



POPULAR SCIENCE ARTICLE

Conserving Indigenous Fish for Food and Cultural Heritage in India

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Abstract

Fish in India hold significance beyond their role as food. They are deeply embedded in stories, rituals, festivals and family traditions that reflect the close relationship between people and rivers. Indigenous species such as the shimmering Hilsa (*Tenualosa ilisha*), the majestic golden mahseer (*Tor putitora*) and numerous smaller local fishes connect communities with landscapes, seasons and cultural memory. These species, however, are facing rapid decline due to dam construction, habitat alteration, pollution, overfishing and the erosion of traditional knowledge. Conserving indigenous fish has therefore become both a nutritional priority and a cultural responsibility. Across India, efforts are being made to safeguard these species through community-based sanctuaries, river restoration programs, habitat management, broodstock conservation and the recognition of customary rights. Such initiatives not only strengthen food security but also preserve cultural heritage.

Key words: Indigenous, conservation, culture, heritage, traditional knowledge

Introduction

In India fish live not only in rivers and lakes but also in the hearts of people. A Bengali festival without Hilsa feels incomplete. The golden mahseer of Himalayan streams is remembered in local folklore. Women in Assam prepare curries of tiny indigenous fishes that strengthen children and mothers. Each of these examples shows that fish are more than protein. They are cultural symbols and carriers of memory.

But the future of these species is under threat. Barrages cut rivers into fragments. Waste chokes breeding grounds. Non-native species spread widely. If indigenous fish vanish, communities lose not only food but also songs rituals and a sense of place (National Biodiversity Authority, 2019). Conserving indigenous fish is therefore as much about protecting cultural identity as it is about saving biodiversity.

Importance of Indigenous Fish in India

The Hilsa is often called the queen of fish in Bengal. Its arrival in markets marks the monsoon and its taste has inspired poems, proverbs and endless family debates on the best recipe. Nutritionally, Hilsa is rich in omega3 fatty acids and proteins that are vital for rural diets.

The golden mahseer of the North and Western Ghats, with its gleaming scales, is valued not only

as a sporting fish but also as a sacred one. Local rituals often involve protecting certain pools where mahseer gather, reflecting a recognition of their ecological role.

Even the smaller fish, such as minnows, catfishes and loaches are irreplaceable in rural food traditions. In Assam and Manipur, they are used in fermented dishes and medicines and in Kerala, river fish curry is part of daily life. To conserve them is to conserve cuisines and cultural identities passed down through generations.

Nutritional Role of Indigenous Fish

Indigenous fish species play a vital role in ensuring nutrition for millions of households in India, especially in rural and tribal areas. Unlike commercially farmed exotic species, many indigenous fishes are rich in micronutrients that are often lacking in staple grain-based diets. Small indigenous fish such as *Amblypharyngodon mola* and *Esomus danricus* provide high amounts of vitamin A, calcium, iron and zinc in easily absorbable forms (Roos *et al.*, 2007). These nutrients are crucial for reducing malnutrition, childhood stunting and maternal deficiencies.

Studies have shown that consuming small quantities of indigenous fish daily can significantly improve dietary diversity and nutritional outcomes (Thilsted *et al.*, 2016). Since many of these fish are eaten whole, including

bones, heads and viscera, they provide concentrated sources of minerals that are otherwise difficult to obtain in poor rural diets.

In regions like Assam, Tripura and Manipur, mothers traditionally feed children small fish curries to improve growth and immunity. In Kerala and West Bengal, dried and fermented fish products made from indigenous species serve as affordable protein reserves during lean seasons. These practices highlight that the nutritional value of indigenous fish is deeply tied to cultural food systems, making conservation not only a matter of biodiversity but also of public health.

Cultural Heritage and Indigenous Fish

Fish in India are more than food items, they are cultural markers that embody tradition, spirituality and collective memory. The Hilsa is celebrated in Bengal not only for its flavour but also for its role in festivals and rituals, where its arrival with the monsoon is greeted with joy. Poems, songs and proverbs often feature Hilsa, reflecting its deep cultural resonance.

The golden mahseer is revered in Himalayan and Western Ghats regions, where it is regarded as a sacred fish. Communities often protect pools in rivers where mahseer congregate, ensuring safe breeding grounds and linking conservation to ritual obligations. In many villages, catching mahseer during certain seasons is taboo, demonstrating the integration of ecological ethics with cultural values.

Smaller indigenous fish species also carry cultural significance. In Assam and Manipur, they are central to fermented dishes such as shidal, napham, ngari and hentak, which are not only delicacies but also part of local medicinal practices (Nath *et al.*, 2024). In Kerala, river fish curries form part of daily meals, strengthening community identity through shared culinary traditions. Across regions, indigenous fish thus serve as cultural connectors that preserve intangible heritage while contributing to livelihoods and health.

Threats to Indigenous Fish

Indigenous fish species in India face multiple pressures that threaten their survival and the communities that depend on them. Habitat alteration is one of the most serious threats. The construction of dams and barrages fragments rivers, disrupts migration routes and alters the natural flow that fish rely on for spawning and feeding (Dudgeon *et al.*, 2006). For species like Hilsa and mahseer, which require long stretches of free-flowing rivers to complete their life cycles, such disruptions are devastating.

Pollution compounds these challenges. Industrial effluents, pesticides and untreated sewage degrade water quality, reducing oxygen levels and contaminating fish habitats. Small rivers and wetlands, which often serve as breeding grounds for indigenous species, are particularly vulnerable to pollution from agricultural runoff (Central Pollution Control Board, 2020).

The introduction of exotic species further threatens indigenous biodiversity. Non-native fishes such as common carp, tilapia and African catfish often outcompete or prey upon local species, altering food webs and ecosystems (Lakra *et al.*, 2008). Once established, these invasive species are extremely difficult to control, leading to a decline in native populations.

Overfishing is another pressing concern. Traditional fishing practices once maintained a balance between harvest and regeneration, but the use of fine-meshed nets, indiscriminate harvesting of broodstock and destructive fishing methods have intensified pressure on wild populations. Coupled with climate change, which affects water temperatures and seasonal flows, these threats collectively endanger the rich diversity of India's indigenous fish.

Conservation Strategies for Indigenous Fish

Safeguarding indigenous fish in India requires a blend of ecological science, community knowledge and supportive policy. Several strategies have shown promise in restoring fish populations while maintaining cultural traditions.

One crucial step is protecting migration routes. For species like Hilsa and mahseer, free-flowing stretches of rivers are essential. Installing fish ladders in dams, modifying barrages and maintaining environmental flows can allow fish to complete their life cycles.

Community-based sanctuaries are another effective model. In states like Meghalaya and Nagaland, local villages have declared stretches of rivers as no-fishing zones. These sanctuaries are often linked to customary beliefs and taboos, which strengthen compliance and community ownership.

Habitat restoration is equally important. Reviving wetlands, replanting riparian vegetation and reducing pollution enhance the breeding and feeding conditions for native species. Programmes that conserve broodstock and establish hatcheries for indigenous fishes can also help replenish declining populations while reducing pressure on wild stocks.

Supporting traditional rights and food systems plays a central role in conservation. Policies that

empower fishing communities, respect their customary practices and integrate traditional ecological knowledge can build trust and sustainability. Equally, raising awareness through schools, local festivals and eco-tourism can ensure that cultural pride in indigenous fish continues to support conservation efforts.

Conclusion

Indigenous fish in India represent much more than a source of nutrition. They are carriers of cultural memory, symbols of seasonal change and vital links between people and their landscapes. From the Hilsa that signals the monsoon in Bengal to the golden mahseer revered in Himalayan rituals and the small fish that enrich daily diets in Assam, Manipur and Kerala, these species embody both sustenance and heritage.

Yet, the pressures of habitat loss, pollution, invasive species and overexploitation threaten to erode this connection. Losing indigenous fish would mean not only a decline in biodiversity but also the disappearance of stories, recipes and traditions that bind communities together.

Conservation efforts therefore need to go beyond ecological science alone. They must integrate community participation, cultural values and policy support. Protecting migration routes, restoring habitats, conserving broodstock, recognizing traditional rights and nurturing community sanctuaries are all essential steps. Equally, celebrating fish in festivals, songs and education can inspire pride and awareness for their protection.

Ensuring the survival of indigenous fish is thus both a nutritional necessity and a cultural responsibility. By valuing them as food and

heritage together, India can safeguard its rivers and lakes as living ecosystems that continue to nourish both body and identity for generations to come.

Conflict of interest

The author declares no conflict of interest.

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