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A Study On Value Chain Management Practices Of Fresh Fish: An Empirical Study Of Coastal Andhra Pradesh Marine Fisheries

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Abstract:- Value Chain Analysis is one of the Managerial Strategies that can reduce various costs associated with processing and can improve the quality and productivity/processing of the product, also reduces distribution cost. The primary objective of the study is to adopt Michael
Porter (1985) Value Chain model to processing of marine fisheries and thereby suggesting cost effective value chain from fishermen to consumer. Value Chain Management in fisheries will help the fishermen in offering great value with minimum cost. This Study analyses cost of value addition processes being performed by fishermen in Coastal area of Andhra Pradesh state and proposes to concentrate on the processes which are of value added and not to concentrate on the processes which are of non-value added.

Keywords:- Value Chain, Value chain analysis, Fresh fish value chain, Value addition, Factor analysis.

I. INTRODUCTION

Marine fisheries are the natural resources, not only been the custodian of livelihood security of the coastal populace but also support the productive and protective habitats. Fishery is the oldest and most important livelihood option for the inhabitants of the coastal line of the country since times immemorial. Fish as a food item is relished by more than sixty percent of the people of India. Fisheries play a pivotal role in the socio-economic development of the country. It is just not a food item for internal consumption but also it is a commodity that can earn foreign exchange. Marine fisheries generate good employment and incomes for a large section of backward and economically weaker sections of the coastal community.

India with a long coastline of 8,129 km, two million sq. km of Exclusive Economic Zone and 1.2 million hectares of brackish water bodies, offers a vast potential for development of fisheries. Against an estimated fishery potential of 3.9 million tonnes from marine sector, only 3.1 million tonnes are tapped. Fishing efforts are largely confined to the inshore waters through artisanal, traditional, mechanised sectors. About 90 percent of the present production from the marine sector is from within a depth range of 50 to 70 meters and remaining 10 percent from depths extending up to 200 meters. While 93 percent of the production is contributed by artisanal, mechanised and motorised sector, the remaining 7 percent is contributed by deep-sea fishing fleets, confining their operation mainly to the shrimp grounds along the upper East Coast (Reports, Dept. of Fisheries, Govt. of India).

Andhra Pradesh has nine coastal districts (Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasham, Nellore) covering 974 Kms of coastline from Srikakulam to Nellore and owning rich marine resources containing mainly of fin fishes, crustaceans and molluscs. While India has a coast line of 8,041 Kms covering 5,06,000 Sq.Kms, continental Shelf-area and 3,726 marine villages with 2,333 landing centres, Andhra Pradesh covers 974 Kms coastline covering 31,000 Sq.Kms, continental shelf-area and 508 marine villages and 508 landing centres. When compared with all India level, Andhra Pradesh has 12.11 percent of Indian coastline, 6.13 percent of continental shelf-area, 13.28 percent of villages and 20 percent of landing centres of Indian fisheries resources (Source: MPEDA, Visakhapatnam). Within the Bay of Bengal states of India Andhra Pradesh occupies first position in owning number of fishing vessels, freezing plants and peeling sheds. But in terms of availability of infrastructure facilities per landing centre, Andhra Pradesh occupies the least position except in the availability of ice plants per landing centre. This

shows that there is a need for the development of infrastructure facilities per landing centre particularly facilities like fishing vessels, cold storage, freezing plants, for the development of the fishing industry. Andhra Pradesh occupies the second rank in landing centres in India and also occupies the second place in availability of infrastructure facilities in Bay of Bengal Region. But in case of production per square kilo meter of coastline it is the least and stood 11th which is the least among the Bay of Bengal States.

II. RESEARCH QUESTION

In India, the fisheries sector is still considered as an unorganised sector, the practices and processes of the trade are performed in unorganised manner. The study will try to adopt modern management tools and strategies, performing scientific and statistical calculations in finding out different value addition processes of marine fisheries along with its cost to propose cost effective value chains. The study differentiates value added processes from non-value added processes to offer great value with minimum cost.

III. REVIEW OF LITERATURE

The Value Chain framework has been used as a powerful analysis tool for the strategic planning for nearly two decades. The aim of the value chain framework is to maximise value creation while minimising costs. The concept of value addition, in the form of the value chain, can be utilized to develop sustainable competitive advantage in the business arena of the 21st Century. 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. All organisations consist of activities that link together to develop the value of the business, and together these activities form the organisation's value chain. Such activities may include purchasing activities, manufacturing the products, distribution and marketing of the company's products and activities (Lynch, 2003).

The Value Chain framework of Porter (1990) is "an interdependent system or network of activities, connected by linkages". When the system is managed carefully, the linkages can be a vital source of competitive advantage (Pathania-Jain, 2001). The Value Chain analysis 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 (Lynch, 2003). The Value Chain describes 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 offered a definition of value chain in 1985 in his book "Competitive Advantage". He stated, "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" (Porter, 1985, p.26). "The value chain disaggregates a firm into its strategically relevant activities in order to understand the behaviour of costs and the existing and potential sources of differentiation." (Porter, 1985, p.33)

The objective of value systems is to position organizations in the supply chain to achieve the highest levels of customer satisfaction and value while effectively exploiting the competencies of all organizations in the supply chain (Handfield and Nichols, 2002). Value chain analysis can be a useful analytical tool in understanding the policy environment in terms of efficiency in allocation of resources within the domestic economy while at the same time understanding the manner in which firms and countries are participating in the global economy (Kaplinsky and Morris, 2007).

Unfortunately there are less or no empirical reviews that were organised value chain research in marine fisheries. To note a few reviews, the following are the previous studies. Devi Prasad (2012) conducted value chain research on Dry Fish and find that that fishermen cost of fish is Rs.18/kg at seashore with transportations charges Rs.0.80/Kg for brining the fish catch to the village. After value addition operations like cleaning (Rs.1.50/kg), Washing (Rs.1.89/kg), Salt Mixing (Rs.0.79/kg), Preservatives Mixing (Rs.2.84/kg), Sun drying (Rs. 3.89/kg) and Packaging (2.20/kg), the value has been increased to Rs.31.91/Kg. Overall there is 43% (Profit - Rs.13.91/kg) price increase added to the product. In another study of Devi Prasad (2011) which was organised on Export Marine Fisheries identified that The Exporter buys the raw fish at the rate i.e. the Average product (fish) cost per KG is Rs.350/-, the Average Transportation (from seashore to processing plant of exporter) cost per KG is Rs. 0.18/-, the Average Labour cost per KG is Rs.0.08/-. It was found that Value Addition (Price Improvement) Processing Stages like Washing & Icing (Rs 0.5/-), Sorting & Grading (Rs 4.07/-), Freezing (Rs

5.5/-), Glazing & Hardening (Rs 2.5/-), Weighing & Packing (Rs 4/-), Metal Detecting (Rs 1/-), Packing & Marking (Rs 5.07/-), Frozen Storage (Rs 5.28/-) and finally Shipment (Rs 25/-). A raw fish Average Cost per KG is Rs.350.26/-, after Value Chain Management process, the product will be selling at Average Price of Rs. 427 / KG.

IV. OBJECTIVES OF THE STUDY

1. Identification different value chain processes that are followed by fishermen in Andhra Pradesh Marine fisheries sector.
2. Identification of cost of each value addition process and identification of the value (price) added to the product i.e. fresh fish.
3. Identifying the correlations among value addition process and their contribution in final price of fresh fish.
4. Finally suggesting cost effective value chains to the fishermen to get good price and offer great value to the customer.

V. METHODOLOGY AND DATA SOURCES

The study sampling was done to incorporate fishermen to produce a complete picture of the fresh fish value chain in Andhra Pradesh. Quota sampling technique was adopted to collect data from fishermen from respective coastal districts. Each Coastal District is considered as quota and there are nine coastal districts in Andhra Pradesh. From each district, 50 fishermen will be selected randomly to collect data within a district to observe VCM (Value Chain management) processes performed by them. The following tools are used to analyse that data empirically.

Means, Proportions and Ranks: Most of the analysis is simple and relied on comparing means (average) and proportion. The VCM processes are ranked basing on the frequency of VCM processes performed.

Factor Analysis: It is a statistical technique used for determining the underlying factors or forces among a large number of interdependent variables or measures (Krishnaswami and Ranganatham, 2007). In social sciences studies, variables cannot be measured directly. Such variables are usually referred as "latent" variables and can be measured by qualitative propositions to reflect the perceptions of the respondents. The factors generated are used to simplify the interpretation of the observed variables. There are eleven Value Chain Management (VCM) processes which are identified during the field study and factor analysis was performed on the data of frequency of VCM processes to identify more frequently performed VCM processes and less frequently performed VCM processes by the fishermen based on the factor loadings. The factor loadings are the correlation coefficients between the variables and factors. Factor loadings are the basis for imputing a label to different factors. Like Pearson's correlation coefficient "r", the squared factor loading is the percentage of variance in the variable, explained by a factor.

Eigen Values: The Eigen value for a given factor reflects the variance in all the variables, which is accounted for by that factor. A factor's Eigen value may be computed as the sum of its squared factor loadings for all the variables. The ratio of Eigen values is the ratio of explanatory importance of the factors with respect to the variables. Eigen Value or Latent root is the sum of squared values of factor loadings relating to a factor (Krishnaswami and Ranganatham 2007).

Chi-Square Test: Using the information provided in each grouped factor, Chi-square test is used to test the significance of the cumulative explanation of variance. If the Calculated Chi- square value is found to be significant (if it is above the table value) the factor/factors are considered as proper and used the factor scores as Indices for further analysis.

KMO Measure: Kaiser-Meyer-Olkin measure of sampling adequacy is performed in factor analysis to determine whether the factor should be considered for further analysis or not. If KMO measure is greater than threshold value of .5, then only the factor should be considered for further analysis: (Hair et al. 1998).

Bartlett's Test of Sphericity: In order to find out the appropriateness of factor analysis for the set of variables Bartlett's Test is used. It measures the correlation of variables where the probability of less than .05 ($p < .05$) is acceptable: (Akansha Anchaliya et al. 2012).

Cronbach's Alpha: The value was calculated for the questionnaire administrated in order to determine the reliability of the data where the alpha value is greater than .70 is the recommended level: (Bernardi 1994).

Regression Analysis: Multiple Regression is a technique that allows additional factors to enter the analysis separately so that the effect of each can be estimated. It is variable for quantifying the impact of various simultaneous influences upon a single dependent variable. Further because of omitted variables bias with simple regression, multiple regression are often essential even when the investigator is only interested in the effects of one of the independent variables. The multiple correlation coefficients, is that correlation between the observed and predicted values of the dependent variable: (Harshna Maheshwari et al. 2012). The final price of the fish was considered as independent variable and the dependent variables were costs of all value addition processes to map cost effective value chain and observe the correlations between cost of value addition process and the final price. This regression analysis also helps to analyse the contribution of each value addition processes in increasing or decreasing the final price of the fresh fish.

Factor Analysis, regression analysis and other data calculations are done with the available statistical packages Statistica.

Identification different Value Chain Management processes that are followed by fishermen in Andhra Pradesh Marine fisheries sector

The Value Chain Management Processes in fisheries refers to the activities performed by the value chain players (like fishermen, middlemen, warehouser, wholesaler, retailer etc) to make it storable, fish easy to prepare, eatable etc. The perishable product like fish needs a few number of activities that increase the value of fish in terms of quality and price. From the field study and interviews, the identified Value Chain Management processes in Andhra Pradesh Marine fisheries sector are described in table 1.

Table 1: Identification of Value Chain Management processes

S.No.	VCM Process	Description
1	Cleaning	After Catching fish from sea, the fish catch will be cleaned with clean water at the sea shore / village.
2	Sorting	After cleaning, the fish catch will be sorted according to the size into groups.
3	Grading	After Sorting, the groups are regrouped according to the type of species. The grade will be given to the species according to the demand in the market.
4	Weighing	The Graded fish will be weighed for packing.
5	Deheading	In market place / sea shore / warehouse, the retailer / processor will process the fish for convenience purpose. The head part of the fish will be removed to cook.
6	Removal of Slime	The Slime of the fish will be removed.
7	Cutting fins	The fins of the fish will be removed.
8	Meat Bone Separation	To make the fish boneless, this separation will take place.
9	Icing	After fish is fully processed, the pieces are mixed with ice for storage purpose.
10	Packaging	The mixture of fish pieces are packaged in thermo cool packages.
11	Branding	The fish produce will finally be given brand names along with commercialisation tools.
Source: field study and interviews with fishermen		

Identification of cost of each value addition process and identification of value (price) added to the product i.e. fresh fish.

Table 2: Fresh Fish Value Chain

Particulars of Item	**Avg. Price Rs. / Kg**	**Contribution to final price (Rs.74.66/-)**
Fisherman Price at Seashore	41.98	56%
Cost of Catching	8.02	11%
HR Cost	1.38	2%
Transportation cost to Village	1.62	2%
Price without Value Addition	**53**	**71%**
Value Addition Operations by fisherman		
Cleaning	0.59	1%
Sorting	1.29	2%
Grading	1.88	3%
Weighing	1.43	2%
Deheading	0.92	1%
Removal of Slime	1.53	2%
Cutting fins	1.23	2%
Meat Bone Separation	2.98	4%
Icing	2.44	3%
Packaging	2.84	4%
Branding	4.53	6%
Price with Value Addition	**74.66**	**100%**

Source: Date collection through questionnaire

Table 2 shows that there is 29% value increased to the product after performing value chain operations by fishermen for fish. Fisher man price (average) at sea shore is fixed at Rs.41.98 / kg. The average cost of catching is Rs.8.02/- (includes cost of bait, cost of get (to catch fish), fuel cost), average HR cost is Rs.1.38/- (includes wages for manpower on boat), average transportation cost from sea shore to village is Rs.1.62/- and thereby to market. Finally the average product price will reach to Rs.53 / kg without performing Value Chain Management processes.

The final average price has been increased from Rs.53/- to Rs.74.66/- per KG (29% increase) after performing value chain operations. The price increase after cleaning Rs.0.59/- (1% increase), Sorting Rs.1.29 (2%), Grading Rs.1.88 (3%), Weighing Rs.1.43 (2%), Deheading Rs.0.92 (1%), Removal of Slime Rs.1.53 (2%), Cutting fins Rs.1.23 (2%), Meat Bone Separation Rs.2.98 (4%), Icing Rs.2.44 (3%), Packaging Rs.2.84 (4%) and Branding Rs.4.53 (6%), finally price reaches to Rs. 74.66/- per KG. Hence it can be suggested to the fishermen to go for performing value chain operations for better price.

Identifying the correlations among value addition process and their contribution to final price of fresh fish

In this section an attempt has been made to find out the associations among the VCM processes and their contribution to the final price. To know that, this section is divided into three parts. Part ONE discusses about the contribution of VCM processes in the final price. Part TWO discusses about frequency of performing VCM processes by the fishermen. This analysis will enable to find out the VCM processes that are given importance by the fishermen. Part THREE discusses about correlating frequency of performing VCM processes and their contributions in the final price thereby identifying high value added processes and non-value added processes.

Part One: Analysis of Contribution of VCM Processes in Final Price

In this section an attempt has been made to analyse the associations among eleven VCM processes and their contribution to the final price. Considering final price of fish as dependent variable and VCM processes as independent variables, a multiple regression model is proposed as follows.

Final price = f (Fisherman Price at Seashore, Cost of Catching, HR Cost, Transportation cost to Village, Cleaning, Sorting, Grading, Weighing, Deheading, Removal of Slime, Cutting Fins, Meat Bone Separation, Icing, Packaging and Branding). **[1]**

Table 3: Model Summary

					Change Statistics				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**R Square Change**	**F Change**	**df1**	**df2**	**Sig.**
1	0.89801459	0.896033	0.895869	0.00497	1	6059.6	15	362	.000

The proposed model is statistically significant at 0.000 level with an f value 6059.6 as shown in the table 3, R is found to be 0.898 and R^2 is found to be 0.896. Hence it can be concluded that all the independent variables are able to explain 89.6% in dependent variable. That means there is a significant relationship between value additions with VCM processes to the final price. In further analysis, all the fifteen independent variables of VCM processes have together explained 89% (adjusted R^2) of the variance in final price.

Final Price = 0.694556 + 0.573568 Fisherman_Price_at_Seashore
+0.216381 Cost_of_Catching + 0.049798 HR_Cost
+ 0.051408 Transportation_cost_to_Village
+ 0.028138 Cleaning + 0.036198 Sorting + 0.061903 Grading
+ 0.040178 Weighing - 0.002515 Deheading
+ 0.045577 Removal of Slime - 0.075533 Cutting Fins
+ 0.187094 Meat Bone Separation + 0.054969 Icing
+ 0.067018 Packaging + 0.063393 Branding **[2]**

Table 4: Regression Coefficients

Model	**Variables**		**St. Err.**		**St. Err.**		
1		**BETA**	**of BETA**	**B**	**of B**	**t(362)**	**p-level**
0	(Constant)			0.694556	0.031359	22.14843	0
1	Fisherman Price at Seashore	0.573568	0.003935	0.568581	0.003901	145.758	0*
2	Cost of Catching	0.216381	0.006371	0.102951	0.003031	33.96509	0*
3	HR Cost	0.049798	0.004512	0.02433	0.002204	11.03652	1.32E-24
4	Transportation cost to Village	0.051408	0.006302	0.024369	0.002987	8.157552	5.69E-15
5	Cleaning	0.028138	0.003475	0.00974	0.001203	8.098162	8.61E-15
6	Sorting	0.036198	0.005228	0.010857	0.001568	6.923558	2.02E-11
7	Grading	0.061903	0.006307	0.02179	0.00222	9.814688	2.57E-20
8	Weighing	0.040178	0.004675	0.014224	0.001655	8.594372	2.55E-16
9	Deheading	-0.002515	0.003349	-2.67E-05	3.56E-05	-0.75099	0.453146
10	Removal of Slime	0.045577	0.279576	0.019788	0.12138	0.163022	0.870592
11	Cutting fins	-0.075533	0.170253	-0.024994	0.056338	-0.44365	0.65756
12	Meat bone separation	0.187094	0.112564	0.163619	0.09844	1.662115	0.097355
13	Icing	0.054969	0.007006	0.028412	0.003621	7.846026	4.89E-14
14	Packaging	0.067018	0.006353	0.043497	0.004124	10.54837	7.32E-23
15	Branding	0.063393	0.005584	0.067291	0.005927	11.35274	9.3E-26

Out of fifteen independent variables shown in table 4, only two variables are found to be significant i.e. Fisherman Price at Seashore and Cost of Catching are found to be significant as they are highest contributors of

the final price as expected. Among VCM processes, Grading, Packaging and Branding are the next highest contributors to the final price. Icing is the next value-adder followed by Removal of slime and Weighing. The VCM processes Sorting, Cleaning and Meat bone separation are less value adders according to the model. Two variables i.e. Deheading and Cutting fins are expressing negative correlations with final price.

It can be concluded that the fishermen have to pay more concentration on Grading, Packaging and Branding respectively in order to have good final price. After that, Icing, Removal of slime and Weighing processes have to be given further significance. Sorting, Cleaning and Meat bone separation are other VCM processes to lay emphasis on getting better price for fish produce.

Part Two: Analysis of frequency of Value Chain Management Operations

In this section an attempt has been made to analyse the frequency of performing VCM operations on the fish produce using factor analysis method. The objective behind performing factor analysis is to identify the most frequently performed VCM processes and also to identify less frequently performed VCM processes. The statistical tool - factor analysis reduces the data (eliminates the processes) which are not contributing to the purpose; also it will identify the significant processes by assigning highest factor scores. As the highly contributing VCM processes in the final price are already identified in regression model [2], a comparative analysis can be performed between VCM processes from regression model based on price and VCM processes from factor analysis based on frequency. There is every chance that the fishermen may not be performing a particular VCM process frequently which is highly contributing to the final price. Also there are possibilities that the fishermen may be performing a particular VCM process frequently which is not a good contributor to the final price. Keeping this situation in view, the factor analysis was performed on the data of frequency of performing VCM processes to know the most frequently performed VCM processes and the less frequently performed VCM processes.

Performing Factor Analysis on frequency of Value Chain Management Operations

The fishermen were asked to respond on a five point likert scale (every time [5], frequently [4], sometimes [3], rare [2], never [1]) regarding identified eleven VCM processes i.e. cleaning, sorting, grading, weighing, deheading, removal of slime, cutting fins, meat bone separation, icing, packaging and branding. To determine the data reliability, Reliability test was performed on the data of frequency of performing VCM processes. The value of the Cronbach's Alpha is found to be 0.717, which shows the data of frequency of performing VCM processes is 71.7% reliable which ensures to proceed for further analysis.

Reliability of Data: Kaiser Meyer Olkin (KMO) and Bartlett's Test for Frequency of Performing VCM Processes

Table 5: KMO and Bartlett's Test for Frequency of Performing VCM Processes

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.612
Bartlett's Test of Sphericity	Approx. Chi-Square	102.663
	df	55
	Sig.	.000
Source: Factor Analysis Data Reduction (SPSS 16.0)		

To determine the appropriateness of factor analysis on the data of frequency of performing identified VCM processes, Kaiser Meyer Olkin (KMO) and Bartlett's Test was performed as shown in table 5. The KMO measure is observed to be 0.612 which is higher than the threshold value of .5 (Hair et al. 1998). So it can be interpreted that there is no error in 61.2% of the sample and remaining 38.8% there may occur some sort of error. Bartlett's Test of Spherincity (χ^2 =102.663) is found to be significant ($p < .001$, df 55). Finally it can be concluded that the data collected on frequency of performing VCM processes is appropriate for factor analysis.

Factors – Frequency of Performing VCM Processes

Table 6: Factors - Frequency of Performing VCM Processes

Factor	Eigen Values	% Total variance	Cumulative %
FACTOR 1	1.391	12.65	12.65
FACTOR 2	1.231	11.19	23.84
FACTOR 3	1.174	10.67	34.51
FACTOR 4	1.157	10.52	45.03
FACTOR 5	1.036	9.42	54.45

Source: Factor Analysis Data Reduction (SPSS 16.0)

Factor analysis was performed to analyse the frequency of performing value chain operations the study area. The application was done in Statistica. The factor analysis was performed using principle component extraction method with varimax rotation. After performing factor analysis, all eleven variables were reduced to five factor dimensions, which explained 54.45% of cumulative variance which is indicating that the variance of original values was captured by these five factors as shown in table 6.

Factor Scores Matrix - Frequency of Performing VCM Processes

Table 7: Factor Scores Matrix - Value Chain Operations (frequency)

Variables	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
Grading	0.792				
Sorting	0.716				
Deheading		0.626			
Weighing		0.616			
Cutting fins			0.711		
Icing				0.585	
Cleaning				0.508	
Removal of Slime					0.933

Variables Removed: Meat Bone Separation, Packaging and Branding
Source: Factor Analysis Data Reduction (SPSS 16.0)

The factor scores matrix of frequency of VCM process shows the associated variables in all the five factors and their relative factor scores are presented in table 7. The factor scores in the factor scores matrix represent the priority of performing VCM processes.

- The first factor is formed with an Eigen value of 1.391, variance of 12.65% and two associated variables. The associated variables are Grading (0.792) and Sorting (factor score 0.716).
- The second factor is formed with an Eigen value of 1.231, variance of 11.19% and two associated variables. The associated variables are Deheading (0.626) and Weighing (0.616).
- The third factor is formed with an Eigen value of 1.174, variance of 10.67% and one associated variable. The associated variable is Cutting Fins (0.711).
- The fourth factor is formed with an Eigen value of 1.157, variance of 10.52% and two associated variables. The associated variables are Icing (0.585) and Cleaning (0.508).
- The fifth factor is formed with an Eigen value of 1.036, variance of 9.42% and one associated variable. The associated variable is Removal of Slime (0.933).
- Three variables, Meat Bone Separation, Packaging and Branding are eliminated while performing factor analysis with statistical package SPSS.

Analysis of results of Regression model and Factor Analysis

This section attempts to correlate the results obtained through the regression model (performed on final price and contribution of VCM processes to final price) and the results of factor analysis (Frequency of performing VCM processes).

According to the regression model, Grading, Packaging and Branding are most significant contributors to the final price. But according to the factor analysis results, three VCM process i.e. Meat Bone Separation, Packaging and Branding are eliminated because the fishermen are not performing these processes regularly. So it can be interpreted that the fishermen are not performing Packaging and Branding processes regularly which are better contributors for the final price. Hence it can be suggested that the fishermen have to perform Packaging and Branding regularly because of them they can get better price.

According to the regression model, Icing, Removal of slime and Weighing are next best significant contributors to the final price. But according to the factor analysis results, Icing and Removal of Slime are less frequently performed VCM processes as they are presented at the bottom of factor scores matrix. So it can be interpreted that the fishermen are not performing the processes- Icing and Removal of Slime regularly which are good contributors for the final price. Hence it can be suggested that the fishermen have to perform Icing and Removal of Slime regularly because of them they can get good price.

It should be noted that the VCM process Weighing has got good significance in regression model and in the factor analysis results also Weighing is found to be regularly performed VCM process by the fishermen. It can be interpreted that the fishermen are rightly performing the Weighing process as required to get good price.

According to the regression model, the VCM process Sorting is less value-adder to the final price. But according to the factor analysis results, Sorting is regularly performed VCM processes as they are presented at the top of factor scores matrix. It can be interpreted that the fishermen are performing Sorting process regularly even though it is as less value-adder to the final price. The General practice by the fishermen is that they sort the fish catch according to the size first and then they go for grading of the fish according to the type of species. It can be suggested that the fishermen, if they have the intension to grade the fish catch, it is suggested that not to perform the sorting process directly and perform the grading process first. It will save the valuable time of fishermen. If the fish catch is not required to grade and fish catch is of similar type of species, then only go for sorting.

Cost effective Value Chain to the fishermen to get good price and offer great value to the customer.

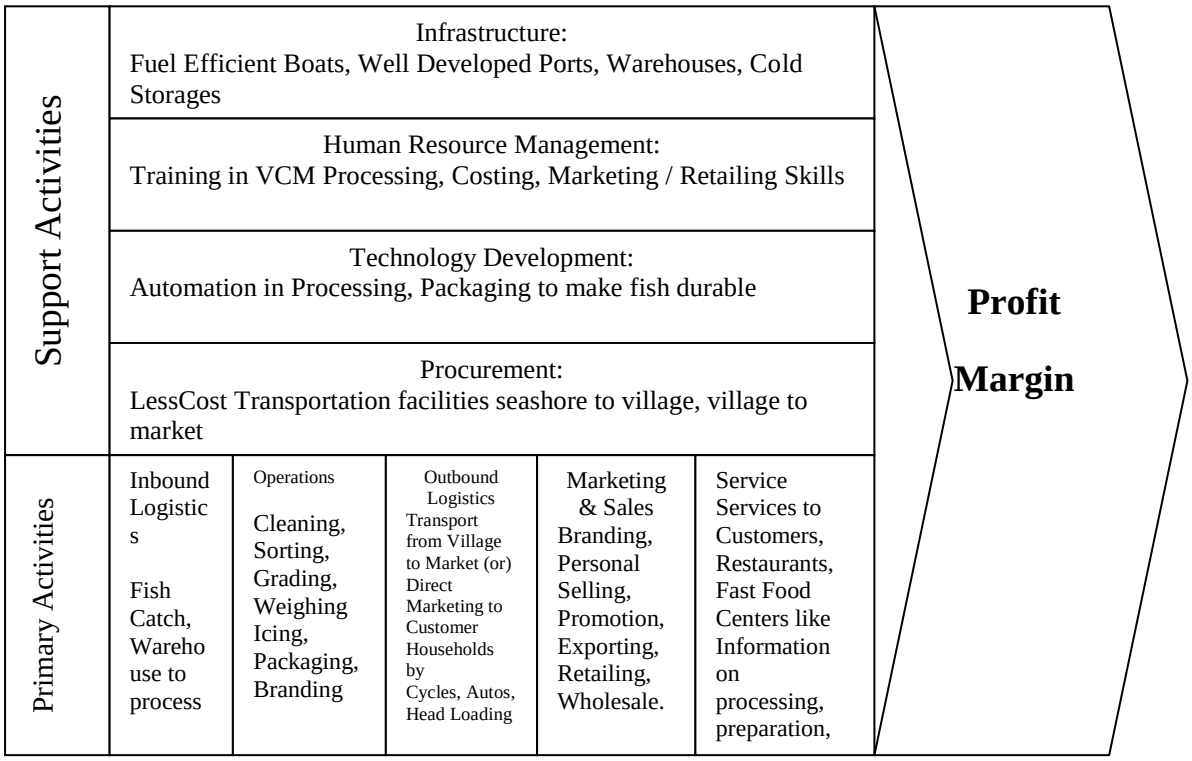

Figure 1: Fresh Fish Value Chain Model

Figure 1 proposes an adapted value chain model for fresh fish based on Michael Porter Value Chain model. The attributes of Primary Activities and Secondary Activities are proposed based on observations during the fieldwork. If the Government bodies and policy makers are able to implement in the proposed model, the fishermen can get good profit margin for their fish catch. The underperforming fisheries sector can perform rightly and can contribute to the GDP of the state as well as the country. With minor modifications, according to the conditions of the other fishing activities, this model can be adopted by the fishing community across the country and all over the world.

Figure 2: Cost Effective Value Chain Model for Fresh Fish

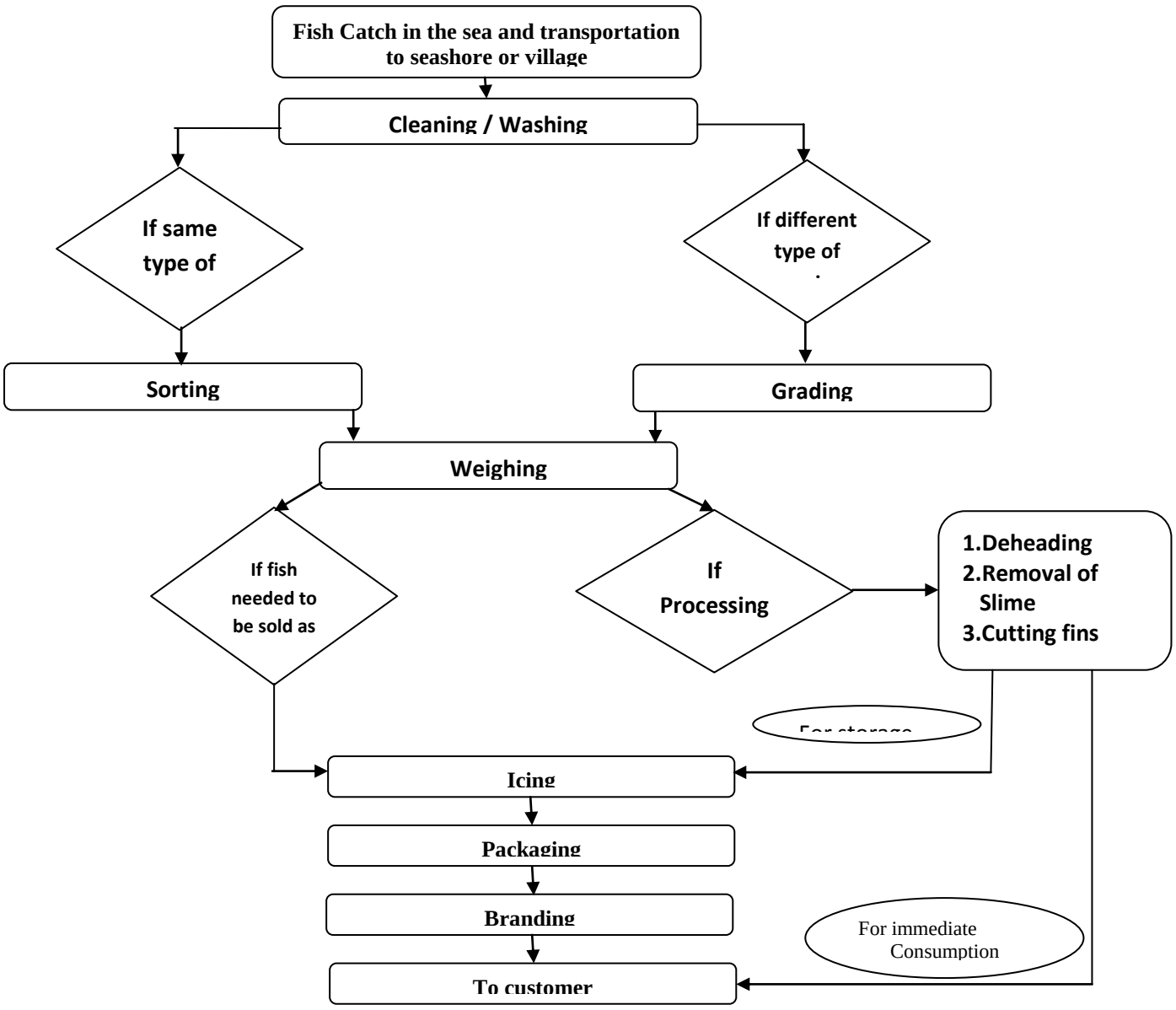

Figure 2 proposes a cost effective value chain model for the fishermen based on the findings of the study. Finally to conclude, Value Chain Management enables the fishermen to get more value for the same

product. An effective Value Chain Management practice encourages value added activities and discourages non value added activities in the processing of the produce. The fishermen community has to identify value added activities in fish processing to perform frequently and also identify non value added activities in processing either not to perform or to perform less frequently.

REFERENCES

[1]. Akansha Anchaliya, Ekta Chitnis, Ira Bapna, Gitanjali Shrivastava. 2012. Job Satisfaction of bank employees – A comparative study of Public and private sector. . In Ritu Sinha, R.S.Ghosh, Svetlana Tatuskar, Shweta Maheswari (Eds.). Ensisage 2020: Emerging Business Practices: 103-116, Excel: New Delhi.
[2]. Bernardi R A.1994. Validating research results when Cronbach's Alpha is below .70: A Methodological procedure. Educational and Psychological Measurement. Vol.54. No.3. 766-775.
[3]. Devi Prasad Kotni V V**.** 2012. A Study on Dry Fish Value Chain Management Practices in Indian Marine Fisheries. South Asian Journal of Social and Political Studies (SAJOSPS). Vol. 13, No.1, 78- 83.
[4]. Devi Prasad, Kotni V V. 2011. Value Chain Management Practices in Marine Fisheries: A Special Reference to Coastal Andhra Pradesh. PES Business Review, Vol.6, No.1, 59-70.
[5]. Hair J F, Anderson R E, Tatham R L, Black W C. 1998. Multivariate data analysis. 5th ed, New Jersey: Prentice Hall, Inc.
[6]. Handfield and Nichols. 2002. Supply Chain Redesign. Financial Times Management, 11-12.
[7]. Harshna Maheshwari, Shiji Lyndon, Shamira Malekar. 2012. Job Satisfaction of bank employees – A comparative study of Public and private sector. In Ritu Sinha, R.S.Ghosh, Svetlana Tatuskar, Shweta Maheswari (Eds.). Ensisage 2020: Emerging Business Practices: 103-116, Excel: New Delhi.
[8]. Kaplinsky, Raphael and Morris, Mike.2007. A Handbook for Value Chain Research, International Development Research Centre.
[9]. Krishnaswami O R, Ranganatham M. 2007. Methodology of Research in Social Sciences, Hyderabad: Himalaya Publishing House, 338-339.
[10]. Lynch, R. 2003. Corporate Strategy, 3rd ed., Prentice Hall Financial Times.
[11]. Marine Products Exports Development Authority, Visakhapatnam.
[12]. Pathania-Jain, G. 2001. Global parents, local partners: A value-chain analysis of collaborative strategies of media firms in India. Journal of Media Economics, Vol. 14, No. 3, 169-187.
[13]. Porter, M. E. 1990. The competitive advantage of nations, New York: Free Press.
[14]. Porter M. E 1985. Competitive Advantage: Creating and Sustaining Superior Performance, New York: The Free Press.