

Annual Report 2025

वार्षिक प्रतिवेदन 2025



भा.कृ.अनु.प.-केन्द्रीय अंतर्स्थलीय मात्स्यिकी अनुसंधान संस्थान
बैरकपुर, कोलकाता-700120, पश्चिम बंगाल
ICAR-Central Inland Fisheries Research Institute
Barrackpore, Kolkata - 700120, West Bengal

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Fishing in the Myntdu river, Meghalaya
Photo courtesy : Shyamal Chandra Sukla Das

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The Annual Report 2025 of the ICAR-Central Inland Fisheries Research Institute presents a comprehensive account of scientific achievements, technological innovations, policy support, and community-centric interventions undertaken by the Institute for sustainable development and management of India's inland fisheries sector. Guided by the national priorities of food and nutritional security, livelihood enhancement, ecological sustainability, climate resilience, and resource governance, the Institute continued to strengthen its leadership in advancing science-led inland fisheries development of the country.

The year witnessed significant progress through the implementation of 19 institute-funded projects, 3 ICAR network projects, and 32 externally funded and consultancy projects, alongside programmes under the Scheduled Caste Sub Plan (SCSP), Scheduled Tribe Component (STC), and Northeastern Hill (NEH) activities. These multidisciplinary efforts generated critical scientific insights, management advisories, and scalable technologies across riverine, estuarine, reservoir, wetland fisheries, and open-water aquaculture ecosystems, supporting informed decision-making for sustainable fisheries governance and blue economy development.

Extensive assessments of fish production dynamics and catch trends including that of Hilsa shad in some of the rivers was conducted during the year towards formulation of evidence based resource governance policy for sustainable riverine fisheries. Investigations in lakes and estuaries further strengthened understanding of their ecology, biodiversity conservation, shoreline dynamics, etc. contributing important

scientific inputs for ecosystem restoration and adaptive fisheries policies.

Research on reservoirs and wetlands emphasized biodiversity conservation, fisheries ecology, climate resilience, and sustainable resource management. Innovative habitat restoration approaches such as macrophyte-based interventions demonstrated promising outcomes for conservation of small indigenous fish species and enhancement of wetland biodiversity.

The Institute also made substantial advances in open-water aquaculture, aquatic animal health, environmental biotechnology, and fisheries informatics. Investigations on fish nutrition, disease diagnostics, antimicrobial resistance, and molecular phylogeny strengthened the scientific foundation for sustainable aquaculture development. Technology-driven innovations such as drone-assisted monitoring, IoT and sensor-based water quality surveillance systems, portable hatchery units, and smartphone-enabled aptasensors for antibiotic detection reflected the Institute's increasing emphasis on climate-resilience, precision, and translational fisheries research aligned with the Blue Economy and One Health frameworks.

In the areas of environmental monitoring and resource assessment, nationwide frameworks for hypoxia evaluation, wetland informatics, greenhouse gas emission studies, and pollution monitoring generated important tools for evidence-based fisheries governance and ecosystem management. Research on petroleum hydrocarbons, microplastics, bisphenol compounds, and other emerging contaminants further highlighted the Institute's commitment towards environment and aquatic health management.

The Institute's socio-economic and outreach initiatives continued to create meaningful grassroots impacts through community-based fisheries management, women-centric livelihood programmes, pen and cage culture demonstrations, fish ranching in the Ganga, and large-scale skill development initiatives benefitting fishers across the country. By strengthening stakeholder participation, entrepreneurship

development, and learning-based extension systems, the Institute continued to energize women-centric pathways for the blue economy and contribute towards the vision of Viksit Bharat @2047, while advancing Sustainable Development Goals related to ecological sustainability, nutrition security, gender equality, and livelihood enhancement. Special emphasis was accorded to the Northeastern Hill region through biodiversity exploration, fisheries assessments, culture demonstrations, and livelihood-oriented interventions. Two new fish species, *Pethia dibrugarhensis* and *Puntius torsai*, were discovered from Assam and West Bengal, respectively.

I place on record my sincere gratitude to Dr. M.L. Jat, Secretary, DARE and DG, ICAR for his unstinted support and guidance in steering the Institute's activities. I am also grateful to Dr. J. K. Jena, Deputy Director General (Fisheries Science); Dr. Devika Pillai, Assistant Director General (Inland Fisheries); Dr. Subhadeep Ghosh, Assistant Director General (Marine Fisheries); and other members of the Fisheries SMD for their continuous encouragement and support. I deeply appreciate the dedicated efforts of Team-CIFRI, including the Scientists, Technical and Administrative personnel, supporting staff, RAs/SRFs/YPs, students, and the entire CIFRI fraternity, whose collective commitment and contributions significantly strengthened the Institute's research, development, extension, and policy support initiatives during the year. I also place on record my sincere gratitude to the community of fishers/Professors of Practice across the country whose traditional knowledge, participation, and field-level cooperation greatly enriched the Institute's research, technology validation, and outreach endeavours, while helping bridging scientific innovation with grassroots realities. I also commend the Editorial Team for their sincere efforts in compiling this report.

It is hoped that the scientific outputs, management advisories, technologies, and field-level interventions highlighted herein will contribute in strengthening India's inland fisheries sector, ecological resilience, and inclusive blue economy growth.

Dr. Pradip Dey
(Director)

Dated : 01 March 2026
Barrackpore



भाकृअनुप-केंद्रीय अंतर्स्थलीय मात्स्यिकी अनुसंधान संस्थान (ICAR-CIFRI) का वार्षिक रिपोर्ट 2025 भारत के अंतर्स्थलीय मात्स्यिकी क्षेत्र के सतत विकास एवं प्रबंधन की दिशा में संस्थान द्वारा किए गए वैज्ञानिक उपलब्धियों, तकनीकी नवाचारों, नीतिगत सहयोग तथा समुदाय-केंद्रित विकास प्रयासों का एक विस्तृत विवरण प्रस्तुत है। खाद्य एवं पोषण सुरक्षा, आजीविका संवर्धन, पारिस्थितिकीय स्थिरता, जलवायु अनुकूलन तथा संसाधन प्रबंधन की राष्ट्रीय प्राथमिकताओं के अनुरूप यह संस्थान देश में विज्ञान-आधारित अंतर्स्थलीय मात्स्यिकी की सफलता में नई ऊँचाइयों तक पहुँचाने में महत्वपूर्ण भूमिका निभा रहा है।

इस अवधि के दौरान 19 संस्थान परियोजनाओं, 3 आईसीएआर नेटवर्क परियोजनाओं तथा 32 बाह्य वित्तपोषित एवं परामर्शी परियोजनाओं के साथ साथ अनुसूचित जाति उपयोजना (SCSP), अनुसूचित जनजाति घटक (STC) तथा पूर्वोत्तर क्षेत्र (NEH) कार्यक्रमों के प्रभावी क्रियान्वयन में उल्लेखनीय प्रगति देखी गई है। इन बहु-विषयक प्रयासों से नदीय, मुहाना, जलाशय एवं आर्द्रभूमि मात्स्यिकी तथा खुला जल आधारित जलीय कृषि प्रणालियों में महत्वपूर्ण वैज्ञानिक जानकारी, प्रबंधन परामर्श तथा विस्तारयोग्य प्रौद्योगिकियों का विकास किया गया, जिससे सतत मत्स्य संचालन तथा ब्लू इकोनॉमी के विकास के लिए उपयुक्त नीति-निर्माण को सुदृढ़ किया जा सके।

वर्ष के दौरान कुछ नदियों में हिल्सा सहित मत्स्य उत्पादन गतिकी तथा मत्स्य पकड़ का व्यापक मूल्यांकन किया गया, जिससे सतत नदीय मात्स्यिकी हेतु साक्ष्य-आधारित संसाधन संचालन नीति निर्माण में सहायता मिली है। झीलों एवं मुहाना पारिस्थितिक तंत्रों में किए गए अध्ययन से उनकी पारिस्थितिकी, जैव विविधता संरक्षण, तटीय गतिशीलता आदि सूचनाओं और आँकड़ों को सुदृढ़ करने के साथ-साथ पारिस्थितिक पुनर्स्थापन एवं अनुकूलनशील मत्स्य नीतियों के लिए महत्वपूर्ण वैज्ञानिक आधार प्रदान किया गया।

जलाशयों एवं आर्द्रभूमि संबंधित अनुसंधान ने जैवविविधता संरक्षण, मत्स्य पारिस्थितिकी, जलवायु सहनशीलता तथा सतत संसाधन प्रबंधन पर विशेष बल दिया। मैक्रोफाइट आधारित अभिनव आवास पुनर्स्थापन प्रयासों के फलस्वरूप छोटी स्वदेशी मछली प्रजातियों के संरक्षण तथा आर्द्रभूमि जैवविविधता संवर्धन में आशाजनक परिणाम देखने को मिला है।

संस्थान ने खुलाजल आधारित जलीय कृषि, जलजीव स्वास्थ्य प्रबंधन, पर्यावरणीय जैव प्रौद्योगिकी तथा मत्स्य सूचना विज्ञान के क्षेत्रों में भी उल्लेखनीय प्रगति की है। मत्स्य पोषण, बायोफ्लॉक आधारित नर्सरी पालन प्रणालियों, रोग निदान, प्रतिजैविक प्रतिरोध तथा आणविक फाइलोजेनी संबंधी अनुसंधान ने सतत जलकृषि विकास के वैज्ञानिक आधार को और मजबूत किया है। ड्रोन आधारित आईओटी (IoT) एवं सेंसर आधारित जलगुणवत्ता निगरानी प्रणालियाँ, पोर्टेबल हैचरी इकाइयाँ तथा प्रतिजैविक पहचान हेतु स्मार्ट फोन-सक्षम एप्टा सेंसर जैसी तकनीकी नवाचारों ने ब्लू इकोनॉमी तथा वनहेल्थ अवधारणाओं के अनुरूप जलवायु-सहनशील, परिशुद्ध एवं अनुप्रयुक्त मत्स्य अनुसंधान पर संस्थान के बढ़ते फोकस को प्रदर्शित किया। आगामी वर्षों में इन नवाचारों से संसाधन निगरानी, जोखिम मूल्यांकन तथा नीति-उन्मुख मत्स्य प्रबंधन को अधिक प्रभावी बनाने की संभावना है।

पर्यावरणीय निगरानी एवं संसाधन मूल्यांकन के क्षेत्र में हाइपोक्सिया मूल्यांकन, आर्द्रभूमि सूचना तंत्र, ग्रीनहाउस गैस उत्सर्जन अध्ययन तथा प्रदूषण निगरानी के लिए राष्ट्रीय स्तर की रूपरेखा को विकसित किया गया जिससे साक्ष्य-आधारित मत्स्य संचालन तथा पारिस्थितिक तंत्र प्रबंधन हेतु महत्वपूर्ण उपकरण उपलब्ध हो सकें। पेट्रोलियम हाइड्रोकार्बन, माइक्रोप्लास्टिक, बिसफेनॉल योगिकों तथा अन्य उभरते प्रदूषकों पर किए गए अनुसंधान ने पर्यावरण एवं जलीय स्वास्थ्य प्रबंधन के प्रति संस्थान की प्रतिबद्धता को और अधिक प्रदर्शित किया है।

संस्थान ने सामाजिक-आर्थिक एवं विस्तार गतिविधियों के अंतर्गत समुदाय-आधारित मात्स्यिकी प्रबंधन, महिला-केंद्रित आजीविका कार्यक्रम, पेन एवं पिंजरे में मछली पालन पद्धति का प्रदर्शन, गंगा नदी में मत्स्य संवर्धन तथा बड़े पैमाने पर कौशल विकास कार्यक्रमों के माध्यम से मछुआरों, मछली पालकों, जनजातीय समुदायों एवं स्वयं सहायता समूहों को अन्यतम लाभ पहुँचाया है। हितधारक सहभागिता, उद्यमिता विकास तथा शिक्षण-आधारित विस्तार प्रणालियों को सुदृढ़ कर संस्थान ने ब्लू इकोनॉमी में महिला-केंद्रित विकास मार्गों को प्रोत्साहित किया तथा विकसित भारत/2047 के दृष्टिकोण को ध्यान में रखते हुए पारिस्थितिकीय स्थिरता, पोषण सुरक्षा, लैंगिक समानता तथा आजीविका संवर्धन से संबंधित सतत विकास लक्ष्यों में

योगदान दिया है। इसी प्रकार, पूर्वोत्तर क्षेत्र पर विशेष बल देते हुए जैवविविधता अन्वेषण, मत्स्य उत्पादन का ऑकलन, पालन पद्धतियों का प्रदर्शन तथा आजीविका-उन्मुख प्रयास किए गए। असम एवं पश्चिम बंगाल से क्रमशः पेथिया डिब्रुगरहेनसिस (*Pethia dibrugrahensis*) तथा पुनटीयस टोरसाई प्रजाति (*Puntius torsai* sp.) नामक दो नई मत्स्य प्रजातियों को दर्ज किया गया।

मैं डॉ. एम. एल. जाट, सचिव, डेयर एवं महानिदेशक, भाकृअनुप के प्रति संस्थान की गतिविधियों को दिशा-निर्देश प्रदान करने हेतु उनके सतत सहयोग एवं मार्गदर्शन के लिए हार्दिक तौर पर कृतज्ञ हूँ। मैं डॉ. जे. के. जेना, उप-महानिदेशक (मत्स्य विज्ञान); डॉ. देविका पिल्लई, सहायक महानिदेशक (अंतर्स्थलीय मात्स्यिकी); डॉ. शुभदीप घोष, सहायक महानिदेशक (समुद्री मत्स्यिकी) तथा मत्स्य विज्ञान संभाग के अन्य सदस्यों के सतत प्रोत्साहन एवं सहयोग के लिए आभार व्यक्त करता हूँ। मैं सिफरी टीम के वैज्ञानिकों, तकनीकी एवं प्रशासनिक कर्मियों, कुशल सहायक कर्मियों, अनुसंधान सहायक यंग प्रोफेशनल, शोध विद्यार्थियों, संविदा कर्मियों तथा संपूर्ण सिफरी परिवार के समर्पित प्रयासों की सराहना करता हूँ, जिनकी सामूहिक प्रतिबद्धता एवं योगदान से संस्थान की अनुसंधान, विकास, विस्तार एवं नीतिगत सहयोग गतिविधियाँ और भी सुदृढ़ हुई हैं। मैं देशभर के मछुआरा समुदायों एवं विशेषज्ञों के प्रति भी हार्दिक आभार व्यक्त करता हूँ, जिनके पारंपरिक ज्ञान, सहभागिता एवं क्षेत्रीय सहयोग ने संस्थान के अनुसंधान, प्रौद्योगिकी प्रमाणीकरण तथा विस्तार प्रयासों को समृद्ध किया और वैज्ञानिक नवाचारों को जमीनी वास्तविकताओं से जोड़ने में महत्वपूर्ण भूमिका निभाई है। मैं संपादकीय टीम की भी इस रिपोर्ट के संकलन में किए गए समर्पित प्रयासों के लिए प्रशंसा करता हूँ।

अतः मैं यह आशा करता हूँ कि इस रिपोर्ट में उल्लिखित वैज्ञानिक उपलब्धियाँ, प्रबंधन परामर्श, प्रौद्योगिकियाँ एवं क्षेत्रीय प्रयास भारत के अंतर्स्थलीय मात्स्यिकी क्षेत्र, पारिस्थितिकीय सहनशीलता तथा समावेशी ब्लू इकोनॉमी विकास को और अधिक सुदृढ़ बनाने में महत्वपूर्ण योगदान देंगे।


(निदेशक)

दिनांक : 01 मार्च 2026
बैरकपुर



In the year 2025, the Institute operated 19 Institute-funded, 3 network research projects, 32 externally funded and consultancy projects, besides execution of SCSP, STC and NEH programmes. Salient achievements emanated from these activities are summarized below:

Riverine and Estuarine Fisheries

- Based on primary surveys in fishing villages and landing centres annual fish catch from rivers Narmada, Cauvery, Sutlej, Gomti and Pamba have been estimated to be 27259-31236 metric tonnes (MT), 11899 Mt, 436 MT, 3690 MT and 434.4 MT, respectively. Catch per unit efforts (kg/fisher/day) of fishing ranged from 2.93-27 in Narmada, 3.2-23 in Cauvery, 3.03 - 20.3 in Sutlej, 0.54 - 5.33 in Gomti, and 1.9 - 12.85 in Pamba rivers. A bumper catch of 7290 MT Hilsa was recorded in Narmada estuary in 2025.
- Water quality of river Gomti in Lucknow upstream and downstream was sub-optimal with low DO, elevated nutrients, and organic matter loads.
- Ecology and fisheries of Pulicat lake, Kayamkulam estuary and Mahi estuary have been studied. Potential breeding habitats of *Etroplus suratensis* and *Crassostrea madrasensis* were identified in the Kayamkulam estuary.
- Major abiotic and biotic characteristics of Pulicat lake varied widely with seasons. Mud crab and clam fisheries greatly support livelihoods in the lake.
- There is a clear salinity gradient in Mahi estuary influencing its abiotic and biotic parameters. Vulnerable bull shark *Carcharhinus leucas* was recorded for the first time reflecting euryhaline nature of the estuary.
- Decadal shoreline analysis of the Indian Sundarbans showed severe erosion at Mousuni, moderate erosion at Gosaba, and accretion at Jharkhali islands. A total of 116 fish species have been recorded from the estuarine fish catch of the Indian Sundarbans, with dominance of Gobiidae.

Reservoir and Wetland Fisheries

- Fisheries, ecology, and system dynamics of Kanva, Sathanur, and Banasurasagar reservoirs of peninsular India were studied to develop comprehensive database and management strategies for sustainable utilization of the resources.
- An ecological shift from submerged macrophyte dominance to plankton dominance is accompanied by significant loss of wetland biodiversity, especially small indigenous fishes (SIFs) and benthic invertebrates. Artificial park with macrophytes inside small floating cages was found to provide breeding and nursery habitat and might help in restoration of SIFs in wetlands.
- Long-term analyses of data show that fish production in Gandhisagar Reservoir is now driven by management interventions - particularly fishing effort regulation and stocking - rather than by climatic variability, establishing the reservoir as a resilient, management-regulated system.
- Maithon Reservoir is experiencing climate stress, which combined with governance gaps and low adaptive capacity has heightened livelihood vulnerability of downstream fishers. Nesa Reservoir also has a climate-sensitive fishery where erratic rainfall, weak management, and low adaptive capacity are making livelihood vulnerable.
- Getalsud Reservoir is witnessing intensifying cage aquaculture leading to enhanced livelihoods but increased ecological pressure and a shift towards exotic-dominated fisheries.
- Fish production potential of open coal pits (OCPs) of Madhya Pradesh and Jharkhand was estimated to be ranging from 50.2 to 77kg/ha/yr. Heavy metal contents in Tilapia and Pangas from OCPs remained below food-safety limits. However, bottom waters of OCPs levels have low dissolved oxygen and high free CO₂ showing stressful environment for fisheries.

Open-water Aquaculture Production and Management

- Cage culture trial of *Sperata seenghala* demonstrated improved feed intake and growth responses when fed high-protein diets indicating the species' high protein requirements.
- Nursery rearing of Amur carp in a biofloc system revealed 200 no./m³ as the optimal stocking density with superior biomass production, acceptable growth and survival, and efficient feed utilization.

Fishery Resource Assessment and Informatics

- A nationwide spatio-temporal framework has been developed for assessing hypoxia stress across river systems. Key seven sub-basins showed faster hypoxic risk intensification.
- To facilitate nationwide wetland monitoring, a web portal of wetland informatics was created integrating critical environmental parameters, viz. DO, BOD, pH, water temperature, specific conductivity and nitrate.
- Freshwater wetlands exhibited highest CH₄ and N₂O emissions during the post-monsoon period, and CO₂ emission during monsoon. River Yamuna had highest emissions during summer, with polluted locations acting as major hotspots.
- The Hooghly estuary was assessed for petroleum hydrocarbon, bisphenol-A and nonyl phenol pollution. Presences of per- and polyfluoroalkyl substances were also monitored in commercially important fishes of the estuary.
- Length-weight and morphometric study of *Systomus sarana*, *Ompok bimaculatus*, and *Cirrhinus reba* across five hydroclimatic zones revealed significant spatial variations indicating habitat-specific influences on fish growth and resilience.
- Otolith morphology showed species and river specific patterns, with strong correlation between



fish length and otolith dimensions, highlighting the potential of otolith-based markers for stock discrimination and growth assessment.

Aquatic Environmental Biotechnology

- Investigation of disease outbreaks identified *Aeromonas* spp., *Lactococcus lactis*, *Pseudomonas* spp., *Ichthyophthirius multifiliis* and *Dactylogyrus* sp. as major pathogens in *Labeo rohita*, *L. bata*, *Cirrhinus mrigala* and *Pangasianodon hypophthalmus*.
- An anti-snail formulation with suitable delivery mechanism has been developed. A weed-fish kill formulation has also been developed and evaluated.
- A phylogeny tree of *Channa* spp. was constructed which delimited taxa such as *C. barca*, *C. aurantimaculata*, *C. stewartii*, *C. striata*, *C. micropeltes*, and *C. lucius*. However, it failed to distinguish between closely related pairs such as *C. gachua* and *C. harcourtbutleri*, and between *C. bleheri* and *C. brunnea*.
- Amino acid profiling of *Heteropneustes fossilis* and *Glossogobius giuris* revealed a balanced composition of essential and non-essential amino acids, underscoring their nutritional significances.

Fisheries Socio-Economics

- Initiatives were taken in West Bengal, Assam, Gujarat, Kerala and Karnataka to fulfil selected Sustainable Development Goals (SDGs). In Purulia district of West Bengal, fisheries management practices were demonstrated in 16 rainfed waterbodies (*bandhs*) for community-managed aquaculture benefitting 481 tribal women. To diversify income sources, 30 tribal women from Manbazar, Purulia were provided with tanks and ornamental fish kits.
- Intervention in pond aquaculture in South 24 Parganas, West Bengal, has led to formation of self help groups (SHGs).

- An ecosystem services - based Resilient Blue Economy framework was developed linking provisioning, regulating, supporting, and cultural services with livelihoods, ecological restoration, community empowerment, and institutional coordination.

NEH Programme

- A new fish species, *Pethia dibrugarhensis* (Teleostei: Cyprinidae) has been discovered from Assam. Ichthyofaunal surveys conducted in the Krem Um Ladaw cave, East Jaintia Hills, Meghalaya identified 11 fish species.
- Exploratory surveys were conducted on the fisheries of Diplai, Halowadal, Tipkai, and Sareswar beels in Bodoland Territorial Council. Pen culture trial of carps carried out in these beels recorded high growth rate for most species, suggesting favorable conditions for fish production. ICAR-CIFRI also promoted cage culture in Sitacherra Lake, Tripura.
- A total of 146 fin-fish species have been documented from Brahmaputra River with dominance of *Cabdio morar*. Total fish catch from the studied stretch of the river has been estimated at 933.70 mt. Catch structure analyses of Hilsa showed that the smaller size groups (100-250 mm) dominated the landings.
- Habitat ecology and fisheries of major rivers of Sikkim were studied identifying *Neolissochilus hexagonolepis* and *Schizothorax richardsonii* as the dominant species. Average CPUE of Teesta and Rangeet rivers were estimated to be 3-5 kg/fisher/day, and 4-6 kg/fisher/day, respectively.

ICAR Network Projects

- Withdrawal study determined slow clearance rate of antifungal clotrimazole from *P. hypophthalmus* making the catfish prone to toxicity effects as well as making the treated fish unfit for human consumption at least for one-and-half month. While withdrawal period of Romet³⁰ was

found to be 5 days in the catfish.

- During 2025, a total of 109 farms were studied for identifying AMR pattern in *Escherichia coli*, *Aeromonas* sp., and *Staphylococcus* sp. *E. coli* exhibited over 15% resistance to ceftazidime and ampicillin while *Aeromonas* demonstrated a higher resistance of 19% to cefoxitin and 48% to imipenem.
- Successful natural breeding of cichlids *Neolamprologus pulcher* and *Amphilophus trimaculatus* demonstrated that a sex ratio of 2:4 (F:M) yields a higher number of fry with better survival.
- Market demand and trade pressure of legally protected *Channa barca* were assessed from ornamental fish markets of Assam.

Externally Funded Projects

- The Institute has developed an IoT based turbidity monitoring system with real-time messaging service, and wireless floating water quality monitoring system.
- Scampi seed stocking was undertaken in Ghaghra, Kelaghagh, and Masaria reservoirs to improve livelihood of tribal fisher communities of Jharkhand, resulting in scampi production of 26.8, 57.9, and 34.1 metric tonnes, respectively. In the 2nd phase (2025-2028) six more reservoirs have been taken up for enhancement.
- Annual potential fish yield of the Hirakud Reservoir was estimated to be 70 kg/ha. Spatial analysis of water and sediment in cage and non-cage sites confirmed that the reservoir is environmentally congenial for cage culture.
- Disease surveillance was undertaken in aquaculture farms of Howrah, East Medinipur, and South 24 Parganas districts of West Bengal. Further *Aeromonas veronii* was identified as a major pathogen in cage-cultured Pangas in Hirakud Reservoir.
- Disease surveillance in *Lates calcarifer* was conducted in West Bengal and Odisha. Whole

transcriptomic analysis of gut, and liver tissues showed significant expression of noble genes with extensive infection-induced transcriptional reprogramming.

- A total of 30 river ranching programs were conducted to restore IMC and Mahseer in the Ganga River. For Hilsa fisheries restoration in middle stretch of the river, 98,719 Hilsa of different sizes, artificially bred 9.1 lakh spawns and 11.64 lakh fertilized eggs were ranched above Farakka barrage.
- A portable FRP carp hatchery was established at Farakka and about 100,000 IMC fingerlings, generated through breeding, were released into the Ganga above Farakka barrage for enhancing the natural stock of IMC.
- Outreach initiative educated 26,352 fishers about destructive fishing practices, fostering community engagement through events like 'Ganga Aarti' and 'World Environment Day.'
- 'River Dialogue' was organized in the 14th Asian Fisheries and Aquaculture Forum, stressing citizen involvement in conservation of the Gangetic dolphin.
- All the *bheries* of East Kolkata Wetlands (EKW) were recorded in GIS database. Study revealed fish productivity in the range of 1829 - 2095 kg/ha/year with total annual production of 8931-10,242 mt from the EKW with 30-35% contribution from Tilapia alone.
- Load of microplastic contamination ranged from 140 to 420 particles/m³ in water and 13.63 to 53.33 particles/kg in sediments in different stretches of the Brahmaputra River was found with the highest loads in Desangmukh (in water) and Dibrugarh (in sediment).
- Oils extracted from silkworm *Antheraea mylitta* and *Bombyx mori* pupae showed limited antimicrobial activity in crude form; however, purified *B. mori* oil inhibited fish fungi and some bacteria. Nutritionally, *A. mylitta* oil had higher palmitic/oleic acids and stronger antioxidant (ABTS, FRAP) activities.
- Community-led HDPE pen culture of high-value *Mystus tengara* was promoted in eastern India enhancing fishers' income as well as supporting conservation in wetlands.
- Demonstration of table fish production of *Ompok bimaculatus* in cages is ongoing in reservoirs of Tripura, Manipur, and Jharkhand in co-management mode for increased adoption and farmers' profit.
- Community-based HDPE pen demonstrations in wetlands of Assam, West Bengal, and Bihar showed successful seed raising and auto-breeding potential of SIFs.
- A smartphone-based colorimetric aptasensor using gold nanoparticles as a nanozyme enables sensitive detection of oxytetracycline in fish and water at below FSSAI limits.
- A quadcopter drone (70 kg payload, 5 km range) has been developed and field-validated in Sundarbans, demonstrating efficient live fish transport by drones.
- A transboundary initiative on Hilsa fisheries in the Bay of Bengal involving India, Bangladesh, and Myanmar was initiated to develop coordinated management strategies.

STC, SCSP and Training Programmes

- The SCSP and STC programmes were implemented benefitting more than 6000 fishers and fish farmers from different parts of India including West Bengal, Tamil Nadu and Karnataka towards livelihood development through fisheries.
- The Institute imparted training to 500 SC fishers, and 200 ST fishers. The Institute also organized more than 110 awareness / sensitization programmes on different aspects of livelihood generation through fisheries and fisheries conservation.
- The Institute conducted 59 Training programmes imparting knowledge and skills to 2806 fishers/fish farmers/officials, entrepreneurs and students.
- The Institute has filed applications for 6 patents, one trademark, 6 copyrights and published 93 research papers and 22 book/book chapters.



वर्ष 2025 में संस्थान ने 19 संस्थान-वित्तपोषित, 3 नेटवर्क अनुसंधान परियोजनाएँ तथा 30 बाह्य-वित्तपोषित एवं परामर्शी परियोजनाओं का संचालन किया है। इसके अतिरिक्त अनुसूचित जाति उप-योजना (SCSP), जनजातीय घटक (STC) और पूर्वोत्तर क्षेत्र (NEH) कार्यक्रमों का भी क्रियान्वयन किया गया। इन गतिविधियों के अंतर्गत हुई प्रमुख उपलब्धियाँ निम्नलिखित हैं।

नदीय एवं मुहाना मत्स्यिकी

- मछुआरा समुदाय वाले गाँवों और अवतरण केंद्रों में किए गए प्राथमिक सर्वेक्षणों के आधार पर नर्मदा, कावेरी, सतलुज, गोमती और पंजा नदियों से वार्षिक मछली उत्पादन क्रमशः 27259–31236 मीट्रिक टन (मी.टन), 11899 मी.टन, 436 मी.टन, 3690 मी. टन और 434.4 मी.टन आंका गया है। प्रति इकाई मत्स्ययन प्रयास (किग्रा/मछुआरा/दिन) द्वारा मछली पकड़ नर्मदा में 2.93–27, कावेरी में 3.2–23, सतलुज में 3.03–20.3, गोमती में 0.54–5.33 तथा पंजा में 1.9–12.85 के बीच रही। वर्ष 2025 में नर्मदा मुहाने से हिल्सा मछली की अत्यधिक पकड़ 7290 मी.टन दर्ज की गई।
- लखनऊ क्षेत्र में गोमती नदी के ऊपरी और निचले भागों का जल-गुणवत्ता स्तर कम पाया गया, जिसमें घुलित ऑक्सीजन (DO) की कमी, पोषक तत्वों की अधिकता तथा कार्बनिक पदार्थों का स्तर उच्च पाया गया।
- पुलिकट झील, कायामकुलम मुहाना तथा माही मुहाना की पारिस्थितिकी और मात्स्यिकी का अध्ययन किया गया। कायामकुलम मुहाने में *एट्रोप्लस सुरेन्टेंसिस* (*Etroplus suratensis*) तथा *क्रासोस्ट्रेया मैड्रासेंसिस* (*Crassostrea madrasensis*) के संभावित प्रजनन स्थलों की पहचान की गई।
- पुलिकट झील के प्रमुख अजैविक एवं जैविक घटक मौसम के अनुसार व्यापक रूप से परिवर्तित होते पाए गए। यहाँ पर कीचड़ में वास करने वाले कंकड़े (Mud crab) और सीपी (Clam) पालन पर स्थानीय लोगों की आजीविका निर्भर करती हैं।
- माही मुहाने में लवणता की स्पष्ट प्रवणता (salinity gradient) देखी गयी, जो इसके अजैविक एवं जैविक कारकों को प्रभावित करता है। संवेदनशील बुल शार्क (*Carcharhinus leucas*) मछली को पहली बार दर्ज किया गया जो इस मुहाने की यूरीहेलाइन (विभिन्न लवणीय स्तर के प्रति सहनशीलता) प्रकृति को दर्शाता है।
- भारतीय सुंदरबन के दशकीय तट रेखा विश्लेषण से मौसुमी द्वीप पर गंभीर कटाव, गोसाबा में मध्यम कटाव तथा झारखाली द्वीपों में निक्षेपण (accretion) पाया गया। भारतीय सुंदरबन के मुहाना क्षेत्र की मछली पकड़ में कुल 116 प्रजातियाँ दर्ज की गईं, जिनमें गोबिडे (Gobiidae) वर्ग का प्रभुत्व देखा गया।

जलाशय एवं आर्द्रभूमि मत्स्यिकी

- भारत के प्रायद्वीपीय क्षेत्र, कण्वा, सतनूर तथा बनावसुरसागर जलाशयों की मत्स्यिकी,

पारिस्थितिकी और गतिकी का अध्ययन किया गया, ताकि संसाधनों के सतत उपयोग हेतु समग्र डाटाबेस एवं प्रबंधन रणनीतियाँ विकसित की जा सकें।

- पारिस्थितिक तंत्र में जलमग्न मैक्रोफाइट (submerged macrophyte) बहुल क्षेत्रों में प्लवक (plankton) की प्रचुरता के साथ आर्द्रभूमि जैवविविधता में उल्लेखनीय कमी पाई गई, विशेषकर छोटी स्वदेशी मछलियों (SIFs) और बैथिक अकशेरुकी जीवों की उपस्थिति में। छोटे तैरते पिंजरे में मैक्रोफाइट के साथ कृत्रिम पार्क के निर्माण से प्रजनन एवं नर्सरी आवास सुलभ हुआ है, जो आर्द्रभूमि में छोटी स्वदेशी मछलियों के पुनर्स्थापन में सहायक हो सकता है।
- दीर्घकालिक आंकड़ों के विश्लेषण से पता चला कि गांधीसागर जलाशय में मछली उत्पादन अब जलवायु परिवर्तनशीलता के बजाय प्रबंधन हस्तक्षेपों – विशेषकर मत्स्ययन प्रयास विनियमन और बीज संचयन (stocking) – से संचालित हो रहा है, जिस से यह एक सुदृढ़, प्रबंधन – नियंत्रित प्रणाली के रूप में स्थापित हुआ है।
- मैथन जलाशय जलवायु दबाव का सामना कर रहा है, जो संचालन संबंधी कमियों और कम अनुकूलन क्षमता के साथ मिलकर डाउनस्ट्रीम मछुआरों की आजीविका को अधिक प्रभावित कर रहा है। नैसा जलाशय में भी जलवायु-संवेदनशील मात्स्यिकी दर्ज की गई, जहाँ अनियमित वर्षा, कमजोर प्रबंधन और कम अनुकूलन क्षमता आजीविका को प्रभावित कर रही हैं।
- गेतालसूद जलाशय में पिंजरे में मत्स्य पालन (cage aquaculture) की तीव्र वृद्धि देखी जा रही है, जिससे आजीविका में सुधार हुआ है, किन्तु इसके साथ पारिस्थितिक दबाव वृद्धि के साथ विदेशी मछली प्रजातियों का प्रभुत्व भी बढ़ रहा है।
- मध्यप्रदेश और झारखंड के खुला कोयला खदानों (OCPs) में मत्स्य उत्पादन क्षमता 50.2 से 77 किग्रा/हेक्टेयर/वर्ष के बीच पाई गई। इन क्षेत्रों में तिलापिया और पंगास मछलियों में भारी धातुओं की उपस्थित मात्रा खाद्य सुरक्षा मानकों से कम दर्ज की गई है। हालांकि, इन खदानों के तलछट जल में घुलित ऑक्सीजन की कमी और मुक्त कार्बन डाइऑक्साइड की अधिकता पाई गई, जो मत्स्य पालन के लिए तनावपूर्ण पर्यावरण को दर्शाती है।

खुले जल में जलीय कृषि उत्पादन एवं प्रबंधन

- *स्पेराटा सिंगाला* (*Sperata seenghala*) को परीक्षण हेतु पिंजरे में पालन किया गया जिसमें यह पाया गया कि उच्च प्रोटीन आहार देने पर भोजन ग्रहण और वृद्धि दर में सुधार हुआ, जिससे इस प्रजाति की उच्च प्रोटीन आवश्यकता का संकेत मिलता है।
- बायोप्लॉक प्रणाली में अमूर कार्प (Amur carp) की नर्सरी पालन में यह देखा गया कि 200 मछली प्रति घन मीटर सर्वोत्तम संचयन घनत्व है, जिसमें बेहतर जैव भार उत्पादन,

संतोषजनक वृद्धि एवं जीवित रहने की दर तथा प्रभावी आहार उपयोग देखा गया।

मत्स्य संसाधन आकलन एवं सूचना विज्ञान

- नदी तंत्रों में हाइपोक्सिया (ऑक्सीजन की कमी) के कारण होने वाले तनाव के आकलन हेतु एक राष्ट्रव्यापी स्थानिक-कालिक (spatio & temporal) ढांचा विकसित किया गया। सात प्रमुख उप-घाटियों में हाइपोक्सिक जोखिम की तीव्रता अधिक तेजी से बढ़ती देखी गई।
- देशभर में आर्द्रभूमि की निगरानी को सुगम बनाने हेतु एक वेब पोर्टल विकसित किया गया, जिसमें प्रमुख पर्यावरणीय मानकों जैसे घुलित ऑक्सीजन (DO), बीओडी (BOD), पीएच (pH), जल का तापमान, विशिष्ट चालकता (specific conductivity) एवं नाइट्रेट को समाहित किया गया है।
- मीठे पानी की आर्द्रभूमि में मानसून के बाद मीथेन (CH₄) और नाइट्रस ऑक्साइड (N₂O) का उच्चतम उत्सर्जन तथा मानसून के दौरान कार्बन डाइऑक्साइड (CO₂) का अधिक उत्सर्जन पाया गया। यमुना नदी में ग्रीष्मकाल के दौरान उत्सर्जन सर्वाधिक रहा, जहाँ प्रदूषित क्षेत्र प्रमुख हॉटस्पॉट के रूप में देखे गए।
- हुगली मुहाने में उपस्थित पेट्रोलियम हाइड्रोकार्बन, बिस्फेनॉल-1 तथा नॉनिल फिनॉल प्रदूषण का अध्ययन और आकलन किया गया। इसके साथ ही, इस मुहाने की व्यावसायिक रूप से महत्वपूर्ण मछलियों में परपलुओरोएलकाल एवं पॉलीपलुओरो एल्काइल तत्वों (PFAS) की उपस्थिति की भी निगरानी की गई।
- सिस्टोमस सराना (*Systemus sarana*), ओम्पक बीमाकूलेटस (*Ompok bimaculatus*) तथा सीरहीनस रेबा (*Cirrhinus reba*) पर पाँच विभिन्न जलवायु-हाइड्रोलॉजिकल क्षेत्रों में लंबाई-भार एवं आकारिकी (morphometric) अध्ययन से महत्वपूर्ण स्थानिक भिन्नताएँ सामने आईं, जो मछलियों की वृद्धि और सहनशीलता पर आवास-विशिष्ट प्रभाव को दर्शाती हैं।
- ओटोलिथ (otolith) आकृति विज्ञान से प्रजाति एवं नदी-विशिष्ट पैटर्न का पता चला तथा मछली की लंबाई और ओटोलिथ के आयामों के बीच मजबूत सहसंबंध पाया गया। इससे स्टॉक पृथक्करण और वृद्धि आकलन में ओटोलिथ-आधारित संकेतकों की उपयोगिता स्पष्ट होती है।

जलीय पर्यावरणीय जैव प्रौद्योगिकी

- रोग प्रकोपों की जांच में एरोमोनास प्रजाति (*Aeromonas* spp.), लैक्टोकोकस लैक्टिस (*Lactococcus lactis*), स््यूडोमोनास प्रजाति (*Pseudomonas* spp.), इक्थिओथिरियास मल्टीफिलिस (*Ichthyophthirius multifiliis*) तथा डैक्टिलोगिरस प्रजाति (*Dactylogyrus* sp.) को लेबीओ रोहिता (*Labeo rohita*), लेबीओ बाटा (*L. bata*), सीरहीनस मुगला (*Cirrhinus mrigala*) और पंगोसिआनोडोन हाइपोथालमस



(*Pangasianodon hypophthalmus*) में प्रमुख रोग जनक के रूप में पहचान की गई है।

- उपयुक्त वितरण तंत्र के साथ एक एंटी-स्नेल (घोंघा-रोधी) फॉर्मेशन विकसित किया गया है। साथ ही एक खरपतवार-मछलीनाशक फॉर्मेशन भी विकसित एवं आंकलित किया गया है।
- चन्ना प्रजाति (*Channa spp.*) का एक वंश-वृक्ष (phylogeny tree) तैयार किया गया, जिसमें सी बारका (*C. barca*), सी औरनटीमेकुलेटा (*C. aurantimaculata*), सी स्टेवर्टी (*C. stewartia*), सी स्ट्रीएटा (*C. striata*), सी माइक्रोपेलिस (*C. micropelte*) और सी ल्यूसियस (*C. Lucius*) जैसे वर्गों का विभेदन किया गया। हालांकि, यह सी गछुआ (*C. gachua*) और सी हरकोर्टबुल्टेरी (*C. harcourtbutleri*), तथा सी बलेहरी (*C. bleheri*) और सी ब्रुनीया (*C. brunnea*) जैसे निकटवर्ती जोड़ों के बीच अंतर स्पष्ट करने में असफल रहा।
- हेटरोनिस्टस फॉसिलिस (*Heteropneustes fossilis*) और ग्लॉसोगोबीअस गुरिस (*Glossogobius giuris*) के अमीनो अम्ल प्रोफाइलिंग से आवश्यक एवं अनावश्यक अमीनो अम्लों का संतुलित संयोजन पाया गया, जो इनके पोषणीय महत्व को दर्शाता है।

मत्स्यिकी का सामाजिक-आर्थिक पहलू

- पश्चिम बंगाल, असम, गुजरात, केरल और कर्नाटक में चयनित सतत विकास लक्ष्यों (SDGs) की पूर्ति हेतु पहल की गई। पश्चिम बंगाल के पुरुलिया जिले में 16 वर्षों-आधारित जलाशयों (बांधों) में सामुदायिक प्रबंधित मत्स्य पालन का प्रदर्शन किया गया, जिस से 481 आदिवासी महिलाओं को लाभ हुआ। आय के स्रोतों में विविधता लाने के लिए पुरुलिया के मानबाजार क्षेत्र की 30 आदिवासी महिलाओं को टैंक में मछली पालन हेतु सजावटी मछली किट प्रदान किए गए।
- दक्षिण 24 परगना, पश्चिम बंगाल में तालाब आधारित मत्स्य पालन में हस्तक्षेप के फलस्वरूप स्वयं-सहायता समूहों (SHGs) का गठन हुआ।
- पारिस्थितिकी तंत्र सेवाओं पर आधारित एक सुदृढ़ ब्लू इकोनॉमी ढांचा विकसित किया गया, जिसमें प्रावधान, विनियमन, सहायक एवं पालन सेवाओं को आजीविका, पारिस्थितिक पुनर्स्थापन, सामुदायिक सशक्तिकरण और संस्थागत समन्वय से जोड़ा गया।

एन ई एच कार्यक्रम

- असम से एक नई मछली प्रजाति पेंथिया डिब्रुगरहेनसिस (*Pethia dibrugarhensis*) (टेलियोस्टीरु साइप्रिनिडी) की उपस्थिति देखी गई। मेघालय के पूर्व जयंतिया पहाड़ी स्थित क्रेमडम लाडाव गुफा में किए गए इक्विथोफौना सर्वेक्षण में 11 मछली प्रजातियों की पहचान की गई।

- बोडोलैंड टेरिटोरियल काउंसिल के अंतर्गत डिप्लोई, हलोवाडल, टिपकाई और सारेस्वर बीलों की मात्स्यिकी पर अन्वेषणात्मक सर्वेक्षण किए गए। इन बीलों में कार्प मछलियों की पेनपालन परीक्षण में अधिकांश प्रजातियों की उच्च वृद्धिदर दर्ज की गई, जो मछली उत्पादन के लिए अनुकूल परिस्थितियों का संकेत देती है। सिफरी द्वारा त्रिपुरा की सिताचेरा झील में पिंजरे में मछली पालन को भी प्रोत्साहित किया गया।

- ब्रह्मपुत्र नदी से कुल 146 फिन-फिश प्रजातियों का दस्तावेजीकरण किया गया, जिस में कैबडिओ मोरार (*Cabdiomor*) की प्रचुरता पाई गई। अध्ययन किए गए नदी खंड से कुल मछली पकड़ 933.70 मीट्रिक टन आंकी गई। हिल्सा की पकड़ के विश्लेषण में छोटे आकार समूह (100-250 मिमी) वाली हिल्सा की अधिकता दर्ज की गई।

- सिक्किम की प्रमुख नदियों की आवास पारिस्थितिकी और मत्स्यिकी का अध्ययन किया गया जिसमें निओलिस्चिलस हेक्सगोनोलेप्सिस (*Neolissochilus hexagonolepis*) और साइजोथोरेक्स रिचर्डसोनी (*Schizothorax richardsonii*) प्रमुख प्रजातियां थीं। तीस्ता और रंगीत नदियों में औसत प्रति इकाई मत्स्ययन प्रयास (CPUE) क्रमशः 3-5 किग्रा/मछुआरा/दिन और 4-6 किग्रा/मछुआरा/दिन आंका गया।

आईसीएआर नेटवर्क परियोजनाएं

- निकासी (withdrawal) अध्ययन से पता चला कि पंगेसिओनोडोन हाइपोथालमस (*Pangasianodon hypophthalmus*) में एंटीफंगल क्लोट्रिमाजोल की निकासी दर धीमी होती है, जिस से यह कैंटफिश विषाक्त प्रभावों के प्रति संवेदनशील हो जाती है तथा उपचारित मछली कम से कम डेढ़ महीने तक मानव उपभोग के लिए अनुपयुक्त होती है। हालांकि Romet®30 का निकासी काल 5 दिन निर्धारित किया गया।
- वर्ष 2025 के दौरान 109 मत्स्य फार्मों का अध्ययन किया गया, जिस में इसकरेकीया कोलाई (*Escherichia coli*), एरोमोनास प्रजाति (*Aeromonas sp.*) और स्टेफिलोकोकस प्रजाति (*Staphylococcus sp.*) में एएमआर (एंटी माइक्रोबियल प्रतिरोध) पैटर्न की पहचान की गई। ई कोलाई (*E. coli*) की प्रतिरोध क्षमता से पटाजिडीम और एम्पिसिलिन के प्रति 15% से अधिक, जबकि एरोमोनास का सेफॉक्सिटिन के प्रति 19% और इमीपेनम के प्रति 48% उच्च प्रतिरोध दर्ज की गई।
- सीविलड मछलियों निओलैम्प्रोलॉगस पल्सर (*Neolamprologus pulcher*) और ऐम्फिलॉफस ट्राइमाकुलेटस (*Amphilophus trimaculatus*) के सफल प्राकृतिक प्रजनन से यह सिद्ध हुआ कि 2:4 (मादा:नर) का लिंग अनुपात अधिक संख्या में फ्राई (शिशु मछलियाँ) तथा बेहतर अतिजीविता दर देखा गया है।

- असम के सजावटी मछली बाजारों से कानूनी रूप से संरक्षित चन्ना बारका (*Channa barca*) की बाजार मांग और व्यापारिक दबाव का आकलन किया गया।

बाह्य वित्तपोषित परियोजनाएँ

- संस्थान ने रियल-टाइम मैसेज सेवासहित IoT आधारित टर्बिडिटी (गंदलापन) मॉनिटरिंग सिस्टम तथा वायर लेस फ्लोटिंग जलगुणवत्ता निगरानी प्रणाली विकसित की गई है।
- झारखंड के आदिवासी मछुआरा समुदायों की आजीविका में सुधार हेतु घाघरा, केलाघाघ और मसरिया जलाशयों में स्कैम्पी बीज संचयन किया गया, जिससे क्रमशः 26.8, 57.9 और 34.1 टन स्कैम्पी उत्पादन प्राप्त हुआ। द्वितीय चरण (2025-2028) में और 6 अतिरिक्त जलाशयों को शामिल किया गया है।
- हीराकुद जलाशय की वार्षिक संभावित मत्स्य उत्पादकता 70 किग्रा हेक्टेयर आंकी गई। पिंजरा और पिंजरा रहित उत्पादन स्थलों के जल एवं अवसाद के स्थानिक विश्लेषण से यह पुष्टि हुई कि यह जलाशय पिंजरा में मछली पालन के लिए पर्यावरणीय रूप से अनुकूल है।
- पश्चिम बंगाल के हावड़ा, पूर्व मेदिनीपुर और दक्षिण 24 परगना जिलों के जलीय कृषि फार्मों में रोग संक्रमण की निगरानी की गई। हीराकुद जलाशय में पिंजरा में पंगस मछली पालन में एरोमोनास वेरोनी (*Aeromonas veronii*) को प्रमुख रोग जनक के रूप में पहचान की गई है।
- पश्चिम बंगाल और ओडिशा में लेटस कैल्करिफेर (*Lates calcarifer*) में रोग निगरानी की गई। आंत और यकृत ऊतकों के संपूर्ण ट्रांसक्रिप्टोमिक विश्लेषण से संक्रमण-प्रेरित ट्रांसक्रिप्शनल पुनर्संरचना के साथ महत्वपूर्ण जीन अभिव्यक्ति पाई गई।
- गंगा नदी में इंडियन मेजर कार्प (IMC) और महसीर की पुनर्स्थापना हेतु कुल 30 "नदी रैंचिंग कार्यक्रम" संचालित किए गए। मध्यभाग में हिल्सा मात्स्यिकी पुनर्स्थापना के लिए फरक्का बैराज के ऊपर विभिन्न आकर की 98,719 हिल्सा मछली, कृत्रिम पालन से उत्पन्न 9.1 लाख स्पॉन तथा 11.64 लाख निषेचित अंडों का संवर्धन किया गया।
- फरक्का में एक पोर्टेबल एफआरपी (FRP) कार्प हैचरी स्थापित की गई और प्रजनन से प्राप्त लगभग इंडियन मेजर कार्प के 1,00,000 अंगुलिकाओं को प्राकृतिक भंडार बढ़ाने हेतु गंगा में छोड़ा गया।
- आउटरीच पहल के अंतर्गत 26,352 मछुआरों को विनाशकारी मत्स्यन प्रथाओं के बारे में जागरूक किया गया तथा 'गंगा आरती' और 'विश्व पर्यावरण दिवस' जैसे आयोजनों के माध्यम से सामुदायिक सहभागिता को बढ़ावा दिया गया।



- 14वें एशियाई मत्स्य एवं जलीय कृषि फोरम में 'रिवर डायलॉग' का आयोजन किया गया, जिसमें गंगा डॉल्फिन के संरक्षण में नागरिक भागीदारी पर बल दिया गया।
- ईस्ट कोलकाता वेटलैंड की सभी भेरी (मत्स्य जल निकाय) को जीआईएस (GIS) डेटाबेस में दर्ज किया गया। अध्ययन से 1829–2095 किग्रा/हेक्टेयर/वर्ष की उत्पादकता तथा 8931–10,242 टन वार्षिक उत्पादन का अनुमान किया गया, जिसमें 30–35% केवल तिलापिया मछलियाँ थीं।
- ब्रह्मपुत्र नदी के विभिन्न भागों में माइक्रोप्लास्टिक प्रदूषण का स्तर जल में 140–420 कण प्रति घन मी और अवसाद में 13.63–53.33 कण प्रति किग्रा पाया गया, जिसमें सबसे अधिक स्तर देसांगमुख (जल) और डिब्रुगढ़ (अवसाद) में दर्ज हुआ।
- रेशमकीट, एनथीरिया माईलिटा (*Antheraea mylitta*) और बॉम्बिकस मोरी (*Bombyx mori*) के प्यूपा से प्राप्त तेलों में कच्चे रूप में सीमित रोगाणु रोधी गतिविधि पाई गई, जबकि शुद्ध *B. mori* तेल ने मछली कवकों और कुछ जीवाणुओं को अवरुद्ध किया। पोषण की दृष्टि से *A. mylitta* तेल में उच्च पामिटिक/ओलिक अम्ल तथा अधिक एंटी ऑक्सीडेंट गतिविधि पाई गई।
- पूर्वी भारत में उच्च मूल्य की मछली मिस्टस

टेंगरा (*Mystus tengara*) के लिए सामुदायिक तौर पर HDPE पेन पालन को बढ़ावा दिया गया, जिस से मछुआरों की आय में वृद्धि के साथ संरक्षण को भी समर्थन मिला है।

- त्रिपुरा, मणिपुर और झारखंड के जलाशयों में पिंजरो में ओंपक बीमाकूलेटस (*Ompok bimaculatus*) की बड़ी मछली उत्पादन का प्रदर्शन सह-प्रबंधन पद्धति के तहत जारी है।
- असम, पश्चिम बंगाल और बिहार के आर्द्रभूमि में सामुदायिक आधारित HDPE पेन प्रदर्शनों से बीज उत्पादन और स्व-प्रजनन (ऑटो-ब्रीडिंग) की क्षमता सफलता पूर्वक प्रदर्शित हुई।
- स्वर्ण नैनोकणों पर आधारित स्मार्ट फोन-रंगमितीय एप्टासेंसर विकसित किया गया, जो मछली और जल में ऑक्सिटेट्रासाइक्लिन का पता FSSAI की मानक सीमा स्तर से कम होने पर लगा सकता है।
- सुंदरबन क्षेत्र में 70 किग्रा पेलोड और 5 किमी रेंज वाले क्वाडकोप्टर ड्रोन का विकास और फील्ड परीक्षण किया गया, जिसने जीवित मछलियों के परिवहन को प्रदर्शित किया।
- बंगाल की खाड़ी में हिल्सा मत्स्यिकी के लिए भारत, बांग्लादेश और म्यांमार के बीच एक अंतरराष्ट्रीय पहल शुरू की गई है, जिसका उद्देश्य समन्वित प्रबंधन रणनीतियाँ विकसित करना है।

जनजातीय घटक, अनुसूचित जाति उप-योजना और प्रशिक्षण कार्यक्रम

- जनजातीय घटक और अनुसूचित जाति उप-योजना के अंतर्गत कार्यक्रमों का क्रियान्वयन किया गया, जिससे पश्चिम बंगाल, तमिलनाडु और कर्नाटक सहित देश के विभिन्न हिस्सों के 6000 से अधिक मछुआरे एवं मत्स्यिकि सान लाभान्वित हुए।
- संस्थान ने 500 अनुसूचित जाति (SC) और 200 अनुसूचित जनजाति (ST) मछुआरों को प्रशिक्षण प्रदान किया। साथ ही मत्स्यिकी आधारित आजीविका और संरक्षण के विभिन्न पहलुओं पर 110 से अधिक जागरूकता / संवेदीकरण कार्यक्रम आयोजित किए गए।
- संस्थान ने 59 प्रशिक्षण कार्यक्रम आयोजित किए, जिनके माध्यम से 2806 मछुआरों / मत्स्य किसानों / अधिकारियों, उद्यमियों एवं छात्रों को ज्ञान और कौशल प्रदान किया गया।
- संस्थान ने 6 पेटेंट, 1 ट्रेडमार्क और 6 कॉपीराइट के लिए आवेदन किए तथा 93 शोधपत्र और 22 पुस्तकें / बुक चैप्टर प्रकाशित किया है।



History

The institute was established on 17 March 1947 as Central Inland Fisheries Research Station at Calcutta under the Ministry of Food and Agriculture, Government of India following the recommendation of the sub-committee of Central Government on Agriculture, Forestry and Fisheries. The institute completed its 78 years of its existence in 2025. The Research Station was promoted to Central Inland Fisheries Research Institute in 1959 shifting its location to Barrackpore, West Bengal and was brought under the umbrella of Indian Council of Agricultural Research (ICAR), New Delhi in 1967. During more than seven and half decades, the organization has established itself as a pioneer research institute in the field of inland fisheries research in India and abroad. The major responsibilities of the Institute were to assess inland fishery resources, develop strategies to optimize fish production in sustainable manner and human resource development in the field of inland fisheries.

The founders of this great institution had a vision of service to the mankind through quality research for food and nutritional security. Subsequently, many stalwarts led this institute and with the help of capable and competent staff, this institute becomes a doyen in the field of fisheries in the world. This institution not only did world class research but also produces highly competent and qualified scientists.

During the late sixties and seventies, the Government of India put much emphasis on aquaculture research and development. The Planning Commission sanctioned five All-India Coordinated Research Projects, namely, Composite Fish Culture, Riverine Fish Seed Prospecting, Air-breathing Fish Culture, Ecology and Fisheries Management of Reservoirs and Brackishwater Fish Farming during 1971-1973. The Institute, besides several other technologies, developed induced breeding and composite fish culture technologies that ushered blue revolution in the country and laid down a solid foundation for development of freshwater aquaculture.

During the late 1980s, the institute's focus has been shifted to research on inland open water fisheries of rivers, reservoirs, floodplain wetlands, estuaries, lagoons and backwaters. This resulted in

development of fisheries enhancement protocols for large, medium and small reservoir and for wetlands and progressive production enhancement from these large resources. IoT, drone application, application of remote sensing and GIS, riverine catch estimation, exploring the unconventional resources, automation of cages are some of the areas added to the research arena of the institute. A vast amount of information were generated on ecology and fisheries status of nearly all the major river systems, reservoirs, wetlands and lagoons with technologies, protocols and policy recommendations for fisheries management and development in inland open water resources of the country. In recent past, to address the national need, focus of the Institute has been inclined towards natural resource management, sustainable production enhancement and ecosystem health with revision in mandate and for the fulfillment of these objectives, the institute has prioritized adaptation of the latest available technologies and also development of new technologies.

Vision

Sustainable fisheries from inland open waters for environmental integrity, livelihood and nutritional security

Mission

Knowledge based management for enhanced fishery, conservation of biodiversity, integrity of ecological services and to derive social benefits from inland open waters

Mandate

- Basic and strategic research for sustainable management of inland open water resources
- Develop protocols for productivity enhancement in reservoirs and wetlands and aquatic ecosystems health management
- Act as repository of information on inland open water fisheries resources
- Human resource development through training, education and extension

Organizational Structure

The Institute is ISO 9001:2015 certified. To address the mandate throughout the country, the institute established Regional Research Centers at Prayagraj, Guwahati, Bengaluru, and Vadodara and Research station at Kochi. The Headquarters of the Institute is located at Barrackpore, West Bengal. The research activities are now taken up through five Research Divisions, viz.,

- Riverine and Estuarine Fisheries (REF) Division
- Reservoir and Wetland Fisheries (RWF) Division
- Open Water Aquaculture Production and Management (OWAPM) Division
- Fisheries Resources Assessment and Informatics (FRAI) Division
- Aquatic Environmental Biotechnology (AEB) Division

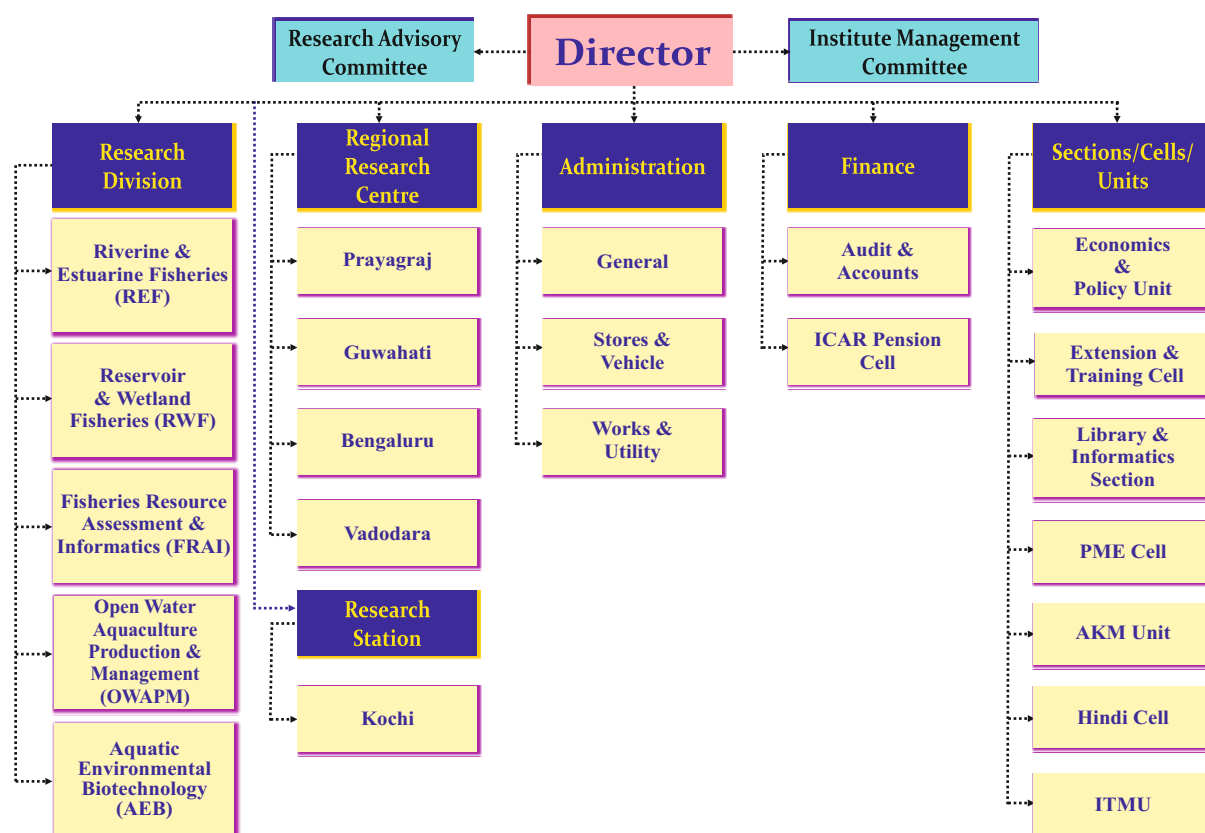
Besides these, Socio-economic research, Extension and Training activities are carried out through the 'Economics and Policy Unit' and 'Extension and Training Cell', respectively. The research activities of each division are led by Head of Division appointed by ICAR. The Regional Research Centers at Prayagraj, Guwahati and Bengaluru are administered by Heads of Regional Centers appointed by ICAR, other research centres and stations are administered by Officers-in-Charges. The Institute has sanctioned cadre strength of 88 Scientists, 86 Technical Officers, 66 Administrative and 65 Supporting personnel.

The head-quarters of the Institute has a number of support services, viz. Administration Section, Audit and Accounts Section, PME Cell, Hindi Cell, AKM Unit, Library and Informatics Section, Institute Technology Management Unit, Stores Section, Vehicle Section, and Nodal Officers for VKSA programme, STC programme, SCSP programme, ICAR Regional Committee meetings, and HRD executing different functions of the Institute.

The overall research, administrative and financial management are responsibility of the Director. He carries out his duties as per guidelines and recommendations of the Institute Management Committee, Institute Research Committee, Research Advisory Committee and Quinquennial Review Team.



Organogram & Location of ICAR-CIFRI Headquarters, Regional Research Centres and Research Station



Budget Details

Budget Details for the year 2025-26 (upto 31.12.2025) (Rs. in lakh)

Head of Accounts	Budget (RE)	Expenditure
Pay and Allowance including OTA*	13046.18	12871.09
TA	56.59	56.59
Other charge including Equipment, Library Books, IT and HRD	1364.52	1087.63
Works	109.89	70.00
Grand Total	14577.18	14085.31

*includes Pension also

The Budget & Expenditure under Institute for the financial year 2025-26 (upto 31.12.2025) (Rs. in lakh)

Budget Head	Institute	
	Budget	Expenditure
Revenue		
Estt. Charges	3576.88	3527.46
OTA	0.00	0.00
TA	56.59	56.59
Other charges	589.30	477.43
Office Building	10.00	9.50
Residential Building	5.00	0.00
Minor Works	10.00	10.00
Misc. Expenses including HRD	14.47	14.47
TSP General	99.00	81.29
NEH General	190.00	124.94
Capital		
Equipment	108.83	73.77
Information Technology	49.31	49.31
Library Books	2.00	0.96
Vessels / Vehicles	0.00	0.00
Furniture & Fixture	30.00	12.80
Works	109.89	70.00
Minor Works	35.11	35.11
TSP Capital	21.00	16.67
NEH Capital	33.00	20.36
SCSP Capital	23.00	16.54
SCSP General	144.50	144.49
Total	5107.88	4741.68
Pension	9469.30	9343.62
Total	14577.18	14085.31
Loans & Advances	129.00	129.00



Other Projects 2025-26 (upto 31.12.2025) (Rs. in lakh)

Budget Head	Budget	Released	Expenditure
Ornamental Fish	43.00	29.00	10.76
CABIN	15.00	15.00	10.72
AMR	20.00	16.25	11.87
NASF Nano Biosensor	11.54	11.54	6.99
NASF Labour migration	1.15	1.15	0.00
Fish Health	16.30	16.30	11.63
ITMU	4.78	4.78	4.71
NePPA	35.00	35.00	13.35
Deposit Schemes (Externally funded)	957.35	957.35	205.07
Consultancies	74.02	74.02	37.60

Revenue Receipts 2025-26 (upto 31.12.2025) (Rs in lakh)

Head	ICAR	Institute	Target	Achievement
Income from Sales / Services	30.01		130.0	30.01
Fee / Subscription	0.00			
Income from Royalty, Publication etc.	0.00			
Other income	15.94	105.53		
STD Interest	0.00			
Sale of Assets	0.00			
Recoveries on Loans and Advances	38.81			
CPWD / Grants Refund	0.00		130.00	30.01
Total	84.76	105.53		

On-going Research Projects during 2025

Institute projects

Sr. No.	Project	Scientist(s)	Page No.
	REF projects	First name is the PI / Sub project leader	
1.	REF/24-26/17: Estimation of fish catch, diversity, and socio-economics of fishers of selected rivers towards fisheries and livelihood sustainability (Narmada, Cauvery, Sutlej, Gomti and Pamba)	S. K. Manna	6
1.1	REF/24-26/17/1: Estimation of fish catch, diversity and socio-economics of fishers of Narmada River towards fisheries and livelihood sustainability	S. K. Manna, D. Bhakta, P. Gogoi, M. Ramteke, C. Johnson, P. Debroy, S. P. Kamble, S. K. Sahu (w.e.f. 01.04.25)	6
1.2	REF/24-26/17/2: Estimation of fish catch, diversity and socio-economics of fishers of Cauvery River towards fisheries and livelihood sustainability, livelihood sustainability	Roshith, C. M., S. K. Das, S. M. Nair, A. Ekka, V. L. Ramya, Sibina Mol S.	7
1.3	REF/24-26/17/3: Estimation of fish catch, diversity, ecological variability and socio-economics of fishers of Sutlej River towards fisheries and livelihood sustainability	A. Alam, D. N. Jha, V. R. Thakur, J. Kumar, V. Kumar, Arun Pandit	8
1.4	REF/24-26/17/4: Estimation of fish catch, diversity, ecological variability and socio-economics of fishers of Gomti River towards fisheries and livelihood sustainability	D. N. Jha, A. Alam, V. R. Thakur, J. Kumar, V. Kumar, Arun Pandit	10
1.5	REF/24-26/17/5: Estimation of fish catch, diversity, ecological variability and socio-economics of fishers of Pamba River towards fisheries and livelihood sustainability	D. Sudheesan, T. T. Paul, T. Abdulla, Ganesh Chandra	11
2.	REF/24-27/18: Assessing changes in estuarine fisheries resources for sustainable management (Pulicat Lake, Kayamkulam estuary, and Mahi estuary)	D. Bhakta	12
2.1	REF/24-27/18/1: Assessing changes in fisheries resources for sustainable management of Pulicat Lake	D. Bhakta, S. K. Manna, S. K. Das (upto 31.03.26), A. K. Sahoo, Sangeetha M. Nair, Aparna Roy, C. Johnson	12
2.2	REF/24-27/18/2: Assessing changes in fisheries resources for sustainable management of Kayamkulam estuary	Preetha Panikkar, Jesna P. K., Sonalika Sahoo, Deepa Sudheeshan, T. T. Paul, Tanuja Abdulla, Ganesh Chandra, Santhana Kumar V. (w.e.f. 01.04.25)	13
2.3	REF/24-27/18/3: Assessing changes in fisheries resources for sustainable management of Mahi estuary	Suhas P. Kamble, Roshith C. M.	15
3.	REF/24-27/19: Evaluation of ecosystem health, fish catch structure, mangrove landscape patterns aiming to Sustainable Development Goals (SDGs) with changing climate scenario in Indian Sundarbans	Ajoy Saha, B. K. Das, Rosith C. M., Pranab Gogoi, Sangeetha M. Nair, Sonalika Sahoo	16
	RWF projects		
4.	RWF/23-26/15: Exploration of ecosystem dynamics and fisheries of Kanva (Karnataka), Sathanur (Tamil Nadu) and Banasuragar (Kerala) reservoirs for sustainability and conservation	Preetha Panikkar, Ramya V. L., Jesna P. K., Sonalika Sahoo, Sibina Mol S. (from 01.04. 2024)	19
5.	RWF/24-27/16: Development of natural farming protocol for culture-based fisheries in wetland	R. K. Manna, H. Chowdhury, Md. Aftabuddin, Lianthuamlaia, Suman Kumari, P. Majhi	20
6.	RWF/24-27/17: Fostering reservoir fisheries for blue growth and achieving SDGs amid climate change and anthropocene	Sajina A. M., A. K. Das, R. K. Manna, Suman Kumari, Lianthuamlaia, Satish K. Koushlesh, Pritijyoti Majhi, Chayna Jana, T. T. Paul, D. Sudheesan, T. Abdulla, Piyashi DebRoy (w.e.f. 01.04.25)	22
7.	RWF/24-27/18: Exploration and feasibility study of pits and quarries for fish production	Suman Kumari, A. K. Das, R. K. Manna, Sajina A. M., S. Kaushlesh, Pritijyoti Majhi	24
	FRAI projects		
8.	FRAI/24-27/01: Harnessing data science for optimizing spatial assessment of riverine and wetland fisheries resources	Malay Naskar, S. K. Sahu, Chayna Jana, Soma Das Sarkar	27
9.	FRAI/24-27/02: Assessment of greenhouse gas emission and carbon sequestration potential of selected wetlands for developing mitigation strategies to reduce the adverse impacts of climate change	B. K. Das, S. Samanata, S. K. Nag, Vikas Kumar, N. Chanu	28

Contd.....



Institute projects

Sr. No.	Project	Scientist(s)	Page No.
10.	FRAI/24-27/03: Assessment of petroleum hydrocarbon, PFAS and phenolic micropollutants in surface water and their effect on ecosystem health	S. K. Nag, Soma Das Sarkar, Ajoy Saha, Md. Aftabuddin	29
11.	FRAI/24-27/04: Assessing the resilience of native fish communities in different hydroclimatic zones	Ramya V. L., Jesna P. K., Sibina Mol S., Sonalika Sahoo, Niti Sharma, Absar Alam, L. N. Murthy (w.e.f. 17.11.25)	30
	OWAPM projects		
12.	RWF/23-26/14: Next generation inland open water cage culture in India with special reference to system and species diversification	B. K. Das, M. A. Hassan (upto 31.01.24), A. U. Muzaddadi (since 01.04.24), Gunjan Karnatak, Mishal P., Suman Kumari, Raju Baitha (upto 03.06.25), Mitesh Ramteke, D. K. Meena, D. Debnath (upto 28.02.24), Sona Yengkokpam (upto 15.03.24), Rahul Das, Venkatesh Thakur, Suhas P. Kamble, P. Das	31
13.	OWAPM/24-27/01: Investigation of ectoparasitism and their effects on fish populations of Eastern Indian reservoirs	A. K. Bera (since 04.06.25), Raju Baitha (PI upto 03.06.25), B. K. Das, A. K. Das, Arman U. Muzaddadi, Rahul Das, M. Shaya Devi (w.e.f. 17.11.25)	32
	AEB projects		
14.	FREM/23-26/20: Aquatic environment health assessment and novel formulations development for fish health management	B. K. Das, Asit K. Bera, H. Chowdhuri, D. J. Sarkar, P. Maurye, Soma Das Sarkar, Santhana Kumar, Kavita Kumari, Vikash Kumar, Suvra Roy, M. Shaya Devi, P. K. Parida (w.e.f. 01.04.25)	34
15.	AEB/24-27/01: Biotechnological interventions for aquatic environment and fisheries management of wetlands	A. Sinha, Dhruba Jyoti Sarkar, Praveen Maurye, Kavita Kumari, Vikash Kumar, Suvra Roy, M. Shaya Devi, Santhana Kumar V., P. K. Parida (w.e.f. 01.04.25)	35
	Social Science projects		
16.	FSE/25-28/07: Sustainable inland fisheries for climate-resilient and gender-inclusive livelihoods towards attaining SDGs	B. K. Das, L.N. Murthy (w.e.f. 17.11.25), A. K. Das, Arun Pandit, Aparna Roy, P. K. Parida, Lianthuamluaia, Anjana Ekka, Dibakar Bhakta, Piyashi DebRoy, Kavita Kumari, Suman Kumari, M. Shaya Devi, Canciyal Johnson, G. Karnatak, P. J. Majhi, Ganesh Chandra, M. Ramteke, Pronob Gogoi, T. N. Chanu, Deepa Sudheesan, Simanku Borah, Pronob Das, S. P. Kamble	37
17.	FSE/25-28/08: Economic accounting of inland open waters for a resilient blue economy in the Indian Sundarbans and North-Eastern Regions	Anjana Ekka, Arun Pandit, Aparna Roy, G. Chandra, P. DebRoy	38
	NEH projects		
18.	NEH/24-27/04: Sustainable management of inland open water fisheries of Northeastern India	S. K. Majhi, B. K. Bhattacharjya, P. Das, S. C. S. Das, S. Borah, A. K. Yadav, Niti Sharma, Rakesh Kumar (upto 07.10.25)	64
19.	NEH/24-27/05: Assessing fisheries and habitat characteristics of River Brahmaputra and rivers of Sikkim in response to natural and anthropogenic changes	B. K. Bhattacharjya	66
19.1	NEH/24-27/05/01: Revitalizing River Brahmaputra for assessing fisheries and habitat characteristics in response to natural and anthropogenic changes	B. K. Bhattacharjya, S. K. Manna, S. K. Majhi, A. K. Yadav, S. C. S. Das, S. Borah, P. Gogoi, Rakesh Kumar (upto 07.10.25), Pronob Das	66
19.2	NEH/24-27/05/02: Assessment of fish diversity, distribution and fish catch structure in rivers of Sikkim	Niti Sharma, S. K. Majhi, A. K. Sahoo, S. C. S. Das, D. Bhakta	67

Externally funded projects

Sr. No.	Project Title	Scientist(s)	Funded by	Page No.
1.	National Agricultural Innovation Fund (NAIF) Component-1: ITMU	ITMC Chairman – Director PI: G. Chandra	ICAR	40
2.	All India Network project on fish health	S. K. Manna, S. K. Nag, A. K. Bera, R. Baitha (upto 04.06.2025), P. Panikkar	ICAR	41
3.	Network Project: Antimicrobial resistance (AMR) in fisheries and aquaculture	A. K. Sahoo, A. K. Bera	ICAR	41
4.	Network Project: AINP-Ornamental fish breeding and culture (2024-2027)	PI.: Suman Kumari (since 20.10.22 and Oct-May 2020-21), U. K. Sarkar (w.e.f. 01.06.21-19.10.22), A Sinha (till Sept 2020) CoPIs: Sona Yengkokpam (upto 15.03.24), H. S. Swain (upto 31.08.22), A. Sinha, Suman Kumari, Niti Sharma (w.e.f. 01.09.2021)	ICAR	42
5.	IoT based precision enclosure culture and fisheries management in inland open waters	B. K. Das, S. Samanta, D. K. Meena, Chayna Jana, A. U. Muzaddadi, P. K. Parida	NePPA	43
6.	Environmental and aquaculture animal health monitoring in Hirakund Reservoir under cage culture programme	B. K. Das, S. K. Koushlesh, C. Johnson, P. Gogoi	DOF, Govt. of Odisha	44
7.	Microbiome meta transcriptomics assessment of Indian river basins for ecosystem health monitoring	B. K. Das, D. J. Sarkar, Suvra Roy, Vikash Kumar, P. K. Parida	CABin, ICAR, New Delhi	45
8.	Imparting state of art knowledge on fish breeding to the local fishermen for livelihood improvement and enhancing the native fish population through ranching programme in river Ganga	B. K. Das, A. K. Sahoo, D. K. Meena	NTPC, Farakka	46
9.	National surveillance programme for aquatic animal diseases: Phase II	B. K. Das, Vikash Kumar, P. K. Parida	PMMSY	46
10.	Improving livelihood of tribal communities through Scampi fisheries enhancement technologies in under-utilized reservoir resources of Jharkhand	Coordinator: Director A. K. Das, Mishal P., Raju Baitha (upto 03.06.25)	Govt. of Jharkhand	47
11.	Identification and comparative expression analysis of novel immune related genes against prevalent bacterial infection and development of remedial measures in Asian Seabass, <i>Latescalcarifer</i>	A. K. Sahoo, D. K. Meena	DBT	48
12.	Fish conservation and stock enhancement of fishery of Ganga river basin (Phase-III) under Namami Gange Mission	B. K. Das, Dibakar Bhakta, P. K. Parida, D. N. Jha, Lianthuamluaia, Aparna Roy, A. K. Sahoo, Raju Baitha (upto 03.06.25), D. K. Meena, Ajoy Saha, Mitesh H. Ramteke, Arun Pandit, Canciyal Johnson, Gunjan Karnatak, Suman Kumari, Santhana Kumar V., T. N. Chanu, Md. Absar Alam, Vikas Kumar, V. R. Thakur, J. Kumar, Piyashi DebRoy	NMCG	48
13.	The changing dynamics of labour migration on employment, livelihoods and resource productivity patterns in Indian marine fisheries sector.	Aparna Roy	NASF, ICAR	50
14.	Assessment of production of fish, fish disease and feasibility study of certification for fish produced in East Kolkata Wetland <i>Subproject 1:</i> Multiple value assessment of agriculture (paddy), horticulture, medicinal plants, floriculture and uses <i>Subproject 2:</i> Culture of indigenous fish species <i>Subproject 3:</i> Assessment of invasive fish species with special emphasis on <i>Pterygoplichthys</i> spp. for control/eradication in East Kolkata Wetland	B. K. Das, S. Samanta, A. K. Das, G. Karnatak, Lianthuamluaia, V. Kumar, Mishal P.	East Kolkata Wetland Management Authority	51

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Externally funded projects

Sr. No.	Project Title	Scientist(s)	Funded by	Page No.
15.	Nutritional Profiling of fishes of Sessa river, Dibrugarh, Assam and sensitization on health benefit of fish consumption (CSR Project)	B. K. Das, B. K. Bhattacharjya, Simanku Borah	Brahmaputra Crackers and Polymers Ltd	52
16.	Benchmarking microplastic pollution in the river Ganga and Brahmaputra in relation to native edible fish fauna	B. K. Das, Dhruva Jyoti Sarkar, Soma Das Sarkar, Ajoy Saha, Rakesh Kumar (upto 07.10.25), Santhana Kumar V. (upto 11.03.2025)	DBT	53
17.	Nutraceutical solutions for sustainable aquaculture: Extraction and utilization on tasar pupae oil and meal in feed formulation	B. K. Das, D. K. Meena, Rahul Das	Central Silk Board	54
18.	A pilot project for developing drone technology for live fish transport and PAN India level demonstration	B. K. Das, Chayna Jana, Pronab Gogoi	NFDB	55
19.	Point of care nano-biosensors for antibiotic residue detection in fish	D. J. Sarkar, B. K. Das, Santhana Kumar (upto 11.03.2025)	NASF-ICAR	55
20.	ICAR-WorldFish collaborative research project (Window-3): Small scale fisheries in wetlands for livelihood and nutritional security	B. K. Das, B. K. Bhattacharjya, A. K. Das, Arun Pandit, A. K. Sahoo, A. Roy, P. K. Parida, G. Karnatak, S. Borah, Pronob Das, Lianthuamluaia	ICAR-World Fish	56
21.	Assessment of Green House Gas emission and Scoping Study for cultivation of indigenous high value fishes in East Kolkata Wetlands	B. K. Das, Srikanta Samanta, Gunjan Karnatak, Thangjam Nirupada Chanu	IWMI	58
22.	Scaling-up cage culture of high-value butter catfish (<i>Ompok bimaculatus</i>): A sustainable approach to profitability	G. Karnatak, P. K. Parida, Mitesh Ramteke, S. C. S. Das	NFDB	58
23.	Leveraging auto-recruiting indigenous species for sustainable enhancement and conservation of wetland fisheries	Lianthuamluaia, G. Karnatak, Arun Pandit, Simanku Borah, P. K. Parida, Suman Kumari	NFDB	59
24.	Conservation and restoration of Gangetic Indian Major Carps and other Indigenous fishes through breeding and ranching at Farakka, West Bengal	B. K. Das, A. K. Sahoo, D. K. Meena, Gunjan Karnatak	NTPC, Farakka	60
25.	'Backyard pond culture through model village development	B. K. Das, Aparna Roy, Ganesh Chandra	SBI-CSIR	60
26.	Developing Transboundary Management Strategies for Hilsa Fishery in the Bay of Bengal Region under Changing Climate	B. K. Das, A. K. Sahoo, D. K. Meena, Piyashi DebRoy, Canciyal Johnson	Bay of Bengal Inter-Governmental Programme	61
27.	Study on the Environmental Impact Assessment of cage culture in inland open waters before bringing cage culture under consent mechanism	B. K. Das, Suhas Kamble, Armaan U. Muzaddadi	Maharashtra Pollution Control Board	62
28.	Survey to assess district-wise utilization of water bodies for fishing and collection of variety-wise fish production/prices in the state including ornamental fish	B. K. Das, Sanjeev Sahu, Anjana Ekka, Chayna Jana, Dharm Nath Jha, V. R. Thakur	UP Government	62

Consultancy projects

Sr. No.	Project title	Scientist(s)	Funded by	Page No.
1.	Assessment of environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of Sardar Sarovar Dam (SSD) in Narmada River	B. K. Das, A. K. Sahoo, S. Kamble, D. K. Meena, Ajoy Saha	SSNL Ltd	63
2.	Investigation on the fish diversity with special focus on migratory behaviour in lean season of the river Mandakini upstream of Guptkashi	B. K. Das, A. K. Sahoo, Absar Alam, Vikash Kumar	Mandakini Jal Urja Private Limited	63
3.	Mapping of hilsa migratory habitat and stock identification in Myntdu river, Meghalaya in the vicinity of MLHEP stage II	B. K. Das, A. K. Sahoo, D. K. Meena, S.C.S. Das, Rakesh Kumar (upto 07.10.25)	Meghalaya Power Generation Corporation Limited (MePGCL)	63
4.	Study on fish kill incidence due to chemical water discharged into Jagbudi and Vasishta River at Ratnagiri which meets Dabhol creek in Maharashtra	B. K. Das, Suhas Kamble	MPCB	63



Riverine and Estuarine Fisheries Projects

Project title: Estimation of fish catch, diversity, and socio-economics of fishers of selected rivers towards fisheries and livelihood sustainability (Narmada, Cauvery, Sutlej, Gomati and Pamba)

Project code: REF/24-26/17

Sub-project 1 (REF/24-26/17/1): Estimation of fish catch, diversity, and socio-economics of fishers of Narmada River towards fisheries and livelihood sustainability

Fish catch

Narmada, the most important west-flowing river of India, plays important roles in riverine fisheries, fish diversity and fishers' livelihood. The fisheries resource assessment surveys recorded an annual

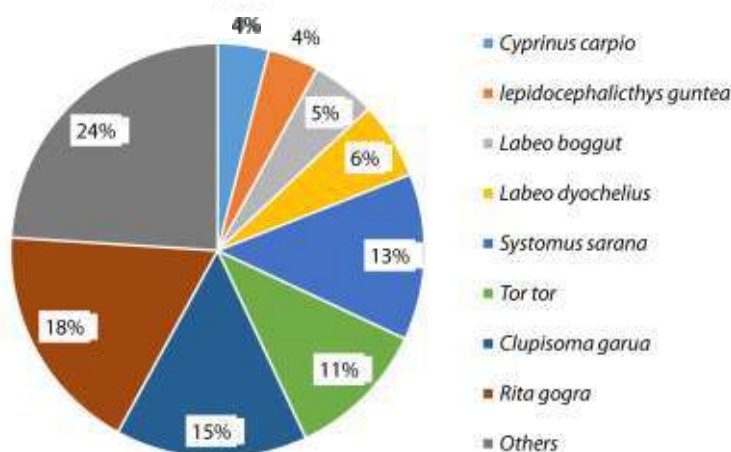
catch of 14,742 metric tonnes (MT) of fish – 2,459 MT from upper stretch (Annupur to Narmadapuram), 2,130 MT from middle stretch (Raisen to Khargaon) and 10,153 MT from lower stretch (Dhar to Bharuch) of the river. Season-wise, fish catch was estimated to be 1,418 MT, 10,259 MT and

3,061 MT in summer, monsoon and winter season, respectively.

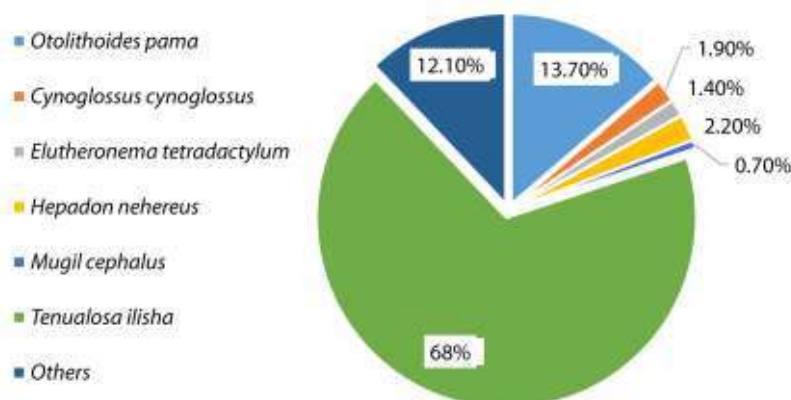
This year, the lower stretch recorded a bumper catch of 7,290 MT *Tenualosa ilisha*, against average annual catch of 990-2420 MT in last five years, pushing up total fish catch from the river estuary as well as fishers' income. Average CPUE (kg/fisher/day) of Hilsa fishing enhanced to 27 in 2025 from 12 in the last year.



A glimpse of assorted fish catches from river Narmada in the market



Fish catch composition in upper and middle stretches of Narmada



Fish catch composition in the lower stretch of Narmada

Fish catch composition and diversity

There were marked variations in ichthyofaunal diversity in commercial catch of upper, middle and lower stretches. In upper and middle stretches *Rita gogra* (18.63%) dominated the catch during monsoon season; *Clupisoma garua* contributed 14.71% and *Tor tor* contributed 10.78% to total catch. In lower stretch, *Tenua ilisha* (68%) was the most important catch during monsoon season. The river holds vibrant Mahseer (*Tor tor*), catfish (especially *Rita gogra*) and *Corica soborna* fisheries, but fishers reported decline in catch of *T. tor* and *Labeo fimbriatus* in recent past.

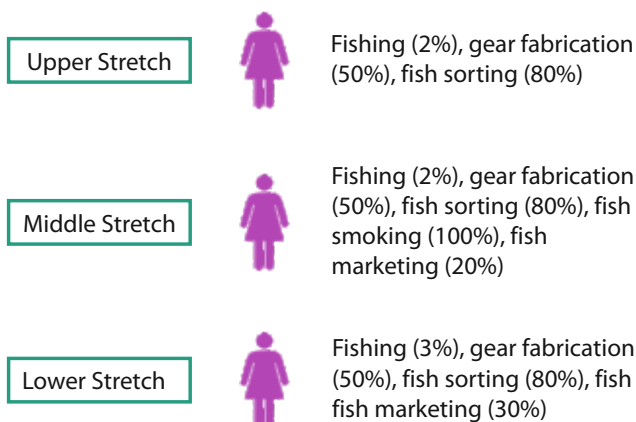
A total of 78 fish species belonging to 65 genera, 35 families and 12 orders were recorded from the river. Family-wise, members of Cyprinidae (16.25%), Gobiidae (12.5%), Mugilidae (7.5%), Bagridae (7%) dominated fish germplasm diversity.

Roles of women in riverine fisheries

Although fishing in fast-flowing Narmada is a men's terrain, women of the fishers' families play important roles in various fisheries activities such as gear fabrication, sorting of the catch, fish marketing, sun drying or smoking and even fishing. Drying and/or smoking of small indigenous fishes, majorly *Corica soborna* and *Rita gogra*, to enhance their shelf-life and market demand are commonly practiced in several stretches of the river. In upper stretch, *Baiga* tribal women use traditional fishing techniques with traps made of aquatic interrupted cupscale grass (*Sacciolepis inetrrupta*) targeting SIFs



such as *Puntius*, *Pethia*, *Garra*, *Channa*, *Salmophasia bacaila*, *Osteobrama cotio*, *Systomus sarana*, *Botia dario*, *Lepidocephalus guntea*. In the lower stretch, women participate in collecting *Macrobrachium rosenbergii* seeds using scoop nets, and also participate in fishing with drag nets, push nets, hook and line, and funda (for mud skippers).

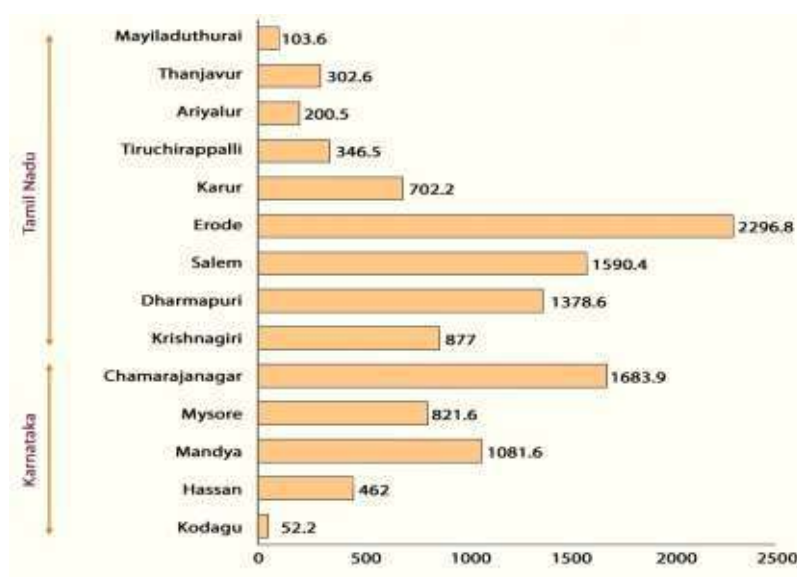


Involvement of women in riverine fisheries activities of Narmada

Sub-project 2 (REF/24-26/17/2): Estimation of fish catch, diversity, and socio-economics of fishers of Cauvery River towards fisheries and livelihood sustainability

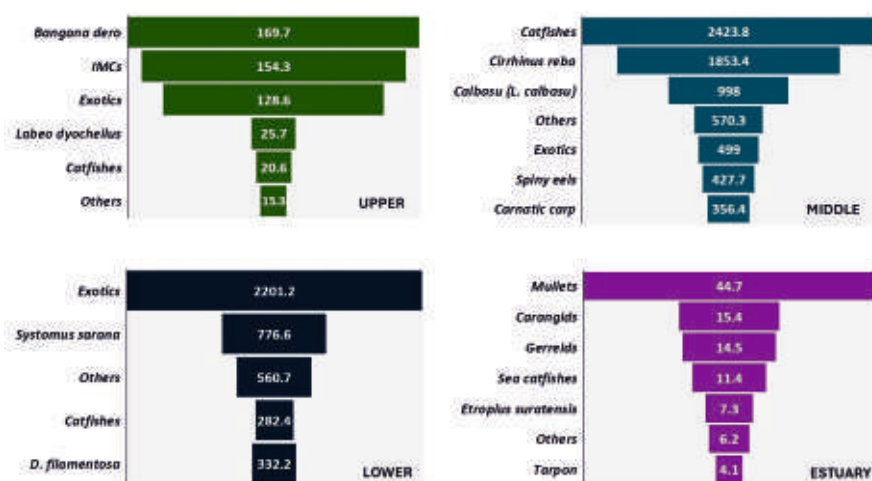
Fish landings, diversity and catch structure

Comprehensive fisheries resource assessment surveys in 70 fishing villages and 14 major fish landing centres estimated 11,899.5 MT of total annual fish landings from the River Cauvery. About 65% of the landings (7,798.2 MT) from the river was from Tamil Nadu, while Karnataka accounted for the remaining. While the middle stretch of the river constituted the largest percentage of total riverine fish landings, district-wise data indicated that the Erode District of Tamil Nadu, situated in the lower stretch, had the predominant share with a contribution of 19.3% (2,296.8 MT). The estimated average CPUE was 12.51 kg/fisher/day for the entire stretch of River Cauvery.



District-wise fish landings (mt) along the River Cauvery

There was distinct variability in the fish catch structure along different stretches, with carps (*Bangana dero*, IMCs, and *Labeo dyocheilus*) being the major catch components in the upper stretch, whereas catfishes dominated the fish landings in the middle stretch. The exotic fishes, dominated by *Oreochromis niloticus*, *O. mossambicus*, and *Clarias gariepinus*, accounted for nearly 53% of the landings in the lower stretch. Mulletts were the major catch components in the estuarine part with an estimated landings of 44.7 MT, followed by carangids and gerreids.



Landings (mt) of major fish species/groups in different stretches of River Cauvery

Documentation of indigenous needle fish and freshwater eel fisheries

A distinctive needle fish (called 'Kokku





Red-tipped halfbeak *H. xanthopterus* (A), and the Indian mottled eel *A. bengalensis* (B) captured from the lower stretch of the Cauvery

'meen') fishery was documented along the lower stretch of the river. The fishery employs small meshed gill nets to target the indigenous red-tipped halfbeak *Hyporhamphus xanthopterus*, constituting approximately 85% of the catch. The CPUE ranged from 0.8 to 4.5 kg/fisher/day. The other notable indigenous fishery documented was the catadromous freshwater eel (locally called 'Velangu') fishery along the lower stretch of the river, where the Indian mottled eel (*Anguilla bengalensis*) is captured using cylindrical traps, called 'Pari', with an estimated catch per unit effort (CPUE) ranging from 0.65 to 3.2 kg/fisher/day.

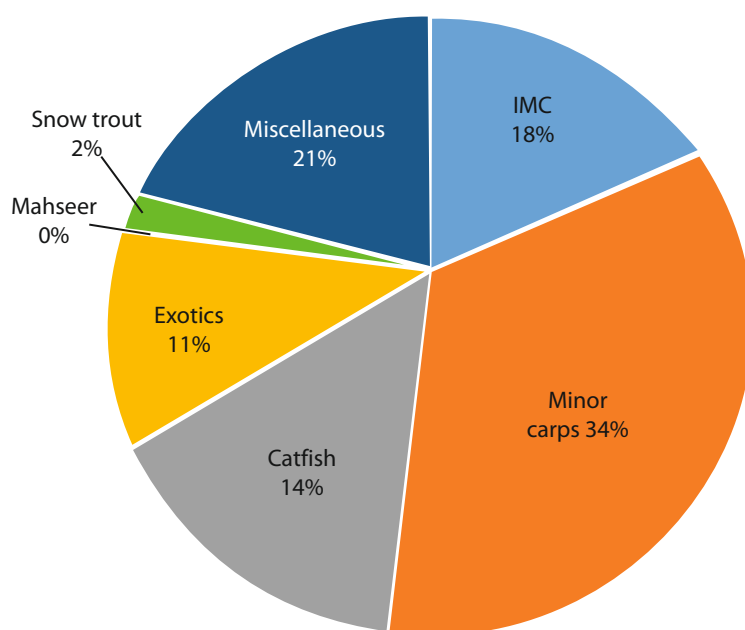
New record of *Osteobrama tikarpadaensis* from River Cauvery



Osteobrama tikarpadaensis recorded from middle stretch of the Cauvery

The present study recorded *Osteobrama tikarpadaensis* from Talakkad along the middle stretch of the river Cauvery in Karnataka. The species was originally described from Tikarpada in the Mahanadi River.

Sub-project 3 (REF/24-26/17/3): Estimation of fish catch, diversity, ecological variability and socio-economics of fishers of Sutlej River towards fisheries and livelihood sustainability



Fish catch composition in the Sutlej River

Fish catch and CPUE

River Sutlej is a lifeline for fisheries in Punjab and Himachal Pradesh. Total fish catch from 6 landing sites of the river during summer and monsoon was estimated as 222 MT with notable variations across regions. Harike recorded the highest catch of 64.64 MT, while Ferozpur had the lowest at 28.6 MT. In the Middle region, Sultanpur and Ludhiana had comparable catches (37.79 and 35.44 MT, respectively). Overall, minor carps dominated the harvest with 34% contribution, followed by miscellaneous group (21%), IMC (18%), catfish (14%) and exotic species (11%). Snow trout contributed 2%, and share of mahseer in total catch was negligible.

The upper stretch recorded the highest CPUE in all seasons, peaking at 20.3 kg/fisher/day, followed by the middle stretch (18.6 kg) and lower stretch (15.5 kg) during peak season. Productivity

declined during the lean season, with the upper stretch still leading at 8.8 kg/fisher/day, while CPUE in the lower stretch dropped to just 3.03 kg/fisher/day.

Fish diversity

A total of 72 fish species were documented from the Sutlej River. Cyprinidae was the most dominant family, followed by Danionidae, Bagridae, and Ambassidae. Harike was the most biodiverse site, followed closely by Mattewara, Ferozpur, Govind Sagar, and Rupnagar. Buddha nala exhibited notably low diversity with just 10 species. Six exotic fish species were recorded during the study, namely, *Clarias gariepinus*, *Hypophthalmichthys molitrix*, *Hypophthalmichthys nobilis*, *Ctenopharyngodon idella*, *Oreochromis niloticus*, and *Cyprinus carpio* in the catch.

Fishing crafts and gears

Sutlej River fisheries employ a diverse range of traditional and modern fishing gears, including gill nets, cast nets, drag nets, longlines, rod and line, bamboo traps, and night-time spear fishing with torchlight. The gill nets were the dominant gear in the Sutlej River. Fishing crafts consist mainly of wooden plank-built boats (13–22 ft) and tyre tubes.

Macrobenthos diversity

A total of 10 species of macrobenthos (Mollusc 04, Bivalves 04, Insects 02) belonging to 5 orders and 7 families were documented from the selected sites of the river. The benthos density varied from 10–120 N/m², 10–390 N/m² and 40–220 N/m² during winter, summer and monsoon seasons, respectively. Harike had the highest number of benthic species (8). In the downstream, gastropods such as *Filopaludina bengalensis* and bivalve *Corbicula striatella* were dominant during the summer and monsoon periods, respectively.

Phytoplankton, zooplankton and periphyton diversities

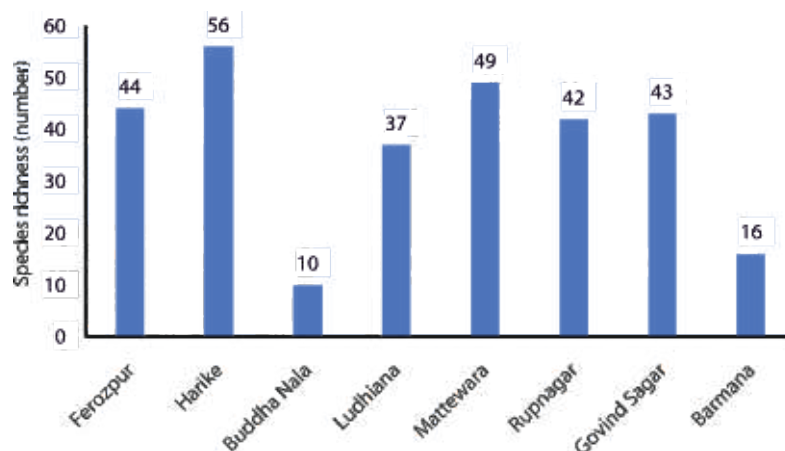
A total of 60 species of phytoplankton belonging to phyla Heterokontophyta (diatoms), Cyanobacteriophyta (blue-green algae), Cryptista (cryptists), and Chlorophyta (green algae) were recorded from the river. The dominant genera were Cyclotella, Navicula, Ulnaria, and Nitzschia

among diatoms, Monoraphidium in green algae and Merismopedia in blue-green algae. A total of 20 species of zooplankton, belonging to phyla Rotifera, Ciliophora, Arthropoda and Amoebozoa were recorded. A total of 53 periphytic species belonging to Heterokontophyta (diatoms), Euglenophyta (euglenoids), Cyanobacteriophyta (blue-green algae), and Chlorophyta (green algae) were documented from the river.

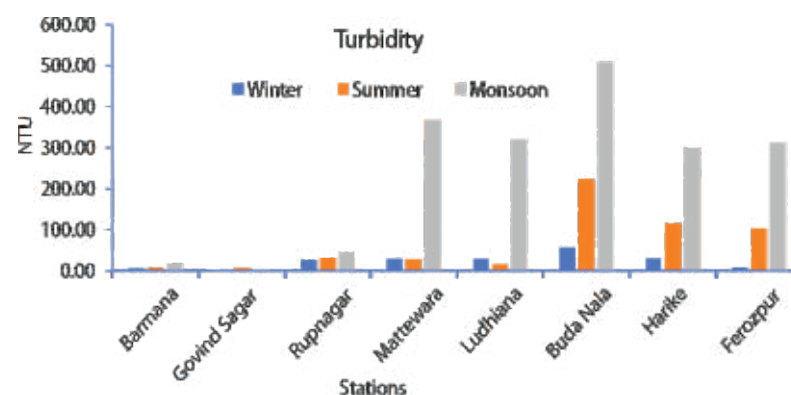
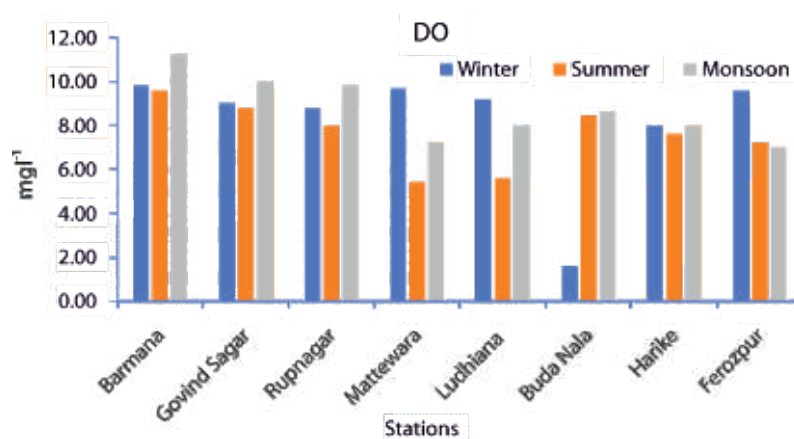
Water quality

Water quality of the Sutlej River showed pronounced seasonal and spatial

variability. Turbidity increased markedly during monsoon, with extreme turbidity at Mattewara (507 NTU) and Harike (367 NTU). Water pH remained alkaline (7.1 – 9.0) throughout the year. Critically low dissolved oxygen (< 2.0 mg/l) in winter, elevated TDS, nutrients, BOD, and COD at Buddha Nala reflected severe urban-industrial influence, whereas upstream sites such as Bhakra and Barman exhibited comparatively good water quality. Seasonal hydrology governed turbidity and nutrient transport, while anthropogenic inputs influenced downstream water quality.



Fish diversity along the stretches of the Sutlej River



Seasonal variations in key water quality parameters in the Sutlej River



Sub-project 4 (REF/24-26/17/4): Estimation of fish catch, diversity, ecological variability and socio-economics of fishers of Gomti River towards fisheries and livelihood sustainability

Water quality

Water quality parameters of river Gomti showed wide spatial and seasonal variations with sub-optimal quality in urban-influenced stations. Dissolved oxygen (DO) levels ranged from 1.4 to 11.2 mg/l with disparagingly low DO at Lucknow upstream and downstream sites during winter and summer. High BOD (0.4 to 30 mg/l) and COD (88.32 mg/l) were also recorded indicating high organic pollution load at Lucknow downstream during summer. EC and TDS showed marked spatial variation, with maximum EC (1,074 $\mu\text{S}/\text{cm}$) and TDS (762 mg/l) at Lucknow downstream in summer, reflecting urban and industrial discharge; lower values were noted during monsoon. Phosphate content showed significant summer enrichment with highest levels at Lucknow downstream (available P: 6.98 mg/l; total P: 7.33 mg/l), indicating eutrophication risk.

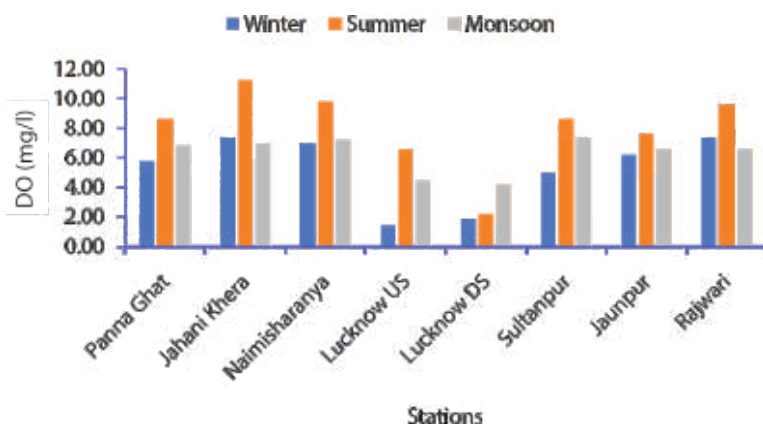
Macrobenthos diversity

A total of 12 species of macrobenthos (Molluscs 6, bivalves 3, insects 3) belonging to six orders and nine families were documented. The benthos density varied from 20 to 270 N/m^2 , 70 to 820 N/m^2 , and from 60 to 280 N/m^2 during winter, summer, and monsoon seasons, respectively. *Chironomus* was observed in almost all downstream sites with highest density at Lucknow DS (820 N/m^2) in summer indicating organic pollution.

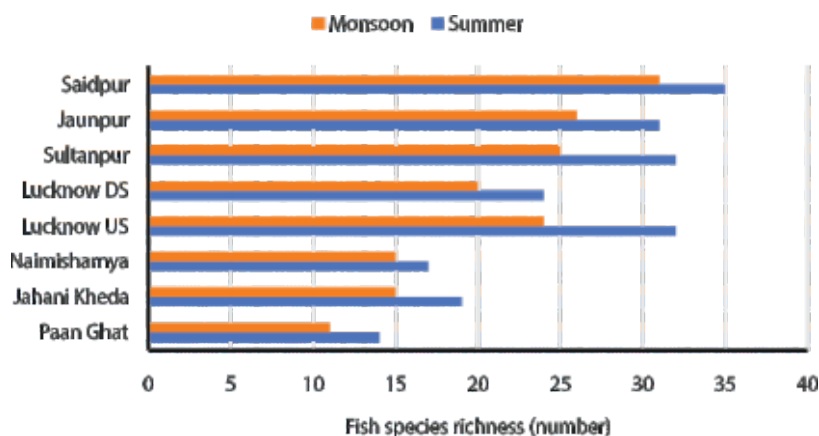
Plankton and periphyton diversities and abundances

A total of 90 phytoplankton species under phyla heterokontophyta (diatoms), chlorophyta (green algae), cyanobacteriophyta (blue green algae), euglenophyta (euglenoids), charophyta (desmids) and cryptista (cryptists) were recorded. There

were wide seasonal and spatial variations in total number: from 2 at Namisaranya to 27 at Jaunpur during winter, from 10 (Panna ghat) to 26 (Jaunpur) during summer and from 7 to 20 during monsoon seasons. A total of 30 species of zooplankton belonging to Rotifera, Protozoa, Arthropoda, and Amoebozoa were recorded with higher diversity of Rotifera (17 species) and Arthropoda (11 species). The species number was highest (15) in polluted site, Lucknow upstream during summer season. 69 species of periphyton belonging to phyla Heterokontophyta (diatoms), Euglenophyta (euglenoids), Cyanobacteriophyta (blue-green algae), Cryptista (cryptists), Chlorophyta (green algae) and Charophyta (desmids) were documented. Their densities ranged from 1.4×10^6 - 3.3×10^6 cells/ cm^2 , 2.6×10^5 - 6.5×10^6 cells/ cm^2 and 3.1×10^5 - 1.4×10^6 cells/ cm^2 during winter, summer and monsoon seasons, respectively.



Seasonal and spatial variations in dissolved oxygen contents in Gomti River water



Fish diversity at different sites of Gomti River

Fish species diversity

A total of 65 fish species representing 50 genera, 23 families, and 8 orders including 6 exotic species were documented. Species richness varied across various stretches with higher diversity in Saidpur, Jaunpur, and Sultanpur and comparatively fewer species in Jahani Kheda and Paan Ghat. Among 59 native species, two were classified as Vulnerable and three as Near Threatened, indicating moderate conservation concern.

Fish catch estimation

For the collection of fish catch data 197 fishermen were interviewed from 43 villages in 11 districts of U.P. along the river Gomti. Based on artisan approach annual fish catch from the river was estimated as 3,690.56 MT with variance as 12,810.2538 square MT. The estimated productivity was 4.48 MT/km and estimated CPUE was 0.54 kg/fisher/day during the lean period and 5.33 kg/fisher/day during the peak period.

Sub-project 5 (REF/24-26/17/5): Estimation of fish catch, diversity, ecological variability and socio-economics of fishers of Pamba River towards fisheries and livelihood sustainability

Fish landings and catch structure

The Pamba is one of the most important rivers of Kerala. The present study on fisheries and fish catch in 9 stations of the river recorded annual fish catch of 434.4 MT with about 89% of the catch coming from the lower stretch. In monsoon season, the fishery is dominated by *Labeo dussumieri*, contributing nearly 40% to the total catch, followed by *Amblypharyngodon* spp. (30%). A more diversified catch structure was observed during the pre-monsoon season with *Systomus sarana* contributing to 16.4%, followed by *Horabagrus brachysoma* (15.4%) and *Channa striata* (13.3%) to the catch.

In the upper stretch, fishing is a part time activity of fishers and therefore, the catch is much less compared to that observed in middle and lower stretches. The middle stretch shows relatively high and consistent catches across seasons, with the highest catch (10.99 kg/fisher/day) during the monsoon, followed by pre-monsoon (8.26 kg/fisher/day). The lower stretch records the highest catch in all seasons, highlighting it as the most productive fishing zone.

Ichthyofaunal diversity

A total of 29 species belonging to 11 orders and 19 families were recorded, including the exotic fish *Pterygoplichthys* sp. and *Oreochromis niloticus* from the river. *Macrobrachium rosenbergii* and *M. idella* were the two shellfish species recorded. Cypriniformes dominate the diversity, contributing the highest number of species (8), followed by Anabantiformes (6 species) and Siluriformes (5 species). In upper stretch fish species like *Dawkinsia filamentosa*, *Barilius bakeri*, *Garra mullya* are abundant, while in middle and lower stretches *Labeo dussumieri*, *Systomus sarana*, *Channa* spp., *Horabagrus brachysoma*, *Etroplus suratensis*, *Oreochromis niloticus* were abundant.

The biodiversity indices exhibited distinct spatial and seasonal variations. Species richness and diversity (Shannon and Simpson indices) increased progressively from the upper to the lower stretches, with higher values during the premonsoon compared to the monsoon season. The middle and lower stretches

during the premonsoon recorded the highest species richness and diversity.

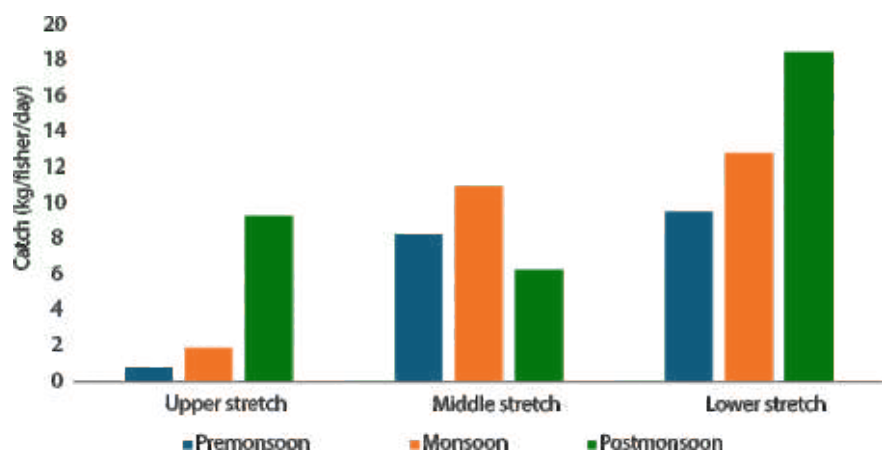
Fishing crafts and gears

Plank built boats and FRP coated boats are the major crafts used for fishing in Pamba river. Coracles are used by the migrant fishermen. Gill nets are the most

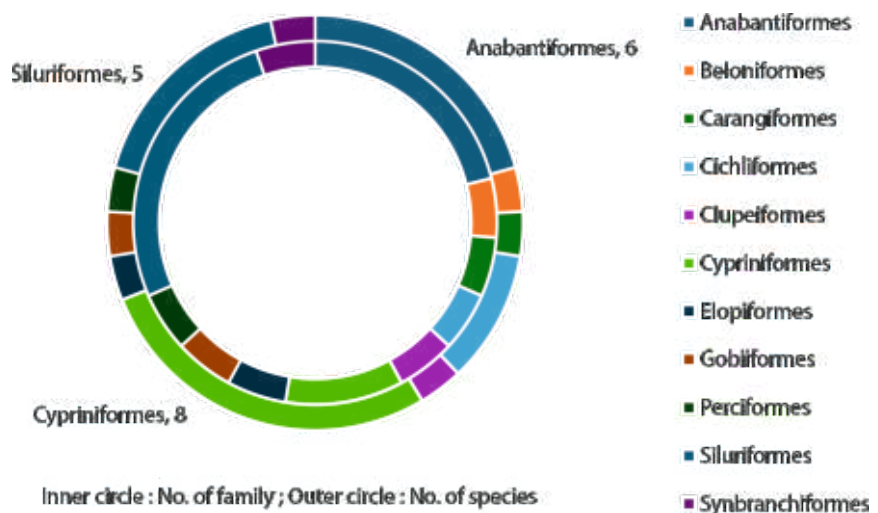
frequently used fishing gears; fishermen use gill nets with different mesh sizes in different seasons and also to target specific species. Seine nets are operated by 5-10 persons using 4 boats for multiple hauls. Cast nets are also commonly used by fishermen in all seasons.



Fish catch from Pamba river



Seasonal catch (kg/fisher/day) along different stretches of Pamba river



Taxonomic composition of fish fauna in Pamba River



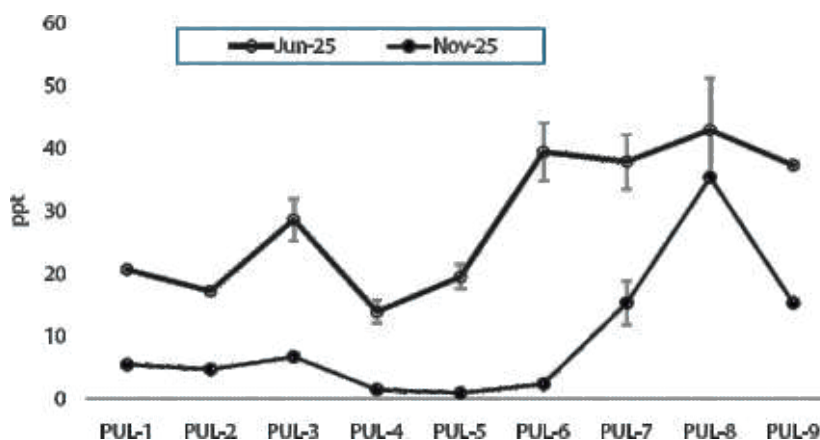
Project title: Assessing changes in estuarine fisheries resources for sustainable management (Pulicat lake, Kayamkulam estuary and Mahi estuary)

Project code: REF/2024-2027/18

Sub-project 1 (REF/24-27/18/1): Assessing changes in fisheries resources for sustainable management of Pulicat Lake

Water quality

Pulicat Lake was studied during the pre-monsoon (June) and monsoon (November) months in nine stations in the Andhra Pradesh and Tamil Nadu. Salinity was the key environmental driver, showing a marked decline in November due to increased freshwater inflow and reduced evaporation. At some stations in Andhra Pradesh, salinity fell below 1 ppt affected biological assemblages. Concentrations of nutrients were largely stable, though localized eutrophic conditions (phosphate $>0.04 \text{ mg L}^{-1}$) occurred at Annamalicheri and Thangalperumbalam, and elevated sulphate near sea-influenced stations indicated seawater intrusion.



Water salinity of Pulicat Lake in two seasons

Finfish diversity and fishery

Finfish diversity and abundance showed clear seasonal changes. During pre-monsoon, there were 61 fish species including dominant estuarine and marine-associated fishes like mullets, pearl spots, anchovies, and sciaenids. During the monsoon, species richness declined to 45, with dominance of freshwater and euryhaline species, including *Mystus* spp., *Chanos chanos*, and juvenile clupeids. Enhanced recruitment during the monsoon highlights Pulicat Lake's role as an important nursery and fishing ground.

Fishing crafts and gears

Traditional plank-built and FRP boats, operated manually or with small motors,

support Pulicat Lake fisheries. Fishing gears include cast nets (10–20 mm mesh size), gill nets (40–80 mm mesh size), drag nets, and stake nets, deployed seasonally based on resource availability. Catch per unit effort was higher during the pre-monsoon due to favorable environmental conditions and greater availability of estuarine and marine species. These small-scale fisheries are central to local livelihoods.

Shellfish fisheries

The mud crab (*Scylla serrata*) fishery represents a major livelihood source, with daily catch of 10–20 kg per boat. However, juvenile overfishing, habitat degradation, and unregulated practices pose serious sustainability concerns. The clam fishery (*Meretrix casta* and *Villorita cyprinoides*) and cast net fishery for Indian white prawn (*Fenneropenaeus indicus*) also provide

substantial income with seasonal peaks during pre- and post-monsoon months.

Plankton and macrobenthic communities

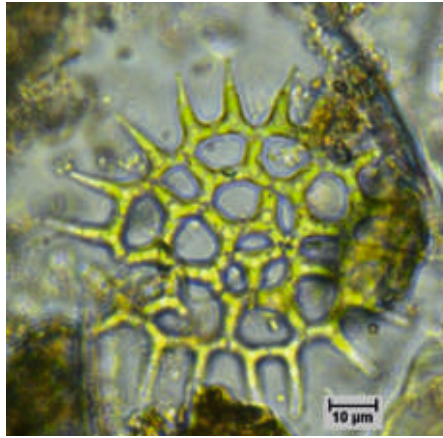
Plankton diversity and abundance were higher during the pre-monsoon (34 species; 31,756 unit/l) than the monsoon (28 species; 20,511 unit/l). Bacillariophyceae dominated pre-monsoon phytoplankton, while Chlorophyceae prevailed during the monsoon. Zooplankton communities were chiefly represented by *Cyclops* sp. and *Tintinnopsis* sp. Macrobenthic diversity was also higher during pre-monsoon (21 species) compared to monsoon season (12 species). In both the seasons, gastropods were the most common type of animal, and *Pirenella cingulata* was the most common type of animal at all stations.



Harvesting crabs (left) and white prawn (right) in the Pulicat Lake

Socioeconomic status of fishers

A socio-economic assessment of 60 fishing households revealed their long-term dependence on lake fisheries, modest income levels, and a strong contribution by women through hand fishing and allied activities. Overall, the findings emphasize the ecological and livelihood importance of Pulicat Lake and indicate that it requires integrated, seasonally informed management to ensure sustainable resource use and community resilience.



Pediatrum simplex



Pirenella cingulata

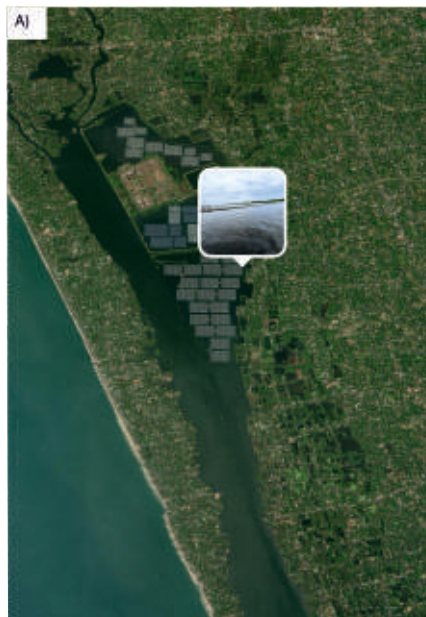


Collection of socioeconomic information from fishers

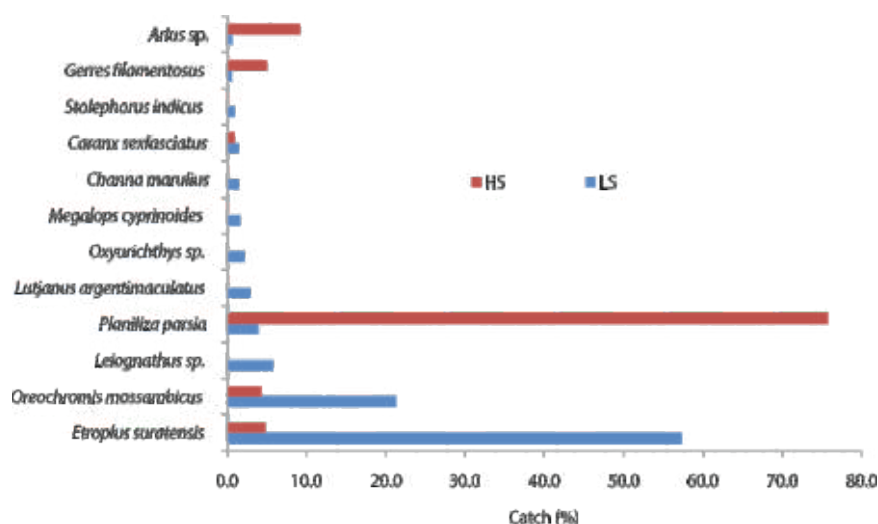
Sub-project 2 (REF/24-27/18/2): Assessing changes in fisheries resources for sustainable management of Kayamkulam estuary

Water quality

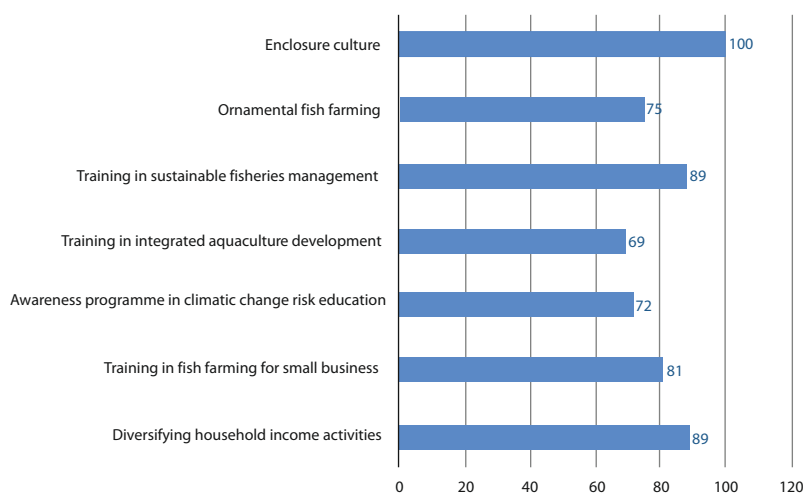
The Kayamkulam estuary along the Kerala coast was assessed for water quality, fisheries, ecosystem health, and vulnerability of dependent fishing communities. Water quality parameters studied during post-monsoon (POM), pre-monsoon (PRM), and monsoon (MON) seasons revealed a chemically stable estuarine environment. Mean pH values remained near neutral to slightly alkaline across seasons. Salinity showed wide seasonal variations, ranging from 10–30 ppt during POM, 0.7–23.4 ppt during PRM, and 0.2–21.5 ppt during MON. Low salinity and total hardness were recorded at upstream stations farther from the estuary–ocean interface, while elevated hardness during POM (>900 ppm) indicated marine intrusion. High water transparency across all seasons suggested



A) *Etroplus suratensis* breeding habitat in Kayamkulam estuary; B) Landing of *Etroplus suratensis*



Fish catch composition of Kayamkulam estuary

*Nematalosa nasus* infected with isopod

Fishers' perception on effectiveness of adaptation/mitigation strategies

less suspended matter. Chloride concentrations were higher in estuarine zones and declined during the monsoon. Overall, monsoonal freshwater input and proximity to the ocean governed spatial and seasonal water quality patterns. GIS-based analysis of water spread area between the year 2000 and 2025 revealed only a marginal decline from 67.67 km² to 66.78 km², indicating that the estuary has remained morphologically stable over the past 25 years.

Breeding habitats of selected fish and shellfish

Breeding habitats of economically important *Etroplus suratensis* and *Crassostrea madrasensis* were identified using local ecological knowledge, supported with field verification. *E. suratensis* breeding grounds were located in low-salinity, shallow zones (~2.2 ppt; ~0.7 m depth) with high dissolved oxygen and structurally complex habitats

dominated by mangroves and aquatic vegetation. In contrast, potential oyster beds occurred in higher salinity zones (~20 ppt) within mangrove ecosystems dominated by *Avicennia* and *Ceriops*.

Plankton dynamics

Plankton dynamics exhibited clear salinity-driven patterns. During the monsoon, dinoflagellates dominated high-salinity stations, while Bacillariophyceae prevailed in low-salinity areas. *Thalassiosira* sp. was the dominant phytoplankton across zones. Zooplankton communities were mainly composed of *Paracalanus* sp. and copepod nauplii.

Fish diversity and catch composition

The study recorded 45 fish species belonging to 28 families. Low-salinity zones supported higher species richness but greater dominance of a few species, whereas high-salinity zones showed greater even assemblages. Juveniles of several commercially important species were observed, indicating the estuary's nursery function.

Observations on fish health

Limited prevalence of isopod infection (5%) in *Nematalosa nasus* was documented, with histopathological evidence of tissue damage, highlighting potential fish health risks under heavy infestation.

Sediment microbial diversity

Sediment bacterial diversity at NTPC site and Vattakayal (industrial area) regions of the Kayamkulam estuary were analyzed using metagenomic sequencing. The Shannon and Simpson microbial diversity were higher in industrial site as compared to NTPC site, likely due to industrial or urban effluent input. At the phylum level, Proteobacteria, Actinobacteria, and Firmicutes dominated. Analysis revealed the predominance of multidrug, beta-lactam, and aminoglycoside resistance genes in both zones, indicating anthropogenic impact and potential contamination from multiple sources. The NTPC site showed the highest antibiotic resistant microbial populations, dominated by *Escherichia coli*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Salmonella enterica*.

Vulnerability of Kayamkulam fishers

A multidimensional vulnerability assessment of fishers of the Kayamkulam estuary using a Likert-scale framework identified substantial exposure and sensitivity to environmental and socio-economic stressors. Horizontal habitat

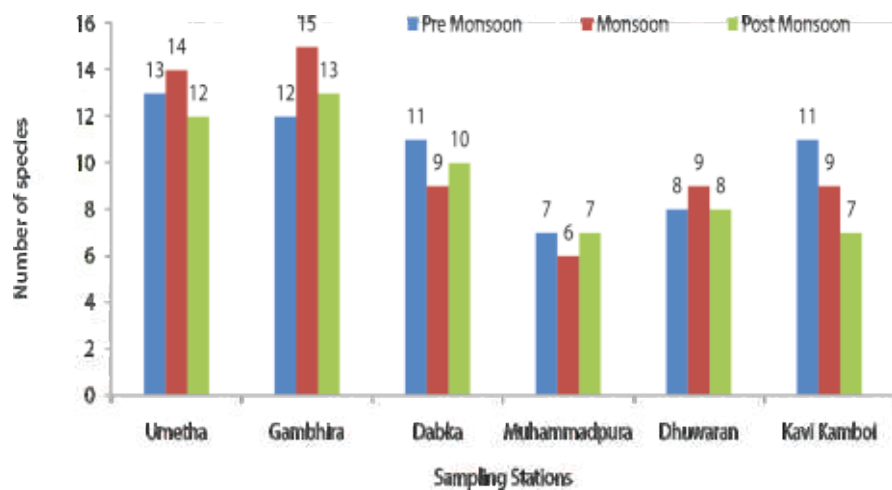
connectivity exhibited the highest exposure (99), followed by changes in fish assemblages (75). Sensitivity analysis showed that the most important factor in vulnerability was the effects of floods on fishing activities (68). Heat waves (66) and loss of income (64) were also important factors. Fishers demonstrated strong

acceptance of adaptation strategies, particularly enclosure culture (100%) and training-based interventions aimed at sustainable fisheries management and livelihood diversification, highlighting the importance of capacity building for enhancing climate resilience.

Sub-project 3 (REF/24-27/18/3): Assessing changes in fisheries resources for sustainable management of Mahi estuary

Fish and fisheries

A total of 24 fish species and two shellfish species belonging to 18 families were recorded from the Mahi estuary, Gujarat. During the pre-monsoon season, species numbers ranged from 7 to 13, with higher diversity at Umetha and Kavi Kamboi and the lowest at Muhammadpura. Monsoon conditions generally enhanced diversity across stations, with a maximum of 15 species at Gambhira, while Muhammadpura consistently recorded the lowest richness. Number of fish species during post-monsoon again ranged between 7 and 13, with Gambhira maintaining higher diversity and a noticeable decline at Kavi Kamboi.



Spatial and seasonal variations in ichthyofaunal diversity of Mahi estuary

Seasonal dominance patterns varied across stations. At Umetha, *Macrobrachium rosenbergii* dominated during pre-monsoon, *Labeo catla* during monsoon, and *Rhinomugil corsula* and *Channa striatus* during post-monsoon. Gambhira and Dabka were largely dominated by *Oreochromis niloticus* during pre- and post-monsoon, while marine or estuarine species such as *Rhinomugil corsula* and *Lates calcarifer* became prominent during monsoon or post-monsoon. Downstream stations (Muhammadpura, Dhuwaran, and Kavi Kamboi) showed strong dominance of migratory and marine-associated species such as *Mugil cephalus*, *Tenualosa ilisha*, and *Otolithoides pama*, particularly during monsoon and post-monsoon periods.

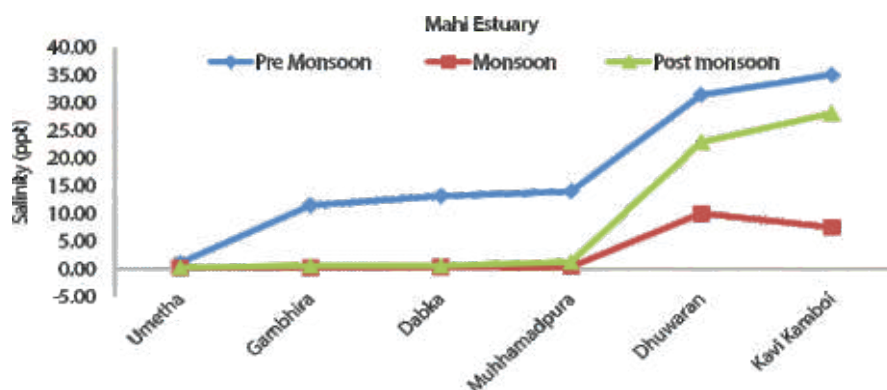
First record of bull shark *Carcharhinus leucas*

Catch of vulnerable bull shark (*Carcharhinus leucas*) was recorded, as an incidental capture in Hilsa gill nets, at Kavi in the Mahi estuary, marking it the first west coast estuarine record in India.



Record of *Carcharhinus leucas* from Mahi estuary





Water salinity dynamics at different stations and in different seasons

Physico-chemical characteristics of water

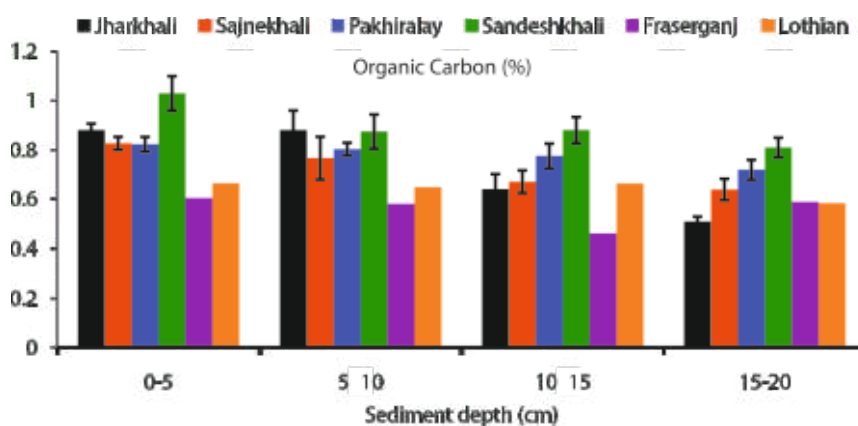
Physico-chemical analysis revealed a strong longitudinal salinity gradient, with freshwater conditions upstream and increasing marine influence toward the estuarine mouth. Monsoon freshwater inflow substantially reduced salinity, while pre- and post-monsoon periods showed seawater intrusion downstream. Other water quality parameters remained within suitable ranges for sustaining estuarine fisheries.

Project title: Evaluation of ecosystem health, fish catch structure, mangrove landscape patterns aiming to Sustainable Development Goals (SDGs) with changing climate scenario in Indian Sundarbans

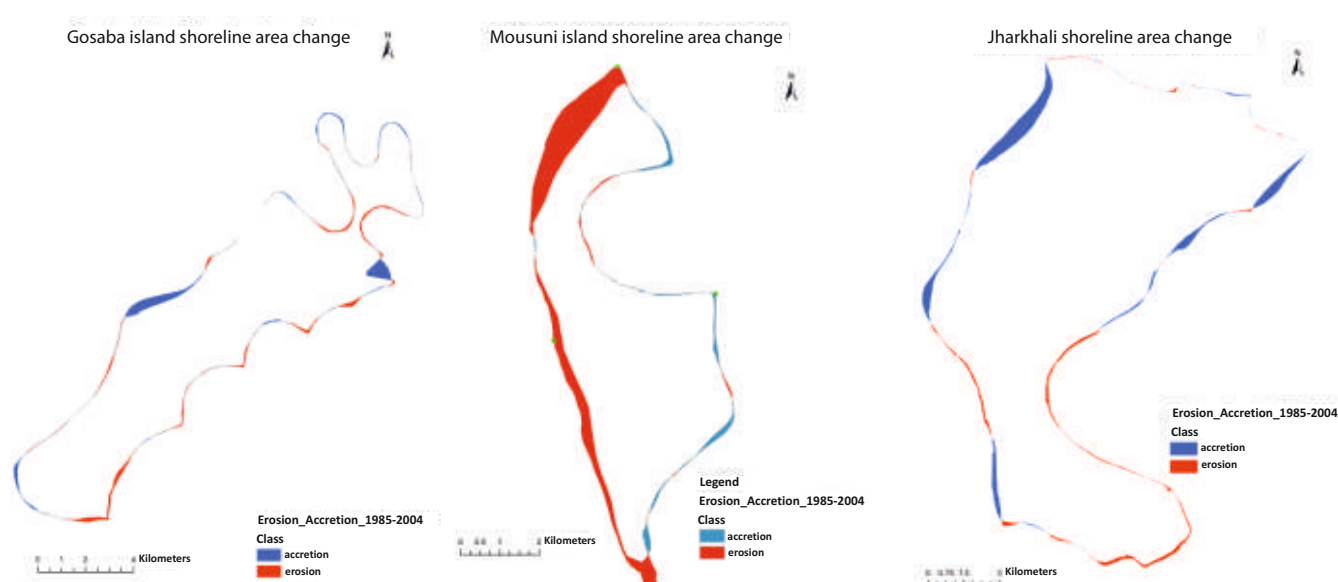
Project code: REF/24-27/19

Water and sediment quality characteristics

Field samplings conducted at Jharkhali, Sajnekhali, Pakhiralay, Sandeshkhali, Fraserganj and Lothian island showed that despite heavy southwest monsoon rainfalls in 2025 the water of Indian Sundarbans remained saline due to sustained seawater intrusion linked to sea-level rise, reduced upstream freshwater discharge, climate change and strong tidal dynamics in the Bay of Bengal. Study on status, distribution, and ecological stoichiometry of organic carbon (OC), total nitrogen (TN), and total phosphorus (TP) in the sediment indicated that fish landing, urban waste and shrimp farms contribute an appreciable amount of organic load in



Spatial distribution of sediment organic carbon (%)



Area change map of Gosaba, Mousuni and Jharkhali

Sandeshkhali. The study also detected higher metal contents in surface sediment than deeper layers indicating recent contamination, particularly near urban and port influenced sites.

Shoreline changes

The decadal shoreline changes in Mousuni, Gosaba, and Jharkhalli islands were analysed using remote sensing and geospatial techniques in Arc GIS 10.8 with DSAS 5.0 to quantify erosion and accretion patterns, and providing insights into coastal vulnerability. Landsat data at five-year intervals during 1985-2024 for Gosaba and Mousuni islands; and 1990-2025 for Jharkhalli island were used and shoreline change rates calculated using End Point Rate (EPR) and Weighted Linear Regression (WLR). EPR results showed erosion along 795 out of 1341 transects in Gosaba, with maximum erosion and accretion rates of -5.99 m/year and 31.68 m/year, respectively. In Mousuni and Jharkhalli, 68.37% and 55.2% of transects were eroding. The WLR analysis shows

erosion affected 63.75%, 68.37%, and 55.21% of transects in Gosaba, Mousuni, and Jharkhalli, respectively. Between 1985- 2024, Gosaba experienced slight net accretion (0.41 km²) and Mousuni experienced extreme erosion. In contrast, Jharkhalli showed net accretion of 3.53 km² between 1990 to 2025 with erosion in southeast and accretion in the north. Severe erosion in Mousuni and moderate erosion in Gosaba require urgent management actions.

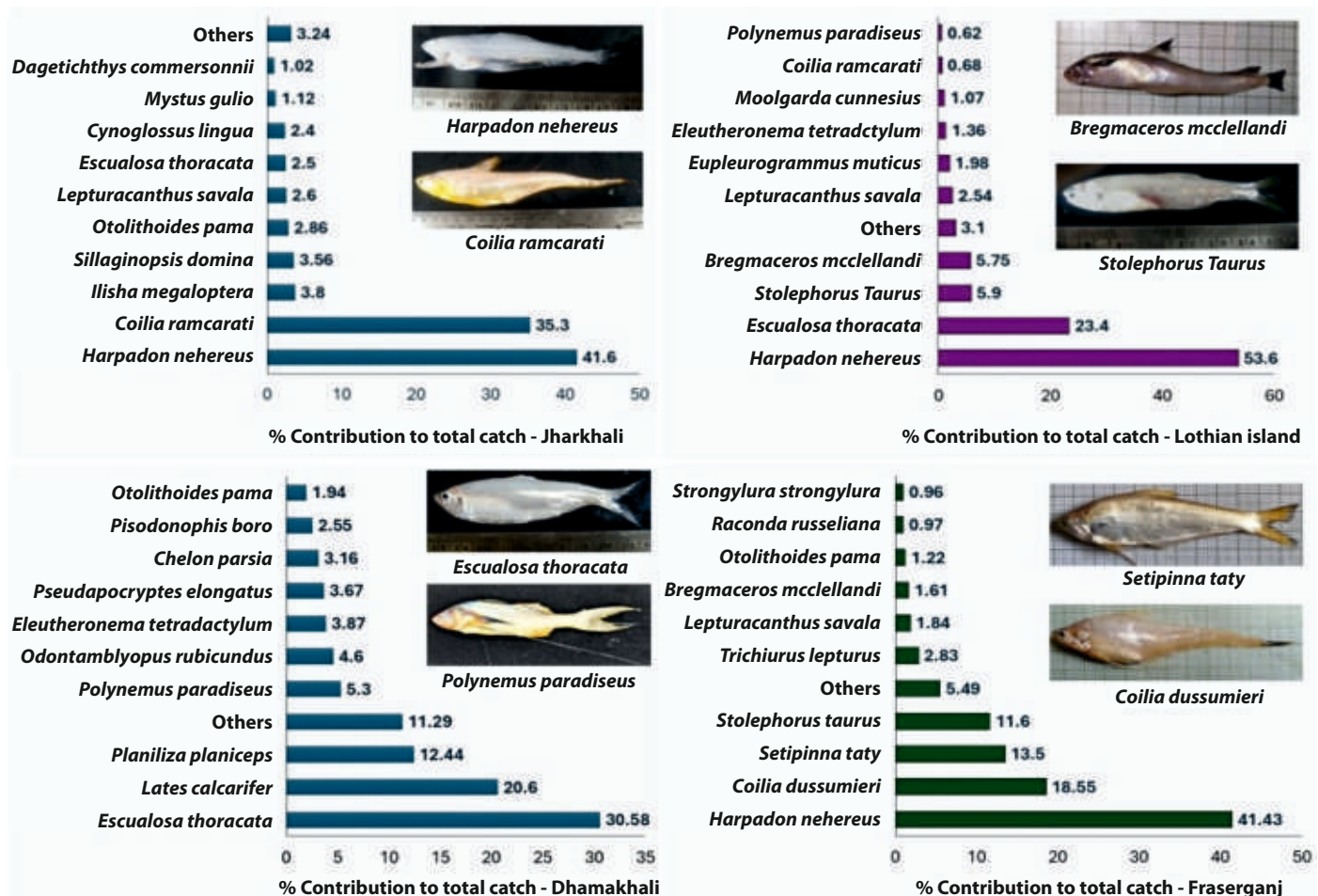
Fish and fisheries

The study recorded a total 116 fish species, dominated by fin fishes (94 species) followed by prawns (14 species), crabs (4 species), cephalopods (2 species), and stomatopods (2 species); Gobiidae constituted the most species-rich family (15 species), followed by Sciaenidae (12), and Engraulidae (10). The penaeid prawns were the most diverse shellfish group, with Indian white prawn (*Fenneropenaeus indicus*) contributing about 68 % of the total prawn catch during monsoon.

The CPUE of set barriers ranged from 6.8 to 30.2 kg/net/day. The salinity influenced fish assemblages in the bagnet catches with dominance of marine migrants in high-salinity zones (Jharkhalli, Fraserganj, and Lothian Island) and estuarine species in lower-salinity area (Sandeshkhali). The estuarine species such as *Odontamblyopus rubicundus*, *Pseudapocryptes elongatus*, and *Pisodonophis boro* were the major components of Sandeshkhali bagnet catch. CPUE of bagnets ranged from 10.2 to 37.3 kg/net/day during monsoon. At Jharkhalli, nearly 77 % of the bagnet catches were constituted by *H. nehereus* and *Coilia ramcarati*, whereas about 60% of the catch at Fraserganj comprised of *H. nehereus* and juveniles of *Coilia dussumieri*.

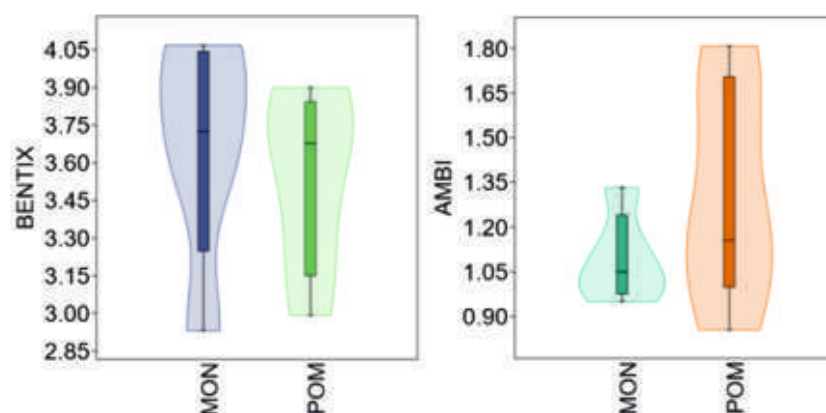
Feeding and ecological guilds of macrobenthos

A total of 45 mangrove-associated macrobenthic taxa were recorded in the Sundarbans mangrove stands with

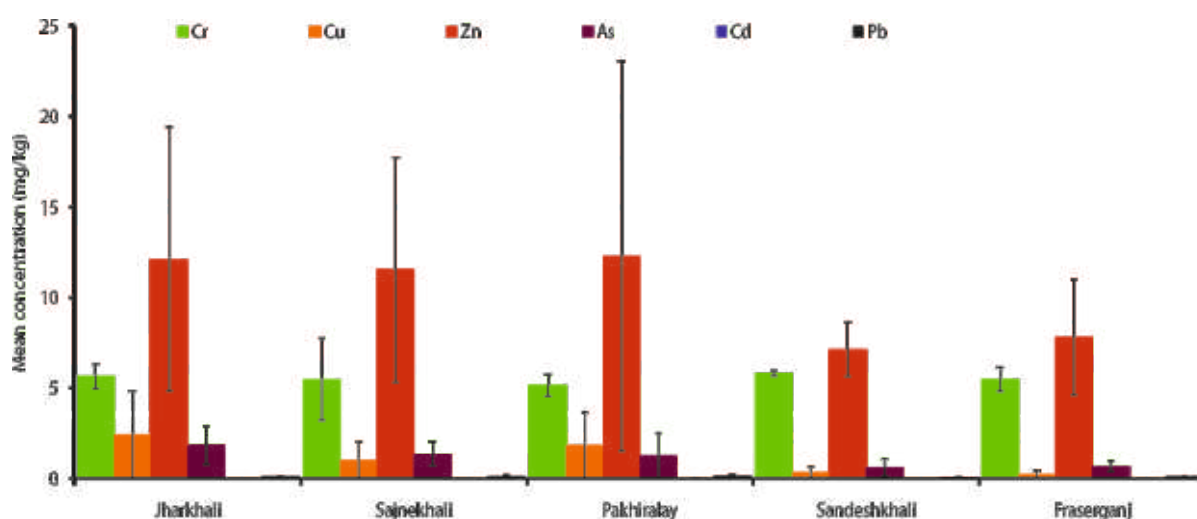


Bagnet catch composition at different study sites





Health status of the Sundarbans estuary based on the seasonal BENTIX and AMBI values



Heavy metal concentrations in fish of different stations

dominance of gastropods (27 species; 77% contribution), followed by polychaeta (6) and bivalvia (5). The macrobenthos feeding guilds were dominated by herbivory (75%), followed by suspension (9%), surface deposit (7%), carnivory (6%) and deposit feeder (4%). Overall, based on abundance, Ecological Group I (EGI) (disturbance-sensitive species), comprised mainly of gastropoda and Bivalvia, accounting for 53% of the total macrobenthic assemblage.

Ecological indices viz., BENTIX (Benthic index) and AMBI (Azati Marine Biotic Index) showed similar indications with good environmental conditions and reflected a stable estuarine ecosystem of Indian Sudarban with relatively good ecological health.

Metal contamination

Estimation of heavy metal contents in fish, prawn and crab species showed

accumulation of heavy metals in few species exceeding non-carcinogenic (THQ, HI > 1) and carcinogenic (risk > 10^{-4}) threshold health risks, especially for Cr and As. The data suggested that occasional fish consumption may be safe, however, prolonged exposure could lead to cumulative health risk.



In contrast, piscivorous fishes were negatively associated with planktivore abundance, indicating trophic cascading.

Water quality index for fresh water fisheries

Water quality index (WQI) for freshwater fisheries was assessed using 13 physico-chemical parameters (pH, electrical conductivity, transparency, water temperature, total dissolved solids, dissolved oxygen, total alkalinity, hardness, chloride, silicate, nitrate, nitrite, and phosphate) which indicated that water of the Kanva reservoir remained in good category throughout the study period. The WQI of Sathanur reservoir was found to be under good category during post-monsoon and summer season, whereas, it declined to the fair category

during the pre-monsoon and monsoon seasons. In case of the Banasurasagar reservoir, the WQI indicated poor water quality during post-monsoon and marginal during monsoon and pre-monsoon seasons. The poor to marginal WQI suggest sub-optimal aquatic environment for sustaining productive freshwater fisheries.

Organic carbon stock

The Walkley-Black organic carbon content in the sediment of Kanva reservoir varied from 1.51 to 2.94% indicating moderate to high organic matter enrichment. The average organic carbon stock in the top 15 cm surface sediment was found to be 3655.76 g/m² highlighting the reservoir's capacity to act as an effective carbon sink. In

Sathanur reservoir, organic carbon level in the surface sediment was substantially high. The average organic carbon stock of 7536.69 g/m² in the surface 15 cm of sediment demonstrates the reservoir's role as an effective sink for organic carbon. The organic carbon content in the surface sediments of the Banasurasagar reservoir ranged from 1.95 to 4.50%, indicating moderate organic matter enrichment. The mean organic carbon stock of 4812.97 g/m² in the surface sediment highlights the reservoir's capacity to act as a significant sink for organic carbon. Compared to more organically enriched reservoirs, the moderate carbon stock in Banasurasagar Reservoir is consistent with its low nutrient status and limited plankton productivity.

Project title: Development of natural farming protocol for culture-based fisheries in wetland

Project code: RWF/24-27/16

Diversification of the candidate species in CBF

Natural farming of *Systemus sarana* in Pen culture system

The raising of *Systemus sarana* seed was initiated in pen culture system with the objective to explore the feasibility of natural farming in enclosure culture system in a productive water body like floodplain wetland. The pen culture system with an area of 100 m² each was set up in Khalsi wetland, Nadia District, West Bengal and *S. sarana* seed with an average initial weight of 2.77 g was

stocked at the rate of 10 individuals/m². It was observed that during the four months culture period the fish had grown from 2.77 ± 1.3 g to 13.36 ± 2.7 g in pen with artificial feeding and 9.23 ± 1.4 g in pen without any supplementary feeding.

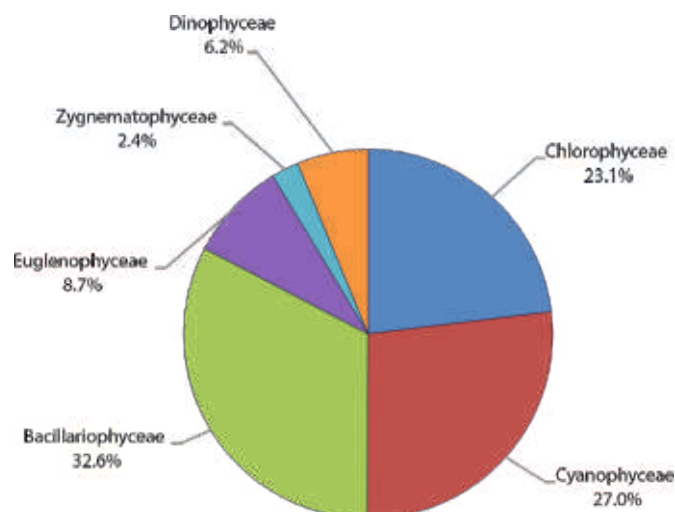
Impact of algal eutrophication on Saguna beel, Nadia, West Bengal

Saguna beel (22°57'20.0"N 88°28'15.0"E), a 40 ha wetland in Nadia district of West Bengal was adopted for study the impact of excessive nutrient loading through untreated sewage from nearby Gayeshpur municipality. Hyper-eutrophic

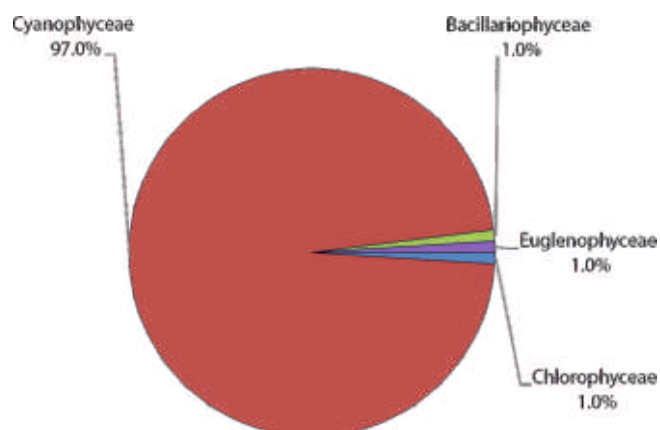
condition with severe algal bloom was recorded in the Saguna beel throughout the year. Complete shift of ecological regime with total absence of submerged macrophyte was observed. Hyper-eutrophication by nutrient loading impacted the plankton diversity severely with complete dominance of the Cyanophycean *Microcystis* (~97%) suppressing other species which were recorded in Saguna beel during earlier studies. Abundance of Cyanophyceae was 26.98% in Saguna beel during pre-eutrophication period of 2012-13.



Natural farming of *Systemus sarana* in Pen culture system



Phytoplankton composition of Saguna beel (2012)



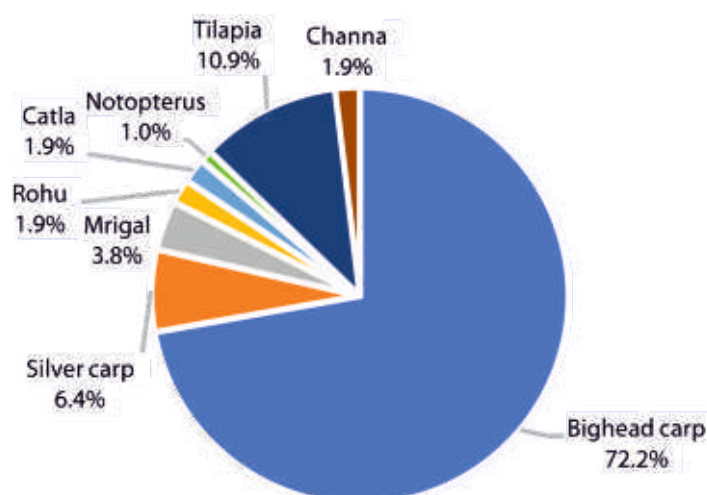
Phytoplankton composition of Saguna beel (2025)

Impact of algal eutrophication on fisheries in Saguna beel

Gudusia chapra (estimated 2.5 MT catch annually, ~20% of unstocked fishes) was a major contributor in SIFs production during pre-eutrophication period (2012) in Saguna beel, now completely vanished from the wetland. Fish production is now mostly contributed by stocked fish comprising exotic bighead carp (50-85%), silver carp (1-20%) and Tilapia (5-20%).

Biodiversity restoration of eutrophic wetlands using surface-set submerged macrophyte Park (SSSMP)

Two wetlands, viz., Khalsi beel and Saguna beel in Nadia district, West Bengal recorded significant loss of aquatic biodiversity due to regime shift from submerged macrophytes dominated ecosystem to plankton dominated ecosystem. Experiments were conducted by placing different species of submerged macrophytes in the euphotic zone inside 1 m³ floating cages placed in surface water. Rootless submerged macrophyte *Ceratophyllum demersum* was kept in the cage ensuring their placement in the euphotic zone, whereas other submerged macrophytes like *Hydrilla verticillata*, *Vallisneria spiralis*, and emergent macrophytes like *Scripus* sp. were planted in plastic tubs and suspended to remain in the euphotic zone. Among different macrophytes attempted, *C. demersum* was identified as a key candidate species for creating artificial habitat of submerged macrophytes. Being rootless macrophyte,



Fish species spectrum of hypereutrophic Saguna beel (2025)



Catch of big head carp in Saguna beel

C. demersum grew very fast (estimated growth about 20 g/100 g/day) to fill the whole cage utilizing the excessive nutrient present in the water.

Submerged macrophytes especially *C. demersum* was observed to attract several macrophyte associated fauna, including mollusks, chironomid larvae, insects,





Ceratophyllum growth inside SSSMP in Khalsi and Saguna beel



Ceratophyllum associated fauna restored in SSSMP in Khalsi beel



Cage (1 m³) used for setting of Surface-Set Submerged Macrophyte Park (SSSMP)

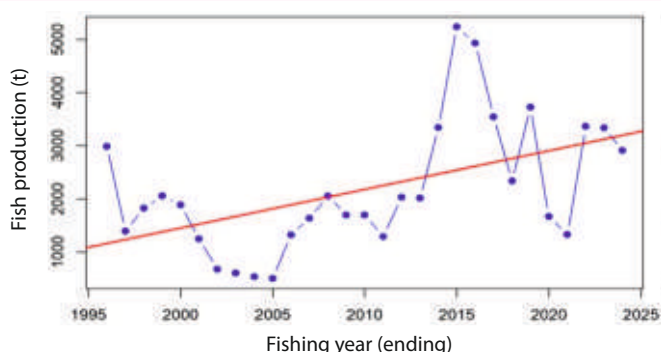
crabs, prawns and fishes. As many as 11 species were recorded as submerged macrophyte associated fauna from Khalsi

beel. Thus, this type of artificially made Surface-Set Submerged Macrophyte Park (SSSMP) can be effectively used to restore

aquatic biodiversity of submerged macrophyte-less and eutrophic wetlands.

Project title: Fostering reservoir fisheries for blue growth and achieving SDGs amid climate change and anthropocene

Project code: RWF/24-27/17



Long-term trends in fish production in Gandhisagar reservoir

The project examines the responses of reservoir fisheries to concurrent climate variability and increasing human use with emphasis on ecosystem health, fisheries sustainability, and livelihood security. Seasonal ecological assessments and stakeholder-based socio-economic surveys were conducted in Gandhisagar, Maithon, Getalsud, Nesa, Malampuzha, and Meenkara reservoirs.

Gandhisagar reservoir, Madhya Pradesh

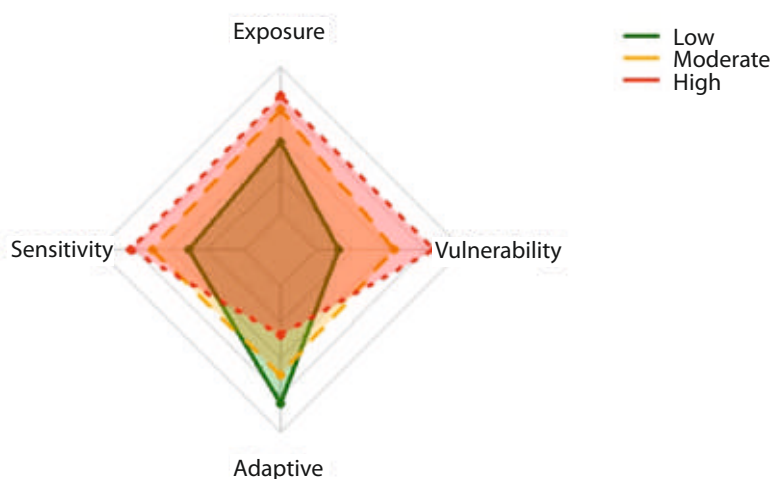
Long-term fishery analysis reveals a sustained increase in fish production from the mid-2000s onwards, with maximum yields surpassing 5,000 tons in the mid-2010s. While rainfall and temperature show inter-annual variability, neither exhibits a strong long-term trend influencing production. Multivariate analyses confirm that fish yield is predominantly governed by anthropogenic drivers, particularly fishing effort, CPUE, and stocking intensity, rather than climatic variables. Although enhanced management has stabilized production, weakening CPUE–effort relationships indicate emerging effort saturation. Future management should therefore prioritize optimization over intensification, with emphasis on stock quality, recruitment efficiency, habitat protection, and scientifically planned stocking.



Multi-day fishers in Gandhisagar reservoir

Maithon reservoir, Jharkhand–West Bengal

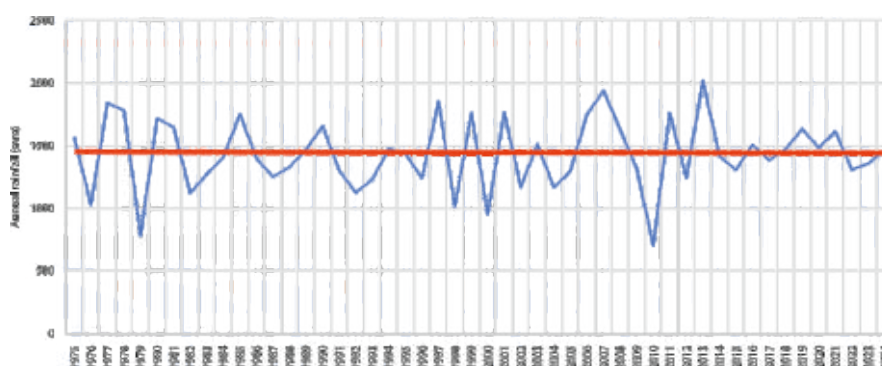
Climatic analysis revealed a transition towards fewer but more intense rainfall events and a pronounced warming trend, with 2024 recording the highest maximum temperature in five decades. These changes have increased hydrological instability and thermal stress, affecting the reservoir and downstream fisheries. Stakeholder-based assessments show moderate to high livelihood vulnerability among fishers, driven by high exposure and sensitivity combined with low adaptive capacity. Downstream fishers identified sudden dam releases, industrial pollution, illegal fishing, and weak interstate governance as major stressors. Traditional fishing communities remain institutionally excluded, limiting access to schemes and support.



Radar plot depicting stakeholder-based climate vulnerability dimensions of fishers in Maithon Reservoir

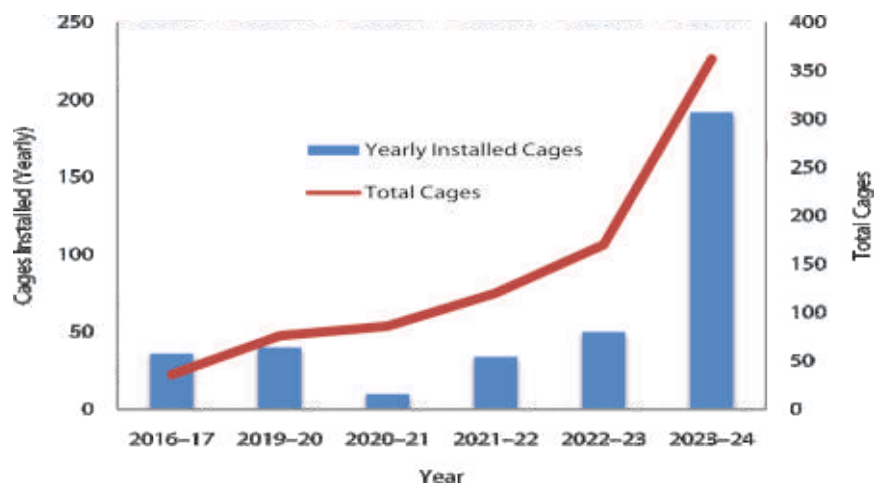
Nesa reservoir, Odisha

Nesa exhibits high inter-annual rainfall variability without a clear long-term trend, resulting in unstable inflows and recruitment conditions. Vulnerability assessments indicate moderate climate vulnerability, primarily driven by high livelihood sensitivity and low adaptive capacity rather than exposure alone.



Long-term rainfall variability in Nesa reservoir indicative of erratic rainfall pattern





Temporal trends in cage culture development at Getalsud reservoir

Getalsud reservoir, Jharkhand

Getalsud functions as a multi-use reservoir supporting cage aquaculture, capture fisheries, and tourism. Cage culture expansion under PMMSY has exceeded 360 units, enhancing livelihoods but increased ecological pressure.

Comparative analysis shows a sharp decline in native fish diversity, with present-day fisheries dominated by stocked and exotic species, including tilapia and exotic carps. Fishers expressed

their concerns over proposed floating solar photovoltaic installations and their potential impacts on fishing grounds and livelihoods.

Malampuzha and Meenkara reservoirs, Kerala

In both reservoirs, stocking intensity shows a weak and inconsistent relationship with fish yield. Malampuzha displays substantial scope for enhancement in fisheries based on production potential estimates, while Meenkara is already operating close to its

estimated capacity. Environmental variability-hydrology, water quality, trophic structure, and species composition-emerged as the dominant control on production. Climate vulnerability assessments indicate high exposure and sensitivity, particularly in Meenkara, with fishers increasingly relying on diversification, training, and allied activities as adaptation strategies.

Blue growth and SDG linkages

The project aligns reservoir fisheries development with the FAO Blue Growth Initiative, emphasizing Blue Production, Blue Trade, and Blue Communities. Evaluation focuses on ecosystem-based enclosure culture, sustainable aquatic value chains, reduction of post-harvest losses, certification, and technology-driven innovation. A rapid appraisal framework was developed to assess reservoir fisheries contributions to selected SDGs (1, 2, 5, 8, 12, 13, and 17), using expert elicitation across 27 targets and 45 indicators. The framework serves as a diagnostic tool to identify strengths, gaps, and pathways for enhancing the role of reservoir fisheries in sustainable development under data-limited conditions.

Project title: Exploration and feasibility study of pits and quarries for fish production

Project code: RWF/24-27/18



Feasibility of fish culture in open pits/quarries

Ara Khadan 8, Ara Khadan 13, and some of the Shondha are parts of 56 abandoned coal pits in Ramgarh and site 48 in Patratu district, Jharkhand that are being repurposed for fisheries through culture-based fisheries (CBF) and cage culture, with water depths ranging from 15 to 50 meters. Cage farming was initiated at Ara Khadan 8 in 2021, Ara Khadan 13 in 2022, and Shondha in 2023, alongside subsistence fishing by local fishermen for household consumption. Tilapia and Pangas are the main species cultured. Based on the morpho-edaphic index (MEI) (Welcomme, 1972), estimated fish production potential of these water bodies is approximately 77 kg/ha/year. The open coal pit (OCP) at Dola village in Anuppur district, Madhya Pradesh, with a total area of 12.13 ha, has been

repurposed for fish culture since 2022 using a floating cage battery of 12 cages, of which six are currently stocked with *Pangasianodon hypophthalmus* and *Oreochromis niloticus*, yielding a relatively low average production of 1.5–2 tonnes per cage. Based on MEI, the estimated fish production potential of the site is 50.2 kg/ha/year. Considering low production potential, there is a scope to increase the fish production potential by fertilization of all the OCPs studied.

Assessment of basic limno-chemical parameters of OCPs

Water quality parameters including transparency, water temperature, pH, specific conductivity, dissolved oxygen, total dissolved solids, chloride, salinity, total alkalinity, total hardness, calcium, magnesium, nitrite-N, nitrate-N, silicate-Si, available phosphorus, and ammonium were found to be within permissible limits, indicating that the water was suitable for aquaculture practices.

Clinograde distribution of limno-chemical parameters

Besides water temperature and dissolved oxygen, vertical distribution of different limno-chemical parameters like pH, free CO₂, sp. conductivity was studied in Ara khadan 13. Significantly lower water temperature, dissolved oxygen and pH were recorded at bottom water. On the other hand, higher free CO₂ and sp. Conductivity were recorded at the

bottom. Lack of water circulation was evident in the OCPs revealed by stratification of water parameters. Bottom aeration is recommended to improve water quality of the OCPs.

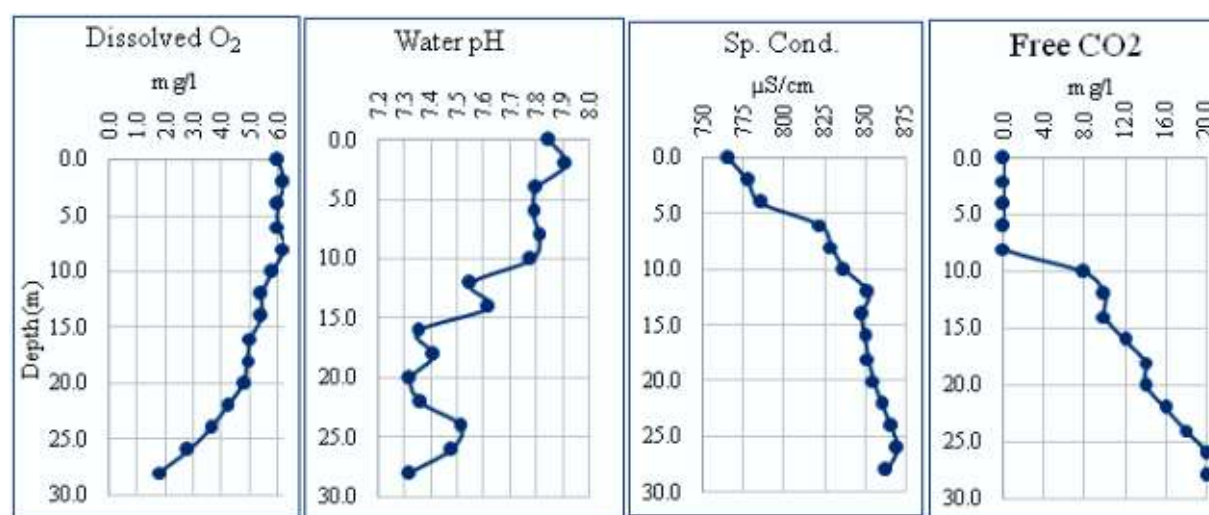
Food safety of cage-farmed fish from pits/quarries

Safety of cage-farmed fish from pits/quarries for consumption was

assessed by collecting fish species from different locations of OCPs and nearby reservoirs. The crude protein, fat, ash, and moisture contents were analyzed and compared to evaluate their suitability for human consumption. Differences in the percentage of crude protein and crude fat were observed among reservoirs and OCPs for all the studied fish species, viz., *P. hypophthalmus*, *O. niloticus*, *Cirrhinus mrigala* and *Labeo catla*.

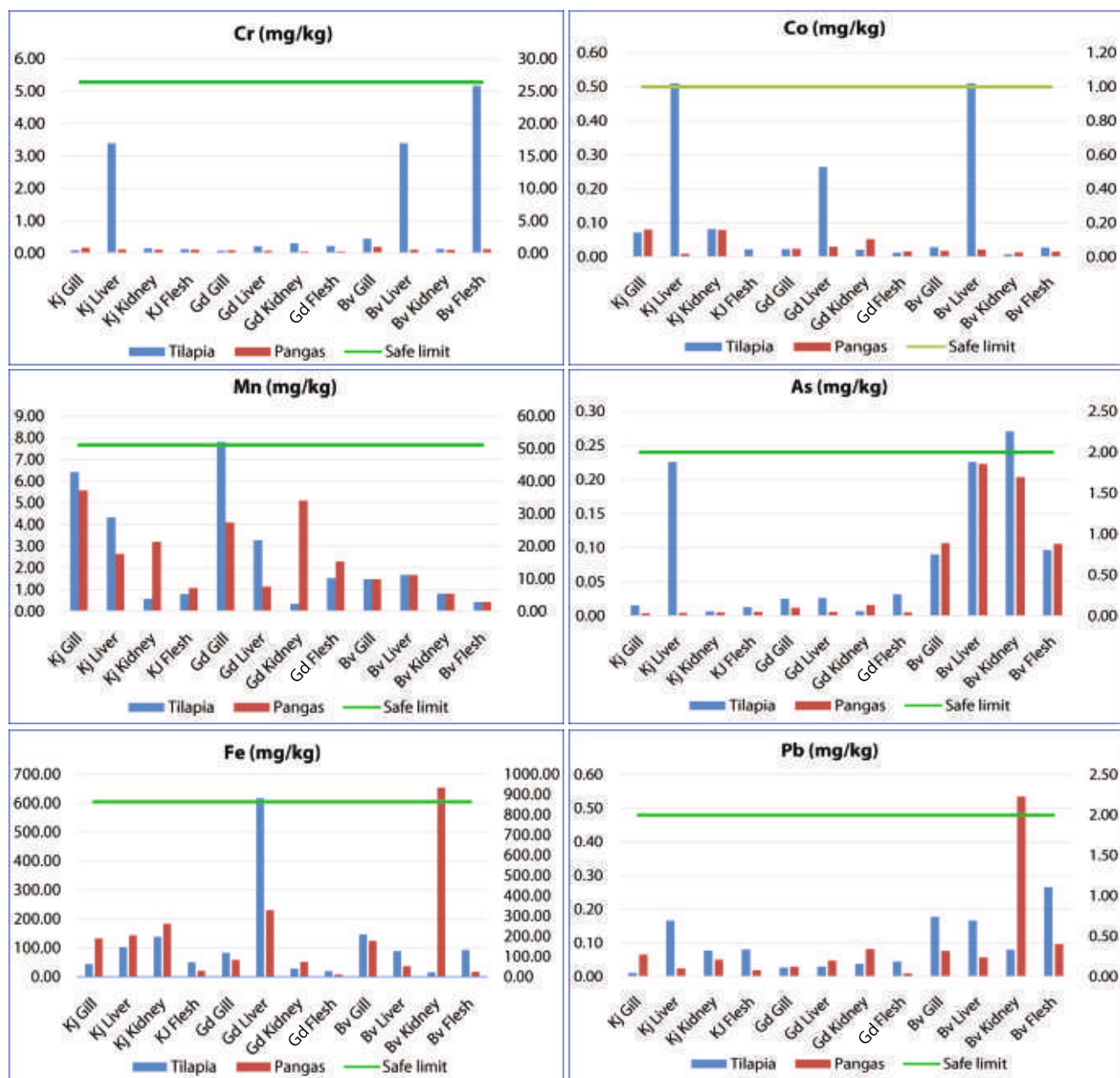


Labeo catla captured from open coal pit, Ara Khadan 13 in Ramgarh, Jharkhand



Clinograde distribution of various limno-chemical parameters in Ara Khadan 13, Jharkhand





Kj - Kuju OCP; Gd - Getalsud reservoir; Bv - Bhairavi reservoir

Heavy metal concentration in fish muscle

Heavy metal concentrations (Cr, Mn, Fe, Co, Ni, Cu, As, Cd, Pb) were measured in

the gill, liver, kidney, and muscle of Tilapia and Pangas fish from an open coal pit (OCP) and reservoirs in Jharkhand. No significant difference was found between the OCP and reservoirs ($p = 0.42$). Also,

heavy metal levels in all fish parts were well below the safety limits set by standard organizations for consumption.

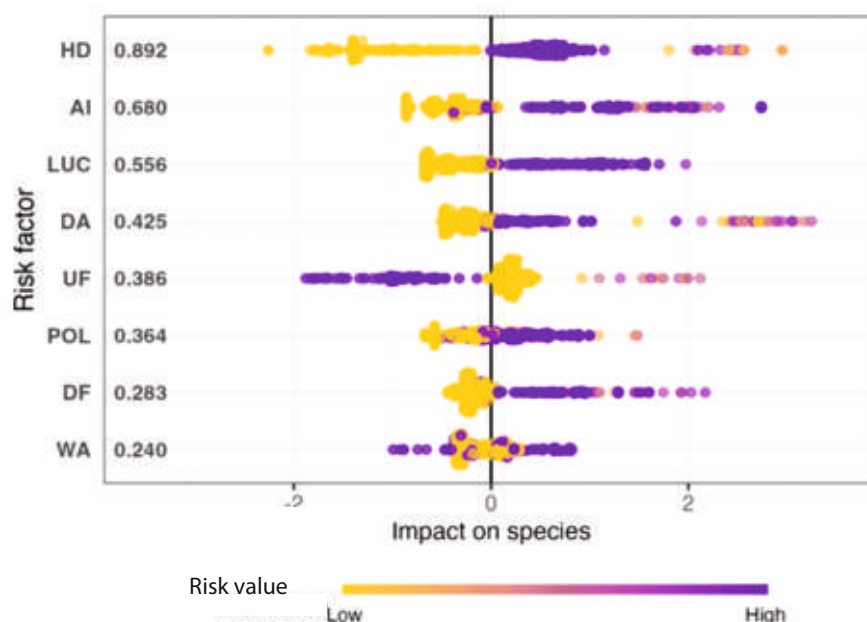
Fisheries Resource Assessment and Informatics Projects

Project title: Harnessing data science for optimizing spatial assessment of riverine and wetland fisheries resources

Project code: FRAI/24-27/01

Machine Learning modelling for threat assessment of native Indian freshwater fishes

The objective was to prioritize influential risk factors and predict the threat risk to native Indian freshwater fish species employing Gradient Boosting Tree (GBT) machine learning model. The study used a standard machine learning process: preprocessing, model training, evaluation, and interpretation. All species were classified as threatened (coded as '1') if it was categorised into any one of 'Vulnerable', 'Endangered', or 'Critically Endangered' in the IUCN 'Red List' and not threatened (coded as '0') otherwise. Potential risk factors were identified based on the IUCN threats classification scheme and grouped into nine broad categories: water abstraction, land use change, pollution, destructive fishing, alien invasion, habitat degradation, developmental activities, and others (e.g., climate change, mining, and disease outbreaks). Influential risk factors to threat classification were in order of 'Habitat degradation' (0.89), 'alien invasion' (0.68), 'land use change' (0.56), 'developmental activities' (0.43), 'unsustainable fishing' (0.39), pollution (0.36), 'destructive



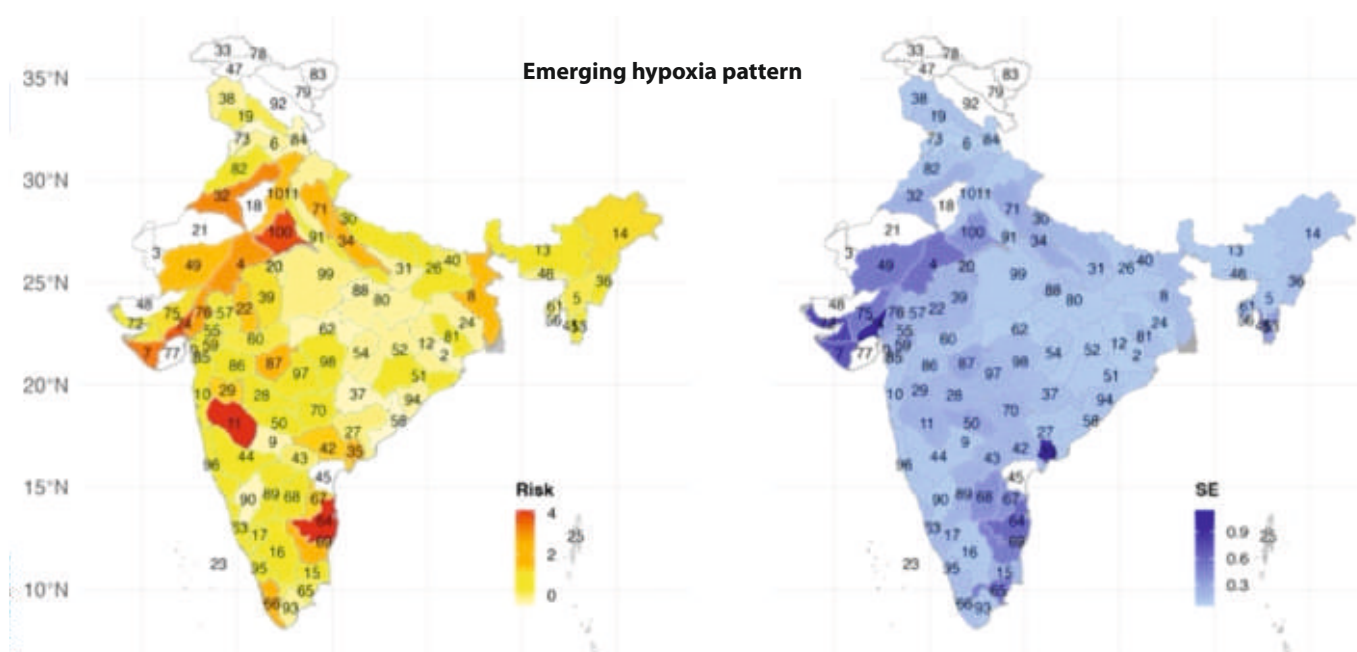
Importance of risk factors for threat classification. The y-axis shows the mean absolute contribution of each risk factor. HD: Habitat degradation; AI: Alien invasion; LUC: Changes in land use pattern; DA: Developmental activities and recreation; UF: Unsustainable fishing and heavy harvest; DF: Destructive fishing; POL: Pollution; WA: Water abstraction.

fishing' (0.28), and 'water abstraction' (0.25).

Spatiotemporal analytics for assessing aquatic hypoxia across Indian river systems

Aquatic hypoxia (low oxygen levels in

water) affects aquatic organisms. Research concerning hypoxia in Indian freshwater ecosystems has been limited to localized field studies. Thus, an attempt was made to generate policy-level insights using summarized dissolved oxygen data across Indian river systems. A



Spatial distribution of hypoxic risk across Indian sub-basins



total of 18,976 site-year summary data (annual minimum, mean, maximum) across 87 sub-basins over 17 years were harvested from publicly available at CPCB's web site. The hypoxic risk is defined as the probability of DO falling below 4 mg/L. Of the 2,088 sites analysed, 47 % experienced annual minimum DO < 4 mg/L, while 7 % and 1 % of sites exhibited annual mean DO < 4 mg/L and annual maximum DO < 4 mg/L, respectively.

In general, the north-western region of India exhibited higher relative risk with other parts of the country, except for one

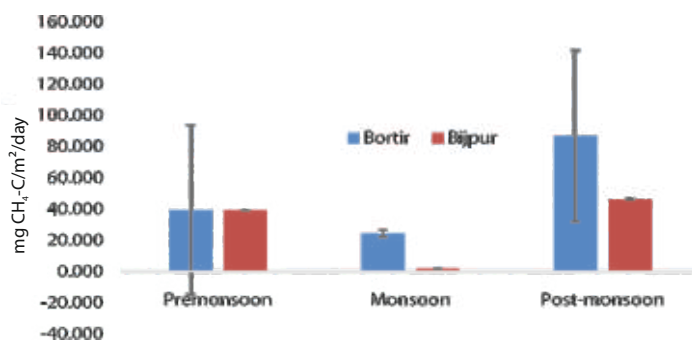
in the south (PAL(64)) and another in the west (KRL(42)). Eight subbasins-BAN(4), BHA(7), GH0(32), GOM(34), PAL(64), RAM(71), SAU(76) and YAM(100)-consistently emerged as multitype hotspots, exhibiting elevated hypoxic risk. This study demonstrates a first spatiotemporal analytic framework exploiting the strength of summary data for Indian riverine hypoxic risk assessment. Notably, India's rivers show faster hypoxic intensification which suggest immediate attention of policy makers.

Web-portal for wetland informatics

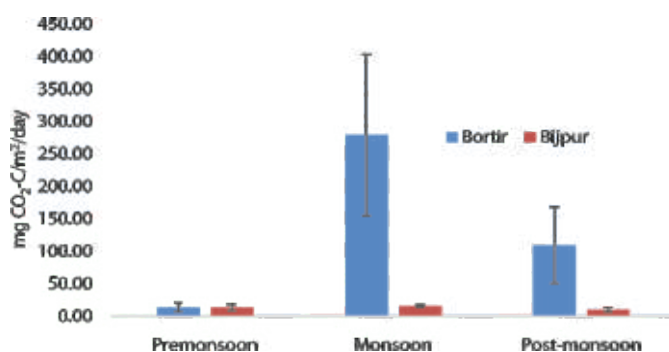
This project develops a Web-GIS application for wetland fisheries planning and management in India. It visualizes spatiotemporal water quality dynamics using data from ~550 sampling stations across six parameters (temperature, DO, pH, conductivity, BOD, and nitrate), sourced from CPCB over 17 years (2007–2023). Future updates will enhance its features to advance wetland fisheries informatics.

Project title: Assessment of greenhouse gas (GHGs) emission and carbon sequestration potential of selected wetlands in West Bengal and Yamuna River for developing mitigation strategies to reduce the adverse impacts of climate change

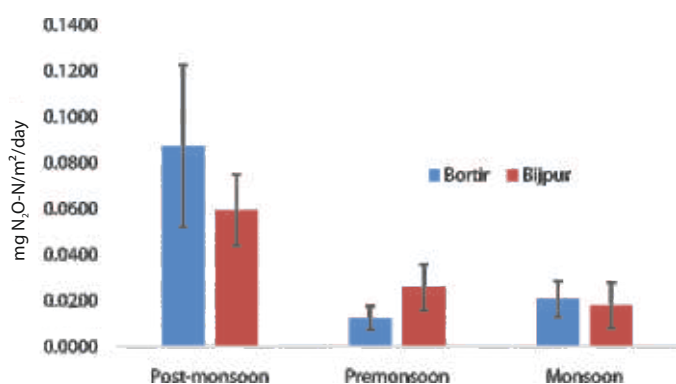
Project code: FRAI/24-27/02



Mean seasonal CH₄ flux in Bortir and Bijpur wetlands



Mean seasonal CO₂ flux in Bortir and Bijpur wetlands



Mean season N₂O flux in Bortir and Bijpur wetlands

Greenhouse gas emissions in wetlands of West Bengal

Seasonal variations in greenhouse gas (GHG) fluxes were assessed in two freshwater wetlands - Bortir and Bijpur. The results indicate seasonal control and distinct site-specific differences in emission dynamics, reflecting variations in hydrology and biogeochemical processes.

Methane (CH₄) emission showed pronounced seasonal variability in both the wetlands. In Bortir wetland, CH₄ fluxes peaked in post-monsoon season (86.57 mg CH₄-C/m²/day), followed by pre-monsoon (39.26 mg CH₄-C/m²/day), with the lowest emissions during monsoon (24.31 mg CH₄-C/m²/day). Bijpur wetland exhibited substantially lower CH₄ emissions overall, with post-monsoon values reaching 46.01 mg CH₄-C/m²/day. Higher post-monsoon CH₄ emissions likely reflect enhanced anaerobic conditions and organic matter availability following water-level recession.

Carbon dioxide (CO₂) flux was dominated by monsoon-season emission, particularly in Bortir wetland. Monsoon CO₂ flux in Bortir reached 278.79 mg CO₂-C/m²/day, substantially exceeding pre-monsoon (13.63 mg CO₂-C/m²/day) and post-monsoon levels (109.11 mg CO₂-C/m²/day). Bijpur wetland showed consistently lower CO₂ emissions, with only a moderate monsoon increase (15.34 mg CO₂-C/m²/day), suggesting high photosynthetic uptake, anaerobic sediment conditions, and efficient carbon

burial, which collectively suppress net CO₂ release.

Nitrous oxide (N₂O) emission from both the wetlands were low but exhibited clear seasonal variability. It peaked in post-monsoon, with higher emissions in Bortir (0.0874 mg N₂O-N/m²/day) compared to Bijpur (0.0594 mg N₂O-N/m²/day). This post-monsoon enhancement likely reflects favorable conditions for nitrogen transformations following floodwater recession. Monsoon-season emissions remained low to moderate (0.0207 mg N₂O-N/m²/day in Bortir and 0.0180 mg N₂O-N/m²/day in Bijpur), likely influenced

by dilution effects and strongly anaerobic conditions that favor complete denitrification to N₂.

Seasonal fluxes of GHGs in the Yamuna river

The CH₄, CO₂, and N₂O fluxes in multiple sampling sites in Yamuna River were studied during summer and monsoon seasons. Distinct spatial and seasonal patterns have been observed, with low emission during monsoon months. Extremely high summer CH₄ fluxes were recorded at Wazirabad Nala (466.08 mg CH₄-C/m²/day) and ITO (2661.36 mg CH₄-C/m²/day), reflecting heavy sewage

inputs. In contrast, Sonia Vihar, Wazirabad, and Prayagraj consistently showed low CH₄ emissions, indicating relatively cleaner conditions. Peak CO₂ fluxes during summer at ITO, Wazirabad Nala (1091.28 mg CO₂-C/m²/day), and Okhla (463.44 mg CO₂-C/m²/day). N₂O emissions were generally higher during summer at nutrient-rich sites such as ITO (1.11 mg N₂O-N/m²/day) and Agra (1.13 mg N₂O-N/m²/day), indicating active nitrogen cycling. Wazirabad Nala, ITO, and Agra emerged to be major summer emission hotspots, while Sonia Vihar and Prayagraj had lower emissions, reflecting better water quality.

Project title: Assessment of petroleum hydrocarbon, PFAS and phenolic micropollutants in surface water and their effect on ecosystem health

Project code: FRAI/24-27/03

The project aimed at assessing petroleum hydrocarbon (PHC) contamination in the Hooghly estuary. Alongside PHC assessment, phenolic micropollutants such as bisphenol A (BPA) and nonylphenol (NP) were monitored in environmental samples, and the occurrence of PFAS was evaluated in fish collected from the estuary.

Water and sediment quality

Water and sediment quality parameters of the studied stretch of the Hooghly river indicate that the physico-chemical characteristics of water remained within acceptable limits for sustaining aquatic life. Sediment analysis showed a moderately alkaline and stable pH across sites. The predominance of sand fractions suggests a relatively high hydrodynamic energy regime, promoting rapid deposition of coarser particles. The comparatively low organic carbon content may be attributed to continuous tidal flushing, which restricts the accumulation of organic matter in the estuarine system.

Assessment of petroleum hydrocarbon

Total petroleum hydrocarbon (TPHC) levels in the water phase of the Hooghly estuary (Budge Budge to Kasthasali) ranged from 1.61 to 7.23 µg/L, while sediments contained 10.36 to 132.12 µg/100g (d.w.). The lowest concentrations in both water and sediment were recorded at Kasthasali (Purbasthali), likely due to minimal ferry movement and absence of petroleum spillage; other

Table: Petroleum hydrocarbon (PHC) in water and sediment of Hooghly Estuary

Location	Water (µg/L)	Soil (µg/100 g)	
	TPHC	TPHC	PAH
Budge budge	2.42	99.69	76.54
Batanagar	3.3	40.20	12.11
Srirampur	6.5	132.12	78.77
Barrackpore	7.23	91.54	55.49
Nawabganj	1.61	125.40	103.24
Kasthasali	2.33	10.36	4.15

downstream sites, except Batanagar, showed comparatively higher levels. In sediments, 30–80% of TPHC comprised polyaromatic hydrocarbons (PAHs), dominated by fluoranthene (33.76%) and pyrene (25.82%). In fish tissues, accumulated TPHC was largely PAHs, ranging from 8.15 to 333.4 µg/100 g depending on species and location, with naphthalene-group PAHs (66.41%) predominating, followed by phenanthrene, fluorene, chrysene, and fluoranthene.

Bisphenol A

Bisphenol A (BPA), a widely used plasticizer and recognized endocrine disruptor, was assessed as a key phenolic micropollutant in the Hooghly estuary. BPA was detected in sediments from Budge-budge (0.26–0.34 µg/g) and Batanagar (0.128–0.513 µg/g). Accumulation of BPA (0.091–0.355 µg/g; mean 0.216 ± 0.095 µg/g) was recorded in *Polynemus paradiseus*, *Otolithoides pama*, *Arius* spp., *Setipinna phasa*, and *Tenualosa ilisha*.

Nonylphenol

4-Nonylphenol (4-NP), a degradation product of alkylphenol ethoxylates used in resins, plastics, detergents, and pesticides, is a persistent and lipophilic contaminant. It bioaccumulates in organisms and exhibits estrogenic activity, disrupting endocrine functions. In the present assessment, 4-NP was not detected in surface water; however, sediments contained 4.27 ± 2.5 µg/g (d.w.) across the estuarine stretch. Of the 31 fish samples analyzed, 29.03% tested positive, with concentrations ranging from 0.104 to 1.207 µg/g (w.w.).

Quantification of PFAS in freshwater and estuarine fish

Per- and polyfluoroalkyl substances (PFAS) are persistent synthetic chemicals widely used in consumer products and industrial processes. Often termed "forever chemicals," they resist degradation, and bioaccumulate, ultimately posing risks to human health even at very low concentrations. In the



present investigation, muscle tissues of fishes caught from Hooghly estuary were analysed using LC-MS/MS for PFHxS, PFNA, PFOS, and PFOA (LOQ: 0.05 µg/kg).

Samples of *Tenualosa ilisha*, *Arius gagora*, *Otolithoides pama*, *Polynemus paradiseus*, *Gagata cenia*, *Odontamblyopus rubicundus*, *Glossogobius giuris*,

Rhinomugil corsula, *Mastacembelus armatus*, and *Clupisoma garua* showed no detectable PFAS residues.

Project title: Assessing the resilience of native fish communities in different hydroclimatic zones

Project code: FRAI/24-27/04

Length–weight relationship

The length–weight relationship (LWR) of *Systomus sarana*, *Ompok bimaculatus*, and *Cirrhinus reba* was analyzed in five rivers (Ganga, Dawki, Bhima, Thenpennai, Cauvery) stocks from different agroclimatic zones. In LWR, the regression exponent “b” value ranged from 2.35 to 3.59 indicating both isometric and allometric growth in *S. sarana*; from 3.04 to 3.56 suggesting predominantly isometric to positive allometric growth in *O. bimaculatus*; and from 2.10 to 3.60 reflecting marked spatial variability in growth patterns in *C. reba*. In all fishes, the coefficient of determination (r^2) value was high (>0.8) confirming a strong relationship between length and weight. Variations in growth coefficients among river stocks suggest the influence of habitat conditions, food availability, and environmental factors on fish growth dynamics.

Image based morphometry analysis

A truss box of 26 lines using 14 landmarks was generated for each fish to represent its basic body shape. Image-based geometric morphometric analysis revealed that distinct sets of phenomic traits clustered into separate factors, providing insight into the morphological variation among fish populations. These morphological variations are likely driven by a combination of environmental conditions, such as water flow and turbidity, food availability, and habitat structure, which exert selective pressures on fish form and function.

Study of otoliths

Otoliths of *C. reba*, *S. sarana* and *O. bimaculatus* from Cauvery and Bhima rivers were extracted following standard procedures. In *C. reba* and *S. sarana* (Order: Cypriniformes), asteriscus is the largest otolith while lapillus is the largest in *O. bimaculatus* (Order: Siluriformes) among the three pairs (sagitta, asteriscus and lapillus). Strong correlation observed between fish length and otolith dimensions (R^2 upto 0.83) highlighted potential of otolith-based markers for stock discrimination and growth assessment.

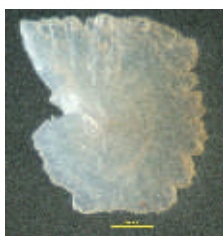
Reproductive biology

Distinct seasonal and river-specific variations were observed for *S. sarana*: gonado-somatic index (GSI) peaked during the monsoon, reaching 20.63% in Cauvery, 18.4% in Thenpennai, and

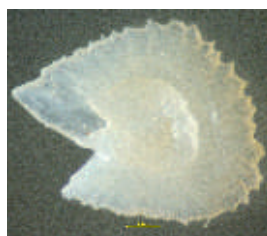
19.24% in Bhima, confirming monsoon as the principal spawning season. Absolute fecundity varied widely among rivers, with the highest values in Cauvery (112,622 eggs/female) and Thenpennai (98,754 eggs/female) during monsoon period. For *O. bimaculatus*, reproductive activity was also strongly seasonal: GSI during monsoon was relatively high (6.18%), accompanied by an absolute fecundity of 15,717 eggs/female, indicating active spawning. Approximately 75.2% of the female population was in the mature stage, while stage III males constituted about 57.2%, suggesting synchronised gonadal development. The study in *C. reba* from the Cauvery River during the monsoon season showed GSI of 7.84% and absolute fecundity of 24,174 eggs/female indicating moderate reproductive investment and confirm monsoon as the peak breeding period for this species.



Landmarks showing different truss morphometric characters in *S. sarana*



Asteriscus of *C. reba*



Asteriscus of *S. sarana*



Lapillus of *O. bimaculatus*

Project title: Next generation inland open water cage culture in India with special reference to system and species diversification

Project code: RWF/23-26/14

Feeding response and growth performance of *Sperata seenghala* (Sykes, 1839) in floating net cage

Sperata seenghala, commonly called "Giant river-catfish", belongs to the family Bagridae. Fingerlings of the bagrid catfish of 12.45 ± 1.94 g initial body weight were stocked in ICAR-CIFRI cage at Maithon reservoir in October 2024. After 120 days of monoculture final body weight of 21.88 ± 2.92 g was recorded with 75.64 % weight gain (WG) and 0.47 %/day specific growth rate (SGR). During this period fishes were fed with pellet feed in dough form in submersed condition, containing 42% crude protein and 6% crude fat. In a second experiment of 60 days the final WG of 65.73% and SGR of 0.84 %/day were attained; this time fishes were fed with 32% CP pellet in a dough form. The experiments highlighted requirement of high-protein diet for this catfish.



Growth monitoring of *S. seenghala* in cages



Advanced fingerlings of *S. seenghala* in cages

Nursery rearing of Amur carp in biofloc system

A study was conducted to assess growth performance and survival of Amur carp in biofloc system under different stocking densities. Fry of Amur carp with initial

weight of 1.74 ± 0.07 g were stocked in three stocking densities, viz., 100, 200, and 300 nos./m³, in biofloc unit of ICAR-CIFRI, Barrackpore. After 90 days of

culture, growth was found significantly higher in the lowest stocking density (100 nos./m³). Feed conversion ratio increased with stocking density, ranging from $1.49 \pm$

Table: Growth performance and feed utilization of Amur carp in biofloc system

Parameters	Stocking densities (numbers/m ³)		
	SD 100	SD 200	SD 300
Initial weight (g)	1.74 ± 0.07^a	1.74 ± 0.07^a	1.74 ± 0.07^a
Final Weight (g)	24.83 ± 1.08^a	22.44 ± 0.24^a	15.96 ± 0.70^b
Weight gain (g)	23.09 ± 1.08^a	20.70 ± 0.25^a	14.22 ± 0.70^b
Absolute growth rate (g/day)	0.26 ± 0.01^a	0.23 ± 0.03^a	0.16 ± 0.01^b
Specific growth rate (%/day)	2.95 ± 0.05^a	2.84 ± 0.01^a	2.46 ± 0.05^b
Relative growth rate (%)	1326.65 ± 61.70^a	1189.37 ± 14.08^a	817.24 ± 40.23^b
Feed conversion ratio (FCR)	1.49 ± 0.04^c	1.72 ± 0.01^b	1.95 ± 0.06^a
Feed conversion efficiency (FCE)	0.67 ± 0.02^a	0.58 ± 0.01^b	0.51 ± 0.02^c
Protein efficiency ratio (PER)	2.11 ± 0.05^a	1.82 ± 0.01^b	1.60 ± 0.05^c
Survival rate %	86.25 ± 0.11^a	83.03 ± 0.77^b	72.08 ± 0.21^c
Biomass (kg/m ³)	2.14 ± 0.09^b	3.73 ± 0.01^a	3.45 ± 0.16^a

Values are Mean $\pm$ standard error. Different superscripts of mean values in the same row differ significantly ($p < 0.05$).

0.04 (100 nos./m³) to 1.95 ± 0.06 (300 nos./m³) indicating poor feed conversion at higher density. Survival rate also declined significantly ($P < 0.05$) with increasing density. However, the highest biomass production was recorded in 200 nos./m³ stocking density (3.73 ± 0.01 kg/m³). The findings suggested a stocking density of 200 nos./m³ is optimal for nursery rearing of Amur carp in biofloc system.



Biofloc tanks and Imhoff cone indicating the floc volume

Project title: Investigation of ectoparasitism and their effects on fish populations of eastern Indian reservoirs

Project code: OWAPM/24-27/01

Fish parasitism in inland open waters, especially in reservoirs, are often neglected and non-reported leaving a big vacuum of information on diseases in these large resources. In present study, Hirakud and Panchet reservoirs, built on Mahanadi and Damodar rivers respectively were selected to catalogue

ectoparasites of fish and relate them to water quality parameters.

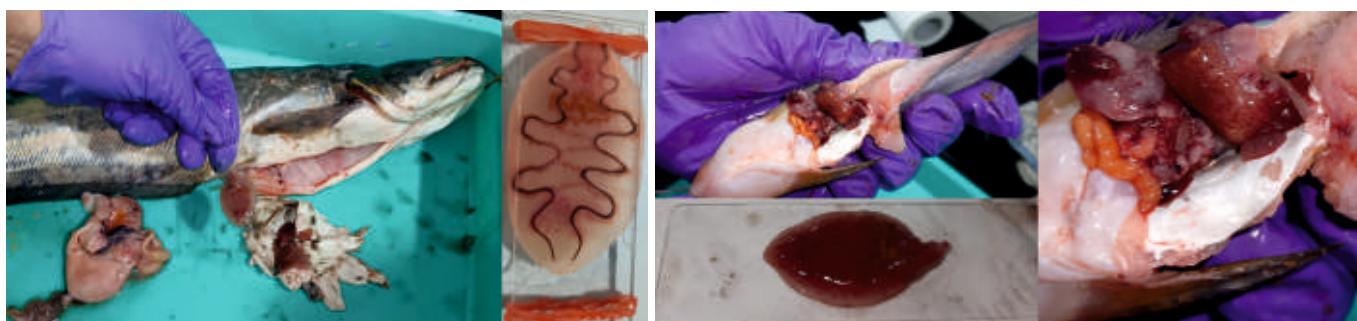
Parasitism in fishes of Hirakud reservoir

The study was conducted at two sites - Mahmadpur and Zero point - for

collection of fish and water samples. Live fish, belonging to *S. seenghala*, *L. rohita*, *C. striata*, *Rita chrysea*, caught with drag net, cast net and traps were included in the parasitological study. *Argulus* sp. was recorded from *S. seenghala* and *Rita chrysea* as ectoparasite during monsoon; *Alitropus* sp. was isolated from *L. rohita*.



Argulus infection on pectoral fin of *S. seenghala* and *Rita chrysea*



Isoparorchis hypselobagri infection in coelom of *W. attu* and *O. bimaculatus*.

During post monsoon, four fish species were screened and occurrences of *Isoparorchis hypselobagri* was recorded in *W.attu* and *O.bimaculatus*.

Parasitism in fishes of Panchet reservoir

Khadapathhar fish landing centre and

Dam site of Panchet reservoir were selected for collecting fish and water samples during the monsoon. A total of 220 fish samples belonging to 15 fish species were examined for presence of parasites. *Argulus* sp. infection on the body surface of *Puntius sophore* and *Pethia conchonius* were recorded in drag-net harvested fish samples. Common

water quality parameters such as dissolved oxygen (8.2 ppm), pH (7.5), total hardness (250) and total alkalinity (118 ppm) of the water sample were within the optimum range for reservoir fish.



Argulus infection on body surface of *Puntius sophore* and *Pethia conchonius*



Aquatic Environmental Biotechnology Division

Project title: Aquatic environmental health assessment and novel formulations development for fish health management

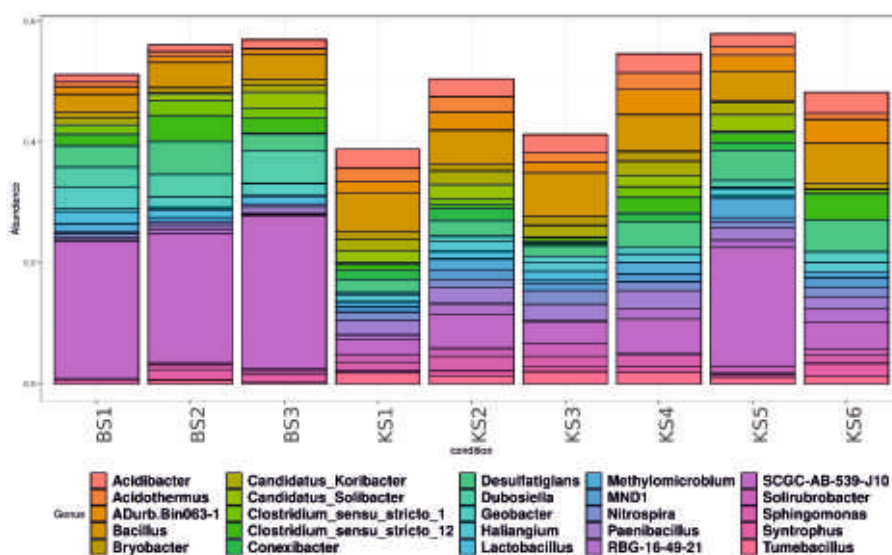
Project code: FREM/23-26/20

Fish disease investigations

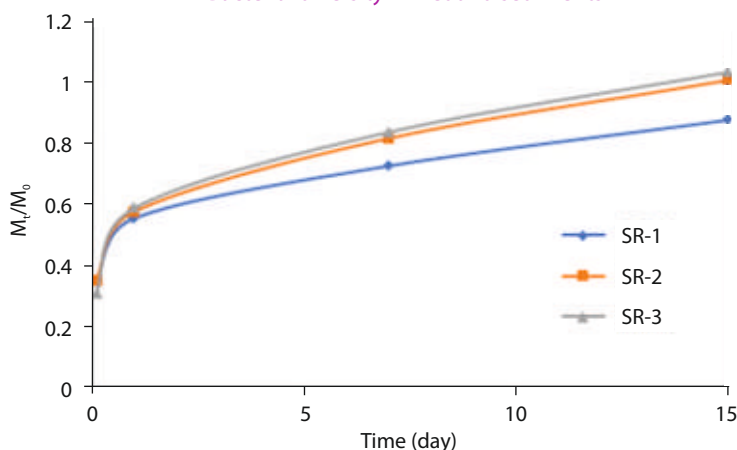
(I) Detailed investigation of mortality of *Pangasianodon hypophthalmus* revealed concurrent infection by *Aeromonas hydrophila* with *Ichthyophthirius multifiliis* and *Dactylogyrus* sp. This is the first report of such concurrent infection. (ii) Another investigation of mass mortality of *Labeo bata* confirmed co-infection by *Aeromonas veronii* and *Megasporoporia* sp. (iii) In winter, the pathogenic *Aeromonas veronii* killed a large number of *Labeo rohita* at Khalsi wetland of West Bengal. The aetiology was confirmed by classical microbiology and molecular techniques. Histological examination identified liver vacuolation, necrosis, and degeneration of hepatocytes; enlargement of nephritic tubules and necrosis. (iv) *Pseudomonas* spp. causing skin and fin lesions in *Labeo rohita* and *Cirrhinus mrigala* were identified using 16S rRNA sequencing. Antibiofilm, biofilm, swimming motility, and gene transcription experiments were conducted to identify the virulence pattern.



Pseudomonas infection in *L. rohita*



Bacterial diversity in wetland sediments



In vitro kinetic of slow release formulation in water

Antimicrobial peptides in skin mucus

Fish mucus enzymes, important for host survival in contaminated environment were examined. The azocasein test was used to measure protease activity in *L. rohita* and *L. catla*. Both the fish found to have high protein contents, enzyme activity, and enzyme band intensity in skin mucus. In *L. rohita*, 1D-Zymogram of skin mucus protease activities showed similar expression of non-specific hydrolytic enzymes. Low range (38.0 kDa) and middle range (62.0 kDa) protease bands showed aspartic protease activity.

Microbial diversity of Bhomra and Khalsi wetland sediments

Metagenomic study revealed that microbiome of Bhomra wetland sediments (BS1-BS3) was dominated by *Sphingomonas*, whereas Khalsi sediment (KS1-KS6) was dominated by SCGC-AB-539-J10, *Acidibacter*, *Acidothermus*, *Bacillus*, and *Bryobacter*. *Geobacter*, *Desulfatigians*, *Candidatus* species

(*Koribacter*, *Solibacter*), and *Clostridium_sensu_stricto_1*. *Sphingomonas* was present in Khalsi samples, but its dominance was less clear and more variable, with fluctuating community composition, reflecting ambient conditions.

Slow-release formulation for snail control

A controlled-release anti-snail formulation has been developed that slowly releases molluscicide chemical into the environment increasing cost-effectiveness and reducing toxicity to



non-target organisms. The release begins with a small burst release, followed by diffusion through the polymer matrix. Later, matrix erosion or degradation drives sustained release of the active compound.

Optimization of nutrient media for *Graesiella emersonii* Mn877773

CIFRI-ALGA S+™ medium was tested in

two different volumes to optimize growth, lipid, and astaxanthin synthesis in *Graesiella emersonii* MN877773. Inoculum (10% v/v) was added indoors under regulated conditions (1300±400 Lux, 26°C, 14:10~L:D cycle). At 100 mL, 25% dilution produced the highest biomass (~0.73 g/L), 3.3x higher than BG11. The maximum biomass productivity was 0.050 g/L/day in 25% dilution and lowest in BG11. Lipid productivity reached

0.0155 g/L/day with 25% dilution. In 2 L culture, 5% and 10% dilutions produced more biomass, while 25% produced the highest lipids (0.0033 g/L/day). Astaxanthin was extracted by DMSO + methanolic NaOH saponification and quantified by HPLC. At a dilution of 25% (40 µg/g) in 100 mL cultures and 5% (26 µg/g) in 2 L cultures, astaxanthin concentration peaked.

Project title: Biotechnological interventions for aquatic environment and fisheries management of wetlands

Project code: AEB/24-27/01

Phylogeography of different *Channa* species

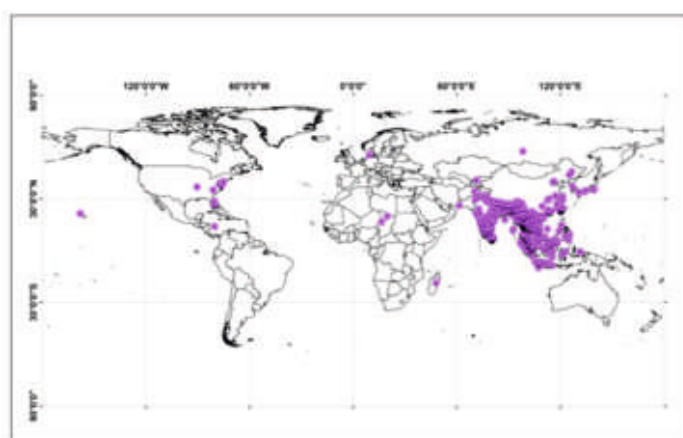
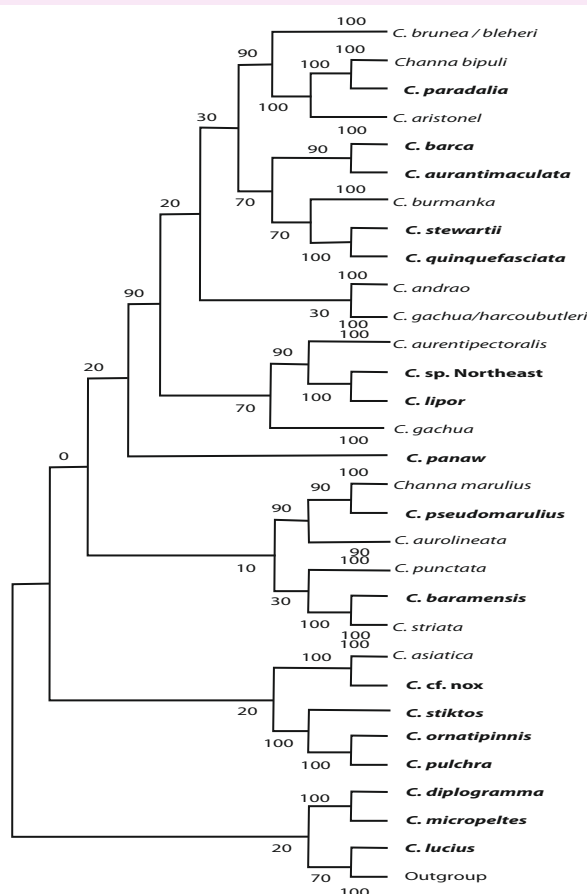
The genus *Channa* encompasses several closely related species having high food value and aquarium trade significance. A Maximum Likelihood phylogeny tree of *Channa* spp. was constructed which clearly delimited taxa such as *Channa barca*, *Channa aurantimaculata*, *Channa stewartii*, *Channa striata*, *Channa micropeltes*, and *Channa lucius*, supporting their taxonomic validity based on morphology. However, it failed to distinguish closely related pairs such as *Channa gachua*/*Channa harcourtbutleri* and *Channa bleheri*/*Channa brunnea*. Distribution patterns indicated highest diversity in South and Southeast Asia, with sparse records in North America and the Middle East likely representing introductions.

Fish diversity in the Shantipur wetland

Fish morphology combined with mitochondrial COI barcoding was used to ensure accurate species identification and establish a reliable baseline of fish diversity in the Shantipur wetland, West Bengal. The integrative study confirmed identity of 13 fish species viz., *Macrognathus pancalus*, *Badis badis*, *Chanda nama*, *Esomus danricus*, *Lepidocephalichthys guntea*, *Parambasis lala*, *Labeo rohita*, *Heteropneustes fossilis*, *Trichogaster fasciata*, *Glossogobius giurus*, *Nandus nandus*, *Parambasis ranga*, and *Notopterus notopterus*.

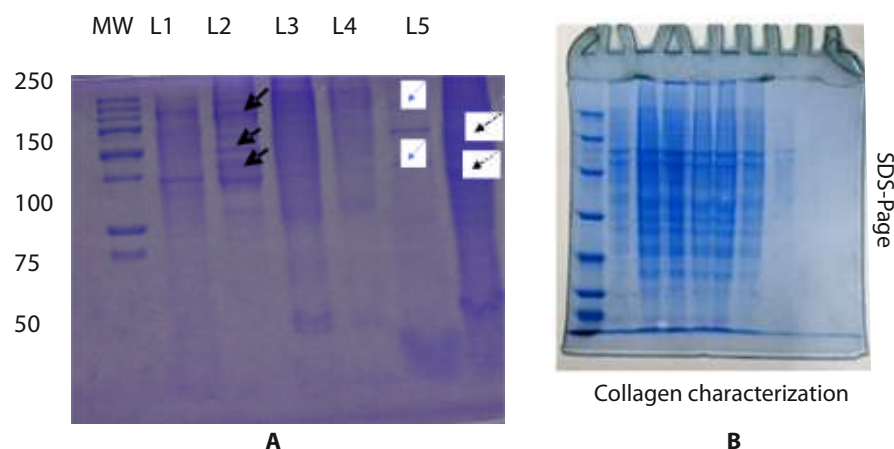
Amino acid profiling and nutritional significance

Amino acid profiling of *Heteropneustes fossilis* and *Glossogobius giurus* collected



Global distribution map and phylogeny of genus *Channa*. Purple dots represent documented sampling localities





(A) 12% SDS-PAGE profile of different tissues of stressed and normal *Systomus sarana*. L1: muscle of stressed fish, L2: muscle of normal fish, L3: gill of stressed fish, L4: gill of normal fish, L5: liver of stressed fish and L6: liver of normal fish.

(B) SDS-PAGE of skin collagen showing two α -chains (α_1 and α_2), along with β -component and a faint band representing γ -component.

from Shantipur wetland was done using UPLC, that revealed a balanced composition of essential and non-essential amino acids, under scoring their nutritional significance. In both the fish glutamic acid was the most abundant amino acid (0.293 and 0.305 g/100 g, respectively), followed by glycine (GLY) (0.261 and 0.263 g/100 g) and aspartic acid (0.137 and 0.131 g/100 g). Among essential amino acids, lysine (LYS) showed the highest concentration (0.180 g/100 g in *H. fossilis* and 0.160 g/100 g in *G. giuris*), followed by leucine (0.067 and 0.064

g/100 g) and valine (0.043 and 0.041 g/100 g), signifies their nutritional importance.

Impact of pollution on tissue protein profiles of *Systomus sarana*

Water pollution can impair soluble muscle, liver, and gill proteins and fish skin collagen. A comparative analysis of soluble muscle, liver, and gill proteins of *Systomus sarana* from East Kolkata Wetlands was performed by 1-D SDS-PAGE. Muscle extracts exhibited ~14

polypeptide bands, with marked differences between control and stressed fish, particularly in 120–45 kDa range. Similar stress-associated alterations in protein banding patterns were also observed in liver and gill tissues.

Skin collagen characterization of *Labeo rohita*

Contaminants such as heavy metals, pesticides, hydrocarbons, and industrial effluents can accumulate in fish tissues, causing oxidative stress that degrades or modifies skin collagen, thereby reducing its yield and functional quality. Skin collagen was extracted from *Labeo rohita* collected from the Shantipur wetland and studied for structural integrity and proximate composition for evaluation of pollutant impact. Hydroxyproline content (35.33 ± 3.06 to 42.00 ± 1.00 mg/g), indicating variability in collagen content, while moisture content (61.25–64.17%) differed significantly but not lipid (0.30–0.35%), crude protein (23.61–23.97%), and ash (0.97–1.22%). Proximate composition indicated reflecting effective purification strategy. SDS-PAGE analysis confirmed type I collagen (with distinct α_1 and α_2 bands) demonstrating preservation of native structure due to less impact of pollutant on the residing fishes.



Harvested IMC from East Kolkata Wetlands

Project title: Sustainable inland fisheries for climate-resilient and gender-inclusive livelihoods towards attaining SDGs

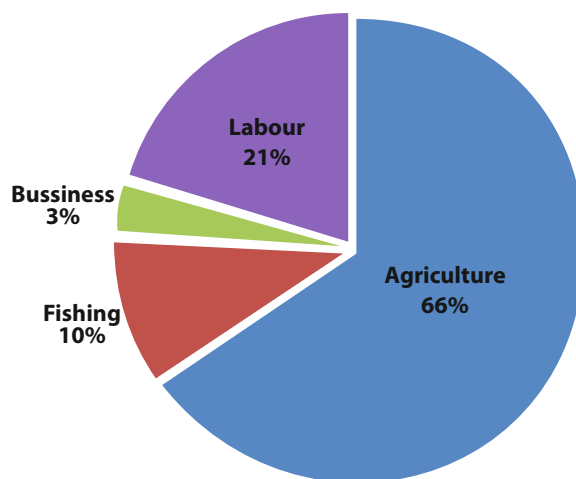
Project code: FSE/25-28/07

Sustainable inland fisheries play a critical role in strengthening climate resilience, enhancing food and nutritional security, and promoting inclusive livelihoods, particularly in developing countries. Inland water resources such as rivers, lakes, reservoirs, wetlands, and floodplains provide essential ecosystem services and support millions of small-scale fishers, many of them are vulnerable to climate variability and socio-economic marginalization. Climate change-induced challenges including altered hydrological regimes, rising temperatures, habitat degradation, and extreme weather events are significantly impacting fisheries and the stability of fisheries-dependent livelihoods. Therefore, adopting climate-resilient fisheries management practices is essential to ensure ecological sustainability and socio-economic stability. Under the project the Institute took initiative in five different states viz West Bengal, Assam, Gujarat, Kerala, Karnataka to fulfil the objectives.

Inland fish production enhancement

To fulfill the objective of inland fishery production enhancement, an initiative was taken in Manbazar, Purulia, a drought prone region under Chhotanagpur Plateau. To support the livelihoods of the tribal people ICAR-CIFRI aims to utilise sixteen rainfed waterbodies (bandhs) of over 140 acres for community-managed aquaculture. The initiative directly benefits around 481 tribal women, organised into 48 Self-Help Groups (SHGs). About 52% of the beneficiaries are illiterate and their family size is 5. About, 66% of the beneficiaries' primary occupation is agriculture and only 10% have fisheries as primary occupation. The average annual income of the beneficiaries is Rs. 51552.00.

The Institute carried out a demonstration of CIFRI ARGURE in the fish farm of Mr. Abhijit Boro, 1 No. Bhatipara Village, Damalchos, Kamrup (R) district of Assam to control Argulosis disease in carps. Mr. Boro observed infection of Argulus (Fish lice) in his pond. As per the directives of ICAR-CIFRI team, he applied CIFRI ARGURE @40ml/acre meter water



Percentage distribution of the tribal beneficiaries of Purulia based on their primary occupation

depth. A total of 3 dosages at an interval of 7 days were applied. Reportedly, the infection was reduced >80% after application of the liquid. The results suggest that CIFRI ARGURE can be used effectively by the fish farmers of Assam to control Argulus infection in carps. The on-farm demonstration also motivated the other farmers to adopt the CIFRI ARGURE to control argulosis in an effective way.

Promotion of small-scale aquaculture leads to transition among agrarian community

A total of 250 farm families were selected from Sonarpur Block, South 24-Parganas, W.B. for intervention in small-scale aquaculture. They were provided with fisheries inputs like fish seed and fish feed, to promote small-scale fisheries. At Ghushighata site, Santipur, a total of seven



Collection of socio-economic data from Narendrapur, 24 Pgs (S)



ponds were sampled to evaluate culture status, nutrient dynamics, and microbial diversity and overall pond condition for assessing suitability for fish farming. Overall, the water quality and stocking pattern indicate that the ponds are generally suitable for carp-based polyculture, with ponds receiving recent sewage input requiring regular monitoring to maintain optimal culture conditions.

Socio-economic surveys were carried out among the fishers at Dihi village, Narendrapur, Sonarpur Block, South 24 Parganas district in West Bengal to analyze how coastal farming communities adjacent to Sundarbans have transitioned from paddy farming to backyard pond-based aquaculture for income sustainability and adapting to changing climatic conditions. The cultured fishes are Indian Major Carps along with naturally available fishes in the

pond such as bata, tilapia, mola, puntius, climbing perch, and snakeheads. The beneficiary fishers of SCSP scheme, executed by the Institute, applied Cage Grow feed which has provided gainful productivity in the ponds. With successful interventions in pond aquaculture, they have organized themselves into Self Help Groups and take benefit of procuring loans for further expansion of their activities. The fishers and fish farmers mainly sell fish in the adjacent Gangajoar wholesale fish market. The Gangajoar is a popular fish market in the area where fishers and fish business merchants from Canning and Diamond Harbour also sell their produce. The monthly income of the fishers ranges from ₹ 10,000 to ₹ 12,000.

Gender-inclusive livelihood

Ornamental fish culture in tanks offers a viable and sustainable livelihood opportunity with significant potential for

women empowerment, particularly in rural areas. Tank-based ornamental fish production requires relatively low investment, minimal land, and can be practiced at the household level, making it highly suitable for women, including those with limited access to traditional income-generating resources. To diversify income sources and support livelihoods, 30 tribal women from Manbazar, Puluria were provided tanks along with ornamental fish kits.

Capacity building of the fishers and fish farmers: A total of 120 fishers including 28 women of vulnerable communities were trained during 2025. About 1100 fishers were sensitized on inland fisheries management. Special emphasis on women's capacity building promoted gender inclusion, entrepreneurship, and equitable participation in fisheries governance and value chains.

Project title: Economic accounting of inland open waters for a resilient blue economy in the Indian Sundarbans and north-eastern regions

Project code: FSE/25-28/08

During the period 2025-26, conceptual and methodological foundation by integrating ecosystem services valuation, resilience thinking, and blue economy principles were focused.

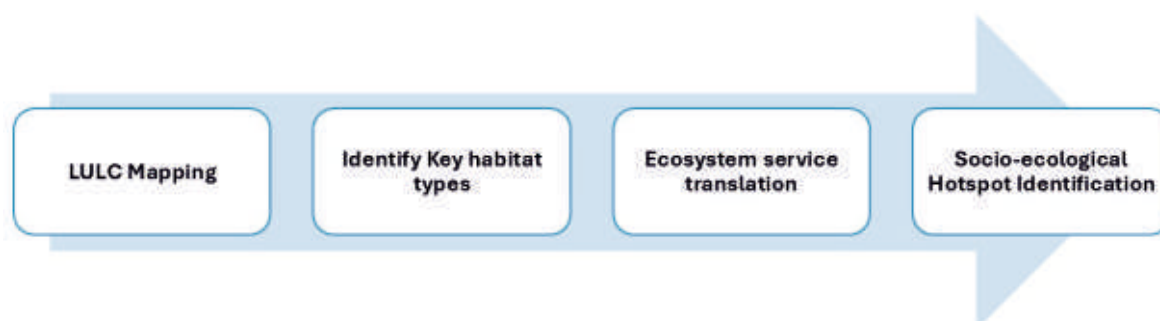
A comprehensive literature review was undertaken to synthesize global and regional studies on the blue economy concept, economic accounting approaches for inland open waters, ecosystem services frameworks, resilience and livelihood gaps, and relevant policy and institutional arrangements. The compiled literature is being developed into a monograph to support conceptual clarity and guide

empirical analysis in subsequent phases. Building on the literature synthesis, an ecosystem services-based Resilient Blue Economy (RBE) framework was conceptualized for the Indian Sundarbans. The framework integrates provisioning, regulating, supporting, and cultural ecosystem services with blue economy objectives, linking ecological sustainability with economic development and social well-being. This approach enables the valuation of inland open waters not merely as production systems but as multifunctional socio-ecological assets.

Based on this framework, key pillars of the

blue economy in the Indian Sundarbans were identified. These include restoration of mangroves and wetlands to strengthen ecological resilience and buffer climate-induced hazards; promotion of diversified livelihoods such as sustainable fisheries, aquaculture, and eco-tourism to enhance economic stability; empowerment of local communities, particularly women and indigenous groups, through inclusive and culturally grounded practices; and strengthening institutional coordination across water, forest, and fisheries sectors to support integrated and adaptive governance.

Provisioning services were linked with

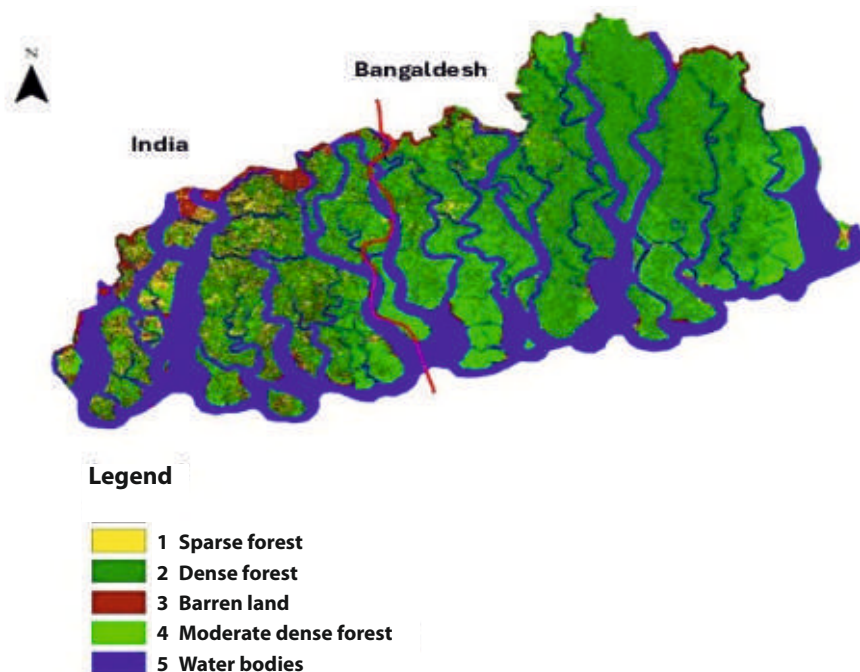


Methodology for mapping of resource use zones in Sundarbans

fisheries production and livelihood security, regulating services with flood regulation, climate buffering, and water quality maintenance, and supporting and cultural services with biodiversity conservation, traditional ecological knowledge, and cultural identity. These linkages highlight the multiple pathways through which inland open waters contribute to resilience and blue growth.

In addition, preliminary spatial mapping of resource use zones in the Sundarbans was undertaken using land-use and land-cover classification. The mapping identified inland water bodies, barren land, sparse forest, moderately dense forest, and dense forest, while also recognising the transboundary ecological continuity between the Indian and Bangladesh Sundarbans. This spatial analysis provides a foundation for future ecosystem service valuation and zone-specific management strategies.

Overall, these activities have established a strong conceptual and spatial basis for the project. The ecosystem services-based RBE framework, combined with



Map of the study area (the Sundarbans)

preliminary mapping and service linkages, offers a structured pathway for assessing the economic and social impacts using SDG-aligned indicators. These activities will be continued and

expanded in the next phase, with greater emphasis on empirical data collection, stakeholder engagement, and policy-relevant economic accounting outputs.

Table: The conceptual framework for studying ecosystem resilience in Sundarbans

Pillar	Focus	Examples
 Ecological Resilience	Restoring and protecting ecosystems	• Mangrove restoration • River and wetland conservation • Coastal erosion control
 Economic Sustainability	Livelihood diversification & resource-efficient practices	• Sustainable fisheries & aquaculture • Ecotourism • Crab fattening • Honey collection • NTFPs harvesting
 Social & Cultural Inclusion	Empowering marginalized communities and promoting traditional knowledge	• Women-led fisher groups • Tribal and fisherfolk rights • Preservation of indigenous practices and beliefs
 Institutional Integration	Cross-sectoral governance and regional cooperation	• Coordination between forest, fisheries, water departments • India-Bangladesh cooperation for climate-resilient delta management

Project title: National Agricultural Innovation Fund (NAIF) Component-1: ITMU

Patents filed

The institute has filed six patent applications under Indian Council of Agricultural Research's name. The details are as follows:

- "A species-specific media for growth of *Flavobacterium columnare*" filed on 04 January 2025. Patent application No. 202531000939
- "A synergistic microbial consortium to control fish pathogen" filed on 27 January 2025. Patent application No. 202531029162
- "Automated ammonia monitoring system with alert messaging service in aquaculture" filed on 13 May 2025. Patent application No. 202531046126
- "IOT-based turbidity monitoring system with real-time messaging service" filed on 16 May 2025. Patent application No. 202531047492

▪ "Smart portable water flow meter with GPS module" filed on 10 October 2025. Patent application No. 202531097972

▪ "Nano-Formulation of lemongrass essential oil for enhanced antifungal and antioxidant applications" filed on 31 October 2025. Patent application No. 202531105779.

Trademark registered

▪ "Cifri Aquapromo" was registered on 5 July 2025, under class 5, in respect of probiotics feed for fish and shrimp. Trademark No. 6432012

Copyright registered

▪ "Mapping of inland water bodies of Manipur" was registered on 28 February 2025, Copyright Regn. no. L-161784/2025

▪ "Women in Small- scale Aquaculture: Success Stories of Sundarbans" was

registered on 26 March 2025, Copyright Regn. no. L-162910/2025

▪ "Catalogue of Genus *Mystus* in India" was registered on 03 April 2025, Copyright Regn. no. L-163236/2025

▪ "Success stories of fishing communities of Sundarbans" was registered on 22 July 2025, Copyright Regn. no. LD-20250168980

▪ "Fish catch and fishers socioeconomics of River Ganga" was registered on 07 August 2025, Copyright Regn. no. LD-20250170377

▪ "Open Water Fisheries Development in Northeast India: ICAR-CIFRI's Intervention" was registered on 30 December 2025, Copyright Regn. no. LD-20250179133

MoU signed with different organizations in 2025



B2B meeting with Anmol Feed (Nouriture) Pvt. Ltd., Kolkata, on 25 June for licensing of CIFRI products



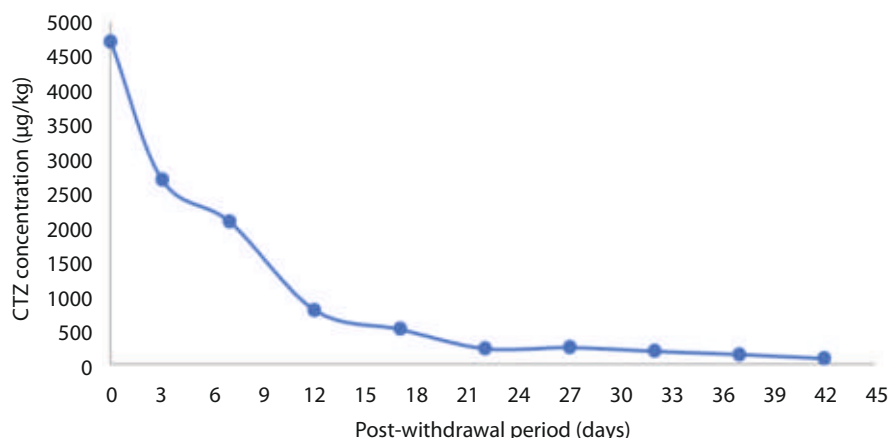
Signing of MoU with Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, on 22 December

MoU with	Date	Purpose
National Thermal Power Corporation (NTPC) Limited	13 January	For the project on "A Study on Greenhouse Gas (GHG) Emission and Carbon Sequestration Potential of the Phytoplankton Communities in River Ganga at Farakka"
National Thermal Power Corporation (NTPC) Limited	13 January	For the project work on "Conservation and restoration of Gangetic Indian Major Carps and other indigenous fishes through breeding and ranching at NTPC Farakka"
Meghalaya Power Generation Corporation Limited (MePGCL)	31 January	For the consultancy service of "Mapping of Hilsa migratory habitat and stock identification in Muntdu River, Meghalaya in the vicinity of Myntdu Leshka Stage-II HE Project."
Mandakini Jal Urja Private Limited, Dehradun, Uttarakhand	31 January	For the consultancy service of "Investigation on the fish diversity with special focus on migratory behavior in lean season of the river Mandakini upstream of Guptkashi"
Sardar Sarovar Narmada Nigam Limited (SSNNL), Gandhinagar, Gujarat	28 February	For the consultancy service of "Assessment of Environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of Sardar Sarovar Dam (SSD) in Narmada River"
Dhanamanjuri University, Imphal, Manipur	26 May	For establishment of joint research, educational programs and community engagement through joint extension activities
West Bengal University, Barasat, West Bengal	29 May	
Chamardaha Fishermen Cooperative Society Ltd. North 24 Parganas, West Bengal	10 July	To work for production enhancement and sustainable fisheries management
Sindrani Fishermen Cooperative Society Ltd. North 24 Parganas, West Bengal		
Nehru Gram Bharti (Deemed to be University), Prayagraj, Uttar Pradesh	11 August	Academic and research collaboration
Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, U. P.	25 August	
Gopal Narayan Singh University, Rohtas, Bihar	25 November	
Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur	22 December	

Project title: All India Network Project on fish health

Persistence of clotrimazole in fish flesh

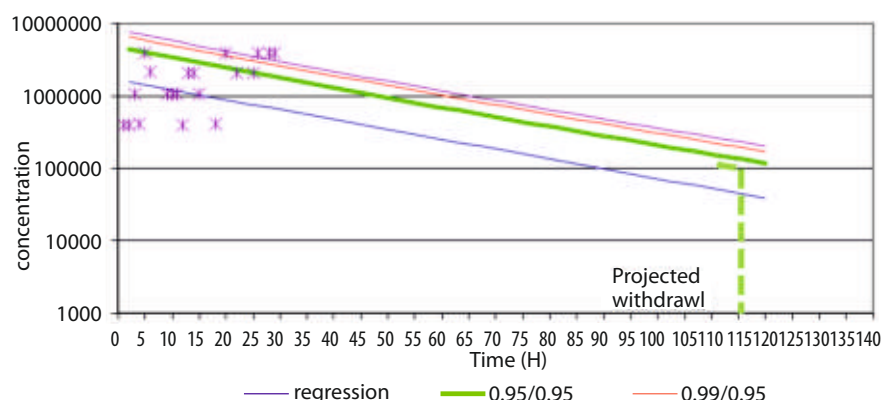
The antifungal drug clotrimazole is commonly found in natural waters around the world, which poses a risk to fish and other aquatic organisms. In other side, it has demonstrated high efficacy against *Saprolegnia*, highlighting its potential for treating fungal diseases in fish. The kinetics of clotrimazole in flesh of *P. hypophthalmus* was examined after oral administration at a dose of 5 mg/kg of biomass daily for 7 days. Quantification using LC-MS/MS revealed residue concentrations of 200 µg/kg and 100 µg/kg in fish flesh on 32 days and 46 days, respectively, indicating the drug's prolonged persistence in fish, which may lead to toxicity effects. Additionally, the treated fish present a risk to consumers for at least 45 days.



Clotrimazole concentration in Pangas flesh after 7 days of oral administration

Withdrawal period of Romet 30® in *Pangasianodon hypophthalmus*

Romet 30®, a combination of sulfadimethoxine and ormetoprim, is a highly effective antimicrobial approved for the control of bacterial diseases in aquaculture in several western countries. However, this drug has not been tested in fish consumed in South and Southeast Asia. The withdrawal period of the drug was investigated through oral administration at a therapeutic dose of 50 mg/kg of biomass for 5 days in *P. hypophthalmus*. Drug residue analysis in fish flesh was conducted using LC-MS/MS at various intervals. Considering a maximum residue limit (MRL) value of 100 µg/kg for sulfonamide drugs, the study projected a withdrawal period of 5 days

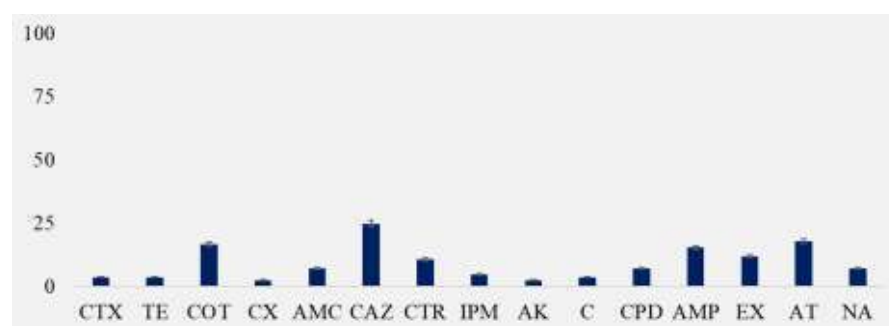


The semi-logarithmic plot of the muscle tissue Romet 30 residue levels quantified at different time points showing. MRL:Maximum Residue Limit (100 µg/kg)

with a tolerance and confidence level of 95%. This suggests that the drug is rapidly excreted from the fish flesh, allowing treated fish to be considered safe for consumption after 5 days of drug cessation.

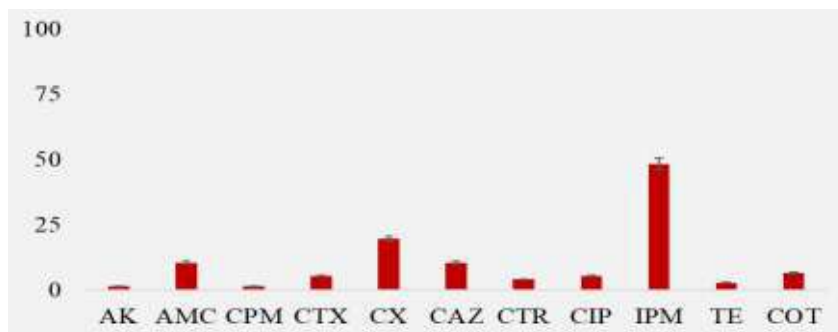
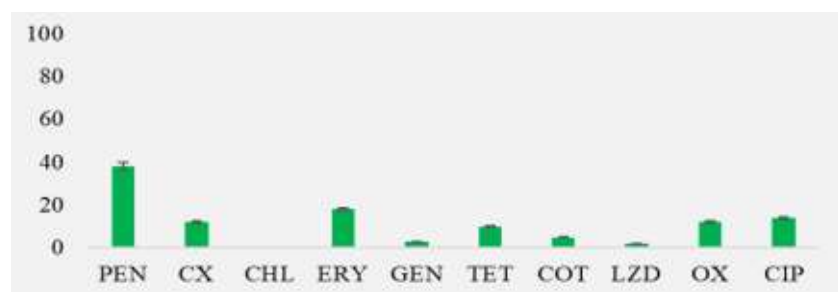
Project title: All India Network Project on Antimicrobial Resistance (AINP-AMR) in fisheries and livestock

In 2025, a total of 109 fishes and 109 water samples from 109 culture farms were collected for examining the AMR pattern in *Escherichia coli*, *Aeromonas* sp., and *Staphylococcus* sp. in districts of North 24 Parganas, South 24 Parganas, Bankura, and East Medinipur. Among 180 *E. coli* isolates, 78 demonstrated positive results for beta-lactamase production. Within this group, 61 isolates tested positive for *TEM* gene, 26 isolates for *CTX-M* gene, and 14 isolates for *SHV* gene. Among 157 *Aeromonas* isolates, 74 exhibited positive results for beta-lactamase production. Specifically, 53 isolates tested positive for



Phenotypic % of resistance in *E. coli*



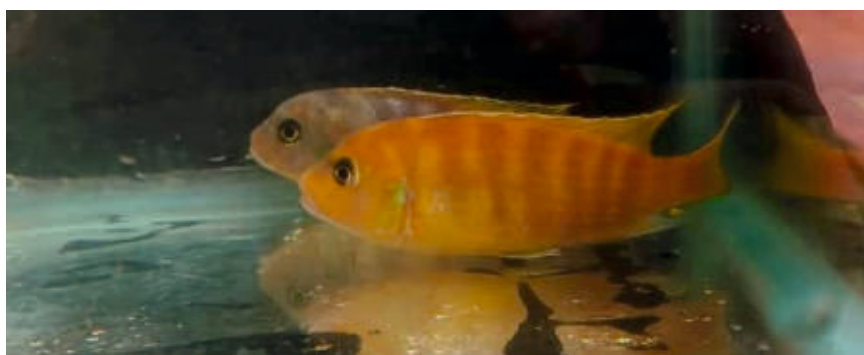
Phenotypic % of resistance in *Aeromonas* sp.Phenotypic % of resistance in *Staphylococcus* sp.

blaTEM gene, 17 isolates for *blaCTX-M* gene, and 12 isolates for *blaSHV* gene. *E. coli* exhibited over 15% resistance to ceftazidime (CAZ) and ampicillin (AMP), while *Aeromonas* demonstrated a higher resistance, nearly 19% to cefoxitin (CX) and 48% resistance to imipenem (IMP).

Additionally, *Staphylococcus* showed more than 38% resistance to penicillin (PEN). Among the 145 *Staphylococcus* isolates, 42 were identified as *Staphylococcus aureus* through the *nuc* gene, while the remaining isolates were classified as coagulase-negative *Staphylococcus* (CONS).

World Antimicrobial Awareness Week was organized during 18-24 Nov. 2025 among the fishermen, fish farmers, students, and teachers to spread the knowledge on AMR and One Health. During this, more than 500 fishermen, students, and research faculties from different organizations interacted with ICAR-CIFRI on antimicrobial resistance.

Project title: All India Network Project on ornamental fish breeding and culture

A breeding pair of *Neolamprologus pulcher*

Natural breeding of banana cichlid

Captive breeding of *Neolamprologus pulcher* was successfully achieved in the ornamental hatchery of ICAR-CIFRI. Among the two broodstock sets evaluated, Set-II (2♀:4♂) performed better, exhibiting higher egg production, fertilization, hatching, and larval survival rates. Eggs were adhesive and deposited on provided substrates; yolk sac absorption occurred by 3 dph, and larvae accepted artificial feed from 4 dph. After six months, juveniles reached 3.4–5.2 cm in length and 0.48–2.36 g in weight under optimal water quality conditions.

Natural breeding of short body flowerhorn cichlid

Successful natural captive breeding of *Amphilophus trimaculatus* was achieved at the ICAR-CIFRI ornamental hatchery. Broodstock, acclimatized under controlled conditions, spawned naturally on provided substrates, with Set-II (2♀:4♂) showing superior reproductive performance in terms of egg production, hatching, and larval survival. Yolk sac absorption was completed by 3 dph; artificial feeding commenced from 4 dph. Juveniles attained 2.1–5.5 cm in length and 0.53–2.52 g in weight in three months.

Offsprings of *Amphilophus trimaculatus*

Natural breeding of albino oscar

Successful natural breeding of *Astronotus ocellatus* was achieved in the ICAR-CIFRI ornamental hatchery. Brooders matured under controlled conditions and spawned naturally, with Set-II (1♀:1♂) exhibiting superior reproductive performance in terms of egg production, fertilization, hatching, and larval survival as compared to Set-I. Biparental care was observed, and larvae completed yolk sac absorption by 3 dph and accepted artificial feed from 4 dph. Under optimal conditions, juveniles attained 3.3–6.9 cm in length and 0.92–6.31 g in weight in three months.



Astronotus ocellatus fry (4 months old)

Domestication of an endemic snakehead

Channa bipuli, an endemic ornamental snakehead of Assam, is distinguished by a bluish dorsum and characteristic black spotting. Owing to its high ornamental value, five breeding pairs were collected from lower Assam. Brooders (11.8–15.2 cm; 12–27 g) were maintained in FRP tanks (400 L) with mud bottoms, aquatic vegetation, and hideouts. Fishes were fed live feed, worms, and boiled chicken viscera. Suitable water quality conditions were maintained (temperature 18–22°C, pH 7.5–7.8, dissolved oxygen 6.2–6.5 mg/L). The broodstock were successfully acclimatized and maintained for future breeding and conservation programmes.



Channa barca (barca snakehead)

Trade pressure and market demand of *Channa barca* in Assam ornamental fish trade

Channa barca, a rare and highly

endangered freshwater fish endemic to Assam, is protected under Schedule II of the Wildlife (Protection) Act, 1972, prohibiting unauthorized capture and trade. During the reporting period, over 50 seized specimens (sub-adult to adult)

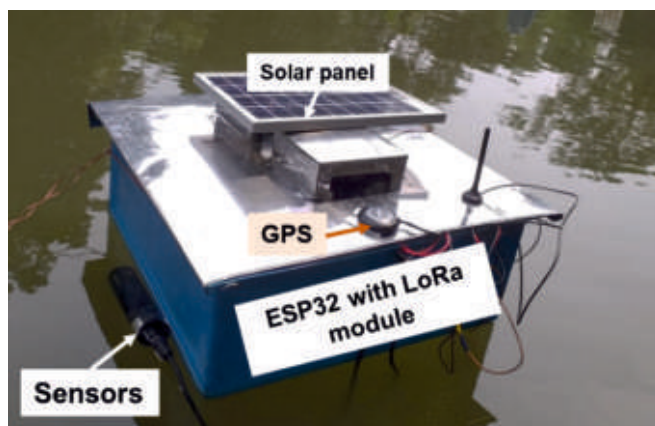
Guwahati Centre, along with other snakeheads. Its high ornamental value (₹50,000-2.0 lakh per pair) drives illegal catch, posing a threat to wild populations and accelerating species' decline.

Project title: IoT based precision enclosure culture and fisheries management in inland open waters

Development of IoT based turbidity monitoring system with real-time messaging service

The system provides real-time monitoring of turbidity in waterbody through a dashboard and mobile app. When it detects high turbidity conditions, based on a predefined turbidity threshold, it sends alert messages to the farm owner. The system has been deployed at various fish farms, including ICAR-CIFA in Bhubaneswar, ICAR-CIFE in Mumbai, and the shrimp farm at Valvin's farm in Venukonda, Andhra Pradesh.





Development of wireless floating water quality monitoring system

It is a wireless floating system for sensor deployment in any part of large water body. The system can be used for real-time monitoring of multiple water quality parameters, viz., DO, temperature, ammonia, pH, and turbidity via a dashboard and mobile app. It wirelessly manages aerator operation using LoRa technology and sends alert messages notifying the parameter stress condition to farm owner based on threshold level.

Development of portable flow meter

This is a handheld meter, which is portable and provides the water flow rate of the surveyed water. It records sampling point location with GPS coordinates. It has an inbuilt data logger for storing all sampling data with coordinates and time, and it can be easily used for field-level data collection.

Project title: Environmental and aquaculture animal health monitoring in Hirakund Reservoir under cage culture programme

Fish and fisheries

The study documented 68 fish species belonging to 25 families and 9 orders, indicating higher biodiversity compared to earlier records. Dominant families included Cyprinidae and Bagridae. Catfishes *Sperata aor* and *Sperata aorella* were newly recorded, along with benthic genus *Branchiodrilus*. Exotic species such as *Oreochromis niloticus*, *Clarias gariepinus*, *Pangasianodon hypophthalmus*, and *Cyprinus carpio* were

also observed. CPUE analysis showed spatial-seasonal variations, with drag nets yielding the highest catch, and estimated annual fish yield exceeded 70 kg/ha, indicating sustainable fishery potential.

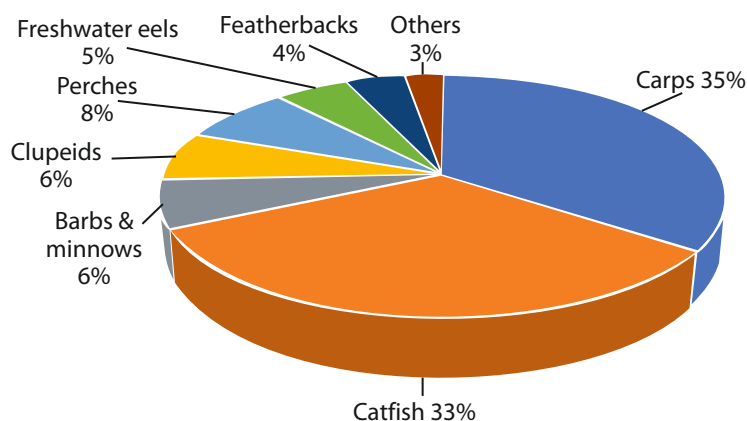
Impact of cage culture on reservoir ecology

A comprehensive environmental and fisheries assessment across 14 sites and three seasons in Hirakund Reservoir evaluated the sustainability of capture

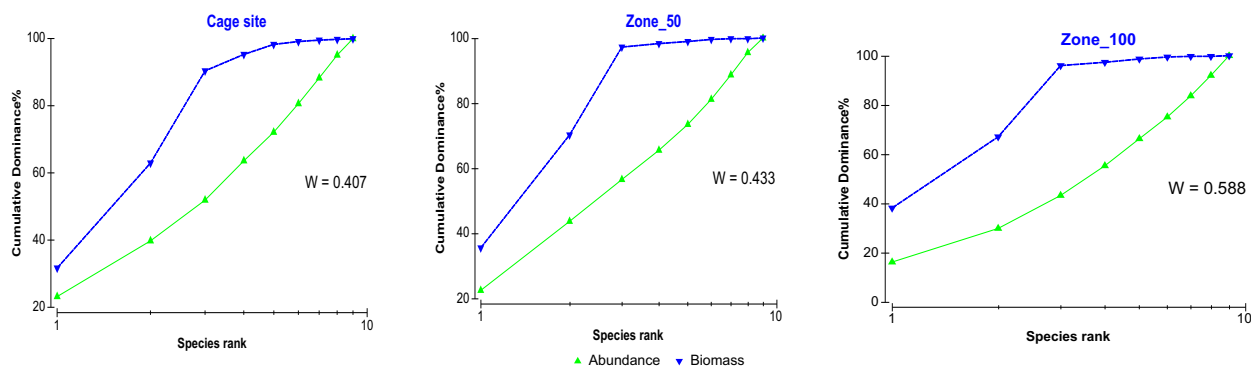
fisheries and cage culture. Water quality, productivity indices, plankton communities, and sediment characteristics indicated moderate productivity and good ecological health. Comparative analysis between cage culture and reference sites showed no significant environmental differences, confirming absence of eutrophication or ecological degradation. Abundance-biomass analysis suggested stable ecological conditions, while fish catch rates near cage areas remained comparable to non-cage zones, demonstrating environmentally sustainable cage farming without adverse impacts on reservoir fisheries.

Fish health scenario

Aquatic animal health surveillance established baseline microbial and disease profiles in cage-cultured and wild fish populations of Hirakund Reservoir. Parvovirus infection was recorded for the first time in the reservoir. Trematode *Isoparorchis hypselobagri* infestation was confirmed in *Sperata seenghala*. A disease



Fish catch composition of the Hirakund reservoir



ABC Curve analysis at cage culture sites and adjacent distances (50 m and 100 m)

outbreak in cage-cultured *Pangasianodon hypophthalmus* was

attributed to antibiotic-resistant *Aeromonas veronii*, highlighting AMR risks

and the need for strengthened biosecurity measures.

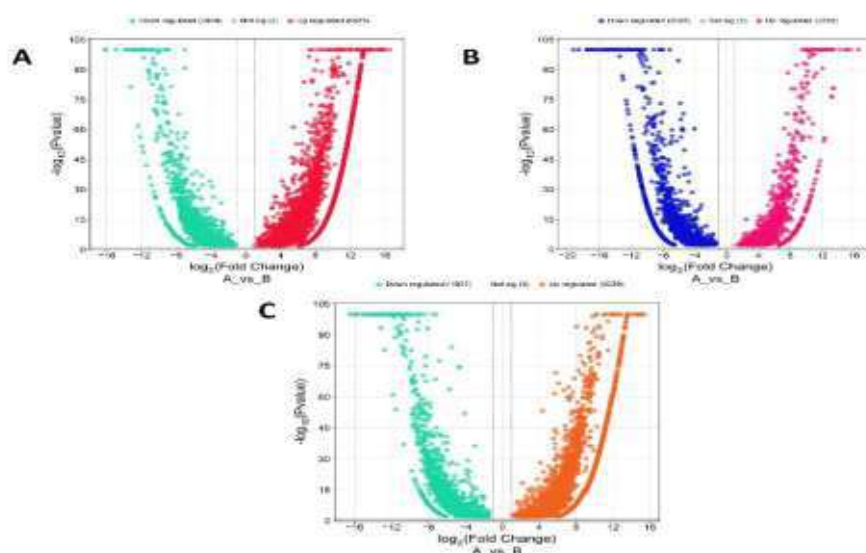
Project title: Network project for agricultural bioinformatics and computational biology on 'Microbiome meta transcriptomics assessment of Indian river basins for ecosystem health monitoring'

Microbial functional profiles in sewage-impacted wetlands

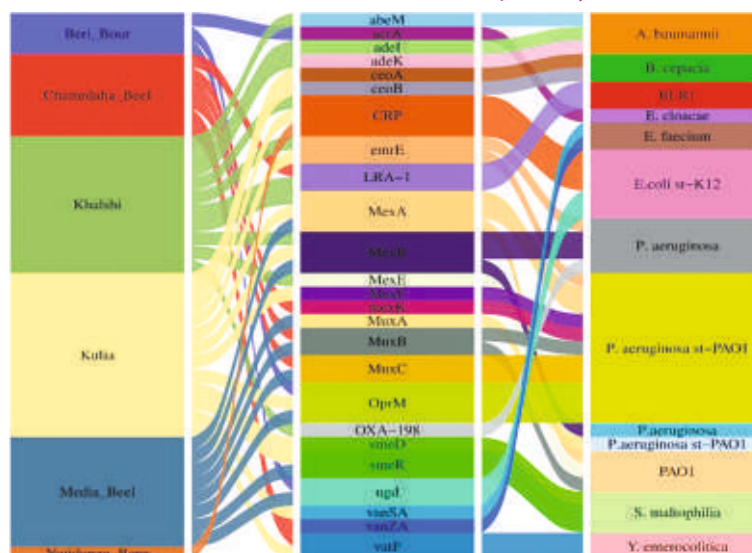
A metatranscriptomic study assessed transcriptionally active microbial communities, antibiotic resistance genes (ARGs), and virulence factor genes (VFGs) in sediments from urban-influenced freshwater wetlands of eastern India. High-throughput RNA sequencing and functional annotation using CARD and VFDB revealed diverse active bacterial communities dominated by *Pseudomonas*, *Acinetobacter*, *Stenotrophomonas*, and *Burkholderia*. Expressed ARGs conferred resistance to multiple antibiotic classes, with efflux pump systems predominating. Concurrent expressions of VFGs linked to adhesion, motility, and secretion indicated potentially pathogenic populations. ARG-VFG distribution showed strong associations with environmental variables such as pH, conductivity, nitrogen, and salinity, highlighting physicochemical control over microbial functional dynamics.

Metatranscriptomic profiling of antibiotic resistance in urban-influenced wetlands

The study investigated transcriptionally active antibiotic resistance genes (ARGs) and virulence factor genes in urban-influenced wetlands using metatranscriptomic analysis. High-quality sediment RNA was sequenced, assembled, and functionally annotated using CARD. Twenty-five actively expressed ARGs conferring resistance to



Volcano plot shows differential gene expressions in three wetlands (A: Chobadanga; B: Boro-Chainavi; C: Jagrasha). Genes with significant upregulation or downregulation are shown in red and blue dots, respectively.



Alluvial plot showing distribution of antibiotic resistance genes across 8 wetlands and the associated bacteria



fluoroquinolones, tetracyclines, aminoglycosides, β -lactams, and multidrug systems were identified, with efflux pump families dominating the

resistome. Host association analysis linked ARGs to opportunistic pathogens, including *Pseudomonas aeruginosa*, *Acinetobacter baumannii*,

Stenotrophomonas maltophilia, and *Burkholderia cepacia*. Spatial variability indicated strong anthropogenic influence on wetland resistome composition.

Project title: Imparting state of art knowledge on fish breeding to the local fishermen for livelihood improvement and enhancing the native fish population through ranching programme in river Ganga

The successful production of quality fish seed began with the careful collection, selection, and stocking of brood fish. Synthetic hormones (Spawn-Pro, Ovasis)

were used for induced breeding. The standard dosage was 0.5 ml/kg for females and 0.3 ml/kg for males of Rohu and Catla.

Fish breeding resulted in production of about 80,000 spawns, with a fertilization rate of 70% and a hatching rate of around 80%. Spawn was reared to fingerling size (25-35g for IMC, 10-15g for *S. sarana*) in hapas within cages in the river, FRP tanks, and the NTPC PTS pond. They were fed plankton, mustard oil cake, rice bran, and artificial feed.

A major river ranching event was held at Taltala Ghat, where around 2 lakh IMC fingerlings were released. The project demonstrates a replicable model of combining modern aquaculture technology (FRP hatchery, induced breeding), community capacity building, and river ranching to enhance fishery sustainability and improve livelihoods for riparian communities.



FRP carp hatchery established for IMC seed production at Farakka

Project title: National surveillance programme for aquatic animal diseases: Phase II



A moribund *Labeo bata* showing clinical signs of co-infection



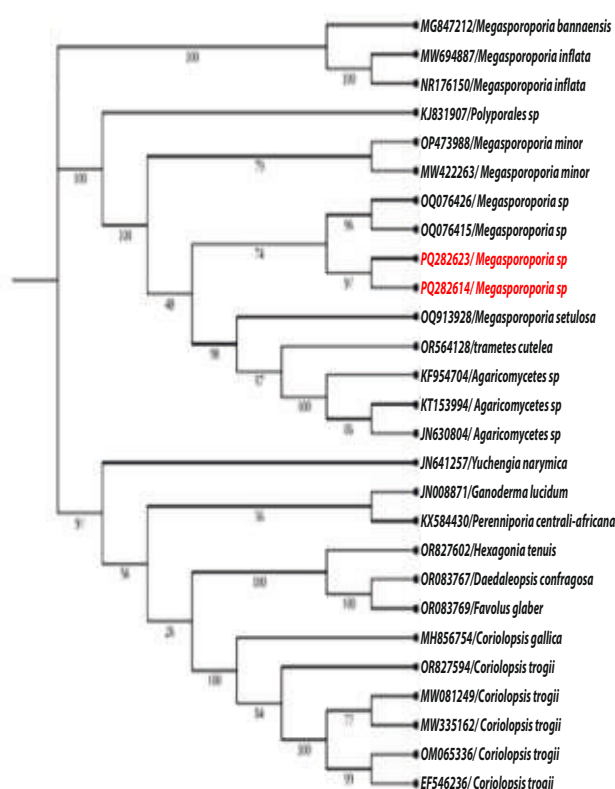
A moribund *Pangasianodon hypophthalmus* showing clinical signs

Detection of fish pathogens

A survey of 75 aquaculture farms was conducted across Howrah, South 24 Parganas, East Medinipur, and East Kolkata Wetlands (EKWs) to assess fish health. Pathogens identified from diseased fish included *Morganella morganii*, *Klebsiella pneumoniae*, *Aeromonas veronii*, *Lactococcus garvieae*, *Lernaea cyprinacea*, *Microcystis*, and TiPV. No infections of KHV or SVCV were detected in the samples analyzed.

Aeromonas* and *Megasporoporia* co-infection in *Labeo bata

A mass mortality in *Labeo bata* was identified to be caused by co-infection of the bacteria *Aeromonas veronii* and fungus *Megasporoporia* sp. through classical and molecular studies. A co-infection fish model was created to study cellular and molecular responses of the co-infection through survival assays, histology, and qPCR. Results indicated varied cellular changes in muscle tissues; transcription analysis showed that co-



Phylogenetic analysis of the fungal isolates based on ITS1 and ITS4 nucleotide sequences

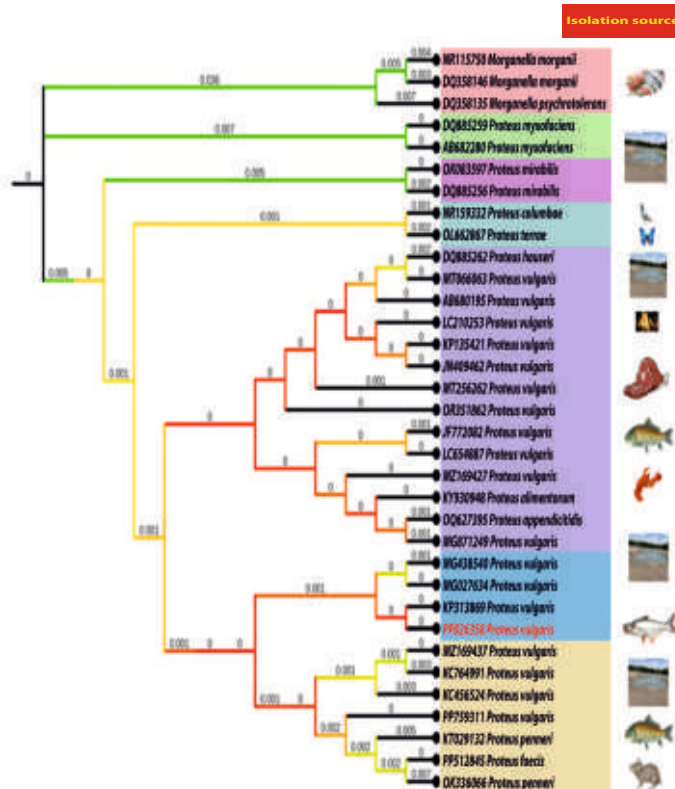
infection affected inflammation-related genes (TNF- α , IL-1 β , and iNOS), immune markers (TLR4, C3, MYD88, and NOD1), and immune responses (IFN- γ , Hsp70, Mx, and IgM) in liver, kidney, and gill tissues.

***Proteus vulgaris* infection in Pangasianodon hypophthalmus in cage culture**

A mass mortality event of *Pangasianodon*

hypophthalmus in freshwater cage farms was attributed to *Proteus vulgaris* through classical and molecular analyses. Infection caused cellular damage in kidneys, the liver, and gills. The isolate exhibited multidrug-resistant phenotypes. Transcriptional profiling revealed that *P. vulgaris* modulates host gene expression related to antioxidants, immune responses, growth regulation,

homeostasis, and DNA damage repair across liver, kidneys, spleen, skin, and gill tissues, highlighting its pathogenicity and AMR risks in aquaculture.



Phylogenetic analysis of *Proteus vulgaris* based on 16S rRNA nucleotide sequence

Project title: Improving livelihood of tribal communities through scampi fisheries enhancement technologies in under-utilized reservoir resources of Jharkhand

The project on scampi-based reservoir fisheries was successfully implemented in three reservoirs in Jharkhand: Ghaghra Reservoir (100 ha), Kelaghagh Reservoir (162 ha), and Masaria Reservoir (110 ha), in collaboration with the Department of Fisheries, Government of Jharkhand. Strategic bay enclosures were installed in Kelaghagh and Ghaghra to reduce predatory pressure, while the innovative "Round Floating Pen"-the first of its kind in India-was introduced in Masaria on 28 Nov 2024 for scampi grow-out.

Scampi juveniles (22-23 PL) were stocked twice: 2 lakh each in Ghaghra and Masaria, and 4 lakhs in Kelaghagh in



Ms. Shilpi Tirkey, Hon'ble Minister of Fisheries, Jharkhand at Elbert Ekka Krishi Mela with the scampi produced after the ICAR-CIFRI intervention



September 2023 and August 2024. Tribal women actively participated in seed counting, acclimatization, stocking, harvesting, and marketing, strengthening community engagement and inclusivity. Scientific management practices such as the removal of predatory fishes (e.g., *Channa punctatus*, *Wallago attu*, and *Clarias gariepinus*), supplementary feeding, and vitamin-mineral application during lunar phases were adopted.

A dedicated group of fishers actively managed the reservoirs: 60 in Kelaghagh, 25 in Masaria, and 20 in Ghaghra. Successive stocking cycles yielded 57.90 MT, 34.10 MT, and 26.80 MT of scampi, respectively, demonstrating sustained production enhancement. Kelaghagh continues as a well-managed small reservoir, while Masaria and Ghaghra faced environmental and human resource constraints. Adaptive management interventions, including

floating bay enclosures and round pens, improved survival and productivity.

The program's impact on livelihoods was acknowledged during a visit by Ms. Shilpi Neha Tirkey, Hon'ble Minister of Fisheries, Jharkhand appreciating the efforts of ICAR-CIFRI and the Department of Fisheries in enhancing socio-economic conditions of tribal communities.

Project title: Identification and comparative expression analysis of novel immune related genes against prevalent bacterial infection and development of remedial measures in Asian Seabass, *Lates calcarifer*

A comprehensive investigation was undertaken to elucidate the molecular immune responses of Asian seabass (*Lates calcarifer*) against *Aeromonas hydrophila* infection. Field surveys were conducted across the aquaculture regions of West Bengal and Odisha, resulting in the isolation of 34 bacterial strains (16 from West Bengal and 18 from Odisha). Molecular identification through 16S rDNA amplification (~1.5 kb), agarose gel confirmation, and phylogenetic analysis validated taxonomic identities, and sequences were submitted to the NCBI database. Some of these are

PQ363081, PQ36308, PQ363089, PQ363125, PQ243269, PQ363085, PQ363087, and Pq363088.

Whole transcriptomic (RNA-Seq) analysis was performed, and extensive infection-induced transcriptional reprogramming was revealed. In gut tissue, 76 genes were found to be upregulated and 59 genes downregulated, indicating enhanced mucosal immune activation. In liver tissue, 98 genes were found to be upregulated and 105 genes downregulated, reflecting systemic immuno-metabolic adjustment. Immune

mediators such as *HP*, *STEAP4*, *ALPL*, and *SOC53B* were activated, whereas metabolic and cell-cycle regulators (*BNC1* and *MCM2/3/5*) were suppressed. Principal component analysis and heatmap visualization were conducted, and distinct clustering between control and infected samples was confirmed, thereby validating organ-specific transcriptional modulation. These differentially expressed genes were identified as potential biomarkers for disease resistance.

Project title: Fish conservation and stock enhancement of fishery of Ganga river basin (Phase-III) under Namami Gange Mission

Component I: Captive breeding of commercially important fish species and ranching programme through livelihood enhancement and conservation in arth Ganga concept

Captive breeding and ranching of carps

A captive breeding program for Indian

Major Carps (IMC)-Rohu, Catla, and Mrigal-was conducted at Balagarh in West Bengal. As part of the National Ranching Programme, a total of 8.22 million spawns has been produced (Rohu: 4.10 million; Catla: 2.55 million; Mrigal: 1.62 million) for ex-situ conservation and stock enhancement of the River Ganga. In total, 32 ranching operations were carried out, resulting in the release of fingerlings of

IMC and mahseer, which were produced from the induced breeding of Gangetic broodstock.

Ichthyofaunal diversity and fish landings in river Ganga

A total of 179 fish species (170 native, 9 exotic) belonging to 58 families and 23 orders were recorded in 2025. Species



A



Ranching at different places A: Barrackpore, B: Farakka



Ranching at Barrackpore

richness was highest in the middle stretch at Bijnor (82 species). Conservation status indicated that 8% of the recorded fish species were categorized as threatened under the IUCN Red List of Threatened Species. Monitoring across 17 sites in four states recorded a total fish landing of 799.39 tonnes, compared to 929.21 tonnes in 2024, indicating an overall decline.

Component II: Establishment of Hilsa stock in middle stretch of river Ganga through ranching of Hilsa seed bred through captive and wild adults

Ranching of wild-collected Hilsa seed/juveniles

Anthropogenic pressures like water abstraction, hydraulic structures, overfishing, pollution, and climate change have depleted *Tenualosa ilisha* populations in the Ganga River. To restore stocks, 98,719 wild-caught Hilsa (11–33.5 cm; 17–498.4g) were released 5–15 km upstream of Farakka Barrage during Nov 2024–Oct 2025, alongside fertilized eggs and spawns in the Rajmahal region, to enhance stock replenishment and fisheries sustainability.

Tagging and migration studies

Fish tagging was undertaken to assess migration routes, habitat use, and growth. Historically, Hilsa migrated up to Prayagraj; however, post-construction of the Farakka Barrage, upstream movement became restricted. Hilsa were captured downstream, tagged, disinfected, and released. Tagged fish had an average length of 27.3 cm and a weight of 382 g, with recoveries documented from Shikarpur (Jharkhand). The programme offers critical insights for the

restoration of migratory connectivity and habitat management.

Artificial breeding and broodstock development

Eight artificial breeding trials were conducted at Farakka (six) and Godakhali (two) using dry and wet fertilization (male: female=3:1). Godakhali broodstock outperformed Farakka, producing 10.36 lakh eggs versus 4.95 lakh, with higher fertilization (80%) and hatching (68%) rates. Fertilized eggs were incubated for 45–60 min, transported to the ICAR-CIFRI hatchery, and hatched within 18 hours. Controlled temperatures (22–27.4°C in Farakka; 23.9–28.5°C in Godakhali) and acclimation protocols ensured successful embryonic development and seed production.

Community sensitization and capacity building

Following migratory disruptions after 1975, upstream Hilsa populations declined in stretches such as Prayagraj, Buxar, and Bhagalpur. With support from the National Mission for Clean Ganga, 45 awareness programmes were conducted across West Bengal, Bihar, and Jharkhand, sensitizing 1,182 fisherfolk and community members. The initiative strengthened fisher-scientist collaboration, promoted sustainable fishing practices, and reinforced conservation-driven stock restoration in the Ganga basin.

Component III: Seed production, restoration, and stock assessment of selected Mahseer species in the upper stretch of river Ganga

Brooder collection and hatchery management

Tor putitora is a large rheophilic freshwater fish inhabiting rocky trans-Himalayan rivers. The species is threatened by overfishing, habitat alteration, river fragmentation, sand mining, hydropower, and climate impacts.

A total of 92 individuals (24–45 cm; 0.27–1.5 kg) of *T. putitora* were collected from the Koteswar and Tehri lakes for captive broodstock development. At the Koteswar Hatchery (Tehri, Uttarakhand), a total of 5300 fingerlings were stocked, of which 4700 fingerlings were of the golden mahseer (2–9 cm; 3–32 g) and 600 fingerlings were of the dark mahseer, *Naziritor chelynoides* (2–7.6 cm; 3–11 g). These interventions strengthen hatchery-based conservation and support the restoration of wild *Tor putitora* populations in the Ganga basin.

Monitoring of fisheries in Tehri Reservoir

Regular monitoring of fish landings in Tehri Reservoir focused on Mahseer and the exotic common carp. The average daily catch was higher for Mahseer (46.8 ± 12.6 kg) than for common carp (27.8 ± 12.8 kg). Mahseer exhibited a wide size range (23.1–103.8 cm) in the landings, whereas common carp were comparatively smaller (20.4–47.3 cm). Seasonal trends showed increased catches for both species during May and October. Fishing activities were



suspended from July to August due to the breeding season.

Component IV: Stock assessment of important fishes in selected tributaries and wetlands of Ganga river basin for their conservation and management

Rivers of the Ganga basin

ICAR-CIFRI studied 17 rivers across Uttarakhand, Uttar Pradesh, Bihar, and West Bengal states including Henval, Rapti, Sone, Betwa, Yamuna, Mahananda, Ajay, Mayurakshi, Kangsabati, Mundeswari, Brahmani, Rasulpur, Thakuran, Raimangal, Saptamukhi, Bidyadhari, and Harinbhanga rivers representing the basin's ecological diversity. Yamuna showed the highest species richness (84), followed by Sone (79), Betwa (67), and Ken (66), while smaller or stressed rivers like Raimangal (6) and Saptamukhi (9) had the lowest richness, reflecting impacts of altered hydrology, habitat degradation, salinity intrusion, pollution, and overexploitation.

Wetlands of the Ganga River basin

Wetlands support ecological balance and

livelihoods through fisheries, agriculture, and other services, improving water quality, reducing erosion, regulating floods, and storing carbon. Four West Bengal floodplain wetlands-Akaipur, Bijpur, Kundipur, and Maniknagar-were assessed for ecosystem health. Fish species richness varied, with Maniknagar showing the highest diversity (40 species) due to favorable habitat, connectivity, and productivity. Lower diversity in Akaipur, Bijpur, and Kundipur was linked to limited water area, seasonal isolation from rivers, anthropogenic disturbances, and fishing pressure, highlighting management needs for sustainable wetland functioning.

Component V: Community sensitization on biodiversity conservation, including river dolphin, along with fish bio-diversity including Hilsa for improving the livelihood of fishers

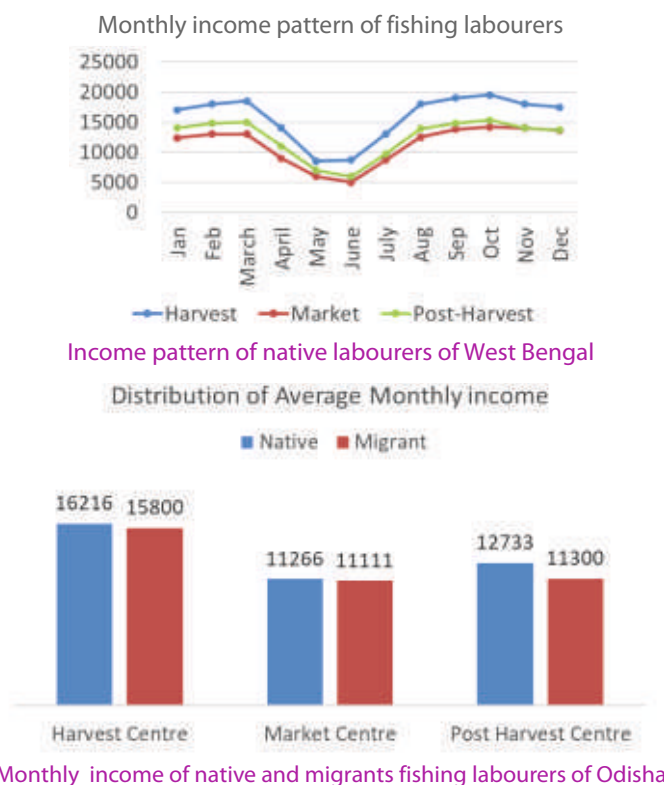
Awareness on dolphin and fish diversity conservation with special reference to Hilsa

The awareness programme emphasized the ecological, cultural, and socio-

economic importance of the Ganga River, promoting public participation in its conservation. Implemented by ICAR-CIFRI from January to September 2025 across West Bengal, Bihar, Jharkhand, and Uttar Pradesh, the programme focused on conserving the Ganges River Dolphin, Hilsa and overall fish biodiversity while promoting sustainable fisheries and livelihoods.

A total of 99 awareness initiatives were conducted along the main river and tributaries (Haldi, Mayurakshi, Rasulpur, Brahmani, Kangsabati, Ajay, and Matla), engaging 26,352 participants, including fishermen, students, farmers, and community members. Activities included community meetings, school campaigns, exhibitions, training sessions, and participation in major events such as Mahakumbh and Gangasagar Mela, with the highest engagement along the main Ganga stretch in West Bengal and Uttar Pradesh. The programme significantly enhanced public awareness, fostered community responsibility, and strengthened stakeholder involvement, contributing to the long-term conservation of the Ganga and its aquatic biodiversity.

Project title: The changing dynamics of labour migration on employment, livelihoods and resource productivity patterns in Indian marine fisheries sector



Labour mobility grid of West Bengal and Odisha

West Bengal attracts migrant labourers for fisheries from nearby states (Odisha, Jharkhand, and Bihar) and distant states (Assam, Tripura, and Andhra Pradesh), with Odisha, Bihar, and Tripura as major contributors. This highlights West Bengal as a fisheries employment hub but also indicates vulnerability to labour disruptions. Similarly, Odisha draws migrant workers from neighbouring states (Jharkhand, Chhattisgarh, WB, and Andhra Pradesh) and distant states like Assam, with West Bengal, Andhra Pradesh, and Chhattisgarh as the primary labour-sending states, reflecting cross-state dependency in fisheries livelihoods.

Intergenerational occupation

Neither native nor migrant labourers are optimistic about their children continuing in fisheries, with 39% strongly

opposing it. Overall, 68% of migrants and 52% of natives perceive low interest among youth, who prefer technology-driven, market-oriented opportunities over traditional fishing methods valued by older workers.

Income and expenditure pattern

The study shows income differences between native and migrant fisheries labourers. Natives earn ₹15,810/month in harvest, while migrants earn ₹14,918. Migrants earn less in market and post-harvest sectors (₹10,980–₹12,100) due to reliance on market jobs. Both spend ~19% on food, but migrants spend more

on shelter, reflecting higher living costs away from home.

Perceived push and pull factors of fishers migration in West Bengal and Odisha

Both groups recognize unique factors that drive their migration decisions. Native workers are motivated to migrate due to fears of declining fish stocks, low wages, and unstable work, while migrant laborers are drawn by the prospect of higher wages and skill enhancement. However, migrant workers also encounter challenges such as excessive overtime, abusive working conditions, and

restricted movement, which significantly complicate their situation.

Constraints faced by migrant and native fisheries labour

In West Bengal, the most significant issue faced by the migrant fishermen is lack of institutional support while social and health security are the least concerning problems (42.33). In Odisha, identity crises at the destination ranked the highest with 81.25. In West Bengal, the major constraints as perceived by the native labourer are lack of credit facility (79), followed by indebtedness (77.8).

Project title: Assessment of production of fish, fish disease and feasibility study of certification for fish produced in East Kolkata Wetland

Subproject 1: Multiple value assessment of agriculture (paddy), horticulture, medicinal plants, floriculture and uses

Subproject 2 : Culture of indigenous fish species

Subproject 3 : Assessment of invasive fish species with special emphasis on *Pterygoplichthys* spp. for control/eradication in East Kolkata Wetland

All the *bheries* of East Kolkata Wetlands (totalling 308) were surveyed and documented in the GIS database. A significant increase in the area dedicated to the fisheries sector has been observed, rising steadily from 4,442 hectares (ha) in 2000 to 5,212 in 2012, and reaching 6,100 ha in 2024. The data revealed variations in fish yields, ranging from 1,829 to 2,095 kg/ha annually, leading to a total annual production of 8,931 to 10,242 metric tonnes. Tilapia accounted for the largest proportion of the catch (30–35%), followed by Indian Major Carps (IMC) and bata (*Labeo bata*).

Diseased fishes revealed the prevalence of pathogenic bacteria (*Aeromonas* sp., *Vibrio* sp., *Proteus* sp., *Klebsiella* sp., *Providencia vermicola*, *Kurthia gibsonii*, *Alcaligenes faecalis*, *Pseudomonas stutzeri*, etc.). Additionally, the presence of viruses (TiLV and TiPV) and parasites (*Argulus japonicus* and *Gyrodactylus kobayashi*) were also documented. Fish flesh metal contents were found to be within the



Fish harvest in the EKW



Awareness program at Chaker bheri

permissible limits, suggesting human consumption of fish from EKW is safe. Heavy metals were found to get

accumulated in the sediment over time, proportional to the intake of wastewater. The invasive species *Pterygoplichthys* sp.,



locally known as the crocodile fish, was recorded to be present in 171 out of 308 *bheries*. Molecular-level identification of collected specimens revealed a strong genetic match in the NCBI database, confirming the species as *Pterygoplichthys pardalis* (Accession No.

PV012483) and *P. disjunctivus*. This invasive fish was found to contribute approximately 3.39–4.18% of the total fish production in the infested *bheries*. Three awareness programs were conducted across different sites of the East Kolkata Wetlands on 26 October

2025 at Jhagrasisha Bheri, 27 October 2025 at Chaker Bheri, and 29 October 2025 at Tardah, each involving nearly one hundred fish farmers predominantly from underprivileged households dependent on wastewater-fed aquaculture for their livelihoods.

Project title: Nutritional profiling of fishes of Sessa river, Dibrugarh, Assam and sensitization on health benefit of fish consumption (CSR Project)

Proximate composition

The study of 38 different fish species revealed considerable variability in moisture, crude protein, crude fat, and ash contents, reflecting diverse nutritional profiles of these species. Moisture content across the species ranged from a minimum of 67.45% in *Botio dario* to a maximum of 81.31% in *Labeo catla*. Most species exhibited moisture levels between 72% and 79%, which is typical for freshwater fishes. On the other hand, species such as *B. dario* (67.45%) and *Salmotoma phulo* (72.54%), which have lower moisture, exhibit higher fat levels, indicating a possible inverse relationship between moisture and lipid content. Crude protein content varied across species, ranging from 14.75% in *Heteropneustes fossilis* to 20.51% in *Monopterusuchia*. Several species such as *Rasbora daniconius* (6.87%), *S. phulo* (6.99%), and

Lepidocephalichthys guntea (6.37%) exhibited higher lipid concentrations. Such species can be considered as rich sources of fish oil and beneficial fatty acids like omega-3, contributing significantly to dietary fat intake. Ash content, which represents the total minerals, ranged from 0.64% in *L. rohita* to 6.50% in *Amblypharyngodon mola*. Species such as *Osteobrama cotio* (5.99%), *Puntius sophore* (5.52%), *Chanda nama* (4.82%), and *Cirrhinus reba* (3.74%) showed notably higher ash levels, indicating a richer mineral profile. These species, particularly the small indigenous ones often consumed whole (including bones), are likely to contribute significantly to the intake of essential minerals like calcium, phosphorus, and iron.

Mineral composition

Study of mineral concentrations in 29

freshwater fish species revealed significant interspecific variations in elemental composition. Among the essential trace elements, iron (Fe) was found in the highest concentrations across all species, with values ranging from 24.448 mg/kg in *Sperata aor* to 276.935 mg/kg in *Trichogaster fasciata*, indicating that Fe is abundantly accumulated in fish tissues. Manganese (Mn) levels varied widely, with the highest concentration detected in *T. fasciata* (50.533 mg/kg) and *O. cotio* (48.351 mg/kg), while the lowest was in *S. aor* (1.245 mg/kg) and *Ompok pabda* (1.880 mg/kg). Similarly, chromium (Cr) concentrations ranged from 0.049 mg/kg in *Channa gachua* to 0.613 mg/kg in *T. fasciata*, suggesting that the latter is a significant accumulator of both Cr and Mn.

Amino acid composition

The amino acid composition of 29 freshwater fish species, expressed in (grams/100 grams) of fish tissue, revealed significant interspecific variations in both essential and non-essential amino acids. Among the essential amino acids, leucine (LEU) emerged as the most dominant, ranging from 0.275 g/100g in *L. gonius* to as high as 0.822 g/100g in *M. pancalus*. Phenylalanine (PHE) content ranged from 0.165 g/100g to 0.568 g/100g, with maximum concentrations in *O. pabo* (0.568 g/100g), *N. nandus* (0.529 g/100g), and *S. aor* (0.512 g/100g), reflecting their potential as rich sources of this aromatic amino acid. Valine (VAL) and Isoleucine (ILE) were also found in appreciable quantities, particularly in *M. dibrugarensis* (0.366 g/100g VAL and 0.594 g/100g ILE), *M. pancalus* (0.219 g/100g VAL and 0.822 g/100g ILE), and *T. fasciatus* (0.412 g/100g VAL and 0.579 g/100g ILE).

Fatty acid composition

The analysis of fatty acid composition

Table. Gross chemical composition (in %) of selected indigenous fishes from Sessa river

Fish species	Moisture	Crude protein	Crude fat	Ash
<i>Labeo rohita</i>	81.18±0.54	18.25±0.23	1.67±0.03	0.64±0.03
<i>Wallago attu</i>	80.01±0.29	18.49±0.56	0.64±0.01	1.32±0.12
<i>Labeo gonius</i>	79.40±0.41	17.30±0.48	2.99±0.09	1.14±0.09
<i>Puntius sophore</i>	74.36±0.41	17.35±0.36	3.76±0.29	5.52±0.23
<i>Osteobrama cotio</i>	75.60±0.39	18.04±0.39	2.34±0.68	5.99±0.24
<i>Mystus cavasius</i>	74.58±1.62	18.47±0.24	4.50±0.75	2.80±0.16
<i>Chanda nama</i>	75.68±0.50	17.38±0.18	3.69±0.41	4.82±0.29
<i>Rasbora daniconius</i>	72.05±0.40	17.89±0.29	6.87±0.78	3.78±0.45
<i>Labeo calbasu</i>	76.89±0.36	17.89±0.47	4.18±0.36	1.91±0.67
<i>Cirrhinus mrigala</i>	78.24±0.17	18.78±0.17	2.47±0.34	1.50±0.33



Workshop on 'Nutritional and health benefits of fish consumption'

across multiple freshwater fish species revealed considerable inter-species variations in the levels of saturated fatty acids (SFAs), monounsaturated fatty acids (MUFAs), and polyunsaturated fatty acids (PUFAs). Among the SFAs, myristic acid (C14:0) and palmitic acid (C16:0) were found to be the most prevalent in the majority of species. Notably, *B. dario* exhibited exceptionally high levels of C14:0 (99.99%) and C16:0 (37.49%), suggesting a very high saturated fat content. Other species such as *Monopterus albus*, *S. phulo*, and *Mastacembelus armatus* also showed moderate to high levels of these SFAs. In terms of MUFAs, oleic acid (C18:1) was consistently the most abundant, with significantly high concentrations observed in *B. dario* (87.35%), *O. pabo* (18.39%), and *M. albus* (16.53%). In contrast, species such as *Channa striata*, *Cirrhinus mrigala*, and *L. rohita* exhibited

relatively low MUFA content, indicative of leaner fat profiles. The analysis of PUFA content, which includes essential fatty acids like omega-3 and omega-6, showed remarkable richness in several species. Linolenic acid (C18:3) and linoleic acid (C18:2) were predominant in most species, with *B. dario* again standing out for its extremely high concentrations of C18:2 (118.27%) and C18:3 (138.41%). Docosahexaenoic acid (DHA; C22:6) and Eicosapentaenoic acid (EPA; C20:5), both crucial for human neurological and cardiovascular health, were notably high in species such as *B. dario* (DHA: 88.43%, EPA: 36.21%), *S. phulo* (DHA: 58.75%, EPA: 15.03%), *M. albus* (DHA: 21.85%, EPA: 4.71%), and *S. aor* (DHA: 28.48%).

Workshop on 'Nutritional and health benefits of fish consumption'

ICAR-CIFRI in collaboration with Brahmaputra Crackers and Polymers Limited (BCPL), Lepetkata, Dibrugarh, conducted a sensitization workshop on 'Nutritional and health benefits of fish consumption' on 18th October, 2025 to bring about awareness on benefits of fish consumption in terms of human health and nutrition at Dibrugarh, Assam. A total of 70 villagers residing in villages situated along the banks of the Sessa River in Dibrugarh participated in the workshop. Dr. B. K. Das, Director, ICAR-CIFRI, Barrackpore; Dr. B. K. Bhattacharjya, Principal Scientist, ICAR-CIFRI Regional Centre, Guwahati; Dr. Chandan Boruah, Nodal Officer, CSR Cell, BCPL, Dibrugarh and Mr. Dildar Neogi, Chief Manager, BCPL were among the dignitaries present in the workshop.

Project title: Benchmarking microplastic pollution in the river Ganga and Brahmaputra in relation to native edible fish fauna

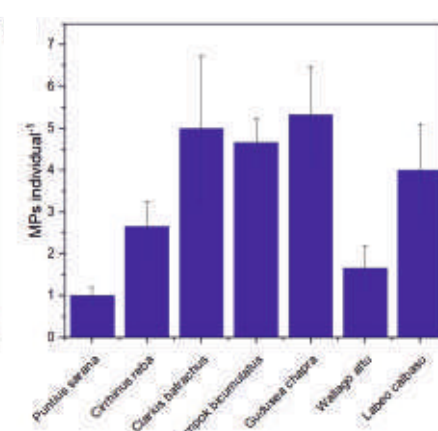
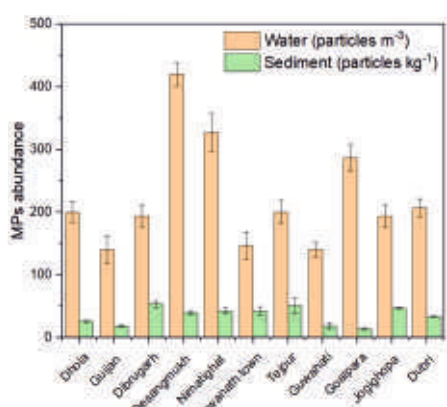
A study was conducted along the Brahmaputra River, covering 11 selected sites including Dhola, Guijan, Dibrugarh, Desangmukh, Nimatighat, Biswanath Town, Tezpur, Guwahati, Goalpara, Jogighopa, and Dubri. Sites were chosen based on their geographical location, anthropogenic activities and potential sources of microplastic pollution. The abundance of microplastics in water and sediments across the selected sites in the Brahmaputra River varied significantly. The number of microplastics in water samples ranged from 140.00 to 420.00 particles/m³, while in sediment samples it ranged from 13.63 to 53.33 particles/kg. The highest number of microplastic in water was recorded at Desangmukh (420.00 ± 9.09 particles/m³) and lowest at Guwahati (140.00 ± 1.14 particles/m³). The sediment samples demonstrated a relatively higher concentration of microplastics compared to water. The highest abundance of microplastics at Dibrugarh (53.33 ± 0.96 particles/kg), and the lowest was recorded at Goalpara (13.63 ± 0.52 particles/kg).

The number of microplastic in the Brahmaputra River's native fish species varied by species. *Gudusia chapra* had the highest microplastic level (5.33 ± 1.15 microplastics / individual), followed by *Ompok bimaculatus* (4.66 ± 0.58

microplastics / individual), and *Clarias magur* (5.00 ± 1.73 microplastics / individual). At all sampling locations, the number of microplastic in sediment was greater than that in water, with the maximum microplastic contamination in sediment found in Dibrugarh.

The results indicate potential sources of microplastics pollution, influenced by urbanization, industrial activities, and hydrodynamic conditions. Microplastics concentrations in water and sediment were consistently high in Desangmukh and Nimatighat, indicating significant Microplastics input in these regions. The possibility of microplastic

bioaccumulation in aquatic creatures, which may have ecological and health consequences, is highlighted by the discovery of microplastics in fish species. The species that consumed the most microplastics, including *G. chapra*, *C. magur*, and *O. bimaculatus*, demonstrated their vulnerability to Microplastics contamination. The effect of microplastic on fish physiology and any hazards to human consumption need to be investigated further. The Brahmaputra River system's microplastic pollution urgently requires monitoring and mitigating measures, as these studies demonstrate.



Load of microplastics in water, sediment and fish



Project title: Nutraceutical solutions for sustainable aquaculture: Extraction and utilization on tasar pupae oil and meal in feed formulation

Antimicrobial activity of silkworm pupae oils

Crude oils from *Antheraea mylitta* and *Bombyx mori* showed limited antifungal effects against *Aphanomyces invadans* and *Saprolegnia parasitica* in vitro. However, purified *B. mori* oil effectively inhibited both the fungi.

Against bacteria, crude oils from both the species failed to control *Aeromonas hydrophila*, *Staphylococcus aureus*, *Escherichia coli*, and *Klebsiella pneumoniae*. Purified *B. mori* oil worked against *Pseudomonas aeruginosa*, *E. coli*, and *Aeromonas veronii*, but purified *A. mylitta* oil was ineffective against Gram-

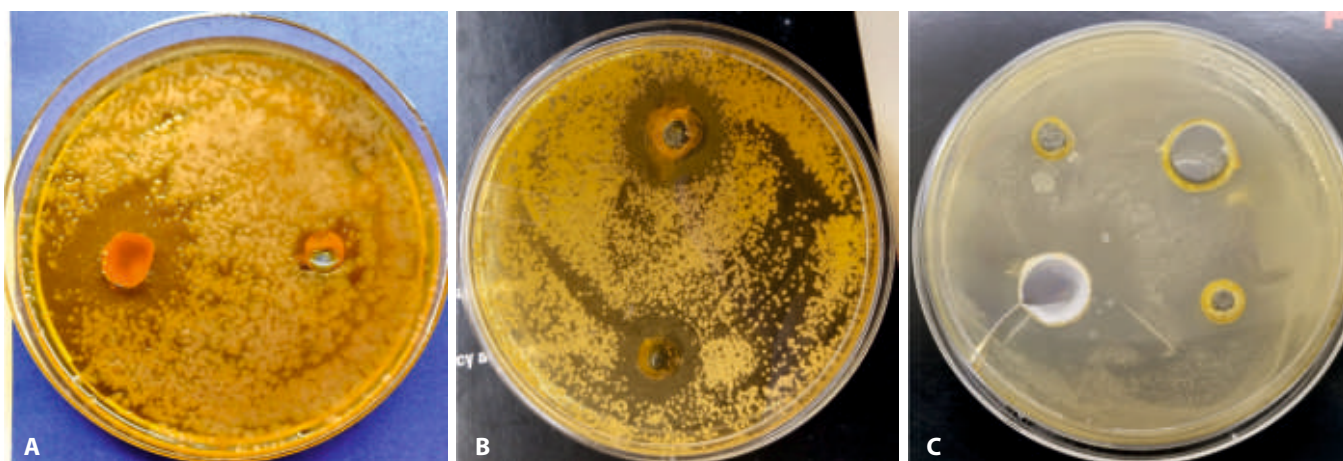
negative bacteria like *E. coli*, *P. aeruginosa*, *Edwardsiella ictaluri*, *A. hydrophila*, and *A. veronii*.

Fatty acid profiling and nutraceutical value of pupae oils

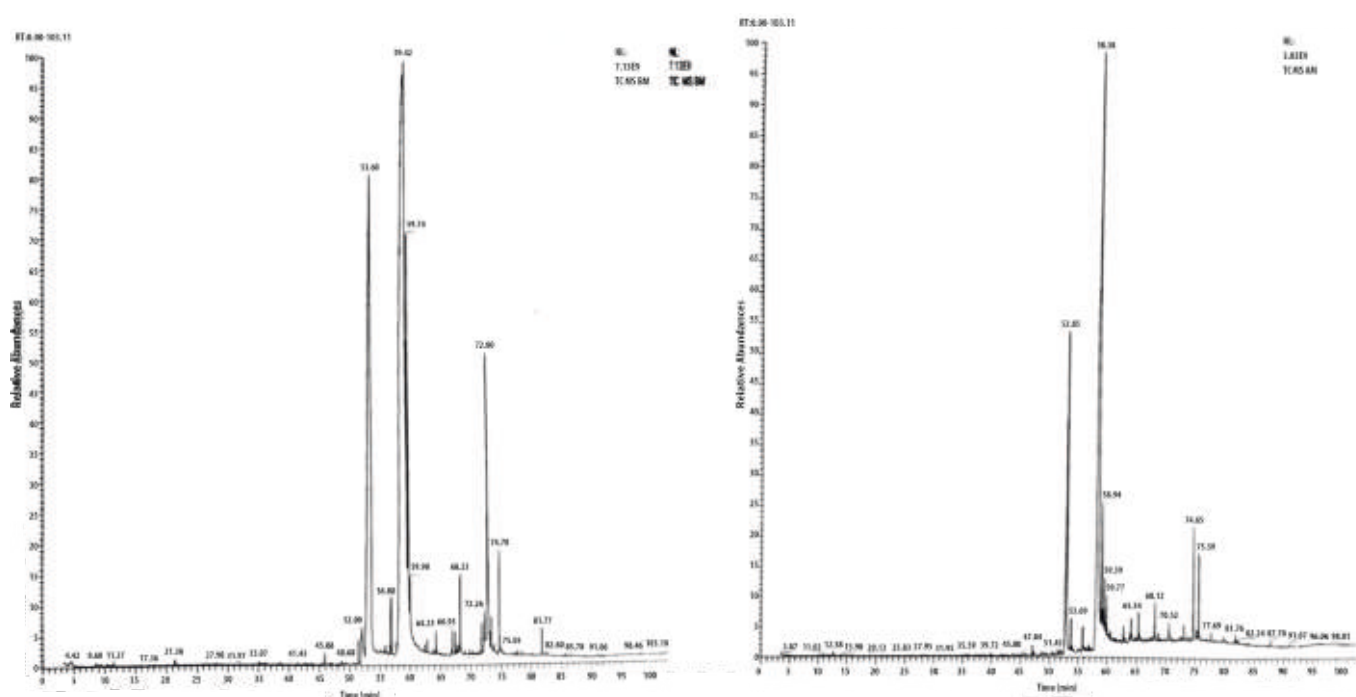
A. mylitta crude oil had higher palmitic acid (C16:0) and oleic acid (C18:1), elevated atherogenic, thrombogenic, and $\Delta 9$ -desaturase C18 indices compared to *B. mori*. Conversely, *A. mylitta* scored lower on desirable fatty acids, nutritional value, health-promoting index, $\Delta 9$ -desaturase C16, and elongase factors. *A. mylitta* crude oil excelled in ABTS and FRAP assays but lagged in DPPH compared to *B. mori*.

GC-MS chemical profile of pupae oils

- A. mylitta* purified oil: Cis-vaccenic acid (C18H34O2) > Hexadecanoic acid (C16H30O2) > Octadecanoic acid (C18H36O2) > Erucylamide (C22H43NO) > Squalene.
- B. mori* purified oil: Oleic acid (C18H34O2) > n-Hexadecanoic acid (C16H32O2) > Octadecanoic acid (C18H36O2) > Glycerol monooleate (C21H44O4) > Erucylamide (C22H43NO) > Linolenic acid (C18H36O2) > Oleic acid (C19H36O2).



Inhibition of *A. invadans* (A), *S. parasitica* (B) and *P. aeruginosa* (C) by purified silkworm pupae oil



GC-MS analysis of purified oils of *A. mylitta* (left) and *B. mori* (right) silkworm pupae

Project title: A pilot project for developing drone technology for live fish transport and pan-India level demonstration

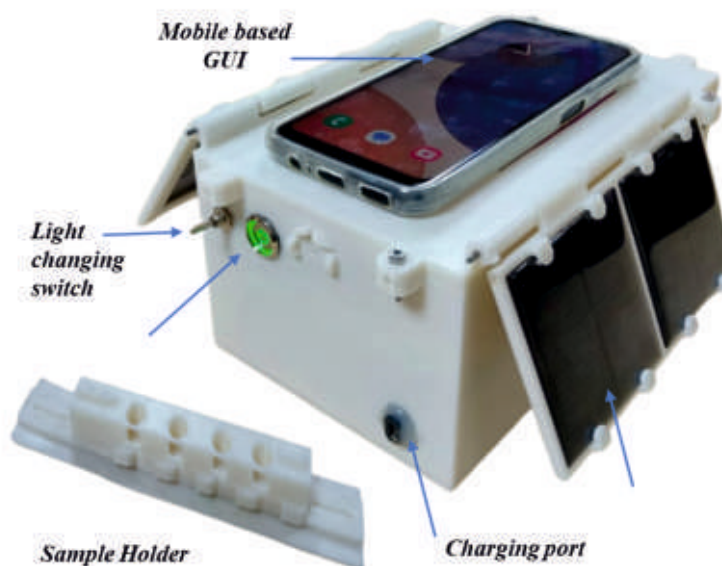
The project aims to design and develop an efficient drone system which would be able to carry upto 100 kg live fish and deliver it to the selected fish market or assembly hub. The drone would cover the flying distance of 10 km in a single flying and can attain further distance with the options of midway halt stations for necessary battery changes. However, various essential parameters like battery power, handling adverse situation, UAV flying rules and regulations in different areas, safety issues are required to be considered before planning a drone-based fish transportation schedule. After thorough research, the heavy payload transport drone has been designed and developed in collaboration with Marut Drone Pvt. Ltd., Hyderabad with configurations as type: quadcopter; payload capacity: 70kg; flying distance range: 5 km; battery backup: 17-20 minutes. The technology has been tested and validated in field condition at Minakhan, Sundarban, West Bengal. Two demonstration programs were organized at Minakhan and Kultali of Sundarban area to showcase the potential of the fish transport drone among the farming community.



Field level demonstration of fish transport drone

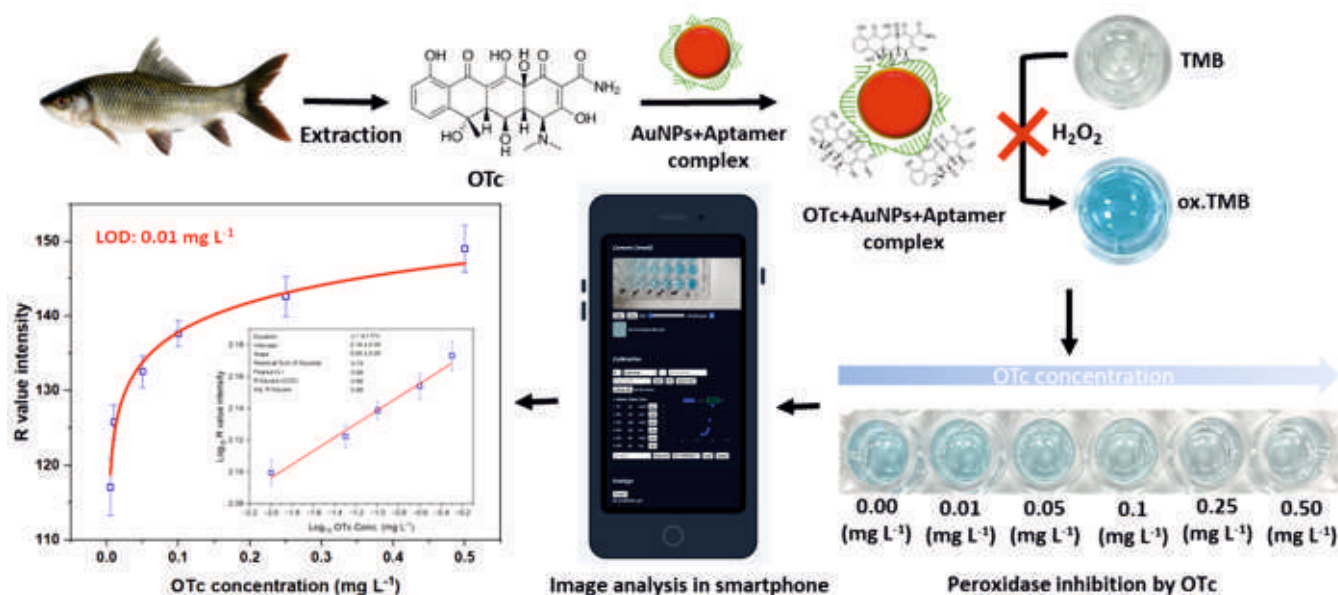
Project title: Point of care nano-biosensors for antibiotic residue detection in fish
Smartphone integrated colorimetric aptasensor for detection of oxytetracycline in water and fish

A smartphone-assisted detection strategy was developed for oxytetracycline (OTC) residue in fish muscle, utilizing an OTC-specific aptamer and the nanozyme activity of gold nanoparticles (AuNPs). The aptamer-functionalized AuNPs (Apt-AuNPs) catalyzed the oxidation of TMB via peroxidase-like activity, yielding a blue-colored oxidized TMB species. However, OTC inhibits peroxidase activity of Apt-AuNPs and blue color formation in a dose-dependent manner, enabling detection of OTC using image analysis based on RGB data. The sensor preferentially responded to OTC, with only marginal interference arising from non-target antibiotics. With a detection range of 0.01–0.5 mg/L, the method achieved a limit of detection of 0.011 mg/L, which is significantly lower than the maximum permissible residue



Prototype of hand-held nano-biosensing device





Working mechanism of oxytetracycline detection using smartphone

level (0.10 mg/kg) defined by EU and FSSAI guidelines. The smartphone-based aptasensing technique showed great potential for fast and sensitive detection of OTC in food fish samples.

Working prototype of hand-held nano-biosensing device

A handheld colorimetric image analysis-based prototype aimed at reliable, and quantitative colorimetric sensing of field level was developed and validated. The prototype integrates optical, electronic, mechanical, and computational components within a

single 3D-printed enclosure and operates on image-based colorimetric signal transduction, thereby eliminating subjective visual interpretation. The device is built around a Raspberry Pi single-board computing module with a fixed-position camera and a 1-watt white LED illumination system. Critical optical parameters were optimized, including light intensity (900 lumen) and camera-to-well distance (11 cm), to ensure uniform illumination and high reproducibility. The system supports dual power operation through a 20,000 mAh power bank and integrated solar panels,

enhancing field applicability and operational robustness. A mobile phone-based graphical user interface enables user-friendly operation, while data are stored locally on a micro SD card. A custom-designed four-well sample holder (330 μL per well) allows parallel sample analysis, reducing processing time and improving throughput. The prototype was validated using the TMB oxidation colorimetric system as a model reaction. Image acquisition under both power bank and solar-powered modes showed comparable illumination stability and color consistency.

Project title: ICAR-WorldFish collaborative research project (Window -3): Small scale fisheries in wetlands for livelihood and nutritional security



Fish seed at the time of stocking and harvest

Pen culture for production enhancement and conservation of high value SIF *Mystus tengara*

Mystus tengara, a commercially important catfish, locally called "Bujuri tengra", is a popular, high-value small indigenous fish species. The fish was stocked in HDPE pen units (0.1 ha) at Chamta Wetland, North 24 Parganas, West Bengal, in April 2025. The fish seeds (average TL: 5.83 cm; TW: 7.27 g) were stocked at a density of 6 nos./ m^2 , amounting to a total biomass of 26.15 kg per pen. After 75 days of culture, *M. tengara* attained a marketable size of approximately 22.10 g. A total harvest of 51-53 kg was obtained from each of the pen systems, while the remaining stock was released into the open wetland to support natural recruitment and

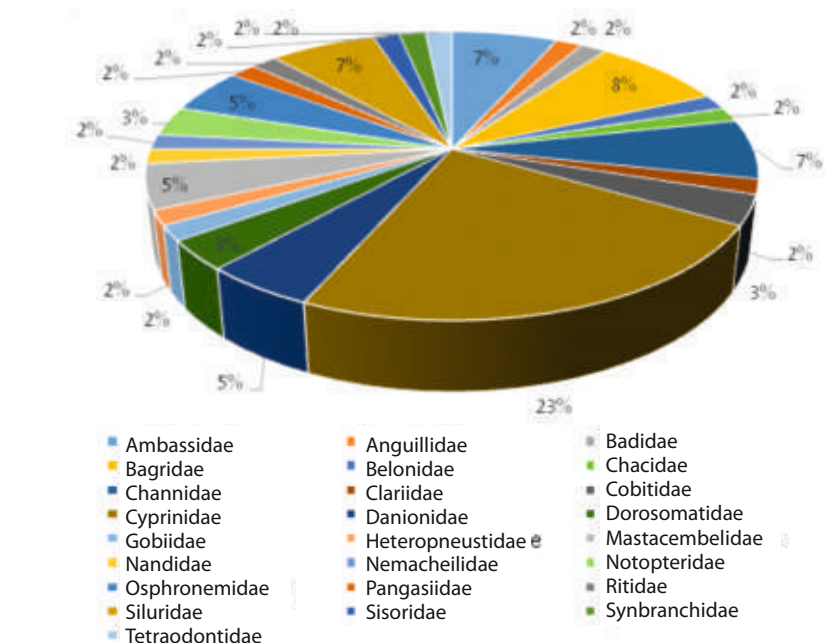
conservation of the species. The harvested fish fetched a market price of INR 1000–1200 per kg, offering significant economic returns (initially Rs. 57200 per pen) to the fishers. The pen-based culture of *M. tengara* demonstrates its potential as a high-value species for wetland-based aquaculture interventions towards both livelihood enhancement and biodiversity conservation, particularly in ecologically sensitive and isolated wetland systems.

Assessment of fish diversity of Tamranga beel, Assam

A total of 60 fish species belonging to 25 families were recorded from Tamranga beel, reflecting its rich ichthyofaunal diversity. Among the recorded families, Cyprinidae was the most dominant group, contributing 23.33% of the total fish species indicating that the beel supports favorable environmental conditions for a variety of carps and minnows, which are generally adapted to both lentic and lotic habitats and play an important role in maintaining trophic balance. The overall diversity not only supports the ecological stability of the wetland but also contributes significantly to the livelihood and nutritional security of local fishing communities. Hence, proper management and conservation of this wetland are essential to sustain its rich fish diversity and ecological productivity.

Pen culture demonstration of *Systomus sarana* in Tamranga beel

ICAR-CIFRI successfully carried out pen culture demonstration of *Systomus sarana* (Olive barb) in CIFRI HDPE pens in Tamranga beel. The growth performance was found to be encouraging. Stocked fish grew from 4.11 ± 1.37 g to 33.73 ± 2.42 g after 3 months of culture. A Field Day on "Harvest of fishes reared in Pens" was



Family-wise fish diversity from Tamranga Beel, Bongaigaon, Assam



Fish catch from Tamranga beel, Assam

organized on 14th October, 2025 at the beel site.

Awareness programme, input distribution programme and meeting with stakeholders

An awareness program on 'Pen culture in beels for livelihood' was organized on 14

October 2025 at Tamranga Beel. The programme was attended by 60 participants, including the beel lessee, fish farmers, officials of the Department of Fisheries, Assam, and a team of scientists from ICAR-CIFRI.



Fish harvest from the pen at Tamranga beel



Awareness programme at Tamranga Beel, Assam



Project title: Assessment of green house gas emission and scoping study for cultivation of indigenous high value fishes in East Kolkata Wetlands

Greenhouse gas (GHG) emissions linked to wastewater-based aquaculture

Greenhouse gases (GHG) - methane (CH_4), carbon dioxide (CO_2), and nitrous oxide (N_2O)—were quantified in five sewage-fed aquaculture systems (bheries) of the East Kolkata Wetlands (EKW) to compare emissions with other land-use systems such as agricultural fields and conventional aquaculture ponds. Sampling was conducted at the inlet (S1), midpoint (S2), outlet (S3), sewage feeding channel (SEW), and an upland reference site (REF) to capture spatial variability.

Spatial analysis showed marked variation in CH_4 and CO_2 fluxes, while N_2O remained relatively uniform. CH_4 exhibited the highest variability and magnitude. The sewage channel recorded exceptionally high CH_4 fluxes (mean $-1174.89 \pm 1616.03 \text{ mg CH}_4\text{-C/m}^2\text{/day}$), far exceeding other sites. Within bheries, CH_4 decreased progressively from inlet to outlet, declining from $393.63 \pm 375.20 \text{ mg CH}_4\text{-C/m}^2\text{/day}$ (S1) to $15.51 \pm 20.87 \text{ mg CH}_4\text{-C/m}^2\text{/day}$ (S3), indicating attenuation

during water movement. The upland reference site showed negligible CH_4 emissions. CO_2 followed a similar trend, with highest emissions in the sewage channel ($553.59 \pm 437.68 \text{ mg CO}_2\text{-C/m}^2\text{/day}$) and moderate, decreasing fluxes from inlet to outlet within bheries. N_2O emissions were consistently low ($0.011\text{--}0.249 \text{ mg N}_2\text{O-N/m}^2\text{/day}$) with minimal spatial variation, indicating a minor contribution to overall GHG emissions. Overall, sewage inputs strongly drive GHG fluxes, while sewage-fed aquaculture systems demonstrate mitigation potential through spatial attenuation of CH_4 and CO_2 .

Scoping study for cultivation of indigenous high value fishes in EKW

A scoping study was conducted in the East Kolkata Wetlands to evaluate the feasibility of promoting high-value indigenous fish species in sewage-fed aquaculture, focusing on ecological suitability, farmers perceptions, and sustainability. The study covered 92 bheries across six locations using questionnaire surveys, field observations,

and profiling of indigenous species, habitat requirements, and culture practices. Polyculture of Indian major carps, exotic carps, and tilapia dominates EKW; however, natural catches confirmed the presence of air-breathing indigenous fishes such as *Clarias magur*, *Heteropneustes fossilis*, *Channa* spp., and *Anabas testudineus*, indicating ecological suitability. Indigenous fish culture was practiced in 28 bheries, with *C. magur* and *H. fossilis* as preferred fish due to high market demand. Key challenges included flood-related escapes, poor-quality seed, hybrid magur prevalence, high input costs, and fluctuating sewage supply. Eutrophic water and sediment conditions driven by high nutrient loads highlight the need for improved nutrient management. Farmers showed positive perceptions, though financial and technical constraints persist. Overall, indigenous fish culture holds strong potential, provided genetic conservation, quality seed supply, capacity building, and integrated management are strengthened.

Project title: Scaling up cage culture of high-value butter catfish (*Ompok bimaculatus*): A sustainable approach to profitability



Stocking of fish in Maithon reservoir, Jharkhand

The present investigation was undertaken to enhance the profitability and sustainability of inland cage aquaculture by culturing high-value indigenous fish species. During the preparatory phase, four reservoirs, viz., Hirakud in Odisha, Dumbur in Tripura, Maithon in Jharkhand, and Mapithel in Manipur, were assessed for their feasibility for cage culture operations. The project plan was thoroughly reviewed with the concerned State Fisheries Departments, and selection of culture sites was finalized based on field observations and stakeholder interactions. Beneficiaries were selected through consultation with state departments to ensure effective implementation and local engagement. Cage culture initiatives were initiated in Dumbur Reservoir (Tripura), Maithon Reservoir (Jharkhand), and Mapithel Reservoir (Manipur) based on these assessments.

In Dumbur Reservoir, cage culture operations were initiated during June–August 2025 with the stocking of 72,000 fish in 12 HDPE cages of size 6 m × 4 m × 3.5 m, maintaining a stocking density of 60 fish/m³. The fish were fed floating pelleted feed containing 32% crude protein and 5% crude lipid at a rate of 5% of biomass per day, offered in two equal rations. The activity is being managed by the Fishermen Cooperative Society (FCS), and the project is currently ongoing. The present average body weight of fish ranges from 37.0 ± 1.04 g to 56.3 ± 4.56 g, indicating satisfactory growth.

In Maithon Reservoir, 72,000 fish seed were stocked during June–July 2025 in 12 GI cages measuring 5 m × 5 m × 3.5 m, with a stocking density of 60 fish/m³. Cage culture activities at this site are ongoing, and the present average weight of fish ranges from 19.05 ± 2.56 g to 43.12 ± 3.87 g, reflecting progressive growth under prevailing reservoir conditions.

Cage culture operations were initiated at Mapithel Reservoir on 13 August 2025. Six GI cages of size 5 m × 5 m × 3.5 m were stocked at a density of 60 fish m³ using seed with an initial average weight of 0.74 ± 0.12 g. The activity is being implemented through a co-management approach involving the Fishermen Cooperative Society. The project is ongoing, and the present average size of the stocked fish has reached 18.99 ± 4.04 g, demonstrating encouraging early growth.

In addition to culture activities, an awareness programme on species diversification for profitable cage farming was conducted at Mapithel Reservoir to sensitize fishers and other stakeholders on the potential of indigenous species-based cage culture and sustainable reservoir aquaculture practices.



Stocking of fish into Mapithel reservoir, Manipur



Awareness program at Mapithel reservoir, Manipur

Project title: Leveraging auto-recruiting indigenous species for sustainable enhancement and conservation of wetland fisheries

The study intended to demonstrate seed raising of small indigenous fishes (SIF) in wetland enclosures and to assess the possibility for auto-breeding of SIFs for conservation and restoration of fish diversity in wetlands.

The demonstration was initiated in two wetlands each in Assam (Mer and

Potakolong in Nagaon District), West Bengal (Sindrani and Chamardaha in North 24 Parganas District) and Bihar (Brahmapura and Manika in Muzzafarpur District). In all the selected wetlands, CIFRI HPDE Pens were installed. In West Bengal, *Systemus sarana* stocked in the pen installed in the wetlands attained an average size of 25 g after three months. In

Bihar *S. sarana* attained an average weight of 14 g after one month culture period. The species also showed healthy growth trends in the wetlands of Assam. The demonstration was carried out in a community participation mode with the fishing community involved in the respective wetlands.





Stocking of fishes in enclosure culture system

Water and sediment parameters along with fish and plankton diversity assessment were also undertaken. It was found that the most abundant SIF was *Amblypharyngodon mola*, followed by *Chanda nama* and *Puntius sophore*, in the wetlands of West Bengal. The plankton diversity was also assessed, indicating high prevalence of *Microcystis* sp. highlighting anthropogenic stress in the Brahmapura Maun. Most of the water quality parameters were within the optimum range for fish production. Dissolved oxygen ranged from 5.78 to 6.58 mg/l, pH ranged from 7.64 to 8.81 and total alkalinity ranged from 77 to 285 mg/l in the selected wetlands.

Project title: Conservation and restoration of gangetic Indian Major Carps and other indigenous fishes through breeding and ranching at Farakka, West Bengal



Brooder collection from identified habitats of the Ganga River

A detailed survey of upstream and downstream stretches of the Ganga River identified key habitats supporting Indian Major Carp (IMC) brooders at Taltola, Rajnagar, and Pagla Ghats near Farakka. Brooders of *Labeo rohita*, *Labeo catla*, *Labeo calbasu*, and *Systomus sarana* were collected and maintained in broodstock ponds and cages. Average weights ranged from 0.4 to 2.5 kg, with species-specific length variations. After acclimatization, healthy brooders were utilized for controlled breeding in a portable FRP hatchery, followed by seed rearing in NTPC ponds for three months. During this period, 50 awareness programmes on artificial breeding, seed rearing, and conservation engaged 752 fishermen in the Farakka region. Subsequently, about 100,000 IMC fingerlings were ranched upstream of Farakka Barrage to enhance natural recruitment and strengthen native carp populations in the river ecosystem.



Breeding of Indian major carps in a portable FRP hatchery tank

Project title: Backyard pond aquaculture through model village development for sustainable development

Under the SBI-Corporate Social Responsibility (SBI-CSR) initiative, ICAR-CIFRI, in collaboration with Kultali Milan Tirtha Society (KMTS), has implemented the project "Backyard pond aquaculture through model village development for sustainable development". In continuation of ICAR-CIFRI's long-

standing engagement in the Sundarbans, "model village development through backyard pond aquaculture" was implemented to demonstrate the field-level application and impact of CIFRI-developed aquaculture technologies at the household scale. The project also aimed at operationalizing proven

scientific practices in selected villages and establish a replicable model for sustainable backyard pond aquaculture under the unique ecological conditions of the Sundarban region. Beyond productivity enhancement, the project has also contributed to livelihood development, nutritional security, and

capacity enhancement in rural households of Sundarbans.

Household fish consumption before and after project intervention

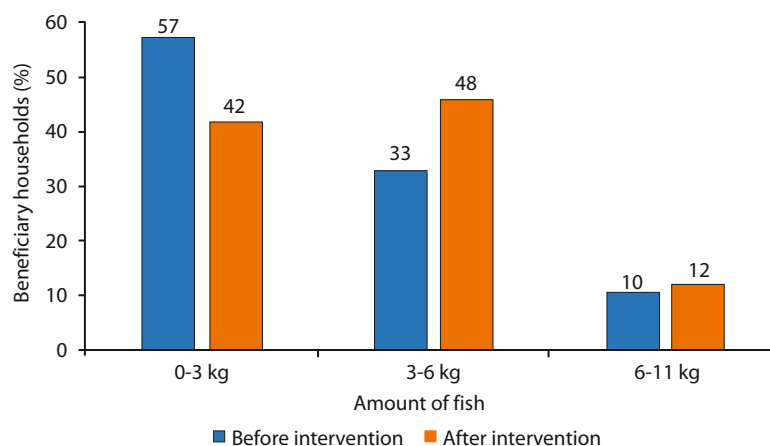
The quantity of fish consumed at the household level is an important indicator of nutritional efficacy and food security.

The quantity of fish consumed per household per week showed a remarkable improvement. Before the intervention, 57% of households consumed only 0-3 kg of fish per week, indicating relatively low intake, while 33% of households consumed 3-6 kg per week, and only 10% reported higher consumption levels of 6-11 kg per week. After the intervention, an improvement in consumption quantity was observed; households consuming 0-3 kg per week decreased to 42%. Also, households consuming 3-6 kg of fish per week increased from 33% to 46%, and those consuming 6-11 kg per week increased from 10% to 12%, reflecting improved availability and enhanced household-level fish consumption.

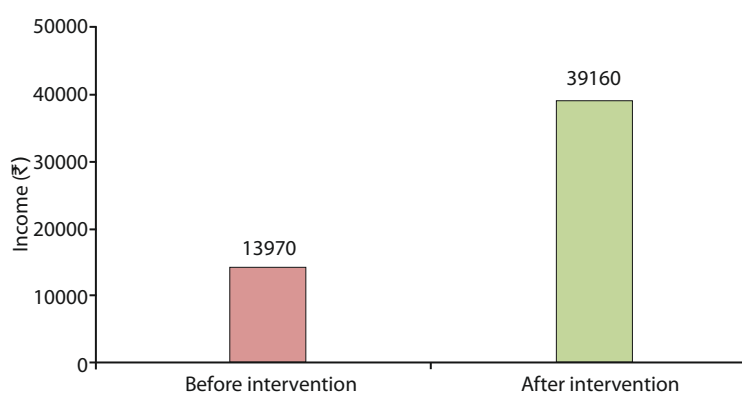
Overall, the intervention led to an increase in the quantity of fish consumption at the household level, indicating an improved availability of fish from backyard pond aquaculture and enhanced dietary intake among the beneficiary households.

Fish production

Fish production from beneficiary ponds showed higher production compared to the previous year, with the help of this project. Before the intervention, the average fish production was 428.11 ± 42.53 kg/acre, indicating low productivity and underutilized pond following the traditional culture practices. After the intervention, average fish production was increased significantly to 1240.49 ± 84.73 kg/acre, approximately 189% growth compared to the previous year's monthly production, which clearly shows the



Household fish consumption before and after the project implementation



Household income from fish culture

impact of the intervention on their pond production.

Income from fish culture

Fish culture in backyard ponds was promoted as an additional and reliable source of income for rural households, particularly small and marginal farmers. To assess the economic impact of the intervention, before and after income data from fish culture were collected from 100 beneficiaries.

The income analysis from the project area showed a remarkable growth in income from fish culture in the backyard pond. Before the intervention, the average annual income from fish culture was $₹13,970 \pm 1,166.2$, indicating a limited

contribution to household livelihoods under traditional culture. By following the adoption of improved aquaculture practices, the average annual income increased significantly to $₹ 39,160 \pm 1,615.8$, representing a 180.3% growth over the pre-intervention level. This significant enhancement in income highlighted the successful transformation of backyard pond aquaculture into a reliable and productive livelihood option, contributing directly to the objectives of Model Village Development through income diversification, efficient utilization of local water resources, and strengthened economic resilience of rural households.

Project title: Developing transboundary management strategies for Hilsa fishery in the Bay of Bengal region under changing climate

The transboundary Hilsa (*Tenualosa ilisha*) fisheries research initiative has made significant progress toward developing a coordinated scientific and management framework for India, Bangladesh, and Myanmar. Given the ecological and economic importance of Hilsa across

marine and riverine ecosystems of the Bay of Bengal region, the project emphasizes stock identification, data harmonization, biological characterization, and regional collaboration to support sustainable hilsa fisheries management. Primary data were collected in the selected fishing areas

including landing centers, fish markets and direct fishermen interaction in India, Bangladesh and Myanmar. Fisheries Performance Indicator (FPI) assessment was conducted to evaluate ecological, economic, and governance performance.





Hilsa landing center in Chandpur, Bangladesh fish market

A field assessment was conducted across six major hilsa landing centers in Bangladesh—Chandpur, Cox's Bazar (BFDC Ghat), Firingee Bazar (Chattogram), BFDC Landing Center (Pathorghata, Barguna),

Mohipur (Patuakhali), and Port Road Bazar (Barisal)—to evaluate the current stock structure and exploitation status of hilsa. Observations from Chandpur, a key breeding and spawning ground, revealed

a noticeable decline in overall hilsa production compared to previous years. The majority of the catch consisted of smaller individuals ranging from 20–30 cm, while larger fish (>50 cm) were rare, indicating reduced abundance of mature spawners. Similar trends were observed in Cox's Bazar, where medium-sized hilsa (28–35 cm) dominated landings, with evidence of sub-adult harvesting prior to full maturity.

Overall, the findings consistently demonstrate high fishing intensity, significant juvenile exploitation, shrinking average size, and reduced presence of mature spawners across major hilsa hubs. These trends suggest recruitment and growth overfishing, posing serious risks to long-term stock sustainability. Immediate management interventions, including strict enforcement of size regulations and protection of spawning and nursery grounds, are essential to ensure sustainable hilsa fisheries.

Project title: Study on the Environmental Impact Assessment of cage culture in inland open waters before bringing cage culture under consent mechanism

The project aimed to assess the impact of cage culture on the limno-chemical characteristics of water and sediment, as well as on biotic communities, and to develop recommendations for the consent mechanism under the Water Act. Studies conducted in the Surya and Bhatghar reservoirs revealed that key physico-chemical parameters remained within acceptable limits throughout the study period. Dissolved oxygen ranged from 4.60 to 7.92 mg/L in Surya Reservoir and 4.92 to 6.93 mg/L in Bhatghar

Reservoir, while biochemical oxygen demand (BOD) varied between 0.92 and 5.25 mg/L and 1.20 and 4.32 mg/L, respectively. The pH values ranged from 7.21 to 9.12 in Surya Reservoir and 7.32 to 9.06 in Bhatghar Reservoir.

Sediment organic carbon content also remained within normal limits, ranging from 0.75 to 1.85% in Surya Reservoir and 0.72 to 1.47% in Bhatghar Reservoir, indicating no significant organic

enrichment or deterioration in sediment quality attributable to cage farming. Seasonal monitoring during the pre-monsoon, monsoon, and post-monsoon periods showed no abnormal fluctuations in water or sediment quality, reflecting the environmental stability of both reservoirs. The culture of pangasius in Surya Reservoir and tilapia in Bhatghar Reservoir did not result in any measurable adverse effects on water or sediment quality.

Project title : Survey to assess district-wise utilization of water bodies for fishing and collection of variety-wise fish production/prices in the state including ornamental fish

The study was undertaken in the state of Uttar Pradesh with the primary objectives of delineating all water bodies larger than 0.2 ha, identifying wholesale and retail fish marketing centres, and developing a geospatial digital database in a GIS environment. The project also envisaged the development of catch assessment software and an analysis of the fish marketing chain. Block boundaries of 36 districts were manually delineated using

village boundary data obtained from the Survey of India and validated with District Census Handbooks.

Water bodies were delineated using Google Earth Engine by applying the Automated Water Extraction Index (AWEI) to LISS-IV and Sentinel-2 satellite imagery acquired during pre- and post-monsoon periods. Pre-monsoon water body

extraction was completed for 35 districts, while post-monsoon extraction was completed for 22 districts. Field surveys were conducted in 193 villages, covering 242 water bodies, 17 retail fish markets, two wholesale fish markets, and one ornamental fish market. Further progress of the project could not be achieved due to the non-disbursement of funds.

Project title: Assessment of environmental flows towards river habitat and ecological requirement with a focus on downstream fish species of Sardar Sarovar Dam (SSD) in Narmada River

Salient achievements:

- The seasonal habitat factors that influenced fish to complete their lifecycle like substrate type, deep pools, scar pools, riparian vegetation, water depth, water flow, river gradient, width of the wetted channel, flood plains were documented.
- Acoustic Doppler Current Profiler (ADCP) survey was conducted along the lower stretch of the Narmada River.
- Width of the river ranged from 213.7 m at Garudeshwar to 965.95 m at Bhadbhut, with notable widening at Bharuch (785.55 m) and Sakarpura (589.9 m).
- Maximum water velocity (3.03 m/s) was recorded from Bhadbhut, and the minimum water velocity (0.85 m/s) was recorded from Jhanor.
- Habitat suitability for the Mahseer and Hilsa were established.

Project title: Investigation on the fish diversity with special focus on migratory behaviour in lean season of the river Mandakini upstream of Guptkashi

Salient achievements:

- Ichthyofaunal diversity of the Mandakini River across different sites showed 4 species belonging to 3 genera in 2 families, 1 order.
- Snow trout species were reported across all the sites through experimental fishing. Snow trout and baril species prefer snow-fed rivers where suitable water quality supports their life cycle.
- 31 taxa of plankton recorded. The dominant species were *Cyclotella menlghinian*, *Aulacoseira granulata*, *Navicula radiosa*, *Nitzschia* spp., *Gomphonema acuminatum*, *Synedra ulna*.

Project title: Mapping of hilsa migratory habitat and stock identification in Myntdu river, Meghalaya in the vicinity of MLHEP stage II

Salient achievements:

- During the survey period representing all the seasons, hilsa availability and catch was zero. This shows no migration of hilsa in Myntdu river
- Fish diversity in the whole stretch of the river Myntdu, a total 7 fish species belonging to 7 genera, 4 families and 3 orders were recorded.
- The most dominating species was chocolate mahseer (*Neolissochilus hexagonolepis*). Chocolate mahseer inhabit fast flowing streams/rivers with rocky bottom and are omnivorous in nature.

Project title: Study on fish kill incidence due to chemical water discharged into Jagbudi and Vasishta River at Ratnagiri which meets Dabhol creek in Maharashtra

Salient achievements:

- A total of 27 fish species belonging to 8 families were recorded, with most species categorized as Least Concern (IUCN); Tilapia was identified as the dominant species (40.80%) in the estuarine catch, along with the identification of plankton and benthic species.
- The study revealed a drastic decline in catch per unit effort (CPUE) from 16.8 kg/boat/day (2020–21) to 2.2 kg/boat/day (2025), linking reduced fish catch to deteriorating water quality, and reduced primary productivity.
- The study documented seasonal variations in key physico-chemical parameters of Dabhol Creek, showing alkaline water conditions (pH 7.12–8.77) within CPCB Class-D criteria and identifying seasonal trends in transparency, dissolved oxygen, salinity, alkalinity, hardness, BOD, and COD.
- Concentrations of metals such as chromium, lead, manganese, cobalt, nickel, arsenic, cadmium, and copper were found to exceed permissible limits set by CPCB, WHO, UNEP, and the European Union, indicating significant pollution stress in the estuarine ecosystem.
- The study classified substrate types across sampling sites (silt-clay, loamy clay, sandy clay, and silt) and highlighted Karambawane region as a relatively uniform and potentially suitable habitat for freshwater ecosystems.



Project title: Sustainable management of inland open water fisheries of Northeastern India

Project code: NEH/24-27/04



Pen culture in Diplai beel, BTC



Growth of fish reared in pen enclosure in Diplai beel

The project aiming management of inland open water fisheries was undertaken in 4 northeast states of India, viz., Assam, Meghalaya, Tripura and Sikkim.

Prospects of fisheries enhancement in beels of BTC, Assam

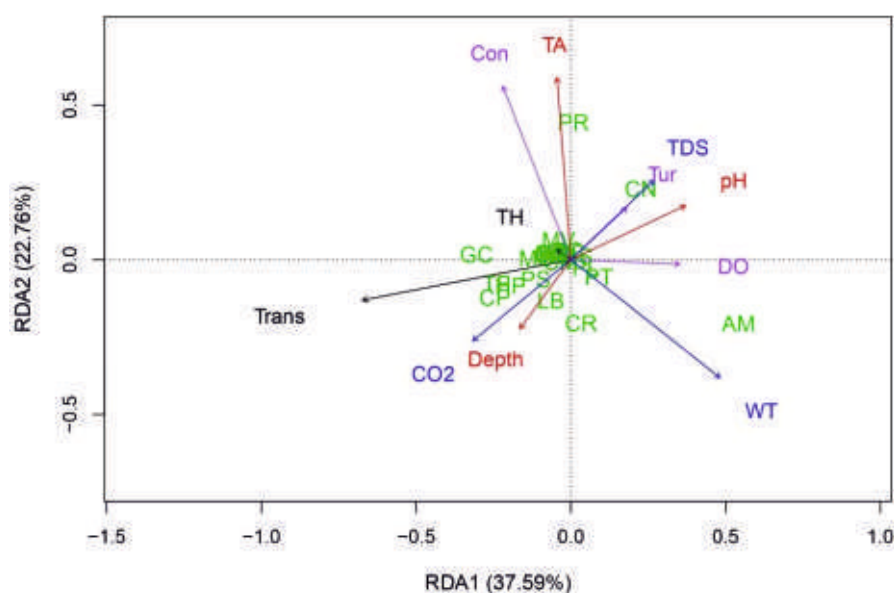
ICAR-CIFRI, in collaboration with the Department of Fisheries (DoF), Assam and Bodoland Territorial Council (BTC), Kokrajhar, surveyed fisheries potentials of four beels (Diplai, Halowadal, Tipkai, and Sareswar Beel) in BTC. Fisheries of these beels are dominated by small indigenous fishes (mainly *Puntius* spp. *Trichogaster* spp. and air-breathing fishes). Despite congenial water quality conditions (pH 7.1-8.78, DO 7.5-10.5 mg/l, alkalinity 16-30 mg/l), fisheries of these beels face multiple challenges such as siltation, macrophyte infestation, low fish production, unregulated fishing and poor fisheries management.

Pen culture of carps was undertaken on trial basis to examine its potential in these beels. After 6 months of pen culture, all the beels were found to support healthy fish growth, with Tipkai and Thulungapuri showing the highest productivity potential.

Ecology and fisheries of Deepor beel, Assam

Study of water quality parameters indicate congenial environment for fisheries development in Deepor beel. Monsoon season exhibited highest values for water depth (601.33 ± 229.97 cm), dissolved oxygen (9.78 ± 3.23 mg/l) and water temperature (33.76 ± 3.01 °C). Phytoplanktons belonging to 55 genera and 6 classes were recorded with dominance of *Chlorophyceae* (17 genera), followed by *Bacillariophyceae* (14 genera), *Cyanophyceae* (11 genera), etc. Shannon index (H') value ranged from 2.017 to 2.440 in different months. Hierarchical cluster Analysis (HCA) of seasonal phytoplankton abundance based on Bray-Curtis similarity revealed a clear seasonal segregation of phytoplankton distribution.

A total of 41 fish species were recorded in the wetland. Members of Cyprinidae (20 species) accounted for majority of species, with Bagridae (6 species),



(AM, *Amblypharyngodon mola*; CR, *Chirinus reba*; PT, *Pethia ticto*; CP, *Channa punctatus*; PR, *Parambassis ranga*; CN, *Chanda nama*; PCH, *Puntius chola*; SS, *Systemus sarana*; MV, *Mystus vittatus*; MT, *Mystus tengara*; MB, *Mystus bleekeri*; GC, *Gudusia chapra*; HF, *Heteropneustes fossilis*; PS, *Puntius Sophe*; PC, *Pethia conchonus*; TF, *Trichogaster faciat*; OCO, *Osteobrama cotio*)

RDA plot of water quality parameters of Deepor beel

Ambassidae (4 species), Channidae (4 species), Danionidae (3 species), Osphronemidae (2 species), and Notopteridae (2 species) following behind. Shannon index (H') of fish diversity varied from 2.568 to 3.166 with highest value in post-monsoon. Fish abundance was negatively correlated with water transparency, CO_2 , nitrite and phosphate concentrations, but showed positive correlations with pH, total dissolved solids, and total alkalinity. Redundancy analysis (RDA) was performed to assess the relationships between fish species composition and environmental variables. The first RDA axis (RDA1) explained 34.79% of the total variance and was majorly influenced by TDS, pH, and transparency. Transparency showed a strong negative association with species distribution along RDA1, whereas TDS and pH were positively associated with *A. mola* and *C. nama*. The second axis (RDA2), accounting for 25.88% of variance, was driven by specific conductivity, total alkalinity, and turbidity, and *P. ranga* and *C. nama* showed positive relationships with these variables.

A new fish species discovered

During a fish fauna survey of the Brahmaputra River at Maijan village near Dibrugarh, a new cyprinid fish species, *Pethia dibrugarhensis*, was described based on several distinctive comparisons with its congeners. The specimen has been deposited in the National Fish Museum and Repository of ICAR—NBFG, Lucknow (holotype and paratype) and Manipur University Museum of Fishes (MUMF) (paratype).

Promotion of cage culture in Sitacherra Lake, Tripura

Sitacherra Lake, located in Hezamara Block, West Tripura district provides livelihood and nutritional security to tribal fishers/forest dwellers through fisheries. For fisheries development in the lake, ICAR-CIFRI and DoF, Tripura cooperated in forming two fishermen cooperative societies (Sitacherra Fisherman Cooperative Society and Rupha hamkwrai Bodol Fisherman Cooperative Society) and provided 72 cages and other inputs for enclosure culture of fish.

Assessing heavy metal pollution in Teesta river, Sikkim

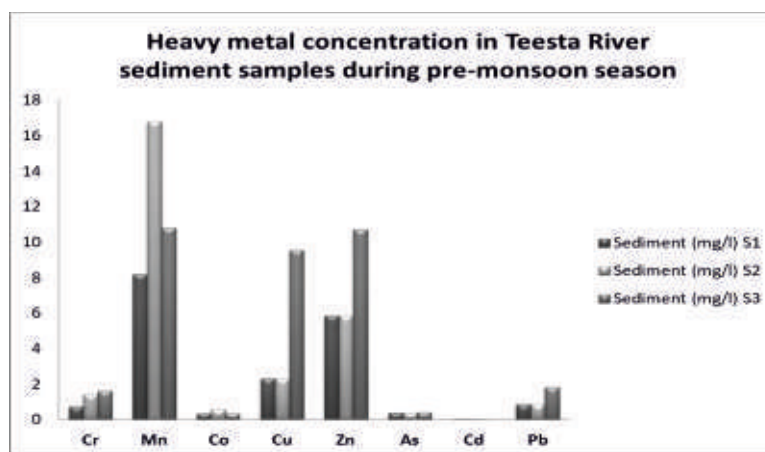
A study was undertaken to assess impact



Pethia dibrugarhensis, a new fish species



ICAR-CIFRI team and local fishers of Sitacherra Lake



Levels of heavy metals in Teesta river sediment

of pharmaceutical industrial effluents on river Teesta. The mean concentrations of heavy metals measured in the sediments and water of Teesta River were in the following decreasing order: $Fe > Mn > Zn > Cu > Pb > Cr > As > Cd$ and $Fe > Zn > Mn > As > Cu > Cr$ respectively.

Concentrations of Ni, Cd, Co and Pb were traces in water and sediment samples. The results emphasize the necessity of upgrading pharmaceutical wastewater treatment and discharge infrastructures to minimize their ecological impact on aquatic ecosystems.



Project title: Assessing fisheries and habitat characteristics of River Brahmaputra and rivers of Sikkim in response to natural and anthropogenic changes

Project code: NEH/24-27/05

Sub-project 1 (NEH/24-27/05/1): Revitalizing River Brahmaputra for assessing fisheries and habitat characteristics in response to natural and anthropogenic changes

Fisheries management in river Brahmaputra

Stretches (5-30 km long) of river Brahmaputra are leased by the Revenue and DM Department of Assam to local fishers' cooperative societies for fishing for 7 years following a competitive bidding process. Annual lease value is considerably higher in the lower stretches, especially in Dhubri and Goalpara districts of Assam because these river stretches are generally wider as well as deeper and fish yield is more. The catch

of high-value migratory Hilsa is another reason for the higher lease value offered in these stretches. In certain stretches like that near Disangmukh, fish catch is usually low. In such cases, the lessees reportedly give a higher share of the catch to the fishers (up to 75%) instead of 60% share stipulated for revenue fisheries. Major problems affecting fisheries management of the river are (i) increased siltation affecting depth and flow during the dry seasons, (ii) occasional and low floods negatively affecting auto-recruitment of fishes and Hilsa migration, (iii) increasing conflicts between traditional fishers and non-fishers for fishing in the river, (iv) pollution (e.g. city sewage) and (vi) over-exploitation. An emerging issue having potential long-term adverse impacts is construction of a

mega hydropower project on upstream Yarlang-Psangbo (fore-runner of R. Brahmaputra) by China.

Ichthyo-faunistic diversity

An updated list of 146 finfish species belonging to 84 genera and 29 families has been prepared incorporating 4 fin-fish species (*Labeo angra*, *L. boga*, *Channa stewartii*, *Ompok padma*) recorded in the river for the first time. Four migratory fin-fishes (*Tenualosa ilisha*, *Anguilla bengalensis*, *Sicamugil cascasia* and *Rhinomugil corsula*) were recorded in the lower stretch between Uzanbazar and Dhubri. *Cabdio morar* was the most dominant fish contributing about 60-90% of the total catch, followed by *Puntius* spp.

Hilsa fisheries

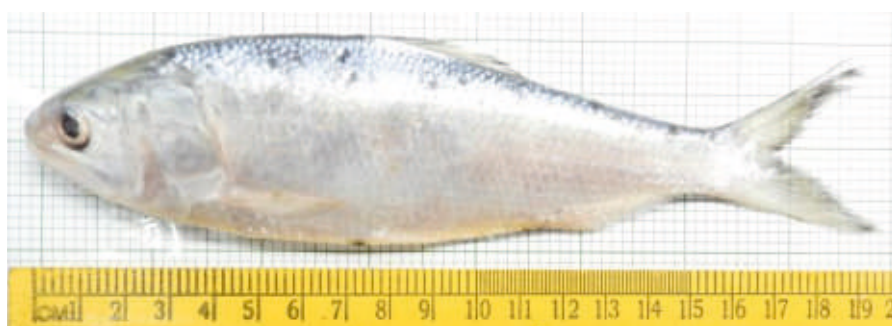
High value Hilsa (*Tenualosa ilisha*) was observed in commercial catches in lower stretch between Dhubri and Uzanbazar. Individuals in size group 150-200 mm dominated the catch during May-July and contributed 57.14-87.5% of total Hilsa catch by numbers, whereas during August individuals in size range 201-250 mm made the Hilsa fishery. Larger size fishes (301-350 mm) contributed 67.74-85.71% to the total catch during September-October and coincided with its spawning season. Length at first maturity was estimated at 290 mm for female and 279 mm for male fish. Overall, 150-200 mm length group dominated Hilsa landings (36.09%) raising concern of recruitment over-fishing.

Habitat characteristics

Sediments in the river stretches with few exceptions, were dominated by sand (84.5–98.5%) and had low levels of organic matter (0.082–0.584%) and available nutrients (N 7.42–18.45 and P 0.18–1.42 mg/100 g). Sediment pH was generally alkaline (7.22–7.72). Specific conductance was moderate (87.5–224.6 $\mu\text{S}/\text{cm}$). Water quality parameters in different stations were congenial for fisheries. Water had alkaline pH (7.1–8.7), medium total alkalinity (48–130 mg/l), total hardness (52.0–136 mg/l), Ca-hardness (36–72 mg/l), Mg-hardness (5.3–



Labeo boga



Tenualosa ilisha



Cabdio morar

24.3 mg/l), sodium (3.8-7.1 mg/l) and potassium (1.3-8.0 mg/l), moderate to high specific conductivity (140.0-534 $\mu\text{S}/\text{cm}$) and total dissolved solids (98.9-380 mg/l) as well as high dissolved oxygen (6.6 to 8.2 mg/l).

Fish landing

From recent data collected by the Department of Fisheries, Assam and the present study, total annual fish catch of 933.70 metric tonnes (MT) was estimated from the river in Assam. The upper region contributed maximum (41.27%), closely followed by the lower region (40.03%) to the catch, while the shorter central region accounted for the lowest fish production (18.70%).

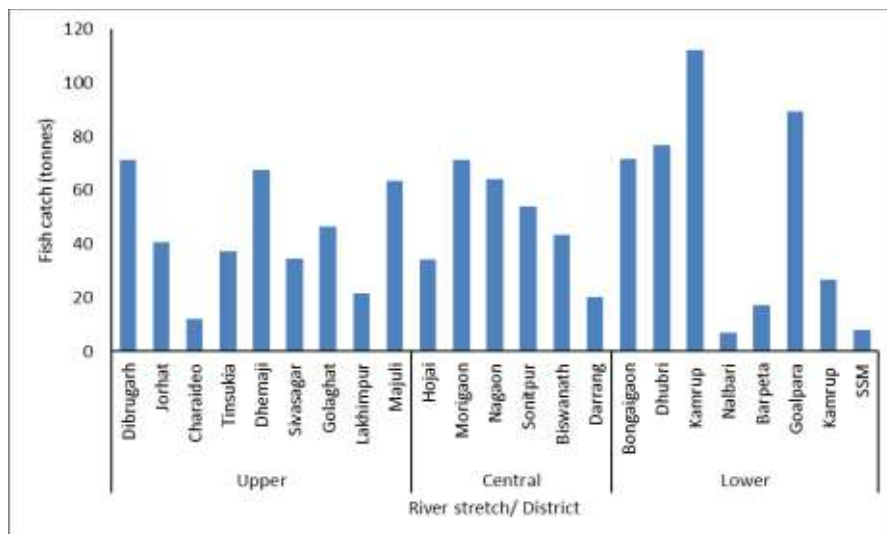
Sub-project 2 (NEH/24-27/05/2): Exploring fish diversity, catch pattern and habitat ecology of the major rivers in Sikkim

Habitat ecology of major rivers of Sikkim

River Teesta and Rangeet with their eleven major tributaries (Ringchu, Rihichu, Kankha River, Lachung chu, Yungthang Chu, Rangpo Khola, Rani Khola, Khani Khola, Koleg Khola, Sangkhola and Ramman khola) were studied in pre-monsoon, post-monsoon and winter seasons. Salient water quality parameters were: temperature 4.5-26.3 °C, pH 7.6-8.7, dissolved oxygen 7.80-9.80 mg/l, total alkalinity 22-54.40 mg/l, specific conductivity 42.40-206 $\mu\text{S}/\text{cm}$, secchi disc transparency 20 cm-1.50 m, total dissolve solids 30.1- 146 mg/l and total hardness 18.0-86 mg/l. The river sediments were mostly sandy with pH 7.6-8.70, electrical conductivity 43.1-245 $\mu\text{S}/\text{cm}$ and free CaCO_3 0.8-3.71 %.

Fish diversity and community structure

A total of 31 fish species belonging to 17 genera, 6 families and 4 orders and a freshwater prawn (*Macrobrachium gangeticum*) were recorded from the rivers. At family levels, Cyprinidae (54.84%) dominates, followed by Nemacheilidae (25.81%), Sisoridae (12.9%), Salmonidae (3.26%) and Cobitidae (3.26%). The most dominating species were chocolate mahseer (*Neolissochilus hexagonolepis*) and snow



Region-wise fish catch (MT) in R. Brahmaputra

trout (*Schizothorax richardsonii*). Other major fish were *Schizothorax progastus*, *Tor puitora*, *Garra*, *Barilius*, *Danio*, Nemacheilids, stone loaches, and torrent catfishes. During post-monsoon, rare fish like *Pangio pangia* (eel-loach) was reported from Rangeet.

Reproductive biology of major fish species

During pre-monsoon season, most of the chocolate mahseer were in immature stage, with dominance of males (85.72%). Both in pre-monsoon and post-monsoon seasons, snow trout were in mature stage suggesting an extended breeding period. In case of snow trout, male dominated (75%) the catch.

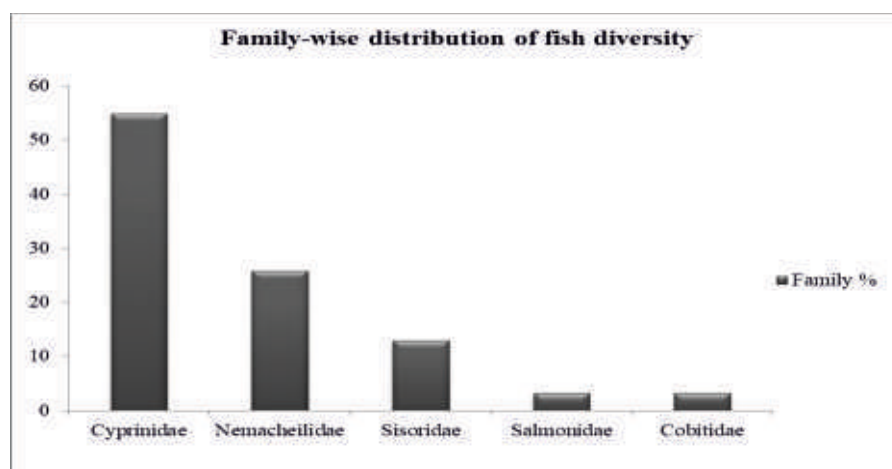
Plankton and periphyton

Plankton diversity in the studied rivers is dominated by Bacillariophyceae (73.77-91.30%), followed by Cyanophyceae

(14.75-20%) and Chlorophyceae (11.47-12.50%). The diversity was higher during the post-monsoon followed by winter and pre-monsoon seasons. Plankton abundance was also highest in post-monsoon season (38.02- 636.80 u/l). Among periphytons, Bacillariophyceae dominated (62.06-88.62%), followed by Cyanophyceae (4.8-20.69%), Chlorophyceae (6.50-17.24%). The number of periphyton varies from 271.87-1153.12 no./cm² during post-monsoon to 37.50-112.50 no./cm² during pre-monsoon season.

Benthic macro-invertebrates

A total of 12 benthic macro-invertebrate taxa comprising of 10 genera of insects, 1 gastropod and 1 annelid, were recorded from Teesta and its tributaries. The benthos abundance varied from 67-710 ind./m². Insecta dominated in all the seasons. Mollusc *Physella acuta* was



Family-wise distribution of Fish diversity



Table : Seasonal variations in water quality of Teesta River

Parameter	Pre-monsoon	Post-monsoon	Winter
Water temperature (°C)	20.2-26.3	19-26	4.5-17.5
Dissolve oxygen (mg/l)	7.8-8.8	8.2-9.4	8.0-9.6
pH	7.6-8.0	8.0-8.6	7.8-8.48
Total Alkalinity (mg/l)	40-48	23-54.4	34-42
Free CO ₂ (mg/l)	0.4-0.8	1.5-2.0	1-2.0
Specific conductivity (µS/cm)	76.4-179.2	62.1-151	52-100.80
TDS (mg/l)	49.7-128	44.3-109	37-71.5
Transparency (cm)	23-65	20-34	30-150



Mature snow trout

Mature gonad of female snow trout

recorded in confluence point of Teesta and Khani Khola with an abundance of 611 ind./m².

Fishing activity

In general, fishing in the rivers of Sikkim is limited and is done by people of diverse profession for household consumption. The average CPUE was estimated to be 3-5 kg/fisher/day in Teesta and 4-6 kg/fisher/day in Rangeet. April and October-November are the most important fishing months. Major gears used for fishing are small cast nets (mesh size ≤ 1 cm), rod & lines, and indigenous traditional traps such as tubular shaped trap (called 'Buk trap') and box trap (called 'Minno trap'). The rivers also face illegal fishing practices such as electric fishing, poisoning, dynamiting.



Fishing in rivers of Sikkim

Scheduled Tribe Component (STC) Programme

CIFRI-CAGEGROW feed popularized in Meghalaya

ICAR-CIFRI Regional Centre Guwahati, in collaboration with the Department of Fisheries, Meghalaya organized an "Awareness-cum-input distribution programme" in Ri-Bhoi District, Meghalaya on 10 January. The programme was attended by 70 participants (22 female) including fish farmers, officials, Scientist, and media personnel. On the occasion, a total of 5000 kg CIFRI CAGEGROW floating feed was distributed among 50 tribal fish farmers' families.



CIFRI CAGEGROW feed distribution

Another "Awareness-cum-input distribution programme" was organized, in collaboration with R-Bhoi Farmers' Union (RFU), at Umbang, Umsning, Ri-Bhoi District on 30 January to popularize the feed among tribal fish farmers of hilly region. It was attended by 70 participants including fish farmers, NGO officials, and Scientists. A total of 5000 kg CIFRI CAGEGROW feed was distributed among 50 selected tribal fish farmers' families for farm demonstration.

Input distribution and awareness programme in Sagar Island

A mass awareness camp-cum-input distribution programme was organized, in collaboration with Sagar Krishnanagar Swami Vivekananda Youth Cultural Society, at Gangasagar on 9 February. Shri Bankim Hazra, Minister of Sundarban Affairs, Government of West Bengal inaugurated the programme, and also the FRP Carp Hatchery. The programme aimed to meet the growing demand for quality fish seed in the region.



Hon'ble MIC, Sundarban graced input distribution cum awareness programme

Awareness campaign and input distribution at Meenkar Dam

Kochi Research Station of ICAR-CIFRI organized an input distribution and awareness campaign at Meenkar Dam, Palakkad, Kerala on 12 March. The event witnessed active participation from members of the Muthalamada SC/ST Fisheries Cooperative Society, Meenkar. As part of the initiative, approximately 3,000 fish seeds of *Etroplus suratensis* and 60 kg of fish feed were distributed to the local fishers.



Etroplus suratensis seed stocking

Empowering fishers of Joygopalpur

The Institute successfully organised a two-day training and mass awareness





Hon'ble Minister, Govt. of W. B. Paschimanchal Unnayan visiting ornamental units



Penculture demonstration at Koodi wetland, Madhya Pradesh



Feed distribution among the cage farmers of Banasurasagar reservoir



Stocking of fingerlings in cages at Banasurasagar reservoir

cum input distribution program at Joygopalpur, Sundarbans, as a part of the support initiative wherein 200 ST fishers received essential fishery inputs, including carp fingerlings and fish feed, to implement fish culture practice.

Empowering tribal women through culture-based fisheries in 'Bandhs'

ICAR-CIFRI, Barrackpore has initiated a program to help tribal women of Purulia district by promoting community-based inland aquaculture in 16 community managed rainfed waterbodies, called 'bandhs', in drought-affected Manbazar, Pancha, and Hura. The initiative directly benefits 481 tribal women, organised in 48 Self-Help Groups (SHGs). To support their operations, 1,620 kg quality fish seed and 22 tonnes of feed were distributed on 25 October. To diversify income sources, 30 women beneficiaries also received FRP tanks with ornamental fish kits following training on ornamental fish culture. Ms. Sandhyarani Tudu, Hon'ble Minister of State (Independent Charge), Paschimanchal Unnayan Affairs, and Parliamentary Affairs Department, Government of West Bengal, graced the occasion. It was decided in the event that

50% of the fish produce would be supplied for mid-day meal of Govindapur Primary School securing children's nutritional demand.

Demonstration of pen culture in Koodi wetland

ICAR-CIFRI Regional Centre Prayagraj organised a seed stocking cum pen culture demonstration in Koodi wetland, Satna, Madhya Pradesh, on 14 October. Following installation of CIFRI HDPE Pen (0.1 ha) 65 kg of IMC seed were stocked. Fishers from local fishery co-operative society attended the event.

Promotion of cage culture of endemic fishes in Banasurasagar reservoir

ICAR-CIFRI Regional Centre, Bengaluru conducted a demonstration of cage culture of endemic fish species in Banasurasagar reservoir, Kerala on 30 October. About 50 tribal fishers, members of Banasurasagar ST-SC Fishermen Co-operative Society attended the program. Fingerlings of *Labeo kontius*, *L. fimbriatus*, and *Horabagrus brachysoma* provided by Aquaculture Development Authority, Kerala were stocked in cages.

Awareness camp cum input distribution for fishers of the River Cauvery

ICAR-CIFRI Regional Centre, Bengaluru conducted a sensitization program on "Responsible fishing and livelihood enhancement of fishers of the River Cauvery" at Sivanasamudra, Mandya district, Karnataka. Gill nets weighing 75 kg were distributed to 15 ST fishers. The program was attended by 50 fishers of Mandya and Chamarajanagar districts.

Supporting alternative livelihood generation for fishers of Birbhum

"Jan Jatiya Gaurav Pakhwada" was celebrated to mark the 150th birth anniversary of the tribal icon Bhawan Birs Munda throughout the country. To pay homage to this great personality as well as to support the tribal community of Birbhum, ICAR-CIFRI, in collaboration with A. K. Dasgupta Centre for Planning and Development, Visva-Bharati, Sriniketan, organized an Input distribution cum mass awareness programme on ornamental fish farming on 14 November at Santiketan, Birbhum.

Scheduled Caste Sub-Plan (SCSP) Programme

The Scheduled Caste Sub Plan (SCSP) aimed at uplifting livelihood of fish farmers of the Institute and empowering rural women fishers through input distribution, demonstration, awareness and training programme in various fisheries component including backyard pond fish culture, culture-based fisheries, hill fisheries development and pen culture. The SCSP programmes benefitted more than 6000 people in different aspects of livelihood development through fisheries from different parts of India including West Bengal, Tamil Nadu and Karnataka.

Backyard pond fish culture for empowering rural women

The Institute, in collaboration with Sasya Shyamala Krishi Vigyan Kendra, RKMVERI,

Sonarpur conducted mass awareness and input distribution programmes. Where the Institute distributed fish seed and feed for backyard pond fish culture to 100 SC women from Sonarpur. An awareness and input distribution programme was organized on 20 April in Sagar Island, where 6 kg IMC fingerlings and 80 kg feed were distributed to 350 women. A two-day training programme was organized by the Institute at Joygopalpur, Sundarbans where more than 100 SC fishers were given essential fishery inputs, including quality carp fingerlings and fish feed. Additionally, 50 aquaria were distributed to nearby schools to promote ornamental fish culture awareness among rural youths.

Mahila Matsyajibi Sammelan 3.0 (Women Fishers' Meet) was organised at Kultali,

Sundarbans on 22 November to mark the World Fisheries Day. Dr. Joykrushna Jena, DDG (Fisheries Science), and Dr. Rajvir Singh, DDG (Agriculture Extension), ICAR, attended the programme as Chief Guest and Distinguished Guest, respectively. In the event, fish fingerlings and ICAR-CIFRI CageGrow feed were distributed to 500 SC women fish farmers.

An awareness and input distribution programme, graced by Shri Bankim Chandra Hazra, Hon'ble Minister of Sundarban Affairs, Government of West Bengal, was conducted on 29 December at Sagar Island. Under the programme, 300 SC fish farmers from various Gram Panchayats of Sagar Community Development Block, each received 6 kg of Indian Major Carp (IMC) fingerlings and 80 kg of fish feed.



Distribution of fish fingerlings by the DDG (Fy. Sc.) at Sonarpur, W. B.



Distribution of fish fingerlings by the Hon'ble Minister, Govt. of W. B. at Sagar Island



Dr. Pradip Dey, Director, ATARI, Kolkata (2nd from left), Dr. J. K. Jena (DDG, Fy.Sc., 3rd from left) & Dr. Rajvir Singh (DDG, Ag. Extn., 4th from left) at the Mahila Matsyajibi Sammelan 3.0, Kultali, Sundarbans



Distribution of fish feed on the occasion of Mahila Matsyajibi Sammelan 3.0 at Kultali, Sundarbans





Fish harvest mela at Kumli wetland, W. B.



Fish harvesting from the pens at Kumli wetland, W. B.



Distribution of coracles in the presence of Chairperson, KFDC at Bhima river, Kerala



Input distribution in the presence of Hon'ble Minister, Govt. of W. B. at Gangasagar

Demonstration of culture-based fisheries (CBF)

A pen culture demonstration was conducted by stocking *Labeo rohita*, *Labeo catla*, and *Labeo bata* in HDPE pen for raising advanced fingerlings in Sindrani, Kundipur, Bijpur, Kumli, Akaipur and Chamardaha wetlands of North 24 Parganas, West Bengal. The Institute conducted a series of Fish harvesting melas from the pens and the harvested fishes were further stocked in main wetlands for demonstrating CBF. A sensitization program on "Fisheries development and livelihood enhancement" was organized on 05 December in Tamil Nadu wherein fishing nets were distributed to 15 fishers,

including three women beneficiaries. The programme was attended by 50 fishers of Mettur Dam, Salem district. The Institute organized a sensitization program on "Responsible fisheries for enhanced fish production and conservation" on 17 September. As part of the programme, coracles were distributed to 5 fishers, including three women beneficiaries. The programme was attended by 50 fishers of Kaburagi district, Karnataka.

Capacity building and sensitization programme

Several awareness programmes for inland fisheries management were held in Kultali, Joygopalpur, Sagar Island, Sonarpur, Takling, and Sittong in West

Bengal, in Mettur Dam in Salem district of Tamil Nadu and in Kaburagi district of Karnataka. Coracles were distributed among the fishers of Bhima river, Kalaburagi, Karnataka in the presence of Chairperson, Karnataka Fisheries Development Corporation (KFDC). More than 6000 farmers and stakeholders attended the programme. Training programmes were organized at Sittong in Darjeeling, Ghatakpur in South 24 Parganas, and Joygopalpur in Sundarbans benefitting over 500 SC fishers and women. Scientific fisheries management practices such as water quality management, multiple stocking-harvesting practices, backyard pond culture, diseases management, etc. were highlighted in the trainings.



Capacity building programme at Joygopalpur, W. B.



Capacity building programme at Kultali, W. B.

Model village project for sustainable livelihood in sundarbans

In a significant stride towards sustainable rural development, the ICAR-CIFRI, in collaboration with Kultoli Milan Tirtha Society and State Bank of India, Kolkata Circle, inaugurated a transformative project under CSR initiatives aimed at uplifting 100 families in the Indian Sundarbans through backyard pond culture. The inception workshop for the project was held on April 26, 2025, at Haldar Para, Uttar Mokamberia Gram Panchayat, Basanti Block, South 24 Parganas. The inaugural ceremony took place at Kultoli marking the formal launch of the initiative that seeks to develop the village as a 'Model Village.' The program included several key activities, such as an inauguration ceremony, interaction with beneficiaries, unfurling of the project site, distribution of fish feed, and the release of fish seed into the ponds of selected beneficiaries. As part of the initial distribution, 10 kg of fish seed and 120 kg of feed were handed over to each beneficiary.



Inception workshop of the Model Village project

Exploration and habitat mapping of hilsa migration in rivers of Meghalaya

To understand the Hilsa availability in Meghalaya, the ICAR-CIFRI, with funding support from Meghalaya Power Generation Corporation Limited (MPGCL), initiated field explorations and delineated the Hilsa migration in the transboundary rivers for the development of future Hilsa management plans. The study will be carried out for a period of one year, covering all the seasons and the habitat suitability for the species.



Habitat mapping of hilsa in rivers of Meghalaya

Cage culture of pabda (*Ompok bimaculatus*) in Dumbur reservoir, Tripura

The institute, in collaboration with the Department of Fisheries, Government of Tripura, has initiated the cage culture of high-value butter catfish, *Ompok bimaculatus* (pabda), in Dumbur reservoir, Tripura. This initiative, undertaken under the NFDB-sponsored project, aims to scale up the cage culture of this commercially important species to enhance profitability and promote adoption in the inland open water system. The present study was initiated at



Stocking of pabda seed in the cage installed at Dumbur



E. suratensis in cage at Banasurasagar reservoir

West Potachari, ADC village, Raishyabari Block of Gandacherra sub-division in Dumbur reservoir. A total of 10,000 pabda seeds (average length 5.45 cm; average weight: 0.55 g) were stocked in the cages on 20 June 2025. Additionally, ICAR-CIFRI has supplied 3 tonnes of floating pellet feed for the caged fish.

First-time introduction of *Etroplus suratensis* for cage culture at Banasurasagar reservoir

Etroplus suratensis (pearlspot) is a highly

priced fish in Kerala with great market demand. Hence, the cage culture of this fish was tried for the first time in Banasurasagar reservoir in the Wayanad district of Kerala. Around 12,000 fingerlings of pearlspot were stocked in the cages at the rate of 4000 fingerlings per cage ($4 \times 3 \times 3 \text{ m}^3$), which was then reduced to 1500 fingerlings per cage. The mean weight gain after eight months of the culture period is $102.5 \pm 8.38 \text{ g}$ and the feed conversion ratio was estimated to be 0.918. The fishermen at Banasurasagar mostly belong to the tribal population,

and the culture of these fish would provide additional income and an improved livelihood of the fishers.

Ichthyofaunal survey in Krem Um Ladaw cave, East Jaintia Hills

A cave system-Krem Um Ladaw ($25^{\circ}13'44.6'' \text{ N}$, $92^{\circ}30'03.6'' \text{ E}$) in East Jaintia Hills, Meghalaya, was surveyed to assess the subterranean aquatic biodiversity and water quality. Eleven fish species were identified in the field, while unidentified specimens were preserved for detailed laboratory examination. The water has a nearly neutral pH of 7.46, moderate conductivity of $322 \mu\text{S}/\text{cm}$, and total dissolved solids of $228 \text{ mg}/\text{L}$, which are normal for karst aquifers. Total hardness ($86 \text{ mg}/\text{l}$) and alkalinity ($137 \text{ mg}/\text{l}$) suggest a well-buffered aquatic environment. Low concentrations of sodium, potassium, and chloride indicate minimal anthropogenic impact. Overall, water quality supports cave-dwelling aquatic life, warranting further taxonomic and ecological studies.



Survey in Krem Um Ladaw cave of Meghalaya

State-wise and Resource-wise Reach of ICAR-CIFRI in 2025

State	Resource	Activity
Andhra Pradesh	Estuary	- Study of ecology, fisheries and fishers' socio-economics of Pulicat Lake - Field Day-cum-Community awareness programs on conservation of indigenous fish species of Pulicat Lake
	Ponds	Deployment of IoT based turbidity monitoring system with real-time messaging service in the shrimp farm at Valvin's farm, Venukonda
Assam	River	- Study of ecology, habitat, fish catch and management regimes of fisheries of River Brahmaputra - Study along the Brahmaputra River, covering 11 sites for benchmarking microplastic pollution in relation to native edible fish fauna - Nutritional profiling of indigenous fishes collected from Sessa River, Dibrugarh and sensitize the local fisher communities on health benefits of fish consumption.
	Wetland	- Survey for fisheries potentials and pen culture demonstration in Diplai, Halowadal, Tipkai, and Sareswar Beel - Study of ecology and fishery of Deepor Beel - Assessment of fish diversity and demonstration of CIFRI HDPE-pen culture of <i>Systemus sarana</i> at Tamranga beel. Awareness programme, input distribution programme were also organized - Demonstration of seed raising of <i>Systemus sarana</i> in Mer and Potakolong beels in Nagaon District
	Livelihood and HRD	- Demonstration of CIFRI ARGCURE at 1 No. Bhatipara Village, Damalchos, Kamrup (R) - Workshop on "Stress-free fish transportation" and "Nutritional and health benefits of fish consumption" - Organized 'National fish farmers day' and three training programmes
Bihar	River	- Assessment of fish and fisheries of the Ganga river system - Conducted 6 ranching programs releasing IMC for carp fisheries restoration in depleted stretches of river Ganga and awareness programmes among the fishers - Ranching of fingerlings of IMC - Estimated landing of fish from river Ganga
	Wetland	Demonstration of seed raising of <i>Systemus sarana</i> in Brahmapura and Manika in Muzaffarpur District
	Livelihood and HRD	- Organized 10 training programs on 'Inland Fisheries Management' for 297 fishers/fish farmers of 9 districts of the state - Awareness programmes on Hilsa, Dolphin and fish biodiversity under NMCG
Delhi	River	Assessment of seasonal fluxes of GHGs in the Yamuna river
Gujarat	River	Fish catch estimation, crafts and gears and socio-economics of river Narmada
	Estuary	Study of ecology, fisheries of the Mahi estuary
Jharkhand	River	Conducted 2 ranching programmes if IMC fingerlings into the river Ganga
	Reservoir	- Study of feeding response and growth performance of the indigenous Giant River catfish, <i>Sperata seenghala</i> (Sykes, 1839) in the floating net cage at Maithon reservoir - Ecological assessments and stakeholder-based socio-economic surveys in Maithon, Bhairavi and Getalsud reservoir. - Experiments of cage culture operations involving <i>Ompok bimaculatus</i> in Maithon Reservoir - Scampi production at Ghagra in Hazaribag district, Kelaghagh in Simdega district and estimation of Masaria in Gumla district. In 2025, 6 reservoirs (Ranchi-2 nos, Lohardaga, Latehar, Gumla, Dumka) were added for similar activities.
	Coal pits and quarries	Fish and plankton diversity, water quality, proximate composition of fish muscle of 3 coal pits in Ramgarh area
	Livelihood and HRD	Awareness programmes on Hilsa, Dolphin and fish biodiversity under NMCG
Himachal Pradesh	River	Fish catch estimation, crafts and gears and socio-economics of river Sutlej



State	Resource	Activity
Karnataka	River	- Fish catch estimation, crafts and gears and socio-economics of fishery of river Cauvery - Study of native fish communities, <i>Systomus sarana</i>, <i>Cirrhinus reba</i> and <i>Ompok bimaculatus</i> of River Cauvery and River Bhima
	Reservoir	Food web structure and water quality index of Kanva reservoir
	Livelihood and HRD	- Sensitization program on "Responsible fisheries for enhanced fish production and conservation" and distribution of coracles to five Scheduled Caste fishers of Kalaburagi district, Karnataka. - Online training on "Technological innovations for enhanced fish production in open waters" - Sensitization program on "Responsible fishing and livelihood enhancement of fishers of the River Cauvery" at Sivanasamudra, Mandya district, Karnataka.
Kerala	River	Fish catch estimation and survey on crafts and gears and socio-economics of fishery of river Pamba
	Estuary	Study of ecology, fisheries of Kayamkulam estuary
	Reservoir	- Study of Ecology and fisheries of Meenkara and Malampuzha reservoirs - Fish assemblage, fish productivity, plankton diversity and habitat parameters study of Banasurasagar reservoir - Cage culture of <i>Etroplus suratensis</i> in Banasurasagar reservoir
	Livelihood and HRD	- Input distribution and awareness campaign at Meenkara Dam, Palakkad. Approximately 3,000 fish seeds of <i>Etroplus suratensis</i> and 60 kg of fish feed were distributed to the local fishers. - Hands-on training programme on 'Fish and environmental monitoring tools in inland open waters' - Celebration of World Wetland Day at Ellappully, Palakkad.
Madhya Pradesh	River	Fish catch estimation and survey on crafts and gears and socio-economics of fishery of river Narmada
	Reservoir	Ecological assessments and stakeholder-based socio-economic surveys in the Gandhisagar reservoirs
	Livelihood and HRD	Seed stocking cum pen culture demonstration in Koodi wetland, Satna
	Coal pits	Fish and plankton diversity, water quality, proximate composition of fish muscle obtained from Dola coal pits in Anuppur district
Maharashtra	River	Fish catch estimation and survey on crafts and gears and socio-economics of fishery of river Narmada
	Pond	Deployment of IoT based turbidity monitoring system with real-time messaging service in the fish farms of ICAR-CIFE, Mumbai
	Livelihood and HRD	- Training on 'Cage and pen culture for enhancing fish production from reservoirs (under STC)' for 60 tribal fishers of Palghar - Training on 'Cage culture: Good Management practices' for 25 nos. DoF officials
Manipur	Reservoir	Experiments of cage culture operations involving <i>Ompok bimaculatus</i> in Mapithel Reservoir
Meghalaya	Cave	Study of fish diversity in three unexplored caves, Krem Tyngheng, Um Ladaw and Krem Lymmit in East Jaintia Hills
	Livelihood and HRD	Awareness-cum-input distribution programme at Uimbang, Umsning, Ri-Bhoi. CIFRI CAGEGROW floating feed was distributed among 50 tribal fish farmers
Odisha	Reservoir	- Environmental and aquatic ecosystem health monitoring and impact study of cage operation on ecology in Hirakud reservoir - Ecological assessments and stakeholder-based socio-economic surveys in Nesa reservoir - Culture of IMC and Pangas in circular cages installed in Hirakud reservoir
		Survey to examine the occurrence of bacterial illness in Asian seabass
		Deployment of IoT based turbidity monitoring system with real-time messaging service in the fish farms of ICAR-CIFA, Bhubaneswar
	Livelihood and HRD	- Studied labour migration in marine fisheries - Eight capacity development programs for the fishers of Odisha on reservoir fisheries and cage culture - Training cum awareness on inland fisheries management (under STC) - Three training cum exposure visits on "Inland fisheries management" for the fishery officers of Odisha - Five training programmes on 'Disease diagnosis and laboratory testing techniques' for fishery officers - Organisation of 2nd Indian Fisheries outlook at College of Fisheries, Berhampur, Odisha
Punjab	River	Assessment of Ecology, fish catch, crafts and gears and socio-economics of river Sutlej

State	Resource	Activity
Sikkim	River	- Assessment of heavy metal pollution in Teesta river - Assessment of ecology, fisheries and fish catch of Teesta, Rangit and their major tributaries, namely Ringchu, Rihichu, Kankha River, Lachungchu, Yungthang Chu, Rangpo Khola, Rani Khola, Khani Khola
	Livelihood and HRD	- Popularisation of Ornamental Fisheries among the school students - Three awareness field days on 'Conservation of endemic fish species of Teesta River, Sikkim' in Teesta River and its tributaries at Gangtok, Pakyong, and Namchi districts
Tamil Nadu	River	- Assessment of fish catch, crafts and gears and socio-economics of fishery of river Cauvery - Study of Resilience of native fish communities, <i>Systemus sarana</i>, <i>Cirrhinus reba</i> and <i>Ompok bimaculatus</i> of <i>Thenpennai</i> river
	Estuary	- Study of Ecology, fisheries and fishers' socio-economics of Pulicat Lake - Field Day-cum-community awareness programme on conservation of indigenous fish species of Pulicat Lake
	Reservoir	Fish assemblage, fish productivity, plankton diversity and habitat parameters study of Sathanur reservoir
	Livelihood and HRD	- Sensitization program on "Fisheries development and livelihood enhancement" and distribution of fishing nets to fifteen Scheduled Caste (SC) fishers of Mettur Dam, Salem district - Awareness programme on Inland fisheries management at Mettur Dam, Salem district
Tripura	Wetland	Promotion of cage culture in Sitacherra Lake
	Reservoir	Experiments of cage culture operations involving <i>Ompok bimaculatus</i> in Dumbur Reservoir
Uttar Pradesh	River	- Study on Ecology, fish catch, crafts and gears and socio-economics of fishery of river Gomati - Assessment of ecology and fish and fisheries of river Ganga - Ranching programme at different stretches of river Ganga, releasing IMC and Mahseer - Estimation of fish landing from river Ganga - Fisheries and ecology assessment of the rivers Rapti, Sone, Ken, Betwa, Yamuna under the NMCG project
	Livelihood and HRD	- Awareness programmes at different sites along river Ganga on Hilsa, Dolphin and fish biodiversity under NMCG - Put exhibition stall at the Mahakumbh in Prayagraj - Five training programmes for farmers, officers and students were organized by the Prayagraj centre of the institute
Uttarakhand	River	- Study of ecology and fisheries of river Havel under NMCG - Collection and maintenance of mahseer brooders and fingerlings - Estimation of fish landing from river Ganga - Brood stock development and seed production of golden mahseer (<i>Tor putitora</i>) - Assessment of stock status of dark mahseer (<i>Naziritor chelynooides</i>) and Hamilton's barila (<i>Opsarius bendelisis</i>) in the upper stretch of the river Ganga
	Reservoir	Monitoring of fish landings in Tehri Reservoir under NMCG
	Livelihood and HRD	- Training cum exposure visit on "Inland fisheries management" for fish farmers of Haridwar, UK 6 awareness programmes at different sites along river Ganga on Hilsa, Dolphin and fish biodiversity under NMCG



State	Resource	Activity
West Bengal	River	- Assessment of fish and fisheries of the Ganga river system for developing suitable conservation and restoration plan - Breeding of wild fish germplasm of Indian Major Carps and ranching in depleted stretches of river Ganga - Hilsa fisheries ranching and awareness at Farakka - Estimated landing of fish from river Ganga - Installed portable FRP carp hatchery at Farakka, equipped for the controlled breeding and hatching of Indian Major Carp. - A total of 300 youth individuals received direct hands-on training on fish breeding and rearing at Farakka. Approximately 150,000 IMC fingerlings bred in the hatchery were released into the Ganga River - Conducted 22 ranching programmes releasing IMC fingerlings for restoration of carp fisheries in river Ganga under NMCG - Study of ecology and fisheries of Kansabati, Brahmani, Ajay, Mundeswari, Thakuran, Bidyadhari, Raimangal, Saptamukhi, Haribhanga, Mayurakshi, Rasulpur river under NMCG
	Estuary	- Assessment of Petroleum Hydrocarbon, PFAS and phenolic micropollutants in surface water and their effect on ecosystem health in Hooghly estuary - Study of Changing dynamics of labour migration on employment, livelihoods and resource productivity patterns at estuarine region - Study of ecosystem health, fish catch and mangrove landscape of Indian Sunderbans
	Reservoir	Ecological assessments and stakeholder based socio-economic surveys in Kangsabati reservoir
	Pond	- Study of 109 farms for understanding the AMR pattern - Survey of <i>bheries</i> in North 24 Parganas, South 24 Parganas and Purba Medinipur districts to examine the occurrence of bacterial illness in Asian seabass
	Wetland	- Surveyed 308 <i>bheries</i> of EKW, estimated production and documented in the GIS database. - Assessed fish disease occurrence, evaluation of feasibility of certifying fish produced in EKW - Conducted three one-day awareness programs across different sites of the East Kolkata Wetlands - Assessment of GHG emission and carbon sequestration in Bortir beel and Bijpur Khal - Development of natural farming protocol for culture-based fisheries in Kholsi beel, Nadia - Impact study of algal eutrophication on Saguna beel, Nadia, West Bengal - Biodiversity restoration of eutrophic wetlands using Surface-Set Submerged Macrophyte Park (SSSMP) in Kholsi and Saguna - Microbial diversity study in the sediment of Bhomra and Khalsi - Morphological analysis combined with mitochondrial COI (~650 bp) barcoding to ensure accurate species level identification and establish a reliable baseline of fish diversity in Shantipur wetland. - Amino acid profiling of <i>Heteropneustes fossilis</i> and <i>Glossogobius giuris</i>, collected from Shantipur wetland - Pen culture for production enhancement and conservation of high value SIF <i>Mystus tangara</i> at Chamta Wetland, North 24 Parganas, West Bengal under the ICAR - WordFish W3 programme - Assessment of the functioning, health, and management needs of four floodplain wetlands viz., Akaipur, Bijpur, Kundipur, and Maniknagar under the NMCG

State	Resource	Activity
West Bengal	Livelihood and HRD	• Distributed fish seed and feed for backyard pond fish culture to 100 SC women from Sonarpur • Awareness and input distribution programme in Sagar Island • Pen culture demonstration by stocking <i>Labeo rohita</i>, <i>Labeo catla</i>, and <i>Labeo bata</i> in HDPE pen for raising the fish seed to advanced fingerlings at Sindrani, Kundipur, Bijpur, Kumli, Akaipur and Chamardaha wetlands located in North 24 Parganas under SCSP • Awareness programme for inland fisheries management across Kultali, Joygopalpur, Sagar Island, Sonarpur, Takling, and Sittong • Livelihood improvement of 481 tribal women in Manbazar, Purulia by utilizing sixteen rainfed water bodies of over 140 acres • Provision of fisheries inputs and water quality analysis services to promote small-scale fisheries among 250 farm families at Sonarpur Block, South 24-Parganas. • Socio-economic surveys of the fishers at Dihi village, Narendrapur, Sonarpur Block South 24 Parganas district. • Provision of tanks along with ornamental fish kits to 30 tribal women from Manbazar, Purulia • Demonstration of seed raising of <i>Systomus sarana</i> in Sindrani and Chamardaha in North 24 Parganas District • Model village development through backyard pond aquaculture in Kultoli, Sundarbans • Ilish Utsav 2025 • Mass awareness camp- cum- input distribution programme at Gangasagar. FRP Carp Hatchery and quality fish seed were distributed. • Training and mass awareness cum input distribution program at Joygopalpur, Sundarbans; 200 ST fishers received essential fishery inputs, including carp fingerlings and fish feed. • Input distribution cum mass awareness programme on ornamental fish farming at Santiiketan, Birbhum district • Mahila Matasyajibi Sammelan 3.0 at Kultali, Sundarbans • 2nd Workshop on fish proteomics, workshop on Inland small-scale fisheries in the Ganga Basin, international workshop on "Transboundary hilsa fisheries management • Celebration of World wetland day at Kulia beel, Nadia, National Fish Farmers Day, World Rivers Day, National Dolphin Day, Mahila Matsyajibi Diwas, World Fisheries Day, Janajatiya Gourav Divas • Two demonstrations of fish transport through drones at Minakhan and Kultali of Sundarban • Fish harvesting mela and sensitisation programme at Sindrani, Kundipur, Bijpur, and Kumli wetlands, North 24 Parganas, West Bengal under NMCG • Fish harvest mela-cum-awareness programme at Akaipur Wetland, North 24 Parganas • Viksit Krishi Sankalp Abhiyan (Kharif) across 13 districts • State-level workshop on Viksit Krishi Sankalp Abhiyan (VKSA) (Rabi) • 10 training programmes for the fishers/fish farmers of Bihar on inland fisheries management and 41 other training programmes for farmers, officers and students were organized by the institute HQs



Training and Capacity Building

Training of Bihar fishers/fish farmers

A total of 10 training programmes were organized for the fishers/fish farmers from different districts of Bihar on inland fisheries management at the institute HQs during 2025.



Date	District	No. of fishers /fish farmers
07-13 Jan	Supaul	30
29 Jan - 04 Feb	Purnia	30
14-20 Feb	Sheikhpura	30
05-11 Mar	Begusarai	30
21-27 Mar	Khagaria	30
02-08 Apr	Muzaffarpur	30
29 Apr - 05 May	Darbhanga	30
20-26 Nov	Siwan	27
02-08 Dec	Madhubani	30
16-22 Dec	Supaul	30

Other trainings for fishers/fish farmers

Sl. No.	Title of the training programme	Date	No. of participants	Venue
1.	Training cum exposure visit on "Inland fisheries management"	10-14 Feb	14 nos. of fish farmers of Haridwar, Uttarakhand	CIFRI HQs
2.	Inland small-scale fisheries management	24-25Mar	Around 500 women fishers of Sundarbans, West Bengal	Kultali, 24 Parganas (South), West Bengal
3.	Hands-on-training on ornamental fish culture for entrepreneurship development	24-25 Mar	25 nos. of women fish farmers from Balagarh, Hooghly, West Bengal	CIFRI HQs
4.	Cage and pen culture for enhancing fish production from reservoirs (under STC)	25-27 Mar	60 tribal fishers of Palghar, Maharashtra	Palghar, Maharashtra
5.	Opportunities of inland open water ornamental fisheries management for income generation (under STC)	23-25 Apr	24 tribal fishers from Shantinikaten, Birbhum, West Bengal	CIFRI HQs
6.	Training cum exposure visit on "Inland fisheries management"	15-17 May	10 nos. of fish farmers of Haridwar, Uttarakhand	CIFRI HQs
7.	Reservoir fisheries and cage culture for the fish farmers of Odisha	18-20 Aug	38	Hirakud, Odisha
		21-23 Aug	40	
		15-17 Sept	34	
		18-20 Sept	35	
		16-18 Oct	40	
		13-15 Oct	30	
		10-12 Nov	35	
		13-15 Nov	35	
8.	Small-scale inland fisheries management under SCSP	28-29 Aug	202 fishers of Sundarbans, West Bengal	Joygopalpur, Basanti, 24 Parganas (South), West Bengal
9.	Hands -on-training on ornamental fish culture for livelihood improvement (under STC)	01-03 Sept	28 tribal fishers of Purulia, West Bengal	CIFRI HQs

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Other trainings for fishers/fish farmers

Sl. No.	Title of the training programme	Date	No. of participants	Venue
10.	Enclosure culture in inland open waters for productivity enhancement and livelihood	22-26 Sep	17 nos. of fish farmers from Jharkhand	CIFRI HQs
11.	Skill development on small scale aquaculture	09-11 Oct	50 fishers of Sundarbans	Kultali, 24 Parganas (South), West Bengal
12.	Conservation and fish culture in East Kolkata Wetlands	26 Oct	108 fishers of EKW, West Bengal	Jhagrasisha Bheri, EKW, West Bengal
13.	Conservation and fish culture in East Kolkata Wetlands	27 Oct	82 fishers of EKW, West Bengal	Chaker Bheri, EKW, West Bengal
14.	Inland fisheries management	28-30 Oct	50 fishers of Sundarbans	Kultali, 24 Parganas (South), West Bengal
15.	Conservation and fish culture in East Kolkata Wetlands	29 Oct	76 fishers	TardahBheri, EKW, West Bengal
16.	Training cum exposure visit on "Inland fisheries management"	18-21 Nov	7 nos. of fish farmers of Himachal Pradesh	CIFRI HQs
17.	Online training on "Technological innovations for enhanced fish production in open waters"	24-28 Nov	24 participants including students and faculties	CIFRI, RRC, Bengaluru
18.	Fish production cum residential itineracy	24-28 Nov	20 fish farmers from Samsatipur, Bihar	CIFRI, RRC, Prayagraj
19.	Management of open water fisheries for productivity enhancement	01 - 03 Dec	15 farmers and entrepreneurs	CIFRI, RRC, Prayagraj
20.	Scientific intervention for enhancement of fish production of inland water bodies	16-19 Dec	40 Farmers from nine districts of Uttar Pradesh	CIFRI, RRC, Prayagraj
21.	Training cum awareness on inland fisheries management (under STC)	28 Dec	261 tribal fishers	Kaptipada, Mayurbhanj, Odisha
22.	Scientific fish culture in rainfed waterbodies of Sundarbans (under SCSP)	29 Dec	265 nos. of fishers of Sundarbans, West Bengal	Sagar Island, 24 Parganas (South), West Bengal

Training of Officials

Sl. No.	Name of the training	Date	Participants	Venue
1-3.	Training cum exposure visit on "Inland fisheries management"	14-18 Jan	30 nos. of Asst. Fisheries Officers from DoF, Odisha	CIFRI HQs
		20-24 Jan	30 nos. of Asst. Fisheries Officers from DoF, Odisha	CIFRI HQs
		04-08 Feb	25 nos. of Jr. Fisheries Technical Asst. and Sr. Fisheries Technical Asst. of DoF, Odisha	CIFRI HQs
4.	Training programme for newly recruited Assistants of ICAR (Module-II)	17-21 Feb	32 Assistants from different ICAR institutes	CIFRI HQs
5.	Cage culture: Good management practices	24-28 Feb	25 nos. DoF officials of Maharashtra	CIFRI HQs
6-10.	Disease diagnosis and laboratory testing techniques	21-25 Jul	30 nos. of Asst. Fisheries Officers from DoF, Odisha	CIFRI HQs
		04-08 Aug	29 nos. of Jr. Fisheries Technical Asst. and Sr. Fisheries Technical Asst. of DoF, Odisha	CIFRI HQs
		18-22 Aug	28 nos. of Jr. Fisheries Technical Asst. and Sr. Fisheries Technical Asst. of DoF, Odisha	CIFRI HQs
		01-05 Sep	29 nos. of Asst. Fisheries Officers from DoF, Odisha	CIFRI HQs
		15-19 Sep	27 nos. of Asst. Fisheries Officers from DoF, Odisha	CIFRI HQs
11.	Sustainable beel fisheries development	18-20 Nov	30 fisheries officers of DoF, Assam	CIFRI, RRC, Guwahati
12.	Integrated management of wetland fisheries	03-05 Dec	30 fisheries officers of DoF, Assam	CIFRI, RRC, Guwahati



Training of Students

Sl. No.	Title of the training programme	Date	No. of participants	Venue
1.	Microplastics pollution assessment using μ FTIR	13-17 Jan	13 nos. of UG and PG students	CIFRI HQs
2.	Winter school on "Ecosystem health monitoring and fisheries management in inland open waters"	12 Feb-12 Mar	15 scientists and faculties across the country	CIFRI HQs
3.	Hands-on training programme on 'Fish and environmental monitoring tools in inland open waters'	14-18 Jul	17 research associate, field assistant and students from College of Fisheries, Jabalpur, St. Albert's College, Kochi and Sacred Heart College, Kochi	CIFRI, Kochi Station
4.	Concept building in basic statistics for biological data analysis	28 – 30 Jul	15 students from Uttar Pradesh	CIFRI, RRC, Prayagraj
5.	RFWE programme	28 Jul-26 Aug	7 nos. of B.F.Sc. students from Narayan Institute of Agricultural Sciences under Gopal Narayan Singh University, Jamuhar, Sasaram, Bihar	CIFRI HQs
6.	Hands-on training on R software for data analysis and visualization	06-08 Aug	9 participants	CIFRI HQs
7.	Fish disease diagnosis and management	08-12 Sep	20 students from Gurudas College, Serampore College	CIFRI HQs
8.	Taxonomy, biodiversity and habitat assessment of inland fishes	08-12 Sep	10 participants from CIFE, NMCG research scholars and Sr. Technical Assistant	CIFRI HQs
9.	Ecosystem-based management of wetland fisheries	08-14 Oct	25 students from Dr. Shyama Prasad Mukherjee University (Ranchi), Vidyasagar College (Kolkata), and P. K. College (Contai, W.B), one faculty member from Dr. M.G.R. Fisheries College and Research Institute, Ponneri	CIFRI HQs
10.	Post-harvest management and utilization of waste in inland fisheries	27-31 Oct	30 fish farmers, field-level extension workers, students, and other stakeholders from Assam	CIFRI, RRC, Guwahati
11.	Inland fisheries management	03-08 Nov	11 M.F. Sc. Students of ICAR-CIFE, Mumbai	CIFRI HQs
12.	Sustainable aquaculture techniques & opportunities for entrepreneurship development	10-14 Nov	19 UG students from Cachar College, Silchar, Assam	CIFRI, RRC, Guwahati

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Training programme on Ecosystem-Based Management of Wetland Fisheries 8-14 Oct

Sl. No.	Title of the training programme	Date	No. of participants	Venue
13.	Diagnostic techniques for infectious diseases of fish	17-21 Nov	22 researchers, students from Dr. Shyama Prasad Mukherjee University (Jharkhand), Dev Bhoomi Uttarakhand University, Sanjivani Matsya Vikas Co-operative Society (Maharashtra), West Bengal University of Animal and Fishery Sciences (West Bengal), and Vidyasagar University (W.B.)	CIFRI HQs
14.	Fish stock assessment in data poor inland fisheries	24-28 Nov	21 participants from fisheries colleges, universities, and research institutions, including Kerala University of Fisheries and Ocean Studies, Late Shri Punaram Nishad College of Fisheries (Chhattisgarh), CCS HAU (Hisar), WBUAFS (WB), College of Fisheries Dholi, RPCAU (Bihar), and SKUAST (Kashmir)	CIFRI HQs



Training of UG and PG students



Training on basic statistics for biological data analysis



Training on post-harvest management and utilization of waste in inland fisheries



Training of students from Dr. Shyama Prasad Mukherjee University (Ranchi), Vidyasagar College (Kolkata), and P. K. College (Contai, W.B.), one faculty member from Dr. M.G.R. Fisheries College and Research Institute, Ponneri



Exposure / Educational Visits

Sl. No.	Particulars of visitors	Date of visit
	Exposure visit to institute HQs	
1.	14 nos. of farmers from ICAR-CRIJAF	07 Jan
2.	40 nos. of farmers from ATMA, Nawada, Bihar	08 Jan
3.	15 nos. of Class IX and X students from Jaffarpur Bidhyarthi Bhaban High School	06 Feb
4.	55 nos. of B.F.Sc. 2 nd year students of LSPN CoF, DSVK Kamdhenu Vishwavidyalaya, Chhattisgarh	11 Feb
5.	27 nos. of B.F.Sc 2 nd year students from CoF, Maharashtra Animal and Fishery Sciences University	12 Feb
6.	138 nos. of Students of Class UKG from St. Augustine School, Barrackpore	14 Feb
7.	100 nos. of Students from Army Public School, Barrackpore	28 Feb
8.	25 nos. of rural youth from N.S.T.I.A.M Baidyabati, Hooghly, W.B. under Biodiverse Farming Pvt. Ltd (TONA Organization Farm) for formulating agri and allied community business	06 Mar
9.	25 nos. of farmers from Jharkhand Kalyan Samajik Sansthan Rahe, Ranchi	11 Mar
10.	27 nos. of rural youth from N.S.T.I.A.M Baidyabati, Hooghly, West Bengal under Biodiverse Farming Pvt. Ltd (TONA Organization Farm) for formulating agri and allied community business	13 Mar
11.	18 nos. of students from Douglas Memorial Higher Secondary School, Barrackpore	17 Mar
12.	22 nos. of farmers from Department of Fisheries, Raipur, Chhattisgarh	19 Mar
13.	21 nos. of rural youth of Purba Medinipur from N.S.T.I.A.M Baidyabati, Hooghly, West Bengal under Biodiverse Farming Pvt. Ltd (TONA Organization Farm) for formulating agri and allied community business	20 Mar
14.	55 nos. of students for Fisheries College and Research Institute Thoothukudi, TNJFU, Tamil Nadu	01 Apr
15.	20 nos. of final year B. F. Sc students of CoF, Tripura	03 Apr
16.	48 nos. of students from Fisheries College and Research Institute Thoothukudi, TNJFU, Tamil Nadu	04 Apr
17.	27 nos. of 6 th Semester students, Zoology from Vidyasagar College for Women Kolkata, W.B.	08 Apr
18.	12 nos. of students of the College of Fisheries Science, Gumla, Jharkhand	15 Apr
19.	36 nos. of 4 th year B. F. Sc. students from TNJFU - Dr. M. GR. Fisheries College & Research Institute Thalainayeru, Nagapettinam, Tamil Nadu	22 Apr
20.	22 nos. of students from College of Agriculture and Research Station, Raigarh, Chhattisgarh	21 May
21.	07 nos. of students from Manmathanath Girls School, Barrackpore.	26 May
22.	38 nos. of students from Mahadevananda Mahavidyalaya, Barrackpore	27 May
23.	41 nos. of Students from College of Fisheries, Mangalore	03 Jun
24.	26 nos. of rural youths of Balughat District, West Bengal under training programme of N.S.T.I.A.M Baidyabati, Hooghly, West Bengal	13 Jun
25.	21 nos. of employees from Central Bank of India, Salt Lake, Kolkata, W. B.	18 Jun
26.	24 nos. of rural youths of South 24 PGS, West Bengal from Netaji Subhas Training Institute of Agricultural Marketing, Baidyabati, West Bengal	20 Jun
27.	25 nos. of rural youths of Nadia, West Bengal from Netaji Subhas Training Institute of Agricultural Marketing, Baidyabati, West Bengal	26 Jun
28.	23 nos. of rural youths of Birbhum from Netaji Subhas Training Institute of Agricultural Marketing, Baidyabati, West Bengal	14 Aug
29.	35 nos. of 2 nd year B. F. Sc. students from Centurian University of Technology and Management, Odisha	19 Aug
30.	20 nos. of rural youths of Murshidabad from Netaji Subhas Training Institute of Agricultural Marketing, Baidyabati, West Bengal	11 Sep
31.	13 nos. of BBA students of Fisheries Enterprise Management of TNJFU, DIVA campus, ECR, Mutukkudu, Tamil Nadu	11 Sep
32.	3 nos. of 4 th year B.F.Sc. students from CoF, RPCAU, Dholi, Bihar	12 Sep
33.	20 nos. of rural youths of Jalpaiguri from Netaji Subhas Training Institute of Agricultural Marketing, Baidyabati, West Bengal	16 Sep
34.	9 nos. of 1 st year M.Sc. Zoology students from Vidyasagar University, W.B.	18 Sep
35.	11 nos. of 3 rd year B.Sc. Zoology students from Ramakrishna Mission Vidyamandir, Belur, W.B.	22 Sep
36.	26 nos. of visitors under State Institute for Rural Development and Panchayati Raj, PR&DW Dept., Govt. of Odisha	28-30 Oct
37.	22 nos. 4 th year B.F.Sc. students of GADVASU, Ludhiana, Punjab	29 Oct
38.	8 nos. of fish farmers from Himachal Pradesh	18-21 Nov

Cont'd.....



Sl. No.	Particulars of visitors	Date of visit
39.	49 nos. of 4 th year B.F.Sc. students of CoF, Karnataka Veterinary, Animal and Fisheries University	21 Nov
40.	17 nos. of 4 th year B.F.Sc. students of CoF, RPCAU, Dholi	26 Nov
41.	17 nos. of fish farmers from Paori, Garhwal, Uttarakhand	18 Dec
	Exposure visit to CIFRI, RC, Bangalore	
42.	40 B.F.Sc. Students from College of Fisheries, Payyannur, Kerala	15 Jan
	Exposure visit to CIFRI, RRC, Prayagraj	
43.	40 nos. students from Government Higher Secondary School, Mauiem, Prayagraj	03 Nov
44.	73 nos. students from Government Higher Secondary School, Manda, Prayagraj	07 Nov
45.	54 Rajkiya High School, Yekashi, Fatehpur	07 Nov
46.	70 nos. students from Government Higher Secondary School, Haswa, Fatehpur	07 Nov
47.	55 nos. students from Government Higher Secondary School, Sarrayarwani, Jaunpur	12 Nov
48.	145 nos. students from Govt. Girls Inter College in Saidabad, Prayagraj	19 Nov
49.	39 nos. students from Government Higher Secondary School, Manda, Prayagraj	21 Nov

Exhibitions/Mela ICAR-CIFRI participated

Sl. No.	Date	Exhibition at	Place
1.	06-08 Jan	<i>Bajarpur, Gramin Pradarshani o Mela ebong Mahotsav</i> organized by Alukaranbarh Seva Sangha, Contai, East Medinipur, WB	Alukaranbarh, Contai, W.B.
2.	11-14 Jan	Dhanyaganga KVK, Ramarishna Mission, Sargachi, Murshidabad, WB	Sargachi Murshidabad, W.B.
3.	17 Jan-26 Feb	Mahakumbh 2025 in Prayagraj	NMCG Pavilion, Maha kumbha 2025, Prayagraj
4.	16-19 Jan	7 th International Conference on Agriculture for food security & nutrition (Agri. Vision- 2025) organized by the society for Agriculture research and management (SARM)	OUAT, Bhubaneswar, Odisha
5.	22-26 Jan	Acharya Satyendranath Bose Smarak Bijnan Prajukti o Mela at Hedua, Kolkata	Hedua, Kolkata, W.B.
6.	01-03 Feb	"Matsya Mela" organized by ICAR -CMFRI, Kochi	Kochi, Kerala
7.	12-15 Feb	14 th Asian Fisheries and Aquaculture Forum (AFAF) at New Delhi	New Delhi
8.	13-17 Feb	2 nd Matsya Pranee Samavesh, Odisha (MPSO)- 2025 at Bhubaneswar	Bhubaneswar, Odisha
9.	24-25 Feb	Agril. Farmers Fair – 2025 at Sasya Shyamala KVK, Sonarpur, W.B.	Sonarpur, South 24 PGS, W.B.
10.	27 Feb -01 Mar	Eastern Regional Fair 2025 organized by ICAR-CRRI, Cuttack	Cuttack, Odisha
11.	28 Feb-03 Mar	14 th National Symposium on Costal Agriculture (NSCA)	CRIJAF, Barrackpore
12.	08 Jun	Viksit Krishi Sankalp Abhiyan, and Meeting of Sri. Shivraj Singh Chouhan, Hon'ble Union Minister of Agriculture and Farmers Welfare	ICAR-Indian Institute of Horticultural Research, Bangalore
13.	13-14 Jun	Agro, Food and Beverage Exposition and Conference	Netaji Indoor Stadium, Kolkata
14.	16-20 Jun	16 th Krishi Fair organized by Shree Shreekheta Soochna, Puri	Puri, Odisha
15.	12-14 Jul	2 nd IFO conference	CoF, OUAT, Berhampur, Odisha
16.	23-27 Sep	12 th Symposium on Diseases in Asian Aquaculture (DAA'12)	Chennai
17.	04-06 Nov	International Symposium on Marine Ecosystems Challenges and Opportunities (MECOS 4)	Kochi, Kerala
18.	10-13 Nov	World Aquaculture 2025	Hyderabad
19.	13-16 Nov	Krishi Mela 2025	University of Agricultural Sciences, GKVK, Bangalore
20.	20-29 Dec	<i>Sundarban Kristi Mela O Loko Sanskriti Utsab</i>	Kultali, South 24 PGS, WB
21.	21-23 Nov	World Fisheries Day and Matsymela 2025	Veterinary College Ground, Hebbal
22.	22-31 Dec	<i>Sundarbans Yuba Mela</i>	Taldi, South 24 PGS, W.B.



Awareness camps/Field Days organized

Sl. No.	Name of the field day	Date	Venue	No of participants
1.	Wetland Day celebration on 2nd February, 2025	02 Feb	Sagunabeel, Nadia, WB	60
2.	Fish harvest mela	03 Apr	Sindrani wetland, WB	145
3.	Fish harvest mela	03 Apr	Kundipur wetland, WB	85
4.	Fish harvest mela	04 Apr	Kumli wetland, WB	75
5.	Fish harvest mela	04 Apr	Bijpur wetland, WB	45
6.	Pen harvest mela	07 May	Akaipur wetland, WB	55
7.	Field Day-cum-Awareness Programme on Conservation of Endemic Fish Species of Teesta River	23-25 May	Gangtok, Pakyong, and Namchi districts, Sikkim	50
8.	Fish harvest mela	26 May	Chamardaha wetland, WB	75
9.	Viksit Bharat event	29 May	Kumlibeel, Nadia, WB	202
10.	Field Day-cum-Community Awareness Programs for Conservation of Indigenous Fishes of the Pulicat Lake	12-17 June	Andhra Pradesh and Tamil Nadu parts of Pulicat Lake	250
11.	Janjatiya Gourav Barsh Pakhawada celebration	04 Nov	Khalsibeel, Nadia, WB	60
12.	Mahila Matsyajibi Sammelan 3.0 to mark World Fisheries Day	22 Nov	Kultali, South 24 Parganas, WB	4500
13.	Interaction meeting	03 Dec	Chamta Wetland, WB	50
14.	Mahila Matsyajibi Diwas 2.0	26 Dec	Kultali, South 24 Parganas, WB	400
15.	Awareness Programme on sustainable utilisation of inland aquatic resources	28 Dec	Dinabandhu Govt. High School, Kaptipada, Mayurbhanj, Odisha	261 attendees, including local fish farmers and students



Field day-cum-awareness programme at Sikkim



Fish harvest mela from pen at Akaipur



Awareness programme at Khalsi



Awareness camp at Kultali



Meetings & Events organized

2nd Workshop on fish proteomics

A three-day workshop was organised by the institute for faculty, researchers, and students on 16-18 January 2025 at the headquarters. Dr. B.P. Mohanty, former ADG (Inland Fisheries), New Delhi, and Dr. B.K. Das, Director of ICAR-CIFRI, inaugurated the programme and emphasised the need for fish proteomics technologies and their prospects to address key areas in aquaculture. The workshop curriculum was designed to cover various proteomics techniques along with available bioinformatics resources for their applications in different areas of fisheries related to safety, quality, and health.



Fish proteomics workshop

Strengthening inland fisheries: Shri George Kurian's visit to ICAR-CIFRI

Shri George Kurian, the Hon'ble Union Minister of State for Fisheries, Animal Husbandry & Dairying, visited the ICAR-CIFRI on 21 January 2025 to review the ongoing research and advancements in the fisheries sector. As part of his visit, Shri Kurian participated in the Ganga River Ranching program by releasing 0.58 lakh advanced fingerlings of Indian Major Carp into the holy river. Following this, Shri Kurian visited the state-of-the-art laboratories and facilities at the ICAR-CIFRI campus. During the drone demonstration, the Hon'ble Minister actively interacted with the fish farmers, local fishers, and researchers.



Shri George Kurian overseeing the drone demonstration

World Wetland Day

Wetlands play an important role in providing several ecosystem services, including water purification, biodiversity conservation, fish production, and water supply, highlighting their role in ecological balance, supporting life, and improving livelihood. ICAR-CIFRI celebrated the world wetland day with the theme of the year, "Protecting wetlands for our common future," on 2nd February 2025 at Kulia beel, Nadia, West Bengal, to sensitise the fishing community of wetlands. Another sensitisation programme was organised by the Kochi research station in Ellappully, Palakkad, Kerala in collaboration with Ramassery Gandhi Ashram of Ellappully, Palakkad, and NFDB, Hyderabad, in Ellappully village. The program was inaugurated by Shri George Kurian, Hon'ble Union Minister of State for Fisheries, Animal Husbandry and



World wetland day





Inauguration of World wetland day by Hon'ble Minister at Ellappully, Palakkad, Kerala



River dialogue



Distribution of ornamental kit

Dairying and Minority Affairs. In his inaugural address, the minister said that Elappully Grama Panchayat, which has more than 500 water bodies, is suitable for inland fish farming and that the main objective of the project to be implemented in partnership with the Central and State Governments is to uplift the fish farmers with social and economic participation.

River dialogue with special emphasis on fisheries and ecology of river Ganga

As part of the 14th Asian Fisheries and Aquaculture Forum (AFAF) held in New Delhi, ICAR-CIFRI, in association with the National Mission for Clean Ganga (NMCG), organised a panel discussion on "River Dialogue with Special Emphasis on Fisheries and Ecology of River Ganga" on 13 February 2025, in NAAS, New Delhi. The session was chaired by Mr. U. P. Singh, IAS, former Director General of the National Mission for Clean Ganga (NMCG). The inaugural session was graced by Dr. J. K. Jena, Deputy Director General (Fisheries), ICAR. Dr. B. K. Das, Director of ICAR-CIFRI, highlighted the significant strides made by ICAR-CIFRI over the last eight years under the NMCG project, on restoring fish populations, economic growth of fishers, community empowerment through fisheries, biodiversity conservation, and river ecosystem health.

Popularisation of ornamental fisheries in schools of Sikkim

ICAR-CIFRI, in collaboration with the Department of Fisheries, Government of Sikkim, organised awareness cum input distribution programs to popularise ornamental fisheries in schools of Sikkim on the 07 and 10 March 2025 at Gangtok. In the state, 50 numbers of aquarium and inputs such as ornamental fishes, feed, aerators, and other accessories were distributed among 50 schools in the two districts (Gangtok and Pakyong) of Sikkim under the NEH program of the institute. Ms. Roshni Rai, Secretary, DoF, Sikkim; Dr. S. K. Majhi, Head, ICAR-CIFRI, Guwahati; and Mr. K. K. Shrestha, Director, DoF, Sikkim were present in the programme.

79th Foundation Day of the Institute

The institute celebrated its 79th Foundation Day on 17th March 2025 with great fanfare and enthusiasm. A river ranching in the sacred river Ganga was

also organized in which fish fingerlings (Rohu, Katla, Mrigal, and Bata) were released for ecological restoration and biodiversity conservation. His Holiness Shrimath Swami Shivapurnananda Ji Maharaj from Belur Math graced the occasion as chief guest, adding spiritual significance to the event.

Fish harvest melas and sensitisation programs in wetlands of West Bengal

The institute organised a “Fish harvesting mela and sensitisation programme” at Sindrani, Kundipur, Bijpur, and Kumli wetlands, North 24 Parganas, West Bengal, on 16 and 17 April 2025. The program was organised under the National Mission for Clean Ganga (NMCG) and SCSP programme. As part of the initiative, ICAR-CIFRI distributed fisheries inputs like CIFRI-HDPE pens, fish seed, fish feed, and an outboard engine fishing boat to support fisheries development in the wetland. A pen culture demonstration was conducted by stocking 150 kg of fish (*Labeo rohita*, *Labeo catla*, and *Labeo bata*) seed each in Bijpur and Kundipur and 75 kg of fish seed each in Kumli and Sindrani.

Another such harvest mela-cum-awareness programme was organised at Akaipur Wetland, North 24 Parganas, on 7 May 2025.

Ensuring sustainability: experts unite to safeguard Chilika lake's fisheries

ICAR-CIFRI, Chilka Development Authority (CDA) and the Sustainable Seafood Network of India (SSNI) organized a stakeholder workshop at ICAR-CIFRI, Barrackpore. The workshop identified potential areas of collaboration, prerequisites, and research focus. They stressed on the urgent need for a collaborative effort to tackle significant threats in inland and marine ecosystems in the region, particularly overfishing and pollution.

Viksit Krishi Sankalp Abhiyan

The Viksit Krishi Sankalp Abhiyan (VKSA) is a dedicated 15-day campaign launched on 29 May 2025 to accelerate adoption of modern, sustainable, and profitable agricultural practices across India. Under this initiative, ICAR-CIFRI, in collaboration with the Krishi Vigyan Kendras (KVKs) reached to 78,076 farmers (46,398 men and 31,678 women) across 290 villages in 13 districts in West Bengal viz, South 24 Parganas, Birbhum, Murshidabad,



Foundation day of the Institute



Stakeholder's workshop on Chilika



Dr. J. K. Jena (3rd from right) at the VKSA programme





Shri Biplab Roy Chowdhury, Hon'ble Minister of Fisheries, Govt. of W. B. at Ilish utsav



Dr. Sukanta Majumdar felicitating progressive farmers on NFFD



Inaugural session of 2nd Indian fisheries outlook

Hooghly, Jhargram, Paschim Medinipur, Nadia, Burdwan, Uttar Dinajpur, Jalpaiguri, Alipurduar, Kalimpong, and Darjeeling.

Ilish utsav

The institute, in collaboration with the National Mission for Clean Ganga, organized *Ilish utsav* 2025 during 4–6 July to promote Hilsa conservation and Bengal's cultural heritage. The festival brought together scientists, policymakers, chefs, fishers, students, and the public to enjoy variety of Ilish dishes and discuss sustainable fishing practices and inland fisheries research. The event was inaugurated by Shri Biplab Roy Chowdhury, Hon'ble Minister of Fisheries, Government of West Bengal. Exhibitions on fishing gear and preservation techniques enhanced public awareness, while fisher-scientist interactions promoted sustainable practices and livelihood opportunities. Folk performances added cultural vibrancy.

National fish farmers day

The institute celebrated National fish farmers day (NFFD) on 10 July 2025, commemorating the induced breeding breakthrough of Dr. Hiralal Chaudhury which triggered India's Blue Revolution. The Chief Guest Dr. Sukanta Majumdar, Hon'ble Minister of State, Education and Minister of Development of North Eastern, Govt. of India, inaugurated the program which was attended by 120 fishers and stakeholders. Seventeen progressive farmers from eight states were felicitated. The event also witnessed release of publications and signing of MoUs for wetland management.

2nd Indian fisheries outlook

The 2nd Indian fisheries outlook (IFO) was jointly organized by the Institute, National Fisheries Development Board, Professional Fisheries Graduates Forum and Inland Fisheries Society of India at College of Fisheries, Berhampur, Odisha during 12–14 July 2025. The inaugural session was graced by Shri Gokulananda Mallik, Hon'ble Minister, Govt. of Odisha. The event brought together policymakers, researchers, industry experts, students, and over 250 farmers. The event included 376 abstracts in seven thematic areas, including responsible fisheries, aquatic health, genetics, and climate-resilient aquaculture.

PM-KISAN utsav

The Institute, in collaboration with ICAR–Central Institute of Fisheries Education, Kolkata Centre, organized PM-KISAN utsav on 02 August 2025. The Chief Guest Shri Rajiv Ranjan Singh, Hon'ble Union Minister for Fisheries and Animal Husbandry interacted with 81 fishers and farmers from South 24 Parganas, West Bengal. The programme connected beneficiaries to the national virtual event addressed by Shri Narendra Modi, Hon'ble Prime Minister, highlighting farmer welfare schemes and strengthening fisheries-based livelihoods.

State-level workshop on Viksit Krishi Sankalp Abhiyan (VKSA) (Rabi)

A state-level workshop on VKSA for the Rabi season campaign was organized at the Institute HQs, Barrackpore. The programme aimed at strengthening agricultural planning, enhance productivity, and promote sustainable farming practices in West Bengal. Representatives from ICAR institutes, SAUs, and KVKs participated, sharing experiences from pre-kharif campaign.

The Institute also organized a hybrid interactive meeting on 8 September to formulate action plan for the Rabi Season Campaign under VKSA-2025 (3–18 October). Chaired by Director, Dr. B. K. Das and co-chaired by Dr. Pradip Dey, Director ICAR-ATARI, Kolkata the meeting involved ICAR institutes, SAUs, KVKs, and RRCs of West Bengal, addressing coordination, logistics, and multidisciplinary planning for successful campaign implementation.

Farmer–scientist interaction & PM-KISAN 21st installment telecast

On the 21st PM-KISAN installment day, ICAR-CIFRI, Barrackpore, hosted 220 fish farmers for a live telecast of the Hon'ble PM's address and farmer–scientist interaction meet. The event also includes awareness with practical scientific guidance, strengthening farmer knowledge, confidence, and community-based inland fisheries management.

Launch of Pradhan Mantri Dhan Dhaanya Krishi Yojana

The launching ceremony of the Pradhan Mantri Dhan Dhaanya Krishi Yojana took place at the Indian Agricultural Research Institute, with participation from ICAR



PM-KISAN utsav



21st PM-KISAN installment day





Launching of PM Dhan Dhaanya Krishi Yojana



Workshop on nutritional and health benefits of fish consumption

institutes and KVKs across the country. The ICAR-CIFRI organized programs both on and off campus on 11 October involving 745 farmers in the Sundarbans and 136 staff at headquarters, focusing on rabi season aquaculture practices, natural farming, and sustainable fisheries efforts.

From vulnerability to possibility: Workshop on small-scale fisheries in the Ganga basin

The ICAR-CIFRI, in collaboration with the National Mission for Clean Ganga and the University of Waterloo, Canada organized a workshop on Inland small-scale fisheries in the Ganga basin on 18 August. Experts and stakeholders discussed ecological and socio-economic challenges and recommended community-based, climate-adaptive strategies for sustainable riverine fisheries management.

Workshop on stress-free fish transportation

The Guwahati centre of the institute organized a workshop on 17 October on "Stress-free fish transportation," highlighting the eco-friendly product 'CIFRI Fish Tanavhari' for live fish and seed transport. Attended by 80 participants, including fishers, officials, and scientists, the programme featured technical sessions and live demonstrations. Another workshop on same topic was organized at the Directorate of Fisheries, Agartala, Tripura on 19 November in which 105 participants attended

Workshop on nutritional and health benefits of fish consumption

ICAR-CIFRI, in collaboration with BCPL, Dibrugarh, organized a sensitization workshop on 18 October at Sukaphaa, Borboruah, Assam, highlighting the nutritional and health benefits of fish consumption. Seventy villagers participated and learned about fish protein, omega-3 fatty acids, vitamins, and minerals beneficial for heart, brain, bone, and vision health. The program also encompassed ICAR-CIFRI's progress on nutritional profiling of 29 fish species from Sessa River and emphasized sustainable livelihoods, fish diversity conservation, and future collaboration for fisher development.

Vigilance awareness week

The institute observed Vigilance awareness week 2025 from 27 October to 2 November under the theme "Vigilance: Our Shared Responsibility." The Director administered the integrity pledge to all the staff members on the inaugural day. Throughout the week, awareness activities were carried out through posters, banners, human chain formation and walkathon to promote transparency and ethical governance. Creative and intellectual engagements included drawing, extemporaneous speech, quiz, and essay competitions involving staff members and students of local schools, fostering dialogue on integrity, accountability, and ethical conduct. The valedictory ceremony on 3 November featured prize distribution and message from Chief Guest Shri Divey Sethi, IRS, Deputy Director of GST, Kolkata.



Vigilance awareness

World antimicrobial awareness week

ICAR-CIFRI observed World antimicrobial awareness week 2025 from 18–24 November on the theme "Act Now: Protect Our Present, Secure Our Future." The events at KVK Sonarpur, and Surendranath College educated around 500 trainees, farmers, and students on antimicrobial resistance (AMR), its impact on human, animal, and aquatic health, and responsible antibiotic use. Interactive sessions, pamphlet distribution, and expert talks promoted the One Health approach.



Awareness on antimicrobial resistance

Mahila matsyajibi sammelan 3.0: Empowering women fishers in the Sundarbans

The institute organized *Mahila matasyajibi sammelan* 3.0 at Kultali, Sundarbans, to mark the World fisheries day on 21 November 2025, celebrating the role of women fishers in strengthening livelihoods. Dr. Joykrushna Jena, DDG (Fisheries Science), and Dr. Rajbir Singh, DDG (Agriculture Extension), ICAR were present on this grand day. ICAR-CIFRI distributed fingerlings and CageGrow feed to 600 SC/ST women fish-farmers across 38 hamlets under 17 Gram Panchayats. With over 4,500 participants, the program reinforced women's empowerment, sustainable aquaculture, and community resilience, supporting inclusive growth under Viksit Bharat @ 2047.



Dr. J. K. Jena speaking at Mahila matsyajibi sammelan 3.0





Quinquennial review team meeting

The Quinquennial review team (QRT) meeting for 2018–2023 at ICAR-CIFRI was held on 28–29 November 2025. The meeting was chaired by Dr. W. S. Lakra and attended by the members, Dr. W. Viswanath, Dr. V. Kripa, Dr. S. M. Shivaprakash, Dr. H. S. Murthy, and Dr. H. K. Vardia. Dr. B. K. Das highlighted the key achievements while presenting the research activities, action taken reports. The QRT praised the institute's growth, interdisciplinary initiatives, and leadership in inland fisheries.

Women in agriculture day

ICAR-CIFRI, Barrackpore, observed Women in agriculture day on 04 December 2025, highlighting the pivotal role of women in inland fisheries. Chaired by Dr. Archana Sinha, HoD, AEB Division, the programme engaged scientists, technical officers, and women scholars in group discussions on economic, social, and skill empowerment; access to resources; and resilience.



International workshop on transboundary hilsa management

An international workshop on "Transboundary hilsa fisheries management" was held at ICAR-CIFRI, Barrackpore, under the Bay of Bengal Program's BIMReN project, bringing together scientists, policymakers, NGOs, and fishermen from India, Bangladesh, and Myanmar. Organized with BOBP-IGO, Chennai, the workshop addressed Hilsa conservation, climate impacts, migration, and stock enhancement. Experts discussed transboundary challenges, data sharing, SOPs, and community-based management. Fisher–scientist interactions highlighted field realities and livelihood concerns.



Other important events



ICAR-CIFRI Annual Sports on 15-16 January, 2025



National Ranching Mission III at Prabhupada Ghat, Mayapur, West Bengal, on 16 May 2025



Independence Day -15 August, 2025



Meeting for developing plan of action for Viksit Krishi Sankalp Abhiyan on 08 September, 2025



Mahila Matsyajibi Diwas on 26 December, 2025 at Kultoli, Sundarbans



Swachh Bharat Activities

During the year various Swachh Bharat Programs were undertaken. These included: Pledge taking, regular cleaning of the office campus, sanitation and cleaning activities of surrounding areas, waste to wealth, swachhta awareness, mass mobilization, social media coverage and impact



Pledge taking during Swachhata Pakhwada: 16-31 December 2025



Human chain to raise awareness, symbolize unity and collective responsibility for cleanliness & sanitation



A Swachhata selfie point made to encourage public participation in cleanliness drives, spread awareness about hygiene, through shareable selfies



Waste to wealth (demonstration of the institute's vermi compost unit among farmers) activity



Regular campus cleaning at Kochi and Vadodara centre





Swachhata awareness at Sheoraphuly Ghat, West Bengal



Swachhata awareness at Rishra Ghat, West Bengal



Swachhta awareness during Kisan Divas at Vadodra centre



Awareness among school children at Barrackpore



Campus cleaning at Barrackpore HQ



राजभाषा कार्य

संस्थान में वर्ष 2025 के दौरान राजभाषा (हिन्दी) कार्य

वर्ष 2025 के दौरान संस्थान गतिविधियों में तिमाही रिपोर्ट का नियमित प्रेषण और पत्रिकाओं जैसे खेती में रचनाओं का प्रकाशन है।

संस्थान में हिन्दी सप्ताह 2025 का आयोजन

भाकृअनुप-केन्द्रीय अंतरस्थलीय मात्स्यिकी अनुसंधान संस्थान में हिन्दी सप्ताह दिनांक 15 से 22 सितंबर 2025 के बीच मनाया गया। इसका उद्घाटन दिनांक 15 सितंबर 2025 को संस्थान मुख्यालय में किया गया। इस समारोह में सबसे पहले राजभाषा प्रतिज्ञा ली गई। संस्थान के प्रभागाध्यक्षों ने हिन्दी के प्रयोग और प्रसार-प्रचार के साथ भावी लक्ष्य के लिए

सुझाव दिए। मुख्य प्रशासनिक अधिकारी ने राजभाषा अनुपालन को एक सांविधानिक दायित्व के रूप में परिभाषित किया। उन्होंने 'एक भारत, श्रेष्ठ भारत' का उल्लेख करते हुए बताया कि हिन्दी का प्रचार-प्रसार सिर्फ केन्द्रीय सरकार का नहीं हम सभी देशवासियों का भी दायित्व है।

सप्ताह के दौरान संस्थान कर्मियों के लिए कई प्रतियोगिताएँ आयोजित की गयीं जैसे दिनांक 15 सितंबर 2025 को अंकन एवं स्लोगन, 16 सितंबर 2025 को श्रुत लेखन, 17 सितंबर 2025 को आशुभाषण, 18 सितंबर 2025 को प्रश्नोत्तरी तथा कार्य समीक्षा और 19 सितंबर 2025 को कविता पाठ। इन प्रतियोगिताओं में संस्थान कर्मियों ने बड़े उत्साह से भाग लिया और पुरस्कार भी जीते। हिन्दी सप्ताह के दौरान एक सांस्कृतिक समारोह का आयोजन

दिनांक 19 सितंबर 2025 को किया गया। समापन समारोह दिनांक 22 सितंबर 2025 को किया गया। सबसे पहले डा. श्रीकान्त सामन्ता, प्रभागाध्यक्ष एवं सर्वकार्याधिकारी, हिन्दी कक्ष ने स्वागत सम्बोधन किया। संस्थान के निदेशक, डा. बसंत कुमार दास ने हिन्दी कार्यों की प्रगति और संस्थान द्वारा विकसित नवीन तकनीकों आदि पर प्रकाश डाला। उन्होंने सभी से राजभाषा हिन्दी के प्रचार-प्रसार के लिए सचेष्ट होने हेतु आह्वान किया। समारोह के मुख्य अतिथि, डा. अरुण होता, प्रोफेसर और प्रभागाध्यक्ष (हिन्दी), पश्चिम बंगाल राज्य विश्वविद्यालय, बारासात, पश्चिम बंगाल ने हिन्दी को एक सामासिक संस्कृति के तौर पर परिभाषित करते हुए अन्य भाषाओं से इसकी अनुकूलनीयता पर प्रकाश डाला। उन्होंने कहा कि भाषा सदैव हमें एक-दूसरे



हिन्दी सप्ताह का उद्घाटन समारोह



हिन्दी प्रतियोगिता



पुरस्कार वितरण

से जोड़ने के लिए होती है और यही हमारी संस्कृति की पहचान है। हिन्दी भाषा के प्रचार-प्रसार और कार्यान्वयन का अर्थ है—हमारी संस्कृति, अस्मिता और एकता के दिशा में प्रयास करना। इस अवसर पर एक लिफलेट, “सतत मत्स्य पालन आउट आजीविका संवर्धन में मनिका मन (बिहार)

की भूमिका” तथा मासिक हिन्दी न्यूजलेटर (सितम्बर 2025) का विमोचन किया गया। हिन्दी सप्ताह 2025 का सफल कार्यान्वयन संस्थान के निदेशक, डा. बि. के. दास के मार्गदर्शन में डा. श्रीकान्त सामन्ता, प्रभागाध्यक्ष एवं सर्वकार्याधिकारी, हिन्दी कक्ष श्री संजीव कुमार साहु, वैज्ञानिक श्री

प्रवीण मौर्य, वैज्ञानिक, डा. गुंजन कर्नाटक, वरिष्ठ वैज्ञानिक डा. सुमन कुमारी, वरिष्ठ वैज्ञानिक, सुश्री सुनीता प्रसाद, मुख्य तक. अधि. (हिन्दी) तथा श्रीमती सुमेधा दास, वरिष्ठ तकनीकी सहायक (हिन्दी) द्वारा किया गया।



हिन्दी लिफलेट का विमोचन



सांस्कृतिक कार्यक्रम की एक झलक



हिन्दी सप्ताह की रंगोली

Library and Informatics Section

The library and informatics section serve as the main repository for books and journals relevant to inland fisheries and allied disciplines and ICAR-CIFRI publications including annual reports, newsletters, bulletins, pamphlets and leaflets. Relevant publications from various agencies and institutes are also kept here. The library currently has a total of 7,882 books including 72 volumes acquired in 2025. This section had a collection of 204 Bulletins, 76 Leaflets, 5 pamphlets, and 66 ICAR-CIFRI others publications covering a diverse range of topics other than annual reports and newsletters. The library, in conjunction with the libraries of the institute's regional centres, plays a crucial role in distributing numerous ICAR-CIFRI publications to various SMDs, key government offices, and a multitude of

other institutes and universities across the country. The Library and Informatics section is structured into four distinct areas for effective management: scientific books, journals, ICAR-CIFRI publications, and Hindi books. Visitors can take advantage of a spacious reading room located on the first floor and ground floor. A mini-conference room is available for users, featuring an Android Smart TV and Wi-Fi, ideal for discussions, small group gatherings, and a range of activities. A committee constituted by Competent Authority carried out the physical verification of books and other publications in the library for the year 2024–25, as per statutory practice.

The library section features a computer linked to the KOHA server, along with a book scanner for the efficient scanning

of books and documents. This year, KOHA has transitioned to an upgraded cloud-based server version replacing the old physical server. KOHA Open-Source Library Management software oversees the library's digitized cataloguing system, accessible to users via the ICAR-CIFRI website and AGRICAT, a union catalogue open to all NARS institutes. ICAR-CIFRI is a part of Hon'ble Prime Minister's One Nation One Subscription (PM-ONOS) initiative to provide seamless, nationwide access to high-quality scholarly journals across all disciplines. The scheme is approved as a Central Sector Scheme and is being implemented by the INFLIBNET Centre, Gandhinagar providing access to 13242 journals from 33 publishers benefitting 7343 institutions of the country through login-based and campus access.



Reading section, library

Research papers

1. Alam, A, Verma RB, Kumar V, Kumar J, Thakur VR, Jha N, Bhat RA, Mishra SK, Singh U and Das BK (2025). Unlocking the limits of how large can *Erethis tesusillus* grow? *Current science* 129(3), 211-212
2. Angmo S, Akter S, Geenita K, Kumar J, Hoque M and Nayak. BB (2025). Report of *Chaetoceros abnormis* (Proschkina-Lavrenko, 1953), from the Indian Coast. *Current Science* 129(7), 587-589
3. Angom J, Singh SK, Devi AG, Das P, Biswas P, Waikhom G, Ngasotter S, Debbarma R, Debbarma S and Yadav NK (2025). Effects of substituting soyabean meal with winged bean on growth, physiological function and flesh quality of Indian Butter catfish (*Ompok bimaculatus*). *Aquaculture Nutrition*, doi:10.1155/anu/9959405
4. Akter S, Wodeyar AK, Nama S, Borah S, Angmo S, Deshmukhe G, Nayak BB and Ramteke K (2025). Phytoplankton environment dynamics in a tropical estuary of the north eastern Arabian Sea: A generalized additive model (GAM) approach. *Environmental Monitoring and Assessment* 197(2), 201
5. Bag A, Kumar, V, Adhikari A, Mandal B, Dhar S and Das BK (2025). Impact of repeated in-vitro bacterial culture on virulence and antibiotic resistance characteristics: a study of Gram-positive and Gram-negative fish pathogens. *Frontiers in Microbiology* 16, doi:10.3389/fmicb.2025.1601681
6. Bera S, Vyas V, Mandal B, Paul S, Meena DK, Bhakta D and Das BK (2025). Enhancing breeding performance of *Osteobrama belangeri* (Valenciennes, 1844): Quantitative evaluation of synthetic hormone HATCHME® dosage and water quality parameters. *Indian Journal of Fisheries* 72(2), doi:10.21077/ijf.2025.72.2.155590-08
7. Bera AK, Shaya Devi M, Mohanty D, Paria P, Chakraborty N, Dey S, Malick RC, Manna RK, Sahoo AK, Chowdhury H and Das BK (2025). Tilapia Lake Virus (TiLV), *Aeromonas caviae* and aquatic environmental variation - the triad stressors lead mass mortality in *Oreochromis niloticus* in wetlands of West Bengal, India. *Brazilian Journal of Microbiology* 56, 2169-2179
8. Bhakta D, Das BK, Kamble SP, Pandit A and Samanta S (2025). Population dynamics of *Macrobrachium rosenbergii* (De Man, 1879) from the Narmada Estuary, west coast of India. *Indian Journal of Fisheries* 72(2), doi:10.21077/ijf.2025.72.2.152318-01
9. Bhakta D, Manna RK, Das BK, Nair SM and Samanta S (2024). First report of *Cistopus platinoides* Sreeja, Norman & Biju Kumar, 2015 (Cephalopoda, Octopoda, Octopodidae) from the tropical Hooghly-Matlah estuary, West Bengal, India. *Indian Journal of Geo-Marine Sciences* 53(07), 518-525
10. Bhattacharya S, Das BK, Roy A, Das B, Parida B, Nayak P, Yateesh DC, Roshith CM, Pradhan S, Kunui A and Gogoi P (2025). Adaptive co-management and future resilience of coastal winter migratory bag net fisheries in Indian Sundarbans: Ensuring livelihood sustainability amidst climate change. *Sustainable Development*, doi.org/10.1002/sd.70288
11. Bhattacharya S, Das BK, Ekka A, Parida PK, Roy A, Lianthumluaia L, Chakraborty S and Saha A (2025). Empowering women through alternative sustainable livelihood: a case study of ornamental fish farming in India. *Frontiers in Sustainable Food Systems* 9, 1507917
12. Bharti V, Kumar T, Sarma K, Singh J, Ahirwal SK, Saurabh K, Kumari S and Kumar A (2025). Multivariate analysis of ichthyofaunal diversity in the Kasaraiya Dhar Wetland, Bihar, India. *Indian Journal of Fisheries* 72(2), 19-26
13. Bidyasagar S, Kamei R, Haobam E, Keisham S, Gogoi P, Bedajit Y, Devi B, Waikhom G, Madhulika, Mahendrajit M and Ngasotter S (2025). Spatio-temporal dynamics of phytoplankton community and their relationship with water quality in a sub-tropical young reservoir of Northeast India. *Discover Applied Sciences* 7, 1193.
14. Das A, Sun Y, Sarkar DJ, Kumar VS and Das BK (2025). Biopolymer-encapsulated calcium peroxide tablets for slow sustained release of dissolved oxygen in fish tank. *Aquacultural Engineering* 110, 102524
15. Das BK, Das Ghosh B, Ray A, Nandy SK, Chakraborty H, Kunui A, Acharjya NK, Paul S, Sahoo AK, Kumar VS and Meena DK (2025). Reproductive vulnerability of *Tenualosa ilisha* in the river Ganga: a climate-driven challenge. *Environment, Development and Sustainability*, doi.org/10.1007/s10668-025-06731-1
16. Das BK, Kumar V, Samanta S, Roy S, Sahoo AK, Bisai K, Jana AK, Chakraborty R, Adhikari A, Malick RC, Rathod SK and Majumder A (2025). Molecular characterization and virulence of fungal pathogens associated with mass mortalities in hilsa Shad (*Tenualosa ilisha*). *Scientific Reports* 15, 13957
17. Das BK, Jana S, Ray A, Bhakta D, Johnson C, Chanu TN, Dasgupta S and Ramteke MH (2025). Stock status of two commercially important catfishes, *Mystus gulio* (Hamilton 1822) and *Mystus cavasius* (Hamilton 1822), in relation to environmental variables along the lower stretches of the River Ganga, India. *Fishes* 10(4), 142
18. Das BK, Dhar S, Kumar V, Mistri A, Parida SN, Bisai K, Devnath S, Jana AK and Behera BK (2025). Morphological and molecular evidence of fish parasite *Gyrodactylus kobayashi* and *Argulus japonicus* isolated from ornamental fish (*Carassius auratus*). *Agricultural Research* 14(3), 579-590
19. Das BK, Kumar V, Samanta S, Roy S, Sahoo AK, Bisai K, Jana AK, Chakraborty R, Adhikari A, Malick RC and Rathod SK (2025). Molecular characterization and virulence of fungal pathogens associated with mass mortalities in hilsa Shad (*Tenualosa ilisha*). *Scientific Reports* 15(1), 13957
20. Das BK, Gogoi P, Malick RC, Koushlesh SK, Chakraborty R and Chakraborty S (2025). Hirakud Reservoir - the longest earthen dam in Asia: An assessment on physicochemical parameters and macrobenthic community assemblage. *Advances in Agricultural and Applied Science* 8(1), 180167
21. Das BK, Pal S, Mandal B, Gogoi P, Paul L, Saha S, Johnson C, Das A, Ray A, Roy S and Dasgupta S (2025). Integrating machine learning models for optimizing ecosystem health assessments through prediction of nitrate-N concentrations in the lower stretch of Ganga River, India. *Environmental Science and Pollution Research* 32(8), 4670-4689
22. Das BK, Tiwari NK, Mohanty TR, Roy S, Ray A, Bayen S, Gupta SD, Mondal K, Swain HS, Baitha R and Ramteke MH (2025). Response of aquatic organisms as an eco-biotic indicator with response to cyclonic intervention in the large river system - A case study of river Ganga, India during cyclone YAAS. *Tropical Cyclone Research and Review* 14(3), 249-269
23. Das BK, Bhakta D, Johnson C, Chanu TN, Ramteke MH, Chauhan SK, Ray A, Nandy S, Kunui A, Roy S, Mohanty TR, Tiwari NK, Acharjya NK, Singh K, Singh D, Jana A, Kumar A, Kayal T and Behera SK (2025). Status of Ganges River dolphin *Platanista gangetica* (Lebeck, 1801) in the lower stretch of the Ganga River, India, with emphasis on threats, conservation, and recommendations. *Frontiers in Ecology and Evolution* 13, 1523537
24. Das BK, Ganguly S, Adhikari A, Raut SS, Pradhan SP, Nag SK, Kumari K and Kumar V (2025). Comparative toxic transcriptomics of long term cypermethrin exposure to aquacultured fish *Labeo catla* (Catla). *Scientific Reports*, doi: 10.1038/s41598-025-86513-x
25. Das SK, Samanta S, Koushlesh SK, Das BK, Dey S, Mondal K and Chakraborty S (2025). Effects of accidental fly ash spillage during transit on aquatic ecosystems with special reference to the lower stretch of river Ganga. *Journal of the Inland Fisheries Society of India* 57(3): 241256
26. Das R, Meena DK, Das BK, Hassan MA and Jena K (2025). Evaluation of vitamin-mineral, anti-nutritional factor, antioxidative properties, and bioactive compound contents of *Antheraea mylittae* pupae, displaying its credentials for animal feed. *Discover Food* 5(1), 352



27. Das Sarkar S, Nag SK, Aftabuddin M, Saha A, Sahu SK, Kumari K, Bandyopadhyay S and Das BK (2025). Toxic footprints: Unveiling phenolic micropollutants of Indian freshwater ecosystems. *Science of The Total Environment* 1003, 180760
28. Das P, Behera BK, Bhakta D, Parida PK, Meena DK, Kumari K, Panda D, Majhi SK and Das BK (2025). Comparative length-weight relationship and condition factor of *Labeo gonius* (Hamilton, 1822) from six river systems in India. *Journal of Inland Fisheries Society of India* 57 (1)
29. Das P, Landge AT, Nayak BB, Ramteke K, Das BK, Majhi SK, Yadav AK, Kumar R, Saikia P, Akter S and Borah S (2025). Fish community structure and environmental drivers in a tropical river wetland continuum: A study from Brahmaputra Basin in the Eastern Himalayan Region. *Ecohydrology* 18(3), e70041
30. Deb S, Biswas P, Singh SK, Waikhom G, Debbarma R, Kashyap S, Lal J, Samal K, Malla S, Yadav NK, Devi NC, Das P, Singh NS, Reddy GD and Irungbam S (2025). Oral administration of GnRH and domperidone via gel feed 2 and its effect on reproductive performance of *Devario devario* (Bengal danio), an ornamental fish. *Gels* 11(7), 554
31. Debnath S, Karnatak G, Puthiyottill M, Lianthuamluaia L, Kumari S, Das Ghosh B, Dutta S, Borah S, Sarkar UK and Das BK (2025). Improving approaches towards climate-smart wetland fisheries with a focus on small indigenous fishes. *Sustainable Water Resources Management* 11(2), 16
32. Ganguly S, Das BK, Adhikari A and Nag SK (2025). Insights into the toxic impact of long-term exposure to diethyl phthalate on commercially important species *Catla* (*Labeo catla*). *Environmental Sciences Europe* 37(1), doi:org/10.1186/s12302-024-01048-8
33. Gogoi P, Das BK, Das SK, Mahapatra A, Jaiswar AK, Panikkar P and Ramteke K (2025). Occurrence of Isopod Parasite *Nerocila phaiopleura* Bleeker, 1857 in *Stolephorus rex* Jordan & Seale 1926 from the Rushikulya River Estuary, India is an Extension of Host Range. *Advances in Agricultural Technology and Plant Sciences* 8(1), 180175
34. Gogoi P, Das BK, Koushlesh SK, Johnson C, Malick RC, Saha A, Kayal T, Chakraborty R, Pradhan L and Das AK (2025). An integrative water quality index and multivariate modelling approach to assess surface water quality, trophic status and nutrient source apportionment in a large tropical reservoir, Hirakud – the longest earthen dam in Asia. *Applied Water Science* 15, 219
35. Hoque M, Akter S, Angmo S, Ramteke K, Sreekanth GB, Bhushan S, Naidu BC, Borah S, Nayak BB and Landge AT (2025). Preliminary insights into the environmental drivers of *Coscinodiscus* bloom in a tropical estuary. *Thalassas: An International Journal of Marine Sciences* 41, 95
36. Hoque M, Landge AT, Nayak BB, Borah S, Akter S, Geenita K, Naidu BC and Kanubhai BS (2025). First record of parasitic isopod *Nerocilas igani* Bowman & Tareen, 1983 (Crustacea, Isopoda, Cymothoida) from the West Coast of India. *National Academy Science Letters*, doi:10.1007/s40009-025-01737-9
37. Jatav SK, Sarkar DJ, Das BK, Das Sarkar S, Vanniaraj SK, Kumar R and Saha A (2025). Microplastics pollution in the Brahmaputra River and its associated ecosystems: A transboundary perspective through meta-analysis. *Water, Air, & Soil Pollution* 236(10), p672
38. Karnatak G, Das BK, Parida P, Roy A, Das AK, Lianthuamluaia L, Ekka A, Chakraborty S, Mondal K and Debnath S (2025). Effectiveness of pen aquaculture in enhancing small scale fisheries production and conservation in a wetland of India. *Frontiers in Sustainable Food Systems* 8, 1506096
39. Kamble MT, Wongprasert K, Chavan BR, Daunde VVY, Palekar GKR, Tayade SH, Thompson KD, Gabriel NN, Medhe SV and Pirarat N (2025). Red seaweeds in aquaculture: Impacts on growth, immunity, antioxidant status, gene expression, and gut health. *Annals of Animal Science*, doi:10.2478/aoas-2025-0092
40. Kumar J, Das BK, Landge AT, Alam A, Saha A, Bhushan S, Mishra SK and Borah S (2025). Phytoplankton functional groups regulated by hydrological parameters in cascading reservoirs of the subtropical Ganga River, India. *Aquatic Ecology* 59(3), 1011–1030
41. Kumar R, Raza MB, Lenka S, Borah S, Yadav AK, Yadav DK, Jena RK, Sarkar DJ, Singh D, Lenka NK, Kanwar RS, Majhi SK and Das BK (2025). Chemometric assessment of anthropogenically impacted ancient artificial wetland, Bhojtal, India, for its drinking water suitability and hydrogeochemical classification. *Water, Air, & Soil Pollution* 236, 139
42. Kumar VS, Sarkar DJ, Das BK, Samanta S, Tripathi G, Das Sarkar S and Nag SK (2025). Utilizing microalgae biofilm for reducing arsenic toxicity on fish grown in contaminated waters: An innovative solution for safer and cleaner aquaculture in arsenic endemic areas. *Aquaculture* 599, doi:10.1016/j.aquaculture.2025.742121
43. Kumar VS, Bera S, Paul S, Kundu S, Jayaswal R, Dutta S and Das BK (2025). Removal of environmentally relevant bisphenol A concentrations from contaminated waters using freshwater pond-grown microalgae biofilm. *Science of the Total Environment* 1003, 180670
44. Kumar V. Das BK, Parida PK, Adhikari A, Dalal S, Sahoo R, Mohanty TR, Jana AK and Samanta S (2025). Environmental deterioration and toxic cyanobacterial blooms (*Microcystis* and *Anabaena*) induce severe pathophysiology in *Labeo rohita*. *Science of The Total Environment* 1014, 181370
45. Kumar V, Swain HS, Das BK, Roy S, Upadhyay A and Ramteke MH (2025). Pioneering investigation of long-term emamectin benzoate exposure on *Labeo rohita*: Insight to haemato-immuno-antioxidant biomarkers, histopathological alteration, and amino acid-fatty acid profiling. *Ecotoxicology* 34, 830–844
46. Kumari K, Sinha A, Gogoi P, Chanu TN, Jana C, Borah S, Devi MS, CM Roshith, Mohanty A, Suresh VR and Das BK (2025). Morphological and molecular delineation of *Opsarius bendelisis* across the south Asia. *National Academy Science Letters*, doi:org/10.1007/s40009-025-01788-y
47. Kumar V, Das BK, Roy S, Dhar S, Bisai K, Adhikari A, Majumder A and Jana AK (2025). Environmental transition navigates phenotype switching, affecting the virulence and multidrug-resistant profile of pathogenic *Morganella morganii*. *Microbial Pathogenesis*, 202, 107430
48. Kumar V, Das BK, Adhikari A, Bisai K and Mandal B (2025). Effect of tilapia parvovirus (TiPV) on fish health: An in vitro approach. *Microbiology Research* 16(3), p68
49. Kumar V, Mitra A, Roy S, Majumder A and Das BK (2025). Disease in shrimp aquaculture: diagnosis and strategies for sustainable management. *Annals of Animal Science*, doi:10.2478/aoas-2025-0063
50. Kumar V, Samanta S, Nag SK, Sajina AM, Das BK, Saha K, Bandyopadhyay S, Paul SK and Bhowmick S (2025). Bioaccumulation and human health risk assessment of potentially toxic elements in commercially important fish species from the peninsular River Mahanadi, India. *Limnology*, doi:org/10.1007/s10201-025-00795-8
51. Kumari K, Naskar M, Aftabuddin M, Sarkar UK, Nag SK, Ghosh BD and Das BK (2025). Assessment of three prokaryote primers for concurrent and comprehensive profiling of methanogen and methanotroph community and habitat specificity in three distinct wetland sediments. *Journal of Soils and Sediments*, 25(6), 2112–2125
52. Kumari K, Lianthuamluaia L, Debnath S, Karnatak G, Puthiyottill M, Sarkar UK, Ghosh BD and Das BK (2025). Fishery and population dynamics of Asian leaf fish *Nandus nandus* (Hamilton, 1822) for sustainable management implications: Insights from West Bengal, India. *Indian Journal of Fisheries* 72(3), 27–34
53. Kumari S, Sarkar UK, Singh S, Sinha A and Das BK (2025). Optimizing induced breeding and larval rearing of the Moustached danio (*Danio danglia*) in captivity: unleashing its aquaculture potential. *Journal of the Inland Fisheries Society of India* 57(1), 41–52



54. Majhi SK, Debnath D, Sharma N, Nag SK, Sarkar SD, Kumar R, Kakati A and Das BK (2025). Formaldehyde contamination in fish samples collected from selected wholesale markets of Guwahati, Assam. *Environment and Ecology* 43 (1), 24-28
55. Mandal A, Ziauddin G, Nagesh TS, Das SK, Jana S and Bhakta D (2024). Seasonal variation in the food and feeding habits of *Setipinna taty* (Valenciennes, 1848) inhabiting the Hooghly-Matlah estuary of West Bengal, India. *Indian Journal of GeoMarine Sciences* 53 (6), 433-442
56. Nagvekar M., Jadhav RR, Chavan BR, Mulye V, Koli J, Sadawarte R, Mayekar S, Ade P and Nimbarte P (2025). Study of traditional brackish water crab traps in Ratnagiri, Maharashtra, India. *Annual Research & Review in Biology* 40(9), 24-38
57. Nagvekar MS, Jadhav RR, Chavan BR, Mulye VB, Koli JM, Sadavarte RK, Banasure AR and Ade PJ (2025). Socio-economic status of crab trap fishermen in Ratnagiri, India. *Asian Research Journal of Agriculture* 18(3), 177-186.
58. Meena DK, Das BK, Sahoo AK and Satvik K (2025). *Terminalia arjuna* bark powder as a nutritive additive for enhancing fish health and environmental sustainability. *Discover Food* 5, 61
59. Mishal P, Sarkar UK, Das BK, Ramteke M, Parakkandi J, Sajina, AM, Karnatak G, Das AK, Saha A, Swain HS and Johnson C (2025). Assessing inland cage aquaculture diversification for sustainable fisheries enhancement in a tropical reservoir. *Environment, Development and Sustainability*, doi.org/10.1007/s10668-025-06754-8
60. Mishra SK, Kumar V, Kumar J, Jha DN, Alam, A, Thakur VR, Verma SK, Singh Uand Das BK (2025). Water quality assessment of river Ganga, India using water quality index and multivariate statistical techniques. *Environmental Monitoring and Assessment* 197(3). doi.org/10.1007/s10661-025-13669-4
61. Mog B, Adiga JD, Ramesh SV, Shamsudheen M, Bhagya HP, Thondaiman V, Manjesh GN, Veena GL, Savadi S, Yadav AK, Nishad J and Mawlong I (2025). Physiological and biochemical mechanisms of salinity tolerance in Indian cashew (*Anacardium occidentale* L.). *Scientia Horticulturae* 348, 114221
62. Nag SK, Das Ghosh B, Das BK and Sarkar UK (2025). Wetlands function as carbon sink: Evaluation of few floodplains of middle Assam, Northeast India in the perspective of climate change. *Journal of Environmental Management* 373, 123841
63. Nair SM, Gogoi P, Bhakta D, Manna RK, Jana C, Sengupta A, Manna SK, Samanta S and Das BK (2025). Salinity variations drive the phytoplankton dynamics in the Gangetic estuary: insights from the modelling approach for species responses and pollution indicators along the longitudinal estuarine gradient. *Marine Pollution Bulletin* 211, 117418
64. Ongh SO, Landge AT, Ramteke K, Borah S, Barman J, Akter S, Yadav AK, Das P, Majhi SK, Chakraborty N and Das BK (2025). Fish community structure in accordance with environmental signatures in a tropical river ecosystem in the Eastern Himalayan ecoregion. *Aquatic Sciences* 87, 40
65. Panda SP, Das BK, Gadnaya A, Nandy SK, Kumar V, Pradhan SP, Raut SS, Chakrabarty R, Kunui A and Sahoo AK (2025). Deciphering the 3D structural characterization of gonadotropin-releasing hormone in *Tenualosa ilisha* using homology modelling, molecular dynamics, and docking approaches. *International Journal of Molecular Sciences* 26, 6098
66. Patil PK, Geetha R, Mishra SS, Abraham TJ, Solanki HG, Sharma SRK, Pradhan PK, Manna SK, Avunje S, Abhinaya D, Felix KT, Vinay, TN, Paniprasad K, Paria A, Raja SR, Saraswathy R, Sahoo SN, Rathod R, Rameshkumar P, Baitha R, Thomas S, Dev AK, Jayanthi M, Swain P, Sanil NK and Jena JK (2025). Unveiling the economic burden of diseases in aquatic animal food production in India. *Frontiers in Sustainable Food Systems* 9, 1480094
67. Phukan B, Kumar AP, Barman MO, Das P, Talukdar A, Kalita A, Deshmukhe G, Tamuli KK, Bhattacharjya BK and Nayak BB (2025). Integrative taxonomy reveals the first record of *Garra substrictorostri* (Actinopteri: Cyprinidae) from the Brahmaputra River Drainage, Assam, Northeastern India. *Taxonomy* 5 (4), 69
68. Pokhrel H, Sarmah R, Sharma D, Ingtipi L, Ahmed N, Bhagabati SK, Dutta R, Patowary AN, Borah S, Das UK, Dekari D and Bordoloi B (2025). Integrated biomarker response in common carp fingerlings exposed to neonicotinoid insecticide imidacloprid. *Ecotoxicology* 34, 1516-1536
69. Pagar TA, Kazi TG, Chavan BR, Mulye VB, Sharagdhara ST, Sadawarte RK, Sharangdhar MT, Mirajkar NB, Elvis T and Gheware PP (2025). Innovative aquaponic system for filtration in freshwater aquarium. *International Journal of Advanced Biochemistry Research* 9(6), 512-520
70. Parakkandi J, Das BK, Sarkar DJ, Krishnani KK, Chadha NK and K Hemaprasanth (2025). Assessment of the toxicological effects of cypermethrin nanoformulation on *Hypselobarus pulchellus* using selected biomarkers. *Fishery Technology* 62, 52 – 62
71. Pradhan SP, Chakraborty HJ, Gadnaya A, Raut SS, Sarkar DJ, Sharma A, Mishra DC, Farooqi MS, Behera BK and Das BK (2025). Comparative transcriptome analysis of *Labeo calbasu* (Hamilton, 1822) from polluted and non-polluted rivers in India. *PLOS ONE* 20(4), p.e0320358
72. Puthiyottill M, Sarkar UK, Das BK, Ramteke M, Parakkandi J, Muhammadali SA, Karnatak G, Das AK, Saha A, Swain HS and Johnson C (2025). Assessing inland cage aquaculture diversification for sustainable fisheries enhancement in a tropical reservoir: Short running title: cage aquaculture and sustainability. *Environment, Development and Sustainability* 1-20. doi:10.1007/s10668-025-06754-8
73. Rathod SK, Shaya Devi M, Bera AK, Mishra S, Das BK, Tandel RK and Manna SK (2025). Abiotic stressors influence saprolegniasis infection, causing mass mortality in *Pangasianodon hypophthalmus* and *Labeo rohita* under cage culture in Eastern India. *International Microbiology*, doi.org/10.1007/s10123-025-00721-z
74. Ramteke MH, Swain HS, Das BK, Kumar V, Behera BK, Krishnani KK, Verma AK, Samanta S, Gogoi P and Sarma D (2025). Density-dependent effects on growth performance, feed utilisation, integrated health biomarkers, and economic efficiency of Amur carp, *Cyprinus carpio haematopterus* (Linnaeus, 1758) in inland cages for sustainable production. *Frontiers in Sustainable Food Systems* 9:1701262
75. Roy A, Das BK, Debnath S, Parida PK, Karnatak G, Borah S, Pandit A, Das AK, Bhattacharya BK, Bhattacharya S, Chandra G, Mondal K, Chakraborty S and Chandra P (2025). A conceptual frame-work for sustainable governance of self-recruiting small indigenous fishes in the lower Gangetic floodplain wetlands of eastern India. *Sustainability* 2025, 17, 2226
76. Roy S, Parida PK, Ramya VL, Bhakta D, Kumar V, Behera BK and Das BK (2025). The complete mitochondrial genome of indigenous catfish *Mystus gulio*: Shotgun assembly, insight into structural characterization and phylogenetic relationships. *Agricultural Research*. doi.org/10.1007/s40003-025-00856-5
77. Sahu SK, Das Sarkar S and Naskar M (2025). Utilizing data science to assess native Indian freshwater fish taxa and their conservation status. *Science of The Total Environment* 1003, p.180695.
78. Sajina AM, Sudheesan D, Nair SM, Samanta S, Kumar V, Paul SK and Bhowmick S (2025). Evaluating ecosystem health of estuaries: functional guild and multimetric analysis of fish communities in the Mahanadi and Devi estuaries of Odisha, India. *Community Ecology* 26253-262. doi.org/10.1007/s42974-025-00244-7
79. Sajina AM, Sangeetha M Nair, Suresh VR, Maity T, Mukherjee J, Banik SK, Sandhya KM, Manna RK and Samanta R (2025) Application of otolith morphology to unveil the stock structure of Hilsa shad (*Tenualosa ilisha*) in the Bhagirathi-Hooghly river system and the associated Northern Bay of Bengal. *Regional Studies in Marine Science* 90, 104467
80. Sajina AM, Kumari S, Thachil MT, Lohith Kumar K, Manna RK and Das BK (2025) Ichthyofaunal diversity of River Kulik and Nagar, two connected transboundary rivers between India



- and Bangladesh. *Journal of Inland Fisheries Society of India* 57(2), 163–174
81. Samal K, Biswas P, Singh SK, Das P, Debbarma R, Deb S, Meena DK and Borah S (2025). Dietary melatonin boosts reproduction and growth performance of ornamental fish Giant danio (*Devario aequipinnatus*): a transformative approach for scrapping wild-caught fish business. *Aquaculture Nutrition* 15. doi.org/10.1155/anu/5540109
 82. Sanjebam B, Keisham S, Behera PR, Sreekanth GB, Ramteke K, Basudha Ch, Gogoi P, Devi S and Waikhom G (2025). Trophic dynamics and ecosystem health of a young tropical reservoir in Northeast India. *Environmental Monitoring and Assessment* 197(5), 616
 83. Sawant AN, Naik SD, Chavan BR, Meshram SJ, Ghode GS and Yadav BM (2025). Substrate addition and their effect on water quality, growth and nutritional composition of *Penaues vannamei* in biofloc-based nursery system. *Journal of Advances in Biology & Biotechnology* 28(6), 1578–1592
 84. Sathiskumar A, Saha D, Karnatak G, Chakrabarti A, Molla S, Samanta S, Das BK, Roy MN and Taron A (2025). Opportunities and potential of small indigenous fish species in the East Kolkata wetlands, India. Colombo, Sri Lanka: International Water Management Institute (IWMI). *CGIAR Sustainable Animal and Aquatic Foods Program*. 69
 85. Sharma N, Vishwanath W, Dishma M, Borah S and Das BK (2025). A New Species of the Genus *Pethia* (Teleostei: Cyprinidae) from the Brahmaputra Drainage, India. *National Academy Science Letters*, doi.org/10.1007/s40009-025-01691-6
 86. Singh GS, Das SK, Bharti VS, Devi CB, Nag SK, Sharma PM and Debnath C (2025). Comparative analysis of carbon sequestration potential in different wetland ecosystems: insights from phumdi-dominated wetlands of Northeast India. *Environmental Monitoring and Assessment* 197, 775
 87. Singh MK, Anjanayappa HN, Das BK, Bhakta D and Kumari K (2025). Unveiling a new *Puntius* species from the Brahmaputra drainage and its genetic connections with related species. *Journal of Ichthyology* 1–13. doi: 10.1134/S0032945224602586
 88. Suraj SK, Samanta S, Ghata A and Ray M (2025). Physico-chemical parameters and biological significant ions in river Ljubljana, Ljubljana, Slovenia. *Journal of Science and Technological Researches* 7(4), 1–5
 89. Sutar VB, Landge AT, Nayak BB, Panikkar P, Ananthan PS and Markad AT (2025). Spatio-temporal monitoring of water quality in the Gharni reservoir (India) by multivariate statistical tools: a case study of a reservoir located in a rainfall deficit area. *Environmental Science and Pollution Research* 32, 11145–11166
 90. Thapa A, Qureshi NW, Ananthan PS, Bhakta D and Debroy P (2025). Non-consumptive value of hilsa fishery restoration in West Bengal, India: An application of contingent valuation method. *Journal of Environmental Management* 373, 124016
 91. Vaisakh GP, Borah S, Deshmukhe G, Jaiswal AK, Sahoo AK and Das BK (2025). A study on the risk-spreading reproductive strategy in landlocked populations of anadromous tropical shad, *Tenualosa ilisha* (Hamilton, 1822), from Ukai Reservoir, in comparison to their anadromous counterparts of Narmada Estuary, India. *Thalassas* 41(4), 239
 92. Yadav AK, Raman RK, Borah S, Jha DN, Naskar M, Das SCS and Das BK (2025). Delineating impact of climatic variable (s) on commercial fish landings in a tropical river through multi-species modelling. *Indian Journal of Fisheries* 72(1), 1–9
 93. Wodeyar A, Aktar S, Nama S, Gogoi P, Ramteke K, Porail L, Nayak BB, Landge AT, Deshmukhe G and Jaiswar AK (2025). Decoding the dynamics of potentially harmful algal bloom (HAB) species, environmental influences and shellfish toxicity in a tropical mesotidal estuary. *Marine Pollution Bulletin* 215(12), 117845
- Popular articles**
1. Abdulla T, Paul TT and Sudheesan D (2025). Advancing fish health management: The role of next generation sequencing (NGS). *Biotica Research Today* 7(8), 224–226
 2. Alam A, Singh U, Kumar V, Kumar J, Jha DN, Thakur VRR, Verma DK, Verma SK, Mishra SK, Parida P and Das BK (2025). Fish production trend in cold water stretch of the Ganga river. *Science and Culture*, 91 450–452
 3. Bhattacharya S, Kumari S, Sinha A, Swain HS, Sarkar UK and Das BK (2025). First report on successfully induced breeding and larval rearing of one stripe spiny eel *Macrogynthus aral* for artificial propagation and conservation. *Science and Culture* 91. doi : 10.36094/sc.v91.2025
 4. Borah S, Sahoo AK, Meena DK, Bhattacharjya BK, Kumar N and Das BK (2025). Delineating the spatio-temporal variation in otolith microchemistry of migratory *Tenualosa ilisha* (Hamilton, 1822) from Brahmaputra River, India. *Science and Culture*, 91(3–4), 224–232
 5. Das BK, Bhattacharya A, Kunui A, Nandy SK, Chakraborty H and Sahoo AK (2025). Reviving the silver harvest: Conservation and breeding strategies to restore Hilsa populations in the middle Ganga. *The Fish World* 2(6), 645–652
 6. Das BK, Jana C, Roy A, Parida PK, Gogoi P, Mondal K and Dasgupta S (2025). Exploring drone technology towards unmanned and autonomous fisheries operations: ICAR-CIFRI's initiatives. *Biotica Research Today* 7(11), 284–288
 7. Das Sarkar S, Gogoi P, Roy A and Sinha A (2025). Feeding habits of small fishes and its habitat (in Bangla). *Krishna Jagaran* 10(7), 48–58
 8. Das P, Das BK, Bhattacharjya BK, Das SK, Tayung T, Borah S, Meena DK, Yengkokpam S, Das A, Mahanta P, Kakati A and Majhi SK (2025). Cage culture in Umiar reservoir, Meghalaya through women participation: A success story. *Biotica Research Today* 7(6), 168–172
 9. Das P, Das BK, Meena DK, Singh SK, Hoque M and Majhi SK (2025). Harmful algal biomass vis-à-vis aquatic ecosystem health. *Food and Scientific Reports* 6(12), 56–63
 10. Das P, Hoque M, Saikia B, Borah S and Majhi SK (2025). Toxic trophic transfers: Biomagnification and bioaccumulation in aquatic ecosystems. *Food and Scientific Reports* 6(7), 82–92
 11. Jesna PK, Ramya VL, Sibina Mol S and Sahoo S (2025). Plankton as bioindicators in aquatic pollution monitoring. *The Fishworld* 2(10), 1058–1063
 12. Kakati A, Sharma N, Gogoi D and Das P (2025). Ornamental fish farming for self-sufficiency: A sustainable pathway to economic independence in North-East India. *Biotica Research Today* 7(5), 150–153
 13. Kumari S, Sajina AM, Manna RK and Das BK (2025). Current status of Kavar Jheel and strategies for reviving its conservation potential. *Science Reporter* 62(9), 42–43
 14. Kumari S, Kumar A, Sajina AM, Manna RK and Das BK (2025). Reviving *Heteropneustes fossilis*: Ensuring sustainable fisheries and livelihoods. *Science and Culture* 91(11–12), 576–580
 15. Kumari S, Sajina AM, Manna RK, Das BK (2025). Nagi and Nakti twin bird sanctuaries: Conservation challenges and the sustainability needs of two ecologically important Ramsar wetlands of Bihar, India. ISSN: 3049-138X. *The Fish World* 2(4), 215–224
 16. Kumari S, Sajina AM, Manna RK and Das BK (2025). Current status of Kavar jheel and strategies for reviving its conservation potential. *Science Reporter* 42–43
 17. Kunui A, Das BK, Majumder P, Acharya NK, Singh K, Sahoo AK and Meena DK (2025). Tagging of Hilsa: An approach to study migration pattern upstream of the Ganga River. *Science and Culture* 91 (3–4), 166–172
 18. Medhe SV, Kamble MT, Anal AK, Umar M, Thompson KD, Chavan BR., Kettawan AK, Thiyajai P, Kettawan A and Pirarat, N. (2025). Comparative effects of germination and cooking processes on the functional and therapeutic properties of horse gram (*Macrotyloma uniflorum*). *Future Foods* 12, 100683
 19. Mondal A, Das BK, Mohanty TR and Ramteke MH (2025). Plankton dynamics and its influence on hilsa availability in the estuarine region of Ganga. *Science*



- and Culture 91 (3-4), 178-186
20. Mohanty TR, Kumari S, Malakar P, Mandal A, Wodeyar AK, Karnatak G and Das BK (2025). Toxin-producing cyanobacteria in the Ganga river system: spatiotemporal dynamics and environmental drivers. *Science and Culture* 91(374-379)
 21. Pal V, Kumar J and Dwivedi AC (2025). Food and feeding habits and reproductive biology of *Cabdio morar* (Hamilton, 1822). *Agri-India Today* 5(10), 172-173
 22. Pal V, Kumar J, Alam A, Kumar V and Dwivedi AC (2025). Chlorophyll a estimation from phytoplankton: A spectrophotometric method. *Agri-India Today* 5(8), 190-192
 23. Pal V, Kumar J and Dwivedi AC (2025). Biology, distribution, and conservation concerns of the Gangetic catfish *Ailia coila* (Hamilton, 1822). *Agri-India Today* 5(7), 337-338
 24. Paul TT, Abdulla T and Sudheesan D (2025). Management of reservoirs in a legally plural scenario. *Biotica Research Today* 7(1), 297-299
 25. Paul S, Das BK, Chakraborty H, Bera S, Sahoo AK, Kunui A and Nandy SK (2025). Growth trends and forecasting of Hilsa (*Tenualosa ilisha*) landing at Farakka, Godhakhali, and Diamond Harbour in River Ganga, India: Insights using autoregressive integrated moving average (ARIMA) model. *Science and Culture* 91 (3-4), 207-214
 26. Sajina AM, Kumari S, Ali Y, Manna RK and Das BK (2025) Strategies for fisheries development of Kharagpur Lake. *Science Reporter* 62(3):40-42
 27. Sibina Mol S., Ramya VL and Jesna PK (2025). Relevance of otoliths in freshwater fisheries management. *Aqua Star* 73-74
 28. Singh A, Kumar J, Alam A, Jha DN, Thakur V, Kumar V, Bhat RA and Das BK (2025). Seasonal variation of zooplankton diversity of river Ganga at Prayagraj, India. *Science and Culture* 91. 422-424.
 29. Sharma N, Kumari S, Yengkokpam S, Ray BC and Das BK (2025). First report of successful breeding of Indigenous Dwarf Chameleon fish. *World Aquaculture* 56(3), 48-51
 30. Wodeyar A, Ray A, Das BK, Singh D, Bhakta D and Johnson C (2025). A current status and conservation of freshwater fish diversity in the middle and lower stretches of Ganga River. *Science and Culture* 91(7-8), 400-404
 - Intervention Published by ICAR-CIFRI, Barrackpore. 154p.
 3. Das BK, Alam A, Kumar V, Kumar J, Jha DN, Thakur VR and Parida PK (2025). Ecological status of the upper and middle stretches of the River Ganga, In: Das BK (Eds.), *Souvenir 2nd Indian Fisheries Outlook 2025 on "Priming Indian fisheries in attaining sustainable development goals"*. ICAR-CIFRI, Barrackpore, 419p.
 4. Das BK, Kumar V and Roy S (2025). Common staining techniques in laboratories. In: Das BK (Eds.), *Laboratory techniques for fish disease diagnosis*. Singapore: Springer Nature Singapore. pp. 37-53
 5. Das BK and Kumar V (2025). *Laboratory techniques for fish disease diagnosis*. Springer, Singapore. ISBN 978-981-96-4619-7. eBook ISBN 978-981-96-4620-3. 622p.
 6. Das BK and Kumar V (2025). *Fish diseases diagnosis and treatment. Volume 04: The Protocol Series*. New India Publishing Agency (NIPA), New Delhi, India. Print ISBN: 978-93-58877-90-8. eBook ISBN: 978-93-58876-60-4. 83p.
 7. Gogoi P, Das BK, Das SK, Jaiswar AK, Panikkar P, Samanta S and Manna SK (2025). Length-weight relationship and condition factor of three mullets (Family: Mugilidae) from Rushikulya-River estuary, Odisha, India. In: Das BK (Eds.), *Aquatic Food Systems for Sustainability*. Narendra Publishing House New Delhi. pp. 142-151
 8. Kamble MT, Medhe SV, Chavan BR, Daunde VY, Palekar GR, Tayade SH, Gabriel N and Nand Pirarat N (2025). Ecotoxicological consequences of microplastics in aquatic life. In Abubakar A, Amin A and Malik MM (Eds.), *Microplastics: Ecological and food security implications*. Springer, Cham. pp. 187-220
 9. Kumar VS, Sarkar DJ, Das Sarkar S and Das BK (2024). *Microalgal Remediation in the aquatic environment*. In: *Handbook of aquatic microbiology* (1st ed.) Pandey PK, Mallik SK, Yumnam R (Eds) Boca Raton CRC Press. eBook ISBN: 9781003408543. pp. 1-11
 10. Kumar V, Sahu AK and Das BK (2025). Molecular techniques in diagnosis of fish parasitic infection. In: Das BK (Eds) *Laboratory techniques for fish disease diagnosis*. Singapore: Springer Nature Singapore. pp. 287-318
 11. Kumar V, Kumar V and Das BK (2025). Biosafety, sterilization, and disinfection protocols. In: Das BK (Eds) *Laboratory techniques for fish disease diagnosis*. Singapore: Springer Nature Singapore. pp. 17-36
 12. Kumar V, Roy S, Sahu AK and Das BK (2025). Disease in shrimp aquaculture: diagnostic technique for sustainable management. In: Das BK (Eds) *Laboratory techniques for fish disease diagnosis*, pp. 147-173
 13. Kumar V, Martin SA and Das BK (2025). *Fish disease diagnosis methods: assessment and possible applications*. In: Das BK (Eds), *Laboratory techniques for fish disease diagnosis*. Singapore: Springer Nature Singapore. pp. 175-200
 14. Majhi SK, Borah S and Das BK (2025). *Surgery in fishes*. Narendra Publishing House, New Delhi, 61p.
 15. Meena DK, Das BK, Sahoo AK, Baitha R, Borah S, Samantaray S, Mohanty D, Sadhukhan D and Kumari M (2025). State-of-the-art review: Unlocking the potential of herbal extracts and medicinal plants to boost fish health and growth performance, with a focus on *Terminalia arjuna*. In: Das BK (ed.), *Aquatic food system for sustainability*. Narendra Publishing House, New Delhi, pp. 49-93
 16. Mohanty BP, Mohanty S and Panikkar P (2025). Harnessing blue food and blue economy for sustainable agri-food systems. *Souvenir: 2nd Indian Fisheries Outlook-2025 on Envisaging blue transformation in Indian fisheries and aquaculture*. ICAR-CIFRI, Barrackpore, pp. 38-45
 17. Mohanty D, Kumari P, Bera AK, Sahoo AK, Baisakhi B, Kumari M and Das BK (2025). Emerging challenges of extended-spectrum β -lactamase producing pathogen: Laboratory strategies for detection. In: Das BK and Kumar V (eds), *Laboratory techniques for fish disease diagnosis*. Springer, Singapore, pp. 555-572
 18. Roy S, Kumar V and Das BK (2025). Fundamentals of innate immune system of shrimp. In: Das BK (Eds.), *Laboratory techniques for fish disease diagnosis*, Singapore: Springer Nature Singapore, pp. 121-145
 19. Sahu AK, Kumar V, Udgata SK and Das BK (2025). Diagnostic techniques for fish fungal diseases. In: Das BK (Eds.), *Laboratory techniques for fish disease diagnosis*. Singapore: Springer Nature Singapore, pp. 227-258
 20. Sathiskumar A, Saha D, Karnatak G, Chakrabarti A, Molla S, Samanta S, Das BK., Roy MN and Taron A (2025). Opportunities and potential of small indigenous fish species in the East Kolkata wetlands, India. Colombo, Sri Lanka: *International Water Management Institute* (IWMI). CGIAR sustainable animal and aquatic foods program. 69p.
 21. Sinha A and Sharma N (2025). Breeding technologies of a few indigenous freshwater ornamental fishes of India. In: Jain AK, Rane AJ and Sinha A (eds). *Ornamental fisheries and aquarium keeping insights from the Indian aquarium industry*. CRC press, Taylor & Francis group, pp. 159-174

Books/Book chapters

1. Das BK, Ramteke MH, Johnson C and Pandit A (2025). A compendium on Riverine fish landing and catch profile of the Mahanadi River. ICAR-CIFRI, Barrackpore, 67p.
2. Das BK, Bhattacharjya BK, Debnath D, Borah S, Yengkokpam S, Yadav AK, Das P, Das SCS, Sharma N and Majhi SK (2025). Recent development of openwater fisheries of Northeast India: ICAR-CIFRI's

Training manual

1. Alam A, Thakur VR, Kumar V, Kumar J, Chavan BR, Das BK and Jha DN (2025). *Training manual (Hindi) on "Management of open water fisheries for productivity enhancement"*. ICAR-Central Inland Fisheries Research



- Institute, Regional centre, Prayagraj, 62 p.
2. Borah S, Borah AK, Majhi SK, Yadav AK and Das BK (2025). *Meen Palan Aru Jalaj Krishi Byabosthapon*. CIFRI/Training Manual/2025/56. ICAR-Central Inland Fisheries Research Institute, Barrackpore, 72 p.
 3. Borah S, Yadav AK, Das P, Das SCS, Sharma N, Majhi SK and Das BK (2025). Sustainable beel fisheries management. CIFRI/Training Manual/2025/52. ICAR-Central Inland Fisheries Research Institute, Barrackpore, 125 p.
 4. Das BK, Roshith CM, Nair SM, Gogoi P and Bhakta D (eds.) (2025). Training manual on taxonomy, biodiversity and habitat assessment of inland fishes. ICAR-Central Inland Fisheries Research Institute, Barrackpore. CIFRI/Training Manual/2025/43, 14 p.
 5. Das BK, Manna SK, Bera AK and Shaya Devi M (2025). Training manual on fish disease diagnosis and management. ICAR-Central Inland Fisheries Research Institute, Barrackpore, India. CIFRI/Training Manual/2025/44, 127 p.
 6. Das BK, Manna RK, Lianthuamluaia L and Majhi P (2025). Ecosystem based management of wetland fisheries. Training manual No.: CIFRI/Training Manual/2025/47, ICAR-CIFRI, Barrackpore. 291p.
 7. Das BK, Bhakta D, Johnson C, Parida PK and Dash G (2025). Training manual on "Fish stock assessment in data poor inland fisheries." ICAR - Central Inland Fisheries Research Institute, Barrackpore, India. CIFRI/Training Manual/2025/, 238p.
 8. Das P, Das SCS, Borah S, Sharma N, Majhi SK and Das BK (2025). Sustainable aquaculture techniques & opportunities for entrepreneurship development. CIFRI/Training Manual/2025/50. ICAR-Central Inland Fisheries Research Institute, Barrackpore, 138 p.
 9. Das P, Das SCS, Borah S, Sharma N, Majhi SK and Das BK (2025). Sustainable utilization of wetland fisheries. CIFRI/Training Manual/2025/54. ICAR-Central Inland Fisheries Research Institute, Barrackpore, 140 p.
 10. Das SCS, Das P, Borah S, Sharma N, Majhi SK and Das BK (2025). Integrated management of wetland fisheries. CIFRI/Training Manual/2025/53. ICAR-Central Inland Fisheries Research Institute, Barrackpore, 132 p.
 11. Chanu TN, Gogoi P and Das BK (2025). Training manual on inland fisheries management. ICAR-Central Inland Fisheries Research Institute, Barrackpore, India. CIFRI/Training Manual/2024/31, 230p.
 12. Chavan BR, Alam A, Thakur VR and Das BK (2025). Training manual (Hindi) on "Training program on fish production cum residential literacy" ICAR-Central Inland Fisheries Research Institute, Regional centre, Prayagraj. CIFRI/training manual/2025/49-122p.
 13. Jha DN, Thakur VR and Kumar V (2025). Training manual (English) on "Concept building in basic statistics for biological data analysis". ICAR-Central Inland Fisheries Research Institute, Regional centre, Prayagraj-211002, 202p.
 14. Kumar R, Borah S, Yadav AK, Majhi SK and Das BK (2025). Hands-on training for water and soil quality testing in open waters. CIFRI/Training Manual/2025/ 45. ICAR-CIFRI, Barrackpore, 151 p.
 15. Majhi SK, Borah S, Yadav AK, Kumar R and Das BK (2025). Conservation of indigenous fishes. CIFRI/Training Manual/2025/46. ICAR-CIFRI, Barrackpore, 102 p.
 16. Murthy LN, Panikkar P, Ramya VL and Jesna PK (2025). Training manual on "Application of scientific tools for management of inland fisheries", ICAR-CIFRI Bangalore, India CIFRI/Training manual/2025/57
 17. Roshith CM and Manna RK (2025). Field identification of commercially important prawns in Indian inland waters. In: Inland fish taxonomy and biodiversity assessment (Das BK, Roshith, CM, Nair SM, Gogoi P eds). Training manual No.: CIFRI/Training Manual/2025/32, ICAR-CIFRI, Barrackpore, pp. 106-127
 18. Roy A, Bhakta D, Gogoi P and Das BK (2025). Training manual on "Inland fisheries management." ICAR-CIFRI, Barrackpore, India. CIFRI/Training Manual/2025, pp. 40-69
 19. Sinha, A, Maurye P and Kumari K (Eds.) (2025). Training manual: Molecular tools for aquatic resource management. Training manual No. CIFRI/Training Manual/2025/41. Published ICAR-CIFRI, Barrackpore, India. Limited edition for the Hands-on training on "Molecular tools for aquatic resource management"
 20. Sudheesan D, Paul TT and Abdulla T (Eds.) 2024. Fish and environmental monitoring tools in inland open waters. CIFRI/Training Manual/2025/39, ICAR-Central Inland Fisheries Research Institute, pp104

Technical pamphlets

1. Jesna PK, Panikkar P and Das BK (2025). Insect meal as an alternative nutrient source for freshwater fish farming. ICAR-CIFRI/Leaflet/2025/31
2. Panikkar P, Jesna PK, Saha A, Ramya VL, Mol S S and Sahoo S (2025). Culture-based fisheries (CBF): prospects for fisheries enhancement in small productive water bodies. ICAR-CIFRI/Leaflet/2025/32
3. Ramya VL, Jesna PK, Panikkar P, Saha A, Mol S S and Sahoo S (2025). Bridging the gap in fish production through fishery enhancement strategies in reservoirs. ICAR-CIFRI/Leaflet/2025/30
4. Sahoo S, Jesna PK, Panikkar P, Saha A, Ramya VL and Mol S (2025). Protecting reservoir water quality with better agricultural practices. ICAR-CIFRI/Leaflet /2025/33

Awards

ICAR-CIFRI Receives National Geospatial Practitioner Award 2025

- The institute has been awarded with the National Geospatial Practitioner Award 2025 during the Open-Source GIS Day celebrations at IIT Bombay. The award was presented to the Director, ICAR-CIFRI, Dr. B. K. Das by Padma Shri Dr. A. S. Kiran Kumar, former Chairman of ISRO, at the Victor Menezes Convention Centre. The awards aim to honour institutions and individuals advancing geospatial technology in India, particularly through open-source platforms in alignment with the National Geospatial Policy 2022 and Indian Space Policy 2023.



Dr. B. K. Das (at the middle) receiving the National Geospatial Practitioner Award

- ICAR-CIFRI Regional Centre, Guwahati was adjudged as the Best Centre of the Year 2024 by the institute. Dr. S. Borah, Scientist was awarded with Best Scientist of Year 2024 by the institute for his significant contribution in research & extension.
- Dr. Absar Alam, Senior Scientist, was awarded with the Fellow of Society of Biological Science and Rural Development (SBSRD), Prayagraj.
- Dr. Santhana Kumar V. received Best Oral presentation award at 14th Asian Fisheries and Aquaculture Forum conducted at New Delhi during 12-15, February 2025. He also received an honorable mention for Yang Yi Young Scientist Fellowship at 14th Asian Fisheries and Aquaculture Forum conducted at New Delhi during 12-15, February 2025.
- Dr. A. K. Yadav was awarded with Best oral presentation award in National seminar on "Progressive Agriculture Viksit Bharat: Preparedness for Eastern Region (PAVER 2025)" organized by the ICAR Research Complex for Eastern Region, Patna, Bihar during 21-23 Feb, 2025.
- Dr. P. Das was awarded with Best Researcher Award 2025 by Scifax Group, an International Organization for the contribution and honourable achievement in Innovative research.
- Dr. P. Das and team awarded with the Best Article Award of Food and Scientific Reports (Dec, 2025).
- Dr. N. Sharma awarded with "Ph.D in Fish Genetics and Breeding" by ICAR-CIFE, Mumbai on 08 January, 2025.
- Dr. N. Sharma awarded with the Best Oral Presentation award in International Conference on Fisheries Biotechnology held at ICAR-CIFE, Mumbai during 17-18 March 2025.
- Dr. Amiya Kumar Sahoo was awarded with the Fulbright Visiting Scholar Award by the Fulbright, USA towards developing collaborative research network and capacity building on the specific area of national priority.
- Dr. Suvra Roy received the Padma Shri Dr. S. Ayyappan Gold Medal Award in 2nd Indian Fisheries Outlook 2025 for her distinguished research contribution during July 12-14, 2025.
- Dr. Suvra Roy received the Best Oral Presentation Award in International Conference on Fisheries Biotechnology (ICFB), held at ICAR-CIFE, Mumbai, during 17-18 March, 2025.
- Dr. Jesna P. K., received the Best Oral Presentation Award in International Conference on "Sustainable Innovations in Agriculture, Veterinary and Allied Sciences" (SIAVAS-2025), organised by University of Agricultural Sciences (UAS), during 29 to 31 December 2025.
- Dr. Sonalika Sahoo, received the Best Oral Presentation Award in International Conference on "Sustainable Innovations in Agriculture, Veterinary and Allied Sciences" (SIAVAS-2025), organised by University of Agricultural Sciences (UAS), during 29 to 31 December 2025.



Dr. Suvra Roy (middle)

Recognitions to the staff members

- Dr.L.Narasimha Murthy chaired Young Talent Hunt during the 2nd Indian Fisheries Outlook 2025 “Envisaging blue transformation in Indian fisheries and aquaculture”, held at OUAT, Berhampur, Odisha from 12-14 July 2025.
- Dr. L. Narasimha Murthy delivered a talk on entrepreneurship development in fisheries during the AICTE VAANI Workshop on Application of information and communication technology in blue economy at MS Ramaiah Institute of Technology, Bangalore on 14 Nov 2025.
- Dr. L. Narasimha Murthy, chaired 8 technical sessions and delivered a lead lecture on Opportunities in inland fisheries during 21-23 November 2025 during the World Fisheries Day and Matsyamela 2025 held at Veterinary College Ground, Hebbal, Karnataka.
- Dr. L. Narasimha Murthy acted as a Domain expert for the meeting on “Revisit Karnataka inland fisheries policies” at DoF, Karnataka on 29 October 2025.
- Dr. Preetha Panikkar, Principal Scientist acted as the external examiner in the viva voce of MFSc and Ph.D thesis of ICAR- Central Institute of Fisheries Education, Mumbai
- Dr. Preetha Panikkar, Principal Scientist acted as the member of the Institute Management Committee of ICAR-CMFRI, Kochi and ICAR-NIANP, Bangalore.
- Dr. Preetha Panikkar, Principal Scientist, Regional Centre of ICAR-CIFRI Bangalore nominated as key expert by Technology Development Board, Department of Science and Technology, New Delhi.
- Dr. Preetha Panikkar, Principal Scientist, Regional Centre of ICAR-CIFRI Bangalore served as Chair at the session on freshwater fisheries resource management at the International World Aquaculture India 2025- “Aquaculture: Opportunities, Options and Optimism” held at Hyderabad, India.
- Dr. B. K. Das, Dr. S. K. Majhi and Dr. S. C. S. Das received certificate of appreciation in recognition of their significant contribution to openwater fisheries of Tripura and their unwavering support to the flood-affected fish farmers (2024-25) of the state on 17.04.2025.
- Dr. B. K. Das and Dr. S.C.S Das received recognition and appreciation certificate from the Director of Fisheries, Govt. of Tripura for their significant contribution in boosting the livelihoods of fish farmers through implementation of sustainable inland aquaculture in pens and cages and flood relief for pond aquaculture in Tripura and also for taking steps to popularize ornamental fish keeping in the schools of Tripura on 21.11.2025.
- Dr. B. K. Das and Dr. B. K. Bhattacharjya were the Member, Steering Committee for guiding the NERIWALM, Tepur team in the fisheries component of the “Study of real economic impact on the Indian side during the lean season of Brahmaputra River water by China”.
- Dr. B. K. Das acted as a Convener of the thematic session on “Water resource Management” and Co-convener of the thematic session on “Administrative reforms” in “Conclave on Development of Fishery sector in Assam” organized by Governor's Secretariat, Raj Bhavan, Guwahati during 05-06 May, 2025.
- Dr. B. K. Bhattacharjya and Dr. P. Das acted as a Co-convener of different sessions in “Conclave on Development of Fishery sector in Assam” organized by Governor's Secretariat, Raj Bhavan, Guwahati during 05-06 May, 2025.
- Dr. B. K. Bhattacharjya and Dr. Niti Sharm acted as an Expert for Phone-in-Live programme by Door Darshan Kendra (DDK), Guwahati.
- Dr. B. K. Bhattacharjya served as the Member, Board of Directors of the Assam Fisheries Development Corporation (AFDC) Ltd., Guwahati for technical advice rendered to the corporation for scientific management of beel fisheries under its administrative control.
- Dr. B. K. Bhattacharjya served as the Member, Technical Review Committee of ADB-SWIFT Project
- Dr. B. K. Bhattacharjya served as the Member, Official Language Implementation Committee of the ICAR-ATARI VI, Guwahati for rendering advice regarding use of OL in technical/ scientific communications.
- Dr. B. K. Bhattacharjya was the Expert, Ph.D. Research Presentation under the University of Science & Technology Meghalaya (USTM), Baridua, Meghalaya
- Dr. B. K. Bhattacharjya was recognized as the Member-Domain Expert of the ARIAS Society, Govt. of Assam, Guwahati
- Dr. S. K. Majhi acted as a key note speaker during the brainstorming session on “Circular economy in Agriculture: Step towards green and clean energy” at Guwahati
- Dr. S. K. Majhi acted as an Expert for programme on fisheries and aquaculture in NE region for the news channel “News18”.
- Dr. Arun Pandit, Dr. D. Bhakta, Dr. A. K. Sahoo, Dr. A. K. Yadav, Ganesh Chandra received certificate of appreciation in recognition for their significant contributions as session convener/ Member of the Organizing Sub-Committee of 14th Asian Fisheries and Aquacultures Forum (14AFAF), NASC Complex, New Delhi, India during 12-15 February, 2025.
- Dr. A. K. Yadav was deputed as Observer for Combined CBT of NET-2025, Preliminary Examination for ARS, SMS (T-6) and STO (T-6) – 2025 for smooth and fair conduct of the examination at Guwahati during 12-13 Nov, 2025.

- Dr. P. Das acted as an External Examiner for viva voce and evaluation of Ph.D. thesis in six occasions under the College of Fisheries, AAU, Raha and ICAR-Central Institute of Fisheries Education, Mumbai
- Dr. P. Das was inducted to Editorial Board as Board Member to BMC Marine Science journal published by Springer Nature.
- Dr. P. Das chaired a poster session on "Eco-conscious & Climate adaptive aquaculture (ECAA)" and Rapporteur of the session on "Aqua feed technology & Nutrigenomics application (ATNA)" in the 2nd Indian Fisheries Outlook 2025 organized at College of Fisheries, Rangailunda, Odisha during 12-14 Jul, 2025.
- Dr. S. C. S. Das acted as an external examiner for conducting viva voce of a Ph.D scholar of Department Fisheries Resource Management (FRM) College of Fisheries, AAU, Raha
- Dr. S. Borah acted as External Examiner in PhD comprehensive viva-voce examination and of a PhD scholar, Dept. of Fisheries Resource Management, CoF, AAU, Raha
- Dr. S. Borah acted as an expert in selection of Fishery Development Officers (FDOs) under Fishery Department, Government of Assam on 21.07.2025.
- Dr. N. Sharma received certificate of appreciation for her contribution in open water fisheries development in Sikkim from Department of Fisheries, Govt. of Sikkim during World Fisheries Day and Fish Festival 2025 on 21st November, 2025 at Siliguri, West Bengal
- Dr. Arun Pandit, Dr. D. Bhakta acted as session Chairs for poster presentation in 2nd Indian Fisheries Outlook 2025 under the Conference Sub-themes: Responsible Fisheries and Aquatic Ecosystem management held at College of Fisheries, OUAT, Odisha during July 12-14, 2025.
- Dr. S. K. Nag was nominated as an expert in selection committee constituted for interview of candidates for promotion to Associate Professor and Professor under the Career Advancement Scheme at Maharashtra Animal & Fishery Sciences University, Nagpur.
- Dr. S. K. Nag was an External Screening and Evaluation Committee Member for short listing of ideas received under MSME idea Hackathon at ICAR-CRIJAF, Barrackpore on 20-08-2025.
- Dr. D. Bhakta co-guided a Ph.D student of ICAR-CIFE, Mumbai, Dr. Abhilash Thapa. Title of thesis is "Valuation of fisheries provisioning services and sustainable in the Hooghly-Matlah estuarine system, India".
- Dr. Suman Kumari was selected as IUCN Commission on Ecosystem Management (CEM), for the 2021-2025.

Invited speakers

- The following scientists served as invited speakers in different fora: Dr. L. Narasimha Murthy, Dr. S.C.S. Das, Dr. Arun Pandit, Dr. R. K. Manna, Dr. A.K. Sahoo, Dr. S.K. Nag, Shri Ganesh Chandra



Dr. Arun Pandit served as the Invited Lecturer at the National Symposium on Coastal Agriculture at the ICAR-CRIJAF, Barrackpore on 01.03.2025



Dr. Santhana Kumar V. receiving Yang Yi Young Scientist Fellowship (Honourable mention) from Asian Fisheries Society, Malaysia during 14th Asian Fisheries and aquaculture forum, 2025, New Delhi, India

Linkages Developed

The institute maintained close linkages with the stakeholders involved in fisheries research and development in India and abroad. The purpose of such linkages are research and development, extension, education, outreach activities, seminars, workshops, publications, etc. During 2025, the Institute maintained linkages with the following organizations:

International Multilateral Organizations

- Food and Agriculture Organization, UN
- Bay of Bengal Programme Inter-Governmental Organization
- International Union for Conservation of Nature, Indonesia
- Network of Aquaculture Centres in Asia-Pacific, Bangkok
- World Fish Centre, Malaysia
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Germany
- SCATEC ASA, Norway

Foreign Universities

- Ghent University, Ghent, Belgium
- University of Manitoba, Canada
- University of Ottawa, Canada
- University of Waterloo, Canada
- Wageningen University, Netherlands
- Freie University, Berlin, Germany
- The University of Arizona, United States
- RMIT University, Australia
- Sylhet Agricultural University, Bangladesh

International Societies and Humanitarian Organizations

- Aquatic Ecosystem Health & Management Society, Canada
- Rotary International
- International Collective in Support of Fishworkers
- Wetlands International South Asia
- World Wide Fund for Nature, India

Linkages within India

Central Departments, Boards and Authorities

- Agrinnovate India Ltd., New Delhi
- Akashvani, Kolkata
- Brahmaputra Board, Ministry of Jal Shakti, Govt. of India

- Bureau of Indian Standards, New Delhi
- Central Water Commission, New Delhi
- Department of Animal Husbandry, Dairying and Fisheries, New Delhi
- Department of Bio-technology, New Delhi
- Farakka Barrage Authority, Murshidabad, West Bengal
- Indian Council of Social Science Research
- Indian Science Congress Association, Kolkata
- Ministry of Environment, Forest & Climate Change, Govt. of India, New Delhi
- Narmada Control Authority, Department of River Development & Ganga Rejuvenation, Ministry of Jal Shakti, Govt. of India, Indore
- National Bank for Agriculture and Rural Development
- National Biodiversity Authority
- National Fisheries Development Board, Hyderabad
- National Thermal Power Corporation (NTPC)
- National Mission for Clean Ganga, Department of River Development & Ganga Rejuvenation, Ministry of Jal Shakti, Govt. of India, New Delhi
- Zoological Survey of India, Kolkata
- Central Silk Board-CSRTI, Mysore and CTR&TI, Ranchi, Ministry of Textiles
- Central Pollution Control Board, Govt. of India
- Centre for Development of Advanced Computing, Kolkata
- State Bank of India, Kolkata

National Central Universities & Institutes

- Assam Agricultural University, Jorhat
- Banaras Hindu University, Varanasi
- Bihar Animal Science University, Patna
- Central University of South Bihar, Patna
- Chaudhury Charan Singh National Institute of Agricultural Marketing, Jaipur
- College of Fisheries, Central Agricultural University, Lembucherra, Agartala
- Department of Zoology, University of Calcutta, Kolkata
- Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur
- G.B. Pant University of Agriculture & Technology, Pantnagar
- Indian Institute of Technology, Hyderabad

- Indian Institute of Technology, Jammu
- Indian Institute of Technology, Kharagpur
- Indian Statistical Institute, Kolkata
- Visva Bharati University, Santiniketan
- Wildlife Institute of India, Chandrabani, Dehradun
- Central Agricultural University, Imphal Manipur
- National Institute of Hydrology, Roorkee, Uttarakhand

ICAR Organizations

- Dhaanyaganga KVK, Nadia, West Bengal
- Ashokenagar KVK, North 24 Parganas, West Bengal
- Gayeshpur KVK, Nadia, West Bengal
- ICAR Research Complex for NEH Region, Umiam
- ICAR-Agricultural Technology Application Research Institute, Kolkata
- ICAR-Central Institute of Brackishwater Aquaculture, Chennai
- ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar
- ICAR-Central Institute of Fisheries Education, Mumbai
- ICAR-Central Institute of Fisheries Technology, Kochi
- ICAR-Central Institute of Sub-tropical Horticulture, Regional Research Station Malda, West Bengal
- ICAR-Indian Institute of Soil and Water Conservation, Dehradun
- ICAR-Central Marine Fisheries Research Institute, Kochi
- ICAR-Central Research Institute of Jute & Allied Fibre, Barrackpore
- ICAR-Directorate of Coldwater Fisheries, Bhimtal
- ICAR-Indian Agricultural Statistics Research Institute, New Delhi
- ICAR-National Academy of Agricultural Research Management, Hyderabad
- ICAR-National Bureau of Agricultural Insect Resources, Bengaluru
- ICAR-National Bureau of Fish Genetic Resources, Lucknow
- ICAR-National Bureau of Agricultural Insect Resources, Karnataka
- Krishi Vigyan Kendra, DRPCA, Pipraikothi, East Champaran, Bihar
- CHIS-Krishi Vigyan Kendra, Malda, West Bengal
- Rathindra Krishi Vigyan Kendra, Visva-Bharati, Sriniketan, Birbhum, West Bengal



State Departments, Boards and Authorities

- Assam Fisheries Development Corporation Ltd.
- Assam Rural Infrastructure and Agricultural Services Society (ARIAS)
- Chilika Development Authority, Bhubaneswar
- Department of Fisheries & Aquatic Resources, Nagaland
- Department of Fisheries, Govt. of Gujarat
- Department of Fisheries, Govt. of Manipur
- Department of Fisheries, Govt. of Tripura
- Department of Fisheries, Govt. of Uttarakhand
- Department of Forest, Govt. of Gujarat, Ukai
- Department of Environment, Forest and Climate Change, Government of Bihar, Patna
- Department of Forest, Govt. of Odisha
- Department of Forest, Govt. of West Bengal
- Department of Forest, Govt. of Madhya Pradesh
- Directorate of Fisheries, Govt. of Andhra Pradesh
- Directorate of Fisheries, Govt. of Arunachal Pradesh
- Directorate of Fisheries, Govt. of Assam
- Directorate of Fisheries, Govt. of Bihar
- Directorate of Fisheries, Govt. of Chhattisgarh
- Directorate of Fisheries, Govt. of Himachal Pradesh
- Directorate of Fisheries, Govt. of Jharkhand
- Directorate of Fisheries, Govt. of Karnataka
- Directorate of Fisheries, Govt. of Kerala
- Directorate of Fisheries, Govt. of Madhya Pradesh
- Directorate of Fisheries, Govt. of Maharashtra
- Directorate of Fisheries, Govt. of Meghalaya
- Directorate of Fisheries, Govt. of Odisha
- Directorate of Fisheries, Govt. of Telangana
- Directorate of Fisheries, Govt. of Tripura
- Directorate of Fisheries, Govt. of Uttar Pradesh
- Directorate of Fisheries, Govt. of West Bengal
- East Kolkata Wetland Management

- Authority, Department of Environment, Govt. of West Bengal
- Gujarat Maritime Board, Bharuch
- Narmada Water Resources, Water Supply and Kalpasar Department, Gandhinagar
- Sardar Sarovar Narmada Nigam Limited
- Sundarban Development Board, West Bengal
- Swami Vivekananda State Police Academy, Barrackpore
- West Bengal Biodiversity Board
- Rural Livelihood Mission, West Bengal
- ATMA, Bhagalpur, Bihar
- Krishi Vigyan Kendra, BAU, Sabour, Bihar
- Madhya Pradesh Fisheries Federation Limited, Bhopal
- Maharashtra Pollution Control Board, Mumbai
- Meghalaya Power Generation Corporation Limited (MePGCL)

State Colleges/Universities

- Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia
- Bihar Agricultural University, Sabour, Bihar
- UP Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalay, Mathura
- Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, U.P.
- Gopal Narayan Singh University, Rohtas, Bihar
- Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya
- Bihar animal science university, Patna, Bihar
- College of Fisheries, BASU Kishanganj, Bihar
- Fakir Mohan University, Balasore
- Munger University, Bihar
- University of Kalyani, Kalyani
- West Bengal University of Animal and Fishery Sciences (WBUAFS), West Bengal
- Manipur University, Imphal
- Utkal University, Bhubaneswar
- Vidyasagar University, Midnapore
- College of Fisheries, Gumla, Jharkhand
- Vidyasagar College for Women, Kolkata
- College of Fisheries, Raha, Assam
- Hooghly Mahsin College, West Bengal
- BKC College, West Bengal
- D.M. College, Imphal
- College of Fisheries, Udgir, Maharashtra

- Tamil Nadu Dr. J. Jayalalithaa Fisheries University, Tamil Nadu
- Nehru Gram Bharti University, Prayagraj
- Maharaja Agrasen University, Solan, Himachal Pradesh
- Odisha University of Agriculture and Technology, Bhubaneswar
- Himalayan University, Arunachal Pradesh
- The Neotia University, West Bengal

Central Public Sector Units

- National Hydroelectric Power Corporation (NHPC) Limited
- North Eastern Electric Power Corporation (NEEPCO) Limited
- Satluj Jal Vidyut Nigam (SJVN) Limited
- National Thermal Power Corporation Ltd., Gaderwara
- Damodar Valley Corporation (DVC)
- Brahmaputra Cracker and Polymer Limited (BCPL)

Other Organizations/NGOs

- Assam Agribusiness and Rural Transformation Project (APART)
- Mandakini Jal Urja Private Limited, Dehradun, Uttarakhand
- BANO Charitable Trust, Odisha
- Glaucus Agrochem Pvt. Ltd., Kolkata
- M. R. Aquatech, Bhubaneswar
- NIRMAL, Odisha
- RKMVERI, Belur
- Odisha Environmental Society, Bhubaneswar
- PRADAN
- Ramakrishna Mission Ashram, Sargachi, Murshidabad
- Ramakrishna Mission Ashram, Ranchi
- Ramakrishna Mission, Bhadrak
- Ramakrishna Society of Moyna, West Bengal
- Ri-Bhoi Farmers' Union, Meghalaya
- SKSVYCS, NGO, Sundarbans
- Hemnagar Sundarban Dream, West Bengal
- Development Foundation Rural Access, New Delhi
- Envoyzyme Technology Pvt. Ltd., Hyderabad
- Das & Kumar, Varanasi, Uttar Pradesh
- Kultali Milon Tirtha Society, Kultali, South 24 Parganas
- Sindrani Fishermen Cooperative Society Ltd., North 24 Parganas
- Chamardaha Fishermen Cooperative Society Ltd., North 24 Parganas





ICAR-CIFRI in Media : 2025



Summary of Activities on social media platforms (January–December 2025)

	X (Twitter)	Facebook	Instagram	You Tube	Anyother (Threads)
No. of posts made	491	380	514	3	108
No. of posts where ICAR was tagged	479	366	414	N/A	16
No. of likes/ comments	5832	13680	17346	59	558
No. of posts shared	811	884	492	N/A	N/A



Training and Capacity Building of ICAR-CIFRI Employees

As per the training plan for the employees of the institute, there was 100% realization of trainings. During the year, Scientists of the institute attended some specialised trainings related to their disciplines e.g., digital soil mapping for environmental management and sustainability, advanced statistical and

machine learning techniques for data analysis for stress management, data analysis and visualization in R, evaluation of ecosystem services for coastal ecosystems, etc. Some of the technical persons attended training on 'Taxonomy, biodiversity and habitat assessment of inland fishes' conducted at the institute.

All categories of employees enthusiastically participated training in the iGOT platform under different competencies like domain, functional and behavioural category. Up to 31st December 2025, the institute could utilize 92.26% of BE for HRD.

Physical targets and achievements

Sl. No.	Category	Total No. of Employees	No. of trainings planned for each category of employee	Total No. of employees undergone training including iGOT during the year
1	Scientist	74	64	64
2	Technical	50	41	41
3	Administrative & Finance	44	38	38
4	SSS	17	17	17
	Total =	185	160	160

HRD budget utilization

BE 2025-26 (Rs in lakhs)	Actual expenditure (up to 31 st December 2023) (Rs in lakhs)	% Utilization of allotted budget
3.1	2.86	92.26



Participation of Staff in Workshops/Seminars/Symposia/Conferences/Meeting in India and Abroad in 2025

Sr. No.	Events	Venue	Date	Participant(s)
1.	11 th Meeting of the Scientific Advisory Committee (SAC) of the Sasya Shyamala KVK, RKMVERI	SasyaShyamala KVK, Sonarpur, South 24 Parganas, West Bengal	08 Jan	R. K. Manna
2.	Meeting of the fisheries SMD regarding finalization of RE and BE	Fisheries SMD, ICAR, New Delhi (on line)	08 Jan	B. K. Das
3.	Golden jubilee celebration of ICAR-RC for NEH Region, Umiam	ICAR-RC for NEH Region, Umiam	9-10 Jan	S. K. Majhi
4.	Awareness program on protection of plant varieties and farmers' rights (PPV & FRA) among the farming community	ICAR-NISR, Indore (online)	10 Jan	Ganesh Chandra
5.	Meeting by Jt Secy (Inland Fy, DoF, Gol) for inclusion of additional data sources for strengthening compilation of GDP estimates	DoF, Govt. of India (on line)	13 Jan	Arun Pandit
6.	Workshop on ownership matters: Copyrights and trademarks simplified	ICAR-CIRB, Hissar (online)	16 Jan	Ganesh Chandra
7.	Interactive meeting on conservation of cave fisheries of Meghalaya	DoF, Shillong	17 Jan	S. K. Majhi
8.	7th International conference on agriculture for food security & nutrition (Agri Vision - 2025)	Odisha University of Agriculture & Technology (OUAT), Bhubaneswar	17-19 Jan	B. K. Das
9.	Interactive meeting of Shri George Kurian, Minister of State for Fisheries, Animal Husbandry and Dairying and Minority Affairs, Govt. of India	ICAR-CIFRI, Barrackpore (Online)	21 Jan	All Scientists
10.	'AqualP': Online IP awareness program on intellectual property rights.	ICAR-CIFT, Kochi, and the IPTM Unit, ICAR (Online)	23-30 Jan	Ganesh Chandra
11.	Technical meeting on advanced tilapia culture project by Technology Development Board, Department of Science and Technology, New Delhi	Mudhol, Karnataka	23-24 Jan	Preetha Panikkar
12.	International seminar on 'Current environmental issues for sustainable circular economic strategies and fisheries development for a greener tomorrow'	Gurukula Kangri Vishwavidyalaya, Haridwar	28-29 Jan	B. K. Das, A. K. Das, Arun Pandit
13.	Interactive meeting on "Organic cluster in Soreng district of Sikkim"	Department of Fisheries, Govt. of India, New Delhi (Online)	28 Jan	S. K. Majhi, P. Das
14.	Interactive meeting on implementation of PM-KSSY with NER states	Department of Fisheries, Govt. of India (Online)	29 Jan	S. K. Majhi
15.	Town Official Language Implementation Committee (TOLIC) meeting	Central Manufacturing Technology Institute (CMTI), Bengaluru	30 Jan	Preetha Panikkar, Jesna P. K.
16.	Meeting with DDG (Fisheries Sc, ICAR) for upcoming AFAF at Delhi	Fisheries SMD, ICAR, New Delhi (Online)	01 Feb	B. K. Das, Arun Pandit
17.	International symposium on "SDGs Symposium 2025-tackling inequalities for sustainability and wellbeing"	Springer Nature (Online)	8 Feb	P. Das
18.	14 th Asian Fisheries & Aquaculture Forum	NASC Complex, New Delhi	12-15 Feb	B. K. Das, R. K. Manna, Arun Pandit, Preetha Panikkar, D. Bhakta, P. Gogoi, A. K. Sahoo, Absar Alam, J. Kumar, Vikas Kumar, C. Johnson, B. K. Bhattacharjya, A. K. Yadav, P. Das, S.C.S. Das, S. Borah, N. Sharma, R. Kumar

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Sr. No.	Events	Venue	Date	Participant(s)
19.	Interactive meeting on "Availability of sucker mouth catfish in waterbodies of Assam"	Meen Bhawan, Directorate of Fisheries, Govt. of Assam	13 Feb	S.K. Majhi
20.	TCAC meeting on terms and condition of licensing of CIFRI Argcure	Agrinnovate India Ltd. New Delhi	14 Feb	B. K. Das, Ganesh Chandra, D.J. Sarkar, Raju Baitha
21.	Review meeting of ATARI, Zone -VI, Guwahati	ATARI, Zone -VI, Guwahati	14 Feb	S. K. Majhi
22.	Meeting on Hirakud project, with a focus on SCSP and TSP	Bhubaneswar	14-15 Mar	B. K. Das
23.	World-Fish project meeting	NASC, ICAR (Online)	17 Feb	Arun Pandit
24.	Annual Review meeting with the Consultative Group on International Agricultural Research (CGIR) Centers (IRRI, CIMMYT, ICRISAT, ICARDA, IWMI, ICRAF, Biodiversity-CIAT alliance, IFPRI, CIP, WFC and ILRI)	DARE, Ministry of Agriculture and Farmers Welfare, Govt. of India, (Online)	17 Feb	B. K. Bhattacharjya, P. Das, S. Borah
25.	International conference on Fisheries biotechnology at ICAR-CIFE	Mumbai	18 Mar	B. K. Das
26.	Review meeting of ICAR-ITMUs through virtual mode	IP & TM Unit, ICAR, New Delhi	19 Feb	Ganesh Chandra
27.	International workshop on R for multiomics data analysis	Decode Life.	21 Feb-23 Mar	K. Kumari
28.	National seminar on "Progressive agriculture viksit Bharat: Preparedness for Eastern Region (PAVER 2025)	ICAR Research Complex for Eastern Region, Patna, Bihar (Online)	21-23 Feb	A. K. Yadav
29.	14 th National Symposium on coastal agriculture ' Harnessing fragile coastal ecosystem for food and environmental security'	ICAR-CRIJAF, Barrackpore, West Bengal	28 Feb to 03 Mar	B. K. Das, S. K. Nag, Arun Pandit, R. K. Manna, Soma Das Sarkar, D. Bhakta
30.	Post budget session webinar on "Agriculture and rural prosperity"	Ministry of Finance, Govt. of India (Online)	01 March	S. K. Majhi
31.	Rajbhasha Sammelan of Eastern and North-Eastern Region organized by Department of Official language, MHA	Mayfair Resorts, Sonapur, Kamrup (M)	5 March	A. K. Yadav
32.	International Young Researchers' Conclave and Rural Science Congress (IYRCRSC-2025)	Assam University, Silchar, Assam	6-8 March	S. C. S. Das
33.	International Conference on Fisheries Biotechnology	ICAR-CIFE, Mumbai	17-18 March	N. Sharma
34.	Aqua Biz 2.0	Hotel Avenue Centre, Kochi	18 March	Deepa Sudheesan
35.	International Conference on Sustainable Innovations in Statistics and Data Science SISR-2025	Department of Statistics and Data Science of CHRIST (Deemed to be University) Bengaluru (Online)	27-28 March	A. K. Yadav
36.	Gunvatta Manthan – One Day Discussion involving stakeholders from the testing and calibration laboratories in Kolkata organized by NABL	Kolkata	28 Mar	S. K. Nag
37.	Consultative Meeting on Integrated Fisheries Management in Sardar Sarovar Reservoir (SSR)	ICAR-CIFE, Mumbai	11 Apr	A. K. Sahoo
38.	Meeting with Managing Director of National Cooperative Consumers' Federation of India Limited (NCCF)	Elappully, Palakkad	28 Apr	Deepa Sudheesan T. T. Paul
39.	World Intellectual Property Day	ZTMC, ICAR-CIFT, Kochi (Online mode)	02 May	Ganesh Chandra

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Sr. No.	Events	Venue	Date	Participant(s)
40.	Governor, Assam conclave on "Development of fishery sector in Assam".	Assam Administrative Staff College, Khanapara	5- 6 May	B. K. Das, S. K. Majhi, B. K. Bhattacharjya, A. K. Yadav, P. Das, S.C.S. Das, S. Borah, N. Sharma, R. Kumar
41.	Expert Consultation on "Aquaculture medicines: Research, policy and implementation"	NASC Complex, New Delhi	08-09 May	S. K. Manna, A. K. Bera
42.	Discussion on ongoing project with CSB-Central Tasar Research and Training Institute (CTCRI), Ranchi	Central Silk Board, Mysuru (Karnataka)	10-11 May	B. K. Das
43.	Meeting with DDG (Fisheries Sc, ICAR) for Viksit Krishi Sankalp Abhiyan	Fisheries SMD, ICAR, New Delhi (online)	15 May	B. K. Das, Arun Pandit
44.	Foundation stone laying of Integrated Aqua Park and state level fish exhibition	Rabindra Satabarshi Bhavan, Agartala	18 May	S. C. S. Das
45.	Online meeting with Hon'ble Ag Minister for VKSA	Krishi Bhawan, New Delhi (on-line)	19 May, 24 Jun	B. K. Das, Arun Pandit
46.	Meetings with DoF, Uttarakhand	Dehradun	21-24 May	A. K. Das
47.	Webinar on voluntary carbon market in fishery and aquaculture	ICAR-CMFRI (online)	02 Jun	Arun Pandit
48.	Workshop on "Healthy aquatic ecosystems – securing the sustainability of Chilika Lake" (Organized by ICAR-CIFRI, Chilika Development Authority)	ICAR-CIFRI, Barrackpore	11 Jun	S. K. Manna, S. K. Nag
49.	Inland fisheries and aquaculture meet 2025 organized by the Department of Fisheries, Government of India	Brilliant Convention Centre, Indore	13 Jun	Sajina A. M., Lianthuamluaia, S. Samanta
50.	Workshop-cum-brainstorming session on the current status & development of a road map on genome editing for aquaculture species in India	ICAR-CIFA, Bhubaneswar	14 June	Suvra Roy
51.	Technology certification meeting	Fisheries SMD, ICAR, New Delhi (Online)	18 Jun	B. K. Das, Ganesh Chandra, Arun Pandit
52.	B2B meeting with M.M. Fish Seed Cultivation Pvt. Ltd, Bilaspur, Chhattisgarh	ICAR-CIFRI, Barrackpore	23 Jun	Ganesh Chandra, D. J. Sarkar, Hemanta Chaudhuri, Asit Bera
53.	B2B meeting with Anmol Feed (Nouriture) Pvt. Ltd, Kolkata, West Bengal	ICAR-CIFRI, Barrackpore	25 Jun	Ganesh Chandra
54.	Interactive meeting with the Faculties of College of Fisheries, Raha	College of Fisheries, Raha	25 Jun	S. K. Majhi
55.	National workshop on "Evolving a traceability framework for the fisheries value chain"	ICAR-CIFT, Kochi	26 Jun	Deepa Sudheesan
56.	National fish farmers day 2025 organized by Department of Fisheries, Sikkim	Department of Fisheries, Sikkim (Online)	10 July	N. Sharma
57.	2 nd Indian Fisheries Outlook 2025: Envisaging blue transformation in Indian fisheries and aquaculture	OUAT, Berhampur, Odisha	12-14 July	B. K. Das, P. K. Parida, Vikash Kumar, Arun Pandit, R. K. Manna, Sajina A. M., Lianthuamluaia, Pritijyoti Majhi, L. N. Murthy, Ramya V. L., Jesna P. K., Sonalika Sahoo, D. Bhakta, P. Gogoi, V.R.Thakur, A. Alam, J. Kumar, Vikas Kumar, D. N. Jha, S. K. Nag, C. Johnson
58.	97th ICAR foundation day	ICAR, New Delhi	16 July	B. K. Das
59.	Brainstorming session on 'Managing emerging environmental contaminants in aquaculture and fisheries' organized by NAAS	Online	18 Jul	B. K. Das, S. K. Nag

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Sr. No.	Events	Venue	Date	Participant(s)
60.	4 th International congress on 'Earth & geological sciences (ICEGS -2025)' organized by United Research Forum	Paris, France	July 21-22, 2025	S.K. Nag
61.	Town Official Language Implementation Committee (TOLIC) meeting	Central Manufacturing Technology Institute (CMTI), Bengaluru	30 Jul	L. N. Murthy, Jesna P.K., Gaurav Kumar
62.	VKSA 2.0 meeting with local ICAR institutes, SAUs	ICAR-CIFRI, Barrackpore	04 Aug	B.K. Das, Arun Pandit
63.	74 th FDC meeting of TB Board, Karnataka	TB Board, Karnataka (Online)	07 Aug	L. N. Murthy
64.	EFC preparation meeting with the DDG (Fisheries Sc., ICAR)	Fisheries SMD, ICAR, New Delhi (Online)	08 Aug	B.K. Das, Arun Pandit
65.	4 th International conference on recent trends and development in agricultural, biological and environmental sciences	Prayagraj	13-14 Aug	Absar Alam, Jeetendra Kumar
66.	VKSA 2.0-State level workshop	ICAR-CIFRI, Barrackpore	19 Aug	B.K. Das, A.K. Das, Arun Pandit
67.	Meeting to study the potential of integrated fish cultivation in rice fields	ICAR-CMFRI, Kochi	22 Aug	Deepa Sudheesan
68.	Meeting on "Developing trans -boundary management strategies for hilsa fishery in the Bay of Bengal region under changing climate" under BIMReN	ICAR-CIFRI, Barrackpore	26 Aug	A.K. Sahoo
69.	SLMC meeting convened by Principal Secretary, DoF, Karnataka to discuss the status of various PMMSY schemes and new action plan approvals.	DoF, Karnataka	29 Aug	L. N. Murthy
70.	Meeting with Shri Shivraj Singh Chouhan, Hon'ble Union Minister of Agriculture & Farmers Welfare and Rural Development, Government of India	ICAR-NBAIR, Bengaluru and ICAR-NIVEDI, Bengaluru	29 Aug	L. N. Murthy, Jesna P. K., SibinaMol S.
71.	International webinar on "Role of artificial intelligence in scientific writing"	Springer Nature (Online)	01 Sept	P. Das
72.	State level workshop on Viksit Krishi Sankalp Abhiyan- Rabi 2025	ICAR-CMFRI, Kochi (Online)	03 Sept	Deepa Sudheesan
73.	International conference on sustainable fisheries	Sylhet, Bangladesh	04-06 Sept	A.K. Das
74.	Stakeholder meeting for pre-assessment of Chilika Lake mud crab with Chilika Development Authority, Chilika, Odisha	Chilika Development Authority, Chilika, Odisha	9-10 Sept	B.K. Das
75.	Mid-term meeting of Regional Committee 2	ICAR-CRRI, Cuttack (Online)	12 Sept	Arun Pandit
76.	Meeting of the E-flow committee on assessment of E-flow of River Narmada downstream of Garudeshwar Weir to Bhadbhut Barrage	Kevadia, Gujarat (Online)	12 Sept	A.K. Sahoo
77.	Meeting with Sardar Sarovar Narmada Nigam Ltd.	Vadodara	13 Sept	B.K. Das
78.	NAAS Sectional committee meeting	NAAS, New Delhi	14-15 Sept	B.K. Das
79.	Viksit Krishi Sankalp Abhiyan Conference	ICAR, New Delhi	15-16 Sept	B.K. Das
80.	West Coast Regional Workshop on "Gear marking in Indian fisheries: Opportunities and challenges"	ICAR-CIFT, Kochi	19 Sept	Tanuja Abdulla
81.	12 th Symposium on Diseases in Asian Aquaculture (DAA 12)	Chennai	23-27 Sept	S.K. Manna, A.K. Bera, B.K. Das

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Sr. No.	Events	Venue	Date	Participant(s)
82.	Brainstorming session on "Extension of lease period of beel fisheries for sustainable management strategy"	Assam Fisheries Development corporation Ltd., Guwahati	07 Oct	B.K. Bhattacharjya, P. Das, S. Borah
83.	Meeting on PM Dhan Dhanya Krishi Yojana	ATARI, Kolkata (Online)	09 Oct	Arun Pandit
84.	Inauguration of PM Dhan Dhanya Krishi Yojana	Kultali, Sundarbans	11 Oct	S. Samanta, Arun Pandit, R.K. Manna, Sajina M
85.	Meeting with the Fisheries Ministry, on data digitization	Ministry of Fishery, Govt. of India (Online)	14 Oct	Arun Pandit
86.	ICAR-WorldFish project meeting	ICAR-CIFRI, Guwahati	14 Oct	B.K. Das
87.	Consultative meeting on "Ease of doing research & development (R&D)"	IIT, Guwahati, Assam	15-16 Oct	B.K. Das
88.	Conference on fish transportation	DoF, Govt of Assam	17 Oct	B.K. Das
89.	George Martin Memorial Geroscience Symposium	Nathan Shock Centre, University of Washington	20 Oct	A.K. Sahoo
90.	Expert appraisal committee meeting on River Valley Hydroelectric power projects	MoEFCC, New Delhi (Online)	31 Oct and 12 Nov	A.K. Sahoo
91.	13 th Annual meeting of the International Cytokine & Interferon Society (Cytokines 2025)	Westin in Seattle, Washington, United States	02-05 Nov	A.K. Sahoo
92.	Meeting with Dr. M. L. Jat, Secretary (DARE) and Director General (ICAR), on his visit to ICAR-NBAIR, Bengaluru	ICAR-NBAIR, Bengaluru	06 Nov	L. N. Murthy
93.	International Symposium on marine ecosystems challenges and opportunities (MECOS 4)	ICAR-CMFRI, Kochi	04-06 Nov	D. Bhakta, P. Gogoi, C Johnson, Deepa Sudheesan, Thankam Theresa Paul, Tanuja Abdulla
94.	Visiting Fulbright Professional Grant Development Workshop	Grant Training Center Arlington, Virginia, (Online)	06-07 Nov	A.K. Sahoo
95.	92nd Institute management committee meeting of ICAR-CMFRI	Online	07 Nov	Preetha Panikkar
96.	International workshop on R for genomics data science and machine learning	Online	8 Nov-3 Dec	K Kumari
97.	World Aquaculture 2025, India	Hyderabad, India	10 -13 Nov	B.K. Das, P. Panikkar, Ramya V.L., Jesna P.K., Sonalika Sahoo, Arun Pandit, S. Samanta
98.	Interactive meeting with Dr. Mohammad Muslem Uddin, Professor, Department of Oceanography, University of Chittagong, Bangladesh	ICAR-CIFRI, Kochi RS	14 Nov	T. T. Paul, Tanuja Abdulla
99.	14th All India Peoples' Technology Congress (14 AIPTC) organized by FOSET	CSIR-CMTRI, Durgapur	15-16 Nov	A.K. Das
100.	Indian Ocean Rim Association (IORA) Workshop on "Enhancing biosecurity practices in inland aquaculture farms"	Padang, West Sumatra (Online)	18-21 Nov	A.K. Sahoo
101.	Workshop on "Stress-free fish transportation: Stakeholder consultation-cum-demonstration	DoF, Govt of Tripura, Agartala	19 Nov	B.K. Das
102.	International conference on 'The pursuit for sustainable hill farming: innovations for profitability and ecological balance to ensure future Livelihood (PASEL-2025)'	ICAR Research Complex for NEH Region, Tripura Centre, Agartala	20-21 Nov	B. K. Das S. C. S. Das

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Sr. No.	Events	Venue	Date	Participant(s)
103.	World fisheries day and fish festival 2025 organized by Department of Fisheries, Sikkim	Siliguri, West Bengal	21-22 Nov	N. Sharma
104.	International fisheries summit organised by FoF, Rajshahi University, Bangladesh.	Rajshahi, Bangladesh	22 Nov	A.K. Das
105.	Fulbright visiting scholar workshop on Scientific manuscript publishing & peer reviews	Grant Training Center Arlington, Virginia, USA, (Online)	25 Nov	A.K. Sahoo
106.	Meeting with Joint Director (Central Zone), Kerala Fisheries Department	Elappully, Palakkad	29 Nov	Deepa Sudheesan, T.T. Paul
107.	International workshop on transboundary hilsa management program	ICAR-CIFRI, Barrackpore	02 Dec	A.K. Das, C Johnson
108.	Water and livelihood in Viksit Bharat 2047: Celebrating 25 Years of policy research. IWMI Tata Partners Meet	NDDDB Campus Anand, Gujarat	04-06 Dec	Ganesh Chandra
109.	Fulbright seminar on America250: Tradition, technology, and innovation in the mountain West	Colorado State University, Colorado	09-12 Dec	A.K. Sahoo
110.	Stakeholder consultation meeting on "Environmental flow (E-flow) study in the upstream reaches of Sardar Sarovar Dam"	DoWR, RD & GR / Chairman, NCA, Indore	15 Dec	A.K. Sahoo
111.	Meeting with Sardar Sarovar Narmada Nigam Ltd. (SSNNL), Gandhinagar	Ahmedabad & Gandhinagar	15-16 Dec	B.K. Das
112.	International Conference on "Modern agriculture and allied sciences (ICMAAS -2025): Bridging agriculture, engineering, policy and practice for a sustainable and resilient future"	SAAST, Odisha (Online)	20-21 Dec	P. Das
113.	Meeting with DoF, Gol in regard to formation of 2000-3000 FCS in reservoirs of India	Online	22 Dec	A.K. Das
114.	International conference on "Sustainable innovation in agriculture, veterinary and allied sciences" (SIAS -2025)	University of Agricultural Sciences (UAS), Raichur	29-31 Dec	Ramya V.L., Jesna P.K., Sibina Mol S, Sonalika Sahoo
115.	Meeting with Bharuch Authority for the hilsa station at Narmada downstream	Bharuch, Gujarat	17 Dec	B.K. Das
116.	U.P. fisheries growth and investment summit	Lucknow	17-18 Dec	B.R. Chavan



Delegates of the technical session : Socio-economic dynamics, extension and gender in fisheries and aquaculture under the 14th Asian Fisheries & Aquaculture Forum, NASC Complex, New Delhi

Distinguished Visitors



Hon'ble Governor of Meghalaya, Shri Chandrashekhar H. Vijayashankar, Hon'ble Union Minister of Agriculture and Farmers Welfare and Rural Development, Shri Shivraj Singh Chouhan; Hon'ble Chief Minister of Meghalaya, Shri Conrad K. Sangma; Director General, Indian Council of Agricultural Research, Dr. Himanshu Pathak visited the CIFRI Exhibition Stall on the occasion of Golden Jubilee Celebration of ICAR Research Complex for NEH Region, Umiam on 10 January 2025.

Barrackpore HQ

Date	Visitors
21 January	Shri George Kurian, Hon'ble Ministry of State for Minority Affairs and Fisheries, Animal Husbandry & Dairy, Govt. of India
24 February	Dr. Arun K. Dhar, University of Arizona, USA
17 March	Dr. Vibha Tandon, Director, CSIR -Indian Institute of Chemical Biology, Kolkata
13 May	Shri M. N. Sanyal, CFO, Youth Aid Foundation, Pune
04 June	Dr. Geetanjali, Director, National Food Laboratory, FSSAI, Kolkata
04 July	Shri Biplab Roy Choudhury, Hon'ble Minister of Fisheries, Aquaculture, Aquatic Resources and Fishing Harbour, Govt. of West Bengal
10 July	- Dr. Sukanta Majumdar, Union Minister of State for Education & Development of North Eastern Region, Govt. of India - Dr. Ravishankar C. N, Former Vice Chancellor & Director, ICAR-CIFE, Mumbai
22 September	Prof. Arun Hota, Head, Dept. of Hindi, West Bengal State University, Barasat, Kolkata
03 November	Mrs. Divey Sethi, GST Bhawan, Kasba, Kolkata
06 November	Ram Dayal Sharma, Joint Director (Official Language), IARI HQ, New Delhi
29 November	W. S. Lakra, Former Vice Chancellor and Director, ICAR-CIFE, Mumbai - Prof. H. Shivananda Murthy, Chair Professor & Dean, Faculty of Fisheries Science, The Neotia University, Sarisa, West Bengal & Former Registrar, Dean & Director, Karnataka Veterinary, Animal & Fisheries Sciences University - Dr. V. Kripa, Former Member Secretary, CAA - Dr. S. M. Shivaprakash, Former Dean, College of Fisheries, Mangalore - Dr. W. Vishwanath Singh, Imphal, Manipur, India - Dr. Hemendra Kumar Vardra, Former Dean, College of Fisheries, Chhattisgarh

Regional/research centres

Date	Visitors
13 January	Dr. G. K. Jha, Head, Centre for Agril. Bioinformatics Division, ICAR-IASRI, New Delhi visited the Prayagraj centre
07 February	Dr. K. K. Krishnanj Joint Director (Academics), ICAR-IIAB, Ranchi visited the Prayagraj centre
04 September	Dr. Chandra Shekhar Ayya, Former Director of Fisheries, Karnataka visited Bengaluru Regional centre
17 October	Dr. Pradip Chandra Bhuyan, Dean, College of Fisheries, Assam Agricultural University (AAU), Raha, Assam visited Guwahati Regional centre
23 October	Dr. Subhodeep Ghosh, ADG (Marine Fisheries), ICAR visited Bengaluru Regional centre
14 November	Dr. Mohammad Muslem Uddin, Professor, Department of Oceanography, University of Chittagong, Bangladesh visited Kochi Research station
18 November	Dr. Kavyashree Mahanta, IAS, Secretary to the Government of Assam, Fishery Department visited Guwahati Regional centre
18 November, 03, 05, 10 and 12 December	Shri G. S. Das, ACS, Director, Department of Fisheries, Govt. of Assam, visited Guwahati Regional centre
02 December	Dr. Arun Padiyar, Country Representative - India, WorldFish along with a team of Senior Fishery Officers of Department of Fisheries, Odisha visited Bengaluru Regional centre
03 December	Shri K. C. Samria, IAS, Additional Chief Secretary to the Govt. of Assam visited Guwahati Regional centre
04 December	Prof. Mohammad Muslem Uddin, Dept. of Oceanography, University of Chittagong, Bangladesh visited Bengaluru Regional centre
05 December	Shri Virendra Mittal, IAS, Commissioner & Secretary to the Govt. of Assam, Finance Dept. and SPD, ARIASS visited Guwahati Regional centre
10 December	Prof. Niranjana Kalita, Vice Chancellor, Assam Veterinary and Fishery University visited Guwahati Regional centre



Dr. Sukanta Majumdar (extreme left), Union Minister of State for Education & Development of North Eastern Region, Govt. of India





Shri George Kurian, Hon'ble Minister of State for Minority Affairs and Fisheries, Animal Husbandry & Dairy, Govt. of India



Dr. Chandra Shekhar Ayya at the Bengaluru Regional Centre



Shri Biplob Roy Choudhury, Hon'ble Minister of Fisheries, Aquaculture, Aquatic Resources and Fishing Harbour, Govt. of West Bengal



Dr. Gitanjali Sharma, Director, FSSI at the Barrackpore Hqs



Dr. Shubhadeep Ghosh, ADG (Marine Fisheries), ICAR visited Bengaluru Regional centre on 23 October 2025



Dr. Pradip Chandra Bhuyan, Dean, College of Fisheries, AAU, Assam visited Guwahati Regional centre on 17 October 2025

Staff as on 01.01.2026

Head Quarter, Barrackpore
Dr. B. K. Das
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Head of Divisions
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Dr. Ranjan Kumar Manna
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Shri Niranjana Kumar
Shri Divakar R





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Shri Abhishek Kumar

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Shri Gaurav Kumar



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Prayagraj

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Dr. Venkatesh Ramrao Thakur
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Shri Jeetendra Kumar Singh
Shri Ram Sajiwan
Shri Munshi Ram Rana
Shri Manish Kumar
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Shri Kanhaiya Kumar

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Shri Ravi Kumar Sonkar
Shri Anil Kumar



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Dr. Shyamal Chandra Sukla Das
Dr. Pronob Das
Mrs. Niti Sharma
Dr. Simanku Borah

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Shri Amulya Kakati
Shri Bipul Chandra Ray
Shri Arijit Ghosh
Shri Vikash Kumar Mandal
Shri Bipul Das

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Shri Soham Adhikary

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Dr. Thankam Theresa Paul
Ms. Tanuja Abdulla

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Shri P. V. Shajil



Research Station, ICAR-CIFRI, Vadodara

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Shri Tadvī Santibhai Chandubhai
Smt. Anita Ganesh Gawate

Abbreviation	Expanded form
µg	Micro gram
µS	Micro Siemens
°C	Degree Celsius
AFDC	Assam Fisheries Development Corporation
avg.	Average
Avl.	Available
BOD	Biochemical Oxygen Demand
C	Carbon
CaCO ₃	Calcium Carbonate
CCC	Criterion Continuous Concentration
Cd, Cr, Cu, Pb, Zn, Fe	Cadmium, Chromium, Copper, Lead, Zinc, Iron
CF	Cat Fishes
Chl-a	Chlorophyll a
Cm	Centimetre
CP	Crude Protein
CPUE	Catch per Unit Effort
DD	Data Deficient
DO	Dissolved Oxygen
DOM	Dissolved Organic Matter
EC	Electrical Conductivity
EN	Endangered
ESBN	Estuarine Set Bag Net
FAD	Fish Aggregating Device
FCE	Feed Conversion Efficiency
FCR	Feed Conversion Ratio
FRL	Full Reservoir Level
g/gm	Gram
GPP	Gross Primary Productivity
ha	Hectare
hr	Hour
IMC	Indian Major Carps
IUCN	International Union for Conservation of Nature
kg	Kilogram
km	Kilometre
L	Litre
LC	Least Concern
m	Metre
mg	Milligram
mgC	Milligram Carbon
ml	Milli litre
Mm	Millimetre
Mn	Manganese
MON	Monsoon
MP	Micro Plastics
mS	Specific Conductivity
MT	Metric Tonnes
N	Nitrogen
NE	Not Evaluated
nos.	Numbers
NP	National Park



Abbreviation	Expanded form
NT	Near Threatened
NTU	Nephelometric Turbidity Unit
OC	Organic Carbon
P	Phosphorous
P2 O5	Phosphorus Pentoxide
PCA	Principal Component Analysis
PER	Protein Efficiency Ratio
PFCS	Primary Fishermen Cooperative Society
POM	Post Monsoon
Ppt	Parts per thousand
PRM	Pre Monsoon
R ²	Coefficient of determination
RA	Relative Abundance
Rs.	Indian Rupees
SCSP	Scheduled Caste Sub Plan
SD	Standard Deviation
T	Ton
TDS	Total Dissolved Solids
TSI	Trophic State Index
U	Unit
u/L	Unit/litre
UP	Uttar Pradesh
VU	Vulnerable
WBNF	Winter Bagnet Fishery
WMBN	Winter Migratory Bag Net
Yr	Year

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