

VALUE CHAIN MANAGEMENT IN MARINE FISHERIES: A CASE STUDY OF ANDHRA PRADESH

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ABSTRACT

The value chain management assists the stakeholders to perform value added operations, add value to the product and have better returns from the market. This paper attempts at value chain management practices adopted by the players of the marine fisheries chain in Andhra Pradesh and how much value they are adding to the final fish product. The study has been structured to capture the essence of the processes and flow of the value chain in Marine fisheries. The study is designed in such a way that it addresses various research questions like the basic value chain structure, value added operations in fisheries value chain, cost of each operation along with price increase and finally the final price of the product. In this paper, in order to suggest the suitable value chain, a thorough market research was conducted to study the Value Chain Management practices employed by Fishermen, Middlemen, Retailers, Head loaders and Cycle carrier with respect to fresh fish in the coastal area of the State of Andhra Pradesh, India.

1. INTRODUCTION

The Value Chain, also known as Value Chain Analysis, is a concept from business management that was first described and popularized by Michael Porter in his 1985 best-seller book, *Competitive Advantage: Creating and Sustaining Superior Performance*. Michael Porter coined the term value system which means a larger interconnected value chains. Porter (1985) described the value system right from the supplier to the customer. The value system integrates the supplier of the firm (and their suppliers all the way back), the production centre or the firm itself, the distribution channels and the buyers of the firm. Another value chain thinker Lynch (2003) described value chain as a series of activities which includes purchasing, manufacturing, distributing and marketing of company's products.

If an attempt is made to understand the insights of value chain concept, some of the individuals and institutions have given their understandings. Porter (1990) in his book opined that the Value Chain framework is an interdependent system or network of activities, connected by linkages. Pathania-Jain (2001) proposed that the system should be managed carefully so that the linkages can be vital source of competitive advantage. Lynch (2003) discussed about value chain analysis and said that it entails the linkage of two areas which are the value of organizational activities with its main functional parts and the second the assessment of the contribution of each part in the overall added value.

World Business Council for Sustainable Development (WBCSD) defined as value chain refers to full life cycle of a product or process which includes sourcing of raw material, production, consumption and finally disposal of the product. Sustainability, UNEP and UNGC (2008) referred value chain as it encompasses thinking about the value created by the chain, particularly for end-use customers.

Kaplinsky, R. and M. Morris (2001) in their book titled “A Handbook for Value Chain Research” which was prepared for the International Development Research Centre (IDRC) 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.

Porter (1985) has given a definition of value chain in his book “Competitive Advantage” as 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 designing, producing, marketing, and distributing its products. While Porter in 1990 said that value chain concept decomposes all activities of one firm into parts and analyses each individual activity and their interdependence”.

Brown (1997) considers, as a tool the value chain divides a business into strategically relevant activities. Through the company is able to identify the sources of competitive advantage and perform these activities more cheaply or better than its competitors. Walters and Lancaster (2000) has offered value chain definition as a business system which creates end user satisfaction (i.e. value) and realizes the objectives of other member stakeholders.

Keeping in view, the advantages of value chain management, in this paper, an attempt has been made to evaluate the Value Chain Management practices employed by fishermen, Middlemen, Retailers, Head loaders and Cycle carrier with respect to fresh fish and dry fish in the State of Andhra Pradesh, India.

2. OBJECTIVES OF THE STUDY

The study entitled “Value Chain Management in Marine Fisheries: A Case Study of Andhra Pradesh” has been structured to capture the essence of the processes and flow of the value chain in Marine fisheries. The study is designed in such a way that it addresses various research questions like the basic value chain structure, value added operations in fisheries value chain, cost of each operation along with price increase and finally the final price of the product. The specific objectives of the study are:

- To identify the different Value Chain Actors in marine fisheries sector.
- To make comprehensive study on various value chain actors, their role in value chain management of fisheries in relation to various markets.
- To assess various operational costs involved at each stage of fish catch to processing.
- To suggest the suitable value chains to the key stakeholders of the sector.

3. REVIEW OF LITERATURE

While conducting desk research of previous studies, it was found that there were some researchers who did value chain analysis earlier in some sectors, industries and even in some management functions.

- Ching Chyi Lee and Jie Yang (2000) conducted value chain research in knowledge sector and proposed a knowledge value chain model.
- Vorster (2001) organised value chain research in mines sector and proposed mining value chain.
- Vander Merwe and Cronje (2004) organised value chain management research in education sector and proposed education value chain.
- Gabriel (2006) has done value chain research in service sector and proposed value chain framework for customised services.
- Rijejan Landry et al. (2006) has done research in health sector and designed value chain model for health organisations.

- Ilyas et al. (2008) conducted research in BPO sector and determined outsourcing of value chain activities effectively.
- Wang Aimin and Li Sunxi (2011) proposed value chain management in CRM function.
- Seyed Mohammad Adeli et al. (2012) proposed charity value chain.

4. METHODOLOGY OF THE STUDY

The study is descriptive research, empirical evidence is provided and the variables used are quantitative in nature. The study has adopted some tools and techniques for collection of information on various aspects. Some of them are detailed below.

- Secondary Research
- Primary survey through structured questionnaires administered to key stakeholders

4.1 Secondary Research

Under secondary research, a thorough desk review was done to develop insights into the key areas that needs to be focused during the primary research and discussions were held with various knowledgeable persons in the Marine Fisheries sector to collect information related to the issue on hand. Collection of Secondary Data from various sources i.e., Census of India, Statistics and Planning Board, CMFRI, CIFT, CIFRI, NIO, MPEDA.

4.2 Primary Research

The survey was conducted using different questionnaires for different players of the fishery value chain from nine Coastal Districts of Andhra Pradesh covering 974 Kms of coastline from Srikakulam to Nellore (From Major Fish Landing Centres) to collect first-hand information on the specific parameters developed on the basis of objectives of the study. Separate questionnaires were administered to each key stakeholder of the study i.e. fishermen, middlemen, head loader, cycle carrier and retailer.

4.3 Study area

The study entitled “A Study on Value Chain Management in Marine Fisheries: A Special Reference to Andhra Pradesh” was conducted according to the preferential sampling of the researcher. The selection of the study area is on the basis of importance of the Marine Fish Landing Centers among the 9 Coastal Districts of Andhra Pradesh covering 974 kms of coastline from Srikakulam to Nellore, the number of fisherman at the landing center, the volume of trade generated, etc. The major regional market for fishery was covered during the study to develop a good understanding of the marine fishery value chain.

4.4 Sampling

The sample frame was designed in such a way that all the key stakeholders are covered i.e. fishermen, middlemen, head loader, cycle carrier and retailers in the study area so that the complete picture of marine fisheries value chain can be assessed as it is presented in Table 1 in which the details about study area and sample size are mentioned with different respondents. Quota Sampling Technique was adopted to collect data from their respective coastal districts. Simple Random Technique was adopted to collect data within a district.

Table 1. Sampling according to Study Area

Respondent	Coastal Districts of Andhra Pradesh									TOTAL
	Srikakulam	Vizianagaram	Visakhapatnam	East Godavari	West Godavari	Krishna	Guntur	Nellore	Prakasham	
Fishermen	50	50	50	50	50	50	50	50	50	450
Middlemen	8	8	8	8	8	8	8	8	8	72
Head loader	10	10	10	10	10	10	10	10	10	90
Cycle Carrier	10	10	10	10	10	10	10	10	10	90
Retailers	20	20	20	20	20	20	20	20	20	180
Total										882

5. IDENTIFICATION OF VALUE CHAIN ACTORS PERFORMING VALUE CHAIN OPERATIONS

Table 2: Value Chain actors

Value Chain Actor	Performing Value Chain	Not Performing Value Chain	TOTAL
Fishermen	378 (84.00)	72 (16.00)	450 (100.00)
Middlemen	54 (75.00)	18 (25.00)	72 (100.00)
Head loader	72 (80.00)	18 (20.00)	90 (100.00)
Cycle Carrier	72 (80.00)	18 (20.00)	90 (100.00)
Retailer	126 (70.00)	54 (30.00)	180 (100.00)
TOTAL	702 (80.00)	180 (20.00)	882 (100.00)
Source: Calculation from Primary Data (Figures in the brackets are percentages to their row totals)			

From the sample what was obtained from the study area, the respondents (i.e. key stakeholders) were divided into two categories i.e. performing value chain and not-performing value chain. From Table 2, it can be found that there are 378 (84%) fishermen who perform value chain operations and 72 (16%) fishermen who are not performing value chain operations. Among the sample, 54 (75%) middlemen who are performing value chain operations and 18 (25%) who are not performing value chain operations. Among the head loaders, 72 (80%) head loaders who are performing value chain operations and 18 (20%) who are not performing value chain operations. There are 72 (80%) cycle carriers who perform value chain operations and 18 (20%) cycle carriers who are not performing value chain operations. Among the retailers, 126 (70%) are

performing value chain operations and 54 (30%) retailers who are not performing value chain operations. Among the total sample, 702 (80%) head loaders who are performing value chain operations and 180 (20%) respondents who are not performing value chain operations.

6. CALCULATION OF PRICES OF FISH WITHOUT VALUE CHAIN OPERATIONS

In this section, an attempt has been made to calculate prices of fish sold out without performing Value Chain Operations. Table 3 presents cost sale price, profit and profit percentage getting by value chain actors. In order to calculate prices, the following parameters were observed as factors that influence price of fish.

1. Fisherman price at sea shore.
2. Middleman commission.
3. Transportation Charges.
4. Market fee.
5. Wholesaler margin.
6. Retailer Margin.

Table 3. Average Price of Fish without Value Chain Operations

Value Chain Actor	Cost of Fish Rs./Kg	Sale Price Rs./Kg	PROFIT Rs./Kg	% of PROFIT
Fishermen Intermediary Marketing	35	42	7	17%
Fishermen Direct Marketing Consumer	35	48	13	27%
Fishermen Direct Marketing Company	35	60	25	42%
Middlemen	42	55	13	24%
Head loader	55	75	20	27%
Cycle Carrier	55	80	25	31%
Retailer	55	65	10	15%

7. IDENTIFIED GENERAL VALUE CHAIN OPERATIONS BY FISHERMEN

Table 4 presents general value chain operations adopted by fishermen for fresh fish to increase value there by price. The identified value chain operations performed by the fishermen for fresh fish are Cleaning, Washing, Separating, Grading, Weighing, Icing and Packaging. The average cost incurred by the fishermen was found to be Rs.11.83 per kg and average price increased found to be Rs.21.38 per kg. Hence there was increase of Rs.9.55/- per kg (55%) (Price increase – cost incurred) for fresh fish.

Table 4. Cost and Price addition through Value Chain for Fresh Fish

Particulars of Item	Cost Rupees/Kg	in	Price Increase	% of Price Increase
Value Chain Operations (fresh fish)				
Cleaning	1.50		3.76	18%
Washing	1.89		2.98	14%
Separating	0.97		1.89	9%
Grading	0.59		1.90	9%
Weighing	1.79		2.75	13%
Icing	2.89		3.98	19%
Packaging	2.20		4.12	19%
Total	11.83		21.38	100%
Value addition for Fresh Fish per Kg (Price - Cost) PROFIT			9.55	55%

8. FRESH FISH VALUE CHAIN OPERATIONS BY FISHERMEN PRACTICING INTERMEDIARY MARKETING

Table 5. Fresh Fish Value Chain with Intermediary Marketing – Fishermen

Particulars of Item	Values in Rs. / Kg	Values in %
Value Addition Operations by fisherman		
Fisherman Price at Seashore	35.00	61%
Transportation cost to Village	0.80	1%
Value Addition Process 1 - Cleaning	3.76	7%
Value Addition Process 2 -Washing	2.98	5%
Value Addition Process 3 -Separating	1.89	3%
Value Addition Process 4 -Grading	1.90	3%
Value Addition Process 5 -Weighing	2.75	5%
Value Addition Process 6 -Icing	3.98	7%
Value Addition Process 7 -Packaging	4.12	7%
Final Avg. sale price (for Middlemen / Retailer)	57.18	
PROFIT / Value addition (Final Sale Price - Seashore Price)	22.18	38%

Table 5 shows, fishermen cost of fish Rs.35/kg, transportations charges Rs.0.80/Kg, after value addition operations like cleaning (Rs.3.76/kg), Washing (Rs.2.98/kg). Separating (Rs.1.89/kg), Grading (Rs.1.90/kg), Weighing (Rs. 2.75/kg), Icing (3.98/kg) and Packaging (4.12/kg), the value has been increased to Rs.57.18/Kg. Overall there is 38% (Profit) price increase added to the product.

9. FRESH FISH VALUE CHAIN OPERATIONS BY FISHERMEN PRACTICING DIRECT MARKETING

This section concentrates on direct marketers in fishing community who practice direct marketing and involving in value chain operations. The fishermen are selling their product directly to consumer and sometimes to Exporter / Fish Companies also.

Table 6. Fresh Fish Value Chain with Direct Marketing – Fishermen

Particulars of Item	Values in Rs. / Kg	Values in %
Value Addition Operations by fisherman		
Fisherman Price at Seashore	35.00	61%
Transportation cost to Village	0.80	1%
Value Addition Process 1 - Cleaning	3.76	7%
Value Addition Process 2 -Washing	2.98	5%
Value Addition Process 3 -Separating	1.89	3%
Value Addition Process 4 -Grading	1.90	3%
Value Addition Process 5 -Weighing	2.75	5%
Value Addition Process 6 -Icing	3.98	7%
Value Addition Process 7 -Packaging	4.12	7%
Final Avg. sale price	57.18	
Fisherman Selling fish to Consumer Directly		
Avg.Sale Price fixed by Fisherman	57.18	77%
Transportation Chagres	4.36	6%
Packing	0.59	1%
Fisherman Margin	12.15	16%
Final Avg.Price for Consumer	74.28	
PROFIT / Value addition (Final Sale Price - Seashore Price)	39.28	52%
Fisherman Selling fish to Company Directly		
Avg.Sale Price fixed by Fisherman	57.18	66%
Fisherman Margin	30.00	34%
Final Avg.Price for fish company / Exporter	87.18	
PROFIT / Value addition (Final Sale Price - Seashore Price)	52.18	59%

Table 6 shows that there is more than 50% value increased to the product after performing value chain operations by fishermen. The fishermen selling fish directly to consumer are getting 52% more returns on their fish catch whereas the fishermen selling fish directly to company/ exporter are getting 59% more returns on their fish. Here it should be noted that the exporter / fish company will purchase product if and if only export quality / high value product fish available.

10. MIDDLEMEN VALUE CHAIN - FRESH FISH

Table 7 shows that middlemen are getting fish either from seashore or fish villages at the average price of Rs.57.18/kg. The middlemen are investing their money on transportation charges, market fee etc. There is 38% value increase in fresh fish middlemen value chain.

Table 7. Middlemen Value Chain - Fresh fish

Particulars of Item	Values in Rs. / Kg	Values in %
Final Avg. sale price fixed by fishermen *	57.18	
Value Addition Operations by Middleman		
Avg.Sale Price fixed by Fisherman	57.18	61%
Middleman Commission	16.5	18%
Transportation Chagres	4.36	5%
Market Fee	1.55	2%
Wholesale Margin (pricing strategy) **	5.6	6%
Retailer Margin (pricing strategy)**	8.45	9%
Final Avg.Price for Consumer	93.64	
PROFIT / Value addition (Final Sale Price - Seashore Price)	36.46	38%
*- Avg. Sale Price Fixed by Fishermen at Seashore / Village. **-The middlemen include ideal wholesale / retail margin in his price.		

11. HEAD LOADER VALUE CHAIN - FRESH FISH

Head loader is like door-to-door sales woman present in urban / town households and sells fish by carrying the product on her head. Table 8 shows that there is 62% price after value addition processes. The major cost goes to transportation. Return will be high because of reduced customer cost as the product is available at door step.

Table 8 : Head Loader Value Chain - Fresh Fish

Particulars of Item	Values in Rs. / Kg	Values in %
Final Avg. sale price fixed by fishermen *	57.18	
Value Addition Operations by Head loader		
Avg.Sale Price fixed by Fisherman	57.18	67%
Cost of Transportation	20.00	23%
Margin of Head loader	8.45	10%
Final Avg.Price for Consumer	85.63	
PROFIT / Value addition (Final Sale Price - Seashore Price)	28.45	62%
*- Avg. Sale Price Fixed by Fishermen at Seashore / Village.		

12. CYCLE CARRIER VALUE CHAIN - FRESH FISH

Cycle Carrier is like door-to-door salesman present in urban / town households and sells fish by carrying the product on a bicycle. Table 9 shows that there is 66% price after value addition processes. The major cost goes to transportation. Return will be high because of reduced customer cost as the product is available at door step.

Table 9. Cycle Carrier Value Chain - Fresh Fish

Particulars of Item	Values in Rs. / Kg	Values in %
Final Avg. sale price fixed by fishermen *	57.18	
Value Addition Operations by Cycle Carrier		
Avg.Sale Price fixed by Fisherman	57.18	60%
Cost of Transportation	30.00	31%
Margin of Cycle Carrier	8.45	9%
Final Avg.Price for Consumer	70.36	
PROFIT / Value addition (Final Sale Price - Seashore Price)	13.18	66%

13. RETAILER VALUE CHAIN - FRESH FISH

Table 10. Retailer Carrier Value Chain - Fresh Fish

Particulars of Item	Values in Rs. / Kg	Values in %
Final Avg. sale price fixed by fishermen *	57.18	
Value Addition Operations by Retailer		
Avg.Sale Price fixed by Fisherman	57.18	74%
Transportation Chagres	4.36	6%
Market Fee	1.55	2%
Weighing	0.79	1%
Cutting	3.89	5%
Washing	0.89	1%
Packing	0.45	1%
Retailer Margin	8.45	11%
Final Avg.Price for Consumer	77.56	
PROFIT / Value addition (Final Sale Price - Seashore Price)	20.38	59%
*- Avg. Sale Price Fixed by Fishermen at Seashore / Village.		

Table 10 shows that retailer will be involving in different value chain operations like cutting, washing etc. there is 59% price increase after retail value added operations to the product.

14. COMPARISON BETWEEN VALUE ADDED SELLING AND NON-VALUE ADDED SELLING

Table 11: Comparison between value added selling and non-value added selling

Value Chain Actor	Value Added Selling		Non-Value Added Selling		Difference	
	Profit		Profit		diff.	diff.
	Rs./Kg	%	Rs./Kg	%	Rs./Kg	%
Fishermen Intermediary Marketing	22.18	38%	7	17%	15.18	68%
Fishermen Direct Marketing Consumer	39.28	52%	13	27%	26.28	67%
Fishermen Direct Marketing Company	52.18	59%	25	31%	27.18	52%
Middlemen	36.46	38%	13	24%	23.46	64%
Head loader	53.72	62%	20	8%	33.72	63%
Cycle Carrier	63.72	66%	25	11%	38.72	61%
Retailer	45.65	59%	10	15%	35.65	78%

The findings of the study are summarised in the Table 11. As it shows, the value chain actor and their profit after selling the product to the customer are presented.

- The fishermen practicing intermediary marketing and performing value added operations are getting 68% more returns than non-value added selling.
- The fishermen practicing direct marketing to consumer and performing value added operations are getting 67% more returns than non-value added selling.
- The fishermen practicing direct marketing to company and performing value added operations are getting 52% more returns than non-value added selling.
- The middlemen performing value added operations are getting 64% more returns than non-value added selling.
- The middlemen performing value added operations are getting 63% more returns than non-value added selling.
- The head loader performing value added operations are getting 63% more returns than non-value added selling.
- The cycle carriers performing value added operations are getting 61% more returns than non-value added selling.
- The retailers performing value added operations are getting 78% more returns than non-value added selling.

15. CONCLUSION

It can be concluded that in the sample of fishermen, 16 percent fishermen are not performing any value addition activities and straight away selling fish catch to either middlemen or retailer whereas 84 percent fishermen are performing value added operations ranging from two or three to six or seven different value addition processes. The most used value added activities for fresh fish are cleaning, grading, separating, washing, weighing, icing and packaging. The value addition operations by different people like fishermen, middlemen, retailer, head loader and cycle carrier

are analysed and it is found that on an average 12 percent value is being added to fish if they perform value addition processes. Therefore it is strongly recommended to all the players of the fish supply chain to practice value chain management in order to get more value in terms of price to vendor and satisfaction to customer in terms of convenience of using the product.

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