



NMCG-WII
GANGA
BIODIVERSITY
CONSERVATION
INITIATIVE
PHASE II

**PLANNING AND MANAGEMENT
FOR AQUATIC SPECIES
CONSERVATION AND
MAINTENANCE OF ECOSYSTEM
SERVICES IN THE GANGA RIVER
BASIN FOR A CLEAN GANGA**



HALF YEARLY REPORT
JULY – DECEMBER 2023

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Progress Report

July – December 2023

Project Investigators

Ruchi Badola, Syed Ainul Hussain

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Wildlife Institute of India, Dehradun

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Editorial Support and Layout

Shivani Barthwal, Neelamadhab Sahu

Text Compilation

Component 1: Zeeshan Ali, Anupam Srivastav,
Surya Prasad Sharma, Neeraj Mahar, Goura
Chandra Das, Richika Sah, Aftab Usmani, Ajit
Kumar, Umama Khan, Vinita Sangela

Component 2: Sangeeta Angom,

Component 3: Pariva Dobriyal, Hemlata
Khanduri, Sandhya Joshi, Deepika Dogra, Ekta
Sharma

Maps

Zeeshan Ali, Aishwarya R. Chandran, Srijani Guha,
Ashish Mani, Shatakshi Sharma

Design

Maheshanand Pandey

Photo Credit

NMCG Team

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S. P. Vashishth, *Executive Director (Admin)*
Bhaskar Dasgupta, *Executive Director (Finance)*
Himanshu Badoni, *Executive Director (Projects)*
D. P. Mathuria, *Executive Director (Technical)*
Brijesh Sikka, *Senior Consultant*
Sandeep Behera, *Biodiversity Consultant*
Sunil Kumar, *Assistant Engineer*

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Ruchi Badola, *Dean*

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COMPONENT 1:

SCIENCE-BASED AQUATIC
SPECIES CONSERVATION
AND MAINTENANCE OF
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COMPONENT - 1

SCIENCE-BASED AQUATIC SPECIES CONSERVATION AND MAINTENANCE OF ECOSYSTEM SERVICES IN THE GANGA RIVER BASIN

PIONEER MSC COURSE IN FRESHWATER ECOLOGY AND CONSERVATION

Freshwater ecosystems are among the most endangered biomes. The intricate links and connectivity between terrestrial and freshwater ecosystem further exacerbate the fragility of the freshwater ecosystem. The recovery plan urges integration of biodiversity inventory and basic ecosystem science, stressor assessment, systematic restoration and protected area management with links to terrestrial realms as required. The emergency recovery plan for the freshwater ecosystems calls for urgent actions through a set of measures, for which a trained workforce of researchers and ecologists are needed. Therefore, a proposal for initiating Master's degree in Freshwater Ecology and Conservation was prepared, on the advice of Secretary Department of Water Resources, River Development & Ganga Rejuvenation (DoWR, RD & GR), Ministry of Jal Shakti, Government of India, discussion during the review meeting of the project "Assessment of the ecological status of select Indian Rivers for conservation planning" under National River Conservation Programme (NRCP) held on 28th March 2023, at New Delhi.

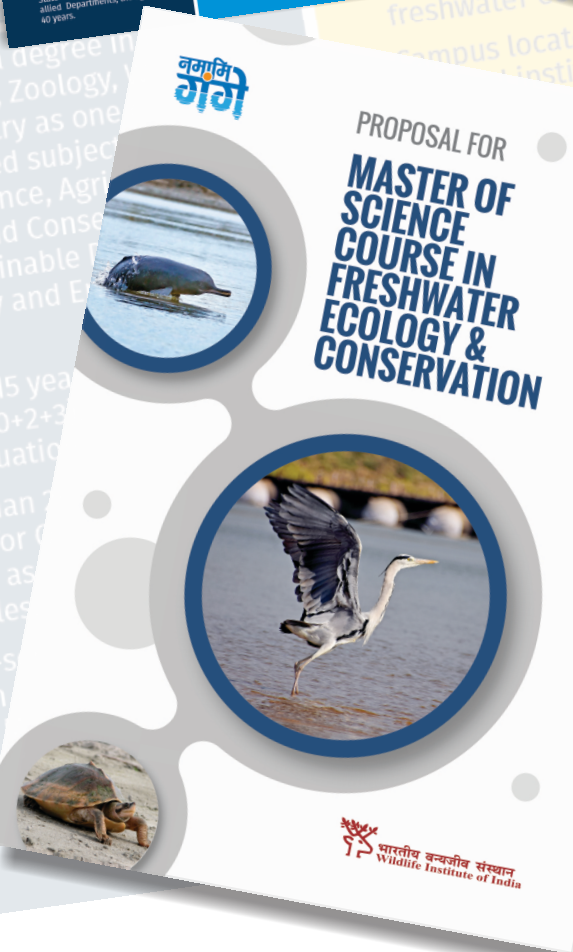
Subsequently a detailed syllabus for MSc in Freshwater Ecology and Conservation was prepared and placed for approval by the 45th meeting of the Training, Research & Academic Council (TRAC) of WII held on 15th May 2023 at WII, Dehradun. The members of the TRAC approved initiating MSc course on Freshwater Ecology and Conservation. The course will be conducted through Academy of Scientific &

Innovative Research (AcSIR), at WII.

The proposal was sent to NMCG and it was presented during the 50th Meeting of the Executive Committee of NMCG, held on 31st July 2023. The proposal was approved and AA&ES was released on 31st August 2023. The MSc course was given in-principal approval for the 5 courses to be run over the course of 10 years.

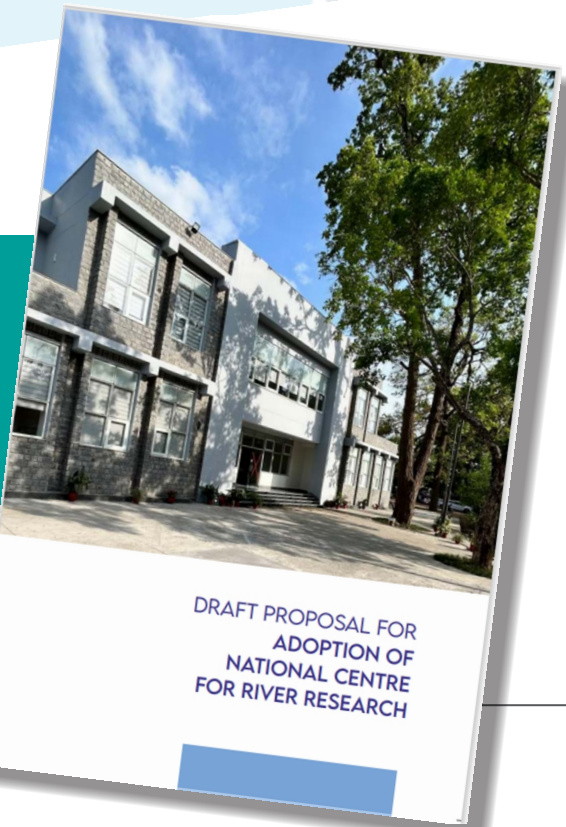
The advertisement process for the course has been initiated and the social media posts were created for the same.





PROPOSAL FOR ESTABLISHMENT OF NATIONAL CENTRE FOR RIVER RESEARCH (NCRR)

For long term sustainability of the Ganga Aqualife Conservation Monitoring Centre (GACMC), a proposal for recognizing the GACMC as National Centre for River Research (NCRR) was submitted to the Ministry of Jal Shakti.



ECOLOGICAL ASSESSMENTS

Amphibian survey

Amphibian status was assessed using the Visual Encounter Method as per Crump et al. (1994) and Khatiwada et al. (2019). The survey covered a 500m buffer around the area, searching for amphibians along the riverbank, nearby ponds, and agricultural land during night (2000 hrs to 2200 hrs). Powerful flashlights and headlamps were used for the night survey, and weather data were collected with a Kestrel 5200 Professional Environmental meter. Various habitats, including riverbanks, ponds, agricultural land, were explored to locate different amphibian groups such as tree frogs, burrowing frogs, and stream-dwelling frogs. During each hour of sampling across varied habitats, information on species and their abundance was documented. Additionally, micro-habitat parameters, including ambient temperature, humidity, substrate characteristics (such as clayey, loamy, muddy, rocky, dry leaves, and other temporary water bodies), and ground cover, were recorded. Ground cover was assessed through the point intercept method, and photographs were taken for each identified species.

Ajay River

The survey was conducted at nine sampling sites from the Punasi Dam to Katwa along the Ajay River between August and September 2023. A total of 13 man-hours and 13 Visual Encounter Surveys (VES) were dedicated to assessing amphibian status in the Ajay River and adjacent areas. A total of 18 species from five families (Bufonidae, Dicroglossidae, Microhylidae, Ranidae, and Rhacophoridae) were documented. Dicroglossidae emerged as the dominant family, comprising seven species, followed by four species in Bufonidae, and three species each in Microhylidae and Rhacophoridae. The Ranidae family was represented by a single recorded species in the survey. Noteworthy species identified in this river include the Bengal True Toad (*Duttaphrynus bengalensis*) and the Assam Pigmy Tree Frog (*Chirixalus simus*).

Damodar River

The study was carried out from Keliyasota to Binogramand five sampling sites were surveyed, during September 2023. A total of 14 species belonging to 11 genera and four families were recorded. Dicroglossidae was the dominant family with seven species, followed by Microhylidae were represented by three species. Bufonidae, and Rhacophoridae were represented by two species each. Four unique species were recorded from Damodar, viz., *Duttaphrynus bengalensis*, *Kaloula pulchra*, *Uperodon globulosus* and *Chirixalus simus*.

Rupnarayan River

The study was conducted at five sampling sites between

Bandar to Mellak, during September 2023. A total 10 species belonging to nine genera and five families were recorded. Dicroglossidae was the dominant family with six species, followed by one species each from the Bufonidae, Microhylidae, Ranidae and Rhacophoridae families. Two unique species were recorded from Rupnarayan River, viz *Hylarana tytleri* and *Polypedates bengalensis*.

Fish Survey

Ajay River

Three sampling sites were surveyed in the upper, middle and lower stretches of the Ajay River. A total of 32 species spanning 17 families and seven orders were documented, with the dominant family being Cyprinidae, comprising six species. Among the 32 species, only one was identified as exotic and near threatened, namely the Silver Carp (*Hypophthalmichthys molitrix*).

Damodar River

This survey was performed in the middle and lower stretches of the Damodar River. Fishes were sampled at four sampling sites. A total of 43 species belonging to 21 families and 11 orders were recorded. The most abundant family was Cyprinidae (nine species). Out of 43 species only one Vulnerable (*Oreochromis mossambicus*) and four Near threatened species (*Hypophthalmichthys molitrix*, *Chitala chitala*, *Parambassis lala*, *Ailia coila*) were reported.

Rupnarayan River

Three sampling sites were surveyed in the Rupnarayan River. Total 42 species belonging to 20 families and 11 orders were recorded. The dominant family was Danionidae (7 species). Out of 42 species only one Vulnerable (*Wallago attu*) and five Near threatened species (*Chitala chitala*, *Parambassis lala*, *Ompok bimaculatus*, *Ompok pabda*, *Harpadon nehereus*) were reported.

Biodiversity survey

A biodiversity survey during October 2023, was conducted along the Chambal River. A combined vehicle and on-foot visual encounter survey took place between Jharel Balaji and Panchnada at the Yamuna confluence, employing the point count methodology. The survey revealed 10 sightings of gharial, 14 sightings of mugger, and 18 sightings of freshwater turtles. Additionally, a total of 42 water and water-associated bird species were documented across 12 sampling sites along the river.

Vegetation Survey

Over the past six months, two field surveys were conducted, namely a pre-monsoon (May-June) survey of Ganga River and post-monsoon (Nov-Dec) survey of Gomti and Ghaghra rivers. The pre-monsoon survey (Haridwar to Farraka) indicated the presence of 456 plant species along the main-stem of the Ganga River. The major dominating families were Asteraceae, Fabaceae, Poaceae, Amaranthaceae, Moraceae, Acanthaceae, Lamiaceae, Convolvulaceae. Among the recorded species, two were in

the Near Threatened category of IUCN – *Jamesbrittenia dissecta* and *Aegle marmelos*. Additionally, two new species, *Lindernia tamilnadensis* and *Lindernia dubia* (the first records from North India), were documented in Bhagalpur, Bihar. A preliminary list, derived from the post-monsoon survey along Gomti and Ghaghra rivers,

suggested the presence of 317 and 308 plant species, (identification and listing yet to be finalized).

The first volume on hydrophytes of River Ganga, titled "Green Lungs of Ganga," was finalized, and the editing process for the second volume is currently underway.



Nesting Indian Skimmer amidst anthropogenic pressures on the Yamuna River

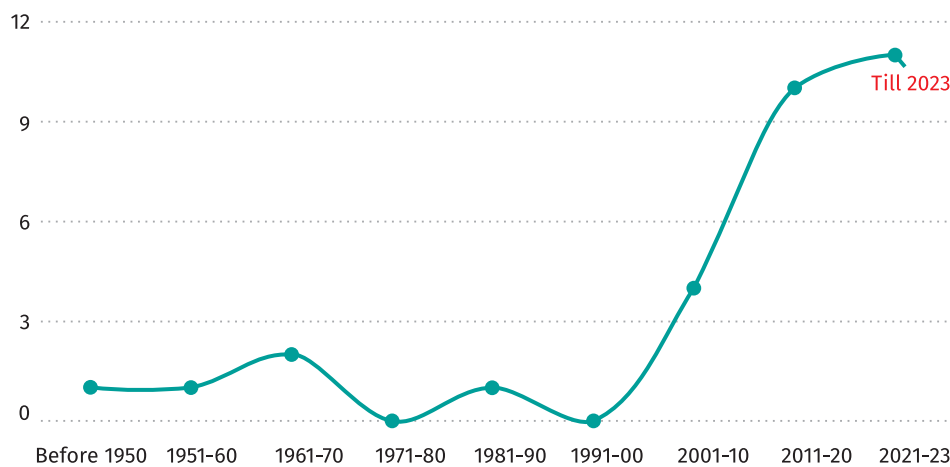
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Status of Waterbirds in the Ganga River Basin: A review (November-December)

Since November 2023, efforts are underway to prepare a comprehensive report on the *Status of Waterbirds in the Ganga River Basin*. A thorough state wise review of literature on the different aspects (diversity, composition, population, migration, behavior, etc.) of waterbirds in the Ganga River Basin is being undertaken. To date, a total 198 published peer reviewed studies have been included in the final review of the waterbird status in Bihar, Haryana, Madhya Pradesh, and Uttar Pradesh and their reports are under

preparation. During this intensive review, an increasing trend was found in the published studies in recent years. More individual natural history records in early and mid 1900s, and systematic studies on the status of waterbirds between late 1900s and 2000s were noticed during this detailed review. Compilation of waterbird related literature of the other Ganga River Basin states- Chhattisgarh, Himachal Pradesh, Jharkhand, Rajasthan, Uttarakhand, and West Bengal is under progress.

Published Studies



Decadal trend in the published peer reviewed studies on the waterbirds in Haryana (Ganga River Basin)

Invertebrate

Review of exiting knowledge base

A comprehensive inventory of major macroinvertebrate taxa, with a primary focus on Odonates, associated with the Damodar River was meticulously compiled. This checklist is founded upon a rigorous analysis of published secondary literature, ensuring the inclusion of the most relevant and scientifically validated information. In parallel, a detailed checklist encompassing major macroinvertebrate taxa, such as Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies), has been curated for the Ramganga River, Asan River, Upper Ganga and Lower Ganga. This compilation is grounded in a thorough examination of pertinent secondary literature,

enhancing the accuracy and completeness of the taxonomic inventory.

Field Survey

Invertebrate sampling was carried out in the Ramganga River, during July and October 2023. Macroinvertebrates were acquired utilizing the kick-net and hand-picking methods, ensuring a comprehensive representation of the aquatic ecosystem during different temporal phases. The collected macroinvertebrate samples and Odonates were identified through established taxonomic keys. The identification process revealed a total of six macroinvertebrate orders. Notably, the order Trichoptera emerged as the most prevalent among the identified aquatic macroinvertebrates.



Collecting specimens from Ramganga River



Family: Hydropsychidae



Orthetrum luzonicum



Family: Psephenidae

TECHNOLOGY IN ECOLOGY

Generated robust genomic sequences for fishes from various rivers within the Ganga River system, including Ganga, Gandak, Kosi, Gomti, Sarayu/Ghaghra, Rapti, Sharda, and Ramganga. Subsequently, a reference genetic barcode database was created for 47 fish species from Kosi River, 24 fish species from Gandak River, and 12 fish species from Sarayu/Ghaghra, facilitating a comparative analysis of genetic signatures across tributaries.

A total 711 DNA sequences from selected aquatic species have been meticulously generated, annotated, and deposited in the National Center for Biotechnology Information. This initiative aims to fortify the genetic sequences repository of the Ganga River, contributing to the broader scientific understanding and research efforts related to the genetic makeup of the Ganga River system. Samples of *Pangura smithii* from the Ganga, Gomti, and Ghaghra rivers displayed moderate genetic diversity, indicating potential signs of recent population expansion. The implications of these findings offer valuable insights for scientific management strategies focused on the conservation and restoration of this turtle species.



Boat survey Kosi River

ECOTOXICOLOGICAL ASSESSMENT

Conducted two field surveys during the period of July - December, 2023. The surveys were aimed at understanding the trophodynamics of emerging contaminants in critical habitats, and estimating the risk to apex predators including the Gangetic Dolphin and the Gharial. The first ecotoxicological survey was conducted in July 2023. Three sites within the National Chambal Sanctuary and a downstream site were covered, from where water, sediment, plankton and scat samples were collected. Fish samples were also collected downstream of the sanctuary.

During the period of October to November 2023, an ecotoxicological study was undertaken to investigate the biomagnification of Contaminants of Emerging Concerns (CECs) within the ecologically rich zones of Ganga river system namely Varanasi, Bihar, and Jharkhand. The assessment involved collection of both abiotic and biotic samples from each location. Abiotic (Water and sediment) and Biotic samples were collected included 70 specimens of fish, planktons, and aquatic insects representing diverse taxa, along with various invertebrates.

The samples will be analysed for the concentrations of both emerging and legacy contaminants in both the abiotic and biotic matrices, to assess the potential risk posed to the Gangetic Dolphin and the Gharial in their respective habitats. The concentrations in each organism (plankton, benthos, insect, fish, higher vertebrates for which the scats were collected) will be assessed to understand the transfer of contaminants from each trophic level to the next, and help predict the exposure of the above-mentioned threatened species to these contaminants through their diet and the environment.

Ecotoxicology Survey-July 2023

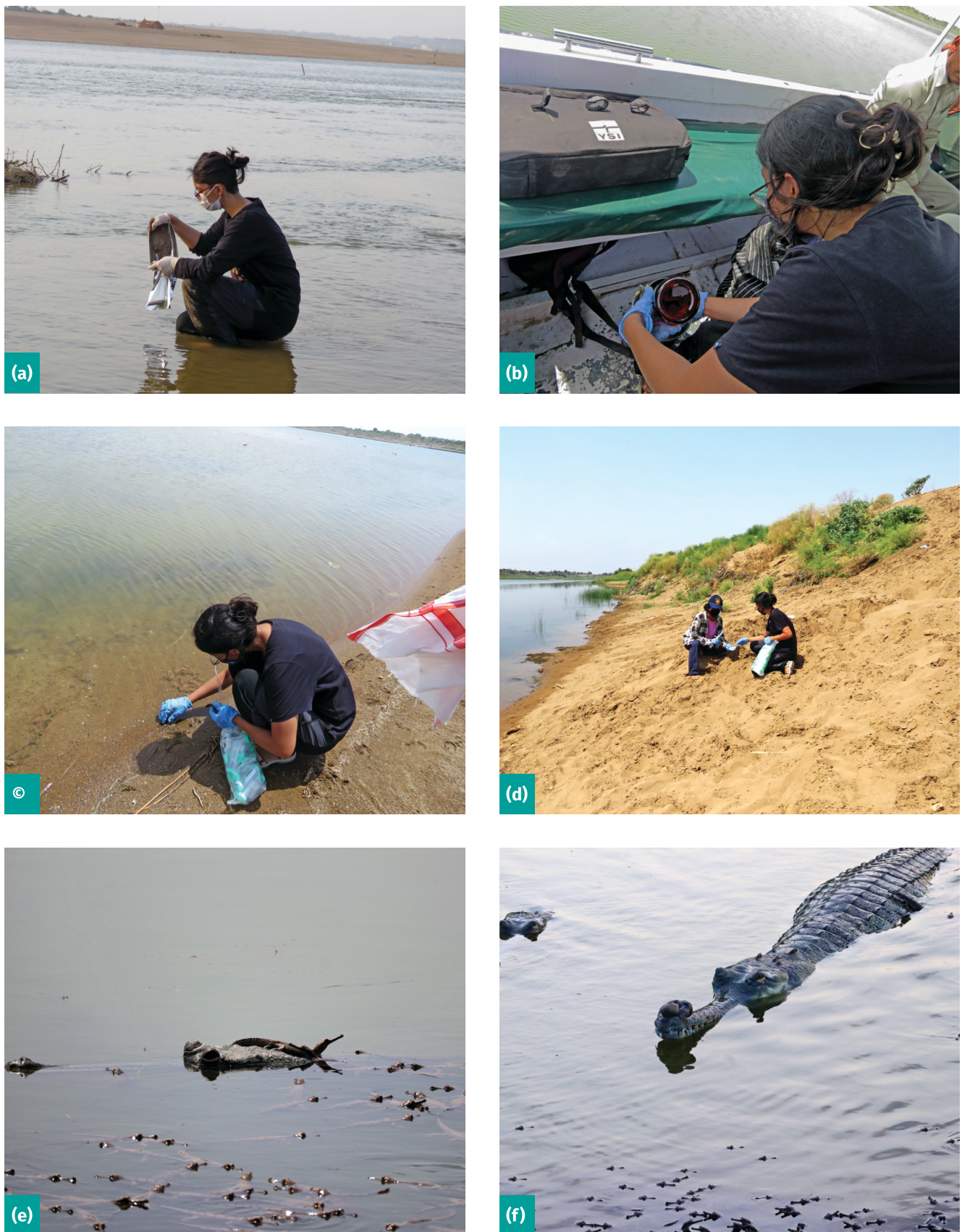


Figure 1: (a-d) Abiotic sample collection, Pali, Chambal (e-f) Gharial at Pali and Nadigaon, Chambal

Ecotoxicology Survey-October- November 2023



Figure 2: (a) Macroinvertebrates collection at Kaithi, Uttar Pradesh (b) Planktons and zooplanktons collection at Kahalgaon, Bihar (c-d) Water quality parameters assessment, at Kahalgaon, Bihar (e-f) Collection of surface water and sediment at Sahibganj, Jharkhand

RESCUE, REHABILITATION, RELEASE, AND RESEARCH

Daily management of the Barhi Turtle Center and Sarnath Rescue and Rehabilitation Centre

Notching for individual identification of three striped roofed turtles (*Batagur dhongoka*) and Red-crowned roofed turtles (*Batagur kachuga*) was carried out in November. Hatchlings of three striped-roofed turtles (*Batagur dhongoka*) and Red-crowned roofed turtles (*Batagur kachuga*) are being reared at the Barhi turtle rescue centre. They were provided with an enriched habitat and balanced diet for ensuring their good health. Feeding with variable diets, including commercial turtle pellets, vegetables, occasional live or dead fish, and dried super worms, was provided. Regular cleaning of the enclosure and pond was carried along-with temperature regulation through creation of sun and shade areas and use of artificial heating sources for temperature regulation.

At the Turtle Rescue and Rehabilitation Centre in Sarnath, daily operations are focussed on providing optimum care for ensuring the well-being of the turtles in our care. Every day, the turtles receive proper feeding, and the personnel on-site ensure the implementation of appropriate enclosure enrichment practices to support their overall health. The team conducts daily monitoring of incubated turtle eggs, taking necessary measures to control the hatchery temperature. As a precautionary measure against winter conditions, polythene sheets and heating lights are installed in the turtle ponds for maintaining an optimum temperature for the turtles during colder months. The centre also actively engages in the procurement of necessary items vital for the effective functioning of the rescue facility. A critical aspect of the centre's activities involves morphometric assessments, focusing on *Batagur kachuga*, *Batagur dhongoka* (for the years 2020 and 2023), and *Nilssonia hurum* (for the 2023 batch).

Winter management of the centres was carried out by installing plastic sheets for insulation along with heating lamps in each enclosure. Running water in the pond was maintained to ensure a temperature range of 28-30°C. In winter, external low temperatures can lower metabolism and activity rates, leading to a 1% body weight loss per month during hibernation. Consequently, feed quantity for all individuals was reduced. Some turtles exhibited swelling on the eyes and nasal discharge at the onset of winter. Both the Barhi and Sarnath centres implemented wintering management, installing plastic sheets and UV lights, along with 200-watt bulbs, to regulate temperatures. Regular temperature recordings were conducted at both centres.

Health care management of turtle hatchlings at the centers

Health monitoring through morphometric assessments and physical examination was carried out on a regular basis. A part of the health management efforts was the necropsy examination of two dead hatchlings of three striped roofed turtles (*Batagur dhongoka*). The carcass was observed with no external signs of injury or disease. Even then, the lungs, liver and heart were observed to be congested. Mucus was found in the intestine, and hypertrophy of the gall bladder was indicative of starvation. Incomplete ingested yolk was found attached with stomach. Undigested food in the stomach was seen and enteritis along with secondary bacterial infection in the gastrointestinal tract which may be due to an unabsorbed yolk sac and metabolic disturbance. Secondary bacterial infection was seen in both the carcasses and animals died due to septicemia.

Biological samples, including nails, tissue, oral swabs, carapace swabs, and cloacal swabs, were collected at the Turtle Rescue and Rehabilitation Centre in Sarnath, Varanasi. The collection of samples for further analysis was ensured during post-mortem examinations. Nail samples from *Nilssonia hurum* hatchlings were specifically gathered for the phylogeny. Blood samples from *Lissemys punctata*, contributing to comprehensive research efforts aimed at improving care and conservation practices at the centre. Additionally, post-mortem and blood collection procedures for rescued animals were carried out, and samples for histopathology, bacterial and viral analysis were taken, further enhancing the centre's commitment to scientific research and the well-being of the rescued turtles.



Rescue and Rehabilitation of turtles

Ten Indian flap shell turtles (*Lissemys punctata*) were rescued from near the Bhind, Railway Station. All rescued individuals were injured (abrasion), and dehydrated. Primary treatment e.g. ASD (Anti Septic Dressing) with Betadine solution (10%) and Neosporin powder was done. Subsequently the turtles were placed in the rescue pond with water at ambient temperature to enable the turtles to regain appropriate hydration levels. To encourage natural behaviours and reduce stress in the turtles housed at the centre environmental enrichment was carried out (Sieved sand, wooden and bamboo platform) for providing opportunities for swimming, basking, and exploration. Monitoring of turtle's behaviour, feeding habits, and overall health was carried. Detailed records of treatments, observations, and any changes in condition are being maintained.



During the rescue operations, the Railway Police Force (RPF) and Forest Dept. successfully rescued 27 *Lissemys punctata* on 15th October 2023, and 23 turtles, including eight *Nilssonina gangetica* and 15 *Lissemys punctata*, on 3rd October 2023, from Mughalsarai railway station. These rescued turtles were expertly cared for at our Turtle Rescue and Rehabilitation Centre, receiving necessary attention such as first aid treatment, feeding, and rehydration. Additionally, a rescue mission was undertaken on 22nd October 2023, in Firozpur, Chandauli, to rescue a Marsh crocodile from a fishery pond, although the attempt was unsuccessful. Remarkably, the crocodile independently escaped the pond a few days later, returning to its natural habitat in the river. The cumulative efforts resulted in the successful rescue of a total of 50 turtles from various locations between July and December 2023.

Capacity-building workshops

Conducted a workshop on 4th October 2023, at Chaudhary Charan Singh University, jointly organized with the Uttar Pradesh Forest Department. The event aimed to focus on the rescue and rehabilitation, specifically on aquatic macro-fauna and snakes. About 35 Forest Department officials, 90 MSc Zoology students from Chaudhary Charan Singh University, University Faculty, participated in the workshop. The workshop covered various aspects of freshwater aquatic ecology and conservation.



The Aquatic Conclave Programme was held at Sanjay Gandhi Biological Park, Patna, on 3rd and 4th September 2023. The event saw active participation from 30 PhD Research Scholars from Patna University, 25 Researchers from NIT, 25 Zoo Ambassadors (comprising students from MSc, BSc, and other classes), and 10 Veterinarians from Patna Zoo. Throughout the conclave, participants shared valuable insights, best practices, and innovative research findings, fostering a collaborative environment focused on advancing aquatic conservation efforts.

An educational exposure visit was organized for the MSc students in Wildlife Science (ACSIR-73-WL-303) of the Wildlife Institute of India, Dehradun. The visit included a trip to the Agra Wildlife SOS Bear Centre and Ganga Avlokana, Haridwar, aimed at providing valuable insights into wildlife health management, survey techniques, and the rescue and rehabilitation of aquatic macrofauna.

Engaged with 40 students from Rajghat Besant School during their field trip to our rescue centre on 9th October 2023, providing a detailed session on the conservation of aquatic species with a special focus on Gangetic turtles.

Engaged with 24 children from Vivekananda Public School during their field trip to our rescue centre on 25th October 2023, providing a detailed session on the conservation of aquatic species with a special focus on Gangetic turtles.

Around 65 students of BSc III years Zoology, Banaras Hindu University, visited Rescue and Rehabilitation Centre, Sarnath, on 25th October 2023, with the purpose of introducing the students to the conservation of aquatic fauna of Ganga Basin. Students were sensitised about basic principles of rescue and rehabilitation, animal identification, handling, morphometry, principles of wild animal health and post-mortem examination, sample collection and storage, etc.

Interacted with six MSc Zoology students of BHU, guiding them through hands-on practice on handling, morphometry, and management of Gangetic turtles. They visited our centre on 3rd and 9th December 2023.

Engaged with 50 trainee teacher students from District Institute of Education Technology, Varanasi, providing a detailed session on the conservation of aquatic species with a special focus on Gangetic turtles. They visited our centre on 16th December 2023.

COMPONENT - 2

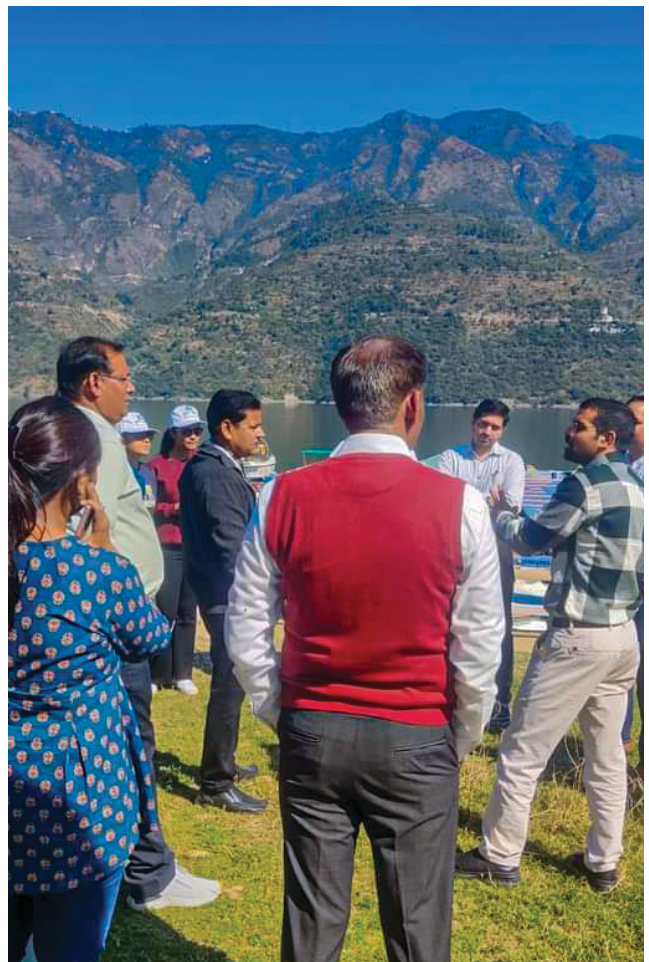
CAPACITY BUILDING OF THE FOREST DEPARTMENT AND OTHER STAKEHOLDERS IN MANAGING AQUATIC AND WETLAND RESOURCES

SPEARHEAD TRAININGS

A National Level Spearhead Training for Engineers from State Irrigation Departments of Ganga Basin states was conducted, a total of 25 Engineers were trained on various aspects of Biodiversity conservation and Sustainable Water Management.



Ganga Prahari learnt about the illegally traded artifacts



Discussion with the participants of the irrigation Department, at Tehri Dam

TRAINING WITH OTHER STAKEHOLDERS

Two onsite training workshops (N=2) were conducted with NSS volunteers at Haridwar and Jaipur. A total of 285 NSS Volunteers and Programme Officers were trained on Ganga Biodiversity Conservation.



BAL GANGA PRAHARI		Bal Ganga Prahari Corners (Ganga Aqualife Knowledge Centre)
		Ten (N=10) Ganga Aqualife Knowledge Centres were established in government schools across five states of the Ganga basin.
Schools	States	
Govt. Girls Inter College Civil Lines, Prayagraj	Uttar Pradesh	
PM Government Inter College, Mirzapur		
Harsahai Jagdamba Sahai Inter College, Kanpur		
Mahiyashi Mahadevi Inter College Fatehgarh, Farrukhabad		
Govt. Abhinav Inter College, Kannauj		
Govt. High School Behral, Ponta Sahib	Himachal Pradesh	
Govt. Sr. Sec. School Pratap Nagar, Yamuna Nagar	Haryana	
Upgraded High School Maskalaiya, Sahibganj	Jharkhand	
Rajasthan Inter School Chowk Bazar, Sahibganj	Rajasthan	
Govt. Maharani Girls Sr. Sec. School Banipark, Jaipur		



Government High School, Behral, Himachal Pradesh



Govt. Abhinav Inter College, Kannauj, Uttar Pradesh



Govt. Girls Inter College, Prayagraj, Uttar Pradesh



Govt. Sr. Sec. School, Pratapnagar, Haryana



Rajasthan Inter School, Sahibganj, Jharkhand



Govt. High School, Behral, Himachal Pradesh

Bal Ganga Prahari Spearhead teams

Spearhead teams (N=6) were also established comprising of 10 students in each teams.



Bal Ganga Prahari Sensitization Programmes

Total 22 sensitization programmes were carried out in which >2,212 students and >102 teachers were sensitized about the importance of Ganga biodiversity and its conservation.



National River Dolphin Day



Independence Day



Plantation Drive (Van Mahotsav)



National Wildlife Week

RADIO TALKS

WII-NMCG resource persons delivered 14 Radio talks on various aspects of conservation and career options for youths through 90.0 FM Radio Rishikesh.

Date/Day	Topic
08/08/2023	Bal Ganga Prahari Programme
12/08/2023 International Youth Day	Environment, Development and Youth
15/08/2023 Independence Day	Role of Youth in Nation Development and Gender Equality
16/08/2023	Career options for youth in Forestry and Biotechnology fields
19/08/2023 World Photography Day	Wildlife and Photography
23/08/2023	Career options for youth in Wildlife Sciences
24/08/2023	Waste Management
25/08/2023	Remote Sensing, GIS and its Applications
25/08/2023	Career options in Remote Sensing and GIS
30/08/2023	Career options in the Field of Commerce and Science
02/09/2023	Importance of street plays for conservation related awareness
09/09/2023 Himalaya Day	Role of Women in Conservation of Himalayas
13/09/2023	Career options in the Field of Environmental Science and Management
04/10/2023 Swachhata Pakhwada	Plastic Waste Management and Composting





EXPOSURE VISITS

Exposure visits were organized for the students under the 'Bal Ganga Prahari Programme' in which a total of 447 students and 20 teachers visited the Wildlife Institute of India and the Ganga Aquaculture Conservation Monitoring Centre and the visitors were introduced to the different aspects of wildlife conservation.



St. Kabeer Academy



St. Kabeer Academy



Shivalik Academy



Indian Cambridge School

WINTER CAMP

A Winter Camp was organized for the Bal Ganga Praharis featuring various events for students like Dance, Yoga, best out of waste, Wildlife Movies, Block Printing, Card Making, Storytelling session and Exposure Visits. More than 550 students from 6 schools actively participated.



COMPONENT - 3

DEVELOP COMMUNITY BASED AQUATIC SPECIES CONSERVATION AND OUTREACH PROGRAMMES FOR THE GANGA RIVER BASIN

A cadre comprising 1,290 individuals (566 females and 724 males) of Ganga Praharis established in the Ganga River basin during Phase-I, were seamlessly transitioned into Phase-II. Additionally, 3,011 Ganga Praharis (comprising 2,109 females and 902 males) have been integrated into the cadre till December 2023. These dedicated Ganga Praharis are strategically distributed across 105 districts of 11 states in the Ganga River basin. Notably, 251 Ganga Praharis (222 females and 29 males) were inducted to the cadre between July and December 2023, emanating from various regions within the Ganga River and its tributaries, including Hooghly, Yamuna, Chambal and a sub-tributary (Bidhyadhari).

A cumulative total of 887 activities, encompassing awareness programs, cleanliness drives, plantation initiatives, sensitisation workshops, mobilization, orientation workshops, consultative meetings, livelihood training sessions, cultural activities, participatory mapping, and ecological surveys were diligently carried out across 52 districts of 8 states including Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Himachal Pradesh, Haryana, Madhya Pradesh across the Ganga River basin by the Wildlife Institute of India (WII). Approximately 29,094 participants, predominantly comprised of different stakeholder categories, including local community representatives, Ganga Praharis, Forest department officials, district administration officials, NGOs and other line agencies, participated in these events.



Awareness Programmes

Activities conducted from July to December

Type of Activities	No. of Activities	Participants
Awareness Programmes	211	11,495
Cleanliness drive	43	1,383
Competitions	5	471
Consultative Meeting	351	3,843
Days Celebration	17	2,386
Exhibition	4	1,131
Focus Group Discussion	7	64
Cultural Activities (Ganga Aarti, Ganga Utsav)	5	205
Livelihood Activities	124	2,786
Livelihood Training	34	1,594
Orientation Programme	8	165
Plantation drive	13	474
Sensitization and Mobilization Workshop	38	1,056
Site visit	4	97
Socio-economic Survey	6	48
Training Workshop	2	105
Others	15	1,791
Total	886	29,094



Social Mapping



Consultative Meeting



Cleanliness Drive



Millet farming

Thirty-two distinct training Programmes were initiated in 17 districts of five states (Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, Himachal Pradesh) in the Ganga River basin, each functioning as a specialized platform for skill development. Across these training sessions conducted at diverse locations, a cumulative total of 868 Ganga Praharis underwent comprehensive training in various fields,

including Bag making, Basket weaving, Herbal Soap making, Dhoop and Incense stick making, Health and wellness, Organic Farming and sewing and stitching. Furthermore, Ganga Prahari's active participation in Jalaj initiatives was pivotal in establishing additional opportunities geared towards cultivating self-sufficiency and independence, aligning with the Arth Ganga initiative.

Skill Development Trainings

Type of Trainings	Nos.	Participants trained
Bag-making	2	33
Basket weaving	1	5
Food processing	1	25
Herbal Soap and Detergent making	1	35
Health and Wellness	1	10
Health and Wellness Advanced course	1	10
Herbal Soap making	2	51
Incense Stick, Dhoop and Organic Colour making	7	216
Millet Value addition	1	29
Organic farming	1	21
Sewing and stitching	14	433
Total	32	868



Food processing training



Certificate distribution of Herbal soap-making training

From July to December 2023, Ganga Praharis, who underwent training, conducted a total of 294 activities, with 228 categorized as input activities and 66 as output activities. These activities encompassed initiatives such as

awareness and cleanliness drives, tree plantation, livelihood development, assistance in ecological monitoring and ecological surveys, and microplan data collection, rescue, and rehabilitation.

Activities initiated by Ganga Praharis

Type of Activities	Input		Output	
	No. of Activities	Participants	No. of Activities	Participants
Awards & Achievements			4	1,583
Awareness Activity	96	5,474	10	472
Cleanliness Drive	8	119	6	52
Consultative Meetings	8	32		
Cultural Activities	1	220	1	232
Cleanliness Drive	29	1,253	4	100
Community Mobilization	4	363		
Days Celebration	16	988	3	80
Ecological Monitoring	36	399	18	125
Livelihood Activities	2	19		
Plantation Programme	13	236	6	95
Participation in activities by other organizations	2	48	12	1,424
Socio-Economic Survey	5	71		
Others	8	261	2	107
Total	228	9,486	66	4,270



Rescue activity by Ganga Praharis



Awareness Programme organized by Ganga Praharis



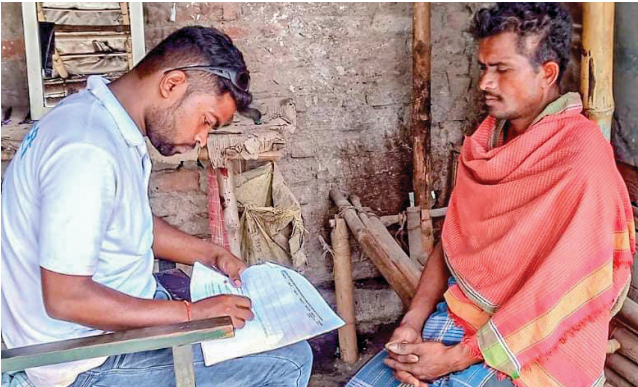
Cleanliness Drive

Participatory mapping of ecosystem services by local communities was carried out in 10 districts of two states, which includes Gorakhpur (n=1), Mau (n=1), Sant Kabir Nagar (n=1), Ayodhya (n=2), Gonda (n=1), and Pilibhit (n=3) districts of Uttar Pradesh state (no. of villages covered=9) and Chamoli (n=3), Rudraprayag (n=2), Tehri (n=1) and Pauri (n=3) districts of Uttarakhand state (no. villages covered = 9), along the rivers Ganga, Alaknanda, Dhauliganga, Ghaghra, Rapti, and Gomti. The purpose of the study is to

assess the perceived dependency of local communities on the ecosystem services provided by rivers (such as the biotic and abiotic resources, cultural and religious services, dependence of agriculture, livestock and other village-level economic constituents upon the riverine resources) and the change in the supply of these ecosystem services over the years, and the consequent change in livelihood. Participants were also asked about any disservices provided by the river.



Participatory mapping



Socio-economic survey conducted by Ganga Praharis

CELEBRATION OF SPECIAL DAYS AND EVENTS

A total of 5634 students including teachers participated in the special day celebrations at 30 different locations of the Ganga River Basin states.



Special Days Celebration	Locations	No. of Events	Total Participants
Van Mahotsav	3	3	400
World Population Day	3	3	290
International Youth Day	2	2	320
Teacher's Day	1	1	250
International Literacy Day	1	1	250
International Day for Preservation of Ozone Layer	2	2	220
Ek Tareekh Ek Ghanta Abhiyan	2	2	1,700
National Wildlife Week	13	13	1,774
International Farmer's Day	1	1	185
National Pollution Control Day	1	1	85
World Soil Day	1	1	160
TOTAL	30	30	5,634

BLOG POSTS

Created posts on various topics
for Ganga Darpan blog.

December 19, 2023

घाघरा नदी की यात्रा

-Shree Pal

घाघरा नदी जिसे गोगराया, घाघरा, नेपाली कौरियाला भी कहा जाता है। यह गंगा नदी की प्रमुख सहायक नदी है। यह दक्षिणी तिब्बत क्षेत्र में मैपचाचूनगों ग्लेशियर से करनाली नदी के रूप में निकलती है और नेपाल से होकर दक्षिण-पूर्व में बहती है। शिवालिक रेंज के दक्षिण की ओर कटते हुए, यह दो शाखाओं में विभाजित हो जाती है जो भारतीय सीमा के दक्षिण में जुड़ जाती है और घाघरा का निर्माण करती है।



December 13, 2023

Yamuna River: A Sacred Journey Through Myth, History, and Modern Life

By- Annie Bisht



Illustration – Arushi Bhatt

Introduction: The Yamuna is a river in India, the largest tributary of the Ganga River. It originates from Yamunotri in Uttarkashi, 30 kilometers north of Gangotri, and merges with the Ganga at Prayag (Prayagraj). Notable tributaries include Chambal, Sengar, Chhoti Sindh, Betwa, and Ken.

December 15, 2023

गंडक नदी

- विनीत रावत

गंडक नदी नेपाल और बिहार में बहने वाली एक नदी है जिसे बड़ी गंडक या केवल गंडक भी कहा जाता है। गंडक नदी हिमालय से निकलकर दक्षिण-पश्चिम बहती हुई भारत में प्रवेश करती है। त्रिवेणी पर्वत से पहले इसमें एक सहायक नदी त्रिशूली गंगा मिलती है। यह नदी काष्ठी दूर तक उत्तर प्रदेश तथा बिहार राज्यों के बीच सीमा निर्धारित करती है। उत्तर प्रदेश में यह नदी महाराजगंज और कुशीनगर जिलों से होकर बहती है। बिहार में यह चंपारन, सारन और मुजफ्फरपुर जिलों से होकर बहती हुई पटना के संमुख गंगा में मिल जाती है। इस नदी की कुल लम्बाई लगभग 814 किलोमीटर है, जिसमें से भारत में कुल 300 किलोमीटर है। इस नदी को नेपाल में शालीग्रामी या शालग्रामी और मैदानों में नारायणी और सप्तगंडकी कहते हैं।



PUBLICATIONS



INTERNATIONAL FORUMS

A presentation titled "Saving the Shelled Wonders: The Vital Role of Turtle Rescue and Rehabilitation in Preserving the Ganga Basin's Freshwater Ecosystem," was presented at the SCB's 31st International Congress for Conservation Biology (ICCB 2023) in Kigali, Rwanda from 23rd to 27th July.

During the 'World Water Week 2023', held at Waterfront Congress Centre, Stockholm, Sweden from 20th to 24th August 2023, Dr. Ruchi Badola and Dr. Syed Ainul Hussain were invited as panelists in the session 'Water Quality Management: Lessons learned from India', where they presented the accomplishments and insights derived from the ecological assessments undertaken as part of the NMCG-WII Ganga Biodiversity Conservation Initiative (Phase I & II).





RESEARCH ARTICLES

1. Dey, D., Shruti, M., De, K., Adhikari, B. S., & Hussain, S. A. (2024). Local and species contribution of beta diversity of macrophytes in perspective of conservation and restoration of Ganga River, India. *Hydrobiologia*, 1-18.
2. Mani, A., Kumari, M., & Badola, R. (2023). A GIS-Based Assessment of Asan River Basin for Watershed Management. In *Proceedings of 42nd INCA International Congress on Digital Cartography to Harness Blue Economy*. INCA: Dehradun, India.
3. Mani, A., Kumari, M., & Badola, R. (2023). Evaluating Urban Topography and Land Use Changes for the Urban River Management using Geospatial Technique. In *Proceedings of the 10th International Electronic Conference on Sensors and Applications*. MDPI: Basel, Switzerland. doi:10.3390/ecsa-10-16004A GIS-Based Assessment of Asan River Basin for Watershed Management.
4. De, K., Dey, D., Shruti, M., Uniyal, V. P., Adhikari, B. S., Johnson, J. A., & Hussain, S. A. (2023). β -diversity of odonate community of the Ganga River: partitioning and insights from local and species contribution. *Wetlands Ecology and Management*, 31(6), 899-912.



भारतीय वन्यजीव संस्थान
Wildlife Institute of India

NMCG

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

WII

Wildlife Institute of India
Chandrabani, Dehradun-248001, Uttarakhand
t.: +91135 2640114-15,+91135 2646100,
f.: +91135 2640117
wii.gov.in/nmcg/national-mission-for-clean-ganga

GACMC

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