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EDITORIAL

GANGA FISHERIES TOWARDS VIKSHIT BHARAT

The river Ganga, often hailed as the "Lifeline of India," holds unparalleled cultural, ecological, and economic significance. Stretching over 2,525 km, it is the largest river in India and ranks fifth globally. Traversing five Indian states, Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, and West Bengal, it sustains more than 400 million people, nearly 40% of the national population. The Ganga supports multiple sectors including drinking water, sanitation, irrigation, fisheries, hydropower, transportation, tourism, and recreation. Beyond its utilitarian value, the river is revered in Indian culture as a sacred purifier and spiritual entity. It also plays a vital role in mitigating water scarcity, with India's annual per capita water availability now standing at just 1,588 m^3. However, the Ganga has faced severe ecological stress due to unchecked urbanisation, industrialisation, population pressure, and unsustainable tourism. Agricultural runoff containing chemical fertilizers has resulted in nutrient loading, eutrophication, and harmful algal blooms. The influx of untreated sewage and industrial pollutants is posing a serious threat to the river health and the communities that depend on it.

To counter these challenges, the Government of India launched the Namami Gange Mission in 2014 under the Ministry of Jal Shakti. This flagship programme rests on four core pillars: Nirmal Ganga (Unpolluted River), Aviral Ganga (Continuous Flow), Jan Ganga (Public Participation), and Gyan Ganga (Knowledge & Research Management). It promotes river rejuvenation through community involvement, scientific interventions, and inter-sectoral cooperation, fostering ecological and cultural harmony. One of the lesser-highlighted yet critical areas in the Ganga's rejuvenation is its fisheries sector. Between 2016 and 2025, significant spatial and seasonal variations in water quality across 19 stations have influenced ecological health and fish biodiversity. Research by ICAR-Central Inland Fisheries Research Institute (CIFRI) under National Mission for Clean Ganga revealed a notable increase in fish species richness. In Tehri, Uttarakhand, species diversity rose from 3 to 9. Mid-river stretches like Haridwar witnessed a jump from 10 to 27 species, indicating improved biodiversity. In Uttar Pradesh, Bijnor showed a remarkable increase from 69 to 109 species. Downstream, in West Bengal, species counts rose from 77 to 85 at Farakka and from 62 to 70 at Fraserganj, reflecting a healthier estuarine environment.

The widespread use of non-selective and destructive fishing practices like, zero-mesh nets, poison, and fishing during breeding seasons, has severely impacted fisheries. Recognising this, ICAR-CIFRI has been conducting regular assessments, emphasizing the urgent need for sustainable fishery practices and long-term biodiversity monitoring. Since 2017, over 130 ranching programmes have been carried out across five states, releasing more than 1.48 crore fingerlings of Indian Major Carps (IMCs), Mahseer, and native species bred from Gangetic brooders. While Phase I (2016–2020) focused on IMCs like *Labeo calbasu*, Phase II (2020 onward) has expanded to include *Tor putitora*, *Labeo bata*, *Systomus sarana*, *Macrobrachium rosenbergii*, and catfishes like *Heteropneustes fossilis* and *Mystus cavasius*. These initiatives aim to restore fish stock, enhance ecological balance, and promote riverine biodiversity. These efforts not only promote biodiversity but also support food and nutritional security. In fact, ICAR-CIFRI has assessed the nutritional value of 71 Gangetic fish species, underscoring their significance for the health of millions.

To strengthen grassroots conservation, 256 awareness programs have educated over 15,800 fishers across five states about the goals of ranching, the dangers of unsustainable fishing, and the importance of breeding season protection (June–August). The Ganges River Dolphin, India's National Aquatic Animal, is an indicator species that reflects the overall health of the Ganga. The species is also now threatened by pollution, habitat loss, and unsustainable fishing. The institute is now working on Dolphin conservation through public awareness involving local communities.

The Ganga fishery plays a critical role in supporting the livelihoods of an estimated 10–13 million people across approximately 3,700 fishing villages in 47 districts along the river's course. With an annual inland fish catch of nearly 56,387 tonnes, it contributes significantly to local economies, food security, and rural employment. Sustaining and enhancing fishery resources requires a multi-pronged approach: ensuring clean and uninterrupted water flow, protecting fish habitats, breeding grounds, and regulating destructive fishing practices. The active involvement of fishing communities through capacity-building, awareness programs, and the promotion of sustainable gear and practices are equally important. By investing in water quality management, habitat conservation, and community participation, the Ganga fishery can become a model of sustainable inland fisheries, contributing not only to nutritional security but also to prosperous future.

As India moves toward the ambitious goal of Viksit Bharat @2047, the rejuvenation of the Ganga River must be envisioned beyond pollution abatement, it must become a platform for inclusive sustainable development. Fisheries, often overlooked in mainstream conservation discourse, represent a vital link between ecological integrity and rural livelihoods. With over 10 million people directly or indirectly dependent on riverine fisheries across the Gangetic basin, the sector holds immense potential to contribute to nutritional security, employment generation, and poverty alleviation. Therefore, integrating fisheries development into the core strategy of river restoration is not only ecologically prudent but also socially. Empowering traditional fishing communities through training, access to markets, institutional support, and conservation-linked incentives can make them stewards of the river's health. With sustained investment, monitoring, and community engagement, Ganga fisheries can evolve into a national model for sustainable inland fisheries, balancing productivity with conservation. By doing this, the Ganga will not only remain a symbol of spiritual heritage but also become a sign of future growth and well-being, truly reflecting the vision of a strong and inclusive Viksit Bharat. ❐

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Dr. Das Developed Linkages with Worldfish, NACA, FAO, GIZ, SAARC, BOBP, IUCN, World Bank, RMIT University, Waterloo University, University of Manitova, University of Aberdeen, TWAS, MoEF&CC, Ministry of Jalshakti, DoF, NMCG, NFDB, CPCB, CWC, State Fisheries Departments. Guided 25 Ph.D. and 35 Masters students including 2 post Doc and 2 international students. Signed 11 MOU with the Govt. department, 3 MoU for commercial, 7 MoU for consultancy project. 2 MoU for research collaboration and 3 MOU for academic and research collaboration. More than 355 international publications having Citations–12895, h-index – 50, i10 index – 216.

Received Awards/Honours like Jawaharlal Nehru Award for outstanding post graduate research conferred by ICAR 1999; Lal Bahadur Shastri Young Scientist Award conferred by ICAR for the biennium 1999- 2000; Dr. Hiralal Chaudhuri Annual Awards 2001-2002; DBT Overseas Associateship 2005; Krushakbandhu Award by Orissa Krushak Samaj 2011; Dr. M.S. Swaminathan Award for Best Indian Fisheries Scientist by Professional Fisheries Graduates Forum 2011; Krushi Ratna Award from Orissa Krushak Samaj 2016; Eminent Zoologist of the Year Award by Zoological Society of India 2017; Krushak Gourav Award from Orissa Krushak Samaj 2017;Cashless Award for making ICAR-CIFRI a Cashless Office, ICAR, New Delhi, 2017; Ganesh Chandra Vidyarthi Award for Hindi Journal, Nilanjali, ICAR, New Delhi, 2018; Best annual Report Award of ICAR-CIFRI, ICAR, New Delhi, 2019; Sardar Patel Outstanding ICAR Institution Award-2020 under Large Institute Category, ICAR, New Delhi, 2020; Rafi Ahmed Kidwai Award for Outstanding Research in Agricultural Sciences under Animal & Fisheries Sciences Category, ICAR, New Delhi, 2020; Ganesh Chandra Vidyarthi Appreciation Award for Hindi Journal, Nilanjali, ICAR, New Delhi, 2020; Agri-Food Empowering India awards 2021; Special Felicitation for outstanding and exceptional contribution to the Nation by State Bank of India, 2022. He is a Fellow of the International Society for Environmental Protection (ISEP); Member, Executive Council, India Science Congress Association for the year 2020-2021; Member, The National Academy of Sciences, India.

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Dr. Pranaya Kumar Parida, Ph.D. in Fisheries Resource Management, has over 20 years of experience in fisheries research, teaching, and extension. His doctoral work focused on fish biology and stock assessment. He holds expertise in fish stock assessment, ECOPATH modelling, GIS, and aquaculture, and has conducted over 50 training programs for farmers, students, and government officials across India. Dr. Parida began his career as a Fishery Extension Officer in Odisha in 2004, later joining the national NGO Action for Food Production as a Fisheries Specialist. There, he led a UNDP project focused on applying ICT tools for risk reduction and livelihood development of marine fishers in Odisha. He also served as the State Livelihood Specialist under the World Bank-funded National Rural Livelihood Mission (NRLM) for the Government of Odisha.

Before joining the Indian Council of Agricultural Research (ICAR) as a Scientist in 2015, he worked as an Assistant Professor in Fisheries Resource Management at the College of Fisheries, GADVASU, Ludhiana. Dr. Parida has made significant contributions to enhancing fish production strategies in large inland water bodies and conducted stock assessment and ECOPATH modelling studies in Chilika Lagoon. He was awarded the prestigious ENDEAVOUR Fellowship for postdoctoral research at RMIT University, Melbourne, where he received training on aptamer-based nano-biosensors for aquatic pollution detection. He also received the Netherlands Fellowship Programme (NFP) award, ICAR-JRF, Sir Dorabji Tata Trust Fellowship, the Gold Medal from the Zoological Society of India, and the “Krushak Bandhu” (Farmers’ Friend) Award.

He has authored over 50 peer-reviewed international research papers, 20 popular articles, and 3 books. He holds three design patents and has filed six additional patents as a co-inventor. Dr. Parida has served as a fisheries expert to the Caribbean Regional Fisheries Mechanism (CRFM), supporting fisheries planning and management for its 17 member countries. Currently, he is a Task Force Member of the IUCN initiative on “Reducing the Impact of Fisheries on Marine Biodiversity” and serves as an Associate Editor for Frontiers in Marine Science (Marine Fisheries, Aquaculture, and Living Resources section).

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