

Vannamei Shrimp Farming in Bangladesh: Stepping Towards Substantial Blue Economic Growth

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Bangladesh is widely recognized as one of the most suitable countries in the world for shrimp farming because of its favorable resources and agro-climatic conditions. A subtropical monsoon climate, low-lying agricultural land, saltwater availability, and a large shallow area provide ideal conditions for shrimp production. In the past three decades, the development of shrimp farming has attracted considerable attention because of its high export potential. Frozen and Live Fish export is the eighth largest export item of our country, which earned about \$532.94 million in the year 2021-22, is about 0.52% of total export, and contributed 0.116% to the national GDP. Shrimp exports hold more than 75% of the frozen and live fish items export category (Bangladesh Export performance report for FY 2022-23, Export Promotion Bureau) in Bangladesh. From 2014 to 2021, there was a downward trend in shrimp exports due to the lack of proper infrastructure, hatcheries, feed mills, and the COVID-19 pandemic. However, a growing trend in shrimp exports began in 2022, aiming to earn \$500 million in 2023.

Over the past decade, global shrimp production has increased by around 50%. Most production occurs in developing countries, with significant output from extensive and semi-intensive systems. According to thefishsite.com, countries in Asia (83.4% of production) and Latin America (16.3%) account for the major share of shrimp production, based on two species: the Pacific white shrimp (*Litopenaeus vannamei*) with 83% of the production and the tiger prawn (*Penaeus monodon*) with 12%. Bangladesh is currently the eighth-largest shrimp-exporting country in Asia. The country captured only 2% of the world shrimp market (The Business Standard, 12 January, 2020). Based on the World Shrimp Market Outlook, the world shrimp market has reached 7.14 million tonnes in 2022. The market is likely to grow at a compound annual growth rate of 6.40% during 2023-2028 to attain a volume of 10.27 million tons by 2028, driven by rising demand for shrimp. So there is a huge opportunity for Bangladesh to expand our shrimp culture by properly selecting the cultivation method and the types of shrimp which will help to promote our blue economy initiatives.

Considering the market demand, production growth, and cost-effectiveness, traders and exporters involved in frozen shrimp export have been demanding approval for commercial production of Vannamei Shrimps in Bangladesh instead of freshwater prawns and black tiger shrimp as exports to European and American markets. The vannamei species of shrimp, popularly known as the 'king prawn' or 'white-leg shrimp,' is originally from the US state of Hawaii. Neighbouring India began commercial cultivation of vannamei shrimp in 2008. Meanwhile, in 1998, Thailand and China started commercial vannamei shrimp cultivation. In 1987, the Philippines initiated commercial vannamei shrimp cultivation. Myanmar and Vietnam entered the market in the year 2000.

Golda (freshwater shrimp) and Bagda (black tiger shrimp) cannot be farmed more than once a year (twice if there are mortalities during a cycle). However, vannamei can be farmed three times a year. A typical pond can produce 300-400kg of shrimp per hectare. On the other hand, it is possible to produce 7,000-8,000kg of vannamei shrimp on the same land area. Moreover, vannamei shrimp are disease-resistant and can tolerate a wide range of salinity levels, making them suitable species for farming in Bangladesh's coastal areas. Vannamei shrimp farming started experimentally in Paikgacha, Khulna, in 2021 under the Bangladesh Fisheries Research Institute (BFRI). That year, two companies were successful in farming. Subsequently, in 2022, 12 institutions were granted permission to grow vannamei shrimp and are seeing success. The Ministry of Fisheries and Livestock approved the cultivation of vannamei shrimp in a letter to the Director General of the Fisheries Department on March 29, 2023. At the same time, guidelines for commercial shrimp cultivation in Bangladesh were provided.

There are several areas in the country where vannamei shrimp cultivation can be practiced commercially. The major shrimp cultivation areas in Bangladesh are Khulna, Satkhira, Cox's Bazar, Chittagong, and Bagerhat. All these districts are located southern part of Bangladesh, have long coastlines, and are suitable for vannamei shrimp farming. Currently, there are 105 approved frozen food processing factories in Bangladesh, but only 60 of them are operating due to the struggle with the shortage of raw materials. Approximately 258,000 hectare of land are used for shrimp farming, where 300-400 kg of freshwater prawns and black tiger shrimp per hectare are produced in 160 days.

Furthermore, according to a report from the Food and Agriculture Organization of the United Nations (FAO), the shrimp sector in Bangladesh employed approximately 1.5 million people in 2019. These workers are involved in various activities related to shrimp farming, including pond preparation, seed collection, stocking, feeding, water management, disease control, harvesting, and processing. Additionally, there are many indirect jobs associated with the shrimp farming industry, such as transportation, marketing, and support services.

The cultivation of vannamei shrimp is becoming more and more popular in Bangladesh due to its potential profitability and growing demand for shrimp on the international market. However, vannamei shrimp farming is relatively new to the country and also presents a number of challenges (Table 1). One of the main issues is the lack of proper infrastructure, including hatcheries, feed mills, and processing facilities, which makes it difficult for farmers to access quality shrimp seed, feed, and market channels. Additionally, this agro-industry has faced environmental concerns, such as water pollution, and there have been reports of disease outbreaks among farmed shrimp populations. As such, government and industry need to work together to implement sustainable practices to address these challenges.

The concept of the blue economy is subject to multiple interpretations of the coverage of

activities, geographical locations and sectors. In Bangladesh, the coastal zone covers an area of 47201 sq km, which represents 32% of the country's landmass and includes 19 districts. The shoreline extends for about 720km. Our blue economy initiatives primarily focus on capture fishing, aquaculture, and seafood processing. In terms of coastal aquaculture, there has been significant growth in production, including shrimp/prawn and finfish farming in ghers (pond/enclosure) along the coastal belt. Currently, farmers adhering to Good Aquaculture Practices (GAP) are showing a growing interest in adopting ecological shrimp cropping systems and clustering approaches. Among coastal aquacultures, Vannamei shrimp now accounts for approximately 77% of the global shrimp trade. This species of shrimp is now being commercially cultivated in 62 countries. Of these, 15 are in Asia. The demand for Vannamei shrimp on the global market is high as the price is lower than that of Bagda and Golda shrimps. Bangladesh's shrimp export has been in decline in the past few years as the country mainly cultivates and exports two types of shrimp species such as black tiger shrimp, or 'Bagda', and scampi shrimp, or 'Golda'. Vannamei shrimp farming has started in Bangladesh commercially from March 29, 2023. This shrimp farming has significant prospects due to the increasing demand, higher profitability, export potential, technological advancements, and employment opportunities. However, sustainable practices and proper infrastructure development are necessary to ensure its long-term success.

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