Opportunities for Inclusive Fisheries Business through Value Chain Management (VCM) Approach

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This e-book is a compilation of resource text obtained from various subject experts in Fisheries sector on "Opportunities for Inclusive Fisheries Business through Value Chain Management (VCM) Approach". This e-book is designed to educate extension workers, students, research scholars, academicians related to Fisheries Science about the Value chain management approaches for inclusive fisheries business. Neither the publisher nor the contributors, authors and editors assume any liability for any damage or injury to persons or property from any use of methods, instructions, or ideas contained in the e-book. No part of this publication may be reproduced or transmitted without prior permission of the publisher/editors/authors. Publisher and editors do not give warranty for any error or omissions regarding the materials in this e-book.

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Chapter 3

GAUGING FISH CONSUMPTION DIVERSITY AND INNOVATIVE INTERVENTIONS TOWARDS AN INCLUSIVE VALUE CHAIN MANAGEMENT FRAMEWORK

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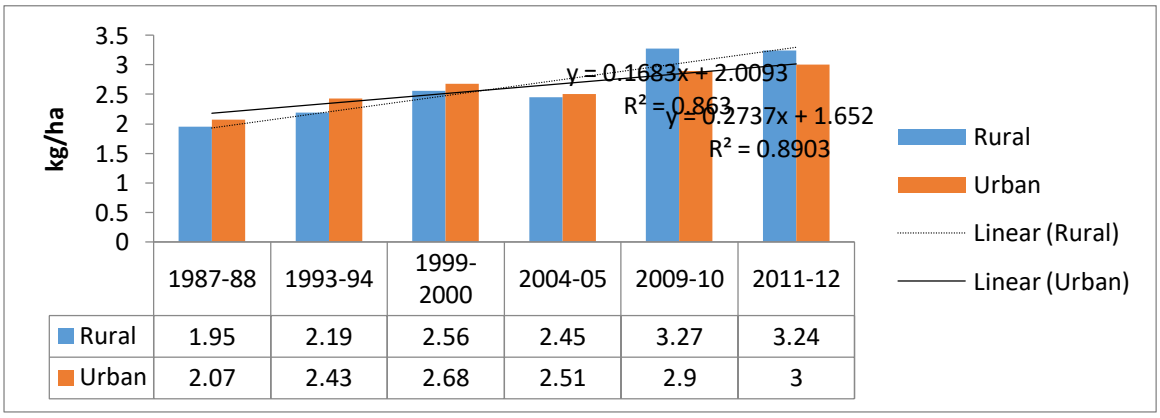
Setting

Fisheries is a fast-growing sector in India, which provides nutrition and food security to a large population of the country as well as providing income and employment to fishermen and fish farmers The fisheries sector registered a sustainable growth rate of over 10 per cent and contributed over one per cent of India's annual gross domestic product during the last decade. India is the third-largest fish producer in the world. Overall fish production has increased from 0.75 million tonnes in 1950-51 to 14.5 million tonnes in 2021-2022. Marine fish landings in India were estimated as 3.05 million tonnes during the year 2021-22.There has been a gradual increase in India's contribution towards global fish production over the years. The growth rate in marine fisheries was about 5.65 percent, whereas the growth rate of 33.64 percent has been achieved in inland fisheries in the country during the last decade. The country has an estimate of the value of marine fish landings during 2021 at landing centre (LC)level of Rs 53,647 crores, (14.24% increase over 2020) and at retail centre(RC) of Rs. 76,640 crores (14.06 % increase). The unit price per kg of fish at LC was Rs.176.04 (2.19 % increase over 2020) and at RC was Rs.251.48 (2.03 % increase). The average annual growth rate of fish and fish products exported from India in terms of quantity and value for the last decade (2010-11 to 2019-20) was 6.13 per cent and 15.47per cent respectively (CMFRI Annual Report, 2021).

Currently, about 80 per cent of the fish produced globally is consumed by people as food. This proportion is not expected to change till 2030. Given that the production is expected to grow by 23.6 per cent during the 2010 to 2030 period and the world population is projected to grow at 20.2 per cent over the same period, the world will likely manage to increase the fish consumption level, on average. At the global level, annual per capita fish consumption is projected to increase from 17.2 kilograms in 2010 to 18.2 kilograms in 2030.

The trend in per capita consumption, however, is diverse across regions. In general, per capita, fish consumption is expected to grow fast in the regions with the highest projected income growth (China, India, South East Asia). However, the highest growth in fish consumption is expected in South Asian Region (SAR), where per capita fish consumption is expected to grow at 1.8 per cent per year over the 2010–30 periods. In all of these regions, however, the growth in per capita fish consumption is expected to slow relative to the 2000–06 period. Adding together all its regions (CHN, EAP, JAP, SEA, IND, and SAR), Asia is expected to represent 70 per cent of global fish consumption by 2030.Though a major producer and consumer of fish globally and a net exporter, consumption per capita in India is well below the world average.

Fish is less expensive than other animal protein sources and is inexpensive in terms of nutrition value in comparison to even vegetables and grains. Food security policies in India are by and large obsessed with cereals. Given our vulnerability to inflation in pulses, a large part of which is imported, India would do well to seriously think about fishing its way out of protein deficits. A preliminary examination of the average annual per capita fish consumption in India indicate that Tripura, Kerala, Manipur, Odisha and Assam are the top fish consuming states (Department of fisheries, 2019)



	1987-88	1993-94	1999-2000	2004-05	2009-10	2011-12
Rural	1.95	2.19	2.56	2.45	3.27	3.24
Urban	2.07	2.43	2.68	2.51	2.9	3

Fig: 1 Average per capita fish consumption in India (kg/ha)

Fisheries sector and fish consumption of India

Fish has become an integral constituent in the food basket of the Indians as it is considered to be a healthy food with a high level of edible protein. Globally, fish provided 6.7 per cent of all protein consumed by humans and offered a rich source of long-chain omega-3 fatty acids, vitamins, calcium, zinc, and iron. One of the major advantages of including fish in the consumption basket is the availability of wide range of products across a huge price range and geographical spread across different states. On one side, fish could be

poor man's protein (low-value fishes) ensuring food security, and on the other, a delicacy offered at a huge price and comparable with other protein sources (high-value species like shrimps, pomfrets and seer fishes etc.).It has been estimated that around 60 per cent of the Indian populace consumes fish and the consumption pattern varies spatiotemporally and across the different social fabrics. The annual per capita consumption of fish for the entire population is estimated at 5-6 kg whereas for the fish-eating population it is found to be 8 -9 kilogram, which is a poor 50 per cent of the global rates. Moreover, the *Pradhan Mantri Matsya Sampada Yojana* (PMMSY) - the flagship scheme of the Government of India in the fisheries front- emphasizes on augmenting domestic fish consumption from 5 kg to 12 kg per capita is a step taken in the right direction.

The existing per capita availability of fish is 6.5 kg and is expected to reach 9.0 kg by 2030.The Indian Council of Medical Research recommends per capita fish consumption be 12 kg per annum. The regional tastes and preferences of the fish-eating population of the country and the frequency of fish consumption also exert substantial influence on the market. It is estimated that the Indian population will reach 1.5 billion by 2030 and cross 1.6 billion by 2050 (The UN Department of Economics and Social Affairs, 2020). The increasing population necessitates identifying and harnessing cheaper protein sources like fish. The fish produced in the country exhibits competing use /users within domestic and international markets. Due to their ease of access to marine fisheries, coastal states/Union Territories (UTs) are likely to be higher consumers of fish compared to the non-coastal states/union territories. However, higher access alone may not lead to higher fish consumption and cultural and religious factors play an important role in state-wise patterns of fish consumption. The species diversification in the export basket indicated that almost all the varieties including sardine and mackerel which are often the most consumed fish in the domestic market are exported. The non-availability of fish in the domestic fish market will lead to a situation where the domestic consumers are devoid of fish in the market at affordable prices. The domestic fish food security is questioned because the export prices are lower than the domestic prices coupled with umpteen trade restricting means and measures by the buyer countries (Paradox of export).

The Indian government is striving to provide food security to all its citizens through various policies and programmes. The National Food Security Act and Pradhan Mantri Garib Kalyan Anna Yojana are important steps in this direction, which aims to give adequate quantities of cheap cereals (predominantly wheat and rice) to the most vulnerable segment of the rural and urban population. Although this effort is laudable, food strategies must not

merely be directed at ensuring just food security for all, but must also address providing adequate quantities of nutritious, safe and good quality foods that could address the makeup of a healthy diet.

Despite rapid economic growth during the past decades, India's average per capita calorie and protein intake have grown only modestly, although the per capita fat consumption has registered higher growth. Calorie and protein source in the Indian diet is diversifying with fruit/vegetable and animal-based food share increasing and cereal and pulses declining. The implication is that the implementation of the cereal-based National Food Security Act will have only a limited impact in achieving the goal of providing nutritional security to the vulnerable section of the population. This necessitates the need to enhance fish consumption.

The Pradhan Mantri Matsya Sampada Yojana (PMMSY)- the flagship scheme of the Government of India in the fisheries front- emphasizes on augmenting domestic fish consumption from 5 kg to 12 kg per capita is a step taken in the right direction. It is important to note that fish consumption is restricted mostly within the near vicinity of less than 50 km of the production centres. Nevertheless, the demand pattern has not improved much and the increased fish consumption was found mostly among the existing fish consumers rather than adding new consumers into the fish consuming population.

India's per capita calorie, protein, and fat consumption remain significantly below that of more developed countries such as China and the United States. The implication is that in the coming years, with rising per capita income and urbanization, India's demand for various superior food products will continue to increase necessitating a possible change in the food production system and agricultural trade. Deliberations on the potential of the food and agriculture sector to meet the demands and challenges posed by this analysis and, its implications for all components in the food chain would be useful.

Summarising a 1966 survey of possibilities of increasing food production to meet India's nutritional requirements, Kent (1987) notes that, "fish is one item in our requirements of food that has the largest potential for increased production causing, at the same time, no strain on India's limited land resources. For a country with such low levels, qualitatively of food consumption, like India, fish ought to command high priority in the solution of India's long term food problem". With excessive dependence on cereals, the Indian diet is often characterised by both energy as well as protein deficiency, which can be met through fish consumption. In comparison to vegetables and grains, fish is relatively expensive based on weight but it is quite inexpensive in terms of nutritional value.

Assessing fish consumption paradigms across coastal states India)

The major advantages of including fish in the consumption basket are its availability of wide range of products across a huge price range and geographical spread across the different states. On one side, fish could be a poor man's protein (low-value fishes) ensuring food security, and on the other, a delicacy offered at huge prices and comparable with other protein sources (high-value species like shrimps, pomfrets and seer fishes. It's been estimated that around 60 per cent of the Indian populace consumes fish and the consumption pattern varies spatiotemporally and across the different social fabrics. The annual per capita consumption of fish for the entire population is estimated at 5-6 kg whereas for the fish-eating population it is found to be 8 -9 kilogram, which is a poor 50 per cent of the global rates. The per capita consumption of other meats such as chicken (2.7 kg), beef (1.3 kg) and mutton (0.6 kg) are less compared to fish. India has a higher part of fish protein in total animal protein consumption than the developed countries.The share of meat, fish and egg in protein intake was only 7% in rural India and 9% in urban India. The share was 26% in both rural and urban Kerala and was 10% or more in only 5 other major States: West Bengal, Assam, Andhra Pradesh, Tamil Nadu, and Karnataka.The Indian Council of Medical Research recommends per capita fish consumption be 12 kg per annum. Moreover, the fish consumption will also be influenced by the availability and price of its immediate substitutes. Ghee, butter, and eggs could act as substitutes for fish in Indian diets.The demand and supply of fish in the years 2017, 2020, 2025 and 2030 were calculated assuming the population of India to be 1.28 billion,1.36 billion,1.45 billion and 1.53 billion, respectively with 60 per cent population consuming fish @ 12 kg/capita. The result shows that the supply-demand gap would be 1.75 Million tonnes by 2017 and would double by 2030.

Fish preferences can vary based on several factors such as place of residence (rural and urban) as well as income level (poor and non-poor households). The fish trade is also differentiated based on market destinations like domestic and international channels. Increasing wealth and urbanization have a strong influence on the consumption of fish and fishery products. About 8 to 21 per cent of the consumers belonging to the higher income group spent their income more on fish compared with the lower-income groups (5 -16 per cent). Similarly, the part of the budget spent on fish is more in the urban areas (6-32 %) compared to rural areas (3-15%). Freshwater species appeared to dominate the household fish consumption especially for those living in the deltaic countries with rich inland waters like India, China, Vietnam, Bangladesh and Thailand which imply that the geographical factors also determine the fish consumption.

A comprehensive understanding of the fish consumption patterns across different coastal and non-coastal regions of the country is the need of the hour given its nutritional security implications. In this context ICAR – CMFRI has done numerous studies on fish consumption paradigms across the different coastal states on India**.** The study identified varied results like the quality, good taste and cheap rate may as the prime reasons to be acknowledged as the effective factors in the consumer's decision in the preference of the buying place. The results indicates that drivers for buying fish have the highest part worth value for all the selected study areas of Andhra Pradesh (36.43), West Bengal (56.00) , Kerala (52.00) expect for Odisha (32.44). Quality, nutrition and taste and preference are the major drivers for buying fish for the consumers. The results also indicates that fish vendors at doorstep, way side markets etc. and even the landing center and supermarkets have considerable importance in choosing the purchase place by the consumers for fish consumption. The quality, good taste and cheap rate may the reasons behind the consumers' decision in the preference of the buying place. Due to the increase in the fish consumption the meat consumption is decreased. People are willing to travel to about 1-2 km to buy good quality fish. The Garrette ranking technique for constraints in fish consumption found that the main constraint in the consumption of fish was observed to be the lack of fresh fish, followed by irregular supply, wide fluctuations in price, and consumption restricted due to high price. The per capita annual fish consumption of the respective states are given below (Table 1) and the results indicates that the state Kerala has got the highest per capita fish consumption followed by West Bengal and Andhra Pradesh.

Table 1. Percapita fish consumption of the Coastal states of India

State	District	Location	Per capita Annual fish consumption (kg)	Year
West Bengal	Purba Medinapur	Coastal Rural	21.84	2019
Andhra Pradesh	Ananthpur	Non- Coastal Rural	5.80	2018
Andhra Pradesh	Visakhapatnam	Coastal Urban	10.98	2018
Andhra Pradesh	Vizianagaram	Coastal Rural	9.52	2018
Andhra Pradesh	Kurnool	Non Coastal Urban	7.96	2018
Gujarat	Somnath Gir	Coastal Rural	16.08	2019
Odisha	Puri	Coastal Urban	10.97	2019
Odisha	Balasore	Coastal Rural	6.78	2019
Odisha	Cuttack	Non Coastal Urban	8.52	2019
Odisha	Mayurbhanj	Non- Coastal Rural	5.15	2019
Kerala	Palakkad	Non- Coastal Rural	20.63	2019
Kerala	Alappuzha	Coastal Rural	31.94	2019
Kerala	Trivandrum	Coastal Urban	34.83	2019

Kerala	Kottayam	Non Coastal Urban	23.96	2019
Karnataka	Mangalore	Coastal Urban	9.50	2018
Maharashtra	Mumbai	Coastal Urban	9.43	2017
Tamil Nadu	Chennai	Coastal Urban	9.47	2017

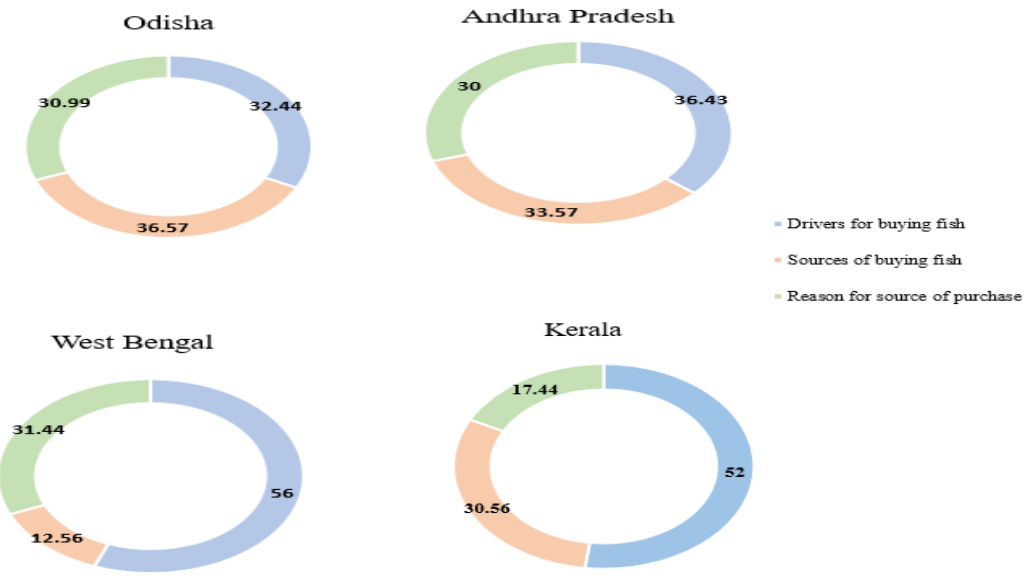


Fig 2: Major drivers for fish consumption

Consumption of fish during COVID:

The COVID-19 pandemic induced stringent stress all over the food supply chain in the country causing changes in people's food consumption pattern. The spread of Corona virus has created bottlenecks in the production, processing, transportation and logistics leading to momentous shifts in fish consumption pattern as well as demand and supply of fish. Efficiency and effectiveness of fish supply chain is a major aspect determining fish consumption across the country. The fish supply chain has undergone rapid changes in consonance with the evolving technology and demand pattern. The COVID 19 pandemic and associated lifestyle changes have also triggered this evolution. Online trading of commodities and services has captured considerable market space and share in India and world over targeting this opportunity. Online fish trade is gaining traction in this digital age where people prefer everything delivered at their doorstep. However, a thorough understanding of the innovative marketing models in fish supply chain using modern/digital technologies in India is required. The online fish trading assists in protecting the interests of both producer and consumers. A recent study indicated that most of the online fish trading firms in Kerala

are of recent origin and firms with strong backward and forward linkages realize higher returns The Online fish marketing in India is gaining momentum with focus on quality and convenience rather than price advantage .Presence of limited literature in this area necessitates a thorough understanding of the innovative marketing models in fish supply chain using modern technologies in India. A rapid impact assessment by A Rapid impact assessment by CMFRI on the COVID pandemic in the marine fisheries sector estimated a total loss of Rs.10, 000 crores for a period of 21 days across the marine fish value chain constituents in India. The fishing operations get disrupted and continued to impose unabated serious threat to the fisher livelihood, fisher income thereby registering a decreasing revenue trend in the fishing sector. These created alterations in the fish consumption – trend and pattern. The unavailability of fish due to the restrictions by the pandemic and hygiene issues in the fear of attack of COVID are one of the two major reasons for the alterations in the fish consumption pattern. As fish is a perishable item, there is high demand for packaged and frozen products due to panic buyers but the processing and canning industry will not be able to cater to this demand due to non-availability of man power. The high-end fresh products which are transported by air are also directly affected due to cancellation of flights, thus directly affecting the trade. Overall, a sharp decline in demand resulted in price drop of many species, particularly those which were served as delicacy in restaurants.

Changing fish basket of Consumers

The fish demand and supply pattern drastically varied during COVID times, the fish consumption analysis across during COVID times indicated that the fish consumption decreased by 48 per cent due to the unavailability as well as increased price. In addition the per capita consumption of fish recorded highest during pre Covid season (27.96 kg). It became lowest during lock down / COVID down (17.76 kg) and spiraled to 23.52kg during 2021.

Table 2: Preference Index of Species during Pre- Post COVID

Species	Pre Covid	Species	Lock Down	Species	Post Covid
Sardine	0.53	Prawns/ Shrimp	0.23	Sardine	0.48
Mackerel	0.28	Tilapia	0.23	Prawns/ Shrimp	0.18
Anchovies	0.22	Others	0.21	Others	0.18
Prawns/ Shrimp	0.17	Mackerel	0.12	Mackerel	0.15
Others	0.16	Sardine	0.12	Tilapia	0.15
Thread fin	0.15	Anchovies	0.10	Ribbon fishes	0.13

breams					
Tuna	0.14	Clam/ Mussel/ Oyster	0.10	Anchovies	0.12
Tilapia	0.10	Seabass/ Milk fish/ Mullet	0.07	Cephalopods	0.12
Cephalopods	0.09	Carps	0.06	Seer fish	0.08
Pomfret	0.09	Crab	0.06	Clam/ Mussel/ Oyster	0.08

The species composition during pre covid, covid and post covid were investigated and the preference indices for the species during the three time periods were computed. Among the species during the Pre Covid period sardine (0.53 kg) was the most preferred fish followed by anchovies (0.22 kg) and mackerel (0.28 kg) in the selected areas of study. During Covid period Prawns/shrimp (0.23 kg) and Tilapia (0.23 kg) registered as the most preferred fish species as these were the most available fish during the Covid time. Sardine resumed being the most preferred fish during the post Covid time however the streaks of Covid retained the preference of Tilapia as the most common fish in the long run. The availability and the consumer preferences are remarked as the major reasons for the highest utilization rate.

Factors determining changing consumption

The consumption basket got diverse due to the availability of inland fishes like tilapias, farmed shrimp, seabass, milk fish, mullet, carps, mussel, oysters and clam Among the different factor which lead to changing fish consumption it was found that non availability of the fish is the main factor that determining the change in consumption followed by the increased stress/ anxiety/ boredom of the quarantine situation. The significant limitation in the consumption of fish was found to be the unavailability of favoured fishes in the state while absence of fresh fish is the second important constraint in the study regions. The purchase and demand of the fish have not been yet reduced due to these reasons and their fish consumption has only increased fairly in despite of the high prices. Yet, the irregular supply, as well as the poor access and different reasons, have also affected in the consumption pattern of the consumers. Due to which they have to rely upon the different hotspots for the utilization of fish.

Fig 3. Factors determining changing consumption

Changing consumer preferences

The seafood industry of India has gone drastic changes over the years in suiting the eating habits and consumer preferences toward the fish products. India is gearing up to produce and supply value added products in convenience packs by adopting the latest technologies and by tapping the unexploited and under exploited fishery resources. There has been considerable structural change in the seafood processing and export industry for the last few years. Large quantities of fish/shellfish are discarded at sea because it is currently uneconomic to preserve and bring them ashore It has been estimated that the global amount of discard of by-catches is in the range of 17-39 million tons/year with an average of 27 million tons/year. Factors discouraging the landing of the by-catch are the low market value of the material, the size and species composition, the lack of suitable refrigerated storage space on-board and over-exploitation of most the available species in the inshore areas. The rapid development of the value addition of fish products over the last four decades made a major contribution to the increased exploitation of these deep sea varieties and the by-catches. It has been found that consumption of fish may be greatly increased by making better use of the existing catch. Due to lack of infrastructural facilities like ice plants, landing facilities etc. the quality of the fish is downgraded particularly in developing countries leading to their use as aquaculture feed. Through improvement in infrastructure facilities, the quality of the landings can be upgraded for direct human consumption. The up gradation of these species may be achieved by use of improved handling and processing techniques on one hand and developing different products on the other preparation of value added product using a species in glut it is sure way of better utilization and distribution of the species when the

landing is scanty.

The linkage between Production- Distribution and Consumption (PDC) - FMPIS

Amidst the technological innovations, improvements in the infrastructure over the years the domestic fish marketing is grappled with numerous bottlenecks at the production, distribution and consumption centers. This can be owed to the inelastic nature of supply and distress sale, seasonality of landings during peak and lean seasons in marine fisheries systems and lack of staggered harvesting in the case of inland fisheries sector, huge amount of by catch/ discards due to less-efficient marketing systems and latent markets, distress sales due to the geographical differentiation of the production and consumption centre, indebtedness to the middlemen (traders) , lack of institutional and policy support, inadequate cold chain facilities, lack of value addition, poor marketing infrastructure, improper fish handling, seasonal variations in demand and supply, unhygienic handling and poor quality control, unethical trade practices and highly localized preferences. However the export sector is better organized with minimal marketing, informed constituents and price spread. The consumers' perspectives also includes huge concern about the unhygienic handling and practices in the market and thus are reluctant to buy the fishes, thereby leading to a situation where the retailers and vendors do sizeable business in the domestic fish marketing channel with huge price spread. This translates to an unhealthy market.

The domestic fish markets are geographically characterized through various marketing systems namely, landing centers related market, wholesale market, retail market and terminal markets. All these markets are characterized by the number of buyers or sellers, the number of products, entry or exist, market information. The market structure information namely, location, access, timings, buyers-sellers profile, product disposal, price stability attributes, arrivals, storage, quality check, infrastructural adequacy, intra- state and inter-state transportation and quantum of sales, species traded, the taxes levied, are often inaccessible to the different stakeholders. The marketing channel for fish in the country isn't organized much in the domestic sector whereas the marketing channel for the export sector is more organized with minimal marketing and constituents and price spread and mostly relying on forward markets and registering the market economies of scale thereby ensuring competitive markets and assured quality. The case is different with the domestic marketing system with grappling issues in the market infrastructure and marketing efficiency levels. The markets are devoid of adequate infrastructure and forward integration facilities. There aren't facilities for the cold storage or any improve interventions available for value addition. The consumers are hugely concerned with the unhygienic handling and practices in the market and are reluctant to buy

the fishes from the markets as noticed from the fact that the retailers and vendor do sizeable business in the fish marketing channel. The prospect of improved information flow in the fisheries sector is important as the fish production and the consumption is on the high across the rural and urban areas a cheap source of protein when compared to other non-vegetarian protein supplement. However the geographical separation of the fish between the production and consumption centres coupled with quality constraints etc necessitates the need for developing e- marketing interventions in the fish distribution across the sector.

Fish marketing system in India has traditionally been highly unorganized and unregulated, which is the prime cause of inefficiency in the whole process, which starts with transporting fish from farmers and finally received by consumers. In fact markets are devoid of adequate infrastructure and forward integration facilities. Lack of value addition, inadequate cold chain facilities, improper fish handling, unhygienic handling and poor quality control, lack of institutional and policy support, indebtedness to the middlemen (traders), unethical trade practices, and consumption is on the high across the rural and urban areas a cheap source of protein when compared to other non-vegetarian protein supplement. Under this background developing e-marketing interventions in the fish distribution across the sector can be used to transfer information and knowledge to the fishing community and provide all necessary fisheries information about various fishing activities. CMFRI has initiated a project titled Supply chain management of marine fisheries sector in India which aims to analyze the market structure and marketing efficiency along the fish supply chain, estimate the demand pattern, supply constraints and market potential for fish and fish products. The build out of India Fish Market Grid / Fish market and price information system (FMPIS) provides fish price Information in markets integrated with fish availability and the nearest fish market navigation. Various functionalities that form the fish market structure is meticulously conceived and optimized in India Fish Market Grid. In connection with a project was implemented jointly by National Fisheries Development Board (NFDB) and ICAR- Central Marine Fisheries Research Institute (CMFRI).

The intend of the project includes development a fish market information system (FMIS) across the country, price information system (FPIS) for the traded commercially important fish species across the country and a trade facilitating platform leading to added fish distribution and consumption utilities. In the first instance CMFRI has developed the state fish marketing (SFM) schedules which helps to identify the different markets (Landing centre / production centre/ wholesale market and retail markets).These schedules will provide the details of all the fish markets including its location ,geographic coordinates, year of

construction – operations. The NFDB funded project "Development of fish Marketing Price Information System (FMPIS) plan initially was to cover 1500 fish markets (landing centre/ production centre / wholesale and retail markets) however was decided to downsize the same to 100 markets on a pilot basis across selected states. The build out of India Fish Market Grid / Fish market and price information system (FMPIS) transmits market information flows across the stakeholders ensuring affordability and availability of fishes. In addition a manual inclusive of inland/marine species across the country was developed across different size ranges. Several outreach activities such as Stakeholders meeting with State representatives at NFDB at different locations were organized and identifies state-level co-ordinator, engaging enumerators for the different identified markets The meetings were a suite of training selected enumerators for data entry in the tablets for the different species indicated in the market price schedule.

The "Development of Fish Marketing Price Information System (FMPIS) is in a huge transformation with newer markets added, geographical spread over the country, novel changes in the data collection, the gadget uses. The FMPIS has provided an opportunity platform wherein the price signals arrive at a single focal point where we will be able to make policy decisions and understand the price dynamics across the different markets. It provides a decision support system for the different stakeholder in taking rational decision in fish trade. Thus an e-auction system will be developed. Through E-auction it provides analysis to increase the marketing decisions in giving prices, product benefits, and consumer benefits, among various other functions and can provide fast and accurate information in order to help provide information on changing needs so that decisions can be made more quickly and accurately. The e-auction system will act as a bridge connecting the geographically separated buyers and sellers. It is a platform where trading, auctioning and marketing can be done surpassing all the existing physical barriers. The market functionaries will thus be directly engaged in auctioning and trading benefiting them in terms of unfiltered information of daily price, demand and supply data. Elimination of these marketing middlemen from the frame ensures to helps the producers to get benefits and reducing costs and also provide an idea to the fishers in finding the best target market, marketers in determining arrivals/ disposal and consumers in making rational decision which further increases the marketing efficiency. This pioneering study has evolved linkages with the different markets across rural and urban, across wholesale and retail, across inland and marine, species areas across the different parts.

Many research works has been carried out during these years across the different markets to identify the different market attributes, constraints experienced by the fish

markets. Price behaviour of fishes and diversity assessment across the different markets also provide an innate idea about the diversity of fish traded within a market and across markets. The FMPIS study target to develop an integrated fish market and price information system for India through mapping the markets on a ten dimensional market structure. The different dimension includes location, access, timing, conduct, species, arrivals, disposals, infrastructural adequacy, regulations and intelligence. The expected outcome includes development of a spatial fish market data base for Indian fisheries sector, identification of innovative commodity specific fish value chains and an integrated fish market grid incorporating species, markets and prices developed. It leads to develop efficient domestic fish marketing in India. Hence, it can be concluded that the Fish market and price information system in fish marketing presents a piece of better information regarding the clear view of prices, demand and trends of fish product. Furthermore, Consumers will be able to obtain pieces of information regarding fish product, fishery tools, equipment, and accessories, helps to reduce the role of intermediaries (marketing middlemen).Therefore, E-auction platform can be used to help marketers to determine the precise price and cheaper for fish products.

Moreover the FMPIS initiatives suggest the need for an E-auction platform for actively engaging the market functionaries so that the intervention of intermediaries can be eliminated. The market functionaries will thus be directly engaged in auctioning and trading benefiting them in terms of unfiltered information of daily price, demand and supply data. They will also act as information sources. The e-auction platform will act as a bridge connecting the geographically separated buyers and sellers. It will act a single window platform where trading, auctioning and marketing can be done surpassing all the existing physical barriers. Aforementioned improvisations and recommendations by this E- auction platform with combined production and marketing systems, consumption levels are a welcoming factor by marine-dependent coastal communities, which indeed will be effectively perceived and adapted for their better sustenance and development in the future.