Business Incubation Initiatives in Indian Fisheries Post Harvest Sector

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Introduction

Fish and fish products contribute 17% of the total animal protein consumed by humans. The bulk of the utilization of fish production is in the form of products for human consumption and this share is projected to grow from 89% in the base period (2016-18) to 91% by 2028 (OECD/FAO, 2019). Fish plays an important role in providing a diversified and healthy diet to many coastal communities and presently being promoted as one of the main components in many programmes to alleviate malnutrition.

World trade of fish for human consumption is projected to total 45.8 Mt live weight by 2028, up 11% on the 2016-18 base period. Live, fresh or chilled is often the most preferred and highly-priced form of fish and represents the largest share of fish for direct human consumption, 45 % in 2016, followed by frozen (31 %), prepared and preserved (12 %) and cured (dried, salted, in brine, fermented smoked) (12 %). Freezing represents the main method of processing fish for human consumption; it accounted for 56 % of total processed fish for human consumption and 27 % of total fish production in 2016 (FAO, 2018). Post-harvest losses of fish account for about 35% of the total global fish production (Gustavsson et al., 2011). It is expected that in nearby future climate change on account of Global warming can have a negative impact on the availability and trade of fish and fish products mainly due to change in the pattern of water currents, habitat modification and destruction. This can adversely affect the migration pattern of fish and thereby reduce the availability and productivity of fish stocks which is already evident in the case of Indian oil sardine, one of the most abundant food fish available in Indian coasts.

Fish caters to the food and nutrient security needs of the rural and urban population of coastal and non-coastal states of India. The total fish production in India was 129.5 lakh tonnes during 2017-18 from marine and aquaculture. Approximately 83% of the total production is available for domestic consumption, 11% is exported and 6% is used for miscellaneous purposes such as reduction to fish meal and oil. However, the monthly per capita consumption of fish is low in India which is about 0.25 to 0.27 Kg (NSSO, 2014).

Globally, India ranks sixth in marine capture fisheries and second in inland fish capture and aquaculture production. India is sixth in the top ten exporters of fish and fish products and the exports of the marine products generated Rs. 46,589 crores of foreign exchange in 2018-19 (Anon.2020). However, less than 10% of the marine exports are traded as value added products, rest are mainly frozen items. As of the case with the rest of the World, value addition is the key for Indian Fisheries sector for diversification and increased unit

value realization from the resources. However, the future emphasis should be on sustainability to conform with the Sustainable Development Goals of the United Nations (Anon.2015)

Technology developments in the fish processing sector offer scope for innovation, increase in productivity, increase in shelf life, improve food safety and reduce waste during processing operations. A large number of value added and diversified products both for export and internal market based on fish, shrimp, lobster, squid, cuttlefish, bivalves etc. have been identified (Ninan & Ravishankar,2018). There are huge prospects for live fish marketing, chilled and minimally processed fish products, mince-based convenience products, speciality products, coated products and shelf-stable products. Fish processing operations generate about 47% of waste in India composed of skin, head, viscera, trimmings, liver, frames, bones and roes. This waste is now termed as rest raw material which is an important source for two categories of products viz. low-value products of mass upgrade and high-value products from quality rest raw material. In India, the rest raw materials from fish processing are either disposed of or converted into mass upgrade products viz., animal feed, fish meal and fertilizer. This leads to ineffective use of raw material and hampers the sustainable utilization of available resources. The disposal of fish processing waste complying with environmental standards adds to the operational cost of the seafood industry. Challenges to full utilization of rest raw material from fish processing are lack of suitable technologies to improve palatability, nutrient utilization and refinement of feed formulation in which protein sources are combined to overcome nutritional liabilities of underutilized ingredients (Sachindra & Mahendrakar,2015). Developing appropriate and scalable technology to recover or isolate the high-value components from rest raw material for high-value nutraceuticals and health formulations products could be of paramount importance in the context of optimal utilization of the resource.

However, the commercialization of fish products still poses a lot of challenges to the entrepreneur and researcher in terms of optimization of technologies and ultimately developing the technologies into a commercially viable business plan. The business incubation drive started by ICAR in 2009 through the World Bank funded projects successfully promoted agribusiness programmes, reinforcing the public-private partnerships in agriculture. Through these partnerships and technology transfers, ICAR was able to ensure the successful dissemination of valuable and diversified ICAR knowledge base to the end-users. There are eight research institutes specialized in the field of Fisheries under ICAR, with a large number of technologies ranging from harvest to post-harvest. ICAR adopted the concept of techno entrepreneurship to enable public-private partnerships benefiting a larger section of the society and utilize the innovations to compete in the global market. It is pertinent that the research outcomes are transformed into marketable products and services that can be leveraged to generate revenue and enhance R&D pursuits in ICAR. The Council implemented a scheme titled National Agriculture Innovation Fund (NAIF) in 2017, which essentially has three main components to promote innovation, incubation and sustainability (Srinivas et. al,2018).

Business Incubation Initiatives in Fish Processing Sector

The fisheries sector has been categorized as a sunrise sector and plays a very important role in the socio-economic development of the country, particularly for the coastal states. This sector generates income and employment opportunities for the rural communities and the single largest earner of foreign exchange among the agricultural products exported from India.

The AgriBusiness Incubation Centre (ABI at ICAR -Central Institute of Fisheries Technology (CIFT) aims at promoting innovation and entrepreneurship in fisheries post-harvest sector. The technology support base of ABI is CIFT and it follows a technology dissemination procedure which equips the entrepreneurs to explore new ways of doing business through the wide spectrum of activities. Pro-active and value-added business services are provided to registered incubatees in the form of technology transfer, contract research, consultancy, contract service, office space, certified state-of-the-art pilot level production facility, on-site guidance and specialized training to establish innovation-based business enterprises.

The ABI Centre is functioning at a location with high fish production and vital markets, which makes it easily accessible to clients. The Institute has developed a wide range of technologies pertaining to fishing technology, resource/energy optimization, fish processing, value addition, high-value by-products, packaging, customized processing equipment, health care products, Aquaceuticals, etc. The Centre is a nodal point for the commercialization of the ICAR technologies, through an interfacing and networking mechanism between research institutions, industries and financial institutions. This industry-specific incubator offers its services irrespective of geographical boundaries through direct and virtual incubation. The Centre is also actively involved in CSR sponsored projects for social empowerment of the weaker sections.

Process of Incubation

The Business Incubation programme primarily aimed at supporting entrepreneurs who can be a startup or an established business unit. The requirements of the former and latter are different concerning the support provided by the ABI. For entrepreneurs, the key factor is handholding and mentorship. For the established business groups, the main requirements are optimisation and standardization of new and innovative products supported by R& D facility for assuring the product quality, packaging requirements and shelf life. For an entrepreneur who is new to the business the first step is to select an appropriate product/technology which will have good prospects as a viable business venture. Through direct incubation process, the BIC support the entrepreneurs through product/technology selection, custom made training programme, product optimisation, trial production, product branding, labelling, packing, trial marketing and preparation of detailed project report. Direct incubation is intended to handhold clients during their infancy period, where they can set up office and production plant with no capital investment. Incubatees are assisted in translating their idea to technology and further to a market-ready product or service. They can also select among the showcased technologies developed in the research laboratories and enter into a licensing agreement. As per the Intellectual Property and Technology Management guidelines of ICAR, the entrepreneur has to agree with the ABI Unit for the services provided. This agreement provides a time frame, defines the terms and conditions and the scope of activity.

The ABI also support the entrepreneurs through virtual incubation programmes. Those entrepreneurs/startups who are limited by constraints of location and accessibility can avail the support of ABI through virtual incubation. Industry interface and technology promotional programmes of ABI helps to identify potential candidates for entrepreneurship programmes.

The residency period for direct incubation is two years, extendable by six months on case to case basis, depending on the need assessment by the ABI Governing Council. All the services provided to the incubatees are chargeable as per IPTM guidelines. The mentorship of the incubatee will continue well beyond the time frame of the agreement which

ensures constant support for solving the issues faced in production and marketing.

Services offered by ICAR-CIFT AgriBusiness Incubation Unit

The ABI offer the following services to the entrepreneurs and startups:

- Impart technical/managerial skills through training
- Provide scientific/technical inputs for developing and optimising the product
- Assist in selecting the appropriate market segment for the product,
- Help in labelling and branding
- Provide support for trial production and test marketing
- If required, assist in developing and protecting IP assets.
- Scout for potential investors and strategic business partners
- Networking services

Direct Incubation facilities:

- Furnished office space with shared facilities
- Preprocessing and processing lines
- Pilot-scale production lines for value added fish products and byproducts
- NABL accredited laboratory facilities for testing, shelf life evaluation and nutritional labelling

Pilot Scale Production Lines

Under the Business Incubation Scheme, ICAR CIFT has established a modern semi-commercial production facility for value added fish and shellfish products and byproducts. This facility is manned by technical staff and the entrepreneurs can utilize this facility for and process optimisation and trial production. This facility has lines for pre-processing, cooking, retort pouch processing, canning, sausage production, extruded products, chitin & chitosan production, smoking, curing & drying, breading & battering and product packaging. This will significantly reduce the requirement of investment in capital assets by the entrepreneurs /startups, which is one of the major bottlenecks during the initial stages of business development.

Business Support Services

The ABI assist the entrepreneurs in complying with business regulations and licensing procedures as required by FSSAI or any other statutory bodies. It also helps them in the preparation of Business plans and Detailed Project Reports, networking services, manpower recruitment and any other specific services as per the requirement.

The ABI since its inception had registered 165 incubatees of which 95 have successfully graduated and established small scale enterprises.16 firms have taken out the office facility and more than 100 clients have utilized the pilot plant facility for product development and trial production for test marketing. More than 850 prospective entrepreneurs have utilized the services of ABI for validation of prototypes and model testing. About 60 product brands developed by ABI are available in the market.

Promotion and Commercialization of ICAR Technologies

The ABI regularly conduct B2B / Industry Meets, Exhibitions, Industry Interface Programmes, online focus group interactions etc. for enhancing the visibility of ICAR technologies towards commercialization. As a result, several agreements have been operationalized for consultancies, technology transfer, contract research, collaborative research for the upscaling and commercialization of technologies. This has helped in fostering the

public-private partnerships and convergence of innovators & entrepreneurs from the fisheries sector to work out viable business options. As Zonal Technology Management Centre for Fisheries in ICAR, CIFT act as a facilitator for the demonstration and commercialization of technologies developed by the eight ICAR Fisheries Institutes. Some of the prominent technologies developed by ICAR Fisheries Institutes for commercialization are seed production technologies of fish and shrimp, cost-effective and nutritious fish feed formulations, diagnostic test kits, field kits for detecting fish adulteration, new and improved aquaculture methods, Fishing craft and gear designs, ready-to-cook / ready-to-serve fish, pharmaceutical and nutraceutical products, seaweed-based formulations, products from the secondary raw material of fish processing viz., chitin and its derivatives, fish collagen, gelatin, peptides, organic fertilizers, fish calcium etc.

Human Resource Development

Fish Processing & Value addition is an emerging sector in India and this sector is always on the lookout for trained manpower who can efficiently manage the unit operations in aquaculture, harvest and postharvest sector. ICAR-CIFT with its qualified and experienced pool of scientific and technical personnel regularly conduct hands-on, application-based training programmes viz., HACCP, Seafood Quality Assurance, Biochemical and microbiological analytical methods, Value addition technologies, Fishery waste management and utilization, Green Harvesting Techniques, Vessel & Gear handling & maintenance, Entrepreneurship Development Programmes etc. The ABI organizes several online seminars and customized training programmes for prospective entrepreneurs and startups in the Fisheries Sector. The Centre also arrange capacity building programmes for the incubatees in the areas of business practices, accounting, networking and financing strategies with the support of external agencies and resource personnel.

Outcomes

- Creating a pool of entrepreneurs in the fisheries sector in India to explore new avenues in the Global fishery trade and business, thereby contributing to the growth of the nation's economy.
- Provide adequate technical support to the entrepreneurs to compete in the global market concerning the product quality and optimized production protocols.
- Equitable distribution of national resources and promotion of regional economic growth through the establishment of micro, small and medium enterprises in rural areas.
- Promoting gender equality and financial independence through women-centric SHG clustering in the fish processing sector.
- Savings on capital investment during the incubation period significantly reduce the chances of failure for first-generation entrepreneurs and provide confidence to face real market situations.
- Import substitution, foreign exchange savings and increase in market share through the introduction of innovative products and services.
- Creation of jobs in non-conventional segments of the fisheries sector viz., value added services for aquaculture, processing through startups and entrepreneurship ventures.
- Enhance the National IPR repository through innovations and novel processes in the sector.
- Create a self-sustaining, competitive and resilient fisheries sector towards Atmanirbhar Bharat.

Incubatee Product Brands developed by BIC, ICAR-CIFT

Conclusion

Fisheries is considered as a sunrise sector in Indian industry considering its potential in creating opportunities for employment, entrepreneurship and income generation. The sector contributes to 1.1% of the national GDP and 4.47% of the total GDP of agriculture and allied sectors (FAO, 2014). 5 million people are directly involved in different fishery activities for their livelihood and revenue generations. Growth and development of fishery sector has huge potential to provide employment and entrepreneurship opportunities in many fields such as capture and culture fishery activities, fish processing, value addition, seed production, feed development, transportation, cold chain, packaging. Utilisation of rest raw material from fish processing for developing high value nutraceuticals and pharma grade products is another promising area which calls for new ventures. The future market scenario demands functional fish products and the challenge will be to retain the functional benefits of fish & shellfish meat by way of adopting product specific processing protocols or alternate delivery systems for sensitive components. Business incubators in Fisheries sector should be able to offer viable business models in these hitherto unchartered areas to the fishpreneurs. Considering the unique nature of this sector, community-based self-help groups should be promoted to take up micro enterprises in fisheries with sufficient incentivisation through schemes like Pradhan Mantri Matsya Sampada Yojana (PMMSY).

Further reading

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