

An Empirical Evaluation on Value Chain Operations Performed in Marketing of Marine Fisheries in Andhra Pradesh

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Abstract

The study has been designed to capture the core of the flow and processes of the value chain in the marine fisheries sector of Andhra Pradesh. The framework of the study will aid in understanding the different levels of the value chain – its function and significance, the cost of operations, etc. This is a comprehensive study on various value chain actors and their role in value chain management of fisheries in relation to various markets. The main aim of the study was to identify various value chain operations performed by fishermen, exporters, and retailers and to know the various operational costs involved at each stage of fish catch, its processing, and selling. The study illustrated four types of value chains in marine fisheries of Andhra Pradesh, that is, exporter value chain, fresh fish value chain, dry fish value chain, and retailer value chain.

Keywords : value, value chain, Porter model, fisheries, fish value chain

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Value is something for which a client/customer pays. Any producer needs to deliver value to a client so as to sustain within the competitive market. Value chain management may be a method of making and managing value in every part - right from processing of raw material, production, marketing, distribution, and marketing to the client.

The term 'value chain' was used by Michael Porter in his book, *Competitive Advantage : Creating and Sustaining Superior Performance*. He stated in his book that the basic tool for diagnosing competitive advantage and finding ways to enhance it is the value chain, which divides a firm into the discrete activities it performs in

Table 1. Definitions/ Descriptions of Value Chain Management Framework

S.No.	Author	Definition
1	Porter (1985)	Described value chain as the full range of activities, which are required to bring a product or service from conception, through the intermediary phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use.
2	Porter (1990)	The value chain framework is an interdependent system or network of activities connected by linkages.

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3	Brown (1997)	Considered value chain as a tool that divides a business into strategically relevant activities through which a company is able to identify the sources of competitive advantage and perform these activities more cheaply or better than its competitors.
4	Walters & Lancaster (2000)	Defined a value chain as a business system which creates end user satisfaction (i.e. value) and realizes the objectives of other member stakeholders.
5	Lynch (2003)	Described a value chain as something which essentially entails the linkage of two areas. Firstly, the value chain links the value of the organisations' activities with its main functional parts. Then the assessment of the contribution of each part in the overall added value of the business is made.
6	Kaplinsky & Morris (2010)	The value chain can be described as the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use.

designing, producing, marketing, and distributing its products. Porter also opined that a value chain disaggregates a firm into its strategically relevant activities in order to understand the behavior of costs and the existing and potential sources of differentiation. Other important definitions given by the authors are mentioned in the Table 1 as they have been defined.

Literature Review and Research Gap

Value chain management allows the producers to know where to reduce the prices, deliver good value at competitive prices, and increase the prices within ratio of the price - quality relationship. It allows the customers to induce abundant value with fewer costs. It not only solely delivers value in terms of quality production, however, it conjointly delivers valuable data regarding levels of customer satisfaction, market, prices, changing needs, and desires.

There are researchers who have conducted research on value chain earlier in some of the sectors/industries and even in some of the functions. The various studies are identified and analyzed in Table 2.

Table 2. Previous Studies on Value Chain Management

S.No.	Value Chain Researchers	Model Proposed
1	Lee & Yang (2000)	The authors proposed a value chain model for knowledge management based on literature survey and case study at Chinese University of Hong Kong. They proposed a knowledge value chain model for the knowledge industry.
2	Vorster (2001)	The author proposed a value chain model for the mining sector in Northern West territories in Canada.
3	Van der Merwe & Cronje (2004)	The authors proposed a value chain model for the education sector. The authors built the education value chain as part of the reengineering process under the concept of BPR (business process reengineering).
4	Gabriel (2005)	The author proposed a value chain in higher education and related fields. The author found that some the research studies adapted the basic value chain model of Michael Porter in explaining primary and secondary activities of the higher education system.
5	Ilyas, Banwet, & Shankar (2005)	The authors proposed a qualitative research on value chain management in an IT driven industry.

6	Gabriel (2006)	A value chain in services was proposed to bring a new dimension of value chain which will cater to the needs of the services sector.
7	Ilyas, Banwet, & Shankar (2007)	The authors proposed a value chain model for decision making as a general management function.
8	Landry, Amara, Pablos - Mendes, Shademani, & Gold (2006)	The authors conducted a research on knowledge management and proposed a knowledge value chain framework with a case study in the health sector.
9	Ilyas, Shankar, & Banwet (2007)	The authors conducted a study of the relative efficiency of value chain relationships in the Indian steel industry using DEA.
10	Ruskov & Ruskov (2007)	A research on modelling the educational processes as a value added chain was conducted.
11	Ilyas, Shankar, & Banwet (2008)	The study focused on how to outsource value chain activities effectively.
12	Makkar, Gabriel, & Tripathi (2008)	Conceptualized a study on an academic mobility e-service for gaining a good understanding of the underlying service systems requirement.
13	Almarabeh, Abuali, Alsharrab, & Lasassmeh (2009)	The study summarized the value chain analysis in a strategic management field to be applied on the knowledge organizations in the knowledge management field which is called as the knowledge value chain.
14	Dubey & Singh (2010)	The authors designed a blue print for the flow of material, information, and cash. They also proposed a value chain model for the cement industry.
15	Antoniou, Levitt, & Schreihans (2011)	They proposed a model with certain attributes for evaluating the value chains.
16	Aimin & Shunxi (2011)	The authors conducted a review study based on secondary data of related literature to build a model of value chain management for customer relationship management.
17	Hutaibat (2011)	The author conducted a research to propose a value chain model for strategic management in the higher education system.
18	Kuo, Lin, & Wu (2011)	A framework in their study was proposed to select a service trade model. The study examined how to identify strategies and practical routes of service trade.
19	Soosay, Fearne, & Dent (2012)	The authors organized a case study on sustainable value chain analysis to identify and diagnose the misalignment between resource allocation and consumer preferences in wine value chain from South Australia to the UK.
20	Castillo & Salem (2012)	The study adopted the classic value chain model of Michael Porter and specified different models regarding the strategic behaviour of the industrial sector firms to know the impact on the technical efficiency. The major finding of the study was the existence of highly heterogeneous efficiency determinants among productive sectors.
21	Kahkonen & Lintukangas (2012)	The objective of the study was to analyze the role of supply chain management as part of value creation in a firm.
22	Adeli, Calderwood, Heintzeler, Huerta, & Legler (2012)	The authors conducted a charity value chain case study that showed mobile digital applications through smart phones could enhance the value chains of services by increasing their value.
23	Karvonen, Karvonen, & Kraslawski (2012)	The authors conducted a study to determine the possibility of utilizing tuned value chain for public research organisations.
24	Bose & Sinha (2012)	Described the concept of the production chain in the global automobile industry and how modern industrial firms created value by their choice of the nature and content of subcontracting and human resource practices.
25	Sultan & Saurabh (2013)	The authors conducted a review study on achieving sustainable development through value chains. The objective of the study was to design a value chain model as a strategy for achieving sustainable competitive advantage and sustainable development.
26	Rapcevicience (2014)	The author conducted a study on management of public sector enterprises and proposed a value chain model for the public sector.

27	Kar, Padhi, & Samantarai (2016)	The authors explored the scope of disruptive and reverse innovation in an emerging-market context and analyzed economic value creation for a sustainable competitive advantage by companies in the service sector.
28	Bashir & Verma (2017)	The authors explained how business model innovation could be a great source of value creation in businesses using a case study of Connect Broadband, a data service provider headquartered in Mohali, Punjab, India.
29	Singh, Srivastava, & Awasthi (2018)	The authors examined different types of existing value chain models of Lucknowi Chikankari (Lucknow sarees/textiles) in context of the value chain model given by Porter (1985).

After making a thorough desk review, a research gap is identified with respect to the current research topic. There are few studies available in the area of the marine fisheries sector. Some of the studies were identified in Andhra Pradesh, but they are limited to inland fish, and that too for processing of shrimp only, but not entire end-to-end (from producer to consumer) value chain of marine fishery. Hence, it is proposed to undertake a detailed end-to-end study of the seafood sector, specifically value chain management of marine fisheries in the state of Andhra Pradesh.

Significance and Objectives of the Study

The fisheries sector is an important contestant in the overall socioeconomic progress of India. The sector's role in employment creation, food and nutritional security, and foreign exchange earnings is now well acknowledged. During 2013-14, export value of marine products touched the ₹ 30,213 crore benchmark.

The value chain in the marine fisheries sector is critically restricted in terms of poor communication facilities and infrastructure that ends up in the inefficient usage of resources. Additionally, the distinctive characteristics of contemporary aquatic merchandise like unsure productivity and transport issues end up in several issues in ancient value chains. The current marketing is less competent to sustain the speedy development of a 'new economy.' In addition to that, domestic producers face foreign competitors backed by robust 'dollar power' and clearly have the favourable position within the trade. Therefore, within the given context, it becomes imperative to grasp the intricacies of the business operation of the fish value chain. Hence, the present study has been conducted to study the core of the flow and processes of the value chain in marine fisheries.

The specific objectives of the study are :

- To make a comprehensive study on various value chain actors and their role in value chain management of fisheries in relation to various markets.
- To identify various value chain operations performed by fishermen, exporters, and retailers.
- To know various operational costs involved at each stage of fish catching to processing.

Methods of Study

The research study type is descriptive that has been designed to evaluate value addition processes and flow of the value chain in the marine fishery sector. The framework of the study would be useful in understanding the degree of the value chain and therefore the price of every value addition. The study has been designed to map the key processes and flows within the value chain of marine fish in relevancy to the local, regional, and international markets. The study is especially empirical in nature and, therefore, the variables used are each quantitative and qualitative in nature.

Table 3. Population and Sample Size of Fishermen

District	No. of Fishermen HH (As per CMFRI Census 2010)*	Sample Drawn Fishermen HH Performing Value Chain**
Srikakulam	25579	26 (0.10%)
Vizianagaram	5138	26 (0.50%)
Visakhapatnam	28779	29 (0.10%)
East Godavari	44476	22 (0.05%)
West Godavari	2451	25 (1.00%)
Krishna	13073	26 (0.20%)
Guntur	11771	24 (0.20%)
Prakasham	15103	30 (0.20%)
Nellore	17057	34 (0.20%)
TOTAL	163427	242 (0.148%)

* Source: Ministry of Agriculture & CMFRI (2010)

** **Note.** Calculations performed to derive sample size.

HH - Stands for households.

Table 4. Sample Frame

Respondents	Size of Sample	Selection Procedure	Sampling Technique
Fishermen	242	From 9 districts, selection procedure shown in Table 2. (242 performing VCM)	Purposive sampling
Retailers	27	3 from each district (3 × 9)	Snowball sampling
Exporters	18	2 from each district (2 × 9)	Convenience sampling
Total Sample Size	287		

(i) Study Area : The study area of the research includes all nine coastal districts of Andhra Pradesh state, that is, Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasam, and Nellore. The study covers a time period from 2016 - 2017.

(ii) Sampling Procedure : The primary data were collected from 287 respondents of which 242 were fishermen, 27 were retailers, and 18 were exporters, who play a key role in value chain management of marine fisheries in the study area, that is, coastal Andhra Pradesh. The sample frame was selected by using the multi-stage sampling method. The sample frame is presented in the Table 4. The fishermen population in the study area and the sample size is presented in the Table 3.

Model Specification

Regression analysis was adopted for analysis of the value chain. The final selling price of the fish is considered as a dependent variable and the independent variables are costs of all value addition processes.

$$\text{Selling Price (SP)} = \text{Cost of Fishing Activities} + \text{Price Increase (After every value chain activity)}$$

where,

Cost of Fishing Activities = Cost of fishing (CF) + HR Cost (HR) + Transportation cost (TC)

Price Increase (Fresh fish value chain) = Cleaning (C) + Sorting (S) + Grading (G) +
Weighing (W) + Icing (I) + Packaging (P) + Branding (B)

Price Increase (Dry fish value chain) = Salt Mixing (SM) + Preservatives Mixing (PM) +
Drying (D) + Weighing (W) + Packaging (P) + Branding (B)

Price Increase (Retailer value chain) = Deheading (DE) + Removal of Slime (RM) + Cutting Fins (CF) +
Meat Bone Separation (MB) + Weighing (W) + Packing (P)

Price Increase (Exporter value chain) = Cleaning (C) + Sorting (S) + Grading (GR) + Glazing (GL) +
Hardening (H) + Metal Detecting (MD) + Weighing (W) +
Icing (I) + Packaging (P) + Branding (B) + Cost of Shipment (CS)

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \upsilon_1$$

where, Y is selling price, $X_1 \dots X_n$ are value added operations, α is constant, and υ_1 is error.

Empirical Analysis and Results

It is identified in the study area that the marine fisheries are classified into four product lines :

(1) Exporter Value Chain : The average value of the first product line (P1) is found to be in between ₹ 300/- to ₹ 1200/- referred to as export value product for which the exporter value chain has been analyzed.

(2) Fresh Fish Value Chain : The average value of the second product line (P2) is found to be in between ₹ 150/- to ₹ 300/- referred to as high value product for which fresh fish value chain has been analyzed.

(3) Dry Fish Value Chain : The average value of the third product line (P3) is found to be in between ₹ 50/- to ₹ 150/- referred to as average value product for which dry fish value chain has been analyzed.

(4) No Value Chain : The average value of the fourth product line (P4) is found to be less than ₹ 50/- referred to as low value product for which the value chain has not been analyzed.

In the Table 5, the various value added activities of fresh fish are depicted along with their contribution in selling price. Average cost of fishing (includes bait, get, boat usage, etc.) is found to be ₹ 8.43/- per kilogram (kg) and contribution to the average selling price is 4.11%. Average price paid to the labour/porter by fishermen is ₹ 1.40/- per kg and contribution to the selling price is 0.68%. Average transportation cost is found to be ₹ 1.69/- and its contribution to the final price is 0.82%. The value added operations observed are : cleaning (price increase ₹ 0.77/- per kg and its contribution to the selling price is 0.38%), sorting (price increase ₹ 1.25/- per kg and its contribution to the selling price is 0.61%), grading (price increase ₹ 1.94/- per kg and its contribution to the selling price is 0.94%), weighing (price increase ₹ 1.36/- per kg and its contribution to the selling price is 0.66%), icing (price increase ₹ 2.52/- per kg and its contribution to the selling price is 1.23%), packaging (price increase ₹ 2.94/- per kg and its contribution to the selling price is 1.44%), branding (price increase ₹ 2.52/- per kg and its contribution to the selling price is 1.23%) and average profit to the fishermen is found to be ₹ 178.79/- per kg.

Table 5. Fresh Fish Value Chain

Centre	Cost Activity / Value Added Activity	Avg. Price / Kg	Contribution to Selling Price
Landing Site	Cost of Fishing (CF) (Bait, Get, Boat usage etc)	8.43	4.11%
	Price paid to labour/porter (HR) (Cost of HR)	1.40	0.68%
	Price paid to truck/vehicle (TC) (Cost of Transportation)	1.69	0.82%
Fishermen	Cleaning (C)	0.77	0.38%
Fresh Fish Processing Centre	Sorting (S)	1.25	0.61%
(Value Added	Grading (G)	1.94	0.94%
Operations)	Weighing (W)	1.36	0.66%
	Icing (I)	2.52	1.23%
	Packaging (P)	2.94	1.44%
	Branding (B)	3.84	1.87%
Market Centre	Profit	178.79	87.25%
	Average Selling Price	204.91	100.00%

In the Table 6, the various value added activities of dry fish are presented along with their contribution in selling price. Average cost of fishing (includes bait, get, boat usage, etc) is found to be ₹ 8.43/- per kilogram (kg) and contribution to the average selling price is 7.38%. Average price paid to the labour/porter by fishermen is ₹ 1.40/- per kg and contribution to the selling price is 1.22%. Average transportation cost is found to be ₹ 1.69/- and its contribution to the final price is 1.48%. The value added operations observed are : Salt mixing (price increase ₹ 7.73/- per kg and its contribution to the selling price is 6.77%), preservatives mixing (price increase ₹ 0.60/- per

Table 6. Dry Fish Value Chain

Centre	Cost Activity / Value Added Activity	Avg. Price / Kg	Contribution to Selling Price
Landing Site	Cost of Fishing (CF) (Bait, Get, Boat usage etc)	8.43	7.38%
	Price paid to labour/porter (HR) (Cost of HR)	1.40	1.22%
	Price paid to truck/vehicle (TC) (Cost of Transportation)	1.69	1.48%
Fishermen	Salt Mixing (SM)	7.73	6.77%
Dry Fish Processing Centre	Preservatives Mixing (PM)	0.60	0.53%
(Value Added	Drying (D)	1.23	1.08%
Operations)	Weighing (W)	1.36	1.19%
	Packaging (P)	2.02	1.77%
	Branding (B)	1.32	1.16%
Market Centre	Profit	88.36	77.43%
	Average Selling Price	114.12	100%

Table 7. Retailer Value Chain

Centre	Cost Activity / Value Added Activity	Avg. Price / Kg (in ₹)	Contribution to Selling Price
Landing Site	Price paid to fishermen/agent (CF) (Cost of Fish)	170.56	81.65%
	Price paid to labour/porter (HR) (Cost of HR)	1.52	0.73%
	Price paid to truck/vehicle (TC) (Cost of Transportation)	1.71	0.82%
Retail Centre	Deheading (DE)	1.15	0.55%
(Value Added	Removal of Slime (RM)	1.84	0.88%
Operations)	Cutting Fins (CF)	1.09	0.52%
	Meat Bone Separation (MB)	2.15	1.03%
	Weighing (W)	1.11	0.53%
	Packing (P)	1.04	0.50%
Market Centre	Profit	26.73	12.80%
	Average Selling Price	208.89	100.00%

kg and its contribution to the selling price is 0.53%), drying (price increase ₹ 1.23/- per kg and its contribution to the selling price is 1.08 %), packaging (price increase ₹ 2.02/- per kg and its contribution to the selling price is 1.77%), branding (price increase ₹ 1.32/- per kg and its contribution to the selling price is 1.16%) and average profit to the fishermen is found to be ₹ 114.12/- per kg.

In the Table 7, various value added activities of retailers are analyzed along with their contribution in selling price. Average cost of fishing (price paid by retailer to fishermen/agent) is found to be ₹ 170.56/- per kilogram (kg) and contribution to the average selling price is 81.65%. Average price paid to the labour/porter by retailer is ₹ 1.52/- per kg and contribution to the selling price is 0.73%. Average transportation cost is found to be ₹ 1.71/- and its contribution to the final price is 0.82%. The value added operations observed are deheading (price increase ₹ 1.15/- per kg and its contribution to the selling price is 0.55%), removal of slime (price increase ₹ 1.84/- per kg and its contribution to the selling price is 0.88%), cutting fins (price increase ₹ 1.09/- per kg and its contribution to the selling price is 0.52%), meat bone separation (price increase ₹ 2.15/- per kg and its contribution to the selling price is 1.03 %), weighing (price increase ₹ 1.11/- per kg and its contribution to the selling price is 0.53%) and packing (price increase ₹ 1.04/- per kg and its contribution to the selling price is 0.50%). Average profit to the retailer is found to be ₹ 26.73/- per kg.

In the Table 8, various value added activities of exporters are interpreted along with their contribution in selling price. Average cost of fishing (price paid by exporter to fishermen/agent) is found to be ₹ 444.72/- per kilogram (kg) and contribution to the average selling price is 69.15%. Average price paid to the labour/porter by exporter is ₹ 3.43/- per kg and contribution to the selling price is 0.53%. Average transportation cost is found to be ₹ 1.72/- and its contribution to the final price is 0.27%. The value added operations observed are cleaning (price increase ₹ 3.57/- per kg and its contribution to the selling price is 0.56%), sorting (price increase ₹ 7.50/- per kg and its contribution to the selling price is 1.17%), glazing (price increase ₹ 9.25/- per kg and its contribution to the selling price is 1.44%), hardening (price increase ₹ 2.30/- per kg and its contribution to the selling price is 0.36 %), metal detecting (price increase ₹ 1.51/- per kg and its contribution to the selling price is 0.23%) weighing (price increase ₹ 2.33/- per kg and its contribution to the selling price is 0.36 %), icing (price increase ₹ 3.25/- per kg and its contribution to the selling price is 0.51 %), packaging (price increase ₹ 6.44/- per kg and its contribution to the

Table 8. Exporter Value Chain

Centre	Cost Activity / Value Added Activity	Avg. Price / Kg	Contribution to Selling Price
Landing Site	Price paid to fishermen/agent (CF) (Cost of Fish)	444.72	69.15%
	Price paid to labour/porter (HR) (Cost of HR)	3.43	0.53%
	Price paid to truck/vehicle (TC) (Cost of Transportation)	1.72	0.27%
Exporter Processing Centre (Value Added Operations)	Cleaning (C)	3.57	0.56%
	Sorting (S)	7.50	1.17%
	Grading (GR)	2.11	0.33%
	Glazing (GL)	9.25	1.44%
	Hardening (H)	2.30	0.36%
	Metal Detecting (MD)	1.51	0.23%
	Weighing (W)	2.33	0.36%
	Icing (I)	3.25	0.51%
	Packaging (P)	6.44	1.00%
	Branding (B)	5.66	0.88%
Export Centre	Cost of Shipment (CS)	18.94	2.95%
	Profit	130.43	20.28%
Average Selling Price		643.17	100.00%

selling price is 1.00 %), and branding (price increase ₹ 5.66/- per kg and its contribution to the selling price is 0.88%). Average profit to the exporter is found to be ₹ 130.43/- per kg.

Model Execution and Evaluation

The regression model is executed on four value chain types twice for two different reasons. First is to find out the associations/influence among final selling price (dependent value) and cost components/value added activities (independent variables). Second is to find out the associations/influence among profit (dependent variable) and value added activities (independent variables). So, four equations for selling price and four equations for profit are constructed and are presented as follows :

$$\text{Fresh Fish Selling Price} = 149.662 + 0.250CF + 9.027HR + 5.201TC - 2.564C + 11.041S + 5.959G + 2.680W + 5.615I - 6.587P + 2.616B$$

$$\text{Fresh Fish Profit} = 154.568 - 3.006C + 13.970S + 4.148G + 3.930W + 5.692I - 8.503P + 1.685B$$

$$\text{Dry Fish Selling Price} = 55.290 + 0.227CF + 15.953HR + 12.199TC + 0.422SM - 12.822PM + 7.560D + 7.847P - 5.122B$$

$$\text{Dry Fish Profit} = 74.485 - 0.238SM - 21.244PM + 8.896D + 14.725P - 8.344B$$

$$\text{Retailer Price} = 17.083 + 1.109CF - 9.227HR + 14.172TC - 18.873D - 3.527RS - 9.839CF + 21.636MB - 4.168W - 11.166P$$

$$\text{Retailer Profit} = 25.827 + 3.259D - 14.469RS - 9.832CF + 13.711MB + 15.637W - 11.023P$$

$$\text{Exporter Selling Price} = 126.246 + 0.855FC + 351.933HR - 642.910TC + 40.196C + 12.328S - 3.693GR + 110.888GL - 22.041H - 37.147MD - 32.647W - 263.575I + 0.149P - 8.086B - 7.257S$$

$$\text{Exporter Profit} = -225.322 + 49.802C - 1.615S + 20.383GR + 28.349GL + 69.895H + 9.608MD + 57.050W - 85.104I - 22.428P - 0.488B$$

Even though each regression model is found out to be statistically significant, some equations (executions) suffer from the multicollinearity problem. The adjusted *R* square is found to be good, and most independent variables explain the dependent variable well.

In the selling price model of fresh fish value chain, the cost components like HR cost and transportation cost are major influencers. The value added activities - sorting, grading, and icing are found to be significant value adders. In profit model of fresh fish value chain also, sorting, icing, and grading are significant value adders.

In the selling price model of dry fish value chain, the cost components like HR cost and transportation cost are major influencers. The value added activities - drying and packaging are found to be the significant value adders. In the profit model of dry fish value chain also, drying and packaging add more value when compared to other value chain activities.

In the selling price model of retailer value chain, the cost components like cost of fish and transportation cost are major influencers. The value added activity - meat bone separation is found to be a significant value adder. In profit model of retailer value chain, meat bone separation and weighing add more value when compared to other value chain activities.

In the selling price model of exporter value chain, the cost components like cost of fish and HR cost are major influencers. The value added activities - glazing, cleaning, sorting, and packaging are found to be the significant value adders. In profit model of exporter fish value chain, hardening, cleaning, weighing, glazing, grading, and metal detecting are significant value adders.

Managerial Implications

To make good profits, the following specific suggestions are made :

- ✦ The fishermen should concentrate on the value added activities - sorting, icing, and grading for fresh fish.
- ✦ The fishermen should concentrate on the value added activities - drying and packaging for dry fish.
- ✦ The retailers should concentrate on the value added activities - meat bone separation and weighing.
- ✦ The exporters should concentrate on the value added activities - glazing, cleaning, and sorting.

The other general policy implications are :

- ✦ The first recommendation that can be offered is that every seller in the marine fisheries sector should perform value chain management, as it is found in the study that there is a significant difference (in terms of profit) between fishermen performing value chain and fishermen not performing value chain.

✧ The second important suggestion is to perform direct marketing than performing intermediary marketing if proper manpower and facilities are available. I observed that there is a significant difference (in terms of profit) between fishermen performing direct marketing and fishermen performing intermediary marketing.

✧ The exporters have to build a good supply chain right from the fishermen, transporters, shipments, distributors, and retailers to foreign (export) markets. A good supply chain can deliver products, money, and information from various stakeholders in the chain.

✧ Exporters have to educate fishermen in areas like temporary storage of fish, the fish (product line) which is in much demand, usage of materials like get, bait, etc.

✧ The Government has to create proper infrastructure in terms of good transport from sea shore to location of processing unit, creation of extension services like storage units at the sea shore, at ports, etc. Strengthening the infrastructure facilities in existing market yards can result in increased customer delivered value.

Conclusion

As a food item, fish is taken into account to have a very good nutritional value. As associate economic artifact, fish will earn forex for the country. The seafood sector is a very important sector of India also as a province economy. India is currently the third largest producer of marine fish and the second largest producer of inland water fish in the world. Such an important sector is facing several issues for varied reasons. Prices of marine products continue to decrease in markets, and the exports from India are decreasing year on year. If this situation continues, the economy, society, trade, exporters, fishermen, and consumers have to suffer. Hence, all the stakeholders of this sector like fishermen, consumers, exporters, employees, government, traders, distributors, and retailers have to perform value chain analysis and enact their role in creating a healthy business environment for healthy fish products.

Limitations of the Study

✧ The conclusions cannot be fully generalized as the sample size is very small when compared to the population.

✧ The study is limited to fish species only. The findings cannot be applied to other marine species like crabs, prawns, etc.

✧ The cost for value addition to fish may change from one market to another. Hence, the cost for value addition determined in the study may differ for different markets.

Scope for Further Research

✧ As the study is limited to only one species of seafood, that is, fish, the same study can be conducted for other marine species like shrimps, crabs, etc. The study can also be extended to inland fisheries or pond or cultivated fish. Since the inland fish sector also contributes for the welfare and livelihood of the people and the nation, a similar study can be conducted for the inland fisheries sector also.

✧ Value chain management research should also be done in the agriculture sector. Some applications like rice value chain, sugarcane value chain, wheat value chain, and cotton value chain are extremely important for better economic performance of the country. Some of the vegetables like potato, tomato, onion, carrot, etc. truly deserve the value chain analysis.

✍ The value chain analysis can also be extended to investment, banking, and financial services industry as for an investor or customer, it is very important to know how much they are investing and what is the value addition of their investments at the time of liquidation.

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