

Chapter-14

Post-Harvest Systems and Performance of India's Fish and Fishery Products: Disposition, Domestic Consumption, and Export Performance

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Abstract

India's fisheries sector has undergone rapid transformation during the last decade, supported by expansion of inland aquaculture, rising domestic demand for fish, and growth in seafood exports. This review critically examines the disposition of fish and fishery products in India with particular emphasis on post-harvest systems, domestic consumption, and export performance. The study synthesizes information from government handbooks, national statistics, export authority reports, and peer-reviewed scientific literature published between 2000 and 2024. Results indicate a substantial increase in total fish production, measurable reductions in post-harvest losses following infrastructure investments, and a strong export orientation dominated by shrimp and frozen fish products. Despite these advances, challenges persist in cold-chain coverage, value addition, market integration, and equitable access to infrastructure for small-scale stakeholders. Strengthening post-harvest systems through targeted investments, diversification of export products, and improved governance mechanisms is essential for ensuring sustainable and inclusive growth of India's fisheries sector.

Keywords: Fisheries sector, post-harvest losses, cold chain, seafood exports, domestic consumption, India

Introduction

Fisheries and aquaculture play a crucial role in global food systems by providing high-quality animal protein, essential micronutrients, and livelihoods to millions of people. According to the Food and Agriculture Organization (FAO, 2022), aquatic foods are increasingly important in addressing malnutrition and food insecurity, particularly in developing countries. India, as one of the world's leading fish-producing nations, occupies a strategic position in global fisheries and aquaculture. In India, fisheries contribute significantly to agricultural GDP, employment generation, and foreign exchange earnings. The sector supports the livelihoods of over 28 million people, including fishers, fish farmers, processors, traders, and ancillary workers (Department of Fisheries [DoF], 2023). Over the last decade, India's fish production has increased substantially, driven primarily by the rapid expansion of inland aquaculture systems, improved seed and feed technologies, and supportive government policies (Department of Fisheries [DoF], 2020, 2023).

Despite impressive gains in production, the benefits of fisheries growth are closely linked to the efficiency of post-harvest systems. Fish is highly perishable, and inadequate handling, storage, and transportation can result in significant quantitative and

qualitative losses. Early studies in India reported post-harvest losses ranging from 15% to 30% in marine and inland fisheries due to poor infrastructure and lack of awareness (Srinath et al., 2008; Shyam et al., 2014). Such losses reduce marketable surplus, depress fisher incomes, and compromise food safety.

Recognizing these challenges, the Government of India launched the Pradhan Mantri Matsya Sampada Yojana (PMMSY) to modernize fisheries infrastructure across the value chain, with particular emphasis on post-harvest management and cold-chain development (National Fisheries Development Board [NFDB], 2020). This review evaluates India's fish and fishery products sector in the context of post-harvest systems, domestic consumption, and export performance by synthesizing evidence from extensive published literature and official data.

Materials and Methods

Study Design

This study adopts a comprehensive narrative review design, based on critical examination and synthesis of secondary data and published literature related to fish production, post-harvest systems, domestic consumption, and export performance in India. The narrative review approach was selected to integrate diverse data sources and analytical perspectives relevant to fisheries value chains.

Data Sources

Data were collected from multiple authoritative sources:

Government publications and official statistics, including the Handbook on Fisheries Statistics (Department of Fisheries [DoF], 2020, 2023), annual reports of the Department of Fisheries (DoF, 2024), and policy documents related to PMMSY.

Export performance reports published by the Marine Products Export Development Authority (MPEDA, 2022; MPEDA, 2024), providing detailed information on commodity-wise export volumes and values.

Peer-reviewed scientific literature from institutions such as the Central Marine Fisheries Research Institute (CMFRI), Central Institute of Fisheries Technology (CIFT), Indian Council of Agricultural Research (ICAR), and academic journals focusing on postharvest losses, cold chain technologies, and value chain economics (Srinath et al., 2008; Salim et al., 2019). International reports and comparative studies, particularly Food and Agriculture Organization FAO (2018, 2022), World Bank (2020), and OECD (2020) publications, to situate India's fisheries performance within a global context.

Data Analysis

Documents published between 2000 and 2024 were systematically reviewed. Data were cross-verified across multiple sources to ensure reliability. Descriptive analysis was used to examine trends in fish production, post-harvest losses, and export composition, while comparative analysis assessed changes before and after major policy interventions such as PMMSY. Figures were developed using consolidated official data to illustrate key trends.

Results and Discussion

Growth in Fish Production and Product Disposition

India's total fish production has grown steadily over the past decade. Official statistics indicate that production increased from approximately 96 lakh tonnes in 2013–14 to nearly 195 lakh tonnes by 2024–25 (Department of Fisheries [DoF], 2023, 2024). Inland aquaculture has emerged as the dominant contributor, accounting for more than two-thirds of total production.

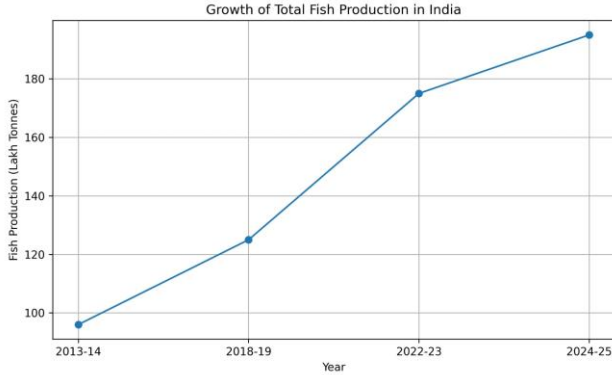


Figure 1 – Fish Production Growth in India

The expansion of inland aquaculture has improved year-round availability of fish and reduced dependence on seasonal marine catches. However, increased production has also intensified pressure on post-harvest systems, particularly at landing centres and primary markets where infrastructure development has not kept pace with output growth (CIFT, 2017).

Post-Harvest Losses and Cold-Chain Infrastructure

Post-harvest losses remain a critical challenge in the fisheries value chain. Recent national assessments report a significant decline in losses, with the national average estimated at approximately 9.16% during 2023–24 (Press Information Bureau [PIB], 2024). This represents a substantial improvement compared to earlier estimates reported by Srinath et al. (2008).

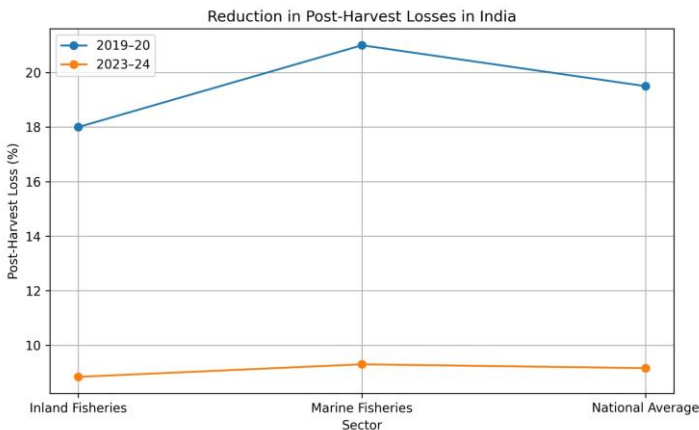


Figure 2 – Reduction in Post-Harvest Losses

The reduction in losses is closely associated with investments in ice plants, cold storages, refrigerated vehicles, and hygienic handling practices under PMMSY (NFDB, 2020). Nevertheless, losses continue to be higher in marine fisheries compared to inland systems, particularly in traditional landing centres lacking basic facilities (CMFRI, 2019).

Domestic Consumption of Fish

Fish constitutes an important source of animal protein and micronutrients in India, especially in coastal and eastern states. Rising incomes, urbanization, and changing dietary preferences have contributed to increased demand for fresh and processed fish products (FAO, 2022). Improved post-harvest systems have enhanced availability and reduced spoilage in urban markets, contributing to more stable prices.

However, disparities persist between urban and rural markets, highlighting the need for decentralized cold-chain solutions and improved retail infrastructure in interior regions (Salim et al., 2019).

Export Performance of Fishery Products

India's seafood exports have grown consistently in both volume and value. MPEDA (2024) reported record exports during 2023–24, with frozen shrimp accounting for more than half of total export earnings. Major export destinations include the United States, European Union, and Southeast Asia.

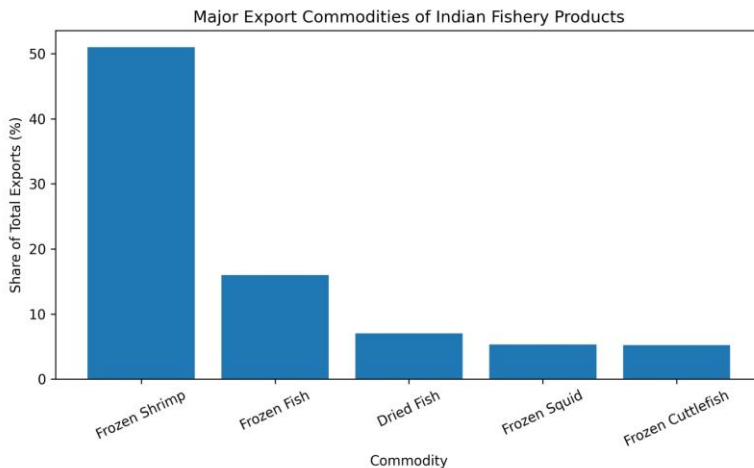


Figure 3 – Export Composition of Indian Fishery Products

While export growth has strengthened foreign exchange earnings, heavy dependence on shrimp exposes the sector to disease outbreaks, trade restrictions, and price volatility (OECD, 2020; Reuters, 2024). Diversification into value-added and ready-to-eat products is widely recommended to enhance export resilience.

Limitations and Future Research

The study relies on secondary data and published literature, which may vary in methodology and reporting periods. Future research should focus on micro-level assessments of post-harvest losses, cost–benefit analysis of cold-chain investments, and environmental sustainability of intensified aquaculture systems.

Conclusion

India's fisheries sector has made notable progress in production growth, reduction of post-harvest losses, and expansion of exports. Government initiatives such as PMMSY have significantly strengthened post-harvest infrastructure and quality management systems. Nevertheless, challenges remain in ensuring equitable access to infrastructure, diversifying export products, and strengthening domestic marketing channels. Continued investment in post-harvest technologies, capacity building, and inclusive market integration is essential for sustaining long-term growth and resilience of the sector.

Figure Captions (APA Style)

Figure 1. Growth of total fish production in India from 2013–14 to 2024–25.

Figure 2. Sector-wise reduction in post-harvest losses (%) in Indian fisheries.

Figure 3. Major export commodities of Indian fishery products and their share in total exports.

References:

1. Department of Fisheries. (2020). Handbook on fisheries statistics. Ministry of Fisheries, Animal Husbandry and Dairying, Government of India. <https://dof.gov.in>
2. Department of Fisheries. (2023). Handbook on fisheries statistics. Ministry of Fisheries, Animal Husbandry and Dairying, Government of India. <https://dof.gov.in>
3. Department of Fisheries. (2024). Annual report 2023–24. Ministry of Fisheries, Animal Husbandry and Dairying, Government of India. <https://dof.gov.in>
4. Food and Agriculture Organization of the United Nations. (2022). The state of world fisheries and aquaculture 2022: Towards blue transformation. FAO. <https://www.fao.org>
5. Food and Agriculture Organization of the United Nations. (2018). Handling of fish and fish products. FAO Fisheries and Aquaculture Technical Paper. <https://www.fao.org>
6. Marine Products Export Development Authority. (2024). Export performance of marine products 2023–24. MPEDA, Government of India. <https://mpeda.gov.in>
7. Marine Products Export Development Authority. (2022). India's seafood exports: Trends and markets. MPEDA, Government of India. <https://mpeda.gov.in>
8. Press Information Bureau. (2024). Government initiatives for reducing post-harvest losses in fisheries. Government of India. <https://pib.gov.in>
9. National Fisheries Development Board. (2020). Pradhan Mantri Matsya Sampada Yojana (PMMSY): Guidelines. NFDB, Government of India. <https://nfdb.gov.in>
10. Srinath, K., Narayanakumar, R., & Shyam, S. S. (2008). Post-harvest losses in marine fisheries of India. *Fishery Technology*, 45(1), 1–8.
11. Shyam, S. S., Salim, S. S., & Safeena, P. K. (2014). Economic impact of post-harvest losses in fisheries. *Indian Journal of Fisheries*, 61(4), 125–130.
12. Central Marine Fisheries Research Institute. (2019). Marine fisheries census 2016: India. CMFRI, ICAR.

13. Central Institute of Fisheries Technology. (2017). Post-harvest fishery technology in India. CIFT, ICAR.
14. Salim, S. S., Safeena, P. K., & Shyam, S. S. (2019). Value chain analysis of fish marketing systems in India. *Agricultural Economics Research Review*, 32(2), 257–266.
15. OECD. (2020). *Rebuilding fisheries: The way forward*. Organisation for Economic Co-operation and Development. <https://www.oecd.org>
16. World Bank. (2020). *Enhancing fisheries value chains in developing countries*. World Bank Publications. <https://www.worldbank.org>
17. Reuters. (2024, April 3). India aims to expand seafood exports to \$12 billion in two years, sources say. Reuters. <https://www.reuters.com>