

The challenges and marketing strategies for nutritious freshwater fishes: A case study of Kolkata district in West Bengal

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Abstract: Fish is an essential for fighting hunger and malnutrition. Fish is a nutrient containing proteins and long-chain omega-3 fatty acids but also a unique source of iodine, vitamin D, and calcium etc.. This study is designed to have a snap-shot of the prevailing local fish markets scenario of different zones of Kolkata district in West Bengal in India. It plays an important roles in market intermediaries, major marketing channels viz. wholesale / retail fish markets and retail outlets in Kolkata has been analyzed. The cultivation of fish products which are perishable in nature depends entirely on a proper marketing system. In this aspect, wholesale and retail marketing system in West Bengal (WB) helps to domestic income, employment and foreign exchanges. This study mainly deals with the wholesale and retail marketing of different fresh water fishes and their constraints and future prospects in Kolkata during the period 2015-16 and 2016-17. As most of the people in Kolkata are fish eater, the local fish marketing is very much dominating in nature. The dominating fish species of freshwater includes rohu, catla, mrigel, tilapia, koi, singhi, magur are mainly of several types. The wholesale and retail markets are found poorer and insufficient. This paper has liked to show the necessity for adopting a uniform market strategy for fish of fresh water for easy operation and regulation, so that the state- fish production is efficiently managed and served to the consumer as well as the fishermen gets the fair price. The facilities are generally not available up to their desired expectations and the fishermen face more problems. The problems of marketing could be solved easily with the help of co-operative societies and Government for sustainable development and marketing facilities.

Keywords: Fish marketing, problems & prospects, sustainable development strategies.

Introduction: It is known that among different states in India WB are the largest producers of varied fishes and it stands uniquely in the 8th position among different states in India. Like Goa, WB is also largely depends on fish intake and it is a also a staple food along with the rice for Bengalis [2]. Fish is one of the important items of regular diet and a cheap source of protein for the people of WB. There are about 477 wholesale markets and 3157 retail markets in West Bengal. The prices of wholesale and retail markets

different freshwater fish species are vary from market to market and also place to place. Current market prices of different freshwater fishes increased at the rate of 2-3% compared to year 2017. WB has an advantages with huge and diversified water bodies for aquatic resources which are utilized by the rural people for their livelihood [1]. In WB, fish consumption rate in urban areas are higher than rural areas. In Andhra Pradesh, fish production is equal to consumption of fish and also selling fishes to the neighboring states like Maharashtra, West Bengal and some other north-eastern states where fish consumption is higher than their production [3]. India is the second largest fish producing country in the world and West Bengal ranked second position after Andhra Pradesh [4]. WB has a coastline of 158 km and covers mainly the districts of South and North 24 Parganas and Purba Medinipur .In WB about 78% of total fish is consumed in fresh condition, 6% is used as dry fish and rest is used as frozen fish [11]. Gupta (1984) and Srivastava (1985) had studied the marketing of fish and fishery products in India and they had also analyzed price variations among species across states and had identified infrastructural bottlenecks. Rao (1983) has emphasized that an efficient fish marketing system could eliminate the problems of malnutrition by supplying fish at reasonable prices to people living below the subsistence level. The lack of study thereafter, covering a wide range of species, markets and their structural problems, performances and the policies are relevant for marketing in India [5].

Freshwater Aquaculture: Freshwater aquaculture offers the maximum scope for increasing income. The cultivation of Indian Major Carp (IMC) with scope for multiple stocking and multiple harvesting offers an irresistible opportunity for enhanced production and income generation activities. An analysis of the costs and returns of various species that are being cultured in India especially in WB will help in deciding to take adoption of those that are advantageous to a particular location. Freshwater aquaculture is practiced all over India. The freshwater species consist of Indian Major Carps. This includes Catla, Rohu, Mrigal, Silver Carp, Tangra and Common Carps. The culture of these fishes can be done in all types of freshwater bodies. The carps are selling at the rate of Rs. 110 to Rs. 130/- per kg. Therefore normal income of the carp farmers has exceeds potentially. The cost of production can be reduced by optimizing the input uses efficiently. It is also possible to popularize the cultivation of 'aquaculture farmer producers companies' (Aquaculture FPCs) by formalizing the existing fishing communities such as the entire villagers Organizations could be developed for functioning as an integrated fishing based business ecosystems. Incomes would also be increased if market imperfections are removed.

Review of Literature: Kathiha et al, (1990) in their research work "Marketing Efficiency: A Case Study of Allahabad Fish Market (U.P)" have made a comprehensive study of the operational and pricing strategy in fish marketing. Chidambaran et al., (1990) in their study have analyzed the supply of fishes and the various marketing problems of the fishermen. They have given suggestion that the fishermen should be educated about the benefits they may receive from co operative societies. Marketing is inexplicably wired to operational finance at the field level. The role of the local traders and commission agents should be eliminated or integrated with fishermen, to achieve growth potential and higher share to fishermen in

returns. Long distance marketing of fishes is fraud with a malpractice which should be addressed on priority basis [11].

Data Sources: This case study is mainly used secondary data from government of WB Fisheries department. The wholesale and retail marketing data is used for Kolkata's fish market. State Fisheries Development Corporations, State Apex Fishermen Cooperatives. Different paper published in journals, books reviews and web sources.

Analysis and Interpretations:

Table1. Market Information (2016-17)

Sl. no		Total No. of Whole sale market	Total No. of Wholesalers	Total No. of Retail Market	Total No. of Retailers
1.	All District	477	3718	3157	44347
2.	Kolkata	06	254	145	1450
3.	%	1.26	6.83	4.59	3.27

Source: Government of West Bengal, department of Fisheries, (2016-17)

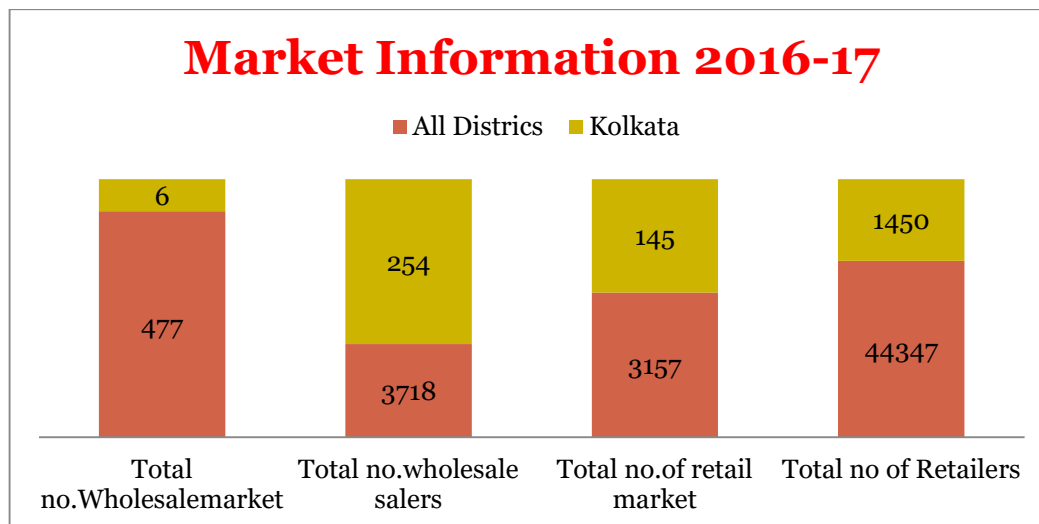


Figure1: compounded from table1.

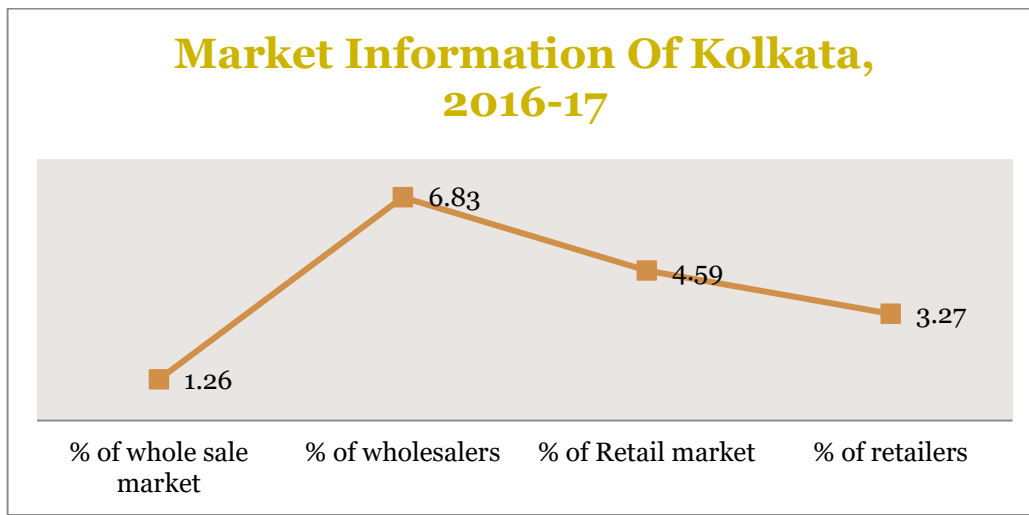


Figure2: compounded from table1.

Table 2: Comparison of prices of food items in WB during three years from 2014 to 2016

Item	2014	2015	2016	% increase w.r.t. 2014 &15	% increase w.r.t. 2015 &16
Fish(1-2.5Kg)	182	186	193	2.19	3.76
Meat(goat)(Rs/Kg)	420	440	480	4.76	9.09
Egg(duck)(Rs/Pair)	12.50	13.00	15	4.00	15.52

Source: Government of West Bengal, department of Fisheries, (2015-16) & (2016-17)

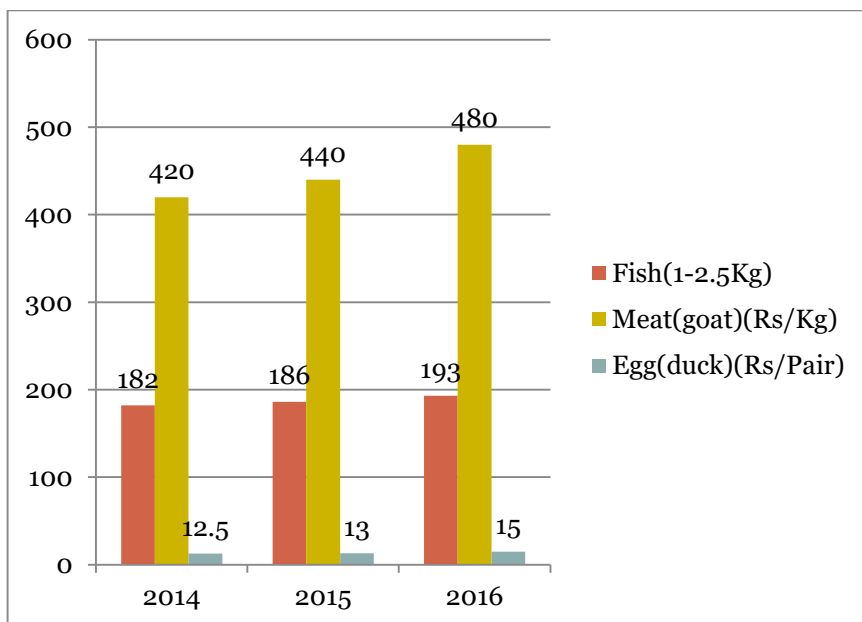


Figure3: compounded from the above table 2.

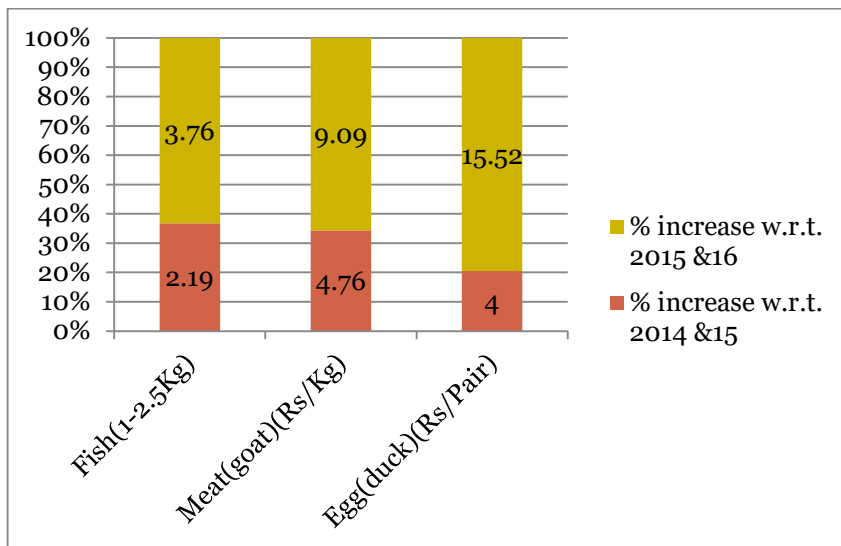


Figure 4: compounded from the above table 2.

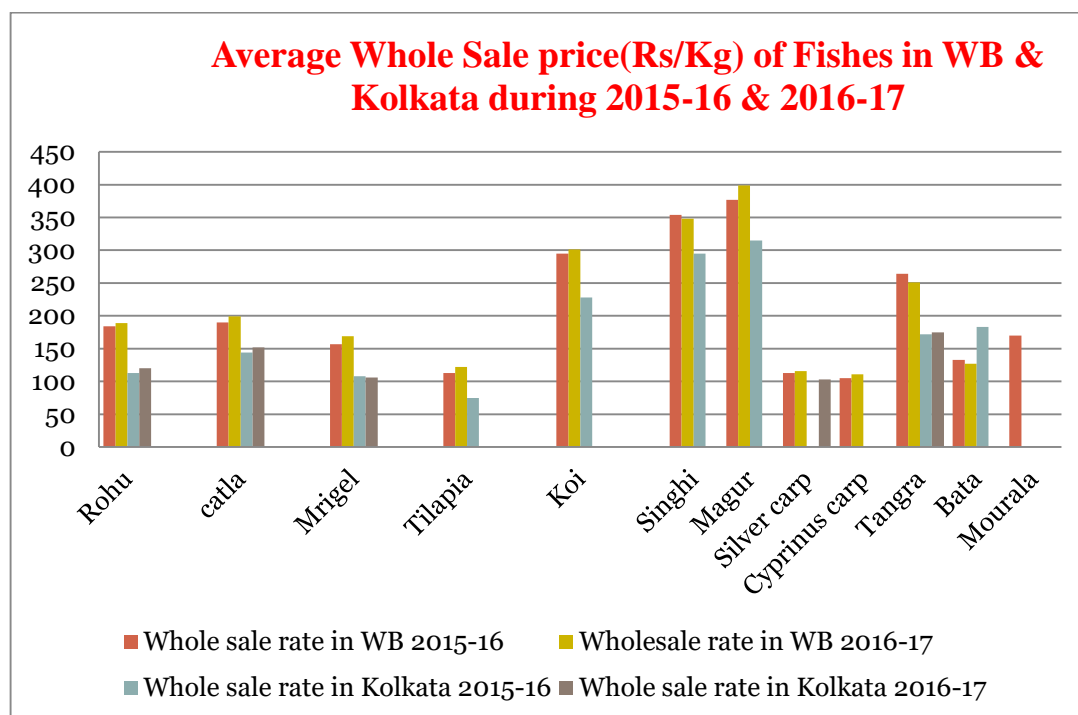
On the domestic front, marketing system of fishes is working on traditional and informal patterns, mostly run by private traders, lacking modern facilities and involving numbers of intermediaries between producers and consumers. All this reduces the efficiency of market and fisherman's income. **Though the local fish markets have a great potential, it is still unorganized and unregulated.** In most of the cases physical facilities and infrastructure in fish markets are far from satisfactory. The key constraint in local fish markets are usually suffer from the perishable nature of the fishes and the time lag to transport the fresh catch from the fish collecting centers to the interior markets Lack of proper handling, results in poor quality of materials, risk of food borne diseases, nutritional and post-harvest loss. Fish is segregated from other food products which tend to disallow shared infrastructure usage. The cultivated fish is not evenly distributed to neighboring areas due to lack of refrigeration and problems of transport facility. Due to various reasons fisheries has been neglected for many years and so serious efforts should be needed for efficient marketing system so as to adjust with its production. Marketing of fishes generally started with the auction system which is highly irregular, unorganized and unregulated in most states of India making it very difficult task for new entry in this market [8].

Table 3: Average Whole Sale (W/S) & Retail(R/T) price (Rs/Kg) of different species of fresh water (12) in Kolkata during 2016-17

Sl. No.	Species of Fishes	Size/weight	Whole sale rate in WB (2014-15)	Wholesale rate in WB (2015-16)	Whole sale rate in Kolkata (2014-15)	Whole sale rate in Kolkata (2015-16)
1.	Rohu	Above 1 kg	184	189	113	120
2.	catla	Above 1 kg	190	199	144	152
3.	Mrigel	Above 1 kg	157	169	108	106
4.	Tilapia	Above 100gms	113	122	75	0

5.	Koi		295	301	228	0
6.	Singhi		354	348	295	0
7.	Magur		377	399	315	0
8.	Silver carp	Above 1 kg	113	116	0.00	103
9.	Cyprinus carp		105	111	0.00	0
10.	Tangra		264	251	172	175
11.	Bata		133	127	183	0
12.	Mourala		170	0	0	0

Source: Government of west Bengal, department of Fisheries (2016-17)

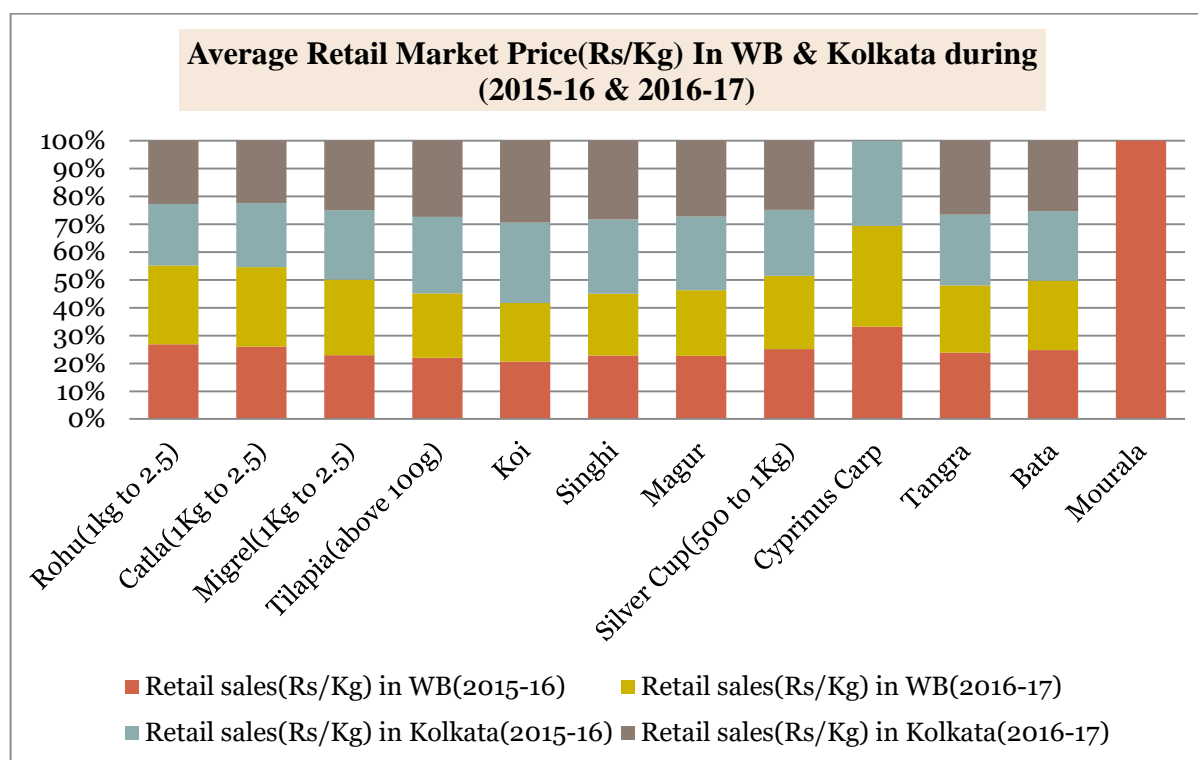


Source: Average Whole Sale (W/S) price (Rs/Kg) of different species of fresh water (12) in WB and Kolkata during 2015-16 & 2016-17

Table 4: Average Retail Market Price (Rs/Kg) of different species of fresh water (12) in WB and Kolkata during 2015-16 & 2016-17

Sl. No.	Species of Fishes	Size/weight	Retail Market Price in WB (2015-16)	Retail Market Price in WB (2016-17)	Retail Market Price in Kolkata (2015-16)	Retail Market Price in Kolkata (2016-17)
1.	Rohu	Above 1 kg	219	230	180	185
2.	catla	Above 1 kg	227	249	201	196
3.	Mrigel	Above 1 kg	169	200	183	184

4.	Tilapia	Above 100gms	144	152	180	179
5.	Koi		377	383	527	538
6.	Singhi		422	413	493	525
7.	Magur		460	477	537	552
8.	Silver carp	Above 1 kg	141	147	133	139
9.	Cyprinus carp		129	141	119	0
10.	Tangra		320	324	341	356
11.	Bata		164	165	165	167
12.	Mourala		230	0	0	0



Source: Government of West Bengal, department of Fisheries, (2015-16) & (2016-17)

Fish and nutritive values:

From the above figure it is found that retail market rate of freshwater fishes in WB is lesser than retail market rate in Kolkata. Mainly the fishes like Koi, singhi, magur and tangra whose retail market rate is more than other important fresh water fishes like rohu, catla and migrel. The number of retailers is 3.27% in Kolkata out of total retailers in WB. Therefore they are facing less competition in this market for selling these 4 kinds of fresh water fishes. Fish can be used to serve as a diet for reducing health problems. For instance, goiter is found in those areas where iodized salt is unavailable but the fishes and fish products which contain natural iodine could help to reduce this problem. Dietary patterns are also changing in developed and middle-income countries and emphasizes on coronary and overall health has led to increases the demand for fishes [15]. Some species of fishes like singhi (*Heteropneustes fossilis*), magur (*Clarias batrachus*), murrels (*Channa sp.*), and koi (*Anabas testudineus*) are known to have therapeutic properties [16]. These species has more nutritious value and good for energy, protein intake and vitamins, easy

digestible for children and pregnant women & old age people. Fish consumption by expectant mother's aids their children's development of nervous system. So this fishes has huge marketing opportunity due consumers demand in Kolkata. Most of the Bengali people are fish lovers and they used fishes for their important social occasions. So the markets are more profitable for wholesalers and retailers. The demands for these fishes are greater than others.

Table5: Nutritional Value of different fresh water fishes in India

Name of Fishes	Energy (Kcals)	Moisture (g)	Protein (g)	Fat (g)	Minerals	Fibre (g)	Carbohydrate (g)	Calcium (mg)	Phosphorus (mg)	Iron (mg)
Rohu	97	77	17	1	1	----	4	650	175	1
Katla	111	74	19	2	1	-----	3	530	235	1
Mrigel	98	75	19	1	1	----	3	350	280	1
Tilapia	-----	-----	-----	---	-----		-----	-----	-----	----
Koi	156	70	15	9	2	--	4	410	390	2
Singhi	124	68	23	1	2	--	7	670	650	2
Magur	86	78	15	1	1	--	4	210	290	1
Silver carp	----	-----	-----	---	-----	---	-----	-----	-----	----
Cyprinus Carp	-----	-----	-----		-----	----	-----	-----	-----	----
Tangra	144	70	19	6	2	---	2	270	176	2
Bata	89	79	14	2	2	---	2	790	200	0
Mourala										

Source: [17]

Socio-economic factors affecting sustainable marketing strategies:

Several socio-economic and institutional factors were identified affecting the livelihood of fish sellers in Kolkata district of WB. Among social factors, recognized area based wholesale & retail fish markets have positive impact on livelihood. Involvement of non-fish sellers in wholesale markets has negative impact because most of them non-fish sellers have more money and power compared to traditional fish sellers. This has led to occupational displacement and threatened livelihood of different districts of WB fish sellers.

The cultural factors like religious festival, marriage ceremony of Kolkata has a significant impact on marketing strategies of wholesalers & retailers. The economic factors like pricing, credit facilities, transport facility, storage facilities are necessary for marketing. The retail outlets are an important link in the local marketing system. It is only the retail marketing chains through which fish is traded to the outlets, to reach the potential consumers. The quality of fish that reaches the retail end is affected by the conditions of the wholesale markets and connecting cold-chain logistics [10].

Challenges or Problems:

The main drawbacks of the retail markets are that the poor distribution quality due to weakness in the wholesale markets to handling, lack of storage and problems in transport. Initial freezing and refrigerated transport to safely connect the fishermen to the local consumer in the system is necessary. Apart from a dynamic cold-chain, provision of other amenities like hygienic retail outlets for merchandising is required.

The marketing strategy is built by the following four (4) criterion:

- ✚ Sustainability of production
- ✚ Monetization of fishermen produce
- ✚ Re-strengthening of marketing services
- ✚ Addressing various structural weaknesses of marketing.

Though India's fish market has demonstrated remarkable progress but it faces many challenges. Originally biological scientists have done lot of work in this field but management services have systemized by an appropriate policy frameworks. Also scientists has mainly focused on new science and technology that will increase the production level into a higher trajectory –that is defined by benchmark productivities & sustainability. However, both production & marketing will merge together hand in hand, unlike in the past when their role was thought to be sequential [14].

Table 6: Impact of socio-economic factors for marketing of fishes in Kolkata

Socio-economic factors		Impact (+ve and ve)
Social	✚ Recognized traditional fish markets	+
	✚ Involvement in non-fish markets	–
	✚ Change in fish markets environment	+
Cultural	❖ Religious importance	+
	❖ Marriage ceremony	+
	❖ Other important social-events	+
	❖ Connection of other districts	–
Economic	➤ Pricing strategies	+
	➤ Differences in wholesale market selling and retail markets	–
	➤ Seasonal demands from consumers	+
Institutional	▪ Formal fish markets	+
	▪ Informal markets	–
	▪ Available Storage facilities	+
	▪ Regional marketing environment	–
	▪ Developing transport facilities	+

Source: Based on different viewpoints of wholesalers and retailers [6]

Conclusion:

Fish is nutritionally significant contains rich in proteins, minerals, fats and vitamins etc. But consumption is still very low at the national level. Fish markets are generating employment and economic benefits to large sections of people in WB [7]. Though the local markets has categorized by complex channels and multiple players. The standard of hygiene and sanitation is needed to be improved. The setting up of the National Fisheries Development Board has given an important opinion for the development of retail markets and the critical areas is to be developed which can be implemented and monitored for building a network of high quality like world class market structure. Increase the awareness of consumer regarding the usefulness of fish as source of nutrition and the changing demands for newer and convenient. Current marketing system will faces new challenges for judicious commercialization and societal needs. The national and international policy regimes vis-à-vis trade, climate change, conservation and environment are changing rapidly and these will have an impact on the fisheries of the country like India. In 2018, Union Budget announced setting up a Fisheries and Aquaculture Infrastructure Development Fund (FAIDF) .The fund is generated for schemes under rural development for promoting women and weaker sections in local fish markets are also undertaken by NFDB. It is expected that will help in developing infrastructure in farms located in remote locations and as well as in enabling market connectivity from fish farms to domestic and international consumers. When loan is not approved for fishermen from formal sources, a dependency is created with local traders, which bounds the fishermen in an unequal relationship. The moneylenders is offered loan without collateral and helps in slack seasons. This will forced the fishermen to sell their produce at low market price. An efficient and effective market structure for fishery is necessary and deserves highest attention [9]. The need for market improvement in various regulation by the cooperative federations so as to make entry easy for new entrants, also to improve the facilities like creating and maintaining infrastructure like launching cold storages at major collection points, improved road access to fish catching centers (ponds, rivers etc.), from the main markets, ice factories, etc. The local fish marketing channels, irrespective of its form, i.e. fresh, dried, processed, etc. is multi-layered and requires collaboration among various agents in the marketing chains [13].

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