

Aquaculture in the Indian Knowledge System: Traditional Wisdom and Modern Relevance

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ABSTRACT

Aquaculture in India has evolved as both a livelihood and a cultural practice, deeply embedded within the Indian Knowledge System (IKS). Rooted in ancient texts, rituals, and community traditions, aquaculture demonstrates the sustainable use of aquatic resources for food, culture, and ecological balance. This paper explores the historical, cultural, and philosophical dimensions of aquaculture in IKS, alongside its practices and their implications for modern aquaculture. By highlighting indigenous knowledge such as rice–fish systems, pond culture, herbal therapeutics, and community water management, the article presents a case for integrating traditional ecological wisdom with modern scientific advancements. Such integration is essential for addressing challenges of food security, climate resilience, and biodiversity conservation. The article concludes by emphasising the relevance of IKS-informed aquaculture in achieving sustainable development goals and fostering community resilience.

Key Words: Climatic Resilience, Indigenous Knowledge, Aquaculture, Ecology, Aquatic Resources

INTRODUCTION

India is the world's second-largest aquaculture producer after China, contributing significantly to global fish production and food security (FAO, 2020). Aquaculture in India today is often associated with intensive scientific practices, including hatchery-based breeding, commercial feed, and high-yield farming systems. Yet, beneath this modern façade lies a rich reservoir of traditional practices, philosophies, and community-driven knowledge that shaped aquatic resource use for centuries.

The Indian Knowledge System (IKS) emphasises the harmony between humans and nature, guided by principles of sustainability, dharma (duty), and loka-samgraha (collective welfare). Aquaculture practices recorded in ancient texts such as the Arthashastra and Rigveda, and embedded in folklore and community traditions, reveal how aquatic systems were managed for ecological balance and social welfare. This paper seeks to contextualise aquaculture within IKS and examine its relevance in modern contexts, particularly for sustainable food production, climate adaptation, and cultural continuity.

Historical Roots of Aquaculture in India

Ancient Textual References

The Arthashastra (4th century BCE) by Kautilya mentions regulations around ponds, water bodies, and the collection of taxes from fishing activities, demonstrating early governance of aquatic resources (Shamasastri, 1915). The Rigveda and Atharvaveda contain hymns referring to rivers, lakes, and aquatic organisms as sacred entities, underscoring their cultural and ecological significance (Griffith, 1896). Later texts, such as the Matsya Purana, emphasised the sanctity of fish and aquatic ecosystems, reflecting a spiritual dimension to aquaculture.

Archaeological and Historical Evidence

Excavations in the Indus Valley Civilisation reveal sophisticated water management systems such as tanks, reservoirs, and canals, which likely supported fish cultivation (Possehl, 2002). In South India, particularly during

the Chola and Pallava periods, inscriptions describe the construction and maintenance of irrigation tanks (ericchery), which often doubled as fish-rearing systems (Ludden, 1985). Buddhist Jataka tales also narrate stories of communities managing ponds with fish, linking aquaculture with ethical and community-based governance.

Traditional Aquaculture Practices in IKS

Rice–Fish Culture

Rice–fish farming, a practice prevalent in Eastern India (West Bengal, Assam, Odisha), involves cultivating fish in paddy fields. This system improves soil fertility, reduces pests through natural predation, and enhances farm income (Dey et al., 2018). The practice is ecologically significant, as fish aerate the soil, recycle nutrients, and provide protein-rich food. In IKS, such symbiotic relationships illustrate the principle of Prakriti–Purusha (harmony of nature and humans).

Pond and Tank Culture

Community tanks (ahars, pynes, johads) across India were used not just for irrigation but also for fish rearing. In Bengal’s “bheri” fisheries, brackish water lagoons sustained carp and prawn culture for centuries (Nayak & Berkes, 2014). These systems were community-managed, with collective responsibilities for maintenance, distribution of catch, and protection from overexploitation, aligning with IKS values of shared responsibility.

Herbal and Indigenous Therapeutics

Traditional fish farmers often used medicinal plants to treat diseases in fish. For example, neem (*Azadirachta indica*) extracts were applied to control ectoparasites, while turmeric (*Curcuma longa*) was used for wound healing (Pillay, 1993). Such practices represent eco-friendly alternatives to chemical therapeutics, reducing environmental toxicity.

Indigenous Fishing Gears and Techniques

Fishing communities employed gears made from bamboo, coir, and cotton nets, which were biodegradable and sustainable. Traditional traps like ghuni jal (cone-shaped nets) and bansi (hook and line) minimise bycatch compared to modern trawling. These practices aligned with IKS principles of minimal ecological disruption.

Philosophical and Cultural Dimensions

Sacred Ecology and Dharma

Indian traditions often sacralized water bodies, considering them abodes of deities like Varuna (god of waters) and Matsya (fish incarnation of Vishnu). Ritual protection of ponds and lakes ensured their maintenance and safeguarded aquatic biodiversity (Haberman, 2006). Dharma emphasised sustainable use and ethical restraint, discouraging overfishing during breeding seasons.

Festivals, Folklore, and Aquatic Biodiversity

In Assam, the Bihu festival includes rituals around fishing, symbolising fertility and prosperity. Folklore across Bengal and Odisha speaks of deities residing in ponds, cautioning against reckless exploitation. Such cultural dimensions reinforced ecological stewardship through community norms.

Integrating IKS and Modern Aquaculture

Complementarities

IKS practices offer low-input, climate-resilient methods that can complement modern aquaculture’s technological advances. For example, rice–fish culture aligns with integrated multitrophic aquaculture models promoted globally for sustainability (FAO, 2018). Herbal remedies can reduce dependence on antibiotics, addressing antimicrobial resistance.

Policy and Institutional Dimensions

The National Fisheries Policy of India acknowledges the role of traditional practices and calls for their integration into contemporary aquaculture. Aligning IKS with policies such as the Blue Revolution and FAO's Sustainable Development Goals (SDGs 2, 14, and 15) can promote food security while conserving ecosystems (Government of India, 2020).

Case Studies

In West Bengal, reviving bheri fisheries has enhanced livelihoods and biodiversity (Nayak & Berkes, 2014).

In tribal Jharkhand, community tanks are used for seasonal fish farming, integrating traditional water harvesting with aquaculture (Singh, 2019).

In Northeast India, indigenous women-led aquaculture cooperatives demonstrate how traditional wisdom supports gender-inclusive development (Saikia, 2021).

Challenges and Opportunities

Despite its potential, integrating IKS into modern aquaculture faces challenges such as commercialisation, habitat degradation, and loss of traditional knowledge among younger generations. However, opportunities exist in community-based conservation, eco-certification of traditional products, and research on ethnobiological practices. Universities and research institutes can document and validate indigenous knowledge for wider application.

CONCLUSION

Aquaculture in the Indian Knowledge System embodies sustainability, cultural continuity, and ecological wisdom. By harmonising traditional practices with modern scientific methods, India can develop climate-resilient, socially inclusive, and ecologically sustainable aquaculture. The revival and integration of IKS not only safeguard biodiversity but also enrich cultural identity and support global sustainability goals.

REFERENCES

1. Dey, M. M., & Prein, M. (2018). Small-scale aquaculture and its role in food and nutrition security. *Aquaculture Economics & Management*, 22(1), 1–13.
2. FAO. (2018). *The State of World Fisheries and Aquaculture 2018: Meeting the Sustainable Development Goals*. Rome: FAO.
3. FAO. (2020). *The State of World Fisheries and Aquaculture 2020: Sustainability in action*. Rome: FAO.
4. Government of India. (2020). *National Fisheries Policy*. Ministry of Fisheries, Animal Husbandry & Dairying.
5. Griffith, R. T. H. (1896). *The Hymns of the Rigveda*. London: E.J. Lazarus.
6. Haberman, D. L. (2006). *River of Love in an Age of Pollution: The Yamuna River of Northern India*. University of California Press.
7. Ludden, D. (1985). *Peasant History in South India*. Princeton University Press.
8. Nayak, P. K., & Berkes, F. (2014). Linking global drivers with local and regional change: Shrimp farming and coastal degradation in India. *Land Use Policy*, 38, 45–54.
9. Pillay, T. V. R. (1993). *Aquaculture: Principles and Practices*. Oxford: Fishing News Books.
10. Possehl, G. L. (2002). *The Indus Civilisation: A Contemporary Perspective*. Rowman Altamira.
11. Saikia, M. (2021). Women in indigenous aquaculture systems of Northeast India: Knowledge, participation and challenges. *Asian Fisheries Science*, 34(2), 127–140.
12. Shamasastri, R. (1915). *Kautilya's Arthashastra*. Bangalore: Government Press.
13. Singh, A. K. (2019). Community water management and aquaculture in tribal Jharkhand. *Indian Journal of Traditional Knowledge*, 18(3), 621–628.