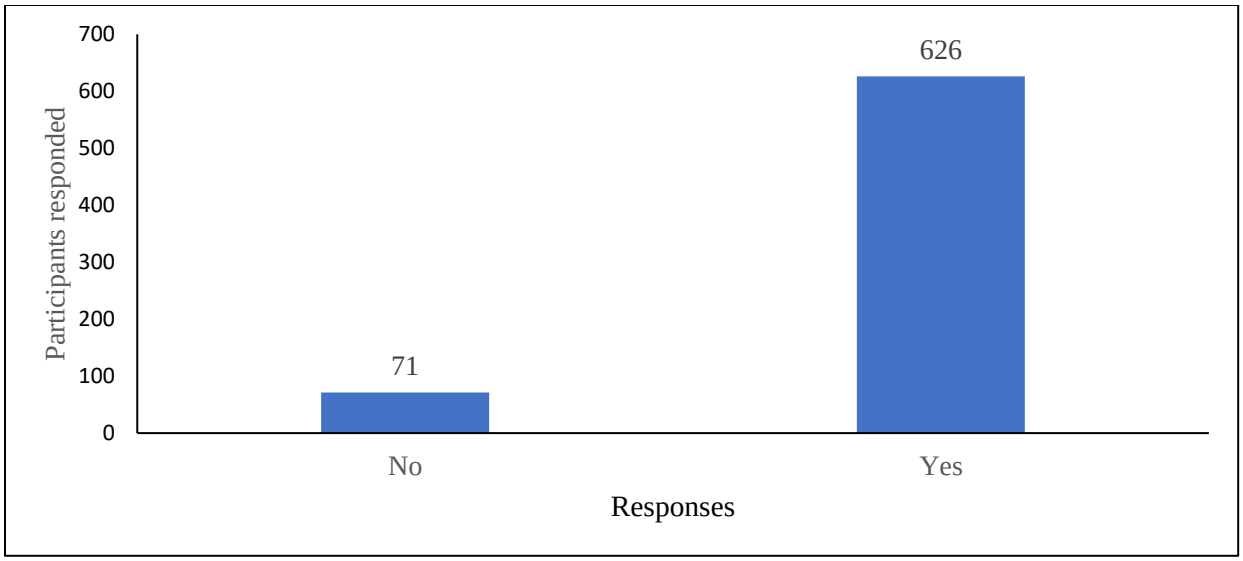


Figure 6.17: Awareness of Government Programmes for Cleaning the Ganga River Among Respondents

The high rate of policy awareness complements earlier findings in the survey, such as the strong support for mass awareness programmes (35.81%), legal enforcement (20.02%), and the shared responsibility model for river conservation, where 58.26% of respondents felt that all sectors government, NGOs, communities, and youth must work together. It also reinforces the training programme's effectiveness, as nearly all participants (97.27%) reported improved understanding of Ganga River conservation, likely including awareness of institutional frameworks and ongoing government actions.

In summary, the data suggest that government programmes to clean the Ganga River are widely known among stakeholders, indicating a promising level of public engagement and potential for collaborative implementation. However, ensuring that the remaining segments of the population are equally informed will be essential for achieving the holistic participation needed to meet long-term conservation goals.

6.3.2.5 What are the key species found in Ganga River Basin?

When participants were asked whether they could name any key species found in the Ganga River Basin, 58.68% (n = 409) (**Table 6.23, Figure 6.18**) responded affirmatively, indicating a moderate to high level of species-specific biodiversity awareness among the surveyed group. This

result aligns with earlier findings in which 69.01% of participants reported being aware of aquatic species in the Ganga, and 97.27% stated that their understanding of biodiversity and conservation had improved following the training. Among those who could name species, commonly mentioned taxa included the Gangetic dolphin (*Platanista gangetica*) an iconic flagship species alongside fish, turtles, gharial, crocodiles, otters, and various riverine birds. This suggests that the training effectively communicated the importance of several high-profile aquatic species, particularly those frequently featured in environmental campaigns or observed in the field.

Table 6.23: Key Species Identified in the Ganga River Basin

Responses	Participants responded
No	288 (41.32%)
Yes	409 (58.68%)
Grand Total	697

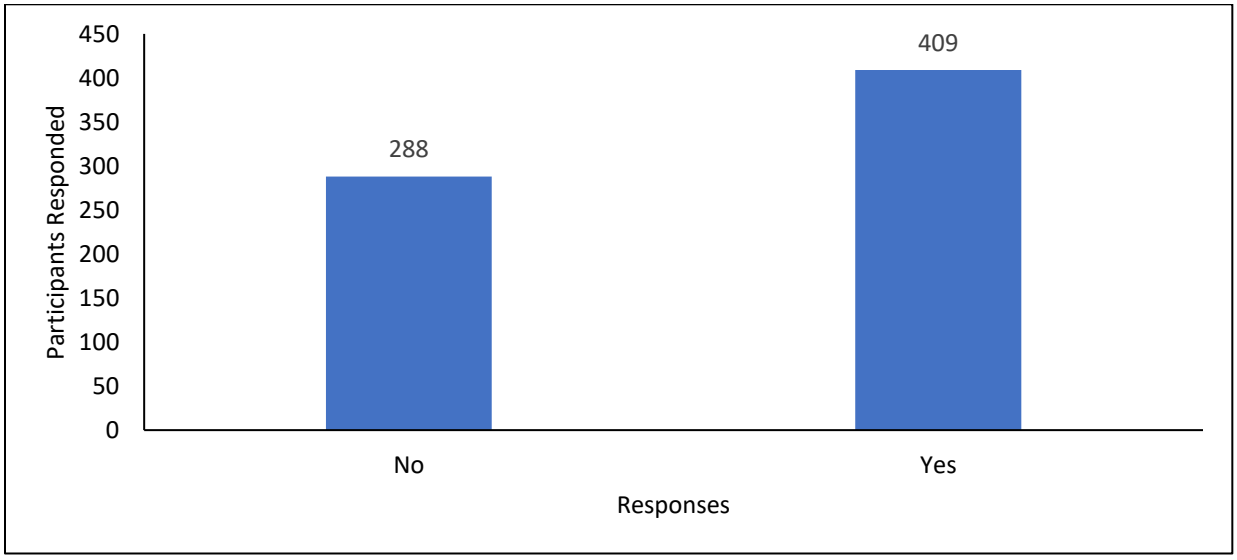


Figure 6.18: Key Species Identified in the Ganga River Basin

However, a considerable 41.32% of participants (n = 288) (**Table 6.23, Figure 6.18**) were unable to name even a single species, pointing to a notable gap in species-level recall or recognition. This shortfall may stem from a lack of direct exposure to certain species, limited prior ecological knowledge, or the need for improved pedagogical tools in training programmes. The findings

indicate that while general awareness has been positively influenced, retention of detailed ecological information remains uneven, particularly for less visible or lesser-known species.

Table 6.24: Respondents' Knowledge of Key Species in the Ganga River Basin

Responses (How many species answer correctly)	Participants Responded
1 Species	281 (40.32%)
2 Species	34 (4.88%)
3 or more Species	94 (13.49%)
No	288 (41.32%)
Total	**697**

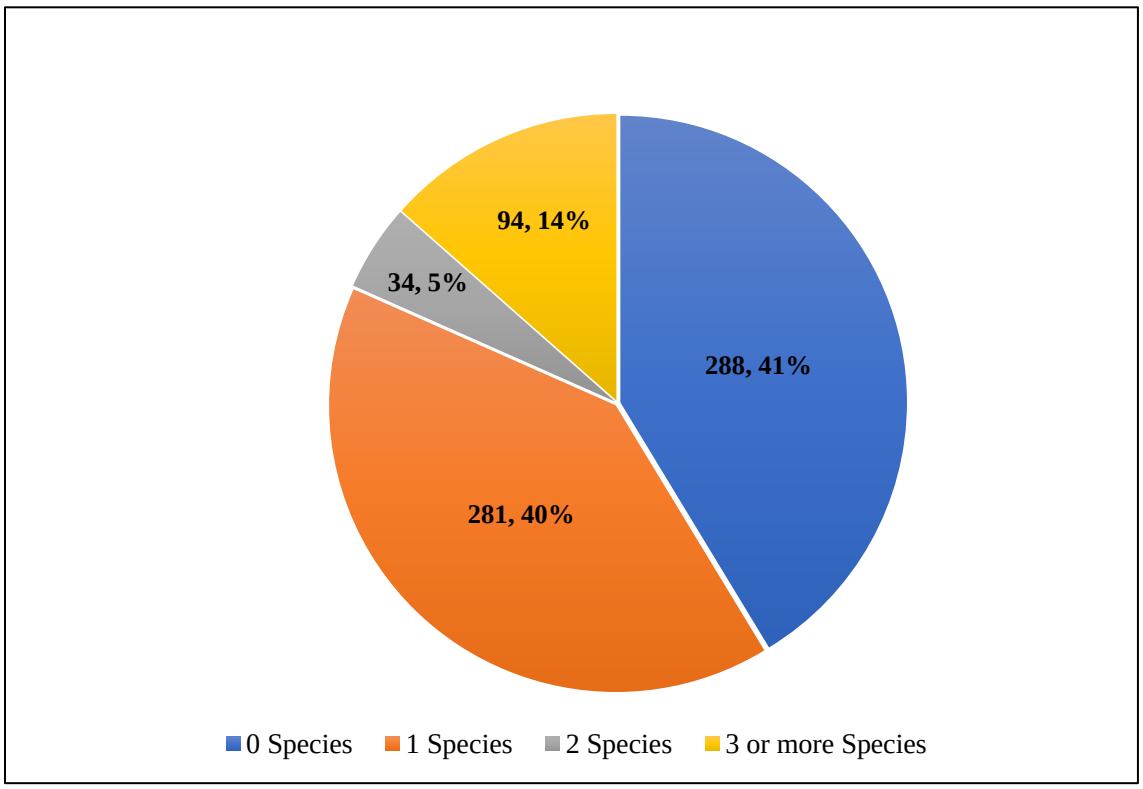


Figure 6.19: Respondents' Knowledge of Key Species in the Ganga River Basin

To assess the depth of species knowledge, participants' responses were further analyzed based on the number of species correctly identified. 40.32% (n = 281) (**Table 6.24, Figure 6.19**) were able to name one species, 4.88% (n = 34) (**Table 6.24, Figure 6.19)** identified two species, and 13.49% (n = 94) (**Table 6.24, Figure 6.19)** demonstrated stronger biodiversity awareness by naming three or more species. These figures show that although many participants possess at

least basic recognition of aquatic fauna, only a smaller proportion have developed a more comprehensive understanding of the river's biodiversity. This pattern reflects an increase in ecological knowledge among a subset of participants, particularly those likely to have had greater field exposure, professional engagement, or educational background in environmental science.

These insights are consistent with data from Question 4a (**6.3.1.4.1**), where species such as the Hilsa, Mahseer, Snow trout, *Wallago attu*, turtles (including tortoises and those "found in India"), and river birds like the Indian skimmer, river tern, Saras crane, egret, and white-throated kingfisher were mentioned but with wide variation in frequency. This suggests that species visibility, cultural relevance, and media representation strongly influence which taxa are most familiar to the public.

In conclusion, while the majority of participants were able to identify at least one key species of the Ganga River Basin, the relatively high proportion of those who could not and the limited number of respondents who demonstrated deeper species knowledge underscore the need for more immersive and targeted biodiversity literacy efforts. Enhancing public understanding of the full spectrum of aquatic and riparian species will be critical to fostering long-term conservation action that extends beyond flagship species and embraces the ecological complexity of the Ganga River system.

6.3.2.6 Do you know any tributaries belonging to Ganga River Basin? Yes/No

When asked whether they were aware of any tributaries that form part of the Ganga River Basin, 88.67% of participants (n = 618) (**Table 6.25, Figure 6.20)** responded affirmatively. This high level of awareness reflects a strong regional and hydrological understanding among the surveyed group, many of whom reside in or near the basin, or are professionally engaged in conservation, research, or environmental education. The widespread knowledge of tributaries such as the Yamuna, Ghaghara, Gandak, Kosi, Son, Gomti, and Ramganga Rivers among others is essential for building a more holistic view of the Ganga River system, which is not a single linear channel but a complex network of interconnected waterways supporting vast ecological and human communities.

Table 6.25: Respondents' Knowledge of Tributaries of the Ganga River Basin

Responses	Participants responded
No	79 (11.33%)
Yes	618 (88.67%)
Total	697

Only 11.33% of participants (n = 79) (**Table 6.25, Figure 6.20)** reported that they were not aware of any tributaries, indicating a relatively small knowledge gap. This group may include individuals from non-riparian regions, those with limited formal education in geography or environmental science, or participants who are new to conservation activities. These results are consistent with earlier findings, where 64.71% of participants were aware of the states that comprise the Ganga Basin, and 67.43% reported residing near a Ganga tributary, suggesting that proximity and lived experience contribute significantly to geographic and ecological literacy.

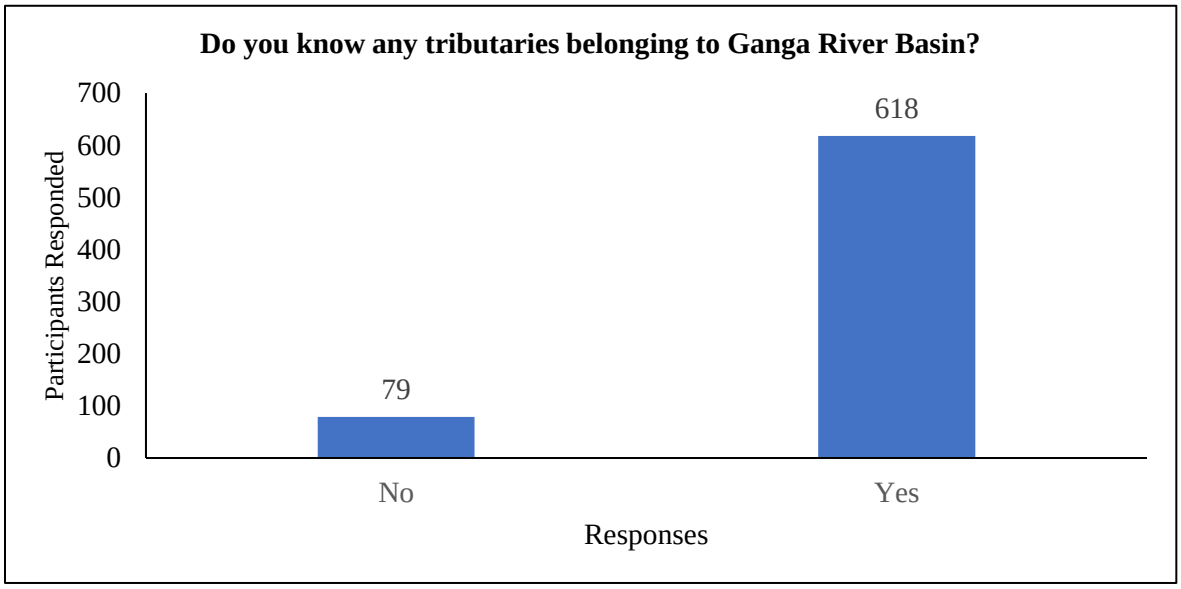


Figure 6.20: Respondents' Knowledge of Tributaries of the Ganga River Basin

The strong awareness of tributaries complements participants' understanding of the broader riverine system and strengthens the potential for decentralized, community-based conservation efforts. By recognizing that the health of the Ganga River is deeply linked to the condition of its tributaries, stakeholders are more likely to support catchment-level interventions, upstream-downstream collaboration, and multi-state conservation policies. This foundational geographic

knowledge is vital for fostering watershed thinking and promoting integrated river basin management practices.

6.3.2.7 Populations of which among the following are decreasing in River Ganga River Basin?

(a) Amphibians (b) Fishes (c) Reptiles (d) Mammals (e) Birds

Participants were asked to identify which groups of fauna they believed were experiencing population declines in the Ganga River Basin. The responses reflected a broad awareness of biodiversity loss across taxa, with particular concern for mammals and fishes. Mammals were perceived to be the most affected group, identified by 23.86% (n = 571) of participants (**Table 6.26, Figure 6.21)**, followed closely by fishes at 21.15% (n = 506). These perceptions align with earlier findings in the survey, where species such as the Gangetic dolphin a riverine mammal were frequently mentioned in open-ended species identification questions, indicating high public awareness of their threatened status. Similarly, fish species such as Hilsa, Mahseer, Catla, and Rohu were also widely recognized, reflecting both ecological concern and the species' socio-economic importance in local fisheries.

Table 6.26: Respondents' Perception of Declining Populations in the Ganga River Basin

Responses	Participants responded
Amphibians	431 (18.01%)
Fishes	506 (21.15%)
Reptiles	462 (19.31%)
Mammals	571 (23.86%)
Birds	423 (17.68%)

Reptiles, including turtles, gharials, and crocodiles, were identified by 19.31% of participants (n = 462) (**Table 6.26, Figure 6.21)** as experiencing population decline. This is consistent with the responses to Question 4a (**6.3.1.4.1**), where turtles and gharials were among the named species but at lower frequencies than dolphins and fish, suggesting that while recognized, these species may not receive equal attention in conservation narratives. Amphibians, though less visible and often underrepresented in mainstream discourse, were acknowledged by 18.01% of participants

(n = 431) (**Table 6.26, Figure 6.21)**, indicating a growing awareness of their ecological vulnerability and sensitivity to pollution, habitat disturbance, and hydrological changes.

Interestingly, birds were identified by 17.68% (n = 423) (**Table 6.26, Figure 6.21)** as declining, making them the least cited group. This may be due to lower visibility of aquatic or riparian bird species in training content or public awareness campaigns, despite their ecological significance. However, in earlier species-specific responses, participants did mention birds such as the Indian skimmer, River tern, Saras crane, Yellow-wattled lapwing, and egrets, indicating that while some recognition exists, birds may not be perceived as critically threatened compared to other fauna.

Overall, these results suggest that participants have a nuanced understanding of biodiversity decline, with heightened concern for more iconic or economically relevant groups such as mammals and fish. At the same time, the relatively balanced distribution of responses across all five categories demonstrates a broad-based awareness of faunal vulnerability within the Ganga River Basin. This presents an opportunity to expand conservation messaging to include lesser-known and ecologically critical species, particularly amphibians and birds, which are often early indicators of environmental degradation.

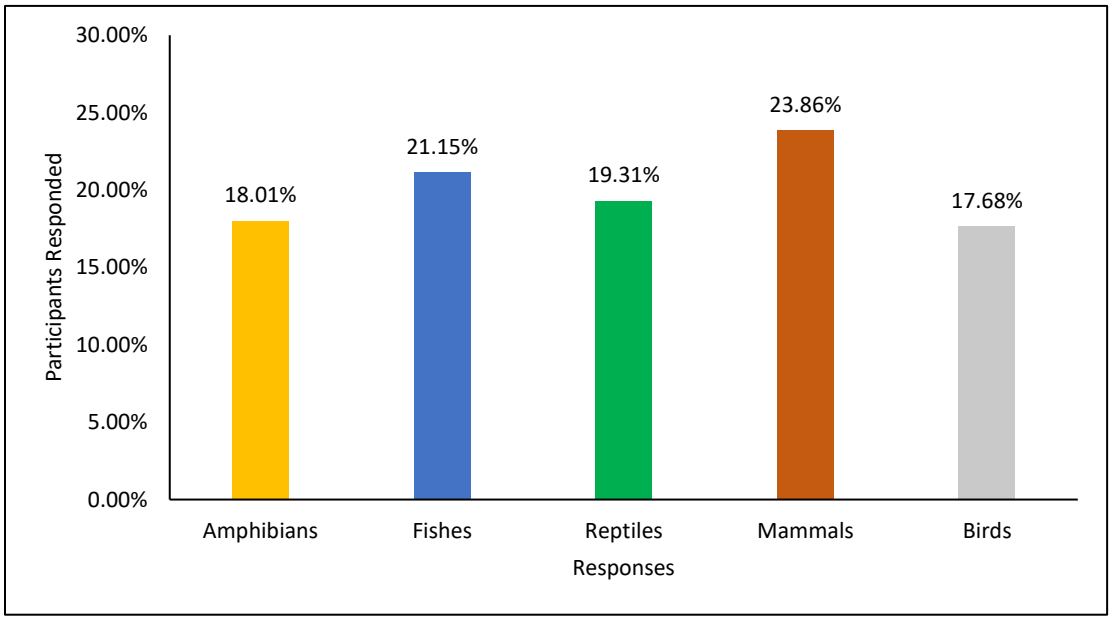


Figure 6.21: Respondents' Perception of Declining Populations in the Ganga River Basin

6.3.2.8 What do you think are the major threats faced by Ganga River Basin?

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) All of the above

When participants were asked to identify the major threats currently facing the Ganga River Basin, a wide range of human-induced pressures were acknowledged, with varying degrees of emphasis. The most frequently cited threat was pollution from industrialization and urbanization, chosen by 17.30% of the total responses (n = 487). This reinforces earlier findings where pollution was consistently ranked as a critical issue, highlighting its visibility and perceived impact on the river ecosystem. Rapidly increasing human population and rising standards of living were the second most reported threat, receiving 14.88% of responses (n = 419).

Table 6.27: Respondents' Perception of Major Threats to the Ganga River Basin

Responses	Participants responded
Rapidly increasing human population and rising standards of living	419 (14.88%)
Pollution	487 (17.30%)
Developmental activities	337 (11.97%)
Sewage waste discharge	398 (14.14%)
Agricultural run-off	325 (11.55%)
Ritual activities in and around Ganga River	341 (12.11%)
Climate change	303 (10.76%)
All of the above	205 (7.28%)
Total	2815

This reflects a public understanding that demographic pressures and growing consumption are placing additional stress on natural resources and infrastructure, particularly in urban and peri-urban stretches of the river.

Sewage waste discharge, often linked with poor municipal waste management and inadequate treatment infrastructure, was selected by 14.14% of respondents (n = 398) (**Table 6.27, Figure 6.22)**. This response resonates with earlier concerns over chemical contamination and the need for improved enforcement of wastewater regulations. Developmental activities such as the construction of dams, roads, and hydropower infrastructure were seen as significant by 11.97% (n = 337), suggesting an emerging public awareness of how large-scale infrastructure can fragment aquatic habitats, disrupt natural flow regimes, and threaten biodiversity.

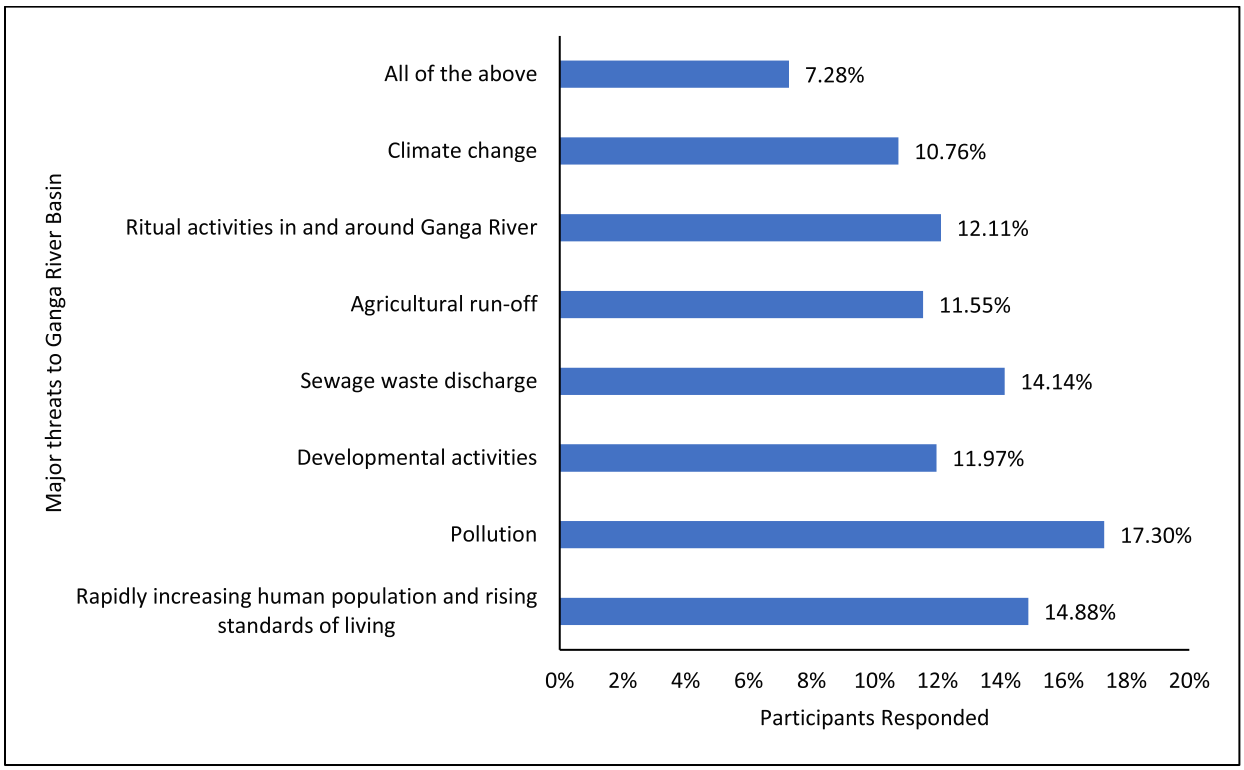


Figure 6.22: Respondents' Perception of Major Threats to the Ganga River Basin

Responses related to agricultural runoff (11.55%), ritual activities in and around the river (12.11%), and climate change (10.76%) (**Table 6.27, Figure 6.22)** were comparatively lower, though still substantial. The concern over agricultural runoff which introduces fertilizers and

pesticides into the water system highlights growing sensitivity to non-point source pollution. Similarly, the mention of ritual activities suggests that some participants recognize the cumulative impact of culturally ingrained practices, such as idol immersion and ceremonial waste disposal. The relatively modest selection of climate change as a major threat may indicate limited understanding of its indirect but severe long-term effects, such as altered hydrological cycles, glacial melt, and habitat shifts.

Interestingly, only 7.28% (n = 205) selected "All of the above" (**Table 6.27, Figure 6.22)**, indicating that most participants tended to focus on specific threats rather than adopting a comprehensive or systems-based view of the problem. This may reflect a lack of holistic environmental literacy or a tendency to prioritize immediate and visible issues like pollution over more complex or interconnected drivers of degradation. The low percentage also underscores the need for enhanced communication and training efforts that promote integrated thinking, emphasizing how multiple threats act synergistically to compromise river health.

Overall, the responses illustrate a well-rounded but somewhat compartmentalized perception of threats to the Ganga River Basin. While industrial pollution, sewage discharge, and population pressure are top-of-mind concerns, there is an opportunity to strengthen understanding of less visible but equally critical issues, such as climate change, ritual impacts, and diffuse agricultural pollution. Encouraging a systems-based perspective among stakeholders will be essential for developing effective, long-term river basin management strategies.

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

a) Decrease in biodiversity of Ganga River Basin, b) Water pollution in Ganga River Basin
b) Changing river flow regime c) All of the above

Participants were asked to identify the key environmental changes in the Ganga River system that they have observed as a result of anthropogenic activities. The most commonly reported change was a decrease in biodiversity, selected by 39.90% of respondents (n = 314) (**Table 6.28,**

Figure 6.23). This response is consistent with earlier findings, particularly from Questions 5 and 7, where participants expressed concern over the decline of aquatic species such as the Gangetic dolphin, fishes, turtles, and riverine birds, as well as recognition of mammals and reptiles as vulnerable groups. The high selection of biodiversity loss indicates a strong ecological sensitivity among participants and reflects the visible degradation of species richness and abundance in many parts of the river basin.

Table 6.28: Major Environmental Changes in the Ganga River System Attributed to Anthropogenic Activities

Major environmental changes in Ganga River system	Participants Responded
Decrease in biodiversity of Ganga River Basin	314 (39.90%)
Water pollution in Ganga River Basin	258 (32.78%)
Changing river flow regime	88 (11.18%)
All of the above	127 (16.14%)
Total	787

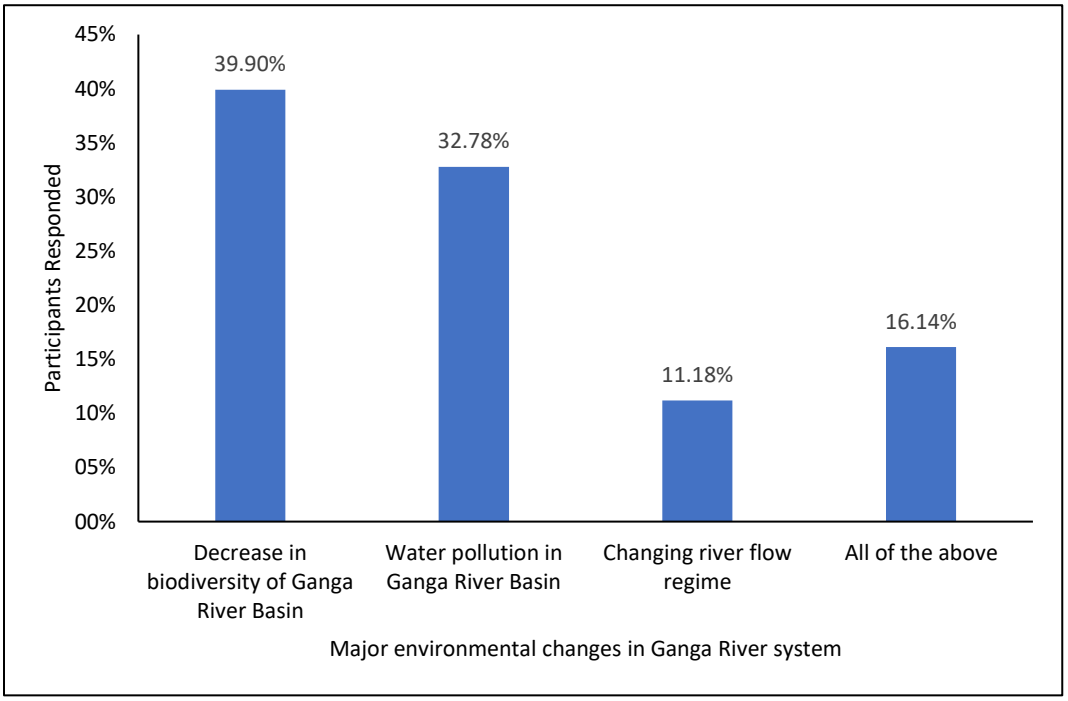


Figure 6.23: Major Environmental Changes in the Ganga River System Attributed to Anthropogenic Activities

Water pollution was cited as the second most observed environmental change, selected by 32.78% of participants (n = 258) (**Table 6.28, Figure 6.23)**. This aligns with repeated emphasis on pollution throughout the survey for example, where 54.70% of participants earlier identified pollution from industrialization and urbanization as the most serious threat, and 17.58% identified sewage discharge. The consistent ranking of pollution as a primary concern underscores its visibility and immediate impact on both the ecosystem and human communities that rely on the Ganga for water, livelihood, and cultural practices.

A smaller portion of participants (11.18%; n = 88) (**Table 6.28, Figure 6.23)** observed changing river flow regimes, which may result from activities such as dam construction, water diversion for irrigation, and hydropower development. Although this category received fewer responses compared to biodiversity loss and pollution, it remains a critical issue that affects sediment transport, fish migration, wetland connectivity, and the natural rhythm of the river. The relatively low response rate may indicate a lack of direct visibility of flow alteration impacts or limited technical understanding of hydrological dynamics among some participants.

Notably, 16.14% of respondents (n = 127) selected “All of the above” (**Table 6.28, Figure 6.23)**, recognizing that the environmental degradation of the Ganga River system is multifaceted and interconnected. While this percentage reflects an emerging holistic awareness, it also suggests that the majority of respondents tend to perceive environmental changes in isolated categories rather than as part of an integrated ecological decline. This highlights a gap in systems thinking and points to the need for further educational and outreach efforts that emphasize the interlinked nature of anthropogenic impacts on river health.

In summary, the results reveal that participants are acutely aware of major human-induced changes in the Ganga River Basin, particularly in terms of biodiversity loss and pollution. However, broader recognition of cumulative and synergistic effects especially those affecting hydrological patterns remains limited. Fostering a more comprehensive understanding of these issues will be essential for empowering stakeholders to support and implement integrated river basin management strategies.

6.3.2.10 What are the ecosystem services provided by Ganga River Basin?

(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

Participants were asked to identify the types of ecosystem services provided by the Ganga River Basin, with the goal of assessing their understanding of the river's ecological, economic, and cultural functions. The largest proportion of respondents 32.13% (n = 259) selected "All of the above" (**Table 6.29, Figure 6.24)**, demonstrating an awareness that the Ganga River supports multiple interconnected services including provisioning, regulating, supporting, and cultural functions. This recognition of the full spectrum of services reflects an encouraging level of ecological literacy among a significant portion of participants, and aligns with earlier results showing a high valuation of water quality, biodiversity, and ecological balance.

Table 6.29: Ecosystem Services Provided by the Ganga River Basin

Ecosystem services	Participants Responded
Provisioning	199 (24.69%)
Regulating	126 (15.63%)
Supporting	125 (15.51%)
Cultural	97 (12.03%)
All of the above	259 (32.13%)
Total	806

However, the majority of respondents selected individual service categories, indicating fragmented or incomplete understanding of the broader concept of ecosystem services. Among individual categories, provisioning services such as the supply of water, food, and fish were most frequently recognized, with 24.69% (n = 199) identifying this function (**Table 6.29, Figure 6.24)**. This is consistent with previous survey responses in which participants demonstrated familiarity with aquatic biodiversity (e.g., fishes like Hilsa, Mahseer, and Rohu) and expressed concern about threats to these species, likely due to their livelihood and food security significance in riparian

communities. Regulating services, such as climate control, water purification, and disease regulation, were identified by 15.63% (n = 126) of participants. This reflects some awareness of the Ganga River's role in maintaining environmental stability, although these benefits may be less directly visible or widely understood compared to provisioning functions. A similar number 15.51% (n=125) acknowledged supporting services, which include nutrient cycling and soil formation (**Table 6.29, Figure 6.24)**. These are foundational to all other ecosystem services but often receive less attention in public discourse due to their abstract nature and long-term impact. Only 12.03% (n=97) of participants identified cultural services, such as spiritual, aesthetic, and recreational values (**Table 6.29, Figure 6.24)**. This is somewhat surprising given the Ganga River's globally recognized religious and cultural significance in India. The relatively low percentage may reflect a tendency among respondents to associate the river more with ecological or livelihood-related benefits, especially in the context of a conservation-oriented training programme. Alternatively, it may indicate that while cultural values are widely appreciated, they are not always conceptualized within the framework of "ecosystem services."

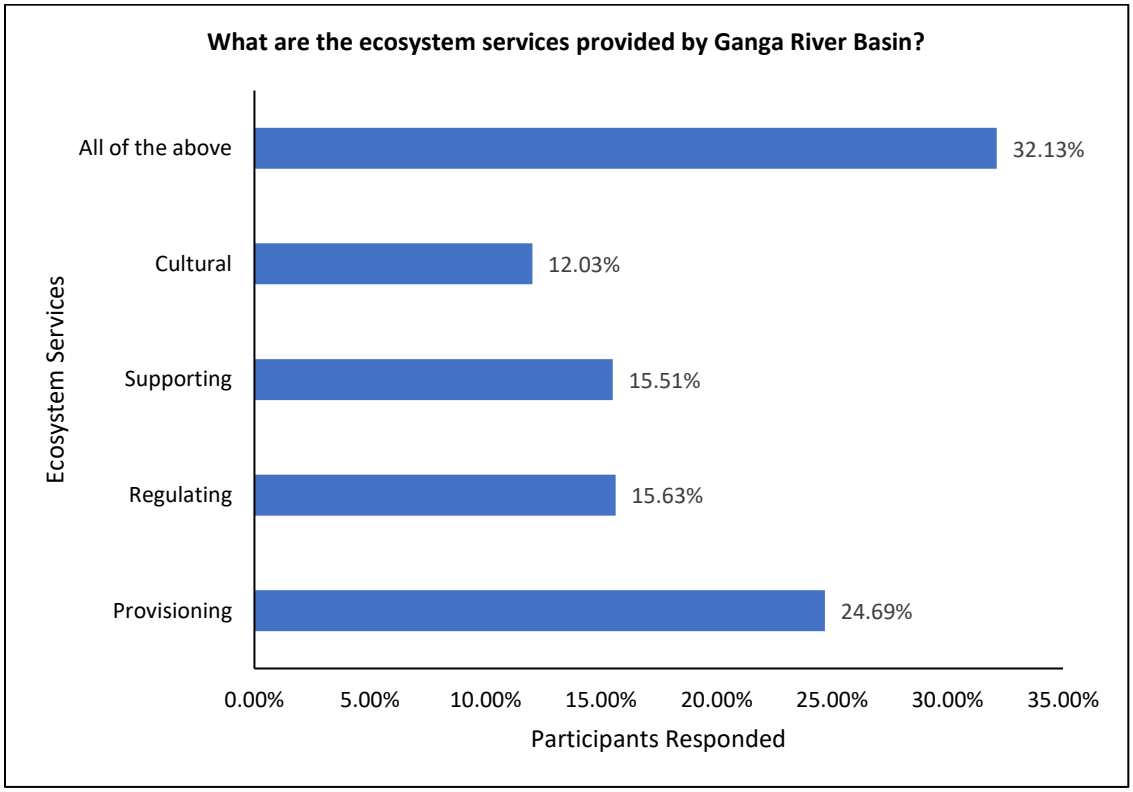


Figure 6.24: Ecosystem Services Provided by the Ganga River Basin

In summary, while nearly one-third of participants demonstrated a comprehensive understanding of the Ganga River Basin's ecosystem services, the majority focused on individual aspects, particularly those with more tangible or immediate benefits. These results point to a need for enhanced ecosystem literacy, particularly in integrating ecological, cultural, and regulating functions into conservation education. Promoting a systems-based understanding of ecosystem services will help broaden stakeholder perspectives and support more inclusive, sustainable management of the Ganga River Basin.

6.3.3 Pre- and Post-Training Effectiveness Comparison

To assess the effectiveness of the trainings conducted for Forest Department and Other Stakeholders in Managing Aquatic and Wetland Resources, a comparative analysis of selected pre- and post-training questionnaire responses was also worked out. The comparison highlights notable changes in participants' ecological awareness, understanding of threats, conceptual grasp of ecosystem services, and perceptions of conservation responsibility. Key findings are presented below with corresponding question numbers.

6.3.3.1 Awareness and Identification of Aquatic Species (6.3.1.4, 6.3.2.5)

In the pre-training assessment (Q4), 69.01% of participants reported being aware of aquatic species found in the Ganga River Basin. However, the survey did not test specific species knowledge at that point. In the post-training assessment (Q5), 58.68% of participants were able to name at least one aquatic species, while Q5a revealed that 13.49% could correctly identify three or more species, including the Gangetic dolphin, Hilsa, Mahseer, turtles, gharial, and several riverine birds. This demonstrates a shift from general awareness to species-level ecological understanding, likely supported by hands-on training modules such as species surveys and rescue sessions.

6.3.3.2 Perception of Environmental Threats (6.3.1.8, 6.3.2.8)

In pre-training responses (6.3.1.8), a majority (54.70%) identified pollution from industrialization and urbanization as the most pressing threat to the Ganga River Basin. Other threats such as

sewage discharge (17.58%), developmental activities (8.03%), and climate change (3.64%) received comparatively less attention. In the post-training version of Q8, threat perception diversified: pollution (17.30%), population growth (14.88%), sewage (14.14%), development (11.97%), and climate change (10.76%). Only 7.28% selected "All of the above," suggesting that while awareness of individual threats increased, the understanding of their interconnected and cumulative impacts remains an area for further strengthening. The more balanced distribution post-training reflects an enhanced systems-thinking approach promoted through ecological training content.

6.3.3.3 Knowledge of Ecosystem Services (6.3.2.10)

The concept of ecosystem services was not directly covered in the pre-training survey but was introduced during training sessions. In the post-training assessment (Q10), 32.13% of participants recognized that the Ganga River Basin provides all four categories of ecosystem services provisioning, regulating, supporting, and cultural. Among individual categories, provisioning services were selected by 24.69%, regulating by 15.63%, supporting by 15.51%, and cultural by 12.03%. This result indicates that the training successfully introduced and clarified complex ecological functions, although retention varied across service types. The responses reflect early-stage conceptual understanding and offer a foundation for deeper future engagement with ecosystem-based management approaches.

6.3.3.4 Shifts in Responsibility Perception (6.3.1.9, 6.3.2.8 Responsibility Section)

Before the training, Question 9 (**6.3.1.9)** responses showed participants prioritized actions such as mass awareness programmes (35.81%), 3R principles (22.57%), and legal enforcement (20.02%) for Ganga River cleaning. This suggests an emphasis on institutional or top-down approaches. In contrast, the post-training assessment (Q8-Responsibility section, **6.3.2.8**) showed that 58.26% of participants believed "All stakeholders" including government, NGOs, private sector, local communities, youth, and village panchayats are collectively responsible for conservation. This marks a clear shift toward recognizing multi-stakeholder responsibility and

participatory conservation, which was a key message delivered through modules on community-based conservation, participatory management, and conservation education.

In summary, the comparative analysis of pre- and post-training responses clearly indicates that the training programme conducted for capacity building of the forest department and other stakeholders in managing aquatic and wetland resources had a significant and positive impact on the participants' ecological knowledge, perception of threats, and conservation mindset. The structured and multi-thematic approach of the training, which included hands-on sessions, field exposure, and interactive discussions, translated effectively into measurable learning outcomes. Several key improvements were observed:

There was a notable enhancement in species recognition and biodiversity awareness among participants. While the pre-training responses revealed a general awareness of aquatic species, the post-training responses demonstrated a more detailed and accurate ability to identify key species such as the Gangetic dolphin, turtles, gharial, Hilsa, Mahseer, and riverine birds. A considerable number of participants were able to name multiple species correctly, reflecting the impact of field-based and practical learning components, such as species rescue demonstrations and ecological survey techniques.

There was a significant shift from a narrow perception of threats primarily focused on industrial pollution to a broader and more balanced understanding of multiple anthropogenic pressures on the Ganga River ecosystem. Pre-training responses largely emphasized pollution as the sole major issue, whereas post-training responses showed increased recognition of additional factors such as population pressure, sewage discharge, agricultural runoff, development activities, ritual practices, and climate change. This expanded awareness indicates the development of systems thinking, where participants began to understand the interlinkages between various stressors and their cumulative impact on river health.

The concept of ecosystem services was successfully introduced and partially understood by the participants. Although not assessed in the pre-survey, post-training responses revealed that a significant portion of participants could identify not only provisioning services (e.g., water, food,

fish) but also regulating, supporting, and cultural services. This shift indicates the training's success in conveying abstract ecological concepts and promoting a more integrated understanding of the river's value beyond tangible resources.

The training appeared to catalyze a shift in the perception of responsibility for river conservation. Before the training, participants largely placed responsibility on government institutions and legal frameworks. However, post-training responses (Responsibility section) reflected a broader understanding that river conservation is a shared responsibility, with over 58% of participants recognizing the role of all stakeholders, including local communities, NGOs, private sectors, youth, and government entities. This change reflects the effectiveness of training modules on community-based conservation, participatory management, and collaborative governance.

In conclusion, the pre- and post-training comparisons demonstrate that the capacity-building programme not only succeeded in improving knowledge and awareness but also contributed to a paradigm shift in participants' attitudes toward conservation. The training fostered a more ecologically literate, engaged, and responsible stakeholder base, equipped with both the knowledge and the motivation to actively contribute to the sustainable management of the Ganga River Basin.

6.4. Carry Forward Activities

The quality and effectiveness of the trainings imparted to diverse stakeholders were assessed by evaluating the extent to which participants translated the acquired knowledge and skills into post-training actions. Monitoring and evaluation of carry-forward activities serve as critical indicators of training relevance, behavioural change, and long-term sustainability, and provide valuable feedback for refining future capacity-building interventions across the Ganga River Basin.

Table 6.30: Participant Responses on Adoption, Further Actions, and Constraints Following Training

	Responses	Responses	Percentage of total response
1.	**Yes**	2,165 (83%)	
	If yes, Further actions carried out		
a.	**Trained more people**	974 (45%)	37%
b.	**Spread awareness**	823 (38%)	32%
c.	**Self-Implementation**	368 (17%)	14%
2.	**No**	313 (12%)	12%
	If No, Reasons Responsible		
a.	**Not Interested**	42 (13%)	2%
b.	**Inadequate Response from Target Groups**	131 (42%)	5%
c.	**Insufficient Training**	28 (9%)	1%
d.	**Lack of Resources**	72 (23%)	3%
e.	**Others Reasons**	40 (13%)	2%
3.	**Other Responses**	130 (5%)	
	Total Responses	**2608**	

To assess the long-term impact of the training programmes implemented under the Ganga River Basin biodiversity conservation initiatives, feedback was obtained from a total of 2,608 trained participants. Respondents were assessed regarding their engagement in carry-forward activities undertaken independently or within their respective institutions following the completion of training programmes.

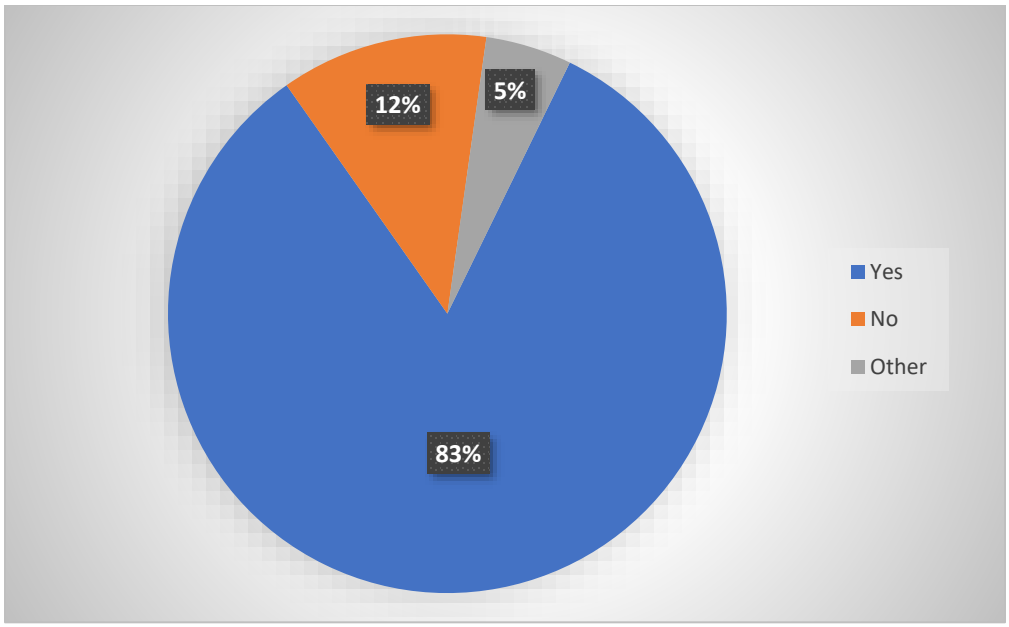


Figure 6.25: Distribution of Participants by Implementation Status (Yes, No, and Other Responses)

The results indicate that a substantial majority of respondents (83%; n = 2,165) reported actively engaging in post-training activities (**Table 6.30, Figure 6.25**). This high level of participation highlights the effectiveness of the training modules in empowering stakeholders to initiate conservation-oriented actions beyond the formal training period.

Among those who reported undertaking carry-forward activities, further analysis revealed a diverse range of engagement. The most prominent activity was training more people, reported by 974 respondents (45% of active participants; 37% of total responses) (**Table 6.30, Figure 6.26**), demonstrating a strong multiplier effect where trained individuals acted as local resource persons within their communities or institutions.

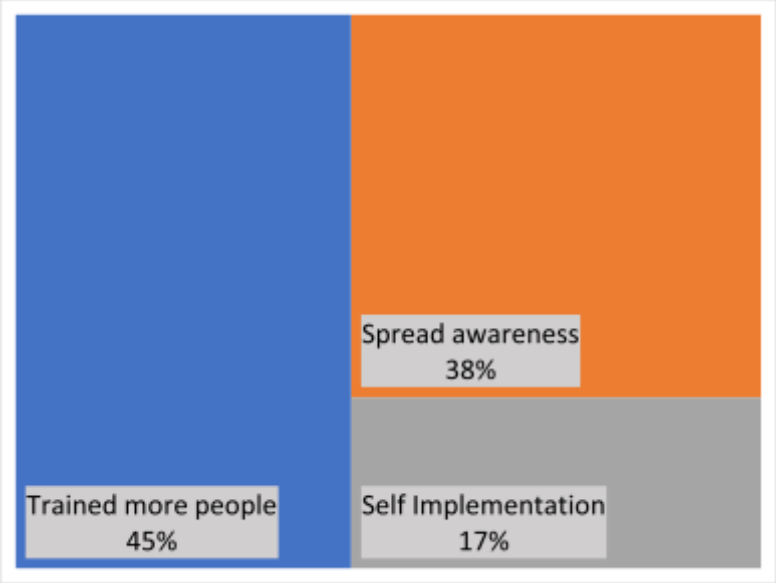


Figure 6.26: Types of Further Actions Carried Out by Participants Following Training

This was followed by spreading awareness, reported by 823 respondents (38% of active participants; 32% of total responses) (**Table 6.30, Figure 6.26**), which included community meetings, awareness campaigns, educational outreach, public interactions, and participation in environmental events. Additionally, self-implementation of conservation actions was reported by 368 respondents (17% of active participants; 14% of total responses), encompassing independent initiatives such as biodiversity-related activities, local environmental interventions, and field-level conservation efforts. Collectively, these findings reflect a layered and sustained impact of the training programmes, with participants contributing through knowledge dissemination, peer learning, and direct on-ground action across the Ganga River Basin.

Meanwhile, 313 respondents (12%) reported that they had not conducted any carry-forward activities post-training (**Table 6.30, Figure 6.25**). To understand the underlying reasons for non-participation, these respondents were further assessed. The most frequently cited constraint was inadequate response from target groups, reported by 131 respondents (42% of non-active participants; 5% of total responses) (**Table 6.30, Figure 6.27**). This indicates that although participants were willing to initiate activities, they faced challenges in mobilizing communities, institutions, or stakeholders to engage in conservation-related efforts.

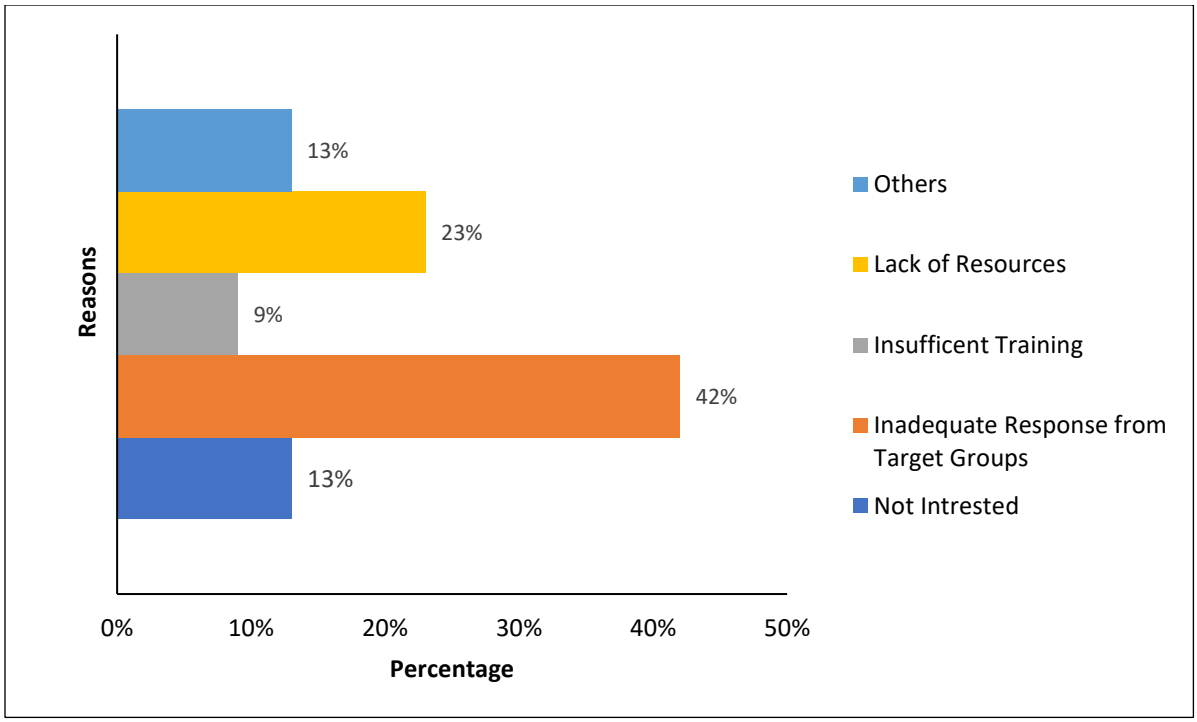


Figure 6.27: Reasons for Non-Implementation of Training Outcomes as Reported by Participants

Other key barriers included lack of resources, reported by 72 respondents (23% of non-active participants; 3% of total responses) (**Table 6.30, Figure 6.27**), such as insufficient materials, financial support, logistics, or institutional backing. Not interested was cited by only 42 respondents (13% of non-active participants; 2% of total responses) (**Table 6.30, Figure 6.27**), suggesting that disinterest was a relatively minor factor. Additionally, insufficient training was reported by 28 respondents (9% of non-active participants; 1% of total responses), indicating a perceived need for additional guidance, refresher training, or mentoring. The remaining 40 respondents (13% of non-active participants; 2% of total responses) (**Table 6.30, Figure 6.27**) fell under the "Other" category, which included reasons such as personal constraints, changes in professional roles, or lack of opportunity to initiate activities.

A small proportion of respondents (5%; n = 130) were categorized under "Other" (**Table 6.30, Figure 6.25**), comprising participants who had partially initiated activities, were in planning stages, or were uncertain about how to proceed further. This segment represents a potential group for targeted follow-up support and handholding interventions. Overall, the evaluation

demonstrates a strong post-training engagement, with more than four-fifths of respondents actively contributing to conservation-related activities after training. The findings underscore the success of the capacity-building programmes in fostering a motivated network of environmental stakeholders across the Ganga River Basin. Addressing the identified barriers particularly community mobilization challenges and resource constraints through structured follow-up mechanisms, institutional linkages, and refresher trainings could further enhance the long-term impact and sustainability of these initiatives.

CHAPTER 7 DISCUSSION

The capacity-building and stakeholder sensitization initiatives implemented across the Ganga River Basin have significantly strengthened the institutional, technical, and community-based framework required for long-term riverine biodiversity conservation. The programme adopted a comprehensive basin-scale approach covering eleven states, recognizing the ecological interconnectedness of the Ganga River and its tributaries. Through extensive literature reviews, expert consultations, and 23 training need assessment workshops, scientifically robust and stakeholder-specific training materials were developed to address the requirements of policy, implementation, and execution-level stakeholders. The organization of 132 training programmes involving 8,903 participants demonstrates the programme's extensive outreach and adaptive scalability. The marked increase in training activities from Phase I to Phase II further reflects the transition from a river-stretch-focused intervention to a broader basin-wide conservation framework aimed at strengthening decentralized conservation capacity and inter-agency coordination. The programme successfully engaged a highly diverse stakeholder base, including Forest Officials, Veterinarians, Ganga Praharis, educational institutions, local communities, volunteers, researchers, and enforcement agencies. The strong participation of frontline government departments enhanced technical capacities related to biodiversity monitoring, habitat management, rescue and rehabilitation, and wildlife law enforcement, while the involvement of community stakeholders promoted participatory conservation and local stewardship of riverine ecosystems.

The spearhead trainings conducted across the Ganga River Basin played a critical role in developing a decentralized network of trained stakeholders capable of supporting long-term biodiversity conservation and river management initiatives. Unlike general awareness programmes, these trainings were strategically designed to create a cadre of technically informed and socially engaged individuals who could function as local conservation leaders, facilitators, and first-level coordinators within their respective institutions and communities. By focusing on river ecology, biodiversity threats, conservation governance, legal frameworks, rescue preparedness, and participatory management approaches, the programme strengthened

both technical competencies and leadership capacities among stakeholders. Such targeted capacity-building initiatives are particularly important in large and ecologically complex river basins where conservation outcomes depend heavily on local stewardship, inter-departmental coordination, and sustained community participation. The participation of 1,150 stakeholders through 24 spearhead trainings across 11 states demonstrates the extensive outreach and strategic importance of the initiative. Higher participation from Uttarakhand and Uttar Pradesh reflects focused attention on ecologically sensitive upper and middle stretches of the basin where anthropogenic pressures, habitat degradation, and biodiversity threats are particularly significant. The strong representation of Forest Officials, Ganga Praharis, Veterinarians, College Professors, researchers, and educational stakeholders highlights the programme's multi-sectoral approach toward conservation capacity building. Forest departments and veterinarians contribute directly to habitat protection, wildlife rescue, and enforcement-related activities, while Ganga Praharis and local volunteers strengthen community-based monitoring and conservation awareness at the grassroots level. Simultaneously, the involvement of academicians, scientists, school teachers, and students supports the integration of scientific knowledge, environmental education, and long-term behavioral change within the broader conservation framework. The district-wise distribution of participants across 109 districts further demonstrates the programme's success in achieving basin-wide geographic penetration and institutional inclusivity. Significant participation from districts such as Dehradun, Kanpur Dehat, Gorakhpur, Varanasi, Jaipur, Sawai Madhopur, and Kolkata indicates targeted interventions in ecologically important, densely populated, and administratively strategic regions of the basin. The inclusion of participants from tributary and upstream states such as Himachal Pradesh, Chhattisgarh, Madhya Pradesh, and Jharkhand reflects an integrated river basin management perspective that recognizes the ecological connectivity of the Ganga system. Overall, the spearhead trainings have strengthened local conservation leadership, enhanced institutional coordination, and promoted informed stakeholder participation across the basin. The cascading impact of these trained stakeholders is expected to contribute significantly toward improved biodiversity conservation, community stewardship, adaptive management, and evidence-based decision-making for the long-term ecological sustainability of the Ganga River Basin.

The Other Stakeholder Trainings implemented across the Ganga River Basin constituted one of the most important components of the capacity-building framework by significantly expanding conservation outreach beyond technical agencies and specialist groups to the broader public domain. Through 94 trainings involving 7,031 participants, the programme successfully promoted conservation awareness, environmental responsibility, and participatory stewardship among a diverse cross-section of society. Such broad-based sensitization is particularly critical in large river basins where biodiversity conservation depends not only on institutional interventions but also on sustained behavioural change and active public participation. By engaging stakeholders from educational institutions, volunteer organizations, local communities, tourism sectors, and frontline agencies, the initiative strengthened the social foundation necessary for long-term conservation of the Ganga River ecosystem. The stakeholder composition highlights the programme's strong emphasis on community participation and youth engagement. The large representation of Ganga Praharis, college students, school students, NSS volunteers, and Forest Officials demonstrates the integration of grassroots conservation networks with formal institutional systems. Ganga Praharis and local communities serve as decentralized custodians of riverine ecosystems and play an important role in monitoring biodiversity threats, promoting conservation awareness, and supporting local conservation initiatives. Simultaneously, the engagement of students, teachers, professors, NCC cadets, and volunteer organizations contributes toward fostering environmental ethics, conservation leadership, and long-term behavioural change among younger generations. Participation from technical stakeholders, including veterinarians, irrigation engineers, line agencies, researchers, and media personnel, further strengthened inter-sectoral coordination and facilitated the dissemination of scientifically informed conservation practices and policy awareness. The extensive district-wise outreach across 166 districts of 11 states demonstrates the programme's success in achieving deep geographic penetration throughout ecologically significant, culturally important, and densely populated regions of the basin. High participation from states such as Uttar Pradesh, Uttarakhand, Bihar, Rajasthan, and Jharkhand reflects targeted conservation outreach in regions experiencing intense anthropogenic pressures and supporting critical biodiversity habitats. Major participation from districts such as Varanasi, Gorakhpur, Dehradun, Haridwar, West Champaran,

Bhagalpur, Jaipur, and Sahibganj indicates strategic focus on important river stretches, tributary systems, and institutional hubs. The Other Stakeholder Trainings have contributed substantially toward strengthening grassroots awareness, improving public support for conservation initiatives, and developing a socially inclusive conservation framework. This large-scale sensitization effort is expected to enhance community stewardship, improve compliance with conservation measures, and reinforce long-term biodiversity conservation and sustainable river management efforts across the Ganga River Basin.

The module-wise distribution of trained participants across the Ganga River Basin demonstrates a comprehensive and strategically balanced approach toward biodiversity conservation, ecological monitoring, community participation, and operational preparedness. Among all modules, Conservation Education recorded the highest participation with 3,463 participants, followed closely by Rescue and Rehabilitation (3,368 participants), Participatory Management (3,352 participants), and Monitoring of Aquatic Biodiversity (3,241 participants), while Wetland Conservation and River Management engaged 1,820 participants. Higher participation from Uttar Pradesh and Uttarakhand across most modules reflects the ecological significance and management priority of the upper and middle stretches of the basin. Uttar Pradesh recorded the highest participation in Monitoring of Aquatic Biodiversity (1,390 participants), Rescue and Rehabilitation (1,363 participants), and Participatory Management (982 participants), whereas Uttarakhand showed maximum participation in Wetland Conservation and River Management (808 participants) and Conservation Education (1,283 participants). Significant participation from Bihar, Rajasthan, Madhya Pradesh, Jharkhand, and West Bengal further indicates successful expansion of capacity-building efforts into ecologically important tributary systems and lower basin regions. The strong representation across all thematic modules highlights the programme's integrated conservation framework, which simultaneously strengthened scientific monitoring, habitat management, rescue preparedness, community stewardship, and environmental awareness for long-term conservation of Ganga River biodiversity.

The rescue and rehabilitation trainings conducted across the Ganga River Basin significantly strengthened field-level preparedness, technical expertise, and coordinated response mechanisms required for effective wildlife rescue and biodiversity conservation within the basin.

Increasing anthropogenic pressures, habitat degradation, accidental entanglements, strandings, and rising human–wildlife interactions have created an urgent need for trained personnel capable of undertaking rapid, scientifically informed rescue interventions. In this context, the programme successfully trained a total of 3,368 stakeholders under various rescue and rehabilitation techniques and capacity-building initiatives, including 722 participants trained through fourteen dedicated Rescue and Rehabilitation trainings specifically designed for intensive practical skill development. The organization of these specialized trainings at the headquarters of the Wildlife Institute of India and selected zoological parks across the basin ensured access to veterinary expertise, rescue infrastructure, live demonstrations, and hands-on operational training required for strengthening rescue preparedness and rehabilitation capacity. The stakeholder composition demonstrates a highly diverse and multi-sectoral participation framework that integrated frontline agencies, technical experts, academic institutions, volunteers, and local communities within a common conservation platform. Forest Officials constituted the largest stakeholder category with 1,371 participants, reaffirming their primary role in wildlife rescue operations, habitat protection, and emergency response management. Strong participation of Ganga Praharis, College Students, Veterinarians, Zookeeper staff, Police Personnel, researchers, and educational stakeholders highlights the programme's emphasis on combining operational preparedness with community engagement, scientific support, and environmental awareness. The inclusion of youth groups such as NCC, NSS, school students, and NYKS members further contributes toward long-term conservation stewardship and localized response preparedness. Importantly, integrating rescue and rehabilitation modules within Spearhead Trainings and other stakeholder-oriented programmes substantially expanded the outreach of rescue preparedness beyond dedicated trainings alone, enabling site-specific and context-based exposure to wildlife rescue protocols across diverse ecological regions of the basin. The state- and district-wise participation patterns indicate that rescue and rehabilitation capacity-building efforts achieved extensive geographic penetration across 74 districts of the basin. Uttar Pradesh recorded the highest participation with 1,363 participants, followed by Bihar (677 participants), Uttarakhand (493 participants), Rajasthan (392 participants), and Madhya Pradesh (269 participants), reflecting intensified conservation outreach in ecologically sensitive

and operationally significant river stretches. Major participation from districts such as Varanasi, Ayodhya, Kanpur Dehat, Gorakhpur, West Champaran, Bhagalpur, Dehradun, Sawai Madhopur, Jaipur, and Morena indicates targeted interventions in areas characterized by high biodiversity value, dense human populations, and frequent wildlife emergency situations. The integration of rescue and rehabilitation modules across broader conservation and sensitization programmes has substantially strengthened institutional coordination, improved local emergency preparedness, enhanced scientific and community-based conservation practices, and contributed toward the development of a resilient and basin-wide wildlife response framework for the long-term conservation of Ganga River biodiversity.

The establishment of a structured first responder network across the Ganga River Basin represents a major advancement in strengthening rapid response capacity for aquatic wildlife emergencies and biodiversity conservation within the basin. Riverine ecosystems of the Ganga are increasingly subjected to anthropogenic pressures, accidental entanglements, habitat degradation, and frequent human–wildlife interactions, necessitating the presence of trained local responders capable of immediate intervention before specialized rescue teams arrive. In this context, the programme successfully developed a multi-layered and geographically distributed first responder framework comprising 2,397 trained personnel across nine basin states. The integration of frontline enforcement agencies, technical experts, community-based volunteers, and institutional stakeholders has significantly enhanced operational preparedness, early reporting mechanisms, site-level coordination, and emergency response efficiency throughout the basin. The composition of the first responder network demonstrates a strong balance between institutional capacity and community participation. Forest Officials constituted the largest responder group with 1,371 trained personnel, reflecting their primary responsibility in wildlife rescue operations, enforcement, habitat protection, and coordination of emergency actions. Their substantial presence in Uttar Pradesh, Uttarakhand, Rajasthan, and Bihar indicates strategic deployment in ecologically sensitive and high-risk river stretches. Simultaneously, the inclusion of Ganga Praharis, ETF-GTF members, local communities, tourist guides, NGOs, and volunteers strengthened grassroots-level surveillance and early warning systems, which are essential for timely rescue interventions in remote and densely populated riverine landscapes.

The active involvement of veterinarians, zookeeper staff, police personnel, and researchers further enhanced the scientific, medical, legal, and technical dimensions of rescue preparedness by ensuring availability of expertise related to animal handling, emergency treatment, crowd management, legal compliance, and scientific documentation during rescue operations. The district-wise distribution of first responders demonstrates that the programme successfully embedded localized rescue preparedness mechanisms across ecologically significant and operationally important regions of the basin. High concentrations of responders in districts such as Prayagraj, Varanasi, Gorakhpur, Ayodhya, Dehradun, Haridwar, Patna, West Champaran, Morena, and Sawai Madhopur reflect focused interventions in areas characterized by intense human–river interactions, biodiversity-rich habitats, and frequent wildlife emergencies. The participation of community-based stakeholders in culturally important riverfront cities and tourism zones further strengthens public engagement and rapid local mobilisation during distress situations. Overall, the establishment of this spatially distributed and functionally diverse first responder network has significantly improved inter-agency coordination, strengthened local response capability, and created a resilient conservation support system capable of enhancing survival outcomes for distressed aquatic fauna and contributing to the long-term conservation of biodiversity across the Ganga River Basin.

The spearhead-led volunteer training initiatives demonstrate the successful translation of institutional capacity building into decentralized, field-level conservation action across the Ganga River Basin. By enabling previously trained spearhead groups to independently organize and facilitate training programmes within their respective regions, the initiative effectively created a cascading model of knowledge dissemination and local leadership development. The conduct of 48 additional training programmes covering 3,437 participants clearly reflects the multiplier effect envisioned under the spearhead training framework. Such an approach is particularly important in large and socio-ecologically diverse river basins where sustained conservation outcomes depend upon the establishment of localized resource persons capable of independently mobilizing communities, institutions, and volunteers for biodiversity conservation and river stewardship activities. The stakeholder composition of these trainings highlights a strong emphasis on youth engagement, institutional strengthening, and community

participation. College students formed the largest stakeholder group with 1,136 participants, followed by Forest Officials (911 participants) and NSS volunteers (566 participants), indicating strategic prioritization of educational institutions and organized volunteer networks for mainstreaming conservation awareness and environmental responsibility. The participation of NCC cadets, school students, Ganga Praharis, local communities, and NGOs further strengthened grassroots-level outreach and fostered long-term stewardship toward riverine ecosystems. Simultaneously, the inclusion of veterinarians, zookeeper staff, ETF-GTF personnel, researchers, irrigation engineers, line agencies, and media professionals ensured interdisciplinary participation and strengthened the technical, scientific, and communication dimensions of the programme. This broad stakeholder integration reflects the programme's holistic approach toward developing socially inclusive and operationally effective conservation support systems across the basin. Importantly, the spearhead-led training model demonstrates the sustainability and scalability of the WII-NMCG capacity-building framework. By creating a network of trained local facilitators and conservation ambassadors, the initiative has reduced dependency on centralized interventions and strengthened decentralized conservation governance at the community and institutional levels. The emphasis on engaging students and youth volunteers contributes significantly toward shaping long-term environmental ethics and building future human resources for freshwater biodiversity conservation. At the same time, strengthening the capacities of frontline agencies and community stakeholders improves local preparedness, enhances conservation communication, and promotes wider dissemination of scientific knowledge and best management practices. Overall, the programme represents a successful example of institutional training translating into self-sustaining conservation action, thereby reinforcing the long-term ecological security and biodiversity conservation goals of the Ganga River Basin.

The training impact assessment provides strong empirical evidence that structured capacity-building interventions can substantially improve ecological literacy, conservation awareness, and stakeholder engagement for biodiversity conservation in the Ganga River Basin. Across 21 training programmes, 1,294 participants were engaged, of whom 697 individuals (53.86%) completed both pre- and post-training assessments, enabling robust comparative analysis of

knowledge acquisition and attitudinal change. The diversity of participants, including students, teachers, Ganga Praharis, forest officials, veterinarians, police personnel, scientists, NGO representatives, irrigation officials, fisheries personnel, and community stakeholders, ensured that the assessment reflected a broad cross-section of actors directly or indirectly associated with river conservation and management. The variation in response rates across programmes, ranging from complete participation in smaller technical trainings to comparatively lower participation in large student-oriented programmes, reflects operational realities commonly associated with field-based conservation training initiatives. Nevertheless, the dataset remains sufficiently large and representative to provide meaningful insights into the effectiveness of the intervention. Importantly, the combination of theoretical modules, practical demonstrations, field exposure, interactive discussions, and participatory learning approaches appears to have contributed significantly to strengthening stakeholder understanding of aquatic biodiversity, ecosystem functioning, conservation threats, and community-based river stewardship.

The statistical findings clearly demonstrate the effectiveness of the training interventions. The Wilcoxon signed-rank test result ($Z = 22.88$, $p < 0.001$) confirms that the observed improvements were statistically highly significant and not attributable to random variation. Moreover, the very large Cohen's d effect size of 2.02 further demonstrates that the intervention produced not only statistically significant but also practically meaningful improvements in ecological knowledge and conservation awareness. Such effect sizes are rarely observed in environmental education and capacity-building programmes, highlighting the strength of the training design and delivery framework implemented under the programme. The confidence interval (1.90 - 2.14) additionally confirms the consistency and robustness of the observed learning outcomes across participants. Collectively, these statistical indicators validate the effectiveness of structured conservation-oriented capacity-building programmes in improving both conceptual understanding and practical awareness related to river biodiversity conservation.

The thematic analysis of participant responses further reveals important shifts in ecological perception, systems thinking, and conservation attitudes. Before training, participants demonstrated relatively high general awareness of aquatic biodiversity, with 69.01% reporting awareness of aquatic species in the Ganga River Basin. However, post-training responses showed

a transition from generic awareness to more species-specific ecological understanding, as participants were increasingly able to correctly identify species such as the Gangetic dolphin, Hilsa, Mahseer, gharial, turtles, and riverine birds. This improvement reflects the effectiveness of practical learning components such as species identification exercises, rescue demonstrations, biodiversity surveys, and field-based ecological discussions incorporated into the training modules. Equally important was the near-universal acknowledgment (96.13%) of biodiversity as essential for maintaining river ecosystem health, indicating that participants internalized the ecological significance of biodiversity conservation beyond species-level appreciation. The ranking exercise further demonstrated a conservation-oriented perspective among stakeholders, with ecological balance, water quality, and biodiversity consistently prioritized over hydropower and infrastructure development. This finding is particularly significant because it reflects an emerging shift in public and stakeholder consciousness from viewing rivers primarily through developmental or cultural lenses toward recognizing rivers as complex ecological systems requiring protection and restoration. The relatively lower ranking assigned to hydropower projects suggests increasing awareness regarding the ecological consequences of river fragmentation, altered flow regimes, habitat degradation, and biodiversity loss associated with large-scale infrastructure development.

The perception of environmental threats also became more nuanced following the training intervention. Prior to training, pollution from industrialization and urbanization dominated participant responses, reflecting strong public concern regarding visible forms of environmental degradation. However, post-training assessments revealed a broader understanding of multiple interconnected stressors affecting the Ganga River Basin, including sewage discharge, developmental activities, agricultural runoff, climate change, ritual activities, and population pressure. This diversification of responses indicates the development of systems thinking among participants, whereby ecological degradation is increasingly understood as the cumulative outcome of multiple interacting anthropogenic pressures rather than a single isolated factor. The relatively increased recognition of climate change and agricultural runoff in post-training responses is particularly important because these issues are often less visible to local communities despite their long-term ecological implications. Similarly, participant

recommendations for river conservation reflected a balanced combination of awareness generation, legal enforcement, pollution control, sustainable resource use, and institutional accountability. The strong support for mass awareness programmes and sensitization activities demonstrates that participants recognize behavioral change and public engagement as foundational requirements for long-term river conservation. At the same time, the endorsement of stricter legal enforcement and effluent control measures reflects awareness of the need for effective governance and regulatory mechanisms to address pollution and ecological degradation.

One of the most significant outcomes of the training programme was the observed shift in stakeholder perception regarding responsibility for river conservation. Prior to training, participants tended to emphasize institutional and government-led interventions for addressing environmental problems. However, post-training responses showed that 58.26% of participants recognized conservation as a shared responsibility involving government agencies, NGOs, local communities, youth groups, private sectors, educational institutions, and village-level organizations. This transition toward participatory and community-based conservation thinking represents a critical achievement of the programme because long-term river restoration and biodiversity conservation cannot be sustained solely through top-down institutional approaches. The training successfully communicated the importance of collaborative governance, stakeholder integration, and local stewardship in achieving conservation outcomes. Furthermore, the findings indicate that the programme contributed to building a socially informed and ecologically aware stakeholder network capable of supporting conservation action at multiple levels ranging from local reporting and community sensitization to policy advocacy and institutional coordination. The high percentage of participants (97.27%) reporting improved understanding after the training further reinforces the effectiveness of the intervention in fostering ecological literacy and positive conservation attitudes. Overall, the training impact assessment demonstrates that the capacity-building initiatives implemented under the programme not only enhanced knowledge and awareness but also contributed to meaningful behavioral and perceptual shifts among stakeholders, thereby strengthening the long-term foundation for participatory conservation and sustainable management of the Ganga River Basin.

The assessment of carry-forward activities clearly demonstrates that the capacity-building programmes implemented under the Ganga River Basin biodiversity conservation initiative generated substantial long-term behavioural and institutional impacts among trained stakeholders. Feedback collected from 2,608 participants revealed that a significant majority (83%; n = 2,165) actively undertook post-training conservation-related activities, indicating that the training programmes were highly effective in motivating participants to apply acquired knowledge and skills beyond the formal training period. The most prominent carry-forward activity was training additional individuals, reported by 974 respondents (45% of active participants; 37% of total responses), demonstrating a strong multiplier effect whereby trained stakeholders functioned as local resource persons within their institutions, communities, and social networks. This cascading transfer of knowledge is particularly important in large and socially diverse landscapes such as the Ganga River Basin, where localized dissemination significantly enhances the outreach and sustainability of conservation interventions. In addition, 823 respondents (38% of active participants; 32% of total responses) reported conducting awareness-generation activities, including environmental campaigns, community meetings, educational outreach programmes, and public sensitization initiatives. These activities indicate that the training programmes not only improved technical understanding but also strengthened participants' confidence and willingness to engage in environmental communication and community mobilization. Furthermore, 368 respondents (17% of active participants; 14% of total responses) independently implemented conservation-oriented actions at the field level, including biodiversity protection measures, local environmental management activities, and practical interventions related to river conservation. Collectively, these findings demonstrate that the training programmes successfully fostered a network of proactive stakeholders contributing through peer learning, awareness dissemination, and direct conservation action across the basin.

This finding reflects broader challenges commonly associated with environmental behaviour change, where awareness alone may not always translate into collective action without sustained institutional support and community engagement mechanisms. Lack of resources was the second major barrier, reported by 72 respondents (23% of non-active participants; 3% of total

responses), highlighting the importance of logistical support, financial assistance, educational materials, and institutional facilitation for sustaining grassroots conservation initiatives. Interestingly, only a relatively small proportion cited lack of interest (13%) or insufficient training (9%) as constraints, indicating that the training content itself was generally perceived as useful, relevant, and technically adequate. Additionally, 130 respondents (5%) were categorized under "Other," comprising participants who had partially initiated activities, were still in planning stages, or remained uncertain regarding implementation pathways. This group represents a potentially valuable target for future mentoring, refresher programmes, and follow-up support mechanisms. Findings strongly demonstrate that the capacity-building interventions successfully generated a motivated and action-oriented stakeholder network across the Ganga River Basin. The high level of post-training engagement reflects the effectiveness of the training framework in promoting conservation leadership, decentralized environmental stewardship, and community participation. However, the identified constraints also underscore the need for structured post-training support systems, stronger institutional linkages, resource facilitation, and periodic refresher engagements to further strengthen the long-term sustainability and conservation impact of these initiatives across the basin.

Overall, the findings clearly demonstrate that the capacity-building initiatives have been successful in creating a motivated and action-oriented network of stakeholders across the Ganga River Basin, with a large proportion of trained participants actively engaging in awareness generation, peer-to-peer training, and conservation-related interventions at the local level. However, the persistence of challenges such as inadequate community response, limited institutional support, and resource constraints also indicates that one-time training interventions alone may not be sufficient to sustain long-term behavioural and institutional change. The dynamic and complex nature of riverine biodiversity conservation, coupled with emerging ecological pressures, increasing anthropogenic impacts, and evolving management requirements, necessitates the development of more comprehensive, continuous, and adaptive training frameworks. Future capacity-building programmes should therefore focus on periodic refresher trainings, advanced technical modules, field-based practical exposure, mentoring support, and stronger institutional networking to reinforce stakeholder competencies and

maintain long-term engagement. In addition, sustained follow-up mechanisms, localized handholding support, and integration of community-based participatory approaches will be essential for translating training outcomes into durable conservation action. Strengthening continuous learning platforms and expanding multi-stakeholder collaboration can significantly enhance the resilience, effectiveness, and sustainability of conservation efforts, thereby contributing to the long-term ecological restoration and biodiversity conservation of the Ganga River Basin.

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Annexure I - Details of Capacity Building and Training Programmes Under Ganga River

1 - Monitoring of Aquatic Biodiversity Module

2 - Wetland Conservation and River Management Module

3 - Rescue and Rehabilitation Module

4 - Participatory Management Module

5 - Conservation Education Module

Sr. no	Training Name	Date	Total Participants	Onsite /WII	1	2	3	4	5	Training Type
1	National Training Programme for Ganga Praharis Spearhead Team	03-02-2020	50	WII	Y				Y	Spearhead Training
2	Ganga Biodiversity Conservation for College Students and Professors	05-05-2020	44	Onsite	Y			Y		Other Stakeholders Training
3	Online Training Workshop on “Birds of Ganga Basin” For Ganga Praharis	11-05-2020	49	WII	Y				Y	Other Stakeholders Training
4	Online Training Workshop on “Birds of Ganga Basin with Special Reference to West Bengal”	18-05-2020	25	WII	Y					Other Stakeholders Training
5	Online Training Workshop on “Biodiversity Conservation and Monitoring of Aquatic Species of Ganga Basin” With Forest Officials of Dudhwa Tiger Reserve	21-05-2020	31	WII				Y		Other Stakeholders Training
6	Online Training Workshop for Naturalist of Different Protected Areas of The Ganga River Basin	10-06-2020	27	WII	Y					Other Stakeholders Training
7	Online Training Workshop on ‘Biodiversity Conservation and Monitoring of Aquatic Species of Ganga Basin’ With Officials from Pilibhit Tiger Reserve	16-06-2020	30	WII				Y	Y	Other Stakeholders Training
8	Training Workshop for Volunteers of NCC And NSS of Ganga Basin	07-07-2020	180	Onsite			Y			Other Stakeholders Training
9	Capacity Building of Zoo Personnel in Managing Rescue, Rehabilitation and Release of Aquatic Macro-Fauna of Ganga Basin	13-07-2020	55	Onsite			Y			Rescue and Rehabilitation
10	Training Workshop on Rescue and Rehabilitation Techniques - "Basics of Reptiles"	22-07-2020	25	WII		Y				Other Stakeholders Training
11	Training Workshop on Rain Water Harvesting Techniques Under "Catch the Rain Campaign"	29-07-2020	107	Onsite	Y					Other Stakeholders Training

12	Online Capacity Building Program for The Stakeholders on Rescue and Rehabilitation of Aquatic Macrofauna Along the Ganga River Basin	20-08-2020	37	WII			Y			Other Stakeholders Training
13	Training Workshop on Conservation of Gangetic River Dolphin for Ganga Praharis From Uttar Pradesh	01-09-2020	44	WII	Y			Y		Other Stakeholders Training
14	Training Workshop on "Conservation of Gangetic River Dolphin for Ganga States"	09-09-2020	55	WII		Y				Other Stakeholders Training
15	Training Workshop on “Conservation of Biodiversity and Wetland” for Youth of Bijnor and Muzaffarnagar Village Around the Haiderpur Wetland	21-09-2020	32	Onsite		Y				Other Stakeholders Training
16	Catch The Rain Webinar for Ganga Praharis of West Bengal	22-09-2020	25	WII	Y					Other Stakeholders Training
17	Training Workshop for Tourist Guide on Conservation of Haiderpur Wetland	24-09-2020	39	Onsite			Y			Other Stakeholders Training
18	Training Workshop Biodiversity Conservation of Ganga River Basin for Ganga Task Force on the Occasion of Wildlife Week	07-10-2020	50	Onsite	Y					Other Stakeholders Training
19	Training Programme on "Conservation of Gangetic Dolphin of Ganga River Basin and its Tributaries"	20-10-2020	49	WII				Y		Other Stakeholders Training
20	Training and Orientation Workshop for the New Recruit Project Personnel	02-12-2020	40	WII	Y	Y				Other Stakeholders Training
21	Training of Ganga Prahari Mentor and Faculty Orientation Exposure Tour	05-12-2020	33	WII					Y	Other Stakeholders Training
22	Bal Ganga Prahari Skill and Development Workshop on Quilling Techniques	28-12-2020	23	WII				Y		Other Stakeholders Training
23	Bal Ganga Prahari Skill and Development Workshop on Stone Painting Techniques	05-01-2021	29	WII			Y			Other Stakeholders Training
24	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	33	WII	Y	Y		Y	Y	Spearhead Training
25	Bal Ganga Prahari Skill Development Workshop on Card Making Techniques	12-01-2021	25	WII					Y	Other Stakeholders Training
26	Bal Ganga Prahari Skill Development Workshop on Decoupage Techniques	20-01-2021	30	WII					Y	Other Stakeholders Training

27	One Day Training Workshop on Wetland Conservation on the Occasion of 'World Wetland Day'	02-02-2021	27	WII		Y				Other Stakeholders Training
28	One Day Training Workshop on Wetland Conservation on the Occasion of 'World Wetland Day'	02-02-2021	67	WII		Y				Other Stakeholders Training
29	One Day Training Workshop on Wetland Conservation on the Occasion of 'World Wetland Day'	03-02-2021	102	WII		Y				Other Stakeholders Training
30	Capacity Building of Front-Line Forest Officials on Ganga Overview and Basics of Rescue and Rehabilitation of Aquatic Macrofauna.	25-02-2021	90	Onsite	Y	Y		Y	Y	Other Stakeholders Training
31	National Level Spearhead Training Programme for Professors of Ganga River Basin “Wetland Conservation and Biodiversity Monitoring of Ganga and its Tributaries	09-03-2021	29	WII	Y	Y		Y	Y	Spearhead Training
32	National Spearhead Training Programme for Ganga Praharis of Ganga	16-03-2021	65	WII	Y	Y		Y	Y	Spearhead Training
33	Capacity Building of Front-Line Forest Staff of Valmiki Tiger Reserve Division 1	05-04-2021	72	Onsite			Y			Other Stakeholders Training
34	Training Workshop on "Biodiversity of Freshwater Ecosystem"	05-04-2021	67	Onsite			Y			Other Stakeholders Training
35	Capacity Building of Front-Line Forest Staff of Valmiki Tiger Reserve Division 2.	07-04-2021	69	Onsite			Y			Rescue and Rehabilitation
36	Training Workshop on "Biodiversity of Freshwater Ecosystem"	07-04-2021	65	Onsite			Y			Other Stakeholders Training
37	Capacity Building Workshops for the Front-Line Forest Staff About Ganga Overview and Rescue and Rehabilitation of Aquatic Macrofauna and Maintenance of Community Relationship	22-04-2021	60	Onsite			Y			Rescue and Rehabilitation
38	Ganga and its Tributaries	29-06-2021	67	WII	Y					Other Stakeholders Training
39	How to Make Black Gold from Your Kitchen Waste and Grow Your Own Microgreens	30-06-2021	67	WII				Y		Other Stakeholders Training
40	Healing Amidst a Pandemic	02-07-2021	68	WII					Y	Other Stakeholders Training
41	Training Workshop on "Animal Rescue and Welfare"	06-07-2021	68	Onsite			Y			Other Stakeholders Training

42	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	55	Onsite			Y			Rescue and Rehabilitation
43	Training Workshop for Frontline Forest Staff on Biodiversity of Freshwater Ecosystem at the Forest Divisional Office, Ayodhya,	19-07-2021	32	Onsite		Y				Other Stakeholders Training
44	Capacity Building Workshop on Rescue and Rehabilitation of Selected Aquatic Macrofauna for the Front-Line Forest Officers	21-07-2021	45	Onsite			Y			Other Stakeholders Training
45	Stakeholders Workshop on Planning and Management for Aquatic Species Conservation and Maintenance of Ecosystem Services in the Ganga River Basin for a Clean Ganga	26-07-2021	39	Onsite	Y	Y				Other Stakeholders Training
46	Workshop on 'Collection and Preservation of Biological Samples for Genetic Study and Biodiversity Conservation' at the Forest Divisional Office	11-08-2021	119	Onsite	Y					Other Stakeholders Training
47	Workshop on 'Collection and Preservation of Biological Samples for Genetic Study and Biodiversity Conservation'	13-08-2021	25	Onsite	Y					Other Stakeholders Training
48	Understanding Amphibian's Behaviours and Communication Processes	18-08-2021	112	WII	Y					Other Stakeholders Training
49	Workshop on 'Collection and Preservation of Biological Samples for Genetic Study and Biodiversity Conservation'	25-08-2021	35	Onsite	Y					Other Stakeholders Training
50	Workshop on 'Collection and Preservation of Biological Samples for Genetic Study and Biodiversity Conservation'	27-08-2021	29	Onsite	Y					Other Stakeholders Training
51	Training and Outreach Programme on 'Ganga Biodiversity Conservation'	06-09-2021	48	Onsite					Y	Other Stakeholders Training
52	Spearhead Training Programme for Ganga Task Force (GTF) and Eco-Task Force (ETF) on Biodiversity Conservation of Ganga River and its Tributaries and Eco Task Force	27-09-2021	25	Onsite	Y		Y			Spearhead Training
53	Training Workshop on Rescue and Rehabilitation Techniques on Biodiversity Conservations of Ganga River & its Tributaries	01-10-2021	32	Onsite			Y			Rescue and Rehabilitation
54	Rural Technology Workshop for Ganga Praharis of Ganga Basin	21-10-2021	52	Onsite				Y		Other Stakeholders Training

55	Sensitisation Workshop of the Local UG And PG Students	21-12-2021	50	Onsite					Y	Other Stakeholders Training
56	Rescue and Rehabilitation Training for Front Line Forest Staff	22-12-2021	40	Onsite			Y			Other Stakeholders Training
57	One Day Rescue and Rehabilitation Training for Frontline Forest Department	05-01-2022	43	Onsite			Y			Other Stakeholders Training
58	Capacity Building Programs for Frontline Forest Officials of Rajasthan Forest Department Working Along Chambal River	16-02-2022	50	Onsite			Y			Other Stakeholders Training
59	Capacity Building Programs for Frontline Forest Officials of Rajasthan Forest Department Working Along Chambal River	18-02-2022	65	Onsite			Y			Other Stakeholders Training
60	Capacity Building Programs for Frontline Forest Officials of Rajasthan Forest Department Working Along Chambal River	19-02-2022	55	Onsite			Y			Other Stakeholders Training
61	Capacity Building Programs for Frontline Forest Officials of Rajasthan Forest Department Working Along Chambal River	21-02-2022	50	Onsite			Y			Other Stakeholders Training
62	A Capacity Building Workshop for Frontline Forest Officials of Uttarakhand Forest Department.	29-02-2022	64	WII			Y			Other Stakeholders Training
63	State Level Training Programme for Stakeholders on Biodiversity Conservation, West Champaran, Bettiah, Bihar	08-03-2022	51	Onsite	Y	Y		Y	Y	Other Stakeholders Training
64	Training Workshop for College Students and Faculties of Govt. P.G College Maldevta, Dehradun on 'Biodiversity and Wetland Conservation'	08-03-2022	65	Onsite	Y	Y	Y		Y	Other Stakeholders Training
65	Capacity Building Programme for 70 Frontline Forest Trainees at FTI, Asan Barrage	23-03-2022	70	Onsite			Y			Other Stakeholders Training
66	Training Workshop on Biodiversity and Wetland Conservation	12-05-2022	30	Onsite	Y	Y			Y	Other Stakeholders Training
67	Calligraphy Workshop for Bal Ganga Praharis Skill Enhancement Programme	30-05-2022	68	WII					Y	Other Stakeholders Training
68	National Level Spearhead Training Programme for Volunteers of NSS (National Service Scheme) on "Biodiversity Conservation of Ganga River & its Tributaries"	14-06-2022	75	Onsite	Y	Y		Y	Y	Spearhead Training
69	Three Days Training on Rescue of Aquatic Species for Frontline Staff of West Bengal Forest Department.	21-06-2022	49	Onsite			Y			Spearhead Training

70	Participant Database of State Level Spearhead Training Programme for Bal Ganga Praharis	12-07-2022	78	WII	Y	Y		Y	Y	Spearhead Training
71	Capacity Building Programme for Vets and Para-Vets at FTI, Jaipur	19-07-2022	80	Onsite			Y			Spearhead Training
72	Workshop on “Approaches for Rescue and Rehabilitation of Aquatic Macro-Fauna” for Veterinary Officers	19-07-2022	25	Onsite			Y			Rescue and Rehabilitation
73	Workshop on “Approaches for Rescue and Rehabilitation of Aquatic Macro-Fauna” for Para Vets	19-07-2022	24	Onsite			Y			Rescue and Rehabilitation
74	State Level Spearhead Training Workshop for Forest Officials of Rajasthan 23rd to 25th August, 2022 at Sawai Madhopur, Rajasthan	23-08-2022	35	Onsite	Y	Y	Y	Y	Y	Spearhead Training
75	Training on Biodiversity Profile of Ganga River Basin	24-08-2022	34	Onsite	Y	Y			Y	Other Stakeholders Training
76	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	46	Onsite	Y		Y			Spearhead Training
77	Training of the Trainers on the Rescue and Rehabilitation of Aquatic Macrofauna in FTI Kanpur, UP	23-09-2022	70	Onsite			Y			Spearhead Training
78	National Programme for Training of Women Scientists and Technologists Working in Government Sectors on Biodiversity Conservation	14-11-2022	16	WII	Y	Y		Y		Spearhead Training
79	State Level Spearhead Training Workshop for Veterinarians, Forest Officials and Zoo Keepers on Handling of Aquatic Species in Distress	19-12-2022	43	Onsite	Y		Y			Spearhead Training
80	One Day Training Workshop on Rescue and Rehabilitation for First Responders of Gorakhpur, Uttar Pradesh	22-12-2022	46	Onsite			Y			Rescue and Rehabilitation
81	Capacity Building Workshop for Frontline Forest Officials of Morena Division, Madhya Pradesh	11-01-2023	52	Onsite			Y			Rescue and Rehabilitation
82	Workshop On “Approaches for Rescue and Rehabilitation of Aquatic Macro-Fauna”	11-01-2023	52	Onsite			Y			Rescue and Rehabilitation
83	Participant Database of State Level Spearhead Training Programme for NCC (National	18-01-2023	41	Onsite	Y	Y	Y	Y	Y	Spearhead Training

	Cadet Corps) on “Biodiversity Conservation In Ganga”									
84	Two Days 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	94	Onsite	Y	Y		Y	Y	Other Stakeholders Training
85	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	154	Onsite	Y			Y		Other Stakeholders Training
86	Training on Linkage Between River Conservation and Livelihood at WII	28-02-2023	58	WII				Y		Other Stakeholders Training
87	National Level Spearhead Training Workshop for Veterinary College Student on ‘Handling of Aquatic Species in Distress’	21-03-2023	34	Onsite	Y	Y	Y	Y	Y	Spearhead Training
88	Training Workshop for NGOs on ‘Biodiversity and Community Participation’ of Uttarakhand & Uttar Pradesh of Ganga River Basin	29-05-2023	40	WII	Y	Y		Y	Y	Spearhead Training
89	Capacity Building Workshops for Tourist Guides and E-Rickshaw Drivers as Part of the Life Program.	14-06-2023	56	Onsite			Y			Other Stakeholders Training
90	State Level Spearhead Training Workshop for Police Personnel on ‘Biodiversity and River Conservation – Role of Enforcement Agencies’	20-06-2023	18	WII	Y	Y	Y	Y	Y	Spearhead Training
91	Three-Day Training Workshop on the Conservation of Aquatic Macrofauna on the Patna Zoo's Aquatic Conclave	03-09-2023	93	Onsite			Y			Rescue and Rehabilitation
92	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	125	Onsite			Y			Other Stakeholders Training
93	Capacity Building Workshop for the School Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin 1	09-10-2023	40	Onsite			Y			Other Stakeholders Training
94	Capacity Building Workshop for the School Students on the Rescue and Rehabilitation of	25-10-2023	24	Onsite			Y			Other Stakeholders Training

	Aquatic Macrofauna of the Ganga River Basin 2									
95	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	65	Onsite			Y			Other Stakeholders Training
96	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	25	WII	Y	Y		Y	Y	Spearhead Training
97	Two Days Training, Outreach and Awareness Programme on 'Ganga Biodiversity Conservation' with NSS Pre-Rd Campers Dev Sanskriti University, Haridwar	22-11-2023	225	Onsite	Y	Y		Y	Y	Other Stakeholders Training
98	Rescue and Rehabilitation Training for the Ganga Task Force at Prayagraj	01-12-2023	80	Onsite			Y			Other Stakeholders Training
99	Capacity Building Workshop for the Final Year BHU Zoology Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin	03-12-2023	6	Onsite			Y			Other Stakeholders Training
100	Training and Outreach Programme on 'Ganga Biodiversity Conservation' with NSS Volunteers.	05-12-2023	81	Onsite	Y	Y		Y	Y	Other Stakeholders Training
101	Capacity Building Workshop for the Final Year BHU Zoology Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin	09-12-2023	6	Onsite			Y			Other Stakeholders Training
102	Capacity Building Workshop for the Trainee Teacher on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin	16-12-2023	50	Onsite			Y			Other Stakeholders Training
103	'Jal, Jan Aur Jaiv Vividhta Sanrakshan: Capacity Building of Ganga Praharis for Biodiversity Conservation'	19-12-2023	59	WII	Y			Y	Y	Other Stakeholders Training
104	Capacity Building Workshop for the School Students on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin	05-01-2024	52	Onsite			Y			Other Stakeholders Training

105	“Jal, Jan Aur Jaiv Vividhta Sanrakshan: Capacity Building of Ganga Praharis and Other Stakeholders for Biodiversity Conservation” at WII, Dehradun	22-01-2024	70	WII	Y			Y	Y	Other Stakeholders Training
106	Two Days Training Workshop for Under-Graduate and Post-Graduate Students on “Ganga Biodiversity Conservation”	07-02-2024	90	Onsite	Y	Y		Y	Y	Other Stakeholders Training
107	National Level Training Workshop on ‘Freshwater Biodiversity Conservation’ for University Teachers and Professors	05-03-2024	27	WII	Y	Y		Y	Y	Spearhead Training
108	Safeguarding The Ganga: The Ganga Prahari Conclave National Level Meet of Ganga Praharis from the Ganga River Basin	19-03-2024	316	Onsite				Y		Other Stakeholders Training
109	Capacity Building Workshop for the Trainee Teacher on the Rescue and Rehabilitation of Aquatic Macrofauna of the Ganga River Basin	01-04-2024	150	Onsite			Y			Other Stakeholders Training
110	One Day Training Workshop for University Students On “Ganga Biodiversity Conservation”	06-05-2024	56	Onsite					Y	Other Stakeholders Training
111	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	110	Onsite			Y			Other Stakeholders Training
112	‘Fisheries Department On "Harmonizing Sustainable Fisheries for Freshwater Biodiversity Conservation" In Ganga River Basin	11-06-2024	39	WII	Y	Y		Y	Y	Spearhead Training
113	Two Days Training Workshop for Zoo Keepers and Frontline Forest Staff On ‘Ganga Biodiversity Conservation’	22-06-2024	52	Onsite	Y		Y			Rescue and Rehabilitation
114	National Level Training Workshop for School Teachers On "Integrating River Conservation into Education Programme"	23-07-2024	121	WII	Y			Y	Y	Spearhead Training
115	Sensitization Of Gram Pradhans for Mainstreaming Biodiversity Conservation in Village Level Development Planning	31-07-2024	60	WII				Y		Other Stakeholders Training
116	Two Days Training Workshop On “Rescue and Handling of Macro Aquatic Fauna in Distress for Veterinarians, Zookeepers and Frontline Forest Staff” at Renukaji Zoo, Sirmour, Himachal Pradesh	06-08-2024	37	Onsite	Y	Y	Y			Rescue and Rehabilitation

117	National Level Ganga Grandma's Course On 'Documenting Traditional Knowledge Systems for Conservation of Freshwater Ecosystems in the Ganga River Basin'	18-09-2024	111	WII				Y		Other Stakeholders Training
118	Two Days Training Workshop for University Students On 'Ganga Biodiversity and Wetland Conservation' at DDUGU, Gorakhpur, Uttar Pradesh	18-10-2024	367	Onsite	Y				Y	Other Stakeholders Training
119	National Level Training Workshop for Veterinarians, Veterinary College Students, Zoo Keepers & Frontline Officials On 'Handling of Aquatic Species in Distress'	22-10-2024	70	Onsite	Y	Y	Y			Rescue and Rehabilitation
120	Vigyan Se Swaavlamban: Green Rural Technologies for Biodiversity Conservation at WII Dehradun	28-11-2024	80	WII				Y		Other Stakeholders Training
121	Sensitization Workshop at National Integration Camp of NSS On 'Unity in Diversity: Ganga Biodiversity Conservation and National Integration'	09-12-2024	184	Onsite					Y	Other Stakeholders Training
122	State Level Training Workshop for Trainee Teachers On 'Conserving Aquatic Wildlife of Ganga River' of Uttarakhand, Uttar Pradesh and Himachal Pradesh	07-01-2025	72	WII				Y	Y	Spearhead Training
123	National Level Training Workshop On "Conservation of Macro Fauna of Riverine Ecosystem" for University Professors	11-02-2025	39	WII	Y	Y	Y	Y	Y	Spearhead Training
124	Ganga Biodiversity Conservation for NCC Cadets at HNB Garhwal University, SRT Campus, Chamba	21-02-2025	160	Onsite					Y	Other Stakeholders Training
125	Reconnecting With Religious Roots: Bridging Science and the Vedas for River Conservation at Gauri Gopal Gurukul Vrindavan	05-03-2025	211	Onsite					Y	Other Stakeholders Training
126	Building Bridges: State Level Ganga Prahari Conclave, Jharkhand	19-03-2025	206	Onsite				Y		Other Stakeholders Training
127	Building Bridges: State Level Ganga Prahari Conclave, Bihar	24-03-2025	300	Onsite			Y	Y		Other Stakeholders Training
128	Two Days Training, Outreach and Awareness Programme on 'Ganga Biodiversity Conservation' with govt.	02-04-2025	52	WII					Y	Other Stakeholders Training

	Abhinav Inter college, Kannauj, Uttar Pradesh									
129	Two Days Training Workshop for NSS Volunteers on Fresh Water Biodiversity Conservation of Mainstem Ganga River and its Tributary Yamuna at DRC, Delhi	30-05-2025	82	Onsite				Y	Y	Other Stakeholders Training
130	State Level Training Workshop On 'Conservation of Macro Fauna of Riverine Ecosystem' For University Students	21-08-2025	112	Onsite	Y		Y		Y	Other Stakeholders Training
131	Sensitization Workshop for Faculty and Students of Department of Zoology, MSLU, Udaipur	11-09-2025	40	Onsite					Y	Other Stakeholders Training
132	Training Workshop for University Students and Faculty of IGNTU, Amarkantak	07-10-2025	39	WII					Y	Other Stakeholders Training

Annexure II - Pre-Training Assessment Questionnaire (English, Hindi and Bengali)

Pre-Training Assessment प्रशिक्षण पूर्व आंकलन
National Mission for Clean Ganga राष्ट्रीय स्वच्छ गंगा मिशन
WII-NMCG PHASE II
Questionnaire Survey प्रश्नावली सर्वेक्षण

Name/नाम **.....**

Designation/पद **.....Age/**आयु**.....**

Male/Female स्त्री/पुरुष**…..... Date&Year/** तिथि और वर्ष **.....**

Department/Institute/School/Other विभाग/संस्थान /स्कूल / अन्य

.....

State/राज्य**..... District/**जिला**.....**

Tick your answer अपने उत्तर पर सही का निशान लगाए **(√)**

1. **Have you ever visited the Ganga River?** क्या आप कभी गंगा नदी पर गये हैं?

   Yes/No हाँ/नही

   If Yes, then what was the purpose of your visit? यदि हाँ तो गंगा नदी पर जाने का उद्देश्य क्या था?

   (a)Religious धार्मिक अनुष्ठानों के संबंध में

   (b)Recreational & Tourism मनोरंजन या पर्यटन

   (c)Scientific and work related visit विभागीय कार्य सम्बन्धित

2. **Are you aware of the states that comprise of Ganga River Basin?** क्या आप गंगा नदी बेसिन में आने वाले राज्यों से परिचित हैं?

   Yes/No हाँ /नहीं

If yes, how many states comprises of the Ganga River Basin? Name them यदि हाँ, तो बताइये गंगा नदी बेसिन में कितने राज्य आते हैं? नाम लिखिए

.....

.....

.....

3. **Do you reside nearby in any of the tributaries of Ganga Basin?** क्या आप गंगा या उसकी किसी सहायक नदी के किनारे रहते हैं?

Yes/No हाँ /नहीं

If yes, then write down the name of the tributary यदि हाँ, तो सहायक नदी का नाम बताइये ……..

5. **Are you aware of any aquatic species found in Ganga River Basin?** क्या आप गंगा नदी बेसिन में पाए जाने वाले किसी जलीय जीव के बारे में जानते हैं?

Yes/No हाँ /नहीं

If yes, then write write the names of the species यदि हाँ, तो नाम बताइये ……..

6. **Have you ever seen any biodiversity in the Ganga basin?** क्या आपने गंगा नदी बेसिन में कोई जैवविविधता देखी हैं?

Yes /No हाँ /नहीं

7. **Do you think that the biodiversity of Ganga River basin is important for the river ecosystem?** क्या आप सोचते हैं कि गंगा नदी बेसिन की जैवविविधता नदी तंत्र प्रणाली के लिए महत्वपूर्ण है?

Yes/no हाँ /नहीं

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

संरक्षण के दृष्टिकोण से एक स्वस्थ पारिस्थितिकी तंत्र को बनाए रखने के लिए आप अपनी प्राथमिकता के आधार पर निम्नलिखित विकल्पों का कैसे मूल्यांकन करेंगे।

	Ist	**IInd**	**IIIrd**	**IVth**	**Vth**	**VIth**
a. Hydorpower Projects जलविद्युत परियोजनायें	☐	☐	☐	☐	☐	☐
b. Ecological Balance पारिस्थितिकी संतुलन	☐	☐	☐	☐	☐	☐
c. Holiness पवित्रता	☐	☐	☐	☐	☐	☐
d. Ecosystem Services पारिस्थितिकी तंत्र सेवायें	☐	☐	☐	☐	☐	☐

e. Biodiversity जैवविविधता	☐	☐	☐	☐	☐	☐
f. Water Quality जल गुणवत्ता	☐	☐	☐	☐	☐	☐

9. What are the major threats (problems) that Ganga River Basin face today? आपके अनुसार वर्तमान में गंगा नदी बेसिन में निम्नलिखित में मुख्य संकट हैं ?

a. Rapidly increasing human population and rising standards of living तेजी से बढ़ती हुई जनसंख्या व जीवन स्तर में वृद्धि

b. Pollution (Industrialization/Urbanization) प्रदूषण (औद्योगिकरण/शहरीकरण)

c. Developmental Activities (Construction of dams & roads) विकासात्मक गतिविधियाँ (बांधों और सड़कों का निर्माण)

d. Sewage waste discharge (chemicals) सीवेज निर्वाह

e. Agricultural Runoff कृषि प्रवाह

f. Ritual activities in and around Ganga River गंगा नदी व उसके आसपास और चारों ओर की धार्मिक गतिविधियाँ

g. Climate Change जलवायु परिवर्तन

Others अन्य……

10. What steps should be taken for cleaning Ganga River Basin? गंगा नदी को स्वच्छ बनाए रखने के लिए निम्नलिखित में से क्या कदम उठाए जाने चाहिए?

a. Mass awareness programmes/sensitizations among people व्यापक स्तर पर जन जागरूकता कार्यक्रम

b. Legal Actions (Implementation of rules and regulations) कानूनी कार्यवाही (नियमों और विनिमयों का कार्यान्वयन)

c. Apply 3R (Reuse, Reduce, Recycle) Principle 3 आर (रीयूज, रीड्यूज़, रीसाइकल) सिद्धांत को लागु करना

d. Effluents from differet sources (Industrial, Agricultural, domestic etc) should be restricted विभिन्न स्त्रोतों (औद्योगिक, कृषि, घरेलू आदि) से निकलने वाले अपशिष्टों को प्रतिबंधित करना

Others अन्य……..

11. Who do you think is responsible for cleaning the Ganga River Basin? आपके अनुसार गंगा नदी बेसिन की सफाई के लिए कौन जिम्मेदार है?

Government सरकार **/NGOs** गैर सरकारी संगठन(एनजीओ) **/ Private sector** निजी क्षेत्र**/ Village Panchayat** ग्राम पंचायत**/LocalCommunities** स्थानीय समुदाय**/Youth** युवा**/All** सभी

……

প্রাক-প্রশিক্ষণ মূল্যায়ন
জাতীয় স্বচ্ছ গঙ্গা মিশন (NMCG)
WII-NMCG পর্যায় II
প্রশ্নাবলী সমীক্ষা

নাম..... বয়স.....

পদমর্যাদা.....

পুরুষ/মহিলা..... তারিখ ও বছর.....

বিভাগ/প্রতিষ্ঠান/বিদ্যালয়/অন্যান্য.....

a)রাজ্য.....b) জেলা.....

আপনার উত্তরটি চিহ্নিত করুন (√)

1. আপনি কি কখনও গঙ্গা নদী পরিদর্শন করেছেন? হ্যাঁ/না
   যদি হ্যাঁ হয়, আপনার ভ্রমণের উদ্দেশ্য কী ছিল?
   গঙ্গা আরতি/মুন্ডন/মেলা/ছট পূজা/মৃত্যু সংক্রান্ত আচার/সরকারি বা কর্মসংক্রান্ত ভ্রমণ/বিনোদন ও পর্যটন/অন্যান্য.....
2. গঙ্গা নদী অববাহিকায় কতটি রাজ্য অন্তর্ভুক্ত? সেগুলির নাম লিখুন.....
3. আপনি কি গঙ্গা অববাহিকার কোনো উপনদীর নিকটে বাস করেন? হ্যাঁ/না
4. আপনি কি গঙ্গা নদী অববাহিকায় পাওয়া কোনো জলজ প্রজাতি সম্পর্কে অবগত?
5. আপনি কি কখনও গঙ্গা অববাহিকায় কোনো জীববৈচিত্র্য দেখেছেন? হ্যাঁ/না
6. আপনি কি মনে করেন গঙ্গা নদী অববাহিকার জীববৈচিত্র্য নদীর পরিবেশ ব্যবস্থার জন্য গুরুত্বপূর্ণ? হ্যাঁ/না
7. গঙ্গা নদী অববাহিকার ক্ষেত্রে নিম্নলিখিত বিষয়গুলিকে আপনি কত নম্বর দেবেন (১ থেকে ৫):
   a. জলবিদ্যুৎ প্রকল্প
   b. পরিবেশগত ভারসাম্য
   c. পবিত্রতা
   d. পরিবেশগত সেবা
   e. জীববৈচিত্র্য
   f. জলের মান

8. বর্তমানে গঙ্গা নদী অববাহিকার প্রধান বিপদ গুলি কী?

   .....

9. গঙ্গা নদী অববাহিকা পরিষ্কার করার জন্য কী পদক্ষেপ নেওয়া উচিত?

   .....

10. আপনার মতে গঙ্গা নদী অববাহিকা পরিষ্কার করার জন্য কে দায়ী?

    সরকার/এনজিও/বেসরকারি ক্ষেত্র/গ্রাম পঞ্চায়েত/স্থানীয় সম্প্রদায়/যুবসমাজ/সকলেই

Annexure III - Post-Training Assessment Questionnaire (English, Hindi and Bengali)

Post Training Impact Assessment
(प्रशिक्षण प्रभाव आंकलन प्रपत्र)
National Mission for Clean Ganga (NMCG)
(राष्ट्रीय स्वच्छ गंगा मिशन)
Biodiversity Conservation and Ganga Rejuvenation
(जैव विविधता एवं गंगा संरक्षण" प्रशिक्षण)

Questionnaire Survey (i'ukoyh lo{k.k)

Name (uke).....Age (vk;) .....

Designation (in) .....Male (पुरूष) /Female (L=h).....

Dated & Year (frfFk vkj वर्ष).....

Department (foHkkx)/Institute (lLFkku)/School (Ldwy)/Others (vU;).....

State (jkT;).....District (fty k) .....

Tick your answer (√)
अपने उत्तर पर सही का निशान लगाए **(√)**

2. How do you like the training programme?
यह प्रशिक्षण आपको कैसा yxk\
(a) Excellent उत्तम (b) Very good cgr vPNk (c) Good vPNk (d) Not satisfied संतोषजनक नहीं

3. Are you satisfied with the following components of the training programme?
आप प्रशिक्षण के निम्नलिखित घटकों में से किससे संतुष्ट हैं\
(a) Lectures (Yes/No) 0;k[;ku ¼gk@ugh½ (b) Activities xfrfof/k ¼gk@ugh½
(c) Material provided ikB~; lkexh ¼gk@ugh½ (d) Field visits {k= Hkek.k ¼gk@ugh½
(e) Lab Visits प्रयोगशाला भ्रमण (हाँ / नहीं)

4. Did the workshop improve your understanding about conservation of Ganga River Basin and its biodiversity?
क्या इस प्रशिक्षण से गंगा नदी बेसिन और इसकी जैव–fofo/krk dk lj{k.k dh ckjs esa vkidh tkudkjh esa of) gÃ g\

(a)Yes gk (b) No ugh (c) Not sure dg ugh ldrs

4. Are you aware of the government programmes to clean Ganga River?
D;k vki xxk unh dk lkQ djus oky vU; dk;Øeksa dh ckjs esa tkurs g\
(a) Yes gk b) No ugh

5. What are the key species found in Ganga River Basin?
xxk unh cflu esa dku&lh çeq[k çtkfr;k ik tkrh g\

……

6. Do you know any tributaries belonging to Ganga River Basin? Yes / No
D;k vki xaxk unh cflu dh fdlh unh dh ckjs esa tkurs gSa\ gk¡/ugh
If yes, name any five. ;fn gk¡ rks fdUgh ikap dk uke fyf[k,
……

7. Populations of which among the following are decreasing in River Ganga River Basin?
vkidh tkudkjh dh vuqlkj xaxk unh cflu esa dkSu lh çtkfr dh thoksa dh vkcknh ?kV jgh gS\

(a) Amphibians mHk;pj ¼esa<d½ (b) Fishes eNyh (c) Reptiles ljhl`i (d) Mammals- Dolphin, Otter, etc. Lru/kkjh ¼MkWfYQu] Ånfcyko½ (e) Birds i{kh

8. What do you think are the major threats faced by the Ganga River Basin?
vkidh vuqlkj xaxk unh cflu dh eq[; ladV D;k gS\

i) Rapidly increasing human population and rising standards of living
rsth ls c<rh gÃ tula[;k vkSj c<rk thou Lrj

j) Pollution (Industrialization and urbanization)
प्रदूषण औद्योगीकरण और शहरीकरण में वृद्धि

k) Developmental activities (e.g. Construction of dams and roads)
fodkldkRed xfrfof/k;k¡ ¼ck/k vkSj lM+dksa dk fuekZ.k½

l) Sewage waste discharge (e.g. Chemicals)
सीवेज अपशिष्ट ¼jklk;fud inkFkZ½

m) Agricultural run-off
कृषि के अपशिष्ट पदार्थ

n) Ritual activities in and around the Ganga River
Xkxk **बेसिन में नदी के किनारे किए जाने वाले धार्मिक अनुष्ठान**

o) Climate change
ekSle ifjorZu

p) Others, mention vU; xfrfof/k;k¡ ……

9. What are the major environmental changes in the Ganga River system observed as a result of anthropogenic activities
xaxk unh Á.kkyh esa dkSu ls Áeq[k lk;koj.kh; ifjorZuksa dk ekuo tfur xfrfof/k;ksa ds ifj.kkeLo:Ik n[kk x;k gS\

c) Decrease in biodiversity of the Ganga River Basin
xaxk unh dh ?kVrh tSofofo/krk

d) Water pollution in Ganga River Basin
गंगा नदी में जल–प्रदूषण

e) Changing river flow regime
xaxk unh dk cnyrk Áokg

f) Others, mention vU; xfrfof/k;k¡ ----------

10. What are the ecosystem services provided by the Ganga River Basin?
xaxk unh cflu ls ÁkIr gksus okyh ikfjfLFkfrdh r= lsok,¡ D;k gS\

(f) Provisioning, such as the production of food and water
Áko/kku lsok,¡ tSls fd Hkkstu vkSj ikuh dk mRiknu

(g) Regulating, such as the control of climate and disease
fofu;eu lsok,] tSls tyok;q vkj jksx dk fu;=.k

(h) Supporting, such as nutrient cycles and crop pollination
समर्थन सेवाएँ, जैसे पोषक चक्र और फसल परागण

(i) Cultural, such as spiritual and recreational benefits
lkaLdfrd lsok,] tSls vk/;kfRed vkj euksjatu lsok,

(j) All of the above
mijksDr lHkh

(k) None of the above
buesa ls dksÃ ugha

11. What do you think can be applied as mitigation measures to save the Ganga River basin?
vkidk vuqlkj xaxk unh cpkus ds fy, D;k dne mBk, tk ldrs gSa\

……

12. Do you feel cleaning Ganga is the responsibility of Government? (a) Yes, (b) No
D;k vkidks yxrk gS fd xaxk unh dh lkQ djuk vdsys ljdkj dh ftEesnkjh gS\ gk¡ ugha
If yes why? ;fn gk¡ rks D;ksa\ .....
If No, then whose responsibility is it
;fn ugha rks ;g fdldh ftEesnkjh gS\ (i) Private sector ÁkbosV lsDVj (ii) Village Panchayat xkaa iapk;r (iii) Local communities LFkkuh; leqnk;] (iv) Youth ;qok (v) NGO'S xSj Lkjdkjh laLFkk,a (vi) Any others vU;

13. Please rate the programme components on a scale of 1 to 10 (low to high)
कृपया इस प्रशिक्षण के घटकों को 1 से 10 तक (कम से ज्यादा की ओर) रेटिंग दें।
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?
(पाठ्यक्रम की प्रासंगिकता/मॉड्यूल/अध्ययन विषय वस्तु/ अपने वर्तमान कार्य के संबंध मं प्रशिक्षण के लाभ/ उपयोगिता तथा कार्यक्रम की संरचना तथा आयोजन के पैमाने पर कितना संतोषजनक रहा)

1	2	3	4	5	6	7	8	9	10

14. Your general observations/remarks about the training programme and/or Recommendations, if any, for the improvement of the programme
इस प्रशिक्षण के बारे में अपने विचार और इस कार्यक्रम में सुधार हेतु आपके सुझाव लिखिए

.....

15. How would you provide a holistic solution to the waste generated from religious services?
(For e.g. Segregate non-biodegradable material and provide compost pits for biodegradable material)
धार्मिक अनुष्ठानों के दौरान उत्पन्न कचरे के समाधान हेतु आपके क्या सुझाव हैं\ ¼tSls & vktSfod dpjs dk vyx djuk] tSfod dpjs ds fy, [kkn xM<k cukuk½

.....

Annexure IV - Details of Programme Schedule for Capacity Building and training programmes of Multiple Stakeholders under Ganga River Basin

PROGRAMME SCHEDULE

NATIONAL LEVEL TRAINING WORKSHOP FOR IRRIGATION DEPARTMENT ON "HARMONIZING BIODIVERSITY, RIVERS & ENGINEERING –TOWARDS SUSTAINABLE WATER MANAGEMENT & BIODIVERSITY CONSERVATION" FROM 1st TO 3rd NOVEMBER, 2023 Venue: Wildlife Institute of India, Dehradun		
Day 1 (1st November, 2023) INAUGURAL SESSION		
TIME	SESSIONS	NMCG-WII & RESOURCE PERSON
09:00-09:30	Registration and Pre-training Assessment	Mr. Rahul Gupta, Mr. S.K Pal, Mr. Anshul Bhawsar, Ms. Simren Dogra and Ms. Alankrita Sharma
09:30-09:40	Welcome Address	Dr. Sangeeta Angom, Scientist & Training Coordinator, WII-NMCG Project
09:40-09:50	Role & Objective of the training workshop	Dr. S.A. Hussain, Former Scientist G, and Project Manager, WII-NMCG Project
09:50-10:00	Address	Dr. Ruchi Badola, Dean WII
10:00-10:10	Vote of Thanks	Mohd. Danish Kaleem, WII-NMCG Project
10:10-1100	GROUP PHOTOGRAPH AND HIGH TEA	
	TECHNICAL SESSIONS	
11:00-11:30	What is Biodiversity? Factors affecting biodiversity in respect to global and Indian context and steps taken by the Government of India	Dr. Ruchi Badola, Dean WII and Nodal officer, WII-NMCG Project
11:30-12:00	Introduction to aquatic biodiversity in respect to rivers and wetlands	Dr. Surya Prasad Sharma, Project Associate, WII-NMCG Project
12:00-12:30	Introduction to the project "Biodiversity Conservation and Ganga Rejuvenation"	Dr. Sangeeta Angom, Scientist & Training Coordinator, WII-NMCG Project
12:30-13:00	Irrigation infrastructures as aquatic biodiversity hotspots: Challenges vs Opportunities	Shri Aftab A Usmasni, Project Associate, WII-NMCG Project
13:00-13:30	LUNCH	

13:30-14:00	Dams as a major aquatic habitat for waterbirds	Shri Goura Chandra Das, Project Associate, WII-NMCG Project
14:00-14:30	Environmental flows: Balancing water allocation for irrigation and ecological needs	Sh. S.K. Zeeshan Ali, Spatial Analyst, WII-NMCG Project
14:30-15:00	Genetic diversity at risk: Understanding the impacts of dam construction on river ecosystems.	Dr Ajit Kumar, Project Associate, WII-NMCG Project
15:00-15:30	Role of emerging Technology for Irrigation and Habitat Management	Shri Ravindra Nath Tripathi, Database Operator, WII-NMCG Project
15:30-16:00	TEA	
16:00-17:30	Forensic Lab Visit (Wildlife trade: Identification of species from parts and derivatives)	Dr. S.K. Gupta, Scientist F, WII/ Dr. C.P. Sharma
	Day 2 (2nd November, 2023)	
06:00-18:30	Tehri Dam Visit	Dr. Neeraj Mahar, Dr. Ajit Kumar, Shri. Gangaiamaran, Shri Prashant Tariyal & WII-NMCG training team
	Day 3 (3rd November, 2023)	
09:30-10:30	Integrating EIA in river engineering projects and case studies of EIA implementation in river and irrigation projects	Dr. G.V. Gopi, Scientist F, WII
10:30-11:00	Water pollution management: best practices for conserving aquatic biodiversity	Ms. Richika Sah, Project Associate, WII-NMCG
11:00-11:30	TEA	
11:30-13:00	Policy frameworks and legal aspects of biodiversity and river conservation	Dr. Rakesh Kumar Singh
13:00-14:30	LUNCH	
	VALEDICTORY FUNCTION	
14:30-14:40	Welcome Address	Dr. Sangeeta Angom, Scientist & Training Coordinator, WII-NMCG Project WII-NMCG
14:40-14:50	Training Report	Ms. Sana Shaikh, Assistant Training Coordinator, WII-NMCG Project
14:50-15:00	Interaction and Experience	Selected Participants

15:00-15:20	Certificate distribution	Dr. Ruchi Badola & Dr. S.A. Hussain
15:20-15:30	Post Training assessment	Mohd. Danish Kaleem, WII-NMCG Project, Ms. Simren Dogra and Ms. Alankrita Sharma
15:30-15:35	Vote of Thanks	Ms. Simran Aggarwal, WII-NMCG Project
15:35 0nwards	Visit to Ganga Avlokan, Chandi Ghat Haridwar. Learning of Ganga Biodiversity conservation initiatives with our Ganga Praharis)	Mr. Rahul Gupta, Mr. Danish Kaleem and WII-NMCG training team
18:00 Onwards	Ganga Aarti, Rishikesh (Optional)	WII-NMCG Training Team

TRAINING WORKSHOP FOR 'FISHERIES DEPARTMENT ON "HARMONIZING SUSTAINABLE FISHERIES FOR FRESHWATER BIODIVERSITY CONSERVATION" IN GANGA RIVER BASIN FROM JUNE 11th -13th, 2024 VENUE: WILDLIFE INSTITUTE OF INDIA, DEHRADUN		
Day 1 (11th June, 2024)		
Time	Sessions	Resource Person
09:30-11:00	Course Inauguration	NMCG Team
11:00-11:30	High Tea	
11:30-12:00	Overview of the Project – Planning and management for aquatic species conservation in the Ganga River basin	Dr Ruchi Badola, Dean WII & PI, WII-NMCG Project
12:00-13:00	Freshwater Macrofauna of Ganga River and their conservation issues	Dr. Sangeeta Angom, Scientist & Training coordinator, WII-NMCG Project
13:00-14:30	LUNCH	
14:30-15:30	Overview of distribution of fishes in Ganga River Basin their ecological importance and conservation issues	Dr. J.A Johnson, Scientist F, WII
15:30-16:30	Identification of hotspots of mortality of Gangetic dolphin and other large aquatic vertebrates in passive fishery	Dr. Surya Prasad Sharma and Shri Goura Chandra Das
16:30-16:45	TEA	
16:45-17:45	Forensic Lab Visit	Dr. C.P. Sharma, Technical Officer, Dr. Ajit Kumar, Project Scientist
Day 2 (12th June, 2024)		
06:30-08:00	Nature walk	WII-NMCG Team

09:30-10:30	Revisiting the fishing Regulation in India	Advocate Mohammad Zayed Khan,
10:30-11:30	Introduction to fish ladder and their role in fish conservation	Mr. Rahul Rana, Project Associate
11:30-11:45	TEA	
11:45-13:00	Sensitizing stakeholders for Freshwater biodiversity conservation, experience from Ganga Basin	Dr. Pariva Doriyal, Project Scientist
13:00-14:30	LUNCH	
14:30-15:30	i. Addressing the issues of ghost gear in the Ganga River for minimizing plastic pollution . Strengthening the socio-ecological resilience of fishing communities of Ganga basin - less plastic and more fish	Anshul Bhawsar, Project Associate II
15:30-16:30	Team Building Exercise	WII-NMCG Team
16:30-16:45	TEA	
TECHNICAL SESSION II		
16:45-17:45	Group Exercise I: Action Planning for Sustainable Fishing and Biodiversity Conservation	Dr. Sangeeta Angom & WII-NMCG Team
18:30-19:30	Participant's Evening	WII-NMCG Team
	Day 3 (13th June, 2024)	
06:30-08:30	Ganga Avlokan, Chandi Ghat, Haridwar (Learning of Ganga Biodiversity conservation initiatives with our Ganga Praharis)	Dr. Sangeeta Angom, Dr. Soufil Malek, Mr. Rahul Gupta, Mr. Danish Kaleem and WII-NMCG Team
08:30-09:30	BREAKFAST	
09:30-10:30	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
10:30-12:00	Role Play + Presentation (Group Exercise)	Dr. Sangeeta Angom, Ms. Simren Dogra, Ms. Simran Aggarwal, Ms Aarti Chauhan
12:00-13:00	Fish Bowl Exercise (Group Exercise)	WII-NMCG Team
13:00-14:00	LUNCH	
14:00-15:00	Valedictory Function	WII-NMCG Team
15:00-15:30	Experience sharing by participants	Selected Participants from Fishery Dept.
15:30-16:00	Post-training assessment & Feedback Session	WII-NMCG Team
16:00-17:00	HIGH TEA	
17:00-19:00	Back to WII	

Aim: Documentation of cultural and traditional knowledge relevant to conservation of freshwater ecosystems.

Objectives:

1. Document Traditional Knowledge Systems such as customs, folklores, folksongs, agricultural practices, cuisine and, related to conservation freshwater ecosystems.
2. Analyze the feasibility of oral history and traditional institutions in preservation and transmission of traditional knowledge related to conservation of freshwater ecosystems.
3. Create a comprehensive digital archive of the documented knowledge, ensuring it is accessible for educational purposes, community engagement, and cultural preservation.
4. Facilitate meaningful interactions with grandmothers to foster a deeper understanding and appreciation of traditional knowledge for aquatic biodiversity conservation.

DOCUMENTING TRADITIONAL KNOWLEDGE SYSTEMS FOR CONSERVATION OF FRESHWATER ECOSYSTEMS IN THE GANGA RIVER BASIN FROM 18th – 21st SEPTEMBER, 2024 VENUE: WILDLIFE INSTITUTE OF INDIA		
Day 1 (18th September, 2024)		
Time	Sessions	Resource Person
09:30-11:00	Course Inauguration	NMCG Team
11:00-11:30	Group Photograph & High Tea	
11:30-12:30	Overview of the Project – Planning and management for aquatic species conservation in the Ganga River basin Jalaj- Connecting River and People to realize Arth Ganga	Dr. Ruchi Badola, Dean WII & PI, WII-NMCG Project
12:30-13:30	Session 1: Dadi Nani ki Kahaniyan aur Sanrakshan Chair: Padma Shri Dr. Madhuri Barthwal, Former Music Director, All India Radio, Nazibabad, Uttarakhand Co-Chair: Dr. Harsha Lakhera, former teacher Delhi Police School & Sahityakaar Rapporteur: Ms. Amanat Kaur Gill & Ms. Simran Aggarwal	Panelists: - Mrs. Kalindi Badola, Storyteller and Radio Jockey, Garhwal, Uttarakhand **2-** Mrs. Tripti Nandkumaran Designer & Writer
13:30-14:30	LUNCH	
14:30-15:30	Session 1: Contd.	

15:30-16:30	Group Task and presentations	Dr. Sangeeta Angom, Scientist & Training Coordinator (WII-NMCG) & WII-NMCG Team
16:30-17:00	TEA BREAK	
17:00-19:00	Cultural Evening SANGAM- Sanskriti ka Ganga Mahotsav	
Day 2 (19th September, 2024)		
09:30-10:30	Session 2: Sri anna se Sri Vridhi tak ki yatra paramparik bhojan aur swathya ke sath. Chair: Dr. Shobha Bhargava, Former Professor, Pune University, Emeritus Professor Department of Zoology, Savitribai Phule Pune University, Pune Co-Chair: Dr. Sangeeta Angom, Scientist & Training Coordinator (WII-NMCG) Rapporteur: Ms. Sunidhi Mishra & Ms. Alankrita Sharma	Mrs. Anupma Koliyal Subject Matter Specialist, WII-NMCG
10:30-11:00	TEA BREAK	
11:00-12:30	Session 2: Women in Entrepreneurship Rapporteur: Ms. Sunidhi Mishra & Ms. Alankrita Sharma	Hanjabam Shubhra Devi Founder Director, Meira Foods Manufacturing Units, Imphal, Manipur
12:30-13:00	Group Task	Dr. Pariva Dobriyal, Project Scientist-III, WII-NMCG & WII-NMCG Team
13:00-14:00	LUNCH	
14:00-15:30	Session 3: Prakriti Hamari Aushadhalaya: Traditional Healing Practices and Folk Medicines Rapporteur: Ms. Shradha Mahajan & Ms. Krishna Venugopal	Panelists: Dr. Sandhya Joshi, Community Expert, WII-NMCG Mrs. Hemlata Khanduri, Eco-Development Officer, WII-NMCG
15:30-16:00	TEA BREAK	
16:00 onwards	CITY TOUR	Mr. Prashant Tariyal, Mr. Abhimanyu Singh, Ms. Hema Pant, Ms. Priyanka Singh, Ms. Krishna Venugopal
	Day 3 20th September, 2024)	

09:30-11:30	Session 4: Hamari Parampara Hamari Nadiyan Chair: Shri Yadvendra (ME), Former Director, CSIR CBRI, Roorkee, Photographer, Hindi Writer and Translation Co-Chair: Smt. Geeta Gairola, Former Director, Mahila Samakhya, Uttarakhand Rapporteur: Dr. Uttaran Bandyopadhyay & Ms. Hema Pant	Panelists: Ms. Sheeba Aslam, Writer, Senior Journalist Ms. Shadab Raza, Poetess and Home Maker
11:30-12:00	TEA BREAK	
12:00-14:00	Session 5: Anurag Aviral, Niramal Rag Ganga Ka: Folk Songs Rapporteur: Ms. Amanat Kaur Gill & Ms. Sunita Rawat	Dr. Rakesh Bhatt, Eminent artist of theatre, music, folk music and recipient Sangeet Natak Academy Award 2023, Uttarakhand
14:00-14:30	LUNCH	
14:30-16:30	Session 6: Sangrakshan Sambandhi Pratha aur Jan Andolan Rapporteur: Dr. Deepika Dogra, Project Scientist II, WII-NMCG & Ms. Sweta Gupta	Panelists: Mrs. Geeta Gairola, Former Director, Mahila Samakhya, Uttarakhand Dr. Ruchi Badola, Dean WII & PI, WII-NMCG Project
16:30-17:00	TEA BREAK	
17:00-18:30	• Valedictory session • 'Hamari Sanskriti Hamari Pehchaan' (Participants Evening)	
	Day 4 (21st September, 2024)	
09:00-10:30	Departure to Haridwar (Ganga Avlokan, Chandi Ghat & Parmarth Niketan)	
10:30-12:00 12:00-13:00 17:00-19:30	• Interaction with Ganga Praharis for involving communities in Ganga Biodiversity Conservation • Experience Sharing by Participants • Ganga Aarti at Parmarth Niketan	Dr. Uttaran Bandyopadhyay, Mr. Prashant Tariyal, Mr. Mukesh Deorari, Ms. Vineeta Sagar, Ms. Mansi Bijalwan Ganga Praharis at Ganga Avlokan: Mr. Monoj Nishad, Mr. Vikas Kuma & Mr. Aman Rawat
19:30 onwards	BACK TO WII	

NATIONAL LEVEL TRAINING WORKSHOP ON 'FRESHWATER BIODIVERSITY CONSERVATION' FOR UNIVERSITY TEACHERS AND PROFESSORS FROM 5th TO 7th MARCH, 2024 Venue: Wildlife Institute of India		
DAY 1	Lecture schedule (Post course inauguration)	Speakers
1100-1200	Project "Planning and management for aquatic species conservation and maintenance of ecosystem services in the Ganga River Basin": Background of the project and lesson learnt.	Dr. Shivani Barthwal, Project Scientist III, NMCG-WII Project
1200-1300	Project "Assessment of the ecological status of select Indian Rivers for conservation planning". Background of the project and lesson learnt.	Dr. Tanveer Ahmed Project Coordinator, NRCD-WII Project
1300-1400	LUNCH BREAK	
1400-1500	Measuring and monitoring of river habitat variables with demonstration of field equipment	Dr. Surya Prasad Sharma, Project Scientist I, NMCG-WII Project; Shri Zeeshan Ali, Principal Project Associate, NMCG-WII Project; Shri Goura Chandra Das, Principal Project Associate, NMCG-WII Project
1500-1600	Monitoring of freshwater mammal (river dolphin & otter) populations	Shri Goura Chandra Das, Principal Project Associate, NMCG-WII Project
1600-1630	TEA BREAK	
1630-1730	Monitoring of waterbird populations	Dr. Neeraj Mahar, Project Scientist I, NMCG-WII Project
1730-1800	FEEDBACK SESSION	
DAY 2		
0930-1030	Monitoring of crocodile populations	Dr. Surya Prasad Sharma, Project Scientist I, NMCG-WII Project
1030-1130	Monitoring of freshwater turtles	Shri Ashish Kumar Panda, Senior Project Associate, NMCG-WII Project
1130-1200	TEA BREAK	
1200-1300	Monitoring water quality	Ms. Richika Sah, Principal Project Associate, NMCG-WII Project
1300-1400	LUNCH BREAK	
1400-1500	Conservation of wetlands for biodiversity	Dr. Gopi G.V, Scientist F, WII
1500-1600	Sampling riparian and wetland vegetation	Dr. Amit Kumar, Scientist D, WII

		Mr. Shivan Kishwan, Herbarium Curator, WII
1600-1630	TEA BREAK	
1630-1730	Tracking movement of waterbirds using satellite	Shri Aftab Alam Usmani, Principal Project Associate, NMCG-WII Project
1730-1830	Visit to the forensic lab and Nature trail	Dr. S.K. Gupta, Scientist F, WII; Dr. C.P. Sharma, Technical Officer, Dr. Ajit Kumar, Project Scientist II, NMCG-WII Project
DAY 3		
0600-1000	Visit to Asan Conservation Reserve and Yamuna River	Dr. Neeraj Mahar, P. Gangaiamaran, Principal Project Associate, NMCG-WII Project; Mr. Ajay Singh Rawat, Project Associate, WII-NMCG Project; Mr. Kamran Hussain, Project Associate I, NRCD-WII Project; Mr. Aniket Sharma, Project Assistant NRCD-WII Project
1000-1100	Monitoring of freshwater fishes and their river habitat	Dr. Vineet Dubey, Project Scientist II, NMSHE Project
1100-1130	TEA BREAK	
1130-1230	Application of Remote sensing and GIS technology for river conservation	Shri Zeeshan Ali, Principal Project Associate, NMCG-WII Project
1230-1330	Collection of biological samples for molecular and ecotoxicological research	Dr. Ajit Kumar, Project Scientist II, NMCG-WII Project and Ms. Richika Sah, Principal Project Associate, NMCG-WII Project
1330-1400	LUNCH BREAK	
1400-1500	Mobilizing stakeholders for river conservation	Dr. Ruchi Badola, Dean, FWS, WII; Nodal Officer and PI, WII-NMCG Project
1500-1600	Conservation education and outreach for river conservation	Dr. Sangeeta Angom, Scientist & Training Coordinator, NMCG-WII Project
1600-1630	Feedback session	NMCG & NRCD Project organizing team
1630-1730	Valedictory session	NMCG & NRCD Project organizing team

DAY 4 (Optional)		
0600-1300	Field Visit to Rajaji National Park and Ganga Avlokan, Haridwar and Bhimgoda Barrage	Mr. Danish Kaleem, Project Associate, WII-NMCG Project; Mr. Anshul Bhawsar; Ms. Aarti Chauhan
1400	COURSE CONCLUSION AND PARTING	

STATE LEVEL TRAINING WORKSHOP FOR TRAINEE TEACHERS ON 'CONSERVING AQUATIC WILDLIFE OF GANGA RIVER' OF UTTARAKHAND, UTTAR PRADESH AND HIMACHAL PRADESH FROM 7th TO 9th JANUARY, 2025 VENUE: WILDLIFE INSTITUTE OF INDIA, DEHRADUN		
Day 1 (7th January, 2025)		
Time	Sessions	Resource Person /WII- NMCG team
09:30-10:00	Registration	
10:00-10:30	Pre-Training Assessment	
10:30-11:20	Inaugural Session	
11:20-11:40	Group Photo and Tea Break	
	Technical Session I	
11:40-12:30	Introduction, workshop objectives, expectations & group norms	WII-NMCG team
12:30-13:00	Overview of WII-NMCG Project Biodiversity profile of River Ganga & its tributaries	Dr. Ruchi Badola, Dean, Faculty of Wildlife Sciences, WII Dr. Sangeeta Angom, Scientist & Training Coordinator (WII-NMCG)
13:00-14:00	Lunch	
	Technical Session II	
14:00-14:30	Importance of Conservation Education in School Curriculum	Ms Nidhi Singh, Senior Project Associate (WII-NMCG)
14:30-15:00	Bal Ganga Prahari – Little Guardians for River Conservation	Mr Rahul Gupta, Senior Project Associate (WII-NMCG)
15:00-16:00	Hands on sessions (Activity based learning)	WII-NMCG team
16:00-16:30	Tea Break	
16:30-17:30	Forensic Lab visit	Dr. C.P. Sharma, Senior Technical Officer

Day 2 (8th January, 2025) Technical Session III		
09:00-14:00	Visit to Regional Science Centre, UCOST Visit to Forest Research Institute	Mr. Rahul Gupta, Mr. Danish Kaleem, Mr. Mayank Joshi, Mr. Vineet Rawat, Mr. Niraj Aswal, Ms. Babli, Ms. Aarti Chauhan & WII-NMCG team
14:00-15:00	Lunch	
	Technical Session IV	
15:00-16:00	Group Exercise: Inclusion of Freshwater Biodiversity Conservation in School Curriculum Team Building Exercises & Conservation Education Games	WII-NMCG team
16:00-16:30	Tea Break	
16:30-17:30	TA Reimbursement	WII-NMCG team
Day 3 (9th January, 2025) Technical Session V		
08:00-11:30	Visit to Ganga Avlokan (Nature Interpretation Centre), Chandi Ghat, Haridwar.	WII-NMCG team
13:00-14:00	Lunch at WII	
14:00-15:00	WII Nature Trail	
	Technical Session VI	
15:00-16:00	Valedictory Function	WII-NMCG Team
16:00-16:30	Experience sharing by participants	Selected Participants
16:30-17:00	Post-training assessment & Feedback Session	WII-NMCG Team
17:00-17:30	HIGH TEA	
	Vote of Thanks	

TRAINING WORKSHOP FOR UNIVERSITY STUDENTS AND FACULTY OF IGNTU, AMARKANTAK ON FRESHWATER BIODIVERSITY CONSERVATION OF GANGA RIVER BASIN FROM 7th – 9th OCTOBER 2025, *VENUE: WILDLIFE INSTITUTE OF INDIA*		
SESSIONS		RESOURCE PERSONS
DAY 1 - *7th October 2025*		
1000-1030	Registration of the participants	Mr. Rahul Gupta, Ms. Aarti Chauhan
1030-1045	Pre-training Assessment	Ms. Aarti Chauhan
INAUGURAL SESSION		
1045-1050	Welcome Address	Dr. Sangeeta Angom, Training Coordinator, WII-NMCG Project
1050-1055	Workshop Address	Dr SA Hussain, Former Scientist G and Subject Matter Specialist
1055-1100	Workshop Address	Dr Ruchi Badola, Dean, FWS, Nodal Officer NMCG
1100-1105	Inaugural Address	Dr. G.S. Bhardwaj, Director WII
1105-1130	GROUP PHOTO AND TEA BREAK	
SESSION I		
1130-1200	An overview of WII and Ganga Biodiversity Conservation	Dr Sangeeta Angom, Training Coordinator, WII-NMCG Project
1200-1300	Visit to Forensic lab	WII-Forensic Cell Team
1300-1400	LUNCH	
SESSION II		
1400-1700	Visit to FRI	WII-NMCG Training Team
1700-1730	WII Herbarium- Photo Gallery	WII-NMCG Training Team
DAY 2- *8th October 2025*		
SESSION III		
0630-0800	Visit to WII Nature Trail	WII-NMCG Training Team
0800-0900	BREAKFAST	
1000-1100	Valedictory Function	WII-NMCG Training Team
1100-1145	Conservation Education Programme and Group Discussion	WII-NMCG Training Team
1145-1200	Post-training assessment	Mr. Rahul Gupta
1200-1300	LUNCH	
SESSION IV		
1300-1700	Field Visit to Ganga Avalokan, Chandi Ghat, Haridwar	WII-NMCG Training Team & Ganga Praharis at Haridwar
1700-1830	Ganga Aarti at Har Ki Pauri	WII-NMCG Training Team & Ganga Praharis
Back to WII		
	DAY 3 - *9th October 2025*	
1000 Onwards	Screening of Wildlife related Videos	WII-NMCG Training Team