



FOOD PROCESSING

Towards Sustainable Growth Opportunities

SECTOR PROFILE

FISHERY







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ABSTRACT

The Indian food processing sector has witnessed remarkable growth, surpassing a 9% average annual growth rate since 2014-15. The Gross Value Addition (GVA) in the food processing sector has shown a Compound Annual Growth Rate (CAGR) of 7.27% in the past five years. The sector contributes approximately 20% to the overall GVA at basic prices, highlighting its competitiveness and ability to cater to international markets. India's processed food exports have experienced a significant surge, reaching US\$13.07 billion in 2022-23. The Ministry of Food Processing Industries has provided support and incentives to the sector through its flagship schemes, such as the Pradhan Mantri - Kisan Sampada Yojana, Pradhan Mantri Formalisation Micro Food Processing Enterprises, and the Production Linked Incentive Scheme.

India holds the distinction of second-largest global producer in fish production, contributing approximately 7.56% to the overall global production. The fisheries processing sector has grown at a rate of 10.87% annually since 2014-15. The country's fish production, both in marine and inland fisheries, has shown consistent growth. The Preserved and Processed Fisheries Sector in India offers a wide range of products, such as frozen whole fishes and fillets (cleaned, cut, and packed), dried unsalted/salted products, smoked and brined fish products, shark fins (dried and salted), fish oil, fish skins, ready-to-cook products (including fillets, nuggets, and preparations), and fish meal soluble.

The document also provides insights into the global trends in preserved and processed fisheries sector highlighting, there is a growing demand for aquatic foods, driven by increasing trends towards healthy and convenient options. There are certain commodities in the global market that hold immense potential and contribute significantly to the trade of fisheries and aquaculture products. These commodities include Farmed Atlantic salmon, particularly salmon, processed and preserved tuna, and high-quality fresh tuna for the sushi and sashimi market, as well as Cephalopods.

India has a competitive advantage in the processed fisheries sector due to its rich raw material base, vast coastline, and inland water resources. The country's processed fish products are in high demand both domestically and internationally. India's fisheries processing industry has witnessed impressive growth, driven by a rich raw material base, a structural shift in consumer preferences, increased demand for healthy food, and the growth of online retail. The country aims to increase its marine product exports and has seen notable growth in exports of frozen shrimp, frozen fish, frozen squid, dried items, and chilled items. The USA, China, and the European Union are major markets for Indian seafood exports.

Overall Indian food processing and fisheries processing sector is experiencing remarkable growth driven by favourable government schemes, abundant raw materials, and efforts to address challenges related to food safety, regulations, standards, and labelling requirements.

01.

INTRODUCTION

India is presently ranked second in the world in terms of fish production, accounting for approximately 7.56% of global production.¹ The Food and Agriculture Organization (FAO) of the United Nations reported that India generated around 14.73 million metric tons of fish in 2020, accounting for roughly 7.96% of global fish production.

YEAR-WISE PRODUCTION AND GROWTH RATE FOR FISHERIES SECTOR IN INDIA

FISH PRODUCTION (IN LAKH TONNES)

MARINE	INLAND	TOTAL
2019-20 37.27	2019-20 104.37	2019-20 141.64
2020-21 34.76	2020-21 112.49	2020-21 147.25
2021-22 41.27	2021-22 121.621	2021-22 162.48

ANNUAL AVERAGE GROWTH RATE (%)

MARINE	INLAND	TOTAL
2019-20 -3.2	2019-20 7.37	2019-20 4.35
2020-21 -6.7	2020-21 7.8	2020-21 4
2021-22 18.7	2021-22 7.76	2021-22 10.34

¹ Ministry of Fisheries, Animal Husbandry & Dairying

The Preserved and Processed Fisheries Sector exhibits immense potential among food processing industry, both in terms of revenue generation and skilled employment generation. The sector uses various marine species such as fish, crustaceans, molluscs, as well as fresh water fishes through aquaculture. Produce from the sector are highly perishable and can pose food safety issues in the absence of sanitary handling. Spoilage and nutrient loss lead to food waste can be prevented through preservation techniques such as freezing, smoking, and canning. This enables a longer shelf life and ensures reliable supply of protein-rich diet and nutritional security to consumers globally.

SOME OF PRESERVED AND PROCESSED COMMODITIES ARE GIVEN AS UNDER:

- Frozen (cleaned, cut and packed) whole fishes and fillets.
- Dried Un-Salted / Salted products
- Treated, Smoked, Brined Fish products
- Shark fins, Dried, Salted etc.
- Fish oil, Cod oil, fish skins
- Ready to Cook products (fillets, nuggets, preparations)
- Fish Meals Soluble

In global scenario, demand for processed fisheries products is expected to increase, driven by increased production in Asia. Though share of aquaculture has risen gradually over the years, products from marine capture are the most popular in global fisheries consumption.

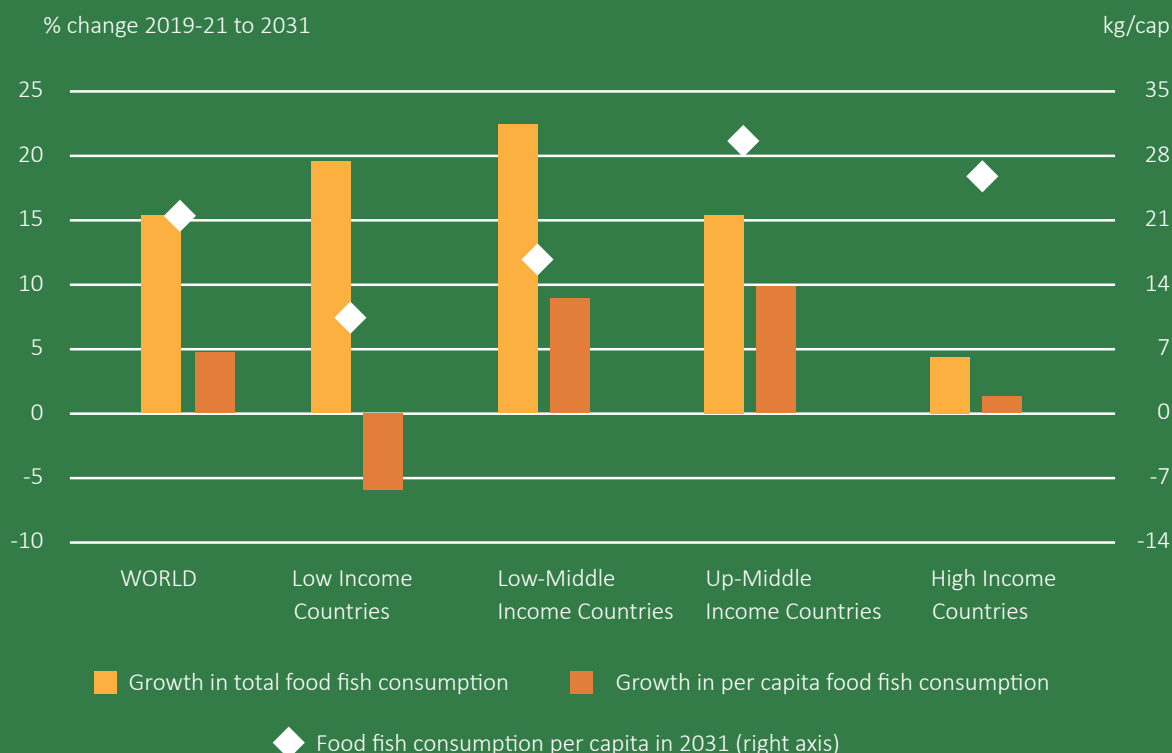
This sector profile will highlight global trends in fisheries processing, India's strength and opportunities in the sector, regulatory landscape, R&D and skill development ecosystem in place and proactive policies taken by the government to promote the sector.

02. GLOBAL OVERVIEW: PROCESSED FISHERIES

Global trade of aquatic products across has increased substantially over the years driven by favourable trade deals, regional common markets, improved logistics and handling infrastructure. However, the COVID 19 pandemic have exerted unprecedented pressure on fisheries and aquaculture output of most countries, disrupting the production, supply chains, markets and global consumption in 2020 and 2021. The global fisheries production trade stayed buoyant towards the end of 2021 and bounced back over the past year. The sector is expected to witness a 14% growth by 2031, considering 2021 production levels as base period².

2.1 GLOBAL CONSUMPTION SCENARIO

In recent years, there has been a significant increase in the global consumption of aquatic foods, and this trend is expected to continue. The annual growth rate in global consumption of fisheries products till 2019 was 3%. Fish consumption globally is projected to reach 21.4 kg per capita in 2031, up from 20.5 kg per capita in 2019-2021. Per-capita fish consumption is expected increase in all continents except Africa, a region with the fastest growing population. The figure below indicates region wise production and per capita consumption of fisheries products.



² OECD-FAO Agricultural Outlook 2022-2031

Most of the processed fish products traded globally is for consumption as food with only 10% going to non-dietary uses like fishmeal and fish oil, live, fresh or chilled aquatic foods continue to be the most popular for direct human consumption, followed by frozen, prepared, and preserved and cured forms. In 2020, live, fresh or chilled aquatic food accounted for the largest share (44%) of fisheries and aquaculture production for direct human consumption, followed by frozen (35%), prepared and preserved (11%), and cured products (10%). Freezing is the main method used to preserve fisheries and aquaculture products, accounting for 63% of all processed aquatic animal production for dietary consumption (excluding live, fresh, or chilled). The five largest consuming countries of aquatic foods, including China, Indonesia, India, the United States of America, and Japan, accounted for 59% of total consumption in 2019³.



44%

FISHERIES AND AQUACULTURE
PRODUCTION FOR DIRECT
HUMAN CONSUMPTION



3%

ANNUAL GROWTH RATE
IN CONSUMPTION OF
AQUATIC FOODS

³ The State of World Fisheries And Aquaculture (SOFIA), FAO Report 2022

2.2 GLOBAL TRADE

Asian countries continue to be the major exporters of fisheries products globally with 47% of total export share. The USA and the EU are the major importers globally and will become the largest importers by 2031, contributing to 15% and 25% of total imports respectively.

The majority of traded aquatic products consist of preserved products, with frozen products being the most popular. Airfreight has facilitated the growth of the export market for premium, fresh aquatic products, including farmed salmon and demersal finfish caught in the wild.

Major commodities that hold immense potential :

- Salmon, particularly farmed Atlantic salmon, has been one of the major contributors to growth in global trade of fisheries and aquaculture products in recent decades.
- Tuna trade consists of two broad groups of commodities - processed and preserved tuna, and high-quality fresh tuna for the sushi and sashimi market.
- Cephalopods are almost entirely wild-caught, with China, India, Morocco, and Peru being the major produce.

FINFISH

SALMONS, TROUTS AND SMELTS 18%



CODS, HAKES AND HADDOCKS 10%



TUNAS, BONITOS AND BILLFISHES 10%



OTHER FINFISH

22%



OTHER PELAGICS

7%



CRUSTACEANS

SHRIMPS AND PRAWNS

16%



OTHER CRUSTACEANS

6%



MOLLUSCS AND OTHERS

**MOLLUSCS AND AQUATIC
INVERTEBRATES**

4%



**SQUIDS, CUTTLEFISHES
AND OCTOPUSES**

7%



2.3 GLOBAL TRENDS

A2020 and 2021 saw a structural shift in consumption patterns worldwide, arising out of the global pandemic. Dietary habits and innovative use of resources developed during the lockdowns, such as a renewed interest in home cooking, a general boom of online retail, the proliferation of app-based home delivery services is expected to have major long-term structural impacts on the fisheries and aquaculture sector. Canned and frozen witnessed unprecedented growth over the last two years globally and the demand is expected to further grow in developing economies.

The sector is expected to grow rapidly, with aquaculture surpassing capture fisheries, forming a major share of global exports in the coming years. The growth will be driven by factors like rising incomes, rapid urbanisation, expansion of fish production, product innovation and processing, improved distribution channels etc.

The fisheries sector will witness challenges arising out of factors like climate change, Russia-Ukraine war and trade disputes. In particular, climate change will heavily impact capture fisheries sector and the abundance of fishing stock, species composition and location. Similarly, policy decision turning out of US-China trade war and sanctions imposed on Russian imports have ability to impact fisheries supply chain globally.

Counterweighing the opportunities and challenges presented globally, countries like India has high potential in fisheries processing and can be a major player in global trade. This prospect is discussed in the next section.



03. OVERVIEW OF FISHERY PROCESSING INDUSTRY IN INDIA

The fishery industry plays a significant role in the economic and social development of India. With a large population depending on it for nutrition and income, the sector has been identified as a "Sunrise Sector" and has experienced impressive growth of 10.87% annually since 2014-15⁴. The value of output from processed fish products industry in India was estimated at ₹ 50,07,405 lakhs generating a net income of ₹ 4,04,770 lakhs in 2019-20⁵.

3.1 STATE-WISE PRODUCTION

India's fisheries processing industry is supported by its vast coastline, system of rivers and a significant number of ponds, tanks, and reservoirs, which have made the country a major producer of fish and seafood products. Fish production in India is primarily driven by small-scale and artisanal fisheries, with marine and inland capture fisheries as well as aquaculture contributing significantly to the country's total output. The government has taken proactive steps to promote processed fish products through various interventions at all stages of fisheries value chain in various states. The top states producing marine and fresh water fishes is given below.

- **MARINE FISH PRODUCTION:**

India's total marine fish production in FY 2021-22:

41.27 lakh tonnes.

Top five states in marine fish production:

Gujarat, Andhra Pradesh, Tamil Nadu, Kerala, and Karnataka.

Gujarat is the largest producer of marine fish among these states.

- **INLAND FISH PRODUCTION:**

India's total inland fish production in FY 2021-22:

121.21 lakh tonnes.

Major producing states for inland fish:

Uttar Pradesh, Bihar, West Bengal, Andhra Pradesh, and Bihar.

Andhra Pradesh is the largest producer of inland fish among these states.

⁴ Ministry of Fisheries, Animal Husbandry Dairying through PIB Year end review 2022

⁵ Annual Survey of Industries, Factory Sector Estimates by 4 digit Industry Class (NIC – 2008)

Total Marine Fish Production accounted in India for 21-22 was 41.27 Lakh Tonnes.

3.2 MARKET OVERVIEW

India's goal is to increase its marine product exports from the current level of over ₹50,000 crore to ₹1,00,000 crore within the next five years. Over the past three years, there has been an increase in both the quantity and value of seafood exports.

YEAR	VALUE IN USD (MN)	QUANTITY (IN MT)
2019-20	6,679	12,89,651
2020-21	5,957	11,49,510
2021-22	7,760	13,69,264

3.3 EXPORT STATUS

India managed to achieve a significant increase in exports, particularly in the export of frozen shrimp, which accounted for 53.18% in terms of quantity and 75.11% of total dollar earnings. Other items like frozen fish, frozen squid, frozen cuttlefish, dried items, chilled items, and live items also showed growth in both quantity and value. The USA was the largest market for Indian seafood, accounting for 37.56% of the total dollar value of exports, followed by China, the European Union, South East Asia, Japan, and the Middle East. (<https://pib.gov.in/Pressreleaseshare.aspx?PRID=1837884>)



FROZEN SHRIMP

It has consistently been the most popular item in terms of sales quantity, with an increasing trend over the years. The export of frozen shrimp accounted for 53.18% in quantity and 75.11% of total dollar earnings.



FROZEN FISH

It has been the second most popular item in terms of sales quantity, but its sales have generally decreased over the years.



FROZEN CUTTLE FISH AND FROZEN SQUID

They have both shown an increasing trend in sales quantity over the years, with some fluctuations. The value and average price of these items have also generally increased, although there have been some dips in value in certain years.



DRIED ITEM, LIVE ITEM, AND CHILLED ITEMS

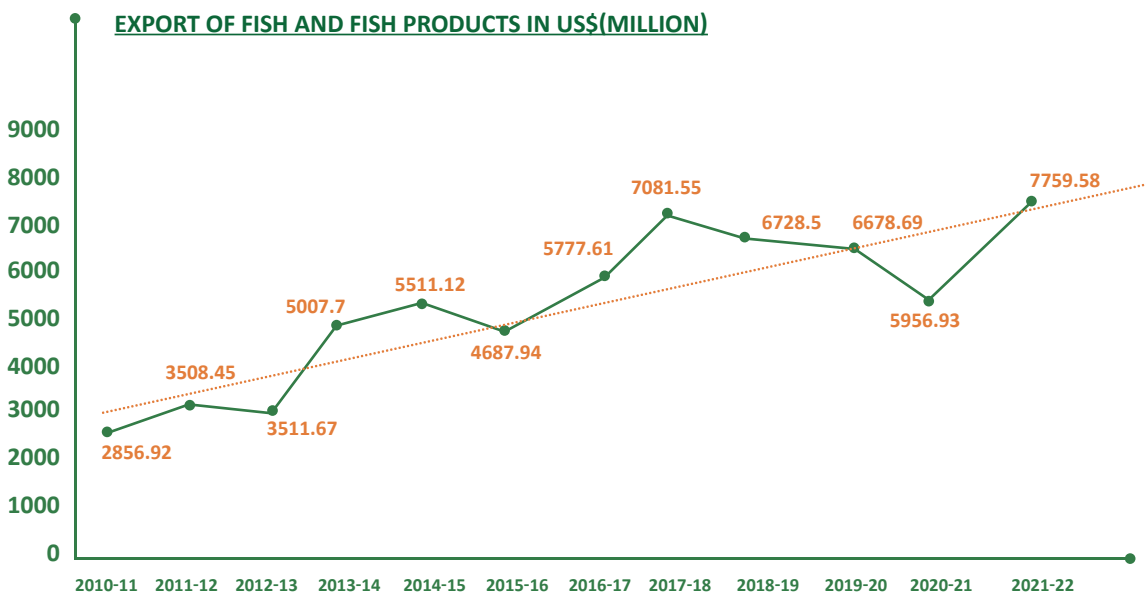
They have all shown some fluctuations in sales quantity, value, and average price over the years



OTHERS

A category that includes various seafood items, has generally shown an increasing trend in sales quantity and value over the years.

EXPORT OF FISHERIES BY PRODUCTS FROM INDIA FROM 2010-11 TO 2021-22



In the fiscal year 2021-22, India achieved its highest ever exports of marine products. India exported marine products to 123 countries.

Some key highlights from India's export data for the period are⁶:



The USA remained the top importer of Indian seafood, accounting for 43.45% of earnings in USD and importing 372,611 MT of seafood. Frozen shrimp was the primary product exported to the USA, comprising 93.33% of USD earnings. Exports of Vannamei shrimp to the USA increased by 34.65% in USD terms, 33.94% in rupee value, and 26.81% in quantity. Black Tiger Shrimp exports to the USA also saw significant growth, with an increase of 68.99%, 151.78%, and 152.06% in terms of quantity, rupee value, and USD terms, respectively.



China is the second largest market for Indian seafood, accounting for 15.14% of earnings and 19.5% of quantity. Frozen shrimp is the majority of exports, accounting for 47.07% in quantity and 67.04% in USD earnings.



The European Union (EU) is the third largest market, with a share of 14.98% in USD earnings. Frozen shrimp is also the majority of exports, comprising 45.62% in quantity and 56.59% in USD earnings.



South East Asia is the fourth largest market, accounting for 10.04% of USD earnings. Frozen shrimp is the major item in this market, accounting for 36.81% of exports.



Japan is the fifth largest market, with a share of 5.68% in USD earnings and 6.60% in quantity. Frozen shrimp is also the major item of exports to Japan, accounting for 74.55% in USD earnings and 42.62% in quantity.



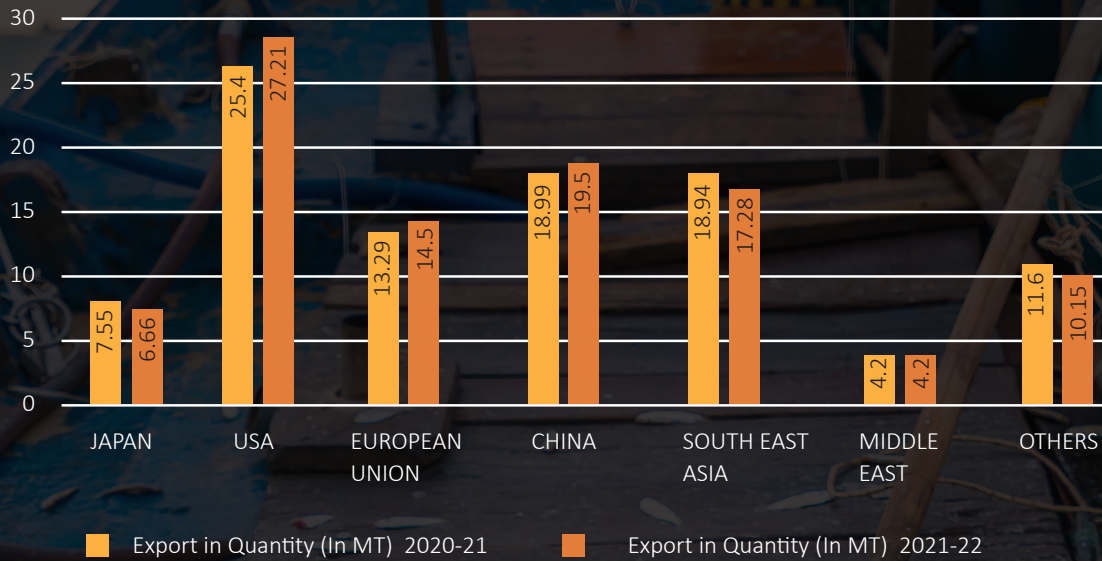
The Middle East is the sixth largest destination, with a share of 3.91% in USD value terms. Frozen shrimp continues to be the major item of exports, accounting for 76% in USD earnings.



Other countries have shown an increase of 35.57%, 26.79%, and 4.29% in rupee value, USD value, and quantity respectively. Canada, Russia, Bangladesh, the Dominican Republic, and Tunisia together contributed 70.72% in USD terms. Frozen shrimp is also the major item in this cluster, accounting for 74.05% in USD earnings.

⁶ Annual-Report 2021-22, MPEDA and Ministry of Commerce and Industry

MAJOR EXPORT CENTRES FOR INDIA FROM 2020-21 TO 2021-22



3.5 KEY GROWTH DRIVERS

The Key Growth Drivers of Processed and Preserved Fisheries Sector that India presents can be summarized as follows :

Rich raw-material base:

India's leadership in fish production is immense due to the vast coastline, and its coastal waters are rich in marine resources. The country also has many rivers, estuaries, and backwaters that are home to a variety of freshwater fish. Additionally, India's location in the tropical and sub-tropical regions of the world makes it an ideal location for the cultivation of various fish species that thrive in warm waters. The country is also home to more than 10% of the global fish biodiversity and is one of the 17-mega biodiversity rich countries.

Structural Shift in Consumption Pattern:

The shift towards healthy and convenient food has been influenced by significant societal changes, particularly in affluent economies. In response to rising obesity rates and related health issues, healthy eating has become a dominant trend in food consumption. As a result, there has been an increased demand for nutritious foods, including aquatic products. This trend has been accompanied by a growing concern for the sustainability of aquatic food systems, leading producers and retailers to rely on certification schemes and labelling to meet consumer demand. In addition to sustainability, consumers in advanced economies also seek convenience due to factors such as higher incomes, urbanization, and smaller family sizes. This has led to an increase in pre-prepared and commercially packaged food products that require minimal preparation, and online platforms have made ordering and delivery more accessible.

Demand for Healthy Food :

There is a growing demand for healthy aquatic and processed fisheries products. As consumers become more health-conscious, they are increasingly seeking out foods that are high in protein and low in fat, and that contain beneficial nutrients like omega-3 fatty acids.

Growth of Online retail and innovative packaging solutions:

India has witnessed unprecedented growth in online retail, powered by startup ecosystem in the country providing mobile app based retail and delivery. Many distribution channels have developed innovative solutions to packaging of fisheries products include gel packs, vacuum sealed packing, layered packaging etc.

3.6 KEY PROCESSED FISHERIES PRODUCTS IN DOMESTIC MARKET

There has been a substantial growth for processed fisheries products in India, driven by demand from urban centres as well growth of online retail . Some of the key processed fisheries products include:

READY-TO-EAT SEAFOOD:

Ready-to-eat seafood products like sushi and sashimi are available in some specialty stores and restaurants.

CANNED SEAFOOD PRODUCTS:

Tuna, salmon, and sardines are popular examples of convenience seafood products. These products are precooked and can be eaten straight out of the can or used as an ingredient in a variety of dishes.

SMOKED FISH PRODUCTS:

Smoked salmon, herring, and mackerel are also popular convenience seafood products. These products are typically vacuum-packed or sold in ready-to-eat slices, making them easy to consume and store.

FROZEN SEAFOOD ITEMS:

Fish fillets, shrimp, and crab are other examples of convenience seafood products. These products are usually precooked and can be quickly heated up in the oven, microwave, or on the stovetop.

BREADED OR BATTERED PRODUCTS :

Fish fillets, fish fingers, and fish cakes are also popular convenience seafood products.

READY-TO-EAT SEAFOOD PRODUCTS :

Sushi, sashimi, and ceviche have become increasingly available in recent years. These products are typically made with raw fish and are sold pre-packaged and ready to eat.

SEAFOOD MEAL KITS:

They include pre-portioned seafood, vegetables, and seasoning have also become popular. These kits allow consumers to quickly and easily prepare a complete seafood meal at home.

LOW-SODIUM CANNED FISH:

Consumers are increasingly aware of the risks associated with a high-sodium diet and are looking for healthier options. As a result, canned fish products that are low in sodium have become more popular. These products are often labelled as "low-sodium" or "no-salt-added" and are designed to meet the demand for healthier options.

REDUCED-FAT SMOKED FISH:

Smoked fish is a popular convenience product, but many varieties are high in fat. To meet the demand for healthier options, some companies now offer reduced-fat smoked fish products. These products are made using leaner fish and often have a lower calorie count than traditional smoked fish.

OMEGA-3 FORTIFIED PRODUCTS :

Omega-3 fatty acids are important for maintaining good health, and many consumers are looking for ways to increase their intake. To meet this demand, some companies now offer omega-3 fortified processed and preserved fisheries products. These products are often labelled as "omega-3 enriched" and may include products such as canned fish, fish sticks, and fish fillets.

FROZEN FISH FILLETS:

Consumers are also seeking out frozen fish fillets that are minimally processed and do not contain any added preservatives or artificial flavours.

ORGANIC SEAFOOD:

Organic food is becoming more popular, and consumers are now looking for organic seafood options. Organic seafood products are produced without the use of antibiotics or synthetic pesticides



3.6 KEY INDUSTRY PLAYERS

The formal processing industry, though in nascent stages is growing rapidly in India with many new startups and companies entering the sector. Some of the key players are

AVANTI FEEDS LTD
COASTAL CORPORATION LIMITED
FRESH TO HOME
ITC
LICIOUS
TATA-BIGBASKET
MEATIGO
MEAT 99
WATERBASE LTD.
APEX FROZEN FOODS LTD
GOLDEN PRIZE INDIA



04.

GOVERNMENT INTERVENTIONS FOR SUPPORTING FISHERIES PROCESSING

The Government of India has taken up various initiatives to boost the Fisheries Processing Industry in India.

4.1 GOVERNMENT INITIATIVES

Government of India has from time to time adopted policies that benefit the meat and poultry sector directly. Some of the prominent policies are listed below:

POLICY INITIATIVES:

- Exemption of processed food items from licensing under the industries (Development and Regulation) Act, 1951.
- 100% Foreign Direct Investment (FDI) permitted through automatic route for the food processing sector subject to sectoral regulations.
- 100% Foreign Direct Investment under Government approval route, for trading, including through e-commerce, in respect of food products manufactured or produced in India.
- Lower Good and Services tax (GST) for raw and processed products, with more than 71.7% of food products under various chapter heads/sub-heads covered in lower tax slabs of 0% and 5%.
- The government supports the sector through 100% exemption of Income Tax on profits and gains for new Food Processing Units for initial 5 assessment years
- Provision of profit-linked tax holiday under Section 80 IB and investment-linked deduction under Section 35 AD of Income Tax Act, 1961.
- Setting up of a Fisheries and Aquaculture Infrastructure Fund (FIDF) with a total funds size of Rs 7522.48 crore to provide affordable credit.

- Assisting in the creation of skill infrastructure in Food Processing Sector and skill development initiatives through the Sector Skill Council [i.e., Food Industry Capacity and Skill Initiative (FICSI)].
- Supporting the creation of global food manufacturing champions commensurate with India's natural resource endowment and supporting Indian brands of food products in the international market.

DEVELOPMENTAL INITIATIVES:

- Creating modern infrastructure for supporting the growth of the food processing sector through the implementation of the Schemes of, development of infrastructure for integrated cold chain and value addition, modernization and strengthening of existing fisheries infrastructure. It also includes the establishment of fish seed banks and hatcheries to provide quality fish seed to fish farmers, as well as the development of inland fisheries, aquaculture, and deep-sea fishing and setting up/modernization of Pradhan Mantri Matsya SAMPADA Yojana (PMMSY).
- Promotion of entrepreneurship in fisheries and allied activities, and creation of a fishers' welfare fund.
- Assistance for setting up of Food Testing Laboratories, active participation in laying down food standards and their harmonization with international standards.
- Developing a strong supply chain for perishable farm produce to reach processing centres with minimal loss of time.



4.2 GOVERNMENT SCHEMES

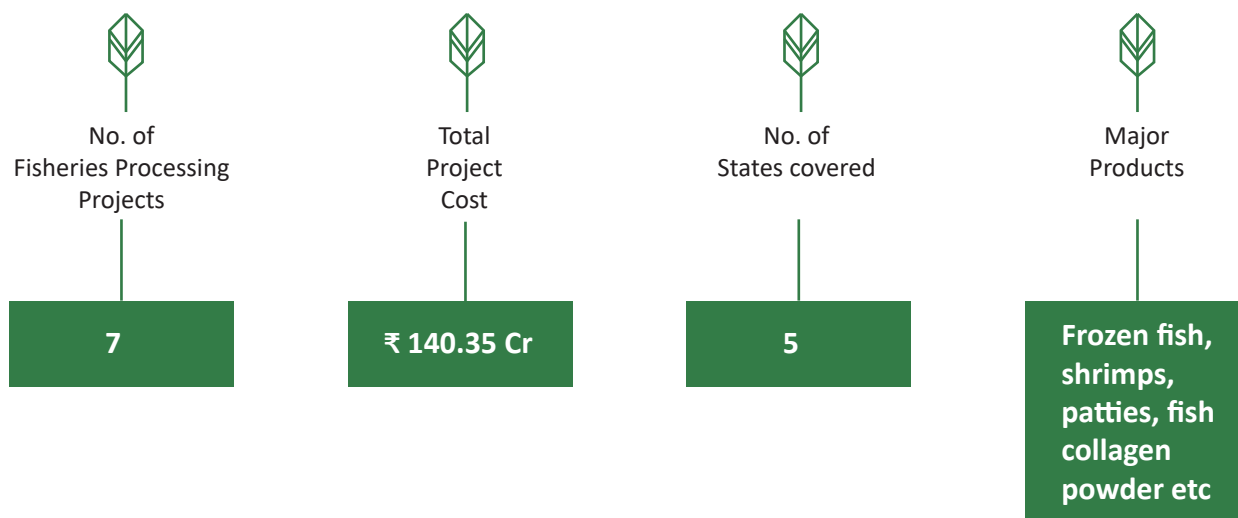
THERE ARE SEVERAL SCHEMES AND INITIATIVES TAKEN BY THE GOVERNMENT OF INDIA FOR STRENGTHENING FISHERIES PROCESSING SECTOR. SOME OF THEM ARE:

A. PRADHAN MANTRI KISAN SAMPADA YOJANA (PMKSY):

PMKSY is a comprehensive scheme implemented by Ministry of Food Processing Industries (MOFPI) which aims to create modern infrastructure with efficient supply chain management from farm gate to retail outlet. The key objectives of PMKSY are:

- Creation of modern infrastructure for food processing mega food parks/ clusters and individual units
- To create effective backward and forward linkages - linking farmers, processors and markets
- To create robust supply chain infrastructure for perishables

Under PMKSY, the sub-scheme titled Creation/Expansion of Food Processing and Preservation Capacities (CEFPPC) is being implemented. The progress of CEFPPC scheme in dairy processing sector is listed below.



FISHERIES PROCESSING PROJECTS
UNDER CEFPPC SUB-SCHEME OF PMKSY

B.**PRODUCT LINKED INCENTIVES FOR FOOD PROCESSING INDUSTRIES (PLIFPI):**

The PMMSY aims to address critical gaps in fish production and productivity, incorporate modern technology and innovation, improve post-harvest infrastructure and management, modernize the value chain and traceability, establish a robust framework for fisheries management, and improve the welfare of fishers.

C.**PM FORMALIZATION OF MICRO FOOD PROCESSING ENTERPRISES (PMFME):**

Government of India approved Production Linked Incentive Scheme for Food Processing Industry including marine products. The aim of the scheme is to create global processing leaders from India by improving competitive strength of Indian companies vis-à-vis their global counterparts in terms of output, value addition, linkages etc. The scheme has an outlay of ₹ 10,900 Crore to be implemented over a six-year period from 2021-22 to 2026-27.

Under the PLI scheme, marine and fisheries processing plants with a cumulative annual capacity of over 45000 tons is being set up in states like Andhra Pradesh, Odisha, Maharashtra, Karnataka, Gujarat and Tamil Nadu.⁷

D.**ANIMAL HUSBANDRY INFRASTRUCTURE DEVELOPMENT FUND (AHIDF):**

The PMFME is a centrally sponsored scheme with an outlay of ₹ 10,000 Crore to be implemented over a period of five years from 2020-21 to 2024-25. The scheme provides financial, technical and business support for existing micro food processing enterprises. As of 2023, a total of 1996 fisheries processing units got support from the scheme to the tune of ₹ 54 Crore across the country.⁸

E.**THE FISHERIES AND AQUACULTURE INFRASTRUCTURE DEVELOPMENT FUND (FIDF):**

It was established by the Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying during 2018-19 to provide funding for the development of fisheries infrastructure. The total funds available are ₹ 7522.48 Crore. The Department of Fisheries provides interest subvention up to 3% per annum for concessional finance, which must be at an interest rate of no lower than 5% per annum.

⁷ PLI Scheme Division, MoFPI

⁸ PMFME Scheme Division, MoFPI

05. GOVERNANCE AND REGULATORY LANDSCAPE

In India, the fisheries processing industry is governed by a regulatory framework consisting of rules and regulations established by various authorities such as Ministry of Fisheries, Animal Husbandry, and Dairying (MFAHD), Ministry of Food Processing Industries (MOFPI), Marine Products Export Development Authority (MPEDA), Food Safety and Standards Authority of India (FSSAI), Bureau of Indian Standards (BIS), and Agricultural Marketing Information and Regulation Department AGMARK. Detailed information on these regulatory bodies is presented below.

5.1 MINISTRY OF FISHERIES, ANIMAL HUSBANDRY, AND DAIRYING

The Ministry of Fisheries, Animal Husbandry and Dairying (MFAHD) is a government ministry in India that was established in May 2019 by merging the Department of Animal Husbandry and Dairying and the Department of Fisheries. The merger was aimed at creating a comprehensive ministry for the development of the animal husbandry, dairy, and fisheries sectors in the country.

The MFAHD is responsible for policy formulation, implementation, and monitoring of programs and schemes for the development of animal husbandry, dairy, and fisheries sectors in the country. Its primary objective is to increase the productivity and profitability of these sectors while ensuring the welfare of animals and the sustainability of the environment.

Some of the functions of the MFAHD include:

- Formulating policies, programs, and schemes for the development of animal husbandry, dairy, and fisheries sectors
- Implementing and monitoring these policies, programs, and schemes
- Strengthening animal health infrastructure and services
- Enhancing milk and meat processing and value addition
- Promoting breed improvement and genetic up-gradation of animals
- Ensuring the availability of quality feed and fodder for animals
- Promoting the use of modern technologies in animal husbandry, dairy, and fisheries sectors
- Ensuring the welfare of animals and the sustainability of the environment.

5.2 MINISTRY OF FOOD PROCESSING INDUSTRIES

The Ministry of Food Processing Industries is a governmental department that was founded in 1988 in India with the objective of nurturing and regulating the food processing industry in the country. The ministry is tasked with two primary responsibilities: providing support for policies and development activities. It has a crucial role in encouraging investment in the food processing industry, providing guidance and aid to the industry, and cultivating a conducive environment for its expansion.

MOFPI's primary objectives are:

- Formulation and implementation of policies and plans for the fisheries processing industry.
- Providing technical and financial assistance for the establishment of fisheries processing industries.
- Conducting research and development activities to promote fisheries processing technology.
- Providing training and capacity building to stakeholders in the fisheries processing industry.
- Promoting food safety and quality through the implementation of food safety standards and regulations for processed fisheries.
- Enhancing exports of processed fisheries products from India.
- Creating a favourable environment for the growth of the fisheries processing industry in India.

5.3 MARINE PRODUCTS EXPORT DEVELOPMENT AUTHORITY

MPEDA, Marine Products Export Development Authority is a statutory body established by the Government of India in 1972 under the Marine Products Export Development Authority Act 1972. Its headquarters is located in Kochi, Kerala. The main objective of MPEDA is to promote the export of seafood products from India. Some of its key functions include:

- Regulating the production and processing of seafood for export.
- Providing assistance to seafood exporters in improving the quality and packaging of their products.
- Developing infrastructure and facilities for the seafood processing industry.
- Conducting market research and intelligence to identify new opportunities and trends in the global seafood market.
- Undertaking promotional activities to create awareness and demand for Indian seafood products in international markets.
- Offering training and capacity building programs for seafood industry stakeholders to improve their skills and knowledge.
- Providing financial assistance to seafood processing units, fishermen, and other stakeholders in the industry.
- Enforcing quality control measures and regulations to ensure the safety and hygiene of seafood products.

5.4 BUREAU OF INDIAN STANDARDS

The Bureau of Indian Standards (BIS) was established in 1986 by the Bureau of Indian Standards Act, and functions as a national body responsible for setting standards.

Some of the Key Functions are as follows:

- The Bureau of Indian Standards (BIS) develops standards for agriculture, food, and processed foods at the national level.
- BIS offers third-party certification for processed foods to ensure that they comply with Indian standards.
- BIS enforces standards through a network of laboratories and inspection offices.
- BIS promotes the use of quality standards to increase the competitiveness of Indian products.
- BIS sets safety standards and certification requirements for processed foods to safeguard consumers.

Bureau of Indian Standard has set various quality standards for processed fish products to ensure their safety, quality, and reliability. Some of the standards are included in table below:

BIS STANDARDS	PRODUCT CATEGORY
IS 1700:2014	This standard specifies the general requirements for frozen shrimp, prawns, and lobsters, including their microbiological and chemical requirements.
IS 13630:2017	This standard provides guidelines for the hygienic handling, processing, and packaging of fish and fishery products, including canned fish
IS 14252:2015	This standard specifies the requirements for fish sauce, including its chemical and microbiological parameters.
IS 15512:2005	This standard provides guidelines for the processing and preservation of dried fish, including their hygiene requirements and packaging.
IS 3313:1974	This standard specifies the requirements for canned fish, including their composition, labelling, and inspection requirements

These standards cover a wide range of processed fisheries, including frozen, canned, and dried fish, as well as fish sauce. By adhering to these standards, processed fisheries can ensure that they meet the necessary safety and quality requirements, and that consumers can trust in the reliability of these products.

5.5 FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

The Food Safety and Standards Authority of India (FSSAI) is a legally constituted organization that was established by the Food Safety and Standards Act of 2006. Its primary objective is to regulate and oversee the production, storage, distribution, sale, and importation of food products to ensure that they meet food safety and hygiene standards in the country.

Some of the key functions of FSSAI under the Food Safety and Standards Act are:

- Developing and enforcing food product standards for safety and quality throughout the production, storage, distribution, sale, and import processes.
- Regulating and licensing food businesses including processing, packaging, storage, transport, and distribution.
- Conducting inspections, surveillance, and enforcement activities to monitor compliance with food safety standards and taking action against non-compliant entities.

- Promoting consumer awareness about food safety and nutrition through education and information dissemination.
- Conducting research, risk assessments, and generating scientific data related to food safety.
- Providing training and capacity-building programs for stakeholders in the food industry to enhance their knowledge and skills.
- Collaborating with international organizations and governments to promote food safety and trade in safe and high-quality food products.

Some of the key regulations to ensure the safety and quality of processed fisheries products in India are given in table below.

REGULATION	PURPOSE	GUIDELINES
Food Products Standards and Food Additives Regulations, 2011	Lay down standards for food products including processed fisheries to ensure safety and quality	Specify quality and safety requirements, maximum limits for contaminants and additives in processed fisheries
Contaminants, Toxins, and Residues Regulations, 2011	Regulate presence of contaminants, toxins, and residues in food products including processed fisheries	Specify maximum permissible limits for contaminants, toxins, and residues in processed fisheries
Food Import Regulations, 2017	Regulate import of food products including processed fisheries into India	Specify conditions and requirements for import of processed fisheries, need for certification from competent authority in country of origin

5.6 AGRICULTURAL MARKETING INFORMATION AND REGULATION

AGMARK is a certification mark employed on agricultural products in India. It was introduced in 1937 by the Government of India to ensure that the agricultural products are graded and certified according to specific standards. The AGMARK certification is a guarantee of quality, and it helps to protect consumers from substandard or adulterated products.

Some key functions of AGMARK related to processed fisheries:

- Setting quality standards: AGMARK sets quality standards for processed fisheries to ensure that they are safe for consumption and meet the desired quality levels.
- Certification of products: AGMARK certifies processed fisheries that meet the prescribed quality standards, which helps in building trust among consumers and facilitates trade.
- Inspection and testing: AGMARK conduct inspections and testing of processed fisheries to ensure that they meet the prescribed standards and are free from contaminants and adulterants.
- Labelling requirements: AGMARK mandates labelling requirements for processed fisheries, which includes the name and address of the manufacturer, date of packing, net weight, and batch number, among others.
- Consumer awareness: AGMARK conducts consumer awareness programs to educate consumers about the quality standards and certification process, helping them make informed decisions when purchasing processed fisheries.

5.7 EXPORT INSPECTION COUNCIL DEPARTMENT

The Export Inspection Council (EIC) was set up by the Government of India under Section 3 of The Export (Quality Control and Inspection) Act, 1963 (22 of 1963). The EIC is the official export –certification body of India which ensures quality and safety of products exported from India. Some of the key functions of EIC include:

- Notify commodities which will be subjected to quality control and / or inspection prior to export
- Establish standards of quality for such notified commodities
- Specify the type of quality control and / or inspection to be applied to such commodities

However, the regulatory checks through EIC are voluntary and are not covered in the EIC Act 1963.

06. R&D AND SKILL DEVELOPMENT ECOSYSTEM FOR FISHERY PROCESSING INDUSTRY

Indian research institutions are actively involved in fishery processing research and development (R&D), which covers a wide range of areas such as post-harvest handling, processing, packaging, preservation, and value addition. These institutions work collaboratively with the industry to develop innovative technologies that enhance production efficiency, minimize wastage, and improve quality and safety. Table 7 describes some of the prominent R&D institutions in India that focus on fishery processing:

FISHERIES INSTITUTES	DESCRIPTION
National Fisheries Development Board (NFDB)	It is an autonomous organization under the Ministry of Fisheries, Animal Husbandry, and Dairying, Government of India. Its main function is to promote and coordinate the development of the fishing industry in India.
Central Institute of Fisheries Nautical and Engineering Training (CIFNET)	It is a premier national training institute in the field of fisheries and marine engineering, established under the Ministry of Fisheries, Animal Husbandry, and Dairying. Its main objective is to impart training to personnel engaged in various activities related to the fishing industry.
National Institute of Fisheries Post Harvest Technology and Training (NIFPHATT)	It is a premier institute under the Indian Council of Agricultural Research (ICAR) for research, training, and extension in the area of post-harvest technology and management of fishery products. It provides training to fishery industry personnel and conducts research on improving the quality and safety of fishery products.
Fishery Survey of India (FSI)	It is a national organization under the Ministry of Fisheries, Animal Husbandry, and Dairying, responsible for carrying out surveys and mapping of the marine and inland fisheries resources in India.

FISHERIES INSTITUTES	DESCRIPTION
Central Institute of Coastal Engineering for Fishery (CICEF)	It is a national-level institute under the Ministry of Fisheries, Animal Husbandry, and Dairying that focuses on research and development in the areas of coastal engineering and management, marine hydrodynamics, and fisheries engineering.
Coastal Aquaculture Authority (CAA)	It is a statutory body under the Ministry of Fisheries, Animal Husbandry, and Dairying, responsible for promoting and regulating the development of coastal aquaculture in India. It provides technical guidance, financial assistance, and monitors the implementation of coastal aquaculture activities.
Other Institutes	<ul style="list-style-type: none"> • Central Institute of Fisheries Technology (CIFT) • Central Institute of Fisheries Education (CIFE) • Central Marine Fisheries Research Institute (CMFRI) • Central Institute of Brackishwater Aquaculture (CIBA) • Tamil Nadu Fisheries University (TNFU) • Kerala University of Fisheries and Ocean Studies (KUFOS) • College of Fisheries, Mangalore Indian Council of Agricultural Research (ICAR)



07. UNLOCKING POTENTIAL IN FISHERY PROCESSING SECTOR IN INDIA

Millions of people in India rely on fisheries and aquaculture for nutrition, culture, food security, and livelihoods. The fisheries sector in India has gradually developed over time and has become an important socio-economic revolution for the nation.

7.1 LOGISTICS AND COLD STORAGE

With increasing potential for processing in the sector, logistics and cold storage facilities is critical for overall health of the fisheries processing value chain. The supply chain side of fisheries processing has very high potential for new entrants to thrive.

7.2 SUSTAINABLE PACKAGING SOLUTIONS

To reduce their environmental impact and attract consumers who are environmentally conscious, industries can implement sustainable packaging solutions. This can lead to an increase in demand for their products. Sustainable packaging options may include using plant-based or paper-based materials. In the seafood industry, there is a growing demand for sustainably sourced products as consumers become more aware of the environmental impact of their food choices. Certification from organizations such as the Marine Stewardship Council (MSC) or the Aquaculture Stewardship Council (ASC) can help meet this demand for sustainable seafood.



7.3 HIGH POTENTIAL PRODUCTS

The Indian domestic and export markets have various highly potential products. The consumption patterns of processed foods can vary significantly based on factors like geographic location, cultural background, and individual preferences.

7.3.1

EXPANSION OF DOMESTIC MARKET:

The demand for processed food is anticipated to rise in the coming years due to various factors like an increase in disposable income, heightened awareness about health, and a preference for convenience. A range of factors can affect consumer preferences and trends. Nonetheless, there are some potential emerging trends, which are:

READY-TO-EAT SEAFOOD SNACKS:

Consumers prefer convenient snacks that are easy to carry and consume on the go, which has led to an increase in demand for ready-to-eat seafood snacks like fish fingers and popcorn shrimp.

CANNED AND PACKAGED SEAFOOD PRODUCTS:

Canned and packaged seafood products like tuna, sardines, and mackerel are popular because of their longer shelf life and ease of use in various recipes.

FROZEN SEAFOOD PRODUCTS:

Frozen seafood products like shrimp, fish fillets, and crab are convenient as they can be stored for a longer period without compromising their quality.

FISH PICKLES AND CHUTNEYS:

Fish pickles and chutneys are a traditional Indian delicacy that is made by marinating fish in spices and oil, which is then preserved for a longer shelf life.

SEAFOOD SPREADS AND DIPS:

Seafood spreads and dips like tuna spread and shrimp cocktail sauce are gaining popularity as a healthier alternative to traditional dips and spreads.

SEAFOOD-BASED READY-TO-COOK MEALS AND MIXES:

Consumers prefer easy-to-cook meals that require minimal preparation time and effort, which has led to an increase in demand for seafood-based ready-to-cook meals and mixes.

SEAFOOD SAUSAGES AND BURGER PATTIES:

Seafood sausages and burger patties are gaining popularity as a healthier alternative to meat-based sausages and patties.

FISH AND SHRIMP CUTLETS AND NUGGETS:

Fish and shrimp cutlets and nuggets are popular as a snack and can be easily prepared at home.

DRIED AND SMOKED FISH AND SHRIMP:

Dried and smoked fish and shrimp are gaining popularity as they have a longer shelf life and can be used in various recipes.

SEAFOOD SOUPS AND BROTHS:

Seafood soups and broths like fish and shrimp soup and crab broth are popular as a healthy and flavourful meal option.

7.3.2

EXPANSION OF EXPORT MARKETS:

The primary reasons for the surge in worldwide consumption of aquatic food will be the interplay of factors such as increasing demand due to higher incomes and urbanization, alongside the growth of fisheries and aquaculture production. India has a diverse range of processed and preserved fisheries products that have the potential for exports. Some of these products include:

Frozen shrimp and prawns:

India is one of the largest producers of shrimp and prawns, and frozen shrimp and prawns are among the most popular exports from the country.

Canned seafood:

Canned tuna, sardines, and mackerel are some of the popular canned seafood exports from India. These products have a long shelf life and are easy to transport.

Dried and salted seafood:

Dried and salted fish and seafood are traditional products in India and have a high demand in foreign markets.

Ready-to-eat seafood products:

Ready-to-eat seafood products such as fish fillets, fish fingers, and fish cakes are becoming increasingly popular in foreign markets.

Value-added seafood products:

Value-added seafood products such as smoked fish, marinated fish, and battered and breaded fish are also in high demand in foreign markets.

Fish meal and fish oil:

India is also a significant producer of fish meal and fish oil, which are used as high-protein feed ingredients in the aquaculture and livestock industries.

CONCLUSION

The Indian seafood processing market has enormous growth and development potential. India has a strong foundation in the fisheries sector, with its position as the world's third-largest fish-producing country and major contribution to worldwide production. The government's initiatives and assistance are critical in propelling the expansion of the fisheries processing business.

The Indian government has actively fostered the development of the fisheries processing sector through programmes such as the Ministry of Food Processing Industries (MOFPI) and the Marine Products Export Development Authority (MPEDA). These interventions have mostly aimed at improving infrastructure, offering financial incentives, creating quality standards, and enabling market access for fisheries goods.

The regulatory framework, led by organisations such as the Food Safety and Standards Authority of India (FSSAI), the Bureau of Indian Standards (BIS), and the Agricultural Marketing Information and Regulation Department (AGMARK), maintains seafood processing operations' governance and quality control. This framework ensures customer safety, encourages standard adherence, and promotes trust in Indian fishery goods both domestically and abroad.

To realise the full potential of the Indian fisheries processing business, infrastructure expansion, technological adoption, and value addition must be prioritised. The sector can cater to changing customer needs and grab a larger portion of the worldwide market by strengthening cold chain logistics, upgrading processing capabilities, and growing product diversification.

Furthermore, to maintain long-term profitability and counteract any negative consequences on marine ecosystems, sustainable fishing practises, environmental conservation, and responsible aquaculture should be prioritised.

Overall, the Indian fisheries processing market is well-positioned for expansion, thanks to favourable government initiatives, a robust regulatory structure, and an emphasis on sustainability. By capitalising on these advantages, the industry may realise its full potential, contribute to economic development, create jobs, and establish India as a major player in the global fisheries processing arena.

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