AQUACULTURE INDUSTRY ANALYSIS

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Sukhanidhi INVESTMENT ADVISORS
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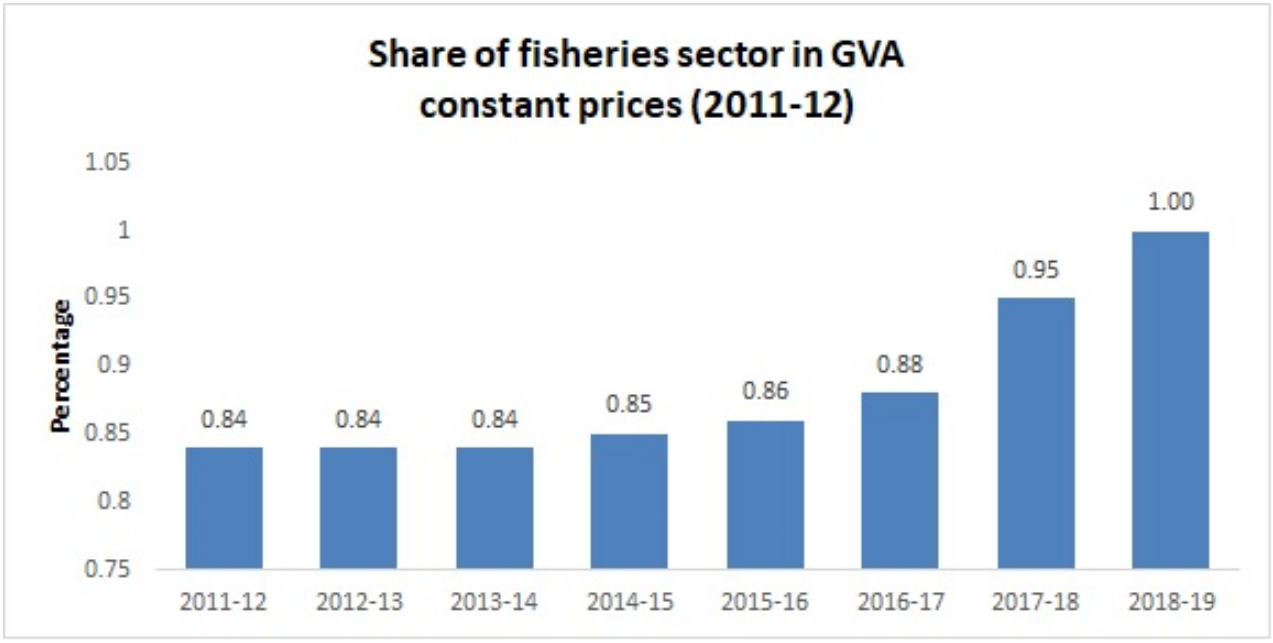
Aquaculture - the farming of fish, shrimp, algae or shellfish - is the backbone of the fishery industry's economic success in India. It is the fastest-growing food production sector in the world. Aquaculture, also known as aqua farming, is the farming of aquatic organisms such as fish, crustaceans, molluscs and aquatic plants. It involves cultivating freshwater and saltwater populations under controlled conditions. Atlantic salmons and shrimps are the major commodities in aquaculture production. Fisheries and aquaculture continue to be an important source of food, nutrition, income and livelihood to millions of people. The sector provides livelihood support to over 250 lakh people at the primary level and almost twice the number along the value chain. Fish being an affordable and rich source of animal protein, is one of the healthiest options to mitigate hunger and nutrient deficiency. Fisheries is sub-sectors of Indian agriculture. Fisheries sector contributes around 1% in National Gross Domestic Product (GDP). The fisheries sector also plays an important role in the national economy and the sector has been one of the major contributors of foreign exchange earnings, with India being one of the leading seafood exporting nations in the world. Aquaculture has replaced catch fisheries as the dominant form of inland production, increasing its share from around 30% to over 70% currently. India is also a major producer of fish through Aquaculture and ranks second in the world after China.



India is blessed by diverse and rich water resources, which sustain a large fisheries sector in the country. The country is surrounded by the marine waters on its three sides and possess more than 8000 km of coastline and has Exclusive Economic Zone (EEZ). India is crisscrossed by 14 major rivers and together with canals. The country has reservoirs, lakes and large estuaries as well. This clearly envisages vast water resources in different climatic zones depicting huge potential for aquaculture in India.

In the country there are mainly two water resources – Inland and Marine. Within inland water resources bifurcation is area under reservoirs is 3.15 million hectare, area under ponds & tanks is 2.41 million hectare, area under brackish water is 1.24 million hectare, Length of river & canals is around 0.19 million Km and flood plain lakes are in area of 0.8 million hectare. Within marine water resources, length of coast line is 8118 km, exclusive economic zone 2.02 million Sq. Km., Continental shelf of 0.53 million sq. km., number of noticed fish landing centers are 1457 and number of fishing villages are 3461.

Marine fisheries in India are a shared responsibility between the national and state governments. In a legal and constitutional sense, state governments are responsible for waters inside the 12 nautical mile territorial limit (22 km), while the Government of India (GOI) is responsible for waters between 12 nautical miles and the country's 200 nautical mile (370 km) EEZ.

Types of aquaculture

Brackish water aquaculture: it is also called coastal aquaculture, is largely dependent on a single species, tiger shrimp. The most common species in brackish water ponds are seabass, mullets, milkfish, pearl spot, and catfish.

Saline aquaculture: it is the farming or culture of aquatic animals and plants using inland (i.e. non-coastal) sources of saline groundwater rather than the more common coastal aquaculture methods. As a side benefit, it can be used to reduce the amount of salt in underground water tables, leading to an improvement in the surrounding land usage for agriculture.

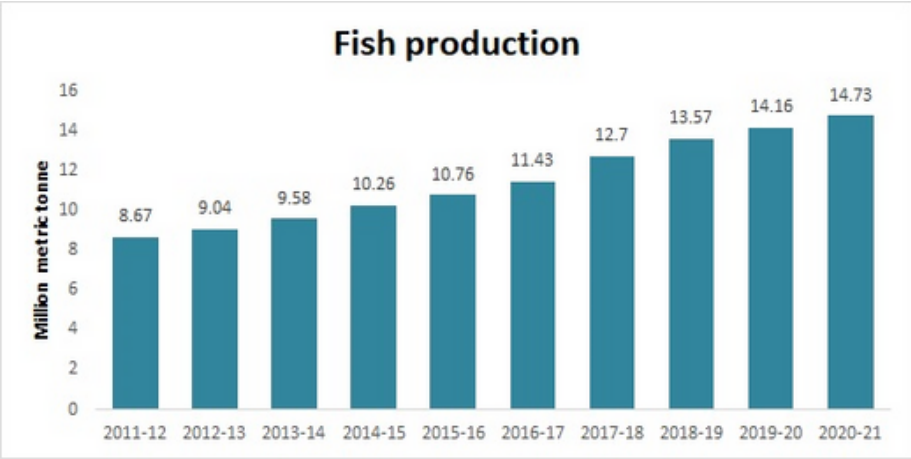
Cold water fisheries: The cold water fishes adopted to live below 100C to 200C temperature. The upland water at high altitudes of mountains and the spring water at low altitude in temperate regions remain cooler than the rest and the cold water fishes flourish in these region. Such water bodies comprising several hill streams, rapids, pools, lakes and reservoirs are abundantly found in the Himalayan region and in the Deccan plateau region of peninsular India.

Riverine Fisheries: It is a part of inland fisheries where the fishes are captured directly from the different river systems with the help of scientifically made fish crafts and gears. The riverine fishery resources in India is immense as large number of productive riverine system is present in this country.

Cage culture: It is when fish are reared from fry to fingerling, fingerling to table size, or table size to marketable size while captive in an enclosed space that maintains the free exchange of water with the surrounding water body. A cage is enclosed on all sides with mesh netting made from synthetic material that can resist decomposition in water for a long period of time and is sold under the brand name Netlon.

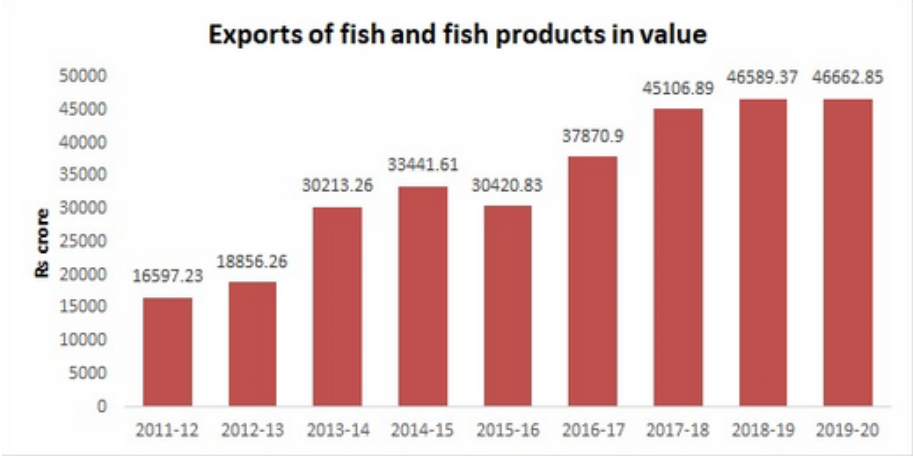
Fish production

In line with the consumption side demand, the production of Fish & other aquatic food has increased over the years. India is the third largest fish producing country in the world and accounts for over 7% of the global production. Fish production in FY20-21 was expected to be 14.73 million metric tonnes (MMT) with a contribution of 11.25 MMT from Inland sector and 3.48 MMT from Marine sector. This was 4% higher as compared to FY20. Fish production has increased from 5.66 MMT in FY2000-01 to 8.67 MMT in FY 2011-12 and further to 14.16 MMT in FY 2019-20. There was continues increase in fish production. Fish are an important source of macro & micronutrients and even small quantities have a significant positive nutritional impact. Hence, they play a crucial role in nutrition and global food security. Besides, betting big on tilapia fish for doubling the country's marine exports, the government has called on the industry to set up hatcheries through public-private partnership (PPP) to ensure availability of quality seeds and scale up production.



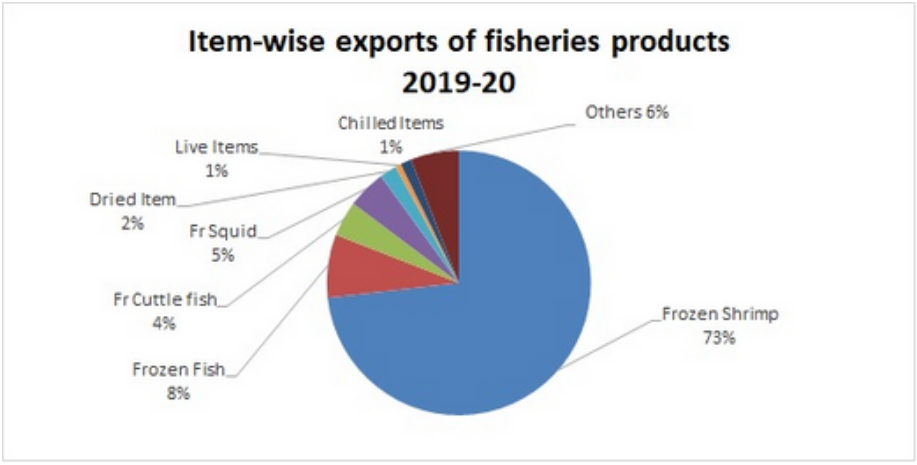
Exports

India is one of the top 5 countries in the world for fish exports (Fishing industry & Exports). 17% of the nation's agricultural exports come from the fishing industry and its byproducts. This exports amounted to approximately Rs 60,000 crore in 2021-2022. During 2020-21, exports of marine products stood at 1.15 MMT and valued Rs 43,717.26 crore despite the market uncertainties raised by the Covid-19 pandemic outbreak. In 2019-20, the country has exported fisheries products worth Rs 46662.85 crore slightly higher compared to Rs 46589.37 crore in 2018-19. Before that the country had exported fish and fish products worth Rs 45106.89 crore in 2017-18 and Rs 37870.90 crore in 2016-17. As for overseas markets, USA continued to be the major importer of Indian seafood with an import worth $24,047.15 million. Meanwhile, Brackish/Saline water aquaculture has gained a great momentum in India. India’s exports growth story is primarily due to the success of brackish water aquaculture of shrimp.



Item-wise exports of fisheries products in 2019-20

Of the total exports of Rs 46,662.86 crore in 2019-20, the country had exported frozen shrimp worth Rs 34,152.03 crore, which was highest among others as the demand for frozen shrimp is robust. Followed by frozen fish exports value was Rs 3,610.01 crore, for Fr cuttle fish was Rs 2,009.79 crore, Fr squid was Rs 2,196.59 crore, Dried item was Rs 981.5 crore, Live items was Rs 324.26 crore, Chilled items was Rs 631.84 crore and Others was Rs 2,756.84 crore.



Impact of climate changes or any other things on industry

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Climate change effects on aquaculture production are expected to be both direct and indirect. The direct effects include influencing the physical and physiology of finfish and shellfish stocks in production systems, while indirect effects may occur through altering the primary and secondary productivity, and structure of the ecosystems, input supplies or by affecting product prices, fishmeal, and fish oil costs, and other goods and services needed by fishers and aquaculture producers.

Changes in rainfall patterns: It will affect aquaculture production and sustainability in two directly opposite ways; increased rainfall (Flooding) and periods of low or no rainfall (Drought). Increased levels of rainfall, particularly if it occurs as heavier events, will increase the production risks in lowland areas. These risks include losing fish from ponds during floods, invasion of ponds by unwanted species, and ponds damage resulting from infilling and washing away of walls. The mixing of pond water and fish with those in the wild could negatively affect the environmental sustainability of aquaculture production mainly through the introduction of invasive fish species and water quality deterioration.

Temperature: It plays a critical role in the growth and development of aquatic animals. Fish, being poikilothermic, may particularly be sensitive to temperature variations resulting from climate. With the predicted 1.5°C rise in average global temperature this century, increased mortalities are likely to occur for most fish, especially cold-water species, such as the Atlantic halibut, Salmon and Cod, and intertidal shellfish due to thermal stress. On the other hand, warmer periods (within species' tolerance conditions) may promote longer growing seasons, especially in temperate regions, and favor the production of warmer water species, such as the Giant tiger prawn, Tilapia, Oysters, and Mussels.

Ocean acidification: It occurs due to a decline in pH levels of ocean water for an extended period (usually over decades) resulting from atmospheric CO2 uptake. The oceans are estimated to store about 50 times more CO2 than the atmosphere. The projected increase in CO2 uptake by oceans at 1.5°C or more global warming will have adverse effects on the growth, development, calcification, survival, and abundance of several aquatic species.

The rise in sea level: It may destroy several coastal ecosystems, such as mangroves and salt marshes, which are considered crucial for maintaining wild fish stocks, as well as supplying seed for aquaculture production. This will negatively affect aquaculture breeding programs and the economic sustainability of the sector. Higher sea level is predicted to affect aquaculture production facilities, such as ponds, cages, tanks, and pens particularly in lowland regions through the intrusion of saline water.

Government initiatives

Pradhan Mantri Matsya Sampada Yojana (PMMSY)

The government on May 20, 2020 approved the Pradhan Mantri Matsya Sampada Yojana (PMMSY) at a highest ever total investment of Rs 20,050 crore comprising of (i) Central share of Rs 9407 crore, (ii) State share of Rs 4880 crore and (iii) Beneficiaries contribution of Rs 5763 crore for its implementation within a period of 5 years from FY 2020-21 to FY 2024-25 in all States/Union Territories. During 2020-21, Proposals from 34 States/UTs (except West Bengal, Chandigarh) and other organizations at a total cost of Rs 2881.41 crore involving central share of Rs 1089.86 crore have been approved and first installment of Central share of Rs 585.68 crore have been released. During 2021-22, the Proposals from 16 States/UTs for developmental projects and 22 States/UTs under Livelihood and Nutritional Support during fishing ban/lean period component with a total project cost worth of Rs 2600.54 crore involving central share of Rs 845.31 crore have been approved and first installment of Central share of Rs 405.92 crore and Rs 176.27 crore as a committed liability were released to various States/ UTs.

- Inland Fisheries: 2983 hectares of pond area for inland aquaculture, 676 Biofloc units and 1178 Nos of Re-circulatory Aquaculture Systems (RAS), 10,490 Nos of cages and 126 hectares pens in reservoirs and other water-bodies; 110 Nos of fish/prawn hatcheries, 79 hectares of pond area for Inland Saline-alkaline culture were approved.
- Marine Fisheries: 101 deep sea fishing vessel, 260 up gradation of existing fishing vessels, 1,353, Bio-toilets in mechanized fishing vessels; 890 nos of open sea cage for fish culture; 2nos Small Marine finfish hatcheries, 642 hectares of pond area for brackishwater aquaculture and 3 nos of brackishwater hatcheries were approved.
- Fishermen Welfare: 974 Nos replacement boats and nets for fishermen; Livelihood and nutritional support for 6,58,462 fishers' families for conservation of fisheries resources during fishing ban/lean period and 19 nos Extension and support services (MatsyaSevaKendras).
- Fisheries Infrastructure: 127 Nos. ice plant/cold storages, 117 Nos fish feed mill/plants; 4660 units of fish transportation facilities viz., refrigerated (67) and insulated trucks (373), auto rickshaws (783), motor cycles (1893) and bicycles with ice box (1304); 957 units of fish retail markets (81) and fish kiosks including ornamental kiosks (876) and 13 value added enterprise units have been sanctioned so far.
- Aquatic Health Management: 4 nos, Disease diagnostic centre and quality testing labs, 2 Mobile centres and testing labs and one Aquatic referral labs have been approved.
- Ornamental Fisheries: 273 Nos of Ornamental fish rearing units and 37 Nos of Integrated Ornamental fish units (breeding and rearing) have been approved.
- Seaweed Cultivation: 23,000 nos rafts and 41,000 nos monoline tubenet approved for seaweed cultivation.

Implementation of FIDF

In order to address the infrastructure requirement for fisheries sector, the Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying during 2018-19 has created dedicated fund namely Fisheries and Aquaculture Infrastructure Development Fund (FIDF) with a total funds size of Rs 7522.48 crore. FIDF provides concessional finance to the Eligible Entities (EEs), including State Governments/Union Territories and State entities for development of identified fisheries infrastructure facilities through Nodal Loaning Entities (NLEs) namely (i) National Bank for Agriculture and Rural Development (NABARD), (ii) National Cooperatives Development Corporation (NCDC) and (iii) All scheduled Banks.
Under the FIDF, the Department of Fisheries provides interest subvention up to 3% per annum for providing the concessional finance by the NLEs at the interest rate not lower than 5% per annum. Loan lending period under FIDF is five years from 2018-19 to 2022-23 and maximum repayment period of 12 years inclusive of moratorium of 2 years on repayment of principal. Under the FIDF, so far 156 nos proposals to the tune of Rs 5954.96 crore have been received from various eligible Entities (EEs) including State Governments and Union Territories. These proposals have been received from a total of 20 States/UTs namely Andhra Pradesh, Tamil Nadu, Maharashtra, J&K, Telangana, Mizoram, West Bengal, Assam, Lakshadweep, Gujarat, Uttar Pradesh, Odisha and Haryana, Himachal Pradesh, Manipur, Andaman and Nicobar, Kerala, Tripura, Goa and Bihar.

Kisan Credit Card (KCC)

The government announced Rs 2 lakh crore concessional credit boost to 2.5 crore farmers including fishers and fish farmers under Kisan Credit Card (KCC) Scheme as a part of Atmanirbhar Bharat Package. Thus, Department of Fisheries in collaboration with all the States/UTs took up a special drive several times to saturate the issuance of KCC to fishers and fish farmers.

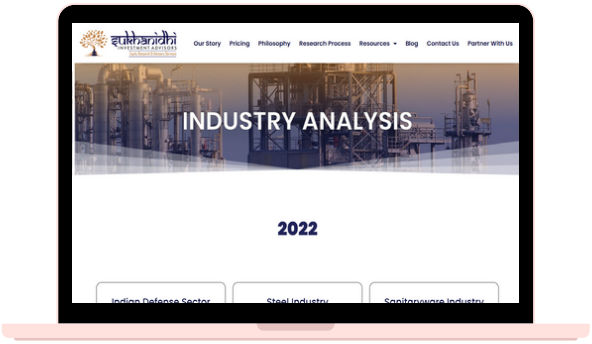
Fishermen can be classified into two types, viz., Marine fishers and fish farmers (Aquaculturists), Aquaculture which required heavy capital investment was still nascent in the country and traditional marine fishers did not require too much capital as per their current practices. Under this scheme and under PMMSY, DoF was working with State Governments and fishers/fish farmers to make them aware about the best practices and encouraging them to scale up their activities. This would help farmers enhance their income and also lead to higher credit offtake.

State-wise initiatives

- Union Fisheries Minister Giriraj Singh announced an investment of Rs 400 crore ($55.30 million) in Goa on February 7, 2021. These funds will be used to construct 30 fish landing jetties linked to the main roads, where fishermen can anchor their boats near their villages.
- Kerala launched 'Parivarthanam' scheme to enhance the livelihood of fishing community in September 2020. The scheme is headed by Kerala State Coastal Area Development Corporation (KSCADC); and will enable home delivery of fresh fish products and guarantee a fixed price to fishermen.
- J. Mercykutty Amma, Kerala's Minister for Fisheries and Harbour Engineering, announced the launch of two modern marine ambulances each costing Rs 6.08 crore ($0.83 million) in January 2021 to provide swift emergency response to fishermen in distress in seas.
- The Maharashtra government has announced a major relief for the state's fishermen community, who faced severe 'fishing drought' on account of the pandemic. Fishing boat owners are likely to receive a one-time cash compensation of up to Rs 30,000 ($414.75).
- Between August 2020 and October 2020, J&K and Odisha introduced bio floc technology (BFT) to boost fish farming in both states. Bio floc technique is an alternative to the conventional open pond fish farming.
- Himachal Pradesh announced plans to build 15 land-based fishponds using Recirculating Aquaculture System (RAS) technology to boost local fish production over the next five years in October 2020. In a recirculating aquaculture system, the water is purified and reused continuously.

Outlook

The Indian aquaculture industry has shown good growth in last decade and it is likely to continue this growth momentum in coming time with expanding demand both domestically and globally and healthy production. Fish is an important source of protein in India as well as abroad. The country is currently one of the key suppliers of frozen shrimp and frozen fish in various international markets. India still has a long coast line ideally suited for Shrimp culture which provides potential opportunities for increasing Shrimp culture in future. While the country holds a strong stand in the global aquaculture race, there is scope for the industry to improve infrastructure and technology in the industry to grow further. Besides, the government is aiming to turn India into a hotspot for fish production through appropriate policies, marketing and infrastructure support. Pradhan Mantri Matsya Sampada Yojana, Fisheries and Aquaculture Infrastructure Development Fund and Kisan Credit Card are among others initiatives of the government to support the industry. The government is targeting to increase fish production to 22 million metric tons by 2024-2025, which is likely to boost the sector and will have positive impact on many fishers and fish farmers in near future.



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