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

ANNUAL REPORT
APRIL 2022 – MARCH 2023

नमामि गंगे

भारतीय वन्यजीव संस्थान
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Annual Report
April 2022 – March 2023

Project Investigators
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BACKGROUND

The Ganga River Basin covers India's 26.3% landmass, which is spread across 11 states, viz. Himachal Pradesh, Uttarakhand, Uttar Pradesh, Delhi, Haryana, Rajasthan, Bihar, Jharkhand, Chhattisgarh, Madhya Pradesh, and West Bengal. In terms of temperature, geomorphology, soil, biogeography, culture, and socioeconomic structure, the basin exhibits a significant degree of heterogeneity. The Ganga River's drainage basin is an intricate network of rivers and streams of Himalayan and Peninsular origin that contribute to 60% of its water flow. Alaknanda, Ramganga, Gomti, Ghaghra, Gandak, and Kosi are among the major tributaries that enter Ganga's north-bank and have their origins in the Himalayas. While the Yamuna River, which has its source in the Himalayas, and the Son River, which has its source in Peninsular India, are the main south-bank tributaries. The Ghaghra River contributes 20% to Ganga's water, while the Yamuna River contributes 16%. Ghaghra-Gomti, Kosi-Mahananda, Gandak, Yamuna, Son, Chambal, and Ramganga drains water into the Ganga in decreasing order. The Ganga River splits in Farakka, West Bengal, into the Padma River, which flows towards Bangladesh, and the Hooghly River, which runs through West Bengal and joins the Bay of Bengal, forming the world's biggest delta, the Sundarbans. The Peninsular rivers, namely Ajay, Rupnarayan, and Kangsabati (Kansai) revitalise the drainage of the Hooghly River. Along with improving the flow of the Ganga, these tributaries provide vital breeding grounds and refuge for aquatic keystone species. For example, the Nayar River provides a breeding grounds for the Golden mahseer (*Tor putitora*), while the Chambal and Ramganga rivers are breeding grounds for the gharial (*Gavialis gangeticus*). Whereas, Yamuna, Kosi, and Gandak rivers have breeding populations of Gangetic dolphin (*Platanista gangetica*). However, tributaries such as the Yamuna also discharge significant pollutants into the Ganga River, which has a cumulative effect on interrupting the nitrogen cycle and the ecosystem's assimilative capacity. Reduced flow and riparian vegetation cover, increased siltation, wastewater inflow from rural and urban areas, and unsustainable resource extraction have resulted from land use and land cover changes surrounding these streams. These anthropogenic influences have modified the hydrological regime and biodiversity of these tributaries, disrupting the Basin integrity. Considering the unique cultural, social, economic, and ecological value of the River, the Government of India (GOI) has been working towards its conservation through the Prime Minister's flagship programme – *Namami Gange* to achieve "*Aviral and Nirmal Dhara*", and to ensure its ecological and geological integrity.

Conservation of both the Ganga River and its aquatic biodiversity thus has been one of the most important attributes of the Namami Gange programme. Given this, the National Mission for Clean Ganga (NMCG) designated the Wildlife Institute of India (WII), an autonomous institute of the Ministry of Environment, Forest and Climate Change, Government of India as the lead knowledge partner of NMCG and entrusted WII with the "Biodiversity Conservation and Ganga Rejuvenation" project to prepare a science-based aquatic species conservation plan for the Ganga River. WII as a lead knowledge partner and conservation planning body of NMCG created the Ganga Aqualife Conservation Monitoring Centre (GACMC) to spearhead the conservation of the Ganga River and its biodiversity.

GACMC has a repository of information on biodiversity and issues of the Ganga River. It continuously provides information on third-party queries to NMCG and Forest

Departments of Ganga states. The spearhead teams comprising of the officials of the Forest Department of the Ganga basin states are carrying out training and ecological survey activities on their own such as Gangetic dolphin survey in Bihar, migratory bird survey at Sahibganj, Jharkhand, and training on ecological monitoring of rivers and wetlands in West Bengal. Stakeholders comprising personnel of the Forest and Veterinary departments, university professors, school teachers and students, religious groups, and local communities have been trained and sensitised. The rescue and rehabilitation centers established under the project enabled the Forest Department to scientifically tackle large consignments of confiscated aquatic animals, especially turtles of the Ganga River. The rescue team has successfully rehabilitated gharial, mugger, and more than 6,000 turtles back into the Ganga River, translocated muggers, and assisted in species restoration in the River. The trained cadre of forest staff, veterinarians, and a network of local communities and Ganga Praharis have improved the information network for poaching/ entrapment/ trade of the threatened aquatic species of the Ganga River. Livelihood and skill enhancement activities for local communities are aligning Ganga conservation with the green economy through livelihood centers, including the innovative mobile livelihood center "Jalaj". Trained volunteers, "Ganga Prahari", from riverside- communities are adopting sustainable livelihood practices and promoting sustainable use of natural resources, conducting cleanliness drives, plantation drives, biodiversity monitoring, and rescue operations, and actively participating in all NMCG activities. The specific skill set and the workforce of these Ganga Praharis are being recognised at the state as well as the national level inspiring more youth to join the cadre. Nature interpretation centers, "Ganga Darpan" and "Ganga Avlokan", are playing a major role in public outreach. The social media pages such as Facebook and Instagram, are followed by more than 3,000 people across the globe from all walks of life. The impact of the project is visible through the enhanced synergies between departments, agencies, and communities at local, national, and global scales, all committed to a cleaner Ganga River. Initial efforts made through the implementation of Phase I of the NMCG-WII Ganga biodiversity conservation initiative, the "Biodiversity Conservation and Ganga Rejuvenation" project, emphasised the urgent need for accounting basin scale natural and anthropogenic processes, and upscaling the present work to basin level to ensure sustainable and effective Ganga conservation actions. Further, it was realised that a centralised repository of basin-scale information and laboratory infrastructure is needed to ensure effective implementation of the project and decision support to NMCG, and subsequently, NMCG sanctioned Phase II of the project to WII, "Planning and Management for Aquatic Species Conservation and Maintenance of Ecosystem Services in the Ganga River Basin for a Clean Ganga".



PHASE II

Planning and Management for Aquatic Species Conservation and Maintenance of Ecosystem Services in the Ganga River Basin for a Clean Ganga.

OBJECTIVES

01 Strengthen the aquatic biodiversity conservation measures at six identified biodiversity hotspots along the Ganga River and monitor status of other areas.

02 Explore the natural and assisted colonisation of species of conservation significance to other stretches of mainstem Ganga River.

03 Determine the current state of aquatic environment and biodiversity of the major tributaries and wetlands in Ganga basin.

04 Identify direct and indirect drivers affecting the integrity of the aquatic environment and biodiversity in the Ganga basin.

05 Pinpoint problematic areas and identify conservation priority zones.

06 Strengthen/establish rescue and rehabilitation centres at strategic locations for aquatic species in distress.

07 Involve communities and other stakeholders in the conservation process through capacity building, innovation and strengthening existing institutions.

08 Garner support for aquatic biodiversity and Ganga conservation through education and outreach programs.

09 Identify and analyse the hydro-socio-ecological relations in the river basin for efficient and targeted conservation action.

10 Prepare an action plan to minimise the negative impacts of the direct and indirect drivers on the aquatic environment and biodiversity of the select tributaries of the Ganga basin.

11 Develop a centralised facility of laboratories and resource centre for aiding in science based management of the Ganga River and its tributaries.

AIM

To intensify the conservation efforts in identified sites along the mainstem Ganga River and up-scale the conservation effort to basin level for aquatic biodiversity conservation and maintenance of ecosystem services for a clean Ganga.

This report provides component wise information on the work done during April 2022 – March 2023.

COMPONENT 01

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



COMPONENT 02

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



COMPONENT 03

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



COMPONENT

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

Habitat modification, fragmentation, invasive species, overexploitation, pollution and climate change are some of the looming threats to freshwater diversity. In addition, persistent xenobiotics, nano-particles and micro-plastics pose a toxicological risk to the freshwater ecosystem. This component aims to document the aquatic diversity of the Ganga River basin and the threats to them, for science-based aquatic species conservation planning. Such documentation would aid in the decision-making process and can facilitate the prediction of future impacts under various scenarios. In addition, the loss of individuals as a result of accidental trapping in fishnets, injury by crafts, and poaching also contribute to the decline in the population of the priority species, viz. Gangetic dolphin, otters, gharial and mugger. To address such emergent situations and to abate the loss of individuals, rescue and rehabilitation centres are being strengthened/upgraded at strategic locations along the Ganga River, through this component. Such efforts would aid in effective rescue and subsequent rehabilitation of the rescued individuals.

ECOLOGICAL ASSESSMENT

A systematic approach to river and biodiversity conservation planning

A boat-based post-monsoon survey of around 850 km was conducted between November 2022 to February 2023 to assess the biodiversity patterns of the major tributaries of the Ghaghra River, viz., Sharda, Kauriala, Girwa, Babai and



1

Rapti rivers. Species such as Gangetic dolphin, gharial, mugger, water and water-associated birds and turtles were recorded during the survey. In addition, one individual of smooth-coated otter was sighted along the Girwa River.

Intensive boat-based visual biodiversity surveys were carried out in the Ghaghra and Gandak rivers between March and April 2023. In the Ghaghra River, the survey was conducted between Girijapuri to Revelganj at Ganga confluence, covering a distance of 615 km. While for the Gandak River, a distance of 290 km from Valmikinagar to Sonepur was surveyed. Gangetic dolphin, gharial, muggers, freshwater turtles, including *Nilssonia gangetica* and water and water-associated bird species were documented during the surveys. Several nests of Indian Thick-knee, river lapwing, red-wattled lapwing, small pratincole, little tern, Indian skimmer, red-naped ibis, Egyptian vulture, white-throated kingfisher, pied kingfisher, grey-throated martin and wire-tailed swallow in the river habitat were recorded from the Ghaghra River. In addition, the congregation of Indian skimmers at two sporadic sites along the Ghaghra River was also documented.

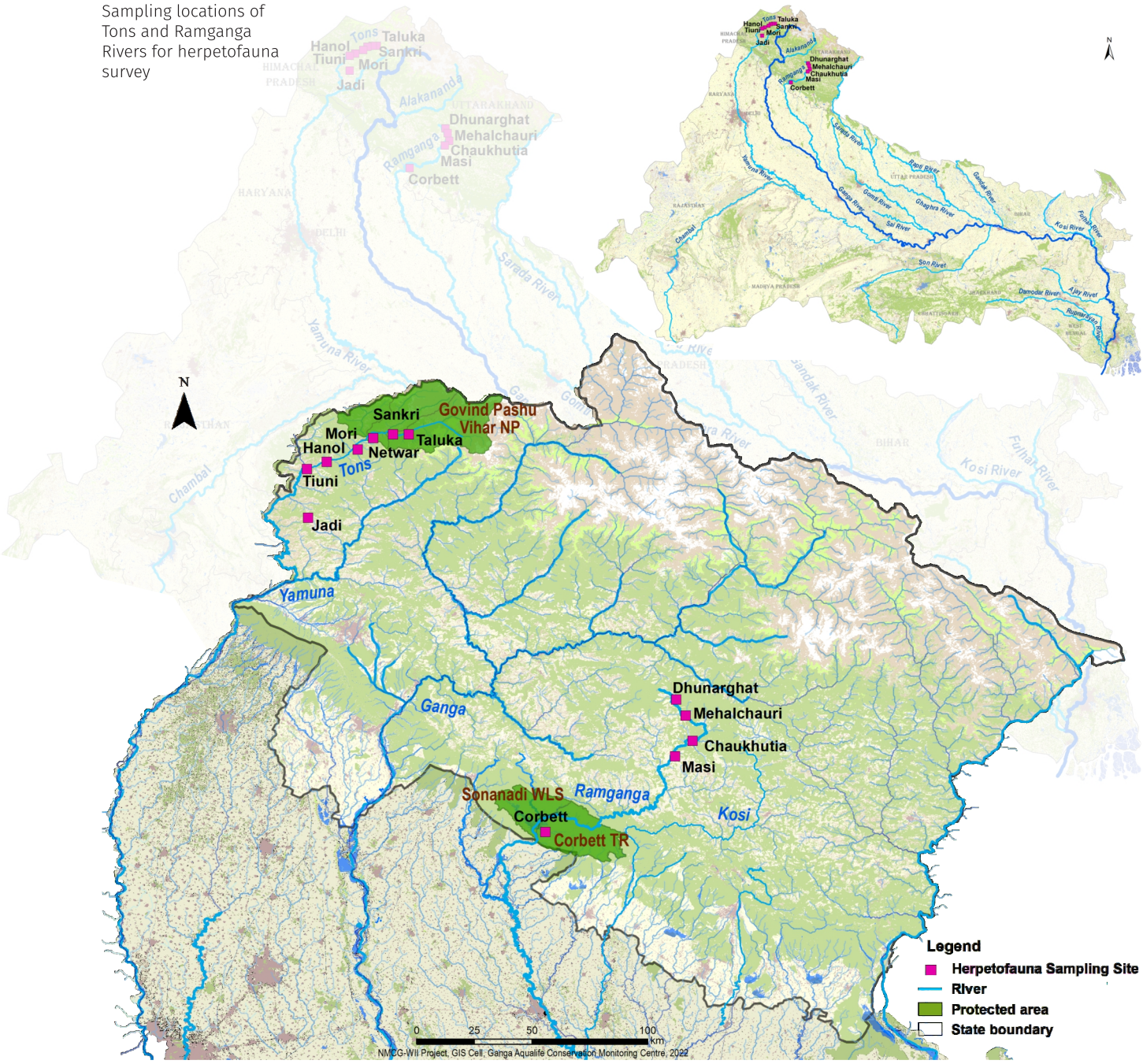


Studies on crocodiles and herpetofauna

Further population trend analysis of two freshwater crocodylian viz, gharial (*Gavialis gangeticus*) and mugger (*Crocodylus palustris*) and genetic assessment of mugger was performed to understand their current population and genetic status and to guide ongoing conservation efforts in the Chambal River. Both the species showed a positive growth trend. Both the species showed a positive growth trend, gharial, with an exponential rate of increase (r) of 0.10 and percent change at 11%, and mugger, with an exponential rate of increase (r) of 0.101 and percent change at 10.6%. The genetic assessment revealed relatively high level of genetic diversity in mugger as compared to gharial in the Chambal River. The overall mean number of alleles per locus was 3.18 ± 0.85 and the observed (Ho) and expected (He) heterozygosities were 0.53 ± 0.12 and 0.48 ± 0.08, respectively.

Surveys were conducted to document herpetofauna along the Tons and Ramganga rivers from June to October 2022. Using the visual encounter method, 22 herpetofauna species were recorded along the Tons River, including 14 reptiles and eight amphibian species. Twenty-five herpetofauna species were recorded along the Ramganga River, including 17 reptiles and eight amphibian species.

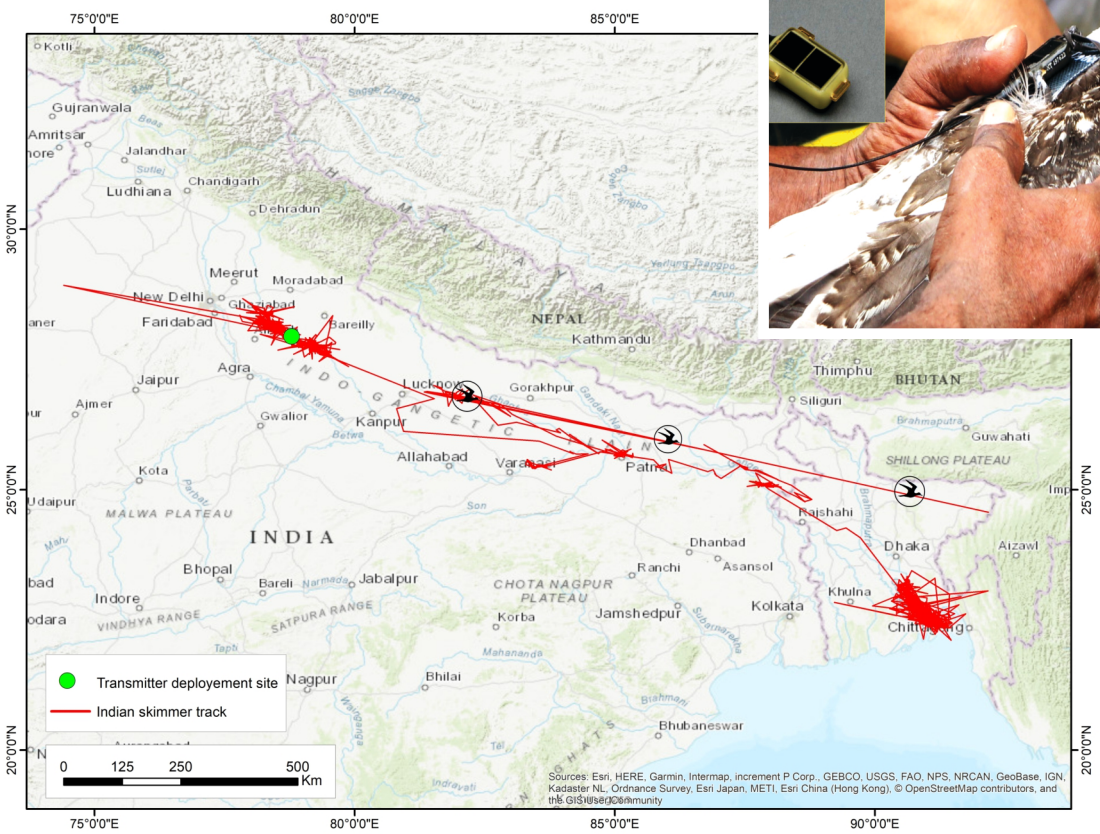
Sampling locations of Tons and Ramganga Rivers for herpetofauna survey



Satellite Tracking of Breeding Birds

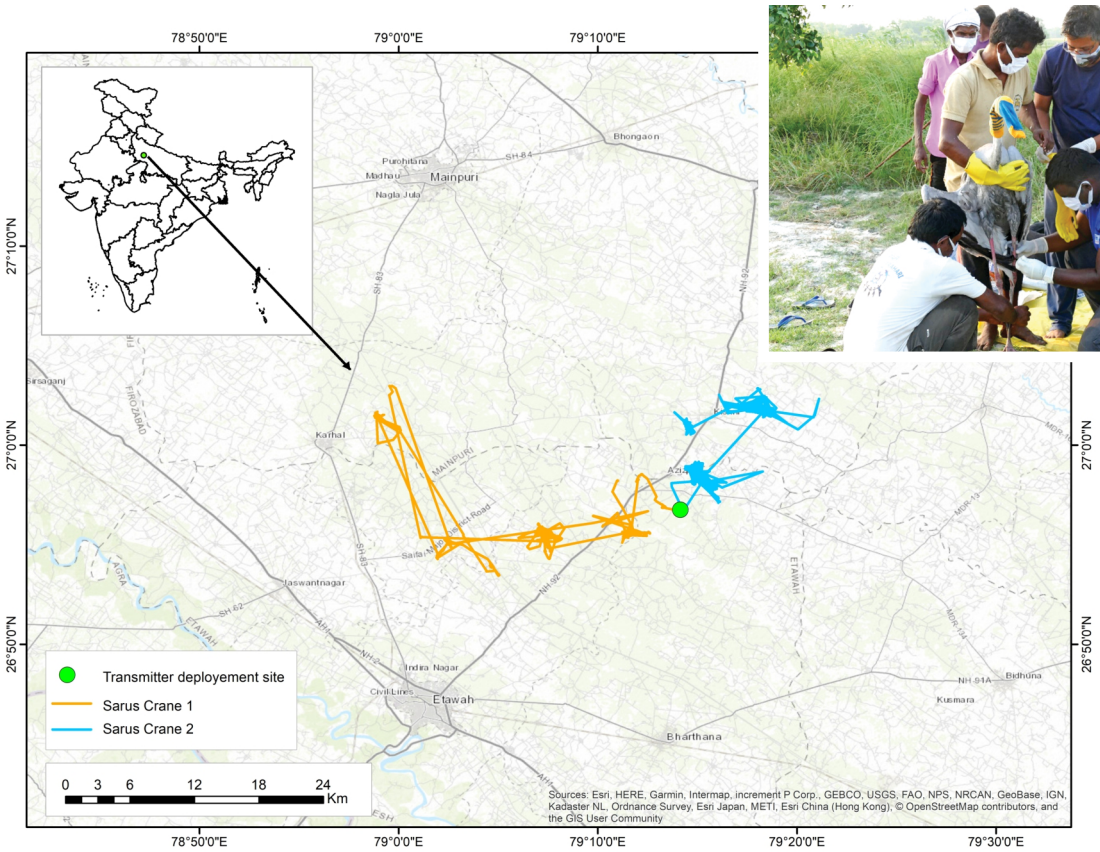
Two individuals each of the Indian skimmer (*Rynchops albicollis*) and Sarus crane (*Grus antigone*) were captured and satellite tagged in Bulandshahr, Uttar Pradesh and Etawah, Uttar Pradesh, respectively. One of the tagged Indian skimmers travelled a distance of around 32,655 km (average 105.3 km/day) within 310 days (Figure 1.2). This individual covered a large geographic distance from Rajasthan (Hanumangarh district) in India to to Nijum Dwip of Sunderban in Bangladesh. In the Ganga mainstem, this individual travelled between Anupshahr to Farrukhabad in the middle stretch and Ghazipur to Rajmahal in the lower stretch. This individual also visited the Ramganga, Ghaghra and Kosi rivers.

Since the deployment of the transmitter, Sarus crane individuals (n=2) have covered a distance of 874 km (average 2.9 km/day) and 1,504 km (average 5.1 km/day). The home range for one of the Sarus crane is 242 sq. km, between Sarasai Nawar wetland and paddy fields of Etawah district. The home range of other bird is 89 sq. km, between Sarasai Nawar wetland and paddy fields of Kishni in Manipuri district.



Satellite tagging of Indian skimmer

Movement of Indian skimmer



Satellite tagging of Sarus crane

Movement of Sarus crane

Important insights from the ecological assessment

Himalayan Wolf Snake (*Lycodon mackinnoni***)**

During the survey carried out from June-October 2022, a rare Himalayan wolf snake was recorded from the Tons River. After being first reported from Mussoorie 112 years ago, the Himalayan wolf snake has been recorded for the first time from the Tons River in the Ganga River basin. Presently this species is restricted to the western Himalayas, from Uttarakhand through Jammu & Kashmir to POK in Pakistan. In the Ganga River Basin, the species is found in terrestrial and rocky areas at an elevation ranging from 900 to 2,000 m asl. The individuals of this species are generally 350 to 456 mm in length, dorsum greyish-brown, with a network of yellow bands from just behind the head to the vent. It is threatened by vehicular traffic, pollution and other tourism related activities. The species is currently classified as "Near threatened" in the IUCN Red List of threatened species. However, it is not listed in the Wild Life (Protection) Act, 1972.



Himalayan wolf snake

Elongated tortoise (*Indotestudo elongata*)

During the survey conducted from June to October 2022, an elongated tortoise was recorded from the Ramganga River. This is a rare species found in India, Nepal, Bangladesh, Myanmar, Southern China, Thailand and Vietnam. In India, this species is found in the foothills of the Himalayas, along the riparian Sal forests. Their shell is considerably depressed, carapace (length upto 360 mm) and the plastron is brownish yellow, each shield with an irregular black spot or blotches. They consume a wide range of foods, such as various types of vegetables, meat, snails, and eggs. The threats to this species are mass harvesting for food markets in China and East Asia, habitat destruction and illegal collecting for the pet trade. The species is currently classified as "Critically endangered" in the IUCN Red List of threatened species and listed under the Scheduled IV of the Wild Life (Protection) Act, 1972, and Appendix II of the CITES.



Elongated tortoise

For the first time, the caspian tern, grey plover, black-faced bunting, black stork were recorded from the Ghaghra River.

a) Black-faced Bunting

b) Caspian tern

c) Grey Plover

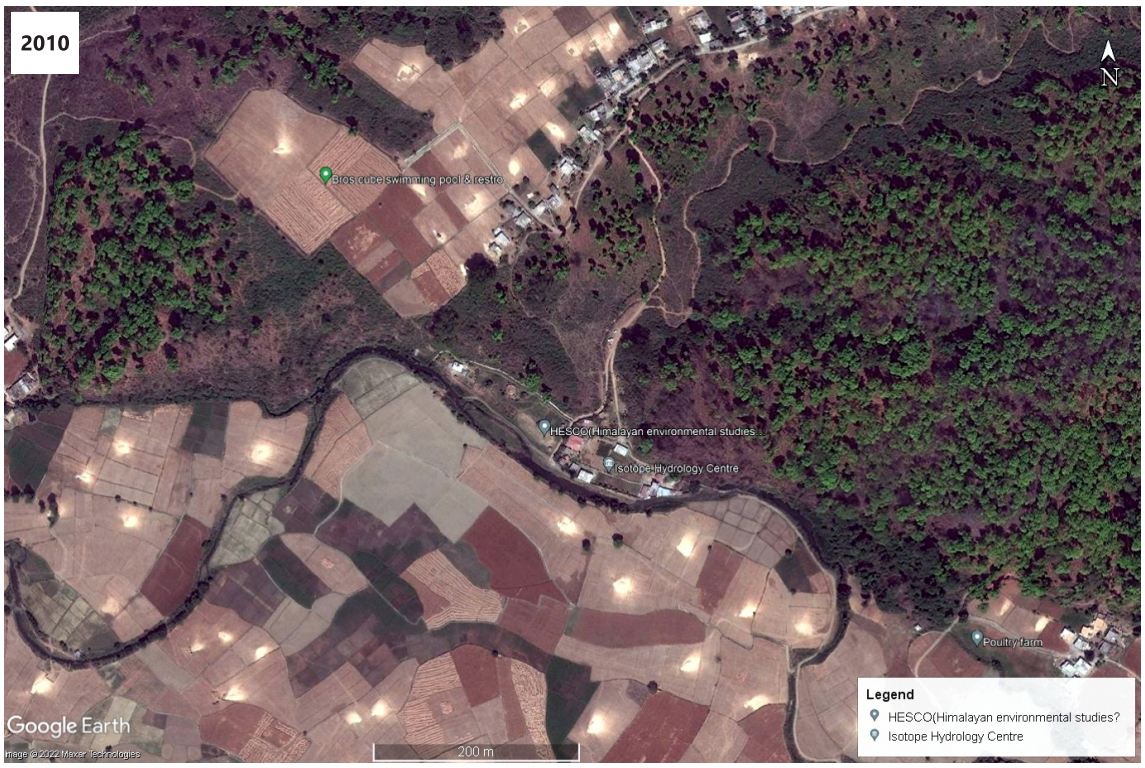






Study of Small Tributaries and their Rejuvenation: Case Study

An assessment of the river rejuvenated by the Himalayan Environmental Studies and Conservation Organisation (HESCO) was undertaken to study ecosystem services provided by the forests rejuvenated by HESCO. A total of 120 bird species were recorded, of which the maximum species were recorded in forest habitats, followed by agriculture and riverine habitats. The findings of the assessment are drafted in the report.



Imagery from 2010 showing the landscape around HESCO



Imagery from 2022 showing the landscape around HESCO

Four small tributaries, namely Asan in Uttarakhand, Solani and Garra in Uttar Pradesh, and Chandan in Bihar were taken up for the study to identify the status of small rivers in the Ganga River Basin. The study revealed that the Asan River Basin supports 88% of bird and 76% of fish species reported from the upper Ganga River and 31.03% of reptile and 25% of amphibian species reported from the entire Ganga River. Solani River Basin supports 57% of bird



Asan River Basin



Solani River Basin

species, 21% of fish species, 87.93% of reptile species and 35.71% of amphibian species reported from the Ganga River. Garra River Basin supports 68% of bird species, 4.6% of fish species, 9% of invasive fish species, 39.66% of reptile species and 10.71% of amphibian species reported from the Ganga River. The findings of the study were drafted in the reports.



Garra River Basin



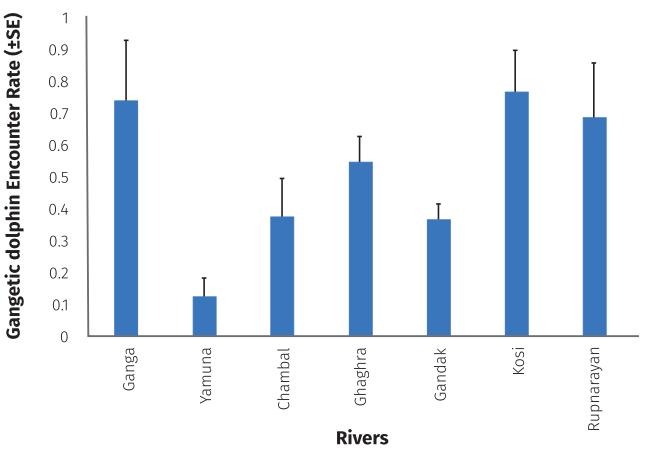
Chandan River Basin

ACTIVE ADAPTIVE MANAGEMENT PLANNING

Priority areas to strengthen the conservation measures

River conservation planning

Surveys were carried out in eight major rivers in the Ganga River Basin, namely Ganga, Yamuna, Ghaghra, Gandak, Kosi, Chambal, Son and Rupnarayan, to assess the population status of Gangetic dolphin. A total of 2,151 visual sightings of surfacing dolphins with mean encounter rate of 0.55 ± 0.09 sightings/km of the river was observed in 4635 km of the surveyed rivers.



Encounter rate of dolphin sightings per km in eight major rivers of Ganga Basin



Ecological survey in the Ganga Basin

The assessment revealed a 24.37 % decline in the Gangetic dolphin range since 1878. The population estimation was done using two approaches, the N-mixture and correction factor based. The model-based abundance of dolphin was 3,330 ± 620 individuals and correction factor-based estimation was 3,270, ± 229 individuals in the Ganga River Basin (Table 1.1).

Table 1.1: River wise abundance estimates of the Gangetic dolphin in the Ganga Basin

River	Estimated population (Mean ± SE)
Ganga	2,009.76 ± 332.04
Yamuna	97.14 ± 28.49
Chambal	110.86 ± 27.2
Ghaghra	532.83 ± 108.38
Gandak	169.02 ± 44.84
Kosi	311.38 ± 58.56
Rupnarayan	99.48 ± 20.74
Ganga Basin	3,330 ± 620

Hydro-morphological and anthropogenic variables such as channel depth, width, river type and meanders were found to influence dolphin occurrence. For effective conservation planning, the flagship species approach was adopted, for which the Gangetic dolphin (*Platanista gangetica*) was chosen as a flagship species. About 40.8% of the river stretches were delineated as conservation priority stretches (Table 1.2).



Table 1.2: Length of identified priority stretches in Ganga Basin for river conservation

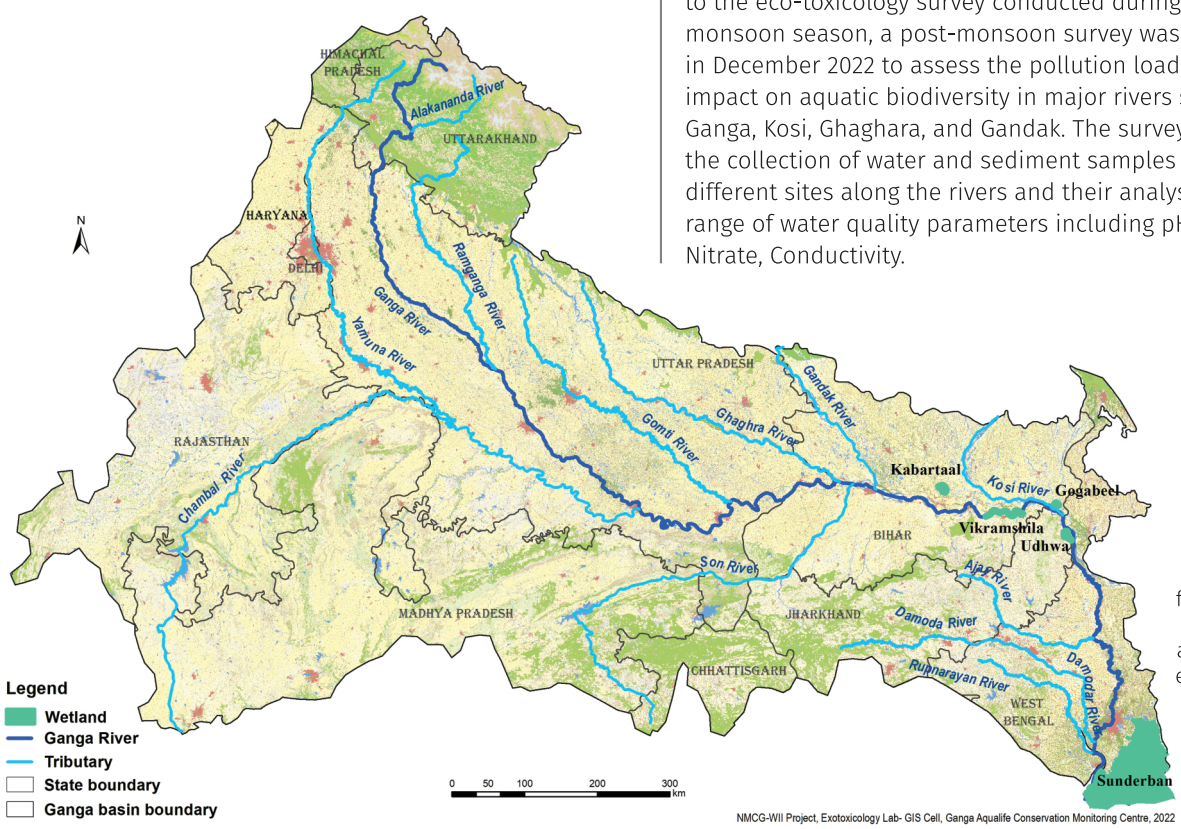
River	Total length (km)	Surveyed length (km)	Conservation Priority Stretches (km)
Ganga	2,525	2,070	1,070
Yamuna	1,435	435	115
Chambal	960	405	195
Ghaghra	1,123	615	290
Son	784	500	30
Gandak	775	295	115
Kosi	729	235	160
Rupnarayan	280	80	65
Total	8,346	4,635	2,040 (40.8 %)

TECHNOLOGY IN ECOLOGY

Integrating modern approaches in conservation

Eco-toxicological Assessment

Eco-toxicology survey was conducted during the monsoon season from August to September 2022 to assess water quality parameters on-site and collect abiotic and biotic samples from five wetlands in the Ganga River basin, namely Vikramshila, Gogabeel, and Kabartal in Bihar, Udhwa in Jharkhand, and Sunderban in West Bengal. Important water quality parameters, including pH, dissolved oxygen (DO), total dissolved solids (TDS) and nitrate were assessed on-site and surface water samples were analysed for heavy metal contamination. In addition to the eco-toxicology survey conducted during the monsoon season, a post-monsoon survey was carried out in December 2022 to assess the pollution load and its impact on aquatic biodiversity in major rivers such as Ganga, Kosi, Ghaghara, and Gandak. The survey involved the collection of water and sediment samples from different sites along the rivers and their analysis for a range of water quality parameters including pH, DO, TDS, Nitrate, Conductivity.



Sampling locations of the wetlands for assessment of pollution and associated ecological risks

Important Findings

Preliminary analysis of the data suggests that certain sites in these wetlands may be subject to pollution load resulting from anthropogenic pressure. However, as the survey was conducted during the monsoon season, further monitoring efforts need to be conducted during different seasons to understand the temporal dynamics of contaminants distribution and their potential impact on the aquatic ecosystem.

Genetic Analysis

The study was conducted to assess the genetic diversity, gene flow, and demographic patterns in the aquatic fauna of the Ganga River basin. A total of 408 biological samples were collected from different tributaries in the Ganga River Basin, namely the Gomti, Kosi, Gandak, and Yamuna rivers. Genetic barcodes were generated from samples collected from the Gandak and Kosi rivers to resolve taxonomic dilemmas and identify lineages and gene flow patterns. The genetic characterisation of African sharptooth catfishes (*Clarias gariepinus*) in the selected stretch of the Yamuna River was also assessed.



Mitogenome sequence data for *Wallago attu* fish species were generated from 19 localities across Ganga, Ramganga, Sharda, Saryu, Rapti, Gandak, and Kosi to examine the gene flow pattern in the Ganga River Basin. The data analysis and drafting of a manuscript are in process.

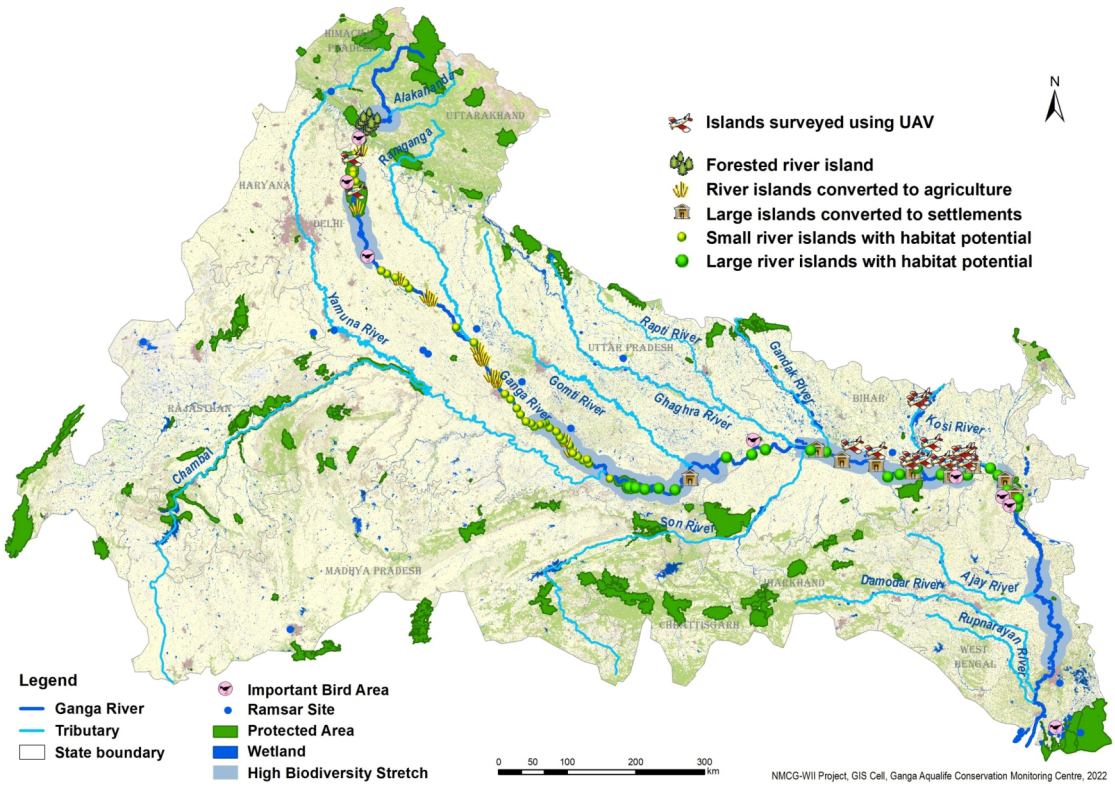
The population genetic structure of critically endangered turtles, namely three-striped roofed turtle (*Batagur dhongoka*) and red-crowned roofed turtle (*Batagur kachuga*), were determined using mtDNA and microsatellite markers. Additionally, the population demography of Indian flapshell turtle (*Lissemys punctata*) was examined. The data will provide robust information for scientific repatriation for the conservation and recovery of the species.

A training workshop on "Genetic study and biodiversity conservation in reference to aquatic species from Ganga River basin and collection and preservation of biological samples" was organised to train forest officials of Bhagalpur, Bihar, on May 26th, 2022. A total of 26 forest officials, including Veterinary Officers, Range Officers, Foresters, and other staff, participated in the workshop.



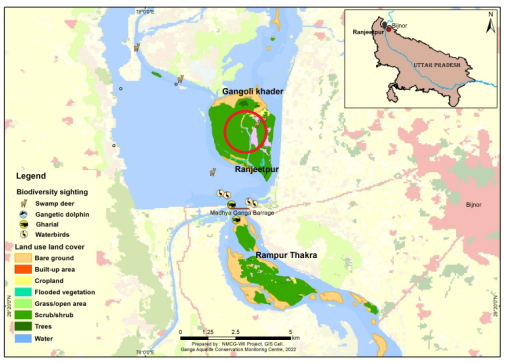
A Nested UAV-RS Approach for Monitoring the River Islands Diara

In surveillance activities such as rivers, bridges, and shorelines inspection and monitoring, an autonomous unmanned aerial vehicle (UAV) can reduce operational expenses, speed the monitoring process, and be employed in situations when a manned inspection is not possible. UAV based surveys were undertaken to study the river islands near the Hastinapur Wildlife Sanctuary. The survey revealed that the islands in the middle Ganga are smaller in size than those in the lower Ganga. The conversion of islands into agricultural fields has begun; the river islands in Rampur shows 80% disturbance, and the island of Khijarpur is being transformed, as evidenced by satellite imagery taken five years ago. The deer habitat in the nearby towns of Shirjepur, Lalpur, and Khirjurpur needs to be managed along with agricultural activity. During the survey, a rare sighting of the Indian grassbird (*Graminicola bengalensis*), which is listed as 'Near Threatened' in the in the IUCN Red List of threatened species, along with the Indian softshell turtle (*Nilsonia gangetica*) (VU) and Indian roofed turtle (*Pangshura tecta*) (LC) were recorded.



Map depicting high biodiversity stretches and UAV survey location

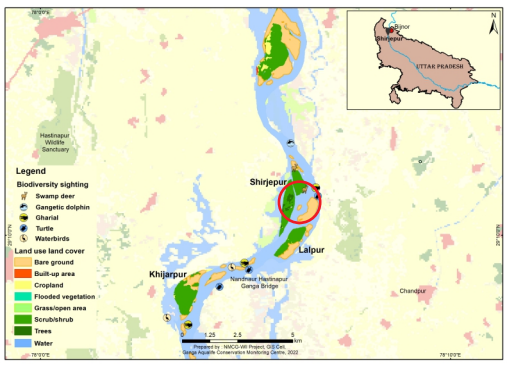
Mapping via the UAV drone



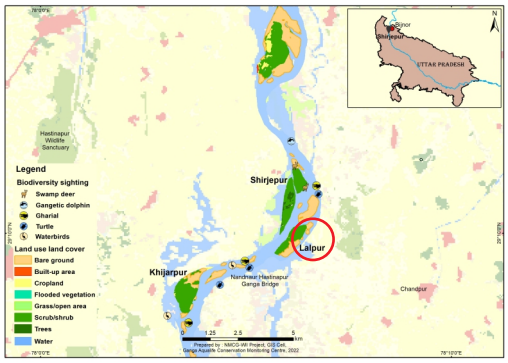
Gangoli khader/Ranjeetpur
Good habitat, scrub veg, low disturbance







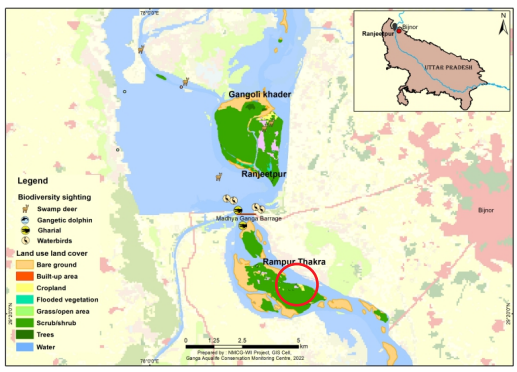
Shirjepur near Behbalpur region
Natural vegetation, low disturbance



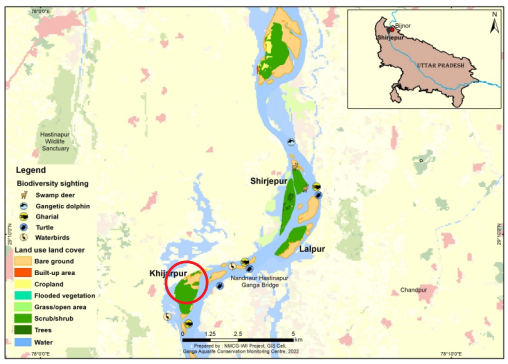
Lalpur near Raipur Khader region
Natural Vegetation, low disturbance







Rampur Thakra
Converted to agriculture, high disturbance

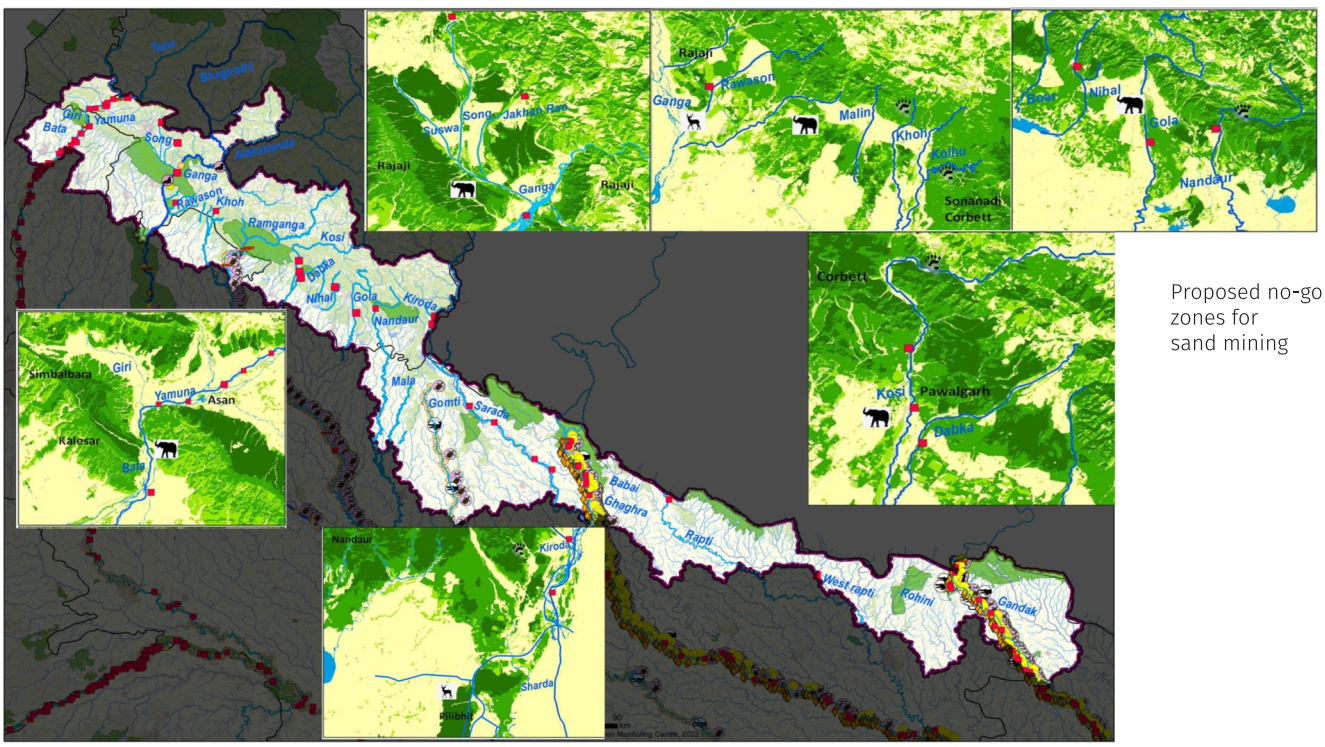


Khijarpur near Nandnaur Hastinapur Ganga bridge
Converted to agriculture, high disturbance



UAV-based Survey on Sand Mining in the Terai Arc Landscape

To assess the impacts of sand mining in the rivers of the Terai Arc Landscape, several drone flights were made on select sites and then the data obtained was processed at the WII Headquarters in Dehradun for proposing no-go zones for sand mining in river eco-sensitive zones. Sand mining regulations should be imposed in these areas and the restrictions for distance from forests, Protected Area, and important riparian habitats such as river islands and crossing corridors should be formulated. The proposed no-go zone for sand mining using the UAV drone includes Rawason, Khoh, Nihal and Kosi rivers, Dabka upstream, Gola elephant corridor, Nandhaur River upstream and near State Industrial Development Corporation of Uttarakhand Limited (SIDCUL), Kiroda nala and Sharda River near Boom Forest range, Song River and Jakhan Rao, and Giri, Bata and Yamuna confluence.



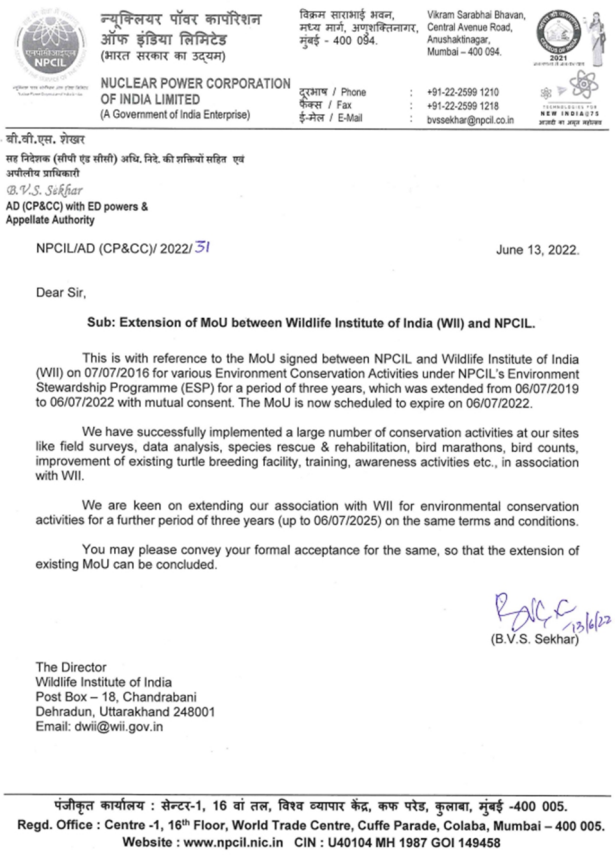
Proposed no-go zones for sand mining

The presence of multiple water channels in the Terai Arc Landscape contributes to its hydrological diversity and supports various ecosystems. The UAV-based survey was carried out in rivers within the Terai Arc Landscape, viz. Khoh, Kosi, Gola, Nandaur, Bhakra-Nihal, and Sarada. The purpose was to preliminary assess and visualise the current situation of surrounding areas, river morphology, hydrological patterns, vegetation cover, connectivity, and any potential human impacts.



PARTNERSHIP FOR CONSERVATION

MoU signed between the Nuclear Power Corporation of India (NPCIL) and the Wildlife Institute of India (WII) was extended on 13th June 2022 till 6th July, 2025. Publication related with this MoU entitled "Biodiversity Conservation and Ganga Rejuvenation - A unique partnership with Nuclear Power Corporation of India" was released on 11th October 2022 at NMCG, New Delhi.



न्यूक्लियर पॉवर कार्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)

विक्रम साराभाई भवन, मध्य मार्ग, अणुशक्तिनगर, मुंबई - 400 094.

Vikram Sarabhai Bhavan, Central Avenue Road, Anushaktinagar, Mumbai – 400 094.

NUCLEAR POWER CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

दूरभाष / Phone : +91-22-2599 1210
फैक्स / Fax : +91-22-2599 1218
ई-मेल / E-Mail : bvssekhar@npcil.co.in

बी.वी.एस. शेखर
सह निदेशक (सीपी एंड सीसी) अधि. निदे. की शक्तियों सहित एवं अपीलीय प्राधिकारी
B.V.S. Sekhar
AD (CP&CC) with ED powers & Appellate Authority

NPCIL/AD (CP&CC)/ 2022/ 31 June 13, 2022.

Dear Sir,

Sub: Extension of MoU between Wildlife Institute of India (WII) and NPCIL.

This is with reference to the MoU signed between NPCIL and Wildlife Institute of India (WII) on 07/07/2016 for various Environment Conservation Activities under NPCIL's Environment Stewardship Programme (ESP) for a period of three years, which was extended from 06/07/2019 to 06/07/2022 with mutual consent. The MoU is now scheduled to expire on 06/07/2022.

We have successfully implemented a large number of conservation activities at our sites like field surveys, data analysis, species rescue & rehabilitation, bird marathons, bird counts, improvement of existing turtle breeding facility, training, awareness activities etc., in association with WII.

We are keen on extending our association with WII for environmental conservation activities for a further period of three years (up to 06/07/2025) on the same terms and conditions.

You may please convey your formal acceptance for the same, so that the extension of existing MoU can be concluded.

(B.V.S. Sekhar)

The Director
Wildlife Institute of India
Post Box – 18, Chandrabani
Dehradun, Uttarakhand 248001
Email: dwii@wii.gov.in

पंजीकृत कार्यालय : सेन्टर-1, 16 वां तल, विश्व व्यापार केंद्र, कफ परेड, कुलाबा, मुंबई -400 005.
Regd. Office : Centre -1, 16th Floor, World Trade Centre, Cuffe Parade, Colaba, Mumbai – 400 005.
Website : www.npcil.nic.in CIN : U40104 MH 1987 GOI 149458

Extended MoU between NPCIL and WII



Release of publication: Biodiversity Conservation and Ganga Rejuvenation - A unique partnership with Nuclear Power Corporation of India

RESCUE, REHABILITATION, RELEASE, AND RESEARCH

Four R's to strengthen conservation measures

A total of 759 turtles were rehabilitated, including 692 three striped roofed turtles and 67 Indian flap-shell turtles, from Kachua Punarwas Kendra, Sarnath, Uttar Pradesh. Presently, 236 and 21 individuals of turtles belonging to eight species, viz., red crowned roofed turtle (*Batagur kachuga*), three striped roofed turtle (*Batagur dhongoka*), Indian flapshell turtle (*Lissemys* spp.), spotted pond turtle (*Geoclemys hamiltonii*), Indian tent turtle (*Pangshura tecta*), brown roofed turtle (*Pangshura smithii*), crowned river turtle (*Hardella thurjii*) and Indian black turtle (*Melanochelys trijuga*), are being rehabilitated at Kachua Punarwaas Kendra in Sarnath and Ganga Aqualife Rescue and Rehabilitation Centre in Narora, respectively. The facilities at Barrackpore, West Bengal and Barhi, Madhya Pradesh, are in a state of readiness to receive rescued chelonians from any emergent situations that may arise. Three capacity building workshops in managing emergent situations of aquatic macro-fauna were organised for West Bengal Forest Department personnel, and veterinarians and para-veterinarians of the Rajasthan Animal Husbandry Department working along Chambal River.



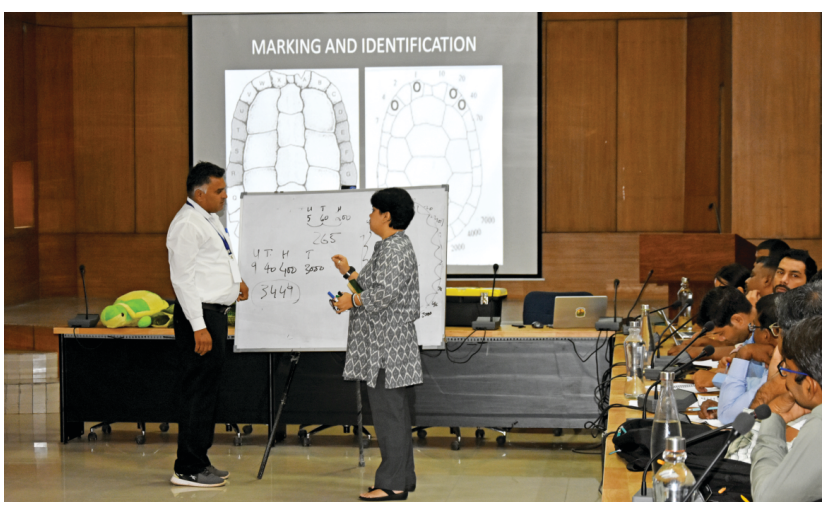


Ganga Aqualife Rescue and Rehabilitation Centre, Narora



Kachua Punarvas Kendra, Sarnath











Capacity Building

PROJECT APPRAISAL

Monitoring project implementation

The Sixth and Seventh meeting of the Monitoring Committee was held under the Chairmanship of Director General, NMCG, Shri G. Asok Kumar, on 11th April 2022 and 29th November 2022, respectively at the Wildlife Institute of India. The Committee members Padma Bhushan Dr. Anil Prakash Joshi, Prof. Jamal Ahmad Khan, Aligarh Muslim University, Prof. Rajiv Sinha, IIT Kanpur appreciated the efforts put in by the NMCG-WII team to carry the project activities. The committee member released reports and brochures.









COMPONENT

CAPACITY BUILDING OF FOREST DEPARTMENT PERSONNEL AND OTHER STAKEHOLDER

Successful implementation of the conservation action plan will depend on the capacity of the stakeholders trained in monitoring of aquatic biodiversity, management planning of wetland, rescue and rehabilitation protocols. Further, to detect any changes in habitat features and species assemblage in future, the capacity of different stakeholders including forest departments, animal husbandry departments, veterinarians and volunteers from concerned areas will be extremely critical. With this background, this component aims to developing capacities of stakeholders for effective conservation of the Ganga.

CATCH THEM YOUNG — THE BAL GANGA PRAHARI PROGRAMME

Linking Bal Ganga Prahari with conservation

In the Ganga River Basin, the Bal Ganga Prahari programme were organised in 16 districts and five states, Uttarakhand (no. of districts, n=7), Uttar Pradesh (n=6), Bihar (n=1), Rajasthan (n=1), and Haryana (n=1). A total of 66,064 students from 104 schools participated in the programme from April 2022 to March 2023.



2

SPEARHEAD TEAM

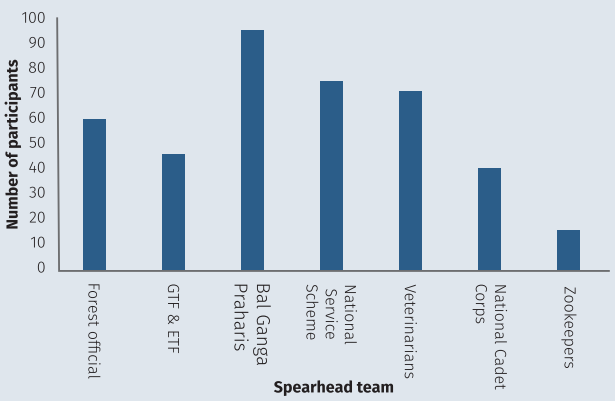
To promote and expedite the conservation efforts

Seven National level spearhead training workshops were conducted for different stakeholder groups. A total of 404 spearhead team members were trained on different aspects of biodiversity conservation. The spearhead team members trained comprise of 35 forest officials (from Ranthambore Tiger Reserve, Mukundra Hills Tiger Reserve, National Chambal Sanctuary and Ramgarh Vishdhari Tiger Reserve), 75 National Service Scheme (NSS) volunteers (from universities and colleges in the Ganga River basin) 46 army personnel (from Ganga Task Force & Eco Task Force), 45 Rescue team (four Veterinarians, 16 Zookeepers, 25 Forest officials involve in rescue operations, 41 National Cadet Corps (NCC) from different colleges of Uttarakhand, 67 Veterinary College students from Ganga and other river states and 95 Bal Ganga Praharis (from Uttarakhand). Other stakeholders such as teachers, college students, local communities, Ganga Praharis, from the Ganga basin states were also trained during training workshops (Table 2.1).





Spearhead team training

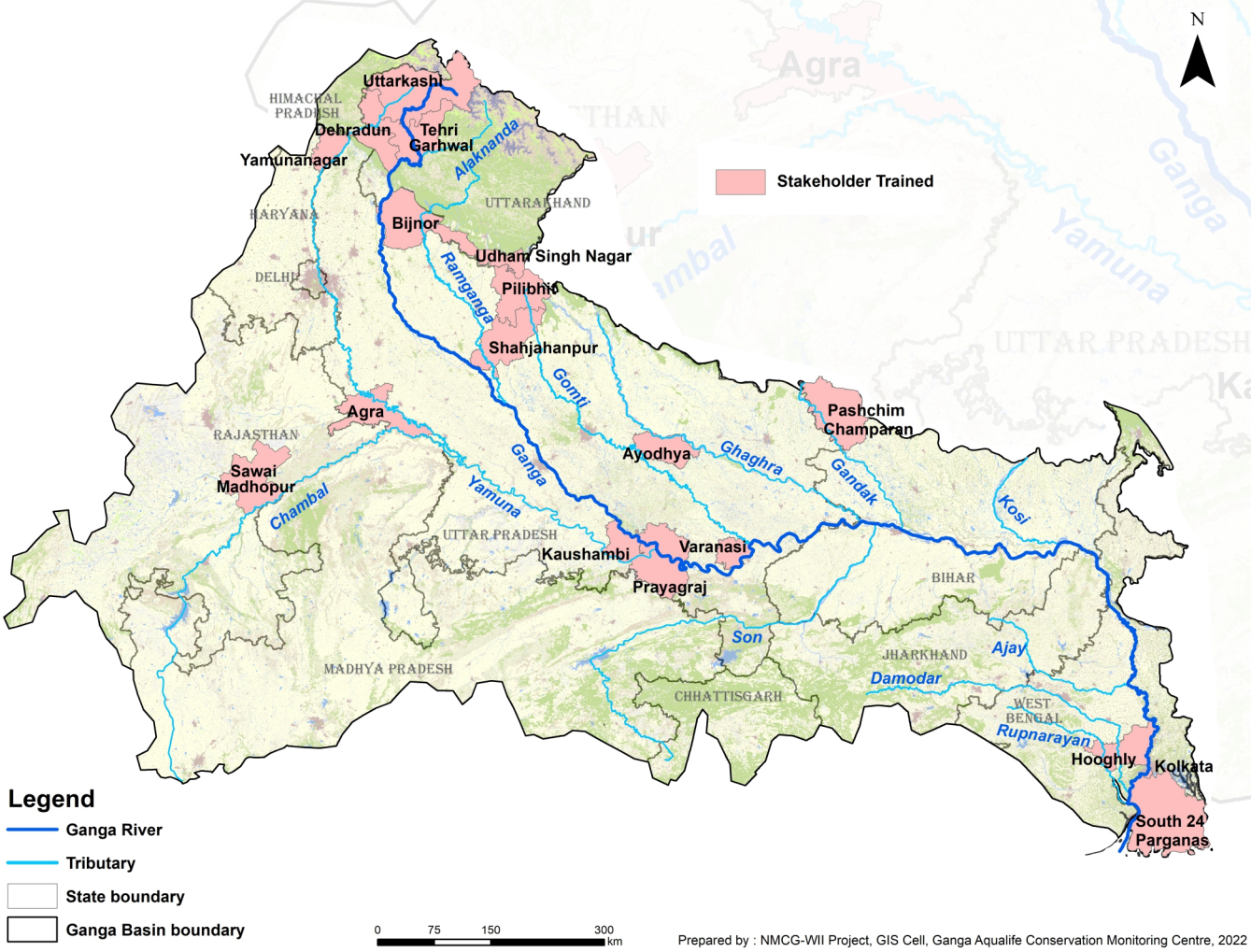


Training of spearhead team conducted in Ganga River Basin from April 2022 to March 2023

Table 2.1: Total number of other stakeholders trained at the Ganga basin States

States	Teacher	College Student	Local Communities	Ganga Praharis	Bal Ganga Praharis
Uttarakhand	83	123	40	00	68
Bihar	01	00	00	00	00
Uttar Pradesh	91	188	00	46	00
Rajasthan	03	00	00	00	00
Haryana	06	00	00	00	00
Total	184	311	40	46	68

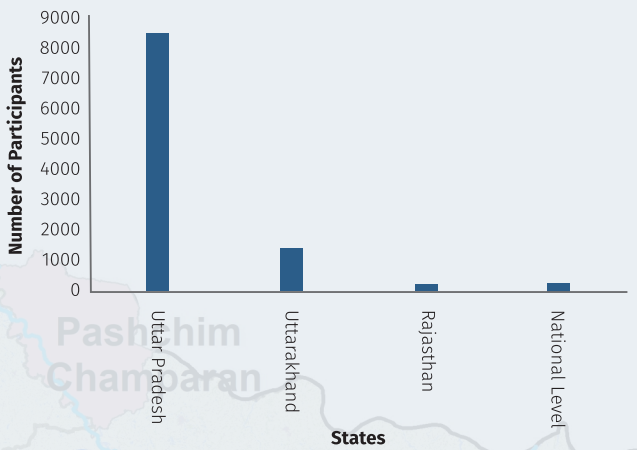
Sensitisation cum training workshops were organised for stakeholders such as college students, local community, Ganga Praharis, Bal Ganga Praharis and school students. A total of 465 participants were sensitised and trained during this workshop.



Map showing stakeholders trained in the Ganga River Basin

CATCH THE RAIN CAMPAIGN

Activities under the 'Catch the Rain' campaign were initiated under the NMCG-WII project in June 2022 and continued till February 2023. Activities such as awareness programme, cleanliness & plantation drives, pledge board installation, heavy gravel & sandbagging, chal and khal renovations, webinars, slogan writing competitions, de-silting of tanks, recharge pit model demonstration, removal of obstruction in channels were organised at 30 locations in the Ganga River Basin, including Uttar Pradesh (n= 10), Uttarakhand (n= 17), Rajasthan (n=1), Haryana (n=1), and Bihar (n=1), A total of 10,454 people from different stakeholder groups (NSS, PRIs, local community, youth, students, and teachers) participated in the activities.



Participation in the Catch the Rain campaign in the Ganga River Basin



COMPONENT

COMMUNITY BASED AQUATIC SPECIES CONSERVATION AND OUTREACH IN THE GANGA RIVER BASIN

River conservation decision is a societal one, owning to trade-offs between competitive use of river's resources between maintaining ecological integrity as well as for sustaining the communities. Aligning local livelihoods with conservation goals is known to create a larger constituency of support for conservation, for which site-specific strategies needs to be developed. These communities should also be made aware about the role of an ecologically intact Ganga basin in enhancing the quality of life. The local communities residing along the banks of the Ganga River have high interests in conservation of the Ganga and its aquatic diversity. These local communities have shown their support to conservation initiatives for the Ganga River and some of the members of communities are now part of the Ganga Prahari cadre of trained volunteers. This component aimed to extend this trained cadre at the basin scale. The component also develops high-quality, science-based awareness and outreach material on Ganga River conservation.

VOCAL FOR LOCAL — GANGA PRAHARI

Local community involved in Ganga River conservation initiatives

The Ganga Prahari cadre has increased to 3,772 individuals in the entire basin, out of which 2,229 are female candidates. From April 2022 to March 2023, a total of 853 newly identified Ganga Praharis were inducted in the basin, of which 646 are female candidates. Capacity development workshops were conducted for the Ganga Praharis from 17 major and small tributaries and newly identified Ganga Praharis from the mainstem Ganga River. Subsequently, they were integrated with the previously inducted cadre.



3



Ganga Prahari Presence in the Ganga River Basin



COMMUNITY ENGAGEMENT IN GANGA RIVER AND BIODIVERSITY CONSERVATION

A total of 1,796 activities were conducted from April, 2022 to March 2023 in which, 64,583 individuals participated (Table 3.1). Trained Ganga Praharis conducted 666 activities, of which 349 were input activities and 317 were output activities (Table 3.2). These activities include awareness and cleanliness drives, plantation, livelihood development, rescue and rehabilitation etc.

Table 3.1: Activities conducted from April 2022 to March 2023

Type of Activities	No. of Activities	Participants
Awareness Programme	327	18,691
Consultative Meetings	747	11,527
Cultural Activities	5	12,662
Exhibition	7	1,166
Field Visit	15	143
Focus Group Discussion	14	143
Livelihood Activities	323	6,689
Livelihood Training	63	1,941
Mobilisation workshop	80	2,245
Plantation	6	1,270
Rescue & Rehabilitation/Ecological Monitoring	3	20
Site Visit	15	26
Socio-economic Survey	65	841
Training Workshops	9	400
Other	117	6,767
Total	**1,796**	**64,583**

Table 3.2: Activities conducted by Ganga Prahari from April 2022 to March 2023

	Input		Output	
	No. of Activities	Participants	No. of Activities	Participants
Awareness and sensitisation	179	26,548	111	9,234
Celebration of special days	26	1,427	25	3,267
Cleanliness Drive	34	617	39	865
Consultative meetings	12	207	-	-
District Ganga Committee meeting	-	-	3	53
Ecological Monitoring	10	59	19	93
Ghat Pe Haat	1	33	1	259
Har Ghar Tiranga Campaign	24	2,246	15	733
Livelihood activities	9	318	2	191
Plantation Programme	19	326	18	446
Rescue & Rehabilitation	20	116	40	654
Others	15	1,120	44	5,264
Total	**349**	**33,017**	**317**	**21,059**

LINKING CONSERVATION AND GREEN ECONOMY

A community-based approach

A total of 48 trainings were conducted to develop sustainable livelihood skills of local communities and Ganga Praharis, during which 1,234 individuals were trained (Table 3.3).

Table 3.3: Livelihood training conducted from (April 2022 to March 2023)

Type of training	No. of trainings	No. of GPs trained
Baking	1	13
Bamboo craft	1	15
Bird guide	2	33
Food processing	4	92
Health and wellness	4	137
Incense stick and candle making	12	225
Jute and other natural fibre handicraft	3	47
LED bulb making	1	30
Mat and basket weaving	1	20
Natural farming	1	90
Sewing and stitching	16	483
Tie and dye, block printing and patch work	2	49
Total	48	1,234

Seven Ganga Prahari societies have been registered along the Ganga (UP & Bihar), Yamuna (UP) and Kosi (Bihar) rivers. In Uttar Pradesh, five societies have been registered, namely Ganga Prahari navik Samiti (Muzaffarnagar), Banaras ganga Prahari Prayavaran Society (Varanasi), Ganga Paryawas ganga Prahari Sewa Samiti (Varanasi), Prayag Urja Samiti (Prayagraj) and Sangam ganga Sewa Samiti (Prayagraj). In Bihar, two societies have been registered, namely Ganga Prahari Prakriti Sanrakshan Society (Bhagalpur) and Shristi ganga Prahari Environment and Welfare Society (Bhagalpur).


संस्थाओं के निबन्धन का प्रमाण–पत्र

(ऐक्ट 21 1860)

मैं इसके द्वारा प्रमाणित करता हूँ कि SRISHTI : GANGA PRAHARI ENVIRONMENT AND WELFARE SOCIETY

Address - Mohalla- Pustakalaya Gali(Near Durga Mandir) , S.M. College Road, Bhagalpur-812001 BHAGALPUR BIHAR 812001

सोसाईटीज रजिस्ट्रेशन ऐक्ट 21, 1860 के अधीन आज यथावत् निर्धारित हुआ/हुई ।

आज तारीख 16 मास Aug वर्ष 2022 को पटना में मेरे हस्ताक्षर के साथ दिया गया।

महानिबंधक, निबंधन, बिहार, पटना।



JALAJ

Connecting river and people to realise Arth Ganga

26 Jalaj were established at different locations in the Ganga River Basin and these were remotely inaugurated by Hon'ble Minister of Jal Shakti Shri Gajendra Singh Shekhawat on 16th August 2022 on the occasion of Yamuna Pe Azadi Ka Amrit Mahotsav, in New Delhi. Several more sites for Jalaj have been identified and are being developed to contribute towards the Arth Ganga goals and support other initiatives by the Government of India.



Jalaj inaugurated by Hon'ble Minister of Jal Shakti, on 16th August 2023









Organised a workshop "Millets for LIFE (Lifestyle for Environment) : Developing climate resilient communities in Ganga Basin" on 24th January 2023, at New Delhi.









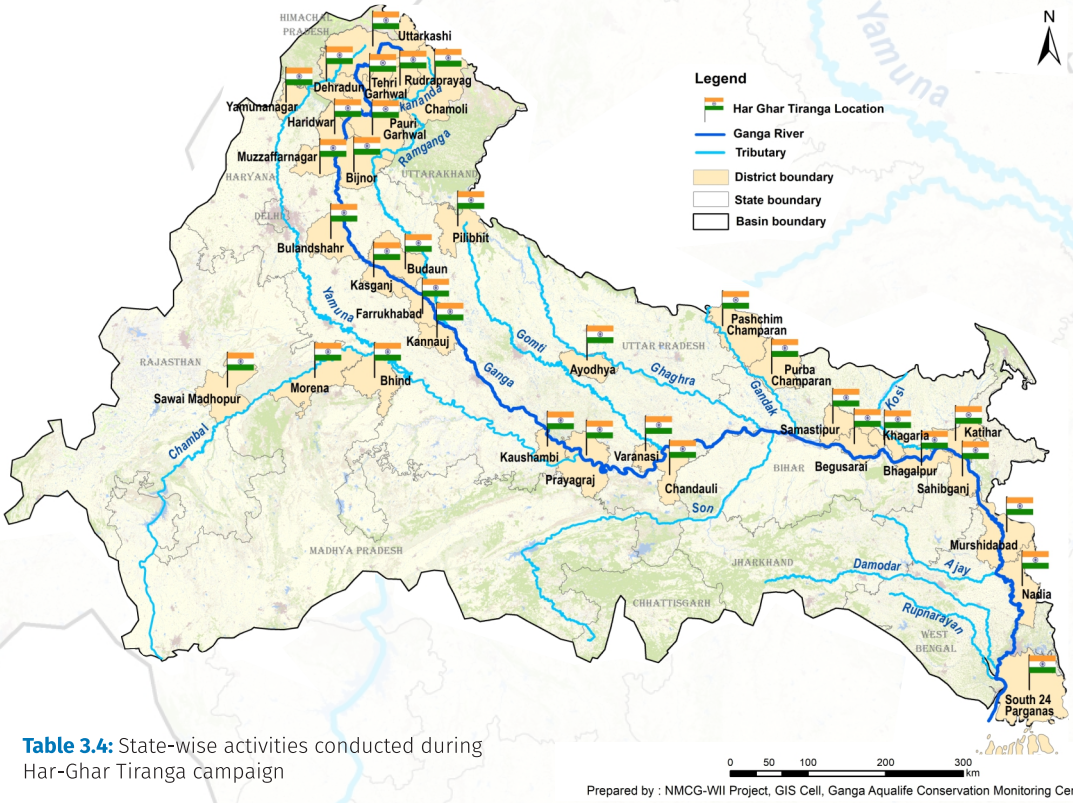
AZADI KA AMRIT MAHOTSAV

Har-Ghar and Har-Ghat Tiranga initiative

To celebrate Azadi Ka Amrit Mahotsav at Ghats, 53 activities were conducted in 20 districts in the five Ganga states. A total of 53 ghats along seven rivers, including Bhagirathi, Alaknanda, Ganga, Yamuna, Ghaghra and Gandak, were covered.

Under the Har Ghar Tiranga campaign, 133 activities were organised in eight states of the Ganga River Basin, i.e. Bihar, Hariyana, Jharkhand, Madhya Pradesh, Rajasthan, Uttar Pradesh, Uttrakhand and West Bengal (Table 3.4). In this campaign, 55,814 people participated directly and three lakhs participated indirectly.

Under the Har Ghat Tiranga campaign, 46 activities were organised in 16 districts from four Ganga states, i.e. Uttarakhand, Uttar Pradesh, Bihar and Jharkhand (Table 3.4). During the campaign, various types of activities such as flag hoisting, slogan reciting, cleanliness drives, cultural programmes, awareness rallies, tiranga river walks, bike rallies were conducted. More than 5,000 people actively participated in this campaign.



Map showing the locations of state-wise activities conducted during Har-Ghar Tiranga campaign

Prepared by : NMCG-WII Project, GIS Cell, Ganga Aqualife Conservation Monitoring Centre, 2022

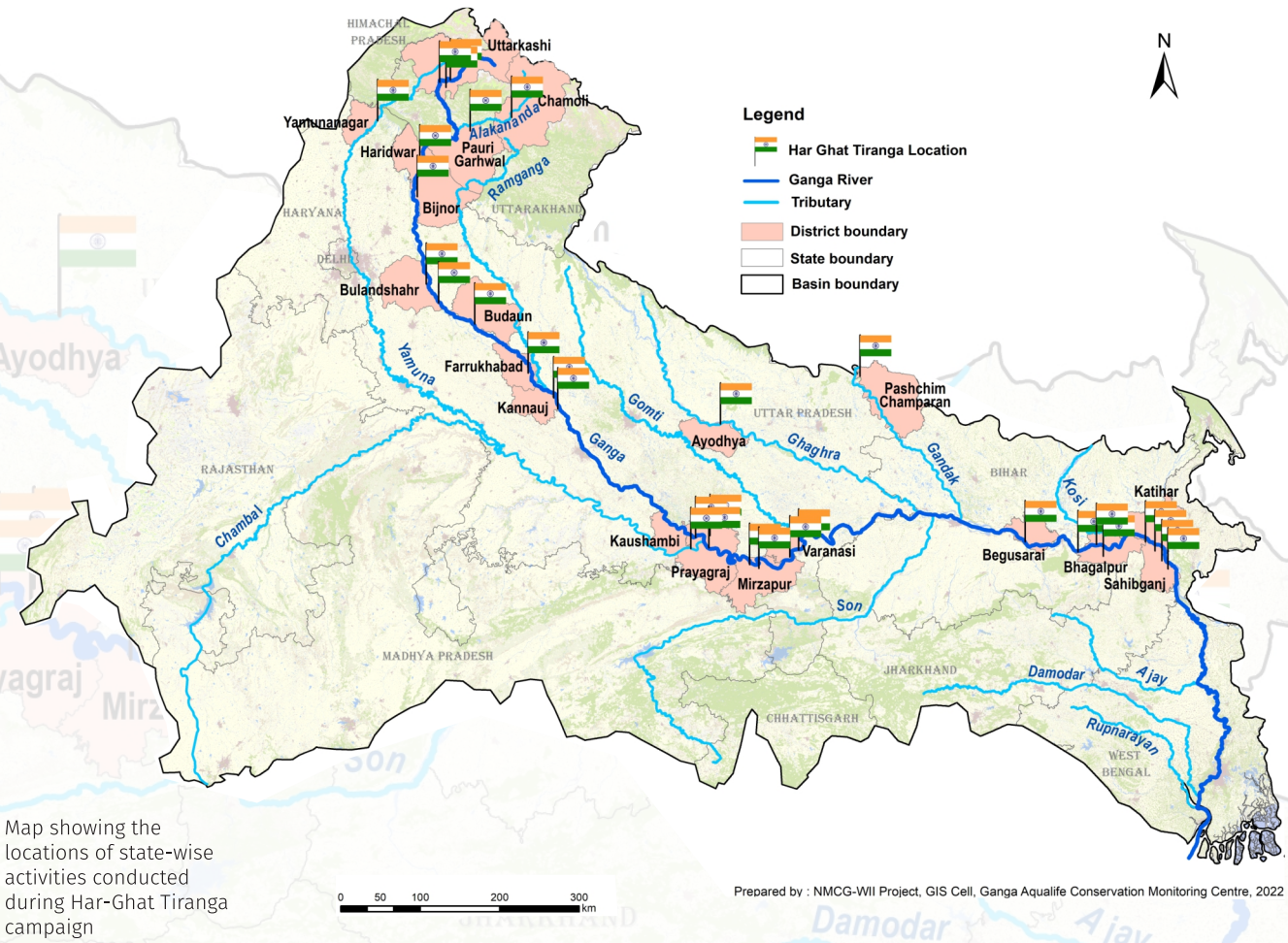
Table 3.4: State-wise activities conducted during Har-Ghar Tiranga campaign

State	No. of activities conducted
Bihar	22
Haryana	5
Jharkhand	8
Madhya Pradesh	6
Rajasthan	3
Uttar Pradesh	62
Uttarakhand	23
West Bengal	4
Total	133









Map showing the locations of state-wise activities conducted during Har-Ghat Tiranga campaign

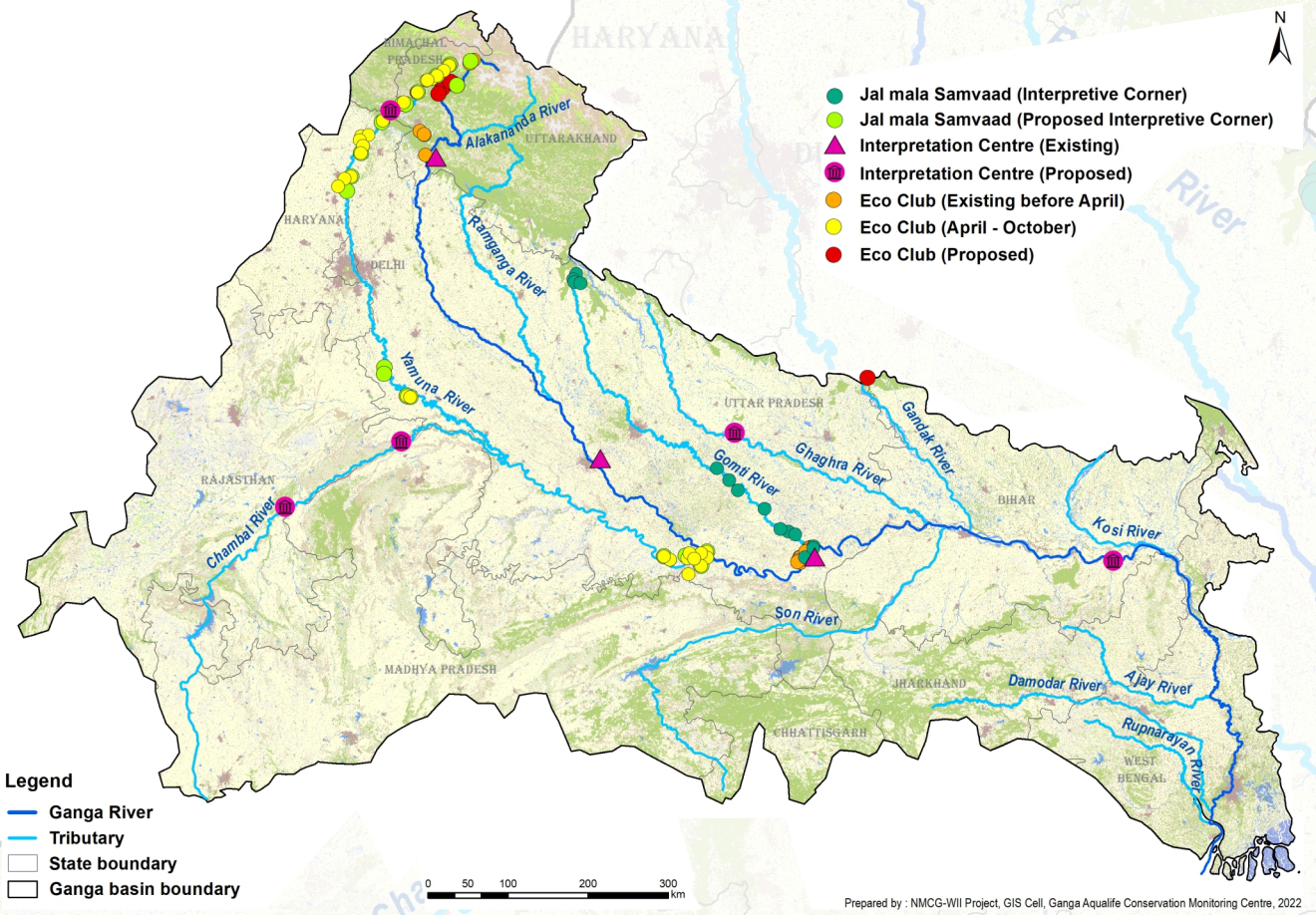
Table 3.5: State-wise activities conducted during Har-Ghat Tiranga campaign

State	No. of activities	Type of activities
Uttarakhand	7	Flag Hoisting, Slogan reciting, Cleanliness drive, Cultural programs, Awareness Rallies, Tiranga river walk, Bike rally
Uttar Pradesh	30	
Bihar	5	
Jharkhand	4	
Total	46	

INTERPRETATION CENTRES

Promoting river and biodiversity conservation

Three new Ganga Aqualife Knowledge Centres have been established in three schools in Devprayag, Tehri and Bijnor. Jalmala Samvad and eco clubs have been established in 14 and 37 schools, respectively, in Uttarakhand, Uttar Pradesh, and Haryana. Ganga Gyan Kosh, a tool box containing relevant teaching aids, including games, and resource material, was provided to each school. Under the Bal Ganga Prahari programme, 27 new schools have been enrolled and more than 2,500 students have been sensitised. Two skill development workshops on 'Calligraphy' and 'Handmade Card Making' was also organised for Bal Ganga Praharis and teachers.



Nature Interpretation and Education Centre





BOOKS & REPORTS






Report on
Celebration of Independence Day programme
har ghar tiranga
सफारी
जलज
CONNECTING PEOPLE AND RIVER TO REALIZE
ARTH GANGA
Har Ghar Tiranga
CELEBRATING PEOPLE, CULTURE, ACHIEVEMENTS AND RIVERS OF INDIA
भारतीय वन्यजीव संस्थान
Wildlife Institute of India
World Environment Day 2022
'Only One Earth'
under
A NESTED DRONE-SATELLITE APPROACH FOR MONITORING THE DIARA OR RIVER ISLANDS IN THE GANGA RIVER
A DETAILED REPORT ON
INTERNATIONAL DAY FOR YOGA 2022

INFORMATION BROCHURES

Information brochures of smaller tributaries were prepared. In addition, the brochures for eleven tributaries were also published in Hindi language.




JALAJ DOLPHIN
safari
life in
SONG
RIVER
VIBRANT GANGA
रामगंगा नदी
कॉर्बेट की जीवनदायनी
AMPHIBIANS
& REPTILES
OF GANGA RIVER BASIN
TRACKING OF
INDIAN SKIMMER
(RYNCHOPS ALBICOLLIS)
AND SARUS CRANE
(GRUS ANTIGONE)
THROUGH SATELLITE
AND GSM TELEMETRY
IN THE GANGA BASIN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Azadi Ka Amrit Mahotsav
एक ही पृथ्वी
Online Quiz Competition
Link will be opening on 5th June at 12.00 pm for five minutes only.
Top three scorers will be awarded with E-certificates and attractive prizes.
Click on the link below (Description)
विश्व पर्यावरण दिवस
5th June 2022

NMCG PHASE-II EXPENDITURE STATEMENT FROM APRIL 2022 TO MARCH 2023

Comp.	Total Funds Alloted	Ist Installment Received (02.08.2019)	IInd Installment Received (15.06.2022)	Total Funds Received	Expenditure January 2020 to March 2021	Expenditure April 2021 to March 2022	Expenditure April 2022 to March 2023	Total Expenditure	F.A + T.A Outstanding	Total Expenditure Including Committed & Advances	Balance Available
C-1A	₹ 354,403,129.00	₹ 114,450,600.00	₹ 76,524,360.00	₹ 190,974,960.00	₹ 30,360,271.00	₹ 34,660,063.92	₹ 42,331,468.00	₹ 107,351,802.92	₹ 241,129.00	₹ 107,592,931.92	₹ 83,382,028.08
C- 1B	₹ 122,128,942.00	₹ 28,648,400.00	₹ 21,923,330.00	₹ 50,571,730.00	₹ 17,815,472.00	₹ 26,500,456.00	₹ 21,254,512.15	₹ 65,570,440.15	₹ 2,820,108.00	₹ 68,390,548.15	-₹ 17,818,818.15
C- 1C	₹ 66,014,662.00	₹ 13,692,800.00	₹ 12,477,080.00	₹ 26,169,880.00	₹ 5,549,942.00	₹ 4,034,951.00	₹ 7,512,316.00	₹ 17,097,209.00	₹ 382,116.00	₹ 17,479,325.00	₹ 8,690,555.00
C- 2	₹ 96,663,134.00	₹ 17,966,300.00	₹ 20,562,080.00	₹ 38,528,380.00	₹ 6,765,969.00	₹ 7,634,653.92	₹ 15,667,795.00	₹ 30,068,417.92	₹ 465,051.00	₹ 30,533,468.92	₹ 7,994,911.08
C- 3A	₹ 384,147,807.00	₹ 67,345,300.00	₹ 73,267,920.00	₹ 140,613,220.00	₹ 22,963,596.00	₹ 26,126,504.00	₹ 50,813,100.53	₹ 99,903,200.53	₹ 2,773,446.00	₹ 102,676,646.53	₹ 37,936,573.47
C- 3B	₹ 116,570,914.00	₹ 21,146,400.00	**₹ 21,780,990.00**	₹ 42,927,390.00	₹ 5,756,705.00	₹ 6,874,366.07	₹ 8,004,258.00	₹ 20,635,329.07	₹ 189,400.00	₹ 20,824,729.07	₹ 22,102,660.93
Total	**₹ 1,139,928,588.00**	**₹ 263,249,800.00**	**₹ 226,535,760.00**	**₹ 489,785,560.00**	**₹ 89,211,955.00**	**₹ 105,830,994.91**	**₹ 145,583,449.68**	**₹ 340,626,399.59**	**₹ 6,871,250.00**	**₹ 347,497,649.59**	**₹ 142,287,910.41**

**Expenditure for the financial year 2022- 2023*

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

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Wildlife Institute of India

Wildlife Institute of India
Chandrabani, Dehradun-248001, Uttarakhand
wii.gov.in/nmcg/national-mission-for-clean-ganga

GACMC

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