



Role of Value-added Fish Products for Boosting Entrepreneurship

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Abstract: Value addition is one of the most prominent approaches among the other processing techniques in the fish and seafood industry with tremendous market values as well as employment opportunities. It is a good option for foreign earnings also by exporting of value-added products. Besides the profitable utilization of low valued fish, it can fulfil the consumers' demands of convenient foods with quality assurance and longer shelf life. With mentioned intention, various diversified fish and seafood products can be prepared. Thus, the nation's economic growth will be gradually increased with production and distribution (through domestic or international trade) of different ready-to-eat or ready to cook or ready to serve products.

Keywords: value addition; fish and fish products; economic growth; surimi; post-harvest loss

1. Introduction

According to United Nations, Department of Economic and Social Affairs, the global population will reach around 10 billion by 2050.^[1] So, providing adequate safe food to the huge global population will be a challenging task. Besides, the Covid-19 pandemic has vigorously affected physical as well as mental health to a great extent all over the world. So there have been always discussions about the 'one earth, one health' approach by various nations. Health, nutrition, and convenience are the major driving factors for global food safety as well as the global economy. In the subcontinent like India having plenty of water resources, fish may be the primary source of protein nutrition (15 to 25%). Fish is an excellent source of high nutritional value protein, rich in essential amino acids like lysine and methionine, is having higher calorific value, good digestibility, and high biological and growth-promoting value. Moreover, fish contains omega-3 fatty acids, especially, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA); vitamins like A, D, B6, and B12; minerals such as iron, zinc, iodine, selenium, potassium, and sodium which are essential for normal growth and development and may prevent coronary artery disease, hypertension, diabetes, arthritis, inflammatory and autoimmune disorders, and cancer.^[2]

The post-harvest losses in fisheries are getting increased day by day due to the unavailability of the commercial valued fishes in

adequate quantity as per demand, harvesting of low-valued, small-sized, higher fat content, and unconventional irregular fish species having less market demand due to unattractive color, flavor, and texture.^[3] As a result, they are often used for animal feed or by-product production, or may even in some cases; these fish are thrown back into the sea. Although these bycatch or small size fishes have less market value, due to their high protein content they can act as a rich protein source especially in developing continents like India where there is the visible below poverty zone.^[4] Thus, to prevent post-harvest fishery losses, conservation and proper utilization of such fishes and shellfishes by collecting them as raw materials and transfer them into value-added products is the most promising approach. For that production of minced meat and the development of surimi technology play a dynamic role in making a range of versatile value-added products like fish cutlet, fish fingers, fish kheema, fish burgers, etc. which will show a commercial profit and great business potential with sustainable economic development.

2. Economic Importance of Fish

Fish and fisheries products are the most internationally traded commodities all over the world. About 40% of global production enters international trade against 10% for meat.^[5] Exports of fish and fisheries products exceed those of meat, cereals, sugar, coffee,

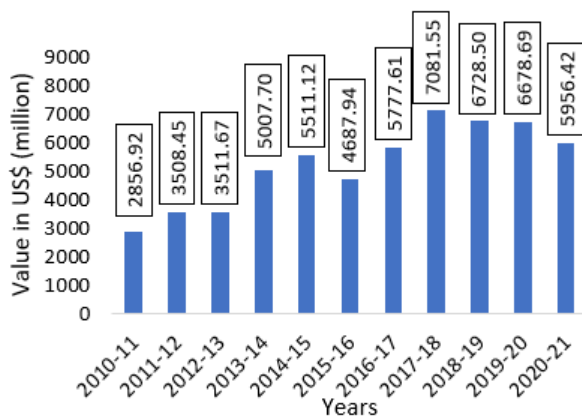


Fig. 1. Indian export of marine products

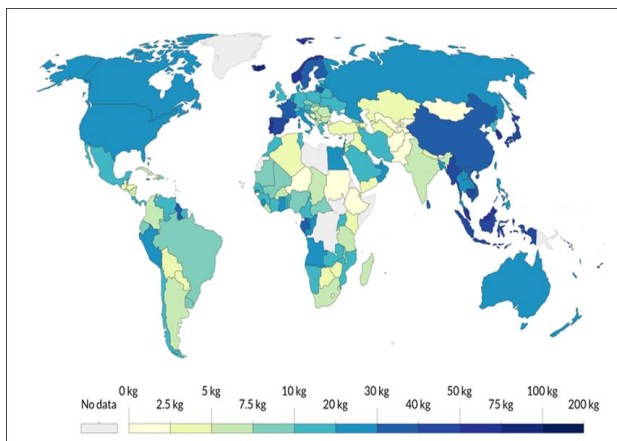


Fig. 2. Fish consumption rate around the world (source: UN Food and Agriculture Organisation)

oilseeds, etc. due to high market demand. In many developing countries, foreign exchange from fish exports finances the other food imports too.

3. Role of Fish in Nutritional Security

Fish is primarily a low-fat high-quality easily digestible cheap protein. It is mainly having lots of essential amino acids which are not synthesized by the human body itself. It acts as a source of human health-beneficial omega-3 fatty acids (EPA and DHA). According to the FAO's "The State of World Fisheries and Aquaculture 2012" report, the flesh of fish and seafood contains around 15-25% proteins, 0.5-30% fat, 0.6-1.5% minerals, and provides body energy of about 33- 150 calories per capita per day.

4. Seafood exports from India

During 2019-20, India exported about 12,89,650 tonnes of seafood worth Rs. 46662.85 crores. But unfortunately, the figure is depicting that the country's exports of marine products fell 10.88% to USD 5.96 billion (Approx. Rs. 43717 crore) during 2020-21 due to the COVID-19 pandemic.^[6] Apart from that, continuing recession in the international markets, the debt crisis in EU economics, world political instability, and sluggish overseas markets are the key factors for this

export downfall of fish and fishery products. Indian fish is being exported to more than 100 countries this year (Fig. 1).^[7]

5. Status of Fish Production and consumption in India

Total fish production of India in 2019-20 is 141.64 lakh tonnes with 4.35% of the average growth rate. The contributions of various sectors are Inland sectors: 70-75%, Marine sectors: 25-30%, Domestic utilization: around 90% and Export: frozen shrimp constitutes 73% of overall exports in terms of value (rupees) which implies the availability of potential resources.^[8] There are two types of fish in terms of value in the Indian market. The high-value fish are seer fish, pomfret, mackerel, shrimp, seafood like lobster, crab, etc. and low-value fish are croakers, pink perch, sardine, ribbon fish, etc. The high-value fish have the established markets already. People can go for value addition with these fish also, but the challenge will be the cost. Because this fish has already fetched a high price in the market and again due to value-addition, the cost of the final product will be more. So naturally, value addition is feasible with the fish fetching the lower price and less market demand although having a similar nutritional profile to that of higher-valued fishes; thus, post-harvest fishery losses are reduced. The fish consumption rate in India is also needed to be improved as 13 kg per capita, whereas the current figure is 5-6 kg per capita consumption (Fig. 2).^[9-10]

6. What is value addition?

The mechanical or human-derived process that changes an entity from its original state to a new form in terms of high organoleptic qualities is the basic concept of value addition.^[11] Value addition means an addition of benefits to the consumer in the usual purchase, making convenient products, adding extra ingredients to exiting commodity, creating longer shelf life and environment-friendly packaging. It provides a variety of products like ready to eat or ready to cook or ready to serve products with improve processing utilization and satisfying the consumer demand for formulating new and convenient products with an increased opportunity for income generation.

7. Need for Value addition

Some Fish and shellfish are having awkward shapes, sizes, skin, bones and some fishy odor has been found from the northeast side of India as well as in the case of the southwest part of India. There are also different fishes which are having low-quality meat and also different odor. These are having low commercial value. So that's why the need for the value addition is very helpful so that the people can be achieved more valuable food products and avoid that fishy odor as well as the awkward shape. And also, products having acceptance in North East India may not be accepted by South West. So, products diversification is highly needed. Major factors influences for value addition are: increase the product volume and weight; more attractive with color, appearance, or packaging; gaining crispier

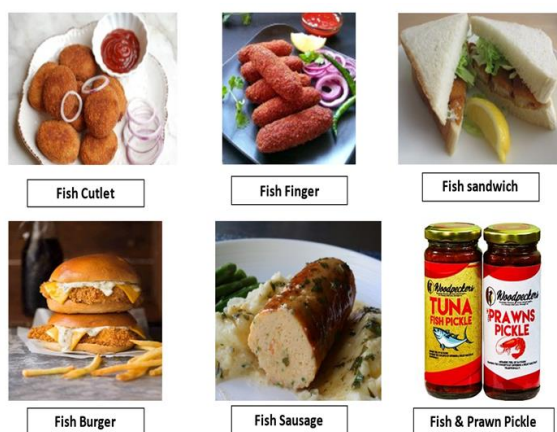


Fig. 3. Some popular value-added fish products in India

texture; any flavor can be introduced; provide a variety of products in markets; ready to eat or ready to cook or ready to serve product; improve processing utilization; according to the consumer demand new products can be formulated and better income can be generated.^[12]

8. Entrepreneurship Development through value addition

Due to the consumers' demand for high-quality processed foods with minimal nutritional changes, fish can be a game-changer. So, there are lots of opportunities to set valuable and productive entrepreneurship from this fisheries industry. The initial work on the production and sale of value-added fish products will show great business potential. Along with this, various central as well as state govt schemes, and funding opportunities (i.e., blue revolutions schemes, PMMSY, etc.) may help investors or stakeholders to form their own business, and also by taking part in the mentioned projects they may help to fulfil the Indian vision of about 55 lakhs employment generation by 2024-25 through this sector. Transfer of technology is highly needed to promote such type of venture.^[13]

9. Value-added products processing

Various products i.e., canned products, dried or cured products, marinated or pickled products, coated or fabricated products, analogue or imitation products can be prepared using fish mince meat or fish fillet. Fish flesh is separated from the skin and bone by using a meat separator is termed as fish mince. Further, it can be frozen in form of 1kg, 2kgs slabs, and made available as a raw material for different value-added products. Surimi is stabilized myofibrillar protein prepared from mincemeat with repeated washing and blended with cryoprotectants.^[14] Since long, the technology is practiced in the Department of Fisheries, Govt. of West Bengal, by starting producing value-added fish and fishery products, and their circulation- distribution- selling chains through various stalls, units, and mobile vans under the umbrella of Benfish, Kolkata. From low-cost fishes, surimi or washed fish mince can be prepared. From which value-added products like fish finger, fish cutlet, shrimp

analogue, crab stick etc. preparations are carried out. India currently is running almost 16-17 surimi industries from where surimi can directly be purchased for product preparation.^[15] Due to reasonable price of the surimi about Rs.100 to 150 per kg, value-added products can be prepared economically. Small or medium sized fishes are used for manufacturing mincemeat or surimi. Ready to eat, fortified extruded products with omega-3 fatty acids, ready to eat bakery products fortified with microencapsulated fish oil, fish pasta or fish noodles can also be prepared (Fig. 3).^[16-17]

10. Limitations

Some challenges are also there when it comes to adopt such new venture. After putting values to an existing product, it generally increases the cost of end product. So, setting an affordable price for marketing of such products is quite a challenging task. Value addition also needs skilled manpower or advanced technology for further processing of products i.e., attractive packaging etc.

11. Conclusion

Promoting consumption of fish in the form of different ready to eat and ready to serve value-added products will help in increasing the per capita consumption of fish in India. Training to unemployed youths, fisherwomen, and self-help groups in making value-added fish products will help in producing skilled manpower and employment generation. Sensitive, economic, attractive, and safe packaging followed by rational market survey and dynamic marketing and advertisement will ultimately lead the future of value-added fish and fishery products.

Conflicts of Interest

The authors declare no conflict of interest

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