Agricultural Economics Research Review
Vol. 21 (Conference Number) 2008 pp 345-354

Domestic Fish Marketing in India – Changing Structure, Conduct, Performance and Policies♣

B. Ganesh Kumar*[a], K.K. Datta[a], P.K. Joshi[a], P.K. Katiha[b], R. Suresh[c], T. Ravisankar[d], K. Ravindranath[e] and Muktha Menon[a]

[a]National Centre for Agricultural Economics and Policy Research, New Delhi - 110 012
[b]Central Inland Fisheries Research Institute, Barrackpore - 700 120, West Bengal
[c]Fisheries College & Research Institute, TANUVAS, Thoothukudi - 628 008, Tamil Nadu
[d]Central Institute for Brackishwater Aquaculture, Chennai - 600 028, Tamil Nadu
[e]College of Fishery Science, SVVU, Muthukur, Nellore - 524 344, Andhra Pradesh

Abstract

This study has been conducted in all the major coastal states and some selected inland states to understand the domestic marketing of fish in India. The total marketing costs of auctioneer, wholesaler, retailer, vendor, marine fishermen cooperative society and contractor/freshwater fishermen cooperative society have been found to be Re 0.98, Rs 8.89, Rs 6.61, Rs 4.50, Rs 6.00 and Rs 3.51, respectively. The marketing efficiencies for Indian major carps (IMC), sardine and seer fish have been found to vary from 34 per cent to 74 per cent, depending on the length of market channel. The marketing efficiency has been found more in the case of marine species than freshwater species, since the latter travel longer distances from the point of production to consumption centre, passing many intermediaries as compared to the former. The fisherman's share in consumer's rupee has shown variations across species, marketing channels and markets. The infrastructure facilities at most of the surveyed landing centres, fishing harbours and wholesale and retail markets have been found grossly inadequate and poorly maintained. The study has highlighted the need for formulating a uniform market policy for fishes for easy operation and regulation so that the country's fish production is efficiently managed and delivered to the consuming population, ensuring at the same time remunerative prices to the fishers.

Introduction

The domestic fish marketing system in India is neither efficient nor modern and is mainly carried out by private traders with a large number of intermediaries between producer and consumer, thereby reducing the fisherman's share in consumer's rupee. Physical facilities and infrastructure in all types of fish markets are far from satisfactory (FAO, 2001). Some of the problems in fish marketing include high perishability and bulkiness of material, high heterogeneity in size and weight among species, high cost of storage and transportation, no guarantee of quality and quantity of commodity, low demand elasticity and high price spread (Ravindranath, 2008).

Gupta (1984) and Srivastava (1985) had studied the marketing of fish and fishery products in India, wherein they had analyzed price variations among

*Author for correspondence, E mail: drgankum@yahoo.com

♣ This paper has drawn inputs from the Interim Report of the research study on 'Exploring market opportunities for fisheries sector in India', sponsored by National Fisheries Development Board, Government of India, Hyderabad species across states and had identified infrastructural bottlenecks in efficient marketing system. Rao (1983) had emphasized that an efficient fish marketing system could eliminate some of the depressed pockets of malnutrition by supplying fish at reasonable prices to people living on subsistence level. There has not been a comprehensive study thereafter, covering a wider range of species, markets and their structure, conduct, performance and the status of policies relevant to fish marketing in the country. Some studies that have been conducted are concentrated on local markets with respect to one or two species. It is difficult to generalize the regional results since fish is a highly heterogeneous commodity with tremendous spatial and seasonal variations in size, quantity, quality and price.

This study was designed to have a snap-shot of the prevailing domestic fish marketing scenario of India. The role of market intermediaries, major marketing channels, structure of fish markets, viz. fish landing centres, wholesale / retail fish markets and fish retail outlets, and current policies relevant to fish marketing in India have been analyzed. The price spread for selected fish species and marketing efficiencies of different marketing channels have been estimated. Recommendations to improve domestic fish marketing in India have been provided and policy implications have been discussed.

Data and Methodology

The study has used both primary and secondary data collected under the project sponsored by National Fisheries Development Board on domestic marketing of fish in India. Structured interview schedules were used to collect information from the major fish landing centres, wholesale and retail fish markets through key informant surveys and focused group discussion with officials and members of trader associations/cooperative societies. Thirty fishermen / fish producers and 5 randomly sampled market intermediaries were interviewed from each category. The secondary information was collected from officials of Commissionerates / Directorates of Fisheries, State Fisheries Development Corporations, State Apex Fishermen Cooperatives, etc. through discussions. The survey was conducted in all the major coastal states, namely Tamil Nadu, Kerala, Andhra Pradesh, Karnataka, Maharashtra, Orissa, Gujarat, West Bengal and one of the major consuming states, viz. Delhi.

Information was collected on prices, marketing costs and marketing margins to estimate price spread for the selected fish species using average and percentage analyses. Fisherman's share in consumer's rupee was obtained from the price spread analysis. Marketing efficiency was calculated as the ratio of consumer's price to total marketing cost and margins (Shepherd, 1972). The higher the ratio, the higher is the marketing efficiency and vice-versa (Elenchezhian and Kombairaju, 2004).

Results and Discussion

Market Intermediaries

Fish passes through several intermediaries from the landing centre or fish pond to the consumer. The intermediaries are involved in providing services of headloading, processing, preservation, packing and transporting and these activities result in cost-addition at every stage of marketing (Bishnoi, 2005). The key intermediaries in fish marketing are: auctioneer, wholesaler, retailer and the vendor. Several other intermediaries like local fish collectors and fishermen cooperatives also exist in several markets. The biggest challenge in documenting intermediaries in fish marketing is their multi-functional performances. There is no strict boundary between intermediaries and they perform several functions while marketing fish.

Auctioneer: The auctioneer is the first intermediary in marine fish marketing channel in India. The fisherman brings his catch to auctioneer, who auctions the fish to various traders at the landing centre. The auctioneer sometimes advances money to the fisherman and in turn gets the right to auction his fish. Auctioneers charge 5-10 per cent of sales value as their commission from the fishermen. There is a virtual barrier to the entry into this profession, which is mainly inherited by the local fishermen community or associations across all the coastal states in the country.

In freshwater fish marketing, the auctioneers employ or source fish through a commission agent.

The commission agent purchases fish from landing sites (river banks, culture ponds, etc.) and sends the fish for sale to the auctioneer. The agent charges 5 - 10 per cent of the sale value as his commission from the fisherman.

Wholesaler: The wholesalers buy fish in bulk from auctioneers and sell it to retailers or other traders. Some value addition is carried out by the wholesalers in terms of sorting, grading, cleaning, icing and packing fish before sale. Exact information on the marketing margin of wholesalers is not available but it has been found that cost structure of wholesalers in India is profit-intensive (Gupta, 1984). They usually know the demand of species outside markets and are aware of average trend of daily fish catches at the landing centres (Bishnoi, 2005). In the case of farmed fish, a wholesaler acts as a commission agent to whom the fisherman sells his produce. The wholesaler assumes the risk of selling the fish and therefore keeps a higher margin as compared to auctioneers. Ice and transportation form the largest share of the wholesaler's costs.

Retailer: The retailers sell the fish directly to consumers. They have the assessment of local demand and limitations of their purchasing power. Maximum value addition to fish happens with the retailers. The retailers grade, clean, ice, pack, display and dress fish for the consumers. Retailers mainly buy fish from the wholesaler, but in several cases, groups of retailers have been found participating in the auction process for buying fish directly from the auctioneer. Retailers keep a marketing margin of about 20 per cent, though the figure shows a lot of variation across the country. Labour forms the largest share of the retailer's costs.

Vendor: Vendors being mobile, sell fish directly at the consumer's doorstep. Most fish vendors in India are women. Vendors also carry out value addition by sorting, grading, cleaning and icing fish. They participate in auction directly in some of the states. They are forced to sell all the produce on a given day, as they don't have the capacity to hold or preserve the fish. The major costs to vendors are on ice and transportation.

Marine Fishermen Cooperatives: Fishermen cooperatives are also involved in fish marketing. Gupta (1984) had found that not only the share of co-operative societies in marine fish marketing was small, most of them were also in losses. Poor management, lack of marketing strategy and well-defined lending policy, and absence of vertical integrations of different activities were found to be the reasons for losses in the co-operative sector. An exception was also found; the Kerala State Co-operative Federation for Fisheries Development Ltd. (Matsyafed) regulates auctions at fish landing centres through primary fishermen cooperative societies. The member-fishermen sell their catch to potential buyers only through the auctioneer, employed by the society. This ensures a better price and immediate payment to the fisherman from the society. Presently, Matsyafed-regulated auctioning is prevalent only in the non-mechanized sector in Kerala.

Contractor/ Freshwater Fishermen Co-operatives: In the case of freshwater capture fisheries, there is another intermediary, who may be either a private contractor or fishermen co-operative. In this system, fishers dispose catch through co-operative/contractor. If the fishing rights of a water body are with a private/public body, i.e. contractor/ co-operative, fishers are paid for fishing and their remuneration depends on the bargaining power of the fisher/contractor.

The detailed break-up of costs incurred by all these market intermediaries has been depicted in Table 1. A perusal of Table 1 reveals that the total marketing cost is maximum for wholesalers (Rs 8.89/ kg), followed by retailer (Rs 6.61/kg), marine fishermen co-operative (Rs 6.00/kg) and vendor (Rs 4.50/kg). The cost for wholesaler is high due to icing and keeping the fish for maximum time in the supply chain.

Price Spread

The price spread of major freshwater and marine fish species, viz. Indian major carps (IMC), sardine (low value) and seer fish (high value), respectively were calculated for different markets and for different marketing channels. The results are discussed below.

Price Spread for IMC at Howrah, West Bengal

Price spread for Indian major carps was studied for three prevalent marketing channels (Table 2) in

Table 1. Marketing costs of the intermediaries in the supply chain of fish

(Rs/kg of fish)

Activity / Function	Market intermediaries					
	Auctioneer	Wholesaler	Retailer	Vendor	Marine fishermen cooperatives	Contractor/ freshwater fishermen co-operatives
Labour	0.63 (63.90)	2.35 (26.47)	2.15 (32.58)	-	-	0.50 (14.23)
Salary	0.18 (18.72)	-	-	-	-	-
Ice	0.08 (8.18)	2.63 (29.52)	1.88 (28.36)	1.5 (33.33)	-	-
Telephone	0.05 (5.51)	0.23 (2.53)	-	-	-	-
Electricity	0.04 (3.69)	0.02 (0.24)	0.07 (1.03)	-	-	-
Transportation	-	1.95 (21.93)	0.97 (14.65)	2 (44.44)	-	-
Packing	-	1.25 (14.06)	1.06 (16.07)	1 (22.22)	-	-
Loading / Unloading	-	0.45 (5.06)	0.44 (6.62)	-	-	-
Rent for shop	-	0.02 (0.17)	0.05 (0.70)	-	-	-
Auctioneer's commission	-	-	-	-	1.25 (20.83)	2.10 (59.77)
Fees	-	-	-	-	0.75 (12.50)	-
Share of Matsyafed	-	-	-	-	1.5 (25.00)	-
Primary cooperative society	-	-	-	-	1.5 (25.00)	-
Bonus to fisherman	-	-	-	-	1 (16.67)	-
Fisher's wage	-	-	-	-	-	0.40 (11.38)
Depreciation costs of net & craft	-	-	-	-	-	0.02 (0.38)
Other items	-	-	-	-	-	0.50 (14.23)
Total	0.98 (100.00)	8.89 (100.00)	6.61 (100.00)	4.50 (100.00)	6.00 (100.00)	3.51 (100.00)

Note: Figures within the parantheses are percentages to total

Source: Primary Survey, 2008

The information pertaining to marine fishermen cooperative society and freshwater fishermen cooperative society belongs to Matsyafed of Kerala and West Bengal, respectively.

Table 2. Prevalent fish marketing channels at Howrah fish market

Channel Number	Marketing channel
Channel I	Fishermen → Fish collector/local dealer → Auctioneer → Wholesaler → Retailer → Consumer
Channel II	Fishermen → Auctioneer → Retailer → Consumer
Channel III	Fishermen → Wholesaler → Retailer → Consumer

Table 3. Price spread for IMC at Howrah

(Rs/kg)

Particulars	Channel I	Channel II	Channel III
Prices received by fishermen	30.21	51.24	55.85
	(34.48)	(58.50)	(63.76)
Cost incurred by the local auctioneer	0.05	7.31	-
	(0.06)	(8.35)	
Margin	2.93	12.44	-
	(3.34)	(14.20)	
Price paid by the fish collector/local dealer	33.18	-	-
	(37.88)		
Cost incurred	7.31	-	-
	(8.35)		
Margin	12.44	-	-
	(14.20)		
Price paid by auctioneer	52.93	70.99	-
	(60.43)	(81.04)	
Cost incurred	0.98	0.85	-
	(1.12)	(0.97)	
Margin	1.94	1.94	-
	(2.21)	(2.21)	
Auctioned price	55.85	73.78	-
	(63.76)	(84.23)	
Cost incurred by the wholesaler	8.89	-	8.89
	(10.15)		(10.15)
Margin	9.04	-	9.04
	(10.32)		(10.32)
Wholesaler's price	73.78	-	73.78
	(84.23)		(84.23)
Cost incurred by the retailer	6.61	6.61	6.61
	(7.55)	(7.55)	(7.55)
Margin	7.21	7.21	7.21
	(8.23)	(8.23)	(8.23)
Retailer's price/ Price paid by consumer	87.60	87.60	87.60
	(100.00)	(100.00)	(100.00)
Marketing efficiency	34.49	58.49	63.76

Note: Figures within the parantheses are percentages to total

the Howrah fish market and is given in Table 3. Fisherman's share in consumer rupee was highest for Channel III at 63.76 per cent. The marketing efficiency was highest for the shortest marketing channel, i.e. Channel III.

Price Spread for Marine Fish at Tuticorin, Tamil Nadu

The price spread for marine fish, sardines and seer, at Tuticorin fish market was studied for prevalent marketing channels (Table 4) and the

Table 4. Prevalent marketing channels at Tuticorin fish market

Fish species	Channel Number	Marketing Channel
Sardine	Channel I	Fishermen → Retailer → Consumer
	Channel II	Fishermen → Vendor → Consumer
Seer fish	Channel I	Fishermen → Wholesaler → Consumer
	Channel II	Fishermen → Retailer → Consumer

Table 5. Price spread of sardine and seer fish across different marketing channels at Tuticorin, Tamil Nadu

(Rs/kg)

Particulars	Sardine		Seer fish	
	Channel I	Channel II	Channel I	Channel II
Price received by fishermen	17.84 (71.36)	17.84 (68.62)	103.71 (74.08)	103.71 (71.52)
Auctioneer's fee	1.19 (4.76)	1.19 (4.58)	6.91 (4.94)	6.91 (4.77)
Price paid by wholesaler	-	-	110.62	-
Costs incurred by wholesaler	-	-	6.99 (4.99)	-
Margin	-	-	22.39 (15.99)	-
Price paid by retailers	-	-	-	110.62
Costs incurred by retailer	1.70 (6.80)	-	-	5.59 (3.86)
Margin	4.27 (17.08)	-	-	28.79 (19.85)
Price paid by vendor	-	19.03	-	
Costs incurred by vendor	-	0.97 (3.73)	-	-
Margin	-	6.00 (23.07)	-	-
Price paid by consumer	25.00 (100)	26.00 (100)	140.00 (100)	145.00 (100)
Marketing efficiency	71.36	68.62	74.08	71.52

Note: Figures within the parantheses are percentages to total

results have been displayed in Table 5. It was found that the actual price paid by fishermen and the auctioneer's commission did not vary between the channels. The variation in fisherman's share of consumer's rupee resulted due to the presence of intermediaries and their marketing functions. Similarly, consumer's price was also affected by the type of intermediaries.

Sardine being a low-value species, value-addition was not usually carried out. Hence, the marketing costs and margins of various intermediaries were also low.

The marketing efficiency of the marketing channels of sardine and seer fish were estimated using Shepherd's index (1972). For sardines, the marketing efficiency was higher in channel I (71.36) than channel II (68.62). It was due to higher margin charged by the vendor in channel II than the retailers in channel I. The marketing efficiency for seer fish was higher in channel I (74.08) than channel II (71.52). It was due to the higher margin charged by retailer in channel II than the wholesalers in channel I.

Fisherman's share in consumer's rupee showed variations across different species, marketing channels and markets. As reported by Gupta (1984), this study also found that fishermen's share was lower for low-value fish (sardines) and high for high-value fish (seer). In addition, fisherman's share was lower for longer channels and vice-versa. Fishermen's share was found highest (96%) when fish was sold directly to consumers and lowest (34.48%) when the intermediaries were involved. These are comparable with earlier results wherein fishermen's share was reported highest (95%) in direct sales to consumers and lowest (27.9%) in sales involving multi-locational distribution system (Gupta, 1984). The results highlight wide variations in fishermen's share and fish marketing scenario as a whole in the country.

Market Infrastructure

Landing Centres: There are about 1068 landing centres in India of which about 100 are major landing centres that handle India's marine landings of 3 lakh tonnes (Srinath *et al*., 2006). Major landing centres in the coastal states of India surveyed in this study were: Veraval, Mumbai, Mangalore, Cochin and Chennai. The particulars of the Cochin fish harbour and landing centre are given in Table 6.

Wholesale Markets: The wholesale fish markets were surveyed in the states of Tamil Nadu, Andhra Pradesh, Karnataka, Kerala, Orissa, Maharashtra, Gujarat, Punjab, and West Bengal. Fish handled by wholesale markets in India range from 1 tonne to 100 tonnes. Most wholesale markets were very old, unhygienic, without proper facilities for handling fish and with limited or no facilities for cold/chilled storage and ice plants. The leftover fish was packed in plastic or thermocol containers with ice and re-sold the next day. There was no quality monitoring by government or municipality / corporation authorities at any market in the country. The poor fish handling at the wholesale markets results in poor quality of fish with low keeping quality. The details of the Musheerabad fish market of Hyderabad are given in Table 7 as a sample wholesale fish market.

Retail Markets: Retail fish markets are miniatures of wholesale markets in our country; the variations being in size of the markets in terms of quantity of fish, number of traders, facilities, proximity to the consumers, etc. Several retail markets were surveyed in the study. Retail markets also presented a dismal picture. Most retailers were found selling fish by the roadside without maintenance of quality or hygiene and without access to drinking water, shelter and fish dressing platforms. Retail markets were found crowded in all the locations surveyed with excess number of traders selling fish even in the passages, leading to inconvenience and hygiene problems. The details of the Saidapet fish retail market at Chennai

Table 6. Particulars of the Cochin fish harbor and landing centre

Particulars	Details
Location	Cochin, Kerala
Area	28 acres
Operational details	
Number of fishing boats	330
Main fishing gears used	Trawl net, Gill net, Long lines and Purse seine nets
Average quantity of fish landed daily	300 tonnes
Main fish species landed	Sardines, Mackerels, Shrimps, Cuttle fish
Infrastructural facilities	
Wharf area	5 acres
Ice plants (privately owned)	12 (total capacity of 200 tonnes)
Cold storages (privately owned)	7 (total capacity of 700 tonnes)
Freezing plants (privately owned)	3
Fuel outlets	3
Other facilities	Marine engine workshops, net repair sheds, police station, rest sheds for crew members, restaurants

Table 7. Particulars of Musheerabad wholesale fish market, Hyderabad

Particulars	Details
Location	Hyderabad
Coverage	Regional (Kerala, Karnataka, Andhra Pradesh, Maharashtra)
Year of establishment	More than 80 years old
Time span	Short period market
Volume of transaction	Wholesale (mainly)
Nature of transaction	Cash (mainly)
No. of commodities	All marine and freshwater fish
Scale of operation	80 tonnes (weekends), 35 tonnes (weekdays)
Main species handled	Indian major carps, murrels, exotic carps, marine fish, shrimps
Stage of marketing	Consuming market
Extent of public intervention	Regulated market
No. of fish sellers	Wholesalers – 97; Retailers - 30
Mechanism of market information	Price discovery based on demand
Weighing process	Physical balance (wholesalers), electronic balance (retailers)
Cold storage facilities	None
Maintenance of sanitation	None
Quality checking	None
Facilities for women	None

are shown in Table 8 to provide a glimpse of a retail fish market in our country.

Fish Retail Outlets: Retail outlets are fish shops operated by both government bodies and private individuals at consumer-friendly locations of cities. The retail outlets were found comparatively cleaner and more hygienic than the retail markets. In recent years, fish retailing has been started by several large, organized private retailers, including the Reliance group, Spencer's, etc. Most of these retailers source their fish supply either from the wholesale markets or through agents at the landing centres. Private retailers provide a large variety of fish with value-added services throughout the year.

The state governments of Tamil Nadu, Kerala and Karnataka have also entered into the fish retailing industry. In Tamil Nadu, the Tamil Nadu Fish Development Corporation Ltd. (TNFDC) operates fish retail outlets under the name of "Neidhal". In Kerala, Matsyafed has started a fish retailing outlet under the name of "Fresh Fish Point". These retail outlets purchase fish directly from fishermen/fishermen cooperative societies and sell to customers at reasonable prices under modern,

Table 8. Particulars of Saidapet fish retail market, Chennai

Particulars	Details
Location	Saidapet, Chennai
Coverage	Regional
Year of establishment	1900
Volume of transaction	Retail
Nature of transaction	Cash (mainly)
No. of commodities	All marine and freshwater fish
Scale of operation	1-3 tonnes per day
Main species handled	Sardine, prawns, seer fish, pomfrets, catla
Stage of marketing	Consuming market
Extent of public intervention	Regulated
No. of fish sellers	120 retailers
Mechanism of market information	Price discovery based on demand
Weighing process	Electronic weighing machine
Cold storage facilities	None
Maintenance of sanitation	None
Quality checking	None
Facilities for women	None

Table 9. Structure and conduct of government, private and traditional fish retail outlets

Particulars	Neidhal (TNFDC outlet)	Reliance (Private outlet)	Traditional retail outlets
No. of outlets	2	45	150
Operating hours	10 hours	12 hours	8 hours
Fish varieties	8-12	15-150	4-5
Price	Close to wholesale price	Fixed by company	20-25% more than wholesale price
Other services	Cleaning and dressing	Cleaning and dressing	Not available/available on extra payment
Availability of substitutes	No	Yes	No
Hygiene	Good	Good	Poor

hygienic conditions. These retail outlets aim to replace/remove the middlemen involved in fish marketing, thereby ensuring higher returns to fishermen and hygienic fishes to consumers at affordable prices. Presently, these outlets source their fish from the local wholesale market, but efforts were being made to purchase fish directly from the producer. A comparison of government, private and traditional fish retail outlets has been presented in Table 9 for a deeper understanding of their structure and conduct in fish retailing.

Policies for Fish Marketing

Fishery is a state subject under the Constitution of India but only a few states have a policy specifically aimed at fish marketing. The only legislation for fish marketing is the West Bengal Fish Dealer's Licensing Order, 1975. The Act has a variety of legal procedures to control the process of supply of fish to other states from West Bengal. It was constituted as a welfare measure for the people of the state, with amendments from time to time till 1997. Every fish merchant has to get a license to conduct business by paying an annual fee. All the fish commission agents and wholesaler-cum-retailers are to be registered with the Directorate of Fisheries under this Order.

All state fisheries departments, state fish development corporations and apex fishermen cooperative societies have schemes to help fishermen to market their catch efficiently. The schemes include provision of vehicles for transporting fish from landing centres to markets, fish kiosks and marketing implements like insulated boxes, utensils, dressing knives, etc. Several organizations have been set up at the national level to promote the fisheries sector and help the fishermen. These include organizations such as the National Cooperative Development Corporation (NCDC), the National Federation of Fishermen's Cooperatives Ltd. (FISHCOPFED) and the National Fisheries Development Board (NFDB). NCDC's fisheries related activities include creation of infrastructural facilities for fish marketing, ice plants, cold storages, retail outlets, etc. FISHCOPFED promotes fishery cooperatives and assists fishermen to market their produce efficiently through hygienic retail fish centres in metropolitan cities thereby providing remunerative prices to fish farmers. NFDB is promoting domestic fish marketing through modernization of wholesale markets, establishment of cold chains, popularization of hygienic retail outlets and technology upgradation.

Fish is not a notified commodity under the APMC Act of 1966, leading to the exploitation of fishermen by commission agents. Unlike in other agricultural commodities, where commission charges are paid by the traders, in fisheries, all commission charges are paid by fishermen. This reduces the share of fishermen in consumer's rupee and makes fishing a non-viable venture. Suitable modifications need to be introduced in the Act to overcome this situation.

Conclusions

Though domestic fish marketing holds a huge potential, it is still highly unorganized and unregulated in India. It has long been neglected for various reasons and serious efforts have not been made on marketing of fishes as compared to its production. The improvement in fish marketing system and distribution would not only reduce the demand-supply gap of fishes across country, but would also contribute to food and nutritional security of a vast majority of resurgent middle income population.

Fish marketing starts with the auction system which is highly unorganized and unregulated in most states of India. There is a strict barrier for entry of any new professional into it. There is a need of regulation at this stage by the cooperative federations, as in Kerala, to ensure that fishermen get better price in the auctioning process. The transportation and storage of fishes need to be facilitated by creating and maintaining the needed infrastructures such as approach roads to landing centres / fishing villages / pond-river-reservoir sites from the main markets, establishing cold storages at major collection points, ice factories, etc. It is evident from the study that the lack of price information among the fishermen is the major reason for realizing lower share in consumer rupee, apart from the presence of several middlemen in the supply chain. Hence, efforts must be made to convey the prices prevailing at the nearby fish markets for various species daily through appropriate media. The hygienic conditions of fish markets should be improved tremendously not only to attract consumers to the markets but also to instill confidence among buyers to consume fish, which is regarded as a healthy food among animal products.

Modern retail outlets have to be promoted vigorously through public-private partnership in every major city so that fish consumption becomes an easier proposition in days to come. Though there are a number of organizations and policies related to promotion of fish marketing in the country, there is a need to formulate a uniform market policy for fishes so that it becomes easier in operation and regulation. It will not only handle country's fish production but will deliver it also to the consuming population, ensuring at the same time remunerative prices to the fishers.

Acknowledgements

The authors would like to acknowledge the National Fisheries Development Board for funding the study.

References

Ayyappan, S. and Krishnan (2004) Fisheries sector in India: Dimensions of development. *Indian Journal of Agricultural Economics,* **59**(3): 392-412.

Bishnoi, Tanuj Kumar (2005) *Marketing of Marine Fisheries*, Sonali Publication, New Delhi, pp. 74-76.

Elenchezhian, T. and Kombairaju, S. (2004) Marketing efficiency of major vegetable in central vegetable market of Madurai. *Madras Agriculture Journal,* **91**(1-3): 27-31.

FAO (2001) *Production, Accessibility, Marketing and Consumption Patterns of Freshwater Aquaculture Products in Asia: A Cross-Country Comparison* (available online).

GOI (2006) *Annual Report 2005-2006*, Department of Animal Husbandry, Dairying and Fisheries, Government of India, New Delhi.

Gupta, V.K. (1984) *Marine Fish Marketing in India* (Volume I – Summary and Conclusions). IIM Ahmedabad & Concept Publishing Company, New Delhi.

MPEDA (Marine Products Export Development Authority) website www.mpeda.com

Rao, P.S. (1983) *Fishery Economics and Management in India*. Pioneer Publishers and Distributors, Mumbai, pp. 197-217.

Ravindranath, K. (2008) In *National Workshop on Development of Strategies for Domestic Marketing of Fish and Fishery Products*, College of Fisheries Science, Nellore, India, pp. 43-48.

Sathiadas, R. and Narayana Kumar, R. (1994) Price policy and fish marketing system in India. *Biology Education,* **11**(4): 225-241.

Shepherd Geoffrey, S. (1972) *Marketing of Farm Products.* Iowa State University Press, Ames, Iowa, USA, pp. 246-247.

Srinath, M., Kuriakose, P.L., Ammini, C.J., Prasad, K. Ramani and Beena, M. K. (2006) *Marine Fish Landings in India 1985-2004: Estimates and Trends*. Central Marine Fisheries Research Institute Spl. Publ. No.89, 161 p.

Srivastava, Uma Kant (1985) *Inland Fish Marketing in India* (Volume I – Overview: Summary and Conclusions), IIM Ahmedabad & Concept Publishing Company, New Delhi.