

From Dams to Diversity: Managing Karnataka's Reservoir Fisheries

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Abstract

Karnataka possesses some of the most important inland fisheries resources in southern India due to its extensive network of reservoirs, rivers, tanks, and irrigation impoundments. Reservoir fisheries state contributes significantly to food security, employment generation, nutritional support, and rural livelihoods, particularly for economically weaker fishing communities. Major reservoirs such as Tungabhadra Reservoir, Krishna Raja Sagara, Almatti Dam, and Bhadra Reservoir support diverse fish populations including Indian major carps, catfishes, murrels, and several indigenous species. However, the sector faces numerous challenges, including overfishing, invasive exotic species, habitat degradation, pollution, irregular stocking practices, and weak cooperative management systems. Scientific stocking programs, conservation of native fishes, community participation, and sustainable reservoir governance can substantially improve fish productivity, biodiversity conservation in Karnataka. This article reviews the status, productivity, biodiversity, management practices, and conservation strategies associated with reservoir fisheries in Karnataka.

Keywords: Reservoir fisheries, Karnataka, Inland fisheries, Biodiversity, Fish production, Invasive species, Aquaculture

Introduction

India is among the leading inland fish-producing countries in the world, and reservoirs contribute significantly to this achievement (FAO, 2022; Ayyappan & Jena, 2001). Karnataka has a large number of major, medium, and minor reservoirs constructed primarily for irrigation, hydropower generation, and drinking water supply (Keshavanath & Gangadhara, 2012). Over time, these reservoirs have become important fisheries resources supporting thousands of fisherfolk families. Reservoir fisheries in Karnataka provide:

Employment opportunities, nutritional security, income generation & rural development support (Department of Fisheries, Government of Karnataka, 2024).

Geographic and Hydrological Profile of Karnataka Reservoirs

Karnataka has hundreds of reservoirs distributed across semi-arid plains, plateau regions, and Western Ghats (Department of Fisheries, Government of Karnataka, 2024). Important reservoirs include:

1. Tungabhadra Reservoir
2. Krishna Raja Sagara Reservoir
3. Almatti Dam
4. Bhadra Reservoir
5. Kabini Reservoir
6. Hemavathi Reservoir

These reservoirs differ in: Depth, water retention period, nutrient availability, productivity & fish diversity. Reservoirs located near the Western Ghats generally possess higher biodiversity due to favourable ecological conditions and perennial water availability (Bhat, 2003).

Fish Species Diversity and Ichthyofaunal Composition

Karnataka reservoirs support rich freshwater fish diversity comprising:

1. Indian Major Carps: Catla (*Catla catla*), Rohu (*Labeo rohita*) & Mrigal (*Cirrhinus mrigala*)
2. Minor carps
3. Catfishes
4. Murrels
5. Featherbacks
6. Freshwater prawns (Jhingran, 1988; Sugunan, 1995)



Several ecologically important native species have also been reported including:

Deccan Mahseer (Tor khudree) & Tor mussullah (Bhat, 2003).

The family Cyprinidae generally dominates reservoir fisheries in Karnataka (Sugunan, 1995). Fish assemblages vary depending on: reservoir age, water quality, stocking practices & hydrological conditions.

Impact of Reservoir Creation on Fish Composition

Construction of reservoirs significantly alters natural river ecosystems. Riverine fish species adapted to flowing water conditions gradually decline, while lentic-adapted species become dominant (Jhingran, 1988). Reservoir impoundment leads to habitat modification, changes in breeding grounds, altered migration patterns, and nutrient redistribution (Sugunan & Sinha, 2000). Stocking of Indian Major Carps has become a common management strategy in Karnataka reservoirs to enhance fish production (Dhanze & Dhanze, 2018).

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Production Potential and Current Yields

Fish productivity in Karnataka reservoirs varies according to reservoir size and management efficiency (Sugunan, 1995). Small reservoirs generally show higher productivity per hectare, whereas large reservoirs contribute substantially to total fish production (Sugunan & Sinha, 2000). Culture-based fisheries are increasingly being promoted in medium and small reservoirs (Keshavanath & Gangadhara, 2012). The total freshwater area in Karnataka is approximately 5.74 lakh hectares, of which reservoirs account for 2.72 lakh hectares (Karnataka Fisheries Department, 2023).

Production Data (Latest Estimates)

Karnataka's total fish production reached 1,225,000 tonnes in 2023, compared to 1,074,000 tonnes in 2022 (Karnataka Fisheries Department, 2023). Inland fisheries are growing rapidly and contributing significantly to national fish production (FAO, 2022).

Key Reservoirs & Management

The state's reservoir fisheries are distributed across major river basins:

River System	Major Reservoirs
Krishna Basin	Narayanpur (Upper Krishna), Tungabhadra, Bhadra, Ghataprabha, Malaprabha, VV Sagar
Cauvery Basin	Hemavathy, Harangi, Kabini, Nugu, Manchanbele
Sharavathy	Linganamakki

Note on Yield: While Karnataka ranks 5th in India for freshwater area, it ranks 10th in actual freshwater production, indicating significant unfulfilled potential in its reservoirs.

Latest Infrastructure & Schemes (2026 Updates)

Under the Pradhan Mantri Matsya Sampada Yojana (PMMSY), which has received a budgetary allocation of ₹2,500 crore for 2026-27, several initiatives are being scaled in reservoirs:

Cage Culture: As of March 2026, 52,058 reservoir cages have been approved nationwide to intensify production.

Modern Systems: A shift toward technology-driven aquaculture is evident with the approval of 12,081 RAS units and 4,205 Bio-floc units as of January 2026.

Support Systems: Livelihood support during fishing ban periods has benefited approximately 4.33 lakh fisher families as of early 2026.

Problems and Constraints in Reservoir Fisheries Management

1. Invasive Exotic Fish Species

Invasive fishes threaten native biodiversity and ecological balance in Karnataka reservoirs.

Common invasive species include:

1. Tilapia (*Oreochromis mossambicus*)
2. African Catfish (*Clarias gariepinus*)
3. Common Carp (*Cyprinus carpio*)

These species compete with indigenous fishes for: Food, habitat & breeding areas (Sandilyan, 2022).

2. Overfishing and Illegal Fishing

Unregulated fishing practices, use of small mesh nets, juvenile fish capture, and poaching reduce fish stocks and breeding success. This exacerbated by a lack of strict enforcement, seasonal bans & coordinated monitoring (Dhanze & Dhanze, 2018).

3. Fish Seed Supply and Quality Issues

Many reservoirs suffer from an inadequate supply of quality fingerlings for stocking programs. Poor transportation, low survival rates, and inconsistent stocking density reduce fish production efficiency. Dependence on seed from neighboring states also creates logistical and quality-control problems.

4. Pollution and Habitat Degradation

Agricultural runoff, industrial discharge, domestic sewage, and eutrophication negatively affect reservoir ecosystems (FAO, 2022).

5. Declining water quality

Oxygen depletion, fish mortality, reduced breeding success & biodiversity loss.

Conservation Imperatives and Strategies

1. Protection of Native Species

Conservation of indigenous fishes such as Mahseer species is essential for maintaining ecological balance and biodiversity (Bhat, 2003).

Strategies include: hatchery development, broodstock conservation, habitat restoration & breeding ground protection.

2. Control of Invasive Species

Strict regulation of the introduction and release of exotic species into open waters is necessary. Management strategies include: awareness programs, monitoring systems, controlled aquaculture practices & legal enforcement.

3. Community-Based Co-Management

Reservoir fisheries can be managed effectively through the participation of fisher cooperatives, local communities, government agencies & research institutions.

4. Community-Based Fisheries Management

Community-based fisheries management improves sustainability and livelihood security (Sugunan & Sinha, 2000).

5. Policy and Institutional Support

Government schemes like PMMSY play a vital role in reservoir stocking, infrastructure development, and fisher welfare programs (Department of Fisheries, Government of Karnataka, 2024).

Support:

Reservoir stocking, fish seed production, Infrastructure development & fisher welfare programs.

Conclusion

Reservoir fisheries in Karnataka represent a valuable resource with significant potential for sustainable fish production, biodiversity conservation, and rural livelihood enhancement. Despite substantial opportunities, the sector faces challenges to invasive species, overfishing, habitat degradation, poor fish seed supply, and weak governance mechanisms. Scientific reservoir management, conservation-oriented fisheries policies, community participation, and improved stocking programs are essential for long-term sustainability. Strengthening institutional coordination and promoting ecosystem-based fisheries management can substantially enhance the ecological and economic benefits of Karnataka's reservoir fisheries.

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