**Opinion Article****Bangladesh's Dying Shrimp Industry Crying for Policy Action**Islam MR<sup>1</sup>, Nurullah SM<sup>1</sup>, Jamal MR<sup>2\*</sup><sup>1</sup>Department of Zoology, National University, Gazipur, Bangladesh<sup>2</sup>Department of Agriculture, Daffodil International University, Dhaka, Bangladesh**ABSTRACT****Article history**

Received: 19 April 2024

Revised: 16 June 2024

Accepted: 27 June 2024

Published online: 30 June 2024

**\*Corresponding author**

Jamal MR, E-mail:

[roushonjamal@yahoo.com](mailto:roushonjamal@yahoo.com)**Keywords**Export earning, *Litopenaeus vannamei*, Bangladesh, shrimp farming, Production.**How to cite:** Islam MR, Nurullah SM, Jamal MR (2024). Bangladesh's Dying Shrimp Industry Crying for Policy Action. J. Agric. Food Environ. 5(2): 66-69.

The shrimp industry shares a significant export portfolio in Bangladesh, contributing substantially to the country's economy. However, despite its bright potential, this export-oriented industry is crying for policy attention for sustainability and competitiveness. The objective of this article is to provide a quick summary message of the shrimp industry in Bangladesh based on available sources. The Department of Fisheries (DoF) has reported a significant decline (50%) in shrimp exports over the past decade, resulting in an associated drop of approximately 40% in export revenues. The loss of competitiveness in the global shrimp market can be explained by several factors, including higher cultivation expenses, lower yield, declining demand, and a failure to introduce exotic, high-yielding species. This article strongly recommends introducing Vannamei shrimp commercially to revitalize the dying shrimp industry in Bangladesh.

© 2024 The Authors. Published by Society of Agriculture, Food and Environment (SAFE). This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0>)

**INTRODUCTION**

Shrimp farming is the most important component of the global aquaculture industry, generating substantial revenues and employment opportunities in Asia and South America (Srinivas, 2019). Shrimp is considered as the second most widely traded seafood globally, with salmon fisheries having greater share (FAO, 2019). Shrimp, prawns and crabs contributed more than 17 percent of the total global volume of seafood sales in 2017 (FAO, 2017). In 2022, the value of the global shrimp market reached around USD 46.94 billion. With an anticipated 6.7% growth rate, the global shrimp industry is expected to achieve the USD 69.35 billion earning goal by the year 2028 (Research and Markets, 2019). Bangladesh is an important shrimp producer, having the largest flooded wetland and favourable biophysical settings. Bangladesh ranks third in Asia in terms of aquatic biodiversity, following China and India (Hosain et al., 2022). Since the 1970s, shrimp farming has been a significant source of export earnings for Bangladesh. With just nine (9)

fish processing plants in Khulna and Chittagong, the shrimp industry began to expand gradually, achieving the brand name 'White Gold'.

However, frustratingly, Bangladesh's shrimp industry is no longer competitive in the global shrimp market. Environmental, production and market-related threats reduced the yield and profitability, reducing its competitiveness (Jamal et al., 2023). Historically, Bangladesh's shrimp industry is mainly extensive in nature, with low-yield potential species such as Black tiger shrimp (*Penaeus monodon*). *Penaeus monodon* held a prominent position in the global commercial shrimp market until the 2000's (Boyd et al., 2021). However, an infestation of diseases, particularly white spot syndrome disease, caused significant yield loss in shrimp-producing countries. The current yield (0.347 tons/ha) in Bangladesh is much lower compared to the global average (2.47 tons/ha). (DoF, 2021; FAO, 2020). The current yield trend generated considerable concern over competitiveness in the rising global market. This paper aims to explore the status of Bangladesh's shrimp

industry and the way forward to revitalize the dying aquaculture sector.

### Status of Bangladesh's shrimp industry

Bangladesh produced 4,276,641 metric tons (MT) of aquaculture items during the 2017-2018 FY, while shrimp production alone contributed more than half of the total production (DoF, 2018). Recently, the demand for Bangladeshi-farmed shrimp has witnessed a decreasing trend in the international market. In 2022-23, Bangladesh exported 27,967 MT of shrimp, which was 54,891 MT in 2010-2011 (DoF, 2021). The export earnings from the shrimp industry experienced a 30% decline in the 2020-2021 FY. Bangladesh earned USD 329 million in 2020-21 FY, while it was USD 472 million in 2015-16 FY (Figure. 1) (EPB, 2022).

While Bangladesh has been struggling to sustain its dying shrimp industry, neighboring India has achieved splendid success, securing a strong position in the global shrimp industry (Jamal, 2023). India, Thailand and Ecuador have gained production and market success through the cultivation and commercialization of Vannamei shrimp (Nisar et al., 2021). Despite having a larger cultivation area (216,000 ha) compared to India (176,00 ha), Bangladesh's shrimp production (70,979 MT) is much lower than India's (682,300 MT) (Boyd et al., 2021; FAO, 2020). In 2022, the overall global export value of shrimp was US\$24.6 billion, which was 28.2% higher than the export value of 2018 (US\$19.2 billion). India earned USD 4.7 billion (24% of the global share), while Bangladesh fetched only US\$0.40 billion (Figure. 2) in 2022. (FAO, 2020; Workman, 2022).

The cultivation of low-yielding Black tiger shrimp was identified as the major cause behind this poor productivity and declining earnings. Black tiger prawn (*Penaeus monodon*) and the Giant River prawn (*Macrobrachium rosenbergii*) are now cultivated extensively in Bangladesh. In recent years, *Litopenaeus vannamei*, commonly known as Vannamei shrimp, has gained popularity due to its excellent profitability in other shrimp-producing countries (Andriani & Pratama, 2023) However, in Bangladesh, Black tiger shrimp is still the dominant shrimp species. Extensive cultivation of Black tiger shrimp contributes only 10% of global trade (Figure 3). Consumer preference for cheaper Vannamei shrimp in the United States and Europe promoted rapid expansion of the high-yielding species.

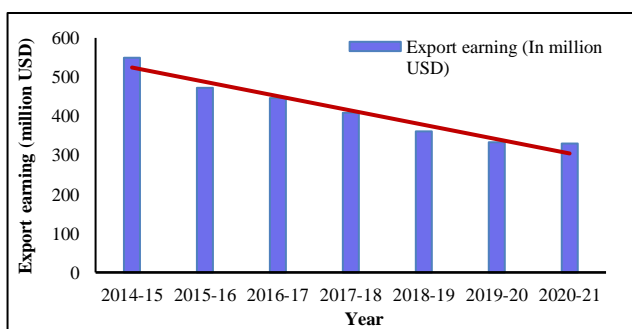


Figure 1: Trend of shrimp export over years in Bangladesh.

Figure 2 represent the export earnings of the major shrimp exporting countries. In 2022, Ecuador was the highest-

earning country, followed by India, Vietnam, and Indonesia. The export earnings by Bangladesh, Spain, China, Belgium, and Myanmar were closer.

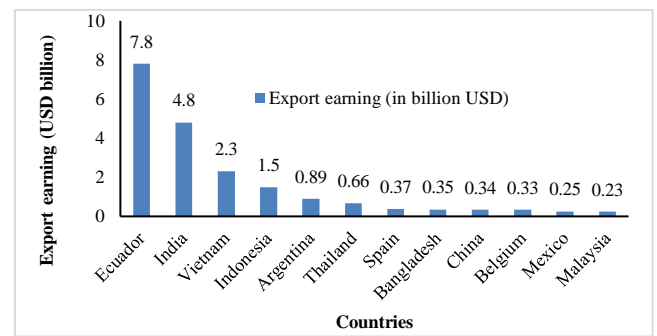


Figure 2: Top export-earning countries in the global shrimp market in 2022.

### Vannamei species might be a change maker in Bangladesh

The international shrimp market is now being dominated by the White leg shrimp or Vannamei shrimp species (*Litopenaeus vannamei*). (Research and Markets, 2019). Over the past 15 years, the Vannamei species has achieved a strong footing in the international market. Very good yield potential, shorter cultivation cycle, cheaper production, greater resistance to disease and stress, and growing demand in the international markets have made this species popular (FAO, 2020; Felix et al., 2021). Major shrimp-producing countries have introduced Vannamei shrimp commercially (FAO, 2017). *Litopenaeus vannamei* currently contributes to over 80% of global shrimp production (Figure). The demand for *L. vannamei* is rising fast due to its cheaper price (FAO, 2020). The price (per kilo) of Vannamei shrimp is consistently \$2.0 to \$2.5 lower compared to the price of Black tiger shrimp (Zaman, 2022). The yield of Vannamei shrimp can reach up to 9000 kg per hectare, while Black tiger shrimp yield only 800-1000 kg per hectare (Washim et al., 2018).

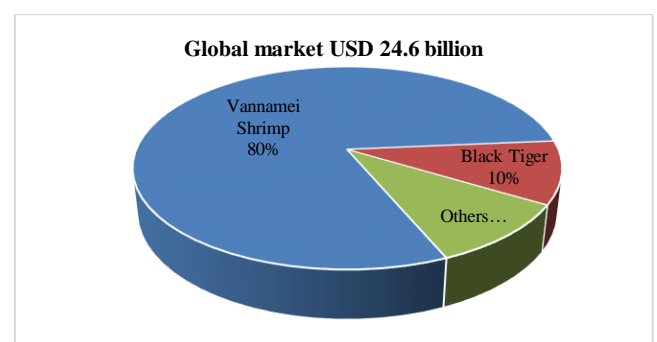


Figure 3: Species-wise share in global shrimp industry.

'Farming of Bagda (*P. monodon*) shrimp has become risky', said Mr. Lutfur Rahman, Owner of Niribili hatchery. The production cost of *P. monodon* is higher, yet shrimp exporters have to ship them at a lower price to maintain market balance and retain buyers, thus incurring losses.

Given the declining competitiveness of Black tiger shrimp, the Ministry of Fisheries could offer a policy node to introduce Vannamei shrimp a decade ago. Shrimp exporters in Bangladesh have constantly been demanding the policy node for commercial cultivation of high-yielding Vannamei

shrimp. India has secured a strong position in the international shrimp market in recent years ([Nisar \*et al.\*, 2021](#)).

Finally, the Ministry of Fisheries approved two pilot projects on 1<sup>st</sup> September 2019 ([Dao, 2020](#)). The piloting phase was executed over a duration of one year; it was intended to be authorized for commercial cultivation if trials were found satisfactory. However, one by the Agribusiness Enterprises Development Services did not start operation. But *Shushilan* – a non-government organization – started the trial at the Saline Water Center of the Bangladesh Fisheries Research Institute in Paikgacha, Khulna and achieved good success. A total of 13,886 kg of Vannamei shrimp were harvested from about 1.56 hectares of land, with an average production of 8901 kg per hectare in just 110 days. Following the success, the Department of Fisheries (DoF) has permitted 11 more firms to conduct piloting ([M.U.SeafoodsLtd, 2022](#); [The Financial Express, 2023](#)).

Commercial cultivation of Vannamei shrimp has already been started in all major shrimp-producing countries, such as India, China, Vietnam, and Ecuador, capturing more than 80% of the global market share ([Shams, 2022](#)). Bangladesh should take the necessary measures to start commercial farming of promising Vannamei shrimp. Additionally, a rising local demand for shrimp is expected to escalate due to the rising per capita income. There is no option but to increase national production to sustain the shrimp economy. As Vannamei shrimp is performing better in countries with similar ecology and biophysical settings, Bangladesh can approve commercial cultivation. Furthermore, Bangladeshi farmers have effectively incorporated many new species and varieties of crops, livestock and fish into their farming practices. Thus, they are expected to be more responsive to new technologies and species ([Jamal, 2023](#)). However, a certification scheme, as practised by India and other major shrimp exporting countries, is essential to boost global competitiveness. A third-party certification scheme would ensure compliance with water quality parameters, the non-use of harmful antifouling growth hormones, minimal impact on critical habitats (e.g., mangrove, wetland, etc.), compliance with social accountability, and the reduction of carbon footprint ([Samerwong \*et al.\*, 2018](#))

Taking advantage of the potential of Vannamei shrimp, Bangladesh can produce 3-4 million tons of Vannamei within the next five years.

Semi-intensive Vannamei shrimp farming would require more investment in feed and management. Government support (technical and incentives) can significantly increase national production if 30-40% of existing extensive shrimp farms are converted to Vannamei cultivation. Medium and large ponds would be suitable for Vannamei farming.

## CONCLUSION

Bangladesh still has the potential to revitalize the dying shrimp industry. An immediate policy node and extension support to introduce Vannamei shrimp is essential to increasing national production and export earnings. Production-based subsidies can be provided for research and development of Vannamei shrimp cultivation. Shrimp economic zones in Cox's Bazar and the Khulna region can be established for a sustainable shrimp industry. Holistic research, substantial financial investment, collaborations,

structural modifications, and the enhancement of farmers' skills and knowledge are crucial for making Bangladesh's shrimp industry competitive. This article recommends a comprehensive economic, biodiversity and social analysis of newly introduced Vannamei shrimp and traditional Black tiger shrimp for future policy planning.

## Acknowledgement

The authors humbly acknowledge the unanimous reviewer for their valuable comments.

## Funding

The authors declare that no finds, grants, or other support were received during the preparation of this manuscript.

## Conflict of interest

The authors declare that they have no competing interests.

## Ethics approval

No ethics approval was required.

## Consent to participate

Not Applicable

## Consent for publication

Not Applicable

## Data Availability

Secondary data were collected from published articles, government documents, statistical year book and annual reports and referenced properly.

## Authors' contributions

Conceptualization: M.R.I.; Writing-original draft: M.R.I. and S.M.N.; Writing-review and editing: M.R.J.; Visualization: M.R.I.; Supervision: M.R.J.

## REFERENCES

- Andriani Y, Pratama RI 2023: A Review on Herb Utilization in Vannamei Shrimp Cultivation. *Asian Journal of Research in Zoology*, **6**(4), 10–17. <https://doi.org/10.9734/ajriz/2023/v6i4117>
- Boyd CE, Davis RP & McNevin AA 2021: Perspectives on the mangrove conundrum, land use, and benefits of yield intensification in farmed shrimp production: A review. *Journal of the World Aquaculture Society*, **53**(1), 8–46. <https://doi.org/10.1111/jwas.12841>
- Dao T 2020: *Bangladesh government grants permission for vannamei pilot farms*. SeafoodSource. <https://www.seafoodsource.com/news/aquaculture/bangla>

- desh-government-grants-permission-for-vannamei-pilot-farms
- DoF 2021: DoF. 2021b Yearbook of Fisheries Statistics 2020–21. Department of Fisheries, Ministry of Fisheries and Livestock, Government of the People's Republic of Bangladesh, Dhaka. <https://file-khulna.portal.gov.bd/media/a94c75c7-32d5-4210-8f17-fb47da864c5b/uploaded-files/YearBook%20of%20Fisheries%20Statistics%20of%20Bangladesh%202019-20.pdf>
- DoF D 2018: DOF 2018. Director of Fisheries. [https://fisheries.portal.gov.bd/sites/default/files/files/fisheries.portal.gov.bd/page/4cfbb3cc\\_c0c4\\_4f25\\_be21\\_b91f84bdc45c/Fisheries%20Statistical%20Yearbook%202017-18.pdf](https://fisheries.portal.gov.bd/sites/default/files/files/fisheries.portal.gov.bd/page/4cfbb3cc_c0c4_4f25_be21_b91f84bdc45c/Fisheries%20Statistical%20Yearbook%202017-18.pdf)
- EPB 2022: EPB 2022. Export Promotion Bureau. [http://www.epb.gov.bd/site/view/annual\\_reports/](http://www.epb.gov.bd/site/view/annual_reports/)
- EPB E 2020: Export Promotion Bureau. Export Promotion Bureau. <http://www.epb.gov.bd/site/page/c1e248e9-6c73-4939-9b9f-371018292fd0/Export-Product-List>
- FAO 2020: FAO 2020 Yearbook. Fishery and Aquaculture Statistics 2018 / FAO annuaire. Statistiques des pêches et de l'aquaculture 2018 / FAO anuario. Estadísticas de pesca y acuicultura 2018. FAO. <https://doi.org/10.4060/cb1213t>
- FAO F 2017: FAO Yearbook. Fishery and Aquaculture Statistics 2017/FAO annuaire. Statistiques des pêches et de l'aquaculture 2017/FAO anuario. Estadísticas de pesca y acuicultura 2017—Latest publications. <https://www.fao.org/fishery/en/publication/256603>
- FAO F 2019: Publication preview page | FAO | Food and Agriculture Organization of the United Nations. FAO Documents. <https://doi.org/10.4060/cb7874t>
- Felix S, Samocha T & Menaga M (Eds.) 2021: *Vannamei shrimp farming*. CRC Press.
- Hosain MA, Ullah K, Sayam MAA, Mohiuddin K & Rahman E 2022: *Present Status and Future Direction of Bangladeshi Shrimp Resources*.
- Jamal MR 2023: Can vannamei shrimp (*Litopenaeus vannamei*) revitalise Bangladesh's dying shrimp industry? *Aquaculture International*, **31**(3), 1637–1641. <https://doi.org/10.1007/s10499-022-01045-9>
- Jamal MR, Kristiansen P, Kabir MJ & de Bruyn LL 2023: Risks and adaptation dynamics in shrimp and prawn-based farming systems in southwest coastal Bangladesh. *Aquaculture*, **562**, 738819. <https://doi.org/10.1016/j.aquaculture.2022.738819>
- MU SeafoodsLtd 2022: *Museafood, Commercial farming of Vannamei will introduce in Bangladesh very soon!* <https://museafood.com/2022/03/02/commercial-farming-of-vannamei-will-introduce-in-bangladesh-very-soon/>
- Nisar U, Zhang H, Navghan M, Zhu Y & Mu Y 2021: Comparative analysis of profitability and resource use efficiency between *Penaeus monodon* and *Litopenaeus vannamei* in India. *PLOS ONE*, **16**(5), e0250727. <https://doi.org/10.1371/journal.pone.0250727>
- Research and Markets R and M 2019: *Research and Markets, 2019. Europe Shrimp Market: Industry Trends, Share, Size, Growth, Opportunity and Forecast 2019-2024*. Research and Market.
- Samerwong P, Bush SR and Oosterveer P 2018: Implications of multiple national certification standards for Thai shrimp aquaculture. *Aquaculture*. **493**: 319-327.
- Shams M 2022: *Commercial farming of Vannamei shrimp gets green light*. <https://businesspostbd.com/front/2022-10-04/commercial-farming-of-vannamei-shrimp-gets-green-light>
- Srinivas D 2019: *Identifying diseases affecting farmed Litopenaeus vannamei in different areas of Nellore district in Andhra Pradesh, India*. **6**, 80–85.
- The Financial Express 2023: *Commercial farming of Vannamei shrimp to start by Mar*. The Financial Express. <https://thefinancialexpress.com.bd/trade/commercial-farming-of-vannamei-shrimp-to-start-by-mar-1672886736>
- Washim MR, Rahman SL & Rubel ASA 2018: Scaling up of tigershrimp (*Penaeus monodon*) production in brackishwater pond under diversified cropping regimes. *Asian Journal of Medical and Biological Research*, **4**(1), 27–35. <https://doi.org/10.3329/ajmbr.v4i1.36818>
- Workman D 2022: *Big Export Sales for Frozen or Fresh Shrimps*. <https://www.worldstopexports.com/big-export-sales-for-frozen-shrimps/>
- Zaman MA 2022: *Shrimp exports shrivel in Q1*. The Daily Star. <https://www.thedailystar.net/business/economy/news/shrimp-exports-shrivel-q1-3146211>