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Marketing System and Efficiency of Indian Major Carps in India[§]

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Abstract

The Kolleru Lake area (KLA) in Andhra Pradesh being a predominant centre for carp culture is known as the 'Carp Pocket of India'. This paper has described the highly efficient fish marketing system prevalent in the KLA and has compared it with the marketing of Indian Major Carps (IMC) in other major aquaculture states like West Bengal and Orissa and marine states like Maharashtra and Tamil Nadu. The marketing channels, market intermediaries, price spread and marketing efficiency have been presented. A comparison of the marketing channels at several fish markets has revealed that the price spread for IMC from Kolleru is highest at the Mumbai market and lowest at the Coimbatore market. Consequently, fishermen's share in consumer price has been found highest for Coimbatore at 61.54 per cent and lowest for Mumbai at 47.06 per cent. Similarly, the marketing efficiency was the highest for Coimbatore at 2.60 and lowest for Mumbai at 1.89. Retail price for KLA carps has been found lower than locally cultured carps at various areas, reflecting the efficiency of the marketing channel in providing cheap fish transported over large distances and through a large number of intermediaries. The reasons for the efficient IMC marketing system at KLA have been discussed and the study has recommended the development of efficient fish marketing system in other parts of the country.

Introduction

India is the third largest producer of fish and second largest producer of freshwater fish in the world (FAO, 2006). Since the beginning of this decade, inland fish production in India has exceeded the marine fish landings. The country recorded inland fish production of 3.53 million tonnes (Mt) and marine fish production of 2.78 Mt in 2004-2005. The inland fisheries sub-sector of the country has grown at the rate of 6.55 per cent during the past decade (1990-2000) and contributes 1.19 per cent to the Gross Domestic Product of the country (ICAR, 2006). Hence, the fisheries sector has to address the issues of demand factors than of supply factors to sustain its growth in future. Of the 3.53 Mt of inland fish produced in India, aquaculture contributed 2.2 Mt. Aquaculture in India is synonymous to carp culture since the latter alone contributes more than 80 per cent to the total aquaculture production in the country. The indigenous Indian Major Carps (IMC), namely *Catla catla*, *Labeo rohita* and *Cirrhinus mrigala* form the predominant group among carps cultured in the country. The current policies of the government also favour enhancement of fish production to about 10 Mt by the end of XI Five-Year Plan through targeted fish production environments. With likely increase in contribution from inland fisheries sub-sector, especially culture fisheries, the necessity of developing an efficient domestic marketing system assumes great importance, since the producers are concentrated in a particular location while the consumers are spread country-wide. Meanwhile, several studies (Ayyappan *et al.*, 2009; Ganesh Kumar *et al.*, 2008a) have pointed out that market would be one of the crucial driving

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forces to sustain the fish production in future, along with technology and infrastructure.

Compared to the achievements in fish production, the fish marketing system is very poor and highly inefficient in India (Ganesh Kumar *et al*., 2008b). Unlike conventional marketing systems of agricultural products, fish marketing is characterized by heterogeneous nature of the product regarding species, size, weight, taste, keeping quality and price. Certain other problems in fish marketing include high perishability and bulkiness of material, high cost of storage and transportation, no guarantee of quality and quantity of commodity, low demand elasticity and high price spread (Ravindranath, 2008). Fish marketing in India has received little attention from public agencies and is mainly handled by the private sector. As a result, there are a large number of intermediaries in the marketing channels, especially in the freshwater fish sub-sector; thus reducing the share of fishermen / aquaculturists in consumer rupee, and contributing to the high retail prices. There is a clear difference between marketing of marine and freshwater fish in the country; the former is marketed mostly in the nearby/local markets while the latter is transported from various production systems to spatially located markets spread across states. Hence, there are many challenges in developing an efficient domestic fish marketing system in India.

An exception to the general fish marketing scenario in the country is the cultured carp marketing system of Kolleru Lake area (KLA) in the state of Andhra Pradesh. The KLA being a predominant centre for carp culture, is known as the 'Carp Pocket of India'. Carps cultured in KLA are primarily destined for the Howrah Wholesale Fish Market (biggest freshwater fish market in India) in the state of West Bengal. The fish are also sent to other states including Orissa, Bihar and North-Eastern states and even to New Delhi. The success of the KLA carp culture industry and economic development of the fish farmers in the area are attributed to the highly efficient fish marketing system prevalent in the area. This paper has described the KLA fish marketing industry and has compared the marketing of IMCs in the other major aquaculture states such as West Bengal and Orissa and marine states such as Maharashtra and Tamil Nadu in terms of structure, conduct and performance of the market. The marketing channels, market intermediaries, price spread and marketing efficiency have been studied and presented in this paper. With tremendous scope for improvement in domestic fish marketing in India, the KLA carp marketing system can serve as a model for other areas in the country.

Data and Methodology

The data were collected from the primary surveys and secondary data sources as part of a national study sponsored by the National Fisheries Development Board, Government of India, on domestic marketing of fish in India during 2008. Structured interview schedules were used to collect information from the production areas and major wholesale/retail fish markets through surveys and discussions with the major stakeholders comprising producer/farmer, traders, brokers/ middlemen, retailers, vendors and officials of trader associations/cooperative societies. Thirty fish producers and 5 members randomly sampled from different market intermediary groups were interviewed from each study location. The secondary information was collected through discussions with officials of Commissionerates / Directorates of Fisheries, State Fisheries Development Corporations, and State Apex Fishermen Cooperatives. The survey was conducted in IMC production areas of KLA (Andhra Pradesh) and fish markets of Bhubaneswar (Orissa), Howrah (West Bengal), Mumbai (Maharashtra), Coimbatore (Tamil Nadu) and Hyderabad (Andhra Pradesh). Information on fish prices, quantities traded, marketing functions, marketing costs and marketing margins were collected and price spread was estimated using average and percentage analyses. The share of fishermen/ producers in the final consumer price was obtained from the fish price spread. Marketing efficiency was estimated as the ratio of consumer's price to total marketing costs and margins (Shepherd, 1972).

Results and Discussion

A. Market Intermediaries at KLA

(i) Producer/Farmer

There were approximately 1000 fish farmers in the KLA. The producers negotiate fish price based on the cost of production (feed, lease, harvesting, chemicals, etc.) and the prevailing prices at Howrah fish market, keeping at least Rs 2 -5 per kg as profit.

Table 1. Cost of production of IMC in Kolleru Lake area

Item	Cost (Rs/kg)
Pond lease	7.50
Feed	21.00
Harvest	0.20
Gear	0.16
Seed	2.00
Feed bags & poles	0.50
Watch & ward	0.16
Electricity	0.20
Chemicals & fertilizers	1.50
Sanitizers	1.00
Agent's commission	0.10
Total cost	34.32

Source: Primary Survey, 2008

The cost of production for Catla and Rohu was found to be Rs 34.32 / kg (Table 1). The farm gate price received by farmers for IMC at Kolleru varied from Rs 40/ kg to Rs 42 / kg, depending on the size of fish.

(ii) Broker/Middleman

A broker extends services to a cluster of villages. In Kolleru area, there were nearly 120 brokers and about 85-90 per cent of the fish farmers sell the fish at the farm gate / pond site to the trader/exporter through brokers. The broker was answerable to both traders and farmers; to traders for the expected quality of fish and to the farmers for the total cash payment for the quantity of fish sold. For this service, the broker received a commission of Rs 500 per vehicle of fish from the trader and Rs 100 / tonne of fish from the farmer. A trader could entertain at a time any number of brokers for arranging fish according to the size of his business. In the same way, a broker could also do business with more than one trader.

(iii) Trader/Transporter

There were nearly 60 traders operating at KLA. These traders buy fish from farmers through the services of brokers. A trader arranges and pays for the crushed ice, plastic crates and fish weighing well in advance, so that the fish is packed in ice without any time lag after harvest. The traders also bear the cost of transporting fish to distant markets. The marketing costs of traders to transport fish to Howrah market, Bhubaneshwar market and Guwahati market are illustrated in Table 2.

B. IMC Marketing System of KLA

The marketing system of IMC at KLA is described below and is illustrated in Figure 1.

Table 2. Cost of transportation of fish from Kolleru Lake Area to Bhubaneshwar, Howrah and Guwahati markets

(Rs/kg)

Item	Markets		
	Bhubaneshwar	Howrah	Guwahati
Broker's commission	-	0.50	0.50
Thermocol box	-	1.91	2.63
Market cess	-	0.21	0.21
Ice	2.5	2.00	2.00
Packing & grading	1.00	0.30	0.30
Transportation	2.00	5.35	7.35
Insulation materials & implements	-	0.40	0.40
Incidental charges	-	0.12	0.22
Howrah agent's commission	-	0.12	-
Miscellaneous	0.50	0.10	0.10
Assam entry tax	-		0.20
Total cost	6.00	10.99	13.91
Price received by trader	50-55	60-65	80-82

Source: Primary Survey, 2008

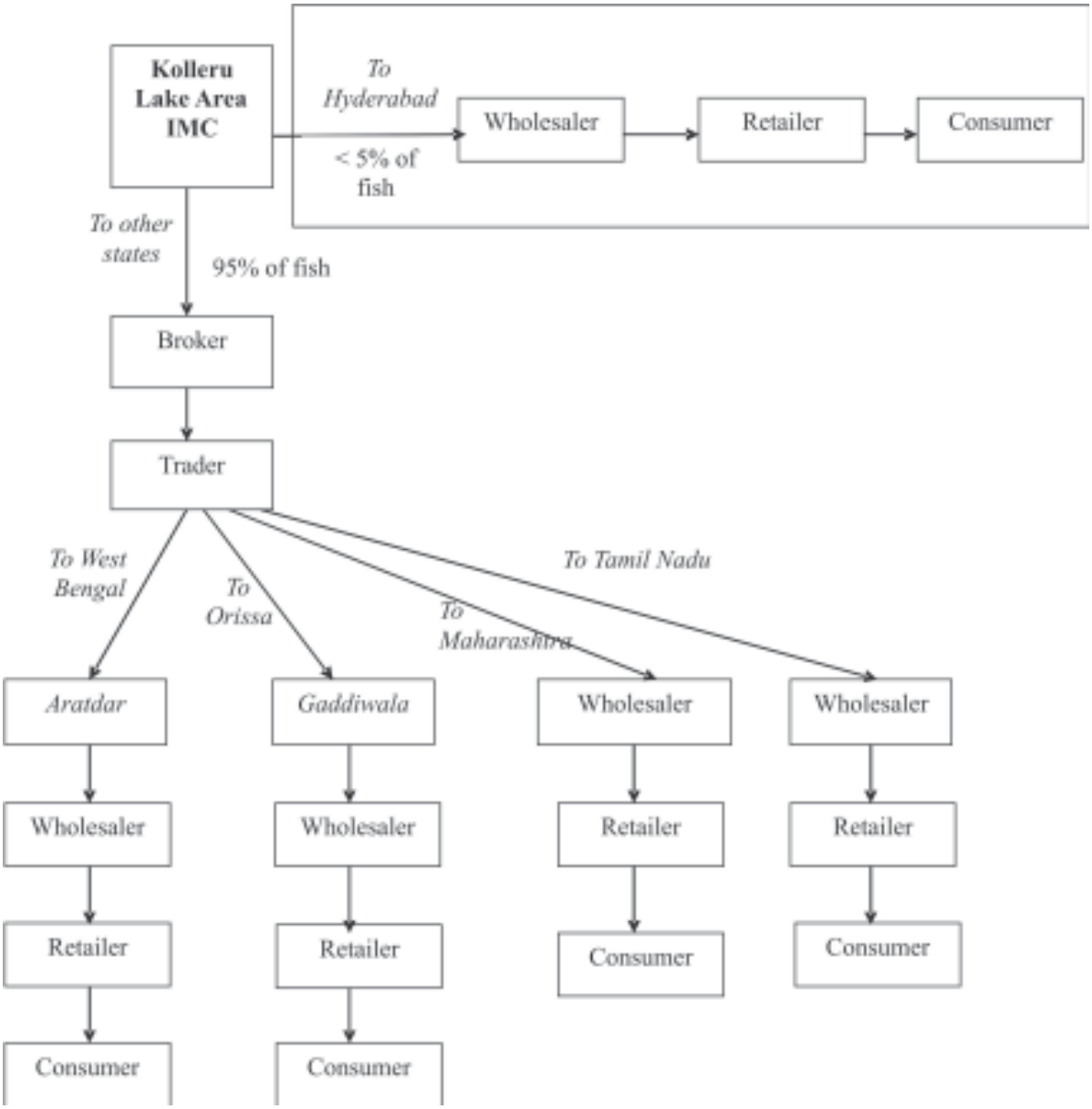

Figure 1. Marketing system of IMC cultured in KLA

(i) Pre-harvest Operations

It was found that the fish producers/farmers interacted with several traders through the services of a broker/middleman for negotiating the best available price of fish to be harvested. Once fish price was fixed, a date for harvest was agreed upon. The farmers of KLA followed certain protocols for ensuring good condition of fish, including cessation of feeding one/ two days before harvest, gradual reduction of water level in fish pond and disturbing the fish stock using nets to inhibit feeding.

(ii) Harvesting of Fish

On the day of harvest, the broker and a representative of the trader would inspect the condition of fish to ensure 'empty guts'. Harvesting progressed only if fish were found with empty guts, as it was believed that such a state prolonged the keeping quality of the fish. The number of persons to be engaged for harvest depended on the size and width (shape) of the pond. A pond of 5-6 ha size required nearly 30 labourers. For seining the pond fish population, one or more 'net pieces' (of 40-50 m width per piece) were

Name of the Farmer: Trader's Mark on Crates: Truck Registration Number:			Village Name: Date of Packing:	
Sl. No.	**Crate No.**	**Variety**	**No. of Fishes**	**Weight (kg)**
1	1101	R (rohu)	20	40
2	1102	R (rohu)	21	40
3	--	--	--	--
--	--	--	--	--
249	1349	K (catla)	14	40
250	1350	K (catla)	13	40

Figure 2. A sample of data sheet of fish loaded into trucks

knitted together just before the harvest. The expenses for harvesting fish, viz. labour charges and cost/rent of fishing nets were borne by the producer/farmer. The post-harvest facilities, namely ice, fish weighing, vehicle, plastic crates and labourers for loading fish were provided by the trader.

(iii) Fish Packing and Transport

While pond seining was in progress, arrangements were made on the pond site to ice and transport the harvested fish without any time lag. After harvest, the fish were separated by species, packed with ice in plastic crates and loaded on to vehicles (trucks). The iced fish were transported to transporting unit/packing sheds/processing areas where the fish were re-iced and packed compactly in thermocol boxes and loaded into vehicles that were lined with thermocol sheets for transport to distant markets. Packing was carried out by a group of semi-skilled labourers known as 'Packers'. The person who maintained this group, known as 'Head Packer', was paid Rs 500/- per vehicle, in addition to the packing and other labour charges. The Head Packer was also involved in deciding the 'fish condition' before actual harvest began. The use of thermocol/styrofoam boxes insulated with panels of the same material and rice husk packed between the boxes and within the truck body had resulted in enhanced shelf-life of iced fish for up to 10 days so as to reach even long distant fish markets in North-Eastern India. On an average, 160-170 trucks transport fish daily from KLA (on average 1130 t / day).

For every truck to be loaded, a 'Data Entry Sheet' was used. This sheet contained details like the name of farmer, village name (pond location), trader's mark on plastic crates, truck registration number and the date of packing. The data sheet also gave details about the number, size and condition of fish (e.g. female with eggs). The data sheet was like an agreement between the trader and the farmer for money transactions to be completed and was the only record for the entire transaction.

(iv) Marketing at Howrah and North-Eastern States

The primary destination for IMC cultured in KLA was the Howrah Wholesale Fish Market at Kolkata, though some truck loads did go to North-Eastern states like Meghalaya, Manipur, Tripura and Mizoram. Marketing of fish at Howrah was fully under the control of wholesalers/auctioneers also known as *'Aratdars'*. Bargaining by eye estimation was carried out and then the fish were unloaded at the market for sale. An *aratdar* was to pay the market cess of Rs 500 per truck. The trader bringing fish was not allowed to sell fish directly to the consumers or vendors. The fish load was auctioned by *Aratdars* for sale to to secondary wholesalers, retailers and vendors.

(v) Marketing at Other Cities

Next to markets in Howrah and North-Eastern states, a sizeable fish were being marketed regularly to other states like Orissa (Bhubaneshwar), Maharashtra (Mumbai) and Tamil Nadu (Coimbatore). Fish from KLA was received by the commission agents,

Marketing channels within the state (5% of fish)	
Channel I	Producers – Consumers (negligible quantities)
Channel II	Producers – Wholesalers – Retailers – Consumers (2%)
Channel III	Producers – Wholesalers – Vendors – Consumers (2%)
Channel IV	Producers – Retailers – Consumers (< 1%)
Marketing channels for other states (95% of fish)	
Channel V	Producers – Local traders – Other states (Tamil Nadu, Kerala, Karnataka, Maharashtra)
Channel VI	Producers – Brokers – Traders (Packers) – Other states (West Bengal, Bihar, Assam, Tripura and Nepal)
Channel VII	Producers – Local traders – Traders (Packers) – Other states (West Bengal, Bihar, Assam, Tripura and Nepal)
Channel VIII	Producers – Brokers – Traders (Packers) – Local traders – Other states (Tamil Nadu, Kerala, Karnataka, Maharashtra)

known as *'Gaddiwalas'* at the Bhubaneshwar fish market. They auctioned fish as well as acted as wholesalers. The *Gaddiwalas* charged a commission of 6.5 per cent for their services, including auctioning of fish. When they acted as wholesalers, they also fixed the price of fish based on the prevailing market conditions. The primary market for KLA carps was the Dadar freshwater fish market at Mumbai, where the fish was received by the wholesalers at the market, who also acted as commission agents charging a commission of 6 per cent from fish suppliers. In Tamil Nadu, the carps cultured at KLA were received by the wholesalers at the Coimbatore market and sold to retailers and vendors. Besides Coimbatore, the fish were marketed at the Tiruppur market also.

Marketing Channels of IMC at KLA

The marketing channels for IMC from KLA are illustrated above in box. It was observed that only 5 per cent of the fish from KLA was marketed within the state of Andhra Pradesh and the rest (about 95 per cent) was marketed outside the state, comprising eastern, north-eastern and southern states.

Price Spread

The price spread for IMC transported from Kolleru to Howrah, Bhubaneshwar, Mumbai, Hyderabad and Coimbatore is shown in Table 3.

The IMCs were sold at different prices at different markets, depending on the distance, length of market channels, number of intermediaries and nature of services undertaken. The retail prices of IMCs ranged from Rs 60/kg at the Bhubaneshwar market to Rs 85/kg at the Mumbai market, depending on the above-mentioned factors and demand-supply situation. These two markets are distinctly of different nature in terms of preference for the fish species; the former prefers freshwater species, while the latter prefers marine species. In terms of retail prices, consumers of Howrah pay about Rs 77/kg for IMCs and considering the quantum of marketed KLA cultured fish, this market was found highly profitable for its functionaries. On the other side, fish farmers of KLA received a sizeable share in the consumer rupee across all markets. In all the market channels, farmers were able to recover cost of production and earned profits ranging from Rs 1/kg to Rs 9/kg. Accordingly, the producer's share in consumer's rupee also showed variation, which was highest at the Coimbatore (61.54%) and lowest at Mumbai (47.06%), the reason being variation in the number of market intermediaries, the distance between the point of production to the point of consumption, mode of transport and the time taken for transportation to these markets. Naik (1994) had reported similar findings in his study conducted in Orissa alone. Another striking difference was that margin charged by the traders/transporters for the Howrah market and to a certain extent at Bhubaneshwar market also, was much higher than at other markets. This tendency of keeping a high margin might be due to the reason that the fish had to travel for more than 3 days to Howrah and 7-10

Table 3. Price spread for IMC at Howrah, Bhubaneshwar, Mumbai, Hyderabad and Coimbatore markets

(Rs/kg)

Particulars	Markets				
	Howrah	Bhubaneshwar	Mumbai	Hyderabad	Coimbatore
Price received by fisherman	40.45	35.00	40.00	42.00	40.00
	(52.51)	(57.66)	(47.06)	(60.00)	(61.54)
Cost incurred by trader	10.99	6.00	11.60	2.00	8.00
	(14.27)	(9.88)	(13.65)	(2.86)	(12.31)
Margin	10.56	6.00	3.40	3.00	2.00
	(13.71)	(9.88)	(4.00)	(4.29)	(3.08)
Price paid by auctioneer	-	47.00	-	-	-
		(77.43)			
Cost incurred	-	6.00	-	-	-
		(9.88)			
Margin	-	2.70	-	-	-
		(4.45)			
Price paid by wholesaler*	62.00	-	55.00	47.00	50.00
	(80.48)		(64.71)	(67.14)	(76.92)
Cost incurred	0.98	-	7.90	2.00	2.00
	(1.27)		(9.29)	(2.86)	(3.08)
Margin	1.94	-	7.10	3.00	3.00
	(2.52)		(8.35)	(4.29)	(4.62)
Price paid by retailer	64.92	55.70	70.00	52.00	55.00
	(84.27)	(91.76)	(82.35)	(74.29)	(84.62)
Cost incurred	6.61	1.50	5.63	8.00	3.50
	(8.58)	(2.47)	(6.62)	(11.43)	(5.39)
Margin	5.51	3.50	9.37	10.00	6.50
	(7.15)	(5.77)	(11.02)	(14.29)	(10.00)
Price paid by consumer	77.04	60.70	85.00	70.00	65.00

Notes: Figures within the parentheses indicate percentages to consumer price

A wholesaler performs the function of auctioning also in the Howrah market.

days to North-Eastern markets. However, it was observed that the producer's share in consumer rupee in fish cultured at KLA and marketed to various fish markets across the country was much higher than in other perishable agricultural commodities marketed in small market channels such as apple (Shaheen and Gupta, 2002), kinnow (Sharan and Singh, 2002), green chillies (Sunil Kumar Babu *et al.*, 2003), rose flower (Jyothi and Raju, 2003) and ginger (Hazarika, 2008).

Table 4. Marketing efficiency across various fish markets

Fish market	Marketing efficiency
Coimbatore	2.60
Hyderabad	2.50
Bhubaneshwar	2.36
Howrah	2.11
Mumbai	1.89

Marketing Efficiency

The marketing efficiency across different fish markets is depicted in Table 4.

The carp marketing channel was found most efficient was at the Coimbatore market, followed by Hyderabad, Bhubaneshwar, Howrah and Mumbai markets. Distance from KLA, length of channel and number and nature of services rendered by the market intermediaries influenced the efficiency of a marketing system for various fish markets. It was found that the traditional source of freshwater fish in Coimbatore has been reservoirs within the state, but since they are increasingly becoming unable to meet the local demand,

Table 5. A comparison of retail prices of locally cultured carps and KLA carps

(Rs/kg)

Market	Retail Price	
	Local IMC	KLA IMC
Howrah	75	60
Bhubaneshwar	65	53
Coimbatore	70	65
Agartala	150	80

KLA carps could find a market at Coimbatore. Similarly, only 15 per cent of the carps marketed in Hyderabad were pond- cultured carps (NCAP, 2009). Thus, there was a sufficient potential for the KLA farmers to diversify and capitalize on the Hyderabad fish market, as well as to expand the marketing of KLA cultured carps to other markets of the state. Marketing channel of KLA carps to Orissa was also very efficient, though the price received by the producers was lower than Howrah and Mumbai market channels, indicating the scope of further capitalizing on the demand in Orissa. The lowest marketing efficiency was for the marketing channel to Howrah. It was expected since the price spread was the highest for the channel on account of more intermediaries present in the channel, the longer transportation time and the higher margins charged by the intermediaries.

A comparison of retail prices of KLA carps and local carps (of various areas) are given in Table 5. Invariably, cultured carps from KLA were found cheaper than locally cultured carps, which showed the higher efficiency in culture practices in the KLA than in any other region of the country. This indicated that despite being transported over large distances, involving various market intermediaries, the marketing channel for KLA carps was found efficient enough to provide cheaper fish to consumers. However, consumers preferred locally cultured carps to KLA carps

Conclusions

The study has revealed that the marketing system of KLA carps is highly efficient in sharing the benefits to aqua farmers while providing quality fish to consumers at reasonable prices. The main reason for the success of fish farming at KLA is the prevalence of an efficient marketing system which enables the producers to fix the pond-site price, as they have access to information on the prices at wholesale market of various fish consuming cities across the country. Farmers follow standard scientific culture practices and harvesting techniques that lead to good quality fish with uniform and standardized cost of production in KLA. Knowledge about cost of culture as well as wholesale prices provide the farmer a better bargaining position while fixing fish prices. Producers are able to negotiate with several traders thereby gaining maximum benefits for their harvest.

Another reason for successful marketing at KLA is the entrepreneurship of the traders. The traders arrange for uninterrupted supply of ice and labourers thereby ensuring icing of the fish without any time lag after harvest, leading to better keeping quality of fish. Innovations in packing with the use of thermocol boxes and vehicles lined with thermocol sheets enable transportation of larger quantities of fish to longer distances with minimum spoilage. Such practices ensure that fish is traded at the best price.

The study has revealed that with scientific culture practices, access to information on prices and availability of requisite infrastructure, fish marketing can be an efficient system in India. The salient features of the carp marketing system of KLA could be adopted at other fish culture systems in the country. This should be developed by the government with the specific aim of achieving efficient marketing of fish in the country, which is essential for the socio-economic development of fishermen as well as providing nutritional security at reasonable prices.

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