

MINI-REVIEW

Delving into the Ebb and Flow: India's Shrimp Production and Export Dynamics

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Authors Contribution

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

Abstract

The fisheries sector in India, particularly shrimp farming, is pivotal for economic growth, employing over 7 million people. However, the industry faces challenges from infectious diseases, incurring significant economic losses globally. Despite this, recent advancements in farming techniques and technology have propelled the Indian shrimp industry's productivity, quality, and global competitiveness. The market reached \$7.3 billion in 2022, projected to grow at 11%, reaching \$14 billion by 2028. Black tiger shrimp production declined due to disease issues, with a shift to Pacific white-leg shrimp, preferred for its resilience and productivity. Scampi production has surged, showing substantial growth potential. India, the world's fourth-largest seafood exporter, witnesses a steady increase in frozen shrimp exports, contributing significantly to the country's GDP. The sector's positive outlook is driven by increasing domestic and international demand, favourable geographical conditions, and a shift towards value-added shrimp products.

KEYWORDS

Dynamics, Export, Production, Shrimp

INTRODUCTION

The fisheries sector in India serves as a crucial pillar of the country's economy, not only contributing significantly to valuable foreign exchange but also serving as a vital source of employment for millions of individuals, particularly those hailing from economically disadvantaged backgrounds. The livelihoods of over 7 million fishermen in India hinge on capture fisheries and aquaculture, underscoring the pivotal role of the fisheries sector in driving socio-economic progress (PIB, 2022). While traditional shrimp aquaculture has existed in certain coastal states for centuries, it has made a more substantial impact on the country's socio-economic development in recent years. Shrimp farming, with a direct employment impact on around 0.3 million individuals, generates additional employment opportunities for an estimated 0.6 to 0.7 million people through its associated ancillary unit (Naik et al., 2020).

The economic repercussions of diseases in shrimp farming are readily apparent to farmers, as the management of these illnesses incurs expenses that must be carefully considered for the overall profits. A thorough comprehension of how diseases impact shrimp productivity and contribute to overall economic losses is essential for the successful implementation of effective health management strategies. These economic costs can include direct losses from stock mortality and expenses associated with controlling and managing infections. Indirect costs may encompass employment losses in upstream sectors like hatcheries and feed mills, as well as downstream activities such as processing and exports, resulting in losses to the government. In several countries, the significant decline in shrimp aquaculture production is primarily attributed to the widespread prevalence of infectious diseases, leading to considerable economic losses. Various studies have estimated these losses to be staggering, ranging from billions of dollars in Asia to global losses over a decade, such as the more than US\$11.58 billion reported in Thailand during 2010-2016, resulting in the loss of 100,000 jobs. In India, the impact of White Spot Syndrome Virus (WSSV) between 2006 and 2008 caused a loss of US\$250 million and led to employment losses of 2.15 million man-days. Highlighting the severity of the issue, white spot disease alone has accounted for a cumulative economic loss of US\$15 billion worldwide over two decades (Patil et al., 2021). Despite these challenges, the industry has made progress in optimizing productivity and achieving economic success through research and development initiatives over the past decade. Presently, the shrimp sector within the country is actively incorporating state-of-the-art farming approaches, including pond-based cultivation, and integrating advanced technologies to combat diseases and optimize water quality management. This has led to increased efficiency, elevated product standards, and heightened competitiveness on the global stage. The shrimp market in India experienced significant growth, reaching US\$ 7.3 billion in 2022, with a projected expansion to US\$ 14.0 billion by 2028. This robust growth, anticipated at 11% during the period from 2023 to 2028, reflects a promising trajectory for the industry (Anderson, 2023). The surging demand for shrimp, both within India and globally, acts as a pivotal force propelling the expansion of the country's shrimp market. Furthermore, due to its favourable geographical positioning, ample water resources, and conducive climatic conditions for aquaculture, India stands as one of the foremost producers and exporters of shrimp. The shrimp sector holds significant economic importance, contributing about 1.6 percent of India's export earnings and employing an estimated 200,000 people. Certainly, here's an alternative version of the sentence. Moreover, the growing awareness and inclination toward nutritious, protein-

rich diets, along with the movement towards shrimp products that have undergone value addition and processing., contributing to a positive market outlook throughout the country (Dao, 2022).

STATUS OF SHRIMP PRODUCTION IN INDIA

Black tiger shrimp (*Penaeus monodon*)

Indian shrimp cultivators were previously heavily associated with the extensive farming of black tiger shrimp, especially along the coastal regions of the country. The decline in black tiger shrimp production in India, attributed to disease-related issues, led to a lack of investment in the sector. In 2009, the introduction of white-leg shrimp prompted a rapid and nearly complete shift among Indian farmers and investors to vannamei, favouring its higher productivity and superior disease resilience. Consequently, black tiger shrimp production in India plummeted to 38,000 metric tons in the financial year 2019-2020, marking a substantial decrease from the consistent levels exceeding 100,000 metric tons observed between 2010 and 2013 (MPEDA, 2023) (Fig. 1).

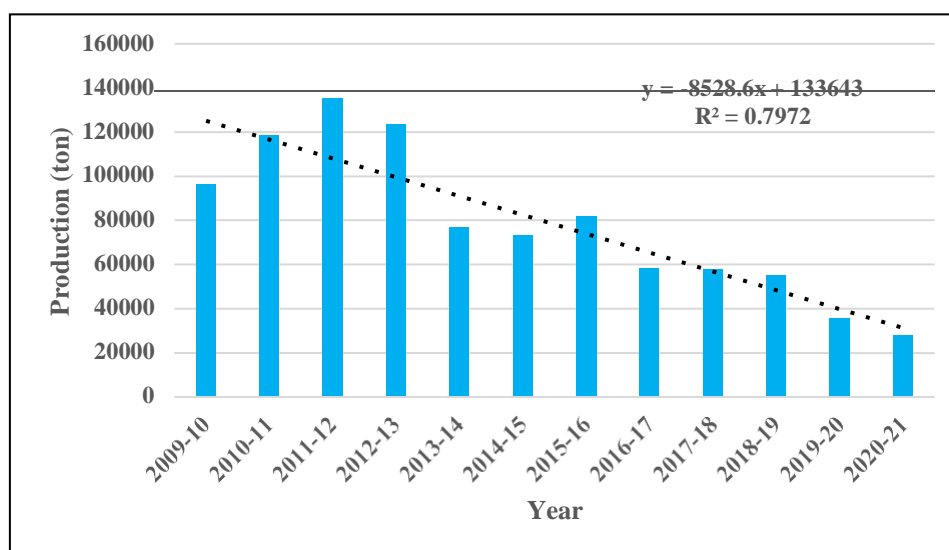


Fig. 1. Production trends of *Penaeus monodon* in India. Dotted line represents the trendline for the production (Source: MPEDA)

Pacific white shrimp (*Litopenaeus vannamei*)

In the year 2020-21, the cultivation of *L. vannamei* spanned a total area of 1,08,526.27 hectares across nine maritime states in India, resulting in a substantial production of 8,15,745 metric tons (Fig. 2). Andhra Pradesh emerged as the frontrunner in both total cultivation area and production, with notable contributions from Gujarat, Tamil Nadu, and Pondicherry. The nationwide average productivity reached 7.52 metric tons per hectare per year, highlighting the significant role of these states in the thriving *L. vannamei* culture industry in India (Suresh, 2020).

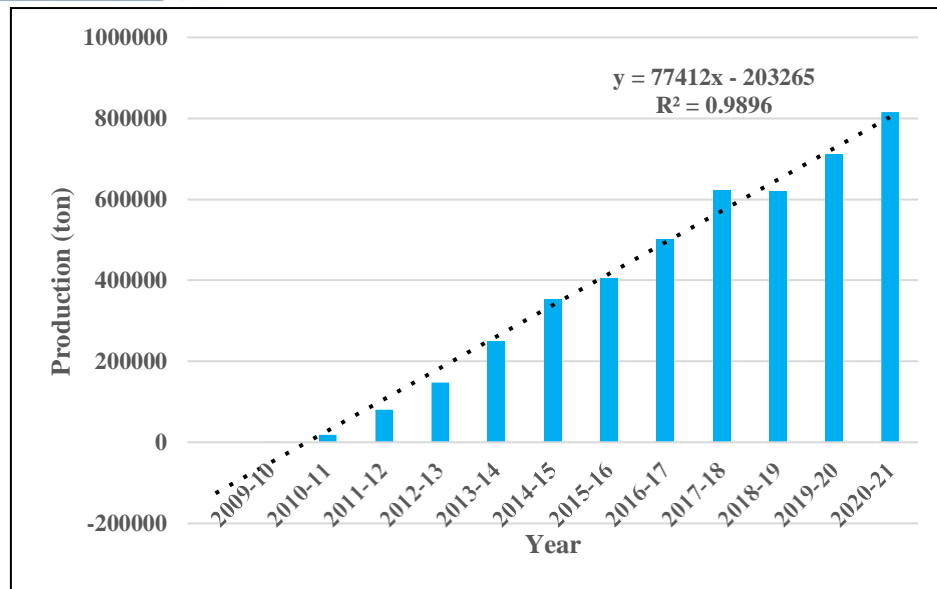


Fig. 2. Production trends of *Litopenaeus vannamei* in India. Dotted line represents the trendline for the production. (Source: MPEDA)

Scampi (*Macrobrachium rosenbergii*)

The country has witnessed a remarkable 2.5-fold surge in scampi production, skyrocketing from 8,303 during the 2020-21 fiscal year (Fig. 3) to 21,317 tonnes in the year 2021-22 (ICAR-CIFA). The significant advancement underscores the possibility of additional expansion in scampi production nationwide. To facilitate the swift growth, ICAR-CIFA has designated five scampi hatcheries as multiplier hatcheries. The hatcheries play a crucial role in the production of CIFA-GI SCAMPI seeds, supplying them to farmers and expanding the network with additional hatcheries to achieve the ambitious goal set by ICAR - CIFA of bringing 25,000 hectares under scampi cultivation by 2026.

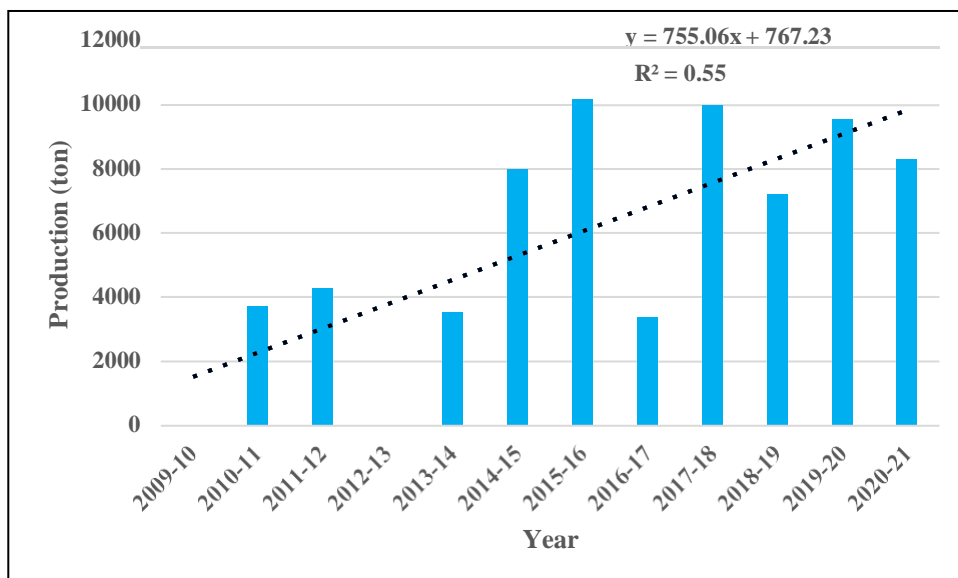


Fig. 3. Production trends of *Macrobrachium rosenbergii* in India. Dotted line represents the trendline for the production (Source: MPEDA)

EXPORT STATUS OF SHRIMP IN THE INDIA

India holds the position of the world's second-largest aquaculture and fish producer, while also ranking as the fourth-largest exporter of seafood. The nation currently exports over 115 varieties of seafood, making a significant contribution to the country's GDP. Various states actively participate in export activities, each differing in the quantity of seafood they contribute to the international market. The trends and patterns of the seafood export of India are displayed in figure 4. The export quantity of frozen shrimp linearly increased right from 2013-14 to 2022-23. The export value of fisheries products was Rs. 30,213 crores during the year 2013-14 and reached Rs. 63,969 crores in 2022-23. Frozen shrimp alone contribute 67.43% of the total export value. Trend analysis of export value clearly indicated a steady growth during the upcoming years (Vinay et al., 2016).

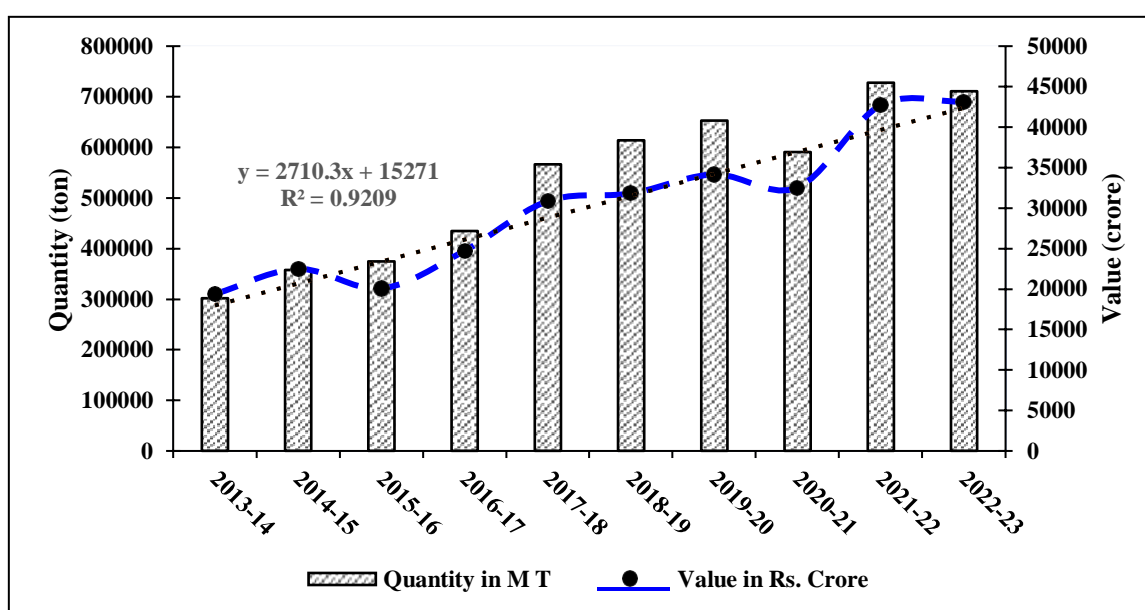


Fig. 4. Production and export trends of frozen shrimp in India. The dotted line represents the trendline for export in terms of value (Source: MPEDA)

CONCLUSION

Shrimp farming, a pivotal component of India's fisheries sector, holds a crucial position in the country's economy by generating extensive employment opportunities for millions and making substantial contributions to foreign exchange earnings. Despite grappling with challenges posed by diseases, the industry has demonstrated commendable progress through the widespread adoption of modern techniques and technologies, leading to heightened productivity and enhanced global competitiveness. The shift from black tiger shrimp to vannamei has been instrumental in sustaining growth. The scampi production has witnessed substantial growth, showcasing further potential. India's seafood export, especially frozen shrimp, has experienced consistent growth, contributing significantly

to the country's GDP. With ongoing efforts in research and development, the Indian shrimp market is poised for continued expansion, reaching a projected value of US\$14.0 billion by 2028. The sector's positive outlook is driven by increasing demand, favourable geographical conditions, and a focus on healthy and protein-rich diets. Overall, the fisheries sector especially the shrimp industries remains a crucial driver of socio-economic development in India.

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