

Availability, Market Demand and Trade Prospects of Indigenous Ornamental Fishes with special reference to Assam

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Abstract

Assam, situated in the north-eastern region of India, is characterized by rich aquatic resources that support a remarkable diversity of ornamental fishes. The extensive river systems of the Brahmaputra and Barak, along with numerous wetlands, beels, ponds and forest streams, provide habitats for nearly 187 species of ornamental fishes. Many of these species, including *Channa barca*, *Channa stewartii*, *C. aurantimaculata*, *Badis sp.*, *Botia sp.* etc. are globally valued for their unique colouration, body patterns, and unique behavioural traits. Such diversity highlights both the ecological significance and economic potential of Assam in the ornamental fish trade. The sector offers scope for livelihood diversification, women's participation in aquaculture, rural employment, and contribution to export markets. The ornamental fish marketing is constrained by several challenges such as unsustainable wild collection, limited awareness, inadequate breeding and seed production facilities, shortage of skilled manpower, high transportation costs, and weak marketing infrastructure. Recognizing these issues, policy initiatives like the Pradhan Mantri Matsya Sampada Yojana (PMMSY) have provided financial incentives to promote ornamental fish farming as a viable enterprise. For sustained growth, emphasis must be placed on captive breeding, conservation of native stocks, development of organized trade networks, and enforcement against illegal exploitation. With integrated strategies, Assam can position itself as a significant hub for ornamental fisheries while ensuring long-term ecological sustainability.

Introduction

Assam is a state with rich natural resources and biodiversity especially in terms of aquatic biodiversity. The extensive river systems of the Brahmaputra and Barak along with their numerous tributaries, seasonal floodplains, beels (oxbow lakes), ponds, wetlands, derelict water bodies and forest streams create a habitat that sustain a wide range of aquatic organisms. Various small and indigenous ornamental fish species are found in the natural water bodies of Assam (Goswami *et al.*, 2015; Pradhan *et al.*, 2023; Kakati *et al.*, 2025). Ornamental fishes constitute an important group within this biodiversity, valued primarily for their aesthetic and recreational significance rather than for consumption. They encompass a broad range of freshwater species, characterized by vibrant coloration, distinct body shapes, intricate patterns

and unique behavioral traits, making them highly desirable for display in aquariums, decorative garden tanks, and public exhibits. Unlike food fishes, their commercial and ecological value lies in their ornamental appeal. Assam's ornamental fish resources include both native species collected from natural water bodies and exotic varieties produced through captive breeding programs (Das, 2015; Deb et al., 2024). In recent years, ornamental fish culture has emerged as one of the fastest-growing sectors of aquaculture, offering economic, ecological and conservation-related benefits. The availability of ornamental fish species in Assam not only enhances the global value of its biodiversity but also plays a vital role in strengthening local economies, fostering livelihood security and promoting conservation oriented aquaculture development.

Status and Availability of Ornamental Fish Species in Assam

According to recent reports from the Department of Fisheries, Assam possesses approximately 71,000 hectares of beel fisheries, 83,000 hectares of derelict water bodies, 298 rivers and tributaries, 6,260 hectares of forest fisheries and nearly 1.7 lakh ponds and tanks, in addition to other aquatic resources. Scientific studies have reported the occurrence of around 187 species of ornamental fishes in the natural water bodies of Assam (Sharma et al., 2023; Kakati et al., 2025). The aquatic ecosystems of the Brahmaputra and Barak valleys, along with the water resources of the hilly regions, are particularly rich in indigenous ornamental fish diversity. These species not only contribute to the ecological and aesthetic value of natural habitats but also hold significant commercial potential in both national and international markets (Deb et al., 2025; Pradhan et al., 2023). In fact, the demand for certain indigenous ornamental fish species is especially high in global trade. A list of some of the important indigenous ornamental fish species recorded from Assam is provided below.

Table 1. List of Ornamental Fishes of Assam, Northeast India

Local Name	Common Name	Scientific name
Kholihona	Banded Gourami	<i>Trichogaster fasciata</i>
SenduriPuthi/ LaalPuthi	Rosy barb	<i>Pethia conchonius</i>
Naga Cheng	Orange spotted/ Gold spotted snakehead	<i>Channa aurantimaculatus</i>
Kola Cheng	Assamese snakehead	<i>Channa stewartii</i>
Goroka Cheng/ Pipli Cheng	Barca Cheng	<i>Channa barca</i>
Singora	Tengara catfish	<i>Mystus tengara</i>
Tura	Spiny eel	<i>Macrognathus aral</i>

Dorikona	Giant Danio	<i>Devario aequipinnatus</i>
Gethu	Loach/ Botia/Rani fish	<i>Botia dario</i>
Bhecheli	Chameleon fish	<i>Badis sp.</i>
Bami	Zigzag eel	<i>Mastacembelus armatus</i>
Chanda	Glass fish	<i>Chanda nama</i>
Jati Puthi	Pool barb/ Spotfin swamp barb/ Stigma barb	<i>Puntius sophore</i>
Bali botia	Guntea loach	<i>Lepidocephalichthys guntea</i>
Ranga chanda	Indian glassy fish	<i>Parambassis ranga</i>

Ornamental fishes are distinguished by a suite of scientifically recognized characters that determine their aesthetic, ecological and commercial value. These include body colour and patterns, iridescence, body shape, fin structure, and transparency, which enhance their visual appeal. Behavioral and physiological characteristics such as schooling behaviour, temperament, habitat preference and adaptability to different water conditions also play an important role in their suitability for aquarium (Sharma et al., 2023; Deb et al., 2024). The table below presents the scientific ornamental characters along with examples of indigenous ornamental fishes of Assam.

Table 2. Ornamental Characters of Taxonomically Diverse Indigenous Ornamental Fishes of Assam

Ornamental characteristics	Example
Body colour / pigmentation	<i>Channa bleheri, C. bipuli, Trichogaster sp.,</i>
Colour patterns (spots, stripes, bands)	<i>Channa aurantimaculata, Botia dario, Mystus tengara</i>
Iridescence / metallic sheen	<i>Danio rerio</i>
Chameleonic habit	<i>Badis badis, Badis blosyrus</i>
Shoaling / schooling behaviour	<i>Devario aequipinnatus, Rasbora sp</i>
Bottom-dwelling habit	<i>Lepidocephalichthys guntea</i>
Transparent / semi-transparent body	<i>Parambassis ranga, Chanda nama</i>
Endemic / rare species with beautiful coloration	<i>Channa barca</i>
Hardiness / adaptability	<i>Heteropneustis fossilis, Anabus testudineus</i>



Figure1. Ornamental fish species available in Assam

Market demand of available indigenous ornamental fish

The demand for indigenous ornamental fish species from Assam has been steadily increasing in both national and international markets, primarily due to their distinctive morphology, attractive coloration patterns and unique behavioral characteristics. Among the various species, *Channa barca* is recognized as one of the most valuable ornamental fishes. The species is known by different local names across regions of Assam, which often creates ambiguity in its identification. For example, it is locally referred to as Noga cheng in Tinsukia and Dibrugarh, Chenga in Jorhat and Sibsagar, Garkaa (including Garkacheng and Garkasol) in Kamrup and Nalbari, Gatoa in Nagaon and Barkaa (Cheng Barka) in the Darrang district (Kakati et al., 2025; Nasreen et al., 2023). In the global aquarium trade, the species commands a high market value, with prices ranging from approximately INR 1–2 lakh per pair. Other notable species such as *Channa stewartii* (Kola Cheng), *Channa aurantimaculata* (Naga Cheng), *Badis* sp. (Bhecheli) and *Trichogaster fasciata* (Kholihona) also fetch high prices and enjoy significant demand in international markets. The collection and trade of these species are largely dependent on local fishers, who harvest them directly from rivers, wetlands and other natural water bodies. These catches are usually sold to traders, who act as intermediaries and

transport the fishes to metropolitan hubs such as Kolkata, which serves as a key export center for the ornamental fish trade. While these indigenous species are highly valued abroad, their recognition as ornamental fishes remains limited within Assam (Nasreen et al., 2023 ; Harrington et al., 2022; Sharma et al., 2022). Locally, many communities continue to regard these species primarily as food fish rather than as ornamental varieties, resulting in relatively stagnant market growth for the ornamental fish sector at the state level.

To address this gap and optimize the economic potential of the sector, several policy interventions have been introduced. A notable initiative is the Pradhan Mantri Matsya Sampada Yojana (PMMSY), implemented by the Department of Fisheries, which offers financial assistance in the form of subsidies ranging from 40% to 60% to promote ornamental fish culture (Department of Fisheries, 2020). These subsidies are intended to encourage farmers and entrepreneurs to engage in ornamental fish farming as a viable livelihood option. Beyond income generation, ornamental fish culture contributes to rural self-employment, women's participation in aquaculture activities and overall employment generation in associated sectors such as fish feed production, aquarium fabrication, and trade networks. Thus, indigenous ornamental fishes of Assam offer significant economic opportunities and have the potential to support sustainable livelihoods while diversifying aquaculture practices in the region.

Table 3. Price list of some important indigenous ornamental fishes of Assam

Scientific name	Common name	Price per piece (₹)
<i>Channa stewartii</i>	Assamese snakehead	500-600
<i>C. aurantimaculata</i>	Orange-spotted snakehead	1500-2000
<i>C. bleheri</i>	Rainbow snakehead	200-250
<i>C. bipuli</i>	True Blue snakehead	200-250
<i>Trichogaster fasciata</i>	Banded gourami	10-15
<i>Devario aequipinnatus</i>	Giant danio	15-20
<i>Pethia conchonius</i>	Rosy barb	10-15
<i>Botia dario</i>	Queen loach	50-60
<i>Badis</i> sp.	Chameleon fish	40-50
<i>Macrogathus aral</i>	One-stripe spiny eel	20-30

Constraints of ornamental fish marketing in Assam

- Limited public awareness of ornamental fishes, their importance and market potential.
- Overexploitation of wild stocks without sustainable replenishment.
- Inadequate knowledge of breeding techniques, maintenance and health management.
- Shortage of trained and skilled manpower.

- Ineffective and poorly developed marketing strategies.
- High transportation costs and inadequate transport facilities.

Management and Conservation Strategies for Ornamental Fish Marketing in Assam

- Raising public awareness about the importance of ornamental fish and market dynamics.
- Protecting natural breeding habitats.
- Controlling illegal fishing and unregulated wild capture.
- Implementing captive breeding programs.
- Releasing fish seeds into natural habitats to support population recovery.
- Preventing illegal export and biopiracy of valuable species.

Conclusion

Assam is endowed with a rich diversity of ornamental fish species which reflects both ecological importance and economic potential. The wide network of rivers, wetlands, beels, ponds and forest streams provides suitable habitats for a variety of indigenous fishes valued for their attractive colours, body patterns and behaviour. Species such as *Channa barca*, *C. aurantimaculata*, *C. bleheri*, *Botia dario*, *Badis sp.* and different barbs and loaches are highly demanded in national and international markets. This natural advantage places Assam in a favorable position to develop a strong ornamental fish sector and to utilize its aquatic biodiversity as a resource for trade and livelihood development.

Indiscriminate collection from the wild, lack of organized breeding facilities, poor infrastructure for transportation and storage, weak marketing channels, and limited technical knowledge have slowed down progress. These issues also pose risks to the sustainability of native fish populations and aquatic ecosystems. Addressing these concerns requires the promotion of captive breeding, scientific culture practices, awareness among local communities, and strict regulation against illegal exploitation and biopiracy. With appropriate policy support, training, and market linkages, Assam's ornamental fish trade can emerge as a sustainable enterprise that generates employment, strengthens the rural economy, and ensures long-term conservation of the valuable aquatic resources of Assam.

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