Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(5): 311-316

Received: 18-07-2018
Accepted: 19-08-2018

S Santhosh
Fisheries College and Research Institute, Thoothukudi, Tamil Nadu, India

M Rajakumar
Fisheries College and Research Institute, Thoothukudi, Tamil Nadu, India

T Umamaheswari
Fisheries College and Research Institute, Thoothukudi, Tamil Nadu, India

R Santhakumar
Dr. M.G.R. Fisheries College and Research Institute, Thalainayar, Tamil Nadu, India

Correspondence
S Santhosh
Fisheries College and Research Institute, Thoothukudi, Tamil Nadu, India

Value chain analysis of fish marketing in Coimbatore city, Tamil Nadu

S Santhosh, M Rajakumar, T Umamaheswari and R Santhakumar

Abstract
The present study estimated the extent of value addition in terms of cost in successive stages of fish movement in fish outlets of Coimbatore city, Tamil Nadu. Using convenience sampling method, 50 fish sellers were interviewed using pre-structured survey schedule. Thirty retailers and four wholesalers were observed performing value addition operations. Contribution of value added cost to the average selling price of fish for wholesalers was maximum for seer fish (₹10.21/kg) and minimum for sardines (₹4.95/kg). In case of retailing, the value addition cost showed highest value for flying fish (₹17.25/kg) and lowest for shrimp (₹12.66/kg). By performing value added services, the increase in mean selling price was estimated higher for catfish (14.22%) and pacu fish (41.71%), respectively in wholesale outlets whereas, it was lower for seer fish in wholesale (3.09%) and retail (9.59%) outlets. It is recommended to impart proper knowledge and awareness on hygienic handling of fish, market cleanliness and its importance in fish spoilage through various capacity building programmes.

Keywords: Fish, fish sellers, value addition, value chain analysis, profit

Introduction
Kapilinsky and Morris (2000) [6] described value chain as the full range of activities which were required to bring a product or service from conception, through the different phases of production and delivery to final consumers. According to Investopedia (2011) [4], value-chain analysis looks at every step a business goes through, from raw materials to the eventual end-user. The goal is to deliver maximum value for the least possible total cost. Market chain analysis aims to provide information on profitability for the various agents along the market chain (Ferris *et al*. 2001) [3]. Economic value chain analysis describes the range of activities required to bring a product to the final consumer and, in the case of international products, the extent to which intermediaries/agents gain from participating in the chain (Jacinto, 2004) [5]. The same may be applied in fish and fishery products marketing to increase the profitability with least added cost in terms of value added services. The objective of the study was to find out the extent of value addition in terms of cost in successive stages of fish movement. Studying value addition for fish in the outlets of Coimbatore city will bring out the major contributors of cost towards the final selling price of fish for both the wholesalers and retailers. Major contributors of value addition in terms of cost will be given more importance for value chain management to acquire maximum profit from the final selling price of fish.

Materials and Methods
The present study was conducted in Coimbatore city (Fig 1), the industrial hub of Tamil Nadu with a population density of 731 persons per sq. km (higher than the State's population density of 555 persons per sq. km) and the existence of more than 50 private fish retail outlets and 15 Tamil Nadu Fisheries Development Corporation Ltd (TNFDC) retail outlets. The paucity of information experienced in the pilot survey was amended by incorporating all the variables considered as required for the study. Through the amended survey schedule, primary data was collected data from 50 fish sellers using convenience sampling technique during December 2017 and April 2018. Simple tools of analyses like tabular and percentage analyses were used. The respondents were categorized based on the performance/non-performance of the value addition processes and comparison over the above in terms of estimated selling price of fish and profit was carried out. Sorting, grading, icing, beheading, descaling /deshelling, deskinning, gutting, filleting, packaging and branding were the value added operations practiced by fish sellers in the study area. Estimation of value addition was inducted for 3 freshwater fishes and 9 marine fishes.

The formulae for cost estimation are as follows:

$$\text{Wholesaler } N = f \sum_{i=1}^{8} (D_i)$$

where,
N - selling price of fish, D_1 - purchase price of fish, D_2 - transport charges, D_3 - electricity and water charges, D_4 - weighing cost, D_5 - sorting and grading costs, D_6 - icing cost, D_7 - packaging and branding costs, D_8 – margin

$$\text{Retailer } Q = f \sum_{i=1}^{12} (F_i)$$

where,
Q = selling price of fish, F_1 - purchase price of fish, F_2 – transport cost, F_3 - electricity &
water charges, F_4 - weighing cost, F_5 - beheading cost, F_6 - descaling cost, F_7 - deskinning
cost, F_8 - gutting cost, F_9 - filleting cost, F_{10} - deshelling cost, F_{11} - packaging & branding
cost, F_{12} – margin

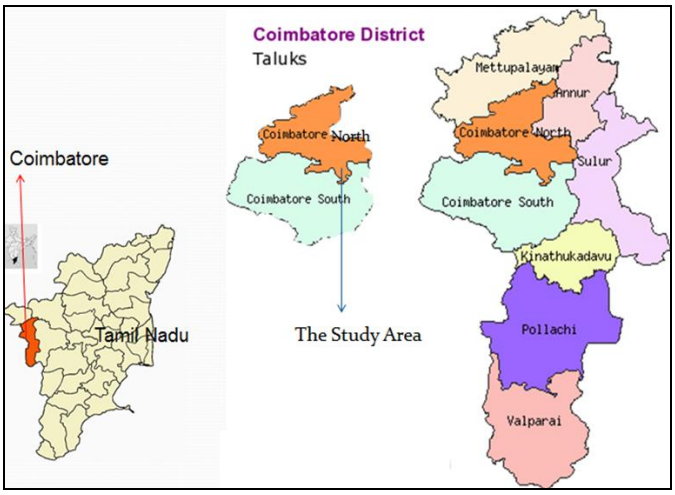

Fig 1: Map showing the study area

Results and Discussion

General information of fish outlets

The results of this study revealed that 40% of fish sellers had established outlets between the years 2006 and 2011. While 80% of the sellers were retailers, 20% were wholesalers. Both electronic weighing balance (76%) and physical balance (24%) were used for weighing the fishes. With a total working hours of 10 to 12 (38%), 88% of the outlets were kept open throughout the week by engaging a maximum of 4 labourers. Similar study on the structural performance of fish markets in Uttar Pradesh conducted by Upadhyay *et al.* (2016) [10] stated that 45 wholesalers were observed to be functioning in the market with small space and temporary shelters with a separate parking space in the market. The marketing activities extended for 16 hours and subjected to change depending upon season, demand and supply of fish. In Coimbatore city, the scale of operation in fish outlets lie between 50 kg and 800 kg on Sundays, whereas it was from 50 kg to 500 kg per day for the left out days of the week. Majority of the outlets (88%) provided parking facilities for consumers and all the outlets were provided with power connectivity. Nearly 50% of the outlets had ice and water supply facilities which extends the scope for selling quality fishes. It is clearly observed that while half of the surveyed outlets did not have any permanent structures for selling fish, 14 outlets were without sanitation and drainage facilities. Mukasa and Reynold (1991) [8] in a similar study stated that the market facilities such as off-loading docks, icing, packaging materials, storage facilities, parking space, drinking water, electricity and telephones are very much essential for fish handling.

Value addition analysis

The fish sellers in the study area were classified as value added and non-value added performers based on the value addition operations performed. It is observed that four wholesalers and thirty retailers performed value addition operations, while six wholesalers and ten retailers were not adopting any value addition processes. Kotni (2016) [7] conducted a similar study in Andhra Pradesh and found that there were 378 (84%) fishermen performed value chain operations and 72 (16%) fishermen were not performing value chain operations in fish landing centres.

The different value addition operations performed cost incurred per kg for 12 fishes at wholesale level (Table 1). The contribution of value addition to the mean selling price per kg for wholesalers was found maximum for seer fish (₹10.21) and minimum for sardines (₹4.95). Similarly, the estimated mean marketing margin and selling price per kg was higher for seer fish showing a value of ₹20.80 and ₹585.63 and lower for sardines accounting to ₹6.28 and ₹66.98, respectively. The percentage increase in average selling price of fish due to value addition was higher for catfish (14.22%) and lower for seer fish (3.09%). Aswathy *et al.* (2014) [2] compared the marketing efficiency in different marketing channels in Kerala and revealed that the market intermediaries received the highest margins per kg of fish for high value fishes like seer fishes (₹118 to ₹157) and pomfrets (₹53 to ₹84) through value addition.

Estimation was furthermore undertaken for retail outlets (Table 2) wherein the flying fish (₹17.25) recorded the highest value addition cost. Though the value added cost was found higher for flying fish, the mean marketing margin (₹29.08) and selling price (₹650.76) was maximum for seer fish and minimum for sardines. Kumar et al. (2017) [9] studied marketing costs in unregulated fish markets in Srinagar and suggested that retailers incurred the highest marketing cost of Rs.10.57/kg followed by wholesalers and vendors with Rs.6.76/kg and Rs.5.33/kg, respectively. Salary to permanent labour was the largest share for both wholesalers and retailers which accounted 46.12 and 44.28 percent to the total cost, respectively which indicate high cost of human labour in the valley. In the present study, the increase in average selling price due to value addition was recorded higher for pacu fish (41.71%) and lower for shrimp (12.78%). Mapped the existence of fish marketing channels in fresh fish marketing of Rajshahi city, Bangladesh. The highest and lowest average fish price were recorded as USD 5.99/kg and USD 1.89/kg for cat fish and snake heads, respectively. The market margins for all intermediaries varied from 23.37% for catfish to 48.57% for prawn species with an average of 40.75%.

Consecutively, cost, marketing margin and mean selling price per kg of fish without any value addition processes was estimated for wholesalers and retailers (Table 3). The results showed that seer fish shared the highest marketing margin and mean selling price among wholesalers (₹13.43 & ₹568.05)

and retailers (₹16.94 & ₹593.82) in the study area. Similar price estimation was documented for retailers as shown in Table 4. In retailing, sardines fetched lower mean marketing margin (₹6.48) and selling price (₹105.99).

A comparative analysis was attempted to document the increase in selling price due to value addition for wholesalers and retailers (Fig 2 & 3). The difference between value added and non-value added mean selling price for the reported fishes *viz*., carps, pacu fish, catfish, sardines, shrimp, seer fish, mackerel, tuna, flying fish, carangid, barracuda and emperor bream were estimated at ₹9.99, ₹11.97, ₹13.13, ₹4.48, ₹13.99, ₹17.58, ₹16.56, ₹18.21, ₹20.29, ₹11.54, ₹12.01 and ₹17.37, respectively for wholesalers. It was found that the percentage increase in mean selling price of fish due to value addition operations was maximum for catfish (14.22%) and minimum for seer fish (3.09%). Value addition has contributed more to the wholesaler mean selling price of fish which was observed maximum for flying fish (₹20.29/kg) and minimum for low value sardines (₹4.48/kg).

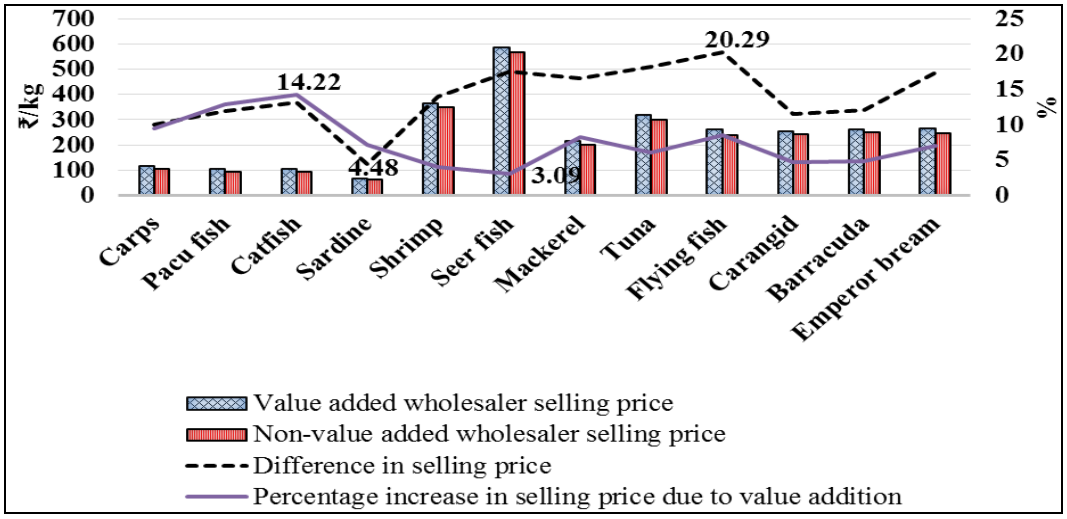

Fig 2: Increase in selling price due to value addition for wholesalers

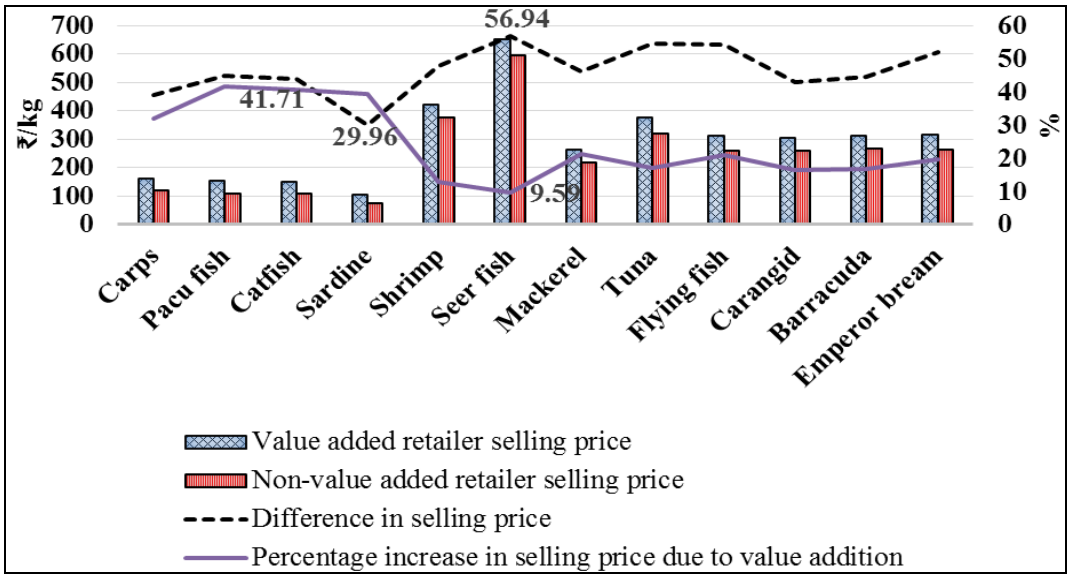

Fig 3: Increase in selling price due to value addition for retailers

In retailing, the difference between the estimated value added and non-value added average selling price for one kg of fish were ₹38.91, ₹44.86, ₹43.89, ₹29.95, ₹47.85, ₹56.94, ₹46.33, ₹54.45, ₹54.16, ₹42.89, ₹44.59 and ₹51.97 and percentage increase in selling price due to value addition operations were arrived at 32.12%, 41.71%, 40.84%, 39.41%, 12.78%, 9.59%, 21.34%, 17.03%, 21.07%, 16.45%, 16.68% and 19.77%, respectively for carps, pacu fish, catfish, sardines, shrimp, seer fish, mackerel, tuna, flying fish, carangid, barracuda and emperor bream. In case of retailing, the contribution of value addition to the mean selling price of fish was found highest for seer fish (₹56.94/kg) and lowest for sardines (₹29.96/kg). The study on value chain operations performed by fishermen in Andhra Pradesh showed that the fishermen's price was ₹35/kg with the transportation cost of ₹0.80/kg. After performing value addition operations like cleaning (₹3.76/kg), washing (₹2.98/kg), separating (₹1.89/kg), grading (₹1.90/kg), weighing (2.75/kg), icing (₹3.98/kg) and packaging (₹1.12/kg), the value was increased to ₹57.18/kg (Kotni, 2016) [7]. But in the present study, higher transportation cost (₹8.80/kg) was incurred by middlemen because of longer distance to transport the fishes.

Table 1: Value addition operations performed and cost incurred – Wholesalers

Particulars	Carps	Pacu fish	Catfish	Sardines	Shrimp	Seer fish	Mackerel	Tuna	Flying fish	Carangid	Barracuda	Emperor bream
Wholesaler purchase price	93.43 (80.82)	80.00 (76.46)	80.00 (75.84)	45.50 (67.93)	330 (90.64)	540 (92.21)	181.67 (83.90)	273.33 (86.40)	220.00 (84.91)	225.00 (88.39)	230.75 (88.19)	225.00 (85.58)
Transport	5.14 (4.45)	6.00 (5.73)	6.00 (5.69)	8.80 (13.14)	10.00 (2.75)	12.60 (2.15)	9.33 (4.31)	12.00 (3.79)	9.00 (3.47)	8.00 (3.14)	9.00 (3.44)	9.00 (3.42)
Electricity & Water	0.31 (0.27)	0.37 (0.35)	0.30 (0.28)	0.31 (0.46)	0.30 (0.08)	0.32 (0.05)	0.33 (0.15)	0.33 (0.11)	0.40 (0.15)	0.30 (0.12	0.35 (0.13)	0.40 (0.15)
Weighing	1.29 (1.11)	1.00 (1.27)	1.00 (0.95)	1.14 (1.7)	1.25 (0.34)	1.70 (0.29)	1.00 (0.46)	1.60 (0.57)	1.00 (0.48)	1.35 (0.55)	1.25 (0.48)	1.89 (0.76)
Cost before value chain management	100.1 (86.65)	87.37 (83.50)	87.30 (82.76)	55.75 (83.23)	341.55 (93.82)	554.62 (94.70)	192.33 (88.83)	287.27 (90.81)	230.40 (88.92)	234.65 (92.18)	241.35 (92.25)	236.29 (89.87)
Cost after value addition processes												
Sorting & Grading	1.29 (1.11)	1.33 (1.27)	1.00 (0.95)	1.14 (1.85)	1.25 (0.36)	1.70 (0.28)	1.00 (0.58)	1.80 (0.32)	1.25 (0.55)	1.40 (0.52)	1.25 (0.52)	2.00 (0.54)
Icing	3.86 (3.34)	5.00 (4.78)	5.32 (5.04)	2.57 (3.84)	7.10 (1.95)	6.86 (1.17)	4.62 (2.13)	6.46 (2.04)	5.48 (2.11)	4.54 (1.78)	5.18 (1.98)	4.86 (1.85)
Packaging & Branding	1.00 (0.87)	1.60 (1.53)	1.00 (0.95)	1.24 (1.85)	1.31 (0.36)	1.65 (0.28)	1.25 (0.58)	1.00 (0.32)	1.42 (0.55)	1.32 (0.52)	1.36 (0.52)	1.42 (0.54)
Value addition cost	6.14 (5.31)	7.93 (7.58)	7.32 (6.94)	4.95 (7.39)	9.66 (2.65)	10.21 (1.74)	6.87 (3.17)	9.26 (2.93)	8.15 (3.15)	7.26 (2.85)	7.79 (2.98)	8.28 (3.15)
Margin of Wholesaler	9.29 (8.03)	9.33 (8.92)	10.86 (10.3)	6.28 (9.38)	12.85 (3.53)	20.80 (3.55)	17.33 (8.0)	19.82 (6.27)	20.56 (7.93)	12.64 (4.97)	12.50 (4.78)	18.35 (6.98)
Wholesaler selling price	115.60 (100)	104.63 (100)	105.48 (100)	66.98 (100)	364.06 (100)	585.63 (100)	216.53 (100)	316.35 (100)	259.11 (100)	254.55 (100)	261.64 (100)	262.92 (100)

Figures In parenthesis represent percentage contribution to the total

Table 2. Value addition operations performed and costs incurred – Retailers (₹/kg)

Particulars	Carps	Pacu fish	Catfish	Sardines	Shrimp	Seer fish	Mackerel	Tuna	Flying fish	Carangid	Barracuda	Emperor bream
Retailer purchase price	115.60 (72.22)	104.63 (68.65)	105.50 (69.70)	66.98 (63.20)	364.06 (85.79)	585.63 (89.99)	216.53 (82.21)	316.40 (84.54)	259.11 (83.25)	254.55 (83.85)	261.84 (83.97)	262.92 (83.52)
Transport	6.71 (4.19)	6.58 (4.32)	6.57 (4.34)	6.83 (6.44)	7.22 (1.7)	7.00 (1.08)	7.11 (2.7)	7.00 (1.87)	7.40 (2.38)	7.29 (2.40)	7.47 (2.39)	7.27 (2.31)
Electricity & Water	0.33 (0.21)	0.34 (0.22)	0.34 (0.23)	0.34 (0.32)	0.38 (0.09)	0.33 (0.05)	0.33 (0.13)	0.32 (0.09)	0.30 (0.10)	0.34 (0.11)	0.34 (0.11)	0.33 (0.10)
Weighing	1.11 (0.69)	1.00 (0.66)	1.00 (0.66)	1.04 (0.98)	1.22 (0.29)	1.50 (0.23)	1.00 (0.38)	1.80 (0.48)	1.00 (0.32)	1.00 (0.33)	1.13 (0.36)	1.40 (0.44)
Labour charges	11.07 (6.92)	12.00 (7.87)	12.00 (7.93)	10.04 (9.48)	11.56 (2.72)	11.00 (1.69)	9.33 (3.54)	10.80 (2.89)	12.00 (3.86)	11.43 (3.76)	10.67 (3.42)	11.47 (3.64)
Cost before value chain management	134.83 (84.23)	124.56 (81.72)	125.41 (82.85)	85.24 (80.42)	384.44 (90.59)	605.46 (93.04)	234.31 (88.96)	336.32 (89.87)	279.81 (89.90)	274.61 (90.46)	281.45 (90.26)	283.38 (90.02)
Cost after value addition processes												
Beheading	2.96 (1.85)	3.00 (1.97)	2.35 (1.55)	2.74 (2.58)	1.2 (0.28)	3.13 (0.48)	2.36 (0.90)	3.69 (0.99)	3.46 (1.11)	3.12 (1.03)	2.61 (0.84)	2.76 (0.88)
Descaling / Deshelling	2.89 (1.81)	2.45 (1.61)	3.00 (1.98)	2.74 (2.58)	10.22 (2.42)	2.94 (0.45)	3.56 (1.35)	2.84 (0.76)	2.44 (0.78)	2.51 (0.83)	2.63 (0.84)	3.41 (1.08)
Deskinning	2.89 (1.81)	2.65 (1.74)	3.00 (1.98)	2.78 (2.63)	0.00	2.68 (0.41)	3.00 (1.14)	2.90 (0.77)	3.65 (1.17)	2.47 (0.81)	2.23 (0.72)	3.13 (0.99)
Gutting	3.00 (1.87)	3.23 (2.12)	2.72 (1.8)	2.87 (2.71)	0.00	3.00 (0.46)	2.71 (1.03)	2.68 (0.72)	3.25 (1.04)	3.42 (1.13)	2.81 (0.9)	2.12 (0.67)
Filleting	2.96 (1.85)	2.45 (1.61)	2.96 (1.96)	1.78 (1.68)	0.00	3.25 (0.5)	3.11 (1.18)	3.58 (0.96)	2.89 (0.93)	2.34 (0.77)	3.14 (1.01)	3.74 (1.19)
Packaging & Branding	1.20 (0.75)	1.33 (0.87)	1.21 (0.8)	1.36 (1.28)	1.24 (0.29)	1.22 (0.19)	1.24 (0.47)	1.23 (0.33)	1.56 (0.5)	1.25 (0.41)	1.35 (0.43)	1.33 (0.42)
Value addition cost	15.91 (9.94)	15.11 (9.91)	15.24 (10.07)	14.27 (13.47)	12.66 (3.00)	16.22 (2.49)	15.98 (6.07)	16.92 (4.52)	17.25 (5.54)	15.11 (4.98)	14.77 (4.74)	16.49 (5.24)
Margin of retailer	9.34 (5.83)	12.75 (8.37)	10.71 (7.08)	6.48 (6.11)	25.22 (5.97)	29.08 (4.47)	13.11 (4.98)	21.00 (5.61)	14.20 (4.56)	13.86 (4.56)	15.60 (5.00)	14.93 (4.74)
Consumer purchase price	160.08 (100)	152.42 (100)	151.37 (100)	105.99 (100)	422.32 (100)	650.76 (100)	263.40 (100)	374.24 (100)	311.26 (100)	303.57 (100)	311.82 (100)	314.80 (100)

Figures in parenthesis represent percentage contribution to the total

Table 3. Costs incurred by wholesalers without value addition (₹/kg)

Particulars	Carps	Pacu fish	Catfish	Sardine	Shrimp	Seer fish	Mackerel	Tuna	Flying fish	Carangid	Barracuda	Emperor bream
Wholesaler purchase price	93.43 (85.35)	80 (82.73)	80 (82.22)	45.5 (73.35)	330 (93.33)	540 (93.84)	181.67 (86.64)	273.33 (89.03)	220 (87.86)	225 (91.35)	230.75 (90.9)	225 (85.42)
Transport	5.14 (4.7)	5.62 (6.2)	5.43 (6.17)	8.8 (14.18)	10.12 (2.82)	12.6 (2.19)	9.33 (4.45)	11.59 (3.9)	8.56 (3.59)	8.97 (3.25)	9.4 (3.55)	9.4 (3.54)
Electricity & Water	0.31 (0.29)	0.37 (0.38)	0.3 (0.3)	0.31 (0.5)	0.3 (0.08)	0.32 (0.05)	0.33 (0.16)	0.33 (0.11)	0.4 (0.12)	0.3 (0.14)	0.35 (0.16)	0.4 (0.16)
Weighing	1.29 (1.17)	1 (1.03)	1.37 (1.02)	1.14 (1.83)	1.25 (3.5)	1.7 (0.29)	1 (0.48)	1.63 (0.65)	1 (0.4)	1.22 (0.49)	1.25 (0.79)	1.3 (0.79)
Total marketing cost	6.74 (6.16)	6.99 (7.61)	7.07 (7.5)	10.25 (14.34)	11.55 (3.27)	14.62 (2.54)	10.66 (5.08)	13.55 (4.67)	10.40 (4.15)	10.49 (3.77)	11.00 (4.17)	11.1 (4.48)
Margin for wholesaler	5.44 (8.48)	5.67 (9.65)	5.25 (1.02)	6.75 (10.12)	8.4 (3.39)	13.43 (3.61)	7.64 (8.26)	11.26 (6.29)	8.86 (7.99)	7.52 (4.87)	7.88 (4.92)	9.45 (7.08)
Wholesaler selling price	105.61 (100)	92.66 (100)	92.35 (100)	62.5 (100)	350.07 (100)	568.05 (100)	199.97 (100)	298.14 (100)	238.82 (100)	243.01 (100)	249.63 (100)	245.55 (100

Figures in parenthesis represent percentage contribution to the total

Table 4. Costs incurred by retailers without value addition (₹/kg)

Particulars	Carps	Pacu fish	Catfish	Sardine	Shrimp	Seer fish	Mackerel	Tuna	Flying fish	Carangid	Barracuda	Emperor bream
Retailer purchase price	105.61 (87.17)	92.66 (86.15)	92.35 (85.93)	62.50 (82.20)	350.07 (93.48)	568.05 (95.66)	199.97 (92.13)	298.14 (93.23)	238.82 (92.89)	243.01 (93.22)	249.63 (93.42)	245.55 (93.43)
Transport	6.71 (5.54)	6.58 (6.12)	6.57 (6.11)	6.83 (8.98)	7.22 (1.93)	7.00 (1.18)	7.11 (3.28)	7.00 (2.19)	7.40 (2.88)	7.29 (2.80)	7.47 (2.80)	7.27 (2.77)
Electricity & Water	0.33 (0.27)	0.34 (0.32)	0.34 (0.32)	0.34 (0.45)	0.38 (0.10)	0.33 (0.06)	0.33 (0.15)	0.32 (0.10)	0.30 (0.12)	0.34 (0.13)	0.34 (0.13)	0.33 (0.13)
Weighing	1.11 (0.92)	1.17 (1.09)	1.37 (1.27)	1.04 (1.37)	1.22 (0.33)	1.50 (0.25)	1.00 (0.46)	1.80 (0.56)	1.62 (0.63)	1.23 (0.47)	1.13 (0.42)	1.20 (0.46)
Total marketing cost	8.15 (6.73)	8.10 (7.53)	8.28 (7.70)	8.21 (10.80)	8.82 (2.36)	8.83 (1.49)	8.44 (3.89)	9.12 (2.85)	9.32 (3.63)	8.86 (3.40)	8.94 (3.35)	8.79 (3.34)
Margin for retailer	7.40 (6.11)	6.80 (6.32)	6.84 (6.36)	5.32 (7.00)	15.58 (4.16)	16.94 (2.85)	8.65 (3.99)	12.53 (3.92)	8.96 (3.49)	8.82 (3.38)	8.65 (3.24)	8.49 (3.23)
Retailer selling price	121.16 (100)	107.56 (100)	107.47 (100)	76.03 (100)	374.47 (100)	593.82 (100)	217.06 (100)	319.79 (100)	257.10 (100)	260.69 (100)	267.22 (100)	262.83 (100)

Figures parenthesis represent percentage contribution to the total

Conclusion

The study concluded that value addition for high value fishes will have a significant impact on the final price of fish for both wholesalers and retailers. However, percentage increase in selling price due to value addition remains less for high value fishes because of higher purchase price of fish by fish sellers. Therefore, wholesalers shall provide more value addition services for seer fishes, flying fish, mackerels, carangids and shrimps to realise a good final price in the business. The retailers, on the other hand, shall adopt the same strategies for seer fish followed by tuna, flying fish and emperor bream. The efficacy of existing fish marketing practices in Coimbatore City shall be improved further through adoption of value added services by all fish sellers, irrespective of their scale of operation, which ultimately results in providing as ready to cook quality fishes to the consumers with a better price.

Recommendations

- A special scheme with subsidies to meet the infrastructure requirements for fish outlets shall be provided
- Establishment of centralised cold storage facilities at Ukkadam for Coimbatore South and Gandhipuram for Coimbatore North fish sellers to reduce revenue loss due to fish spoilage
- Provision of refrigerated display cabinet in retail markets to maintain cold chain and raised platforms in wholesale markets for fish handling
- Replacement of polythene bags with biodegradable materials for packing and carrying fish
- Imparting proper knowledge and awareness on hygienic handling of fish, market cleanliness and its importance in fish spoilage through various capacity building programmes

References

1. Rahaman SM, Ananth GS, Bera BK. A study on problems and constraints in production and marketing of fish in West Bengal. Journal of Crop and Weed. 2013; 9(1):110-113.
2. Aswathy N, Narayanakumar R, Harshan RK. Marketing costs, margins and efficiency of domestic marine fish marketing in Kerala. Indian Journal of Fisheries. 2014; 61(2):97-102. Coimbatore. https://en.wikipedia.org/wiki/Coimbatore. June 10, 2018.
3. Ferris RSB, Collinson C, Wanda K, Jagwe J, Wright P. Evaluating the marketing opportunities for shea nut and shea nut processed products in Uganda. A report prepared for USAID, 77. 2001.
4. Investopedia. http://www. investopedia. com/terms/v/ valuechain.asp.16, 2011.
5. Jacinto ER. A research framework on value chain analysis in small scale fisheries. Paper presented to the 10th Biennial Conference of the International Association for Study of Common Property, Oaxaca, México. 2004;

27:9-13.
6. Kaplinsky R, Morris M. A Handbook for Value Chain Research, International Development research Center (IDRC). Canada, 2000.
7. Kotni VV. Value chain management in marine fisheries: A case study of Andhra Pradesh. International Journal of Managing Value and Supply Chains. 2016; 7(2):9-19.
8. Mukasa CT, Reynolds JE. Fish Markets Survey Organization, Conduct and Preliminary Result. Socio-economic Field Report No.18 (Rev) of FAO/UNDP project. 1990-1991.
9. Stanzin G, Kumar NR, Navghan M, Vinay MH, Vinay A. A study on marketing cost, margin, price spread and efficiency of fish marketing in unregulated fish markets in Srinagar, Jammu and Kashmir. International Journal of Pure and Applied Biosciences. 2017; 5(4)300-308.
10. Upadhyay AD, Jagpal, Piyashi Deb Roy. Structural performance of fish market and socio-economic status of market functionaries of Naveen Machhali Mandi Mahanva of Gorakhpur, Uttar Pradesh. Economic Affairs. 2016; 61(3):511-518.