



# Value Chain Analysis of Fishery in Puri and Ganjam District of Orissa

DRAFT REPORT



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## Executive Summary

NiMble system has completed the research on “Value Chain analysis of Fishery in Puri and Ganjam District of Orissa”. The study was taken up with the objective of identification of local and regional market potential for each main species of fish commonly found in the catch of artisanal fisherfolk in Ganjam and Puri district and to provide information on the price of each of these fish species in local and regional markets.

The study methodology included both desk research and primary research in Puri and Ganjam district and also in various regional markets. Various tools and technique of research including structured questionnaire, personal interviews, group discussion, etc. were employed during the primary study. A sample of 212 respondents from different sections of the fishery trade was covered in the study. The study has employed two framework viz. BCG matrix and VRIO analysis for interpretation and understanding of the supply chain. Statistical analysis of the data generated from the field study was undertaken.

A policy review of the central and state government pertaining to fishery has been taken up to understand the ‘legislative or governing factors’ or the ‘rules of trade’. The implication and impact of the legislative policies on the trade and the various stakeholders has been analyzed.

The study has developed market and product segmentation of the fishery product lines to induce business understanding of the entire gamut of available products. It has listed down the characteristic of the different markets and the specific requirement of the fish species in these markets. The study has come out with the profitability index of the various species found in the catch of Puri and Ganjam artisanal fisher folk and also for the various players of the trade. The above two information’s, when collated together, will help to determine the business planning and strategize it as per the intervention design.

The study identifies the different value chains present in the trade and map it for the various market and product segment. It also gives a detail description of the various players involved, their roles and responsibilities, the cost of operation and the barriers to entry, mobility and exit at various points of the value chain.

The research undertakes a business analysis to understand the “production –distribution – consumption” complex in the new business environment of the ‘new economy’. It looks into the intricacies of “Primary Phase- Secondary Phase Articulation” i.e. the existing production and industrial phase linkages. It further delves upon the dynamics of the current trade issues of socio – cultural, political and economic importance. The gender concern in the trade has also been researched in light of the existing trade scenario.

An indicative cost of operation of the various operators based on the primary study has been developed which can act as a ready reckoner for intervention design. The study has undertaken a “cause effect” analysis (Fish Bone Analysis) to determine the causes of poor livelihood of the fisher folk of Puri and Ganjam districts. Further more “VRIO” trade analysis framework has been employed to develop a broader picture in terms of present supply chain.

The important finding of the research indicates that the fishery value chain is dominated by few big players viz. the export houses and big traders. Moreover, they define and determine the “rules of the trade” in Puri and Ganjam district. The number of intermediaries is high and hence adds up to the cost of product without adding much value to the value chain. On an average 20-25% of the value of the final product goes back to the fishermen. The research points out the presence of ‘patron-client relationship’ throughout the supply chain which is prevalent in both the districts. Credit is another impeding factor which has led to the development of this relationship, thus down sizing the importance and control of the fisher folk on the trade. The infrastructure to support the trade is a limiting factor in development of fishery trade.

The research indicates that the demand for fishes in the regional markets is dominated mainly by few preferential species. The research points that the operators of trade in the regional market are agents who sometime also perform the role of a wholesaler. In the regional markets, auction is the most common prevailing system for determination of prices. Normally the landing center “Gaddiwala’s” are tied up to agents in the regional market.

The research indicates a weak regulatory control over the trade by the government. The enforcement of rules and regulation, government programs and scheme requires a distinct effort to produce intended result. It is worth mentioning that the trade portrays a dismal picture for the women players as the market practices are not suited to their convenience. Lack of education, infrastructure facilities and basic amenities make them vulnerable to exploitation by the dominant players.

The research makes recommendation at two level i.e. policy and business improvement. At policy level, the study recommends policy adequacy for enforcement of regulations, creation of ‘Fishery Produce Marketing Committees’, setting of transparent and streamlined auction mechanism, strengthening the infrastructure facilities, establishment of ‘Community Property Rights’ over near shore fishing activities, disbursement of credit using formal channels and ‘First Right Over Catch’ to fishermen groups.

In business improvement, NiMble recommends two prong interventions i.e. strengthening the existing Supply Chain in short term and long term perspective. In short term perspective, efforts should be directed to improve financial resources, market tie-ups, using services of trained marketer for business development, establishment of cold chain /stores and transportation establishment of market intelligence system. In long term perspective, the opportunities which Nimble sees in fishery are at three avenues firstly new fishery activities, secondly transformation of traditional fishery activities and thirdly foreign trade. The objective of putting forth the business avenues is to have a foresight into future prospects so that the present intervention can be aligned with them.

Finally NiMble will recommend in-depth investigation for business prospect of processed food products of fish and explore the market potential of the same. This investigation should focus on consumer market for FMCG goods.

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## Abbreviations

1. % - Percent
2. AM – Ante Meridian
3. BLC – Beach Landing crafts
4. 'BCG' Matrix – Bostan Consultancy Group Matrix
5. CRZ Notification – Coastal Regulation Zone Notification
6. CDA – Chilka Development Authority
7. DOF – Directorate of Fishery, Orissa
8. *EEZ* – Exclusive Economic Zone
9. EU norms – European Union norms
10. FRP's – Fiber Reinforced Plastic boat
11. FISHFED - Orissa State Fisherman's Co-operative Federation Ltd.
12. FDA norms – Food and Drug Administration's norms; USA
13. GDP – Gross domestic product
14. IBM's – Inboard machine engines
15. ISO - International Organization for Standardization
16. Km – Kilometer
17. MPEDA –The Marine Product Export Development Authority
18. MT - metric tones
19. NGO – Non-governmental organisation
20. OBM's – Outboard motor engines
21. OMFRA – Orissa Marine Fishing Regulation Act
22. PM – Post Meridian
23. P.F.C.S - Orissa Self- Help Cooperative Societies Act, 2001
24. Rs. – Indian rupees
25. Sq. Km. – Square Kilometer
26. Spp. – Species
27. US\$ - US dollar
28. UAA - United Artists' Association

## CHAPTER 1

# Indian Fishery – Environment and Setting

## 1.0 Background

Fishery is the oldest and most important livelihood option for the inhabitants of the coastal line of the country since times immemorial. This natural resource along with the marine environment has not only been the custodian of livelihood security of the coastal populace but also supports the productive and protective habitats. The web of life of the coastal community is woven around it, be it festivals, weddings or even death, the community is intricately related to the natural marine resource. This gift of nature is wedded to the customs and traditions of the coastal society, which understands that this vast natural resource is the key to their prosperity and social development.

*“Oh Ocean, you  
are the store  
house of the 14  
gems!!!*

*There is no end to  
your riches, your  
greatness  
is indeed  
unfathomable”*

India has immense water resource, both fresh and marine. It has a coastline of 7,516 km with Bay of Bengal on the eastern coast, Arabian Sea on the western coast and Indian Ocean towards the south. It has an ‘Exclusive Economic Zone’ of 2.02 million sq. Km.<sup>1</sup> which is in accordance with the provisions of the Territorial Waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act of 1976, of which India is a signatory. Also, the country is endowed with about 1.4 million hectares of brackish water resource, which is available for aquaculture, and about 1.6 million hectares of freshwater lakes, ponds, and swamps; and nearly 64,000 kilometers of rivers and streams, which form the total water resources of the country. The coastline extends to nine States and five Union Territories<sup>2</sup>.

## 1.1 Fishery in India

Approximate of about 1 % of the total population depends upon fishery sector in India as a primary source of livelihood - direct employment to about 6 million fishers and to another six million people who are employed in fishery related activities. The contribution of fisheries to Gross Domestic Product (GDP) at the current price level is 1.3%.

India has an estimated marine resources potential of about 3.9 million tones per year. This potential source can be bracketed under two categories i.e. oceanic fishery and coastal fishery. The important marine fish disposition in India are the Mackerel, Sardines, Bombay duck, Shark, Ray, Perch, Croaker, Carangid, Sole, Ribbonfish, Whitebait, Tuna, Silver belly, Prawn, Shrimp, Squid, Octopus, Red snapper, Lobster, Cat fish and Cuttlefish. Among the species caught, Indian oil sardine, Indian mackerel and Sciaenidae are dominant ones. Marine shrimp, although contributing only 10% of the total catch, is still of paramount commercial importance.

The main freshwater fish are carp and catfish; the main brackish-water fish are hilsa (a variety of shad), and mullet.

Nearly 70% of the fish catch is marketed fresh. The fish drying and curing industry amounts to about 14% fish. Frozen fish production accounts for 6.5%, 8.4% goes for reduction to fish meal, 0.8% for offal reduction and 1.6% for miscellaneous purposes. Only 0.3% of the total catch is used for canning purposes. The per capita fish availability in India is 4.7 kg/ year (Laurenti, 2002).

<sup>1</sup> Claimed Exclusive Economic Zone (km<sup>2</sup>) - 2,103,415  
Territorial sea (up to 12 nautical miles) (km<sup>2</sup>) - 1,93,834

<sup>2</sup> See annexure - 1

At present, India’s marine products export is worth about US\$ 1,330<sup>3</sup> million, covering 60 products. The share of marine products in total export earnings is around 3.4%. Frozen shrimp contributes 65-70% of the marine export earnings. Establishments connected with marine products export include 625 exporters (380 manufacturer-exporters and 240 merchant-exporters), 376 freezing plants, 13 canning plants, 4 in the agar-agar industry, 149 ice plants, 15 fish meal plants, 903 shrimp peeling plants, 451 cold storage units, and 3 chitosan /chitin plants, with 95% of the seafood processing units concentrated in 20 major clusters in 9 states (as registered with MPEDA, 1996). The important buyer of Indian fish are the USA, Canada, Japan, China, countries of European union, countries of Middle East of which UAE is important and South East Asian countries.

The major ports in India are Chennai (Madras), Cochin, Kandla, Kolkata (Calcutta), Mumbai (Bombay) and Vishakhapatnam. Apart from the main fishing harbors, twenty-three minor fishing harbors and ninety-five fish-landing centers are designated to provide landing and berthing facilities to fishing craft. There are 2, 20,903 traditional craft, 39,444 traditional motorized craft and 51,744 mechanized boats operating in Indian waters. They use a wide range of fishing gear, including seines, stake nets, lines, bag nets, encircling nets and lift nets.

Orissa extends over an area of 155,707 square km with a coastline of about 480 km<sup>4</sup>, which is approximately 8% of the Indian coastline. The position of Orissa is eighth among the other coastal states and union territory of the country. The state is bounded by the Bay of Bengal on the eastern side. The state has been divided into 30 administrative districts of which 10 are the coastal districts.

The continental shelf area of 24,000 km is open to marine fishing and is widest off the northern district of Balasore, narrowing toward the south. Among the districts, Puri covers more than a third of the total coastline of the state (DOF, 1998). The coastline is broadly classified into two distinct areas.<sup>5</sup>

- The shallower northern coast extending northwards from Rajnagar in Jagatsinghpur district to Kistania in Balasore district which has a broad shelf, gradual slope and greater tidal effect and
- The southern coast extending southwards from Paradeep in Jagatsinghpur district to Pattisonapur in Ganjam district and which is narrower with broad sandy beaches and open surf-beaten shores.

The total fish production of Orissa is 2, 81,807.24 metric tones with inland fishery contributing about 1, 67,914.18 metric tones and marine fishery contributing about 1, 13, 893, 06 metric tones. The total number of fishing craft in Orissa is 11,314 of which the number of mechanized craft is 1529, Motorized craft is 3292 and that of the traditional craft being 6520. The total brackish water area available for fishery is 12,828.05 ha with a production of 7203.63 MT shrimp during 2001-02.

The marine fishermen community of the state can broadly be classified into three groups-traditional fishermen, mechanized gill-netters and mechanized trawlers. Traditional country fishermen have been fishing for centuries along the Orissa coast with the help of rowing and sailing boats while fishing by mechanized gill-netters is a recent development.. The state does not have a natural harbour and the potential for artificial port is also negligible due to shallow coastline.

*The fisherman communities of Orissa are mostly the **Telugu** and the **Bengali**. The Telugu people who have migrated to the coastline long back and have settled in the southern coastal districts of the state dominate the southern coastline, which consists of Puri, Ganjam and Khorda. The Bengali communities who are permanently established along the coastline dominate the northern coastal districts of Baleshwar and Bhadrak. The native people of the Orissa are engaged primarily in freshwater fishing.*

<sup>3</sup> Annexure – 2

<sup>4</sup> Annexure - 3

<sup>5</sup> BOBP, 1984a; 1986a; Ayyappan & Jena, 2000

## Fishery in Orissa

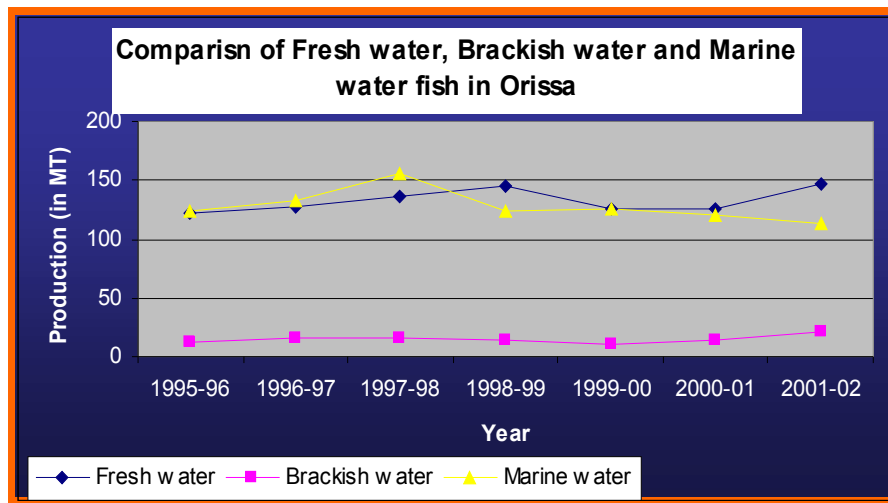
### 2.1 Introduction

Fishery has been a traditional occupation of the coastal inhabitants of Orissa. Through generations, the dependence of the fisherman community on the marine resources has been complete. Majority of the fishermen employ traditional craft to fulfill their subsistence. The ‘small wooden craft’ confronts the vagaries of nature as the fishermen go before the daybreak in the sea to fish with a hope to make a livelihood.

Fisheries provide a vital source of food, employment, recreation, trade and economic well being for people throughout the coastal district of the state and have to be looked in from both the present and future generations’ needs and usages....

### 2.2 Importance of fishery in Orissa

The state has been gifted with abundance of natural water resource in form of fresh water, brackish water and marine water. All the water resources are major contributors to the economy of the state. The total production of the aquatic produce has been varying over the years. The fresh water production and the brackish water production have been on the rise after the year 2000<sup>6</sup> owing to the intensive efforts of the state and other institutions to promote the culture of these. On the other hand, the production of the marine fishes has been falling down. The important reason for this decline is the over exploitation of the ‘capture resources’, increased pressure on the limited coastal marine resources, under utilization of the oceanic marine resources, conservation policy of the state and central government and the illegal fishing by the neighbouring states of West Bengal and Andhra Pradesh. The following graph gives the production figures of the three aquatic produces over the years –



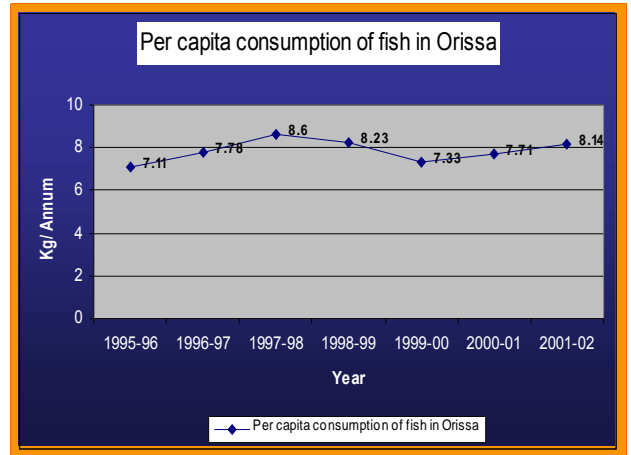
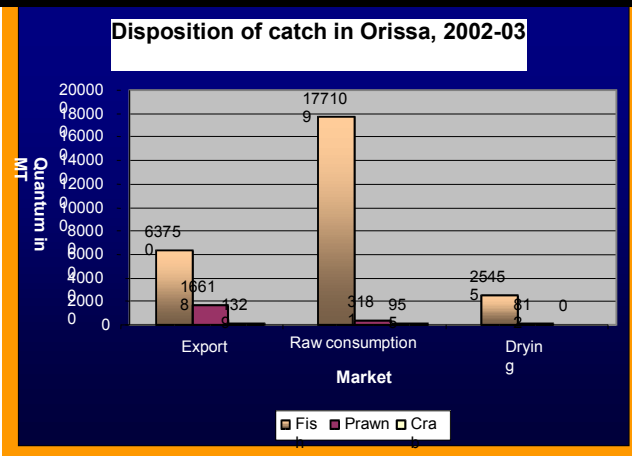
(Graph – 1.1)

Fishery in Orissa supports primarily the internal consumption of the state and hence is the one of the most important contributor to meet the food security of the state. The importance of fishery extends manifold as the dietary practices of the state, especially the coastal district are fish based. Also the poor population of the state is highly dependent on fish as a primary source of protein rich food. The total consumption of raw fish in the state is 1, 77,109 metric tones. This is besides the consumption of prawn and crab. The per capita consumption of 8.14 Kg / annum per person indicates the importance of fish in the food habit of people.

(Graph –1. 2)

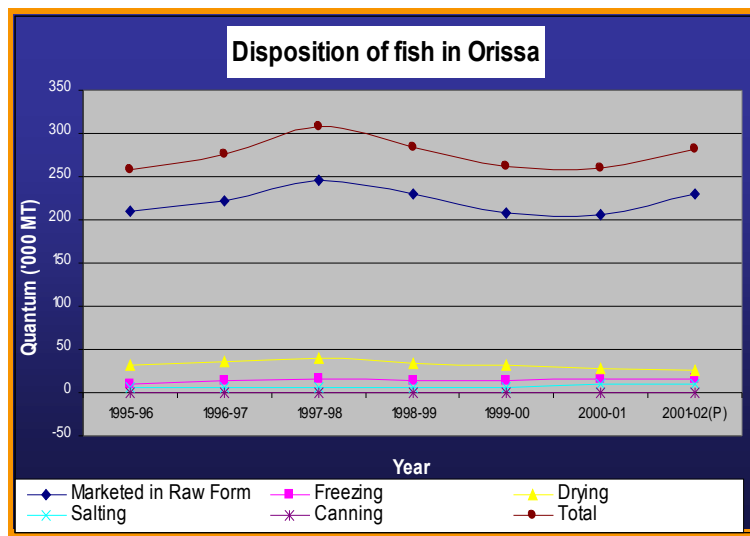
(Graph –1. 3)

<sup>6</sup> See annexure - 4



The fisheries sector provides important contribution to the state economy. Fish product either raw / live or processed has been a significant contributor to the state exchequer. The export of brackish water prawn, marine fishes of economic value<sup>7</sup> like Ribbon fish, Cuttle fish, live crabs, etc has fetched substantial foreign exchange for the state. Besides, fishery as an industry, is a source of livelihood. Subsidiary industries like dry fish product, value added products like fish pickle, fish cutlets, fish powder, etc has in its own way contributed to the economic growth of the state.

Fishery has been important to various industrial units also. Food processing unit of freezing, canning, salting, etc are directly supported by it for their operation and profitability. The following graph gives the details of various fishery-based industries over a period of years –



(Graph –1. 4)

The fresh fish market has been the major contributor both in terms of consumption and value over the period of years as shown in the graph above. The associated industry has not developed in the state as expected. Hence the next impetus of the growth needs to focus on more capital investment in these units, thus enhancing the profitability of the fishery sector. Fishing resources and potentialities of the State can be profitably harnessed for fetching substantial foreign exchange earnings without interfering with the eco system by adopting scientific methods of culture to increase fish production, by assisting fishermen in more efficient fishing, boosting fishing operations in deep sea and transmitting technology both for culture and capture to fishermen and fish farmers. Orissa needs to establish culture of fish and prawn and step-up fish seeds

<sup>7</sup> See annexure - 5

production to create self employment opportunities and to increase per capita income by utilizing un-exploited water resources through application of new technologies and expansion of infrastructural facilities.

## CHAPTER 3

# Policy Review

The purpose of the policy review on fishery is to look at the various dimensions of government policies and the existing acts, rules and regulations and its implication on the overall fishery sector. The objectives of taking up the policy review in this case are following –

1. Analyze the requisite policy framework of fishery pertaining to economic, political, and social implications and to understand their causes and consequences.
2. Analyze the causatum of government actions relating to public issues and concern.

### 3.1 Central Government Policies

The Indian fishery sector is governed by the following policies –

1. **Comprehensive Marine Fishing Policy – Govt. of India**
2. **Coastal Regulation Zone Notification and Aquaculture Authority of India Bill**
3. **Exim Policy – 2002-07**

#### 3.1.1 Comprehensive Marine Fishing Policy

The policy categorically *defines “that marine fishery within the territorial waters is the subject of maritime states whereas fisheries beyond this limit within the EEZ fall in the jurisdiction of Central Government”*. But at the same time it states that the central government will play an advisory role to the coastal states on the state subject and also will provide financial support in development of the resource.

The policy underscores the need for a departure from the open access concept in the territorial waters to government controlled resource rather than promoting common property resource

The policy takes full appreciation of the international conventions in force for conservation, management and sustainable utilization of our invaluable marine wealth, without losing its relevance to the food and livelihood security. It extends beyond the livelihood security of the large coastal population and talks about foreign exchange generation, potential of the sector for employment generation through ancillary activities and stresses specifically on the empowerment of coastal womenfolk.

The main objectives of the policy are:

1. To augment marine fish production of the country up to sustainable level in a responsible manner so as to boost sea food export from the country and also increase per capita fish protein intake of the masses.
2. To ensure socio-economic security of the artisanal fishermen whose livelihood solely depends on this vocation.
3. To ensure sustainable development of marine fisheries with due concern for ecological integrity and bio–diversity

The policy spells a total ban on destructive method of fishing

The present policy the Government seeks to bring the traditional and coastal fishermen in focus together with the other stakeholders in the deep-sea sector so as to achieve harmonized development of marine fishery both in the territorial and extra territorial waters of our country.

The policy also talks about promotion of the deep sea fishing, infrastructure development, export promotion, implementation of international quality regimes for ensuring food safety in fish and fishery products, principle of Code of Conduct for Responsible Fishing Operations, etc.

The policy has been framed to incorporate all the essential components i.e. resource management and utilization, trade development, promotion of the poor fisherman community,

infrastructure development but since the coastal fishing is a state subject, it does not ensure the framing of necessary laws, acts and regulations by the coastal state to maintain the nuances of the policy. Hence various lapses are visible in terms of implementation of the policy by different states.

### 3.1.2 Coastal Regulation Zone Notification and Aquaculture Authority of India Bill

The Coastal Regulation Zone Notification (CRZ Notification) of 1991 seeks to protect the coastal zone – which is demarcated into different sub-zones – from degradation by activities in different sectors. The Aquaculture Authority of India is designated to regulate the proliferation of aquaculture activities in the coastal areas.

The bill promotes the production-oriented approaches to support the small-scale post harvest sector. It defines the need for support to the aquaculture and allied industries, which will focus on the development of poor and vulnerable stakeholder groups within the post-harvest fishery sector.

### 3.1.3 Exim Policy

The Exim policy for fishery has been an encouraging policy for the overall fishery sector. It categorically states ‘Central assistance to States’ for development of critical infrastructure for export such as roads, inland container depots, container freight stations, Export Promotion Industrial Parks and for equity participation of private stakeholders in infrastructure projects.

Exim policy has clear guidelines for state government to encourage setting up Export Zones for fishery industry.

The policy stresses upon the quality aspect of the product and defines Schemes to promote the Concept of “Total Quality Management”. It also talks about better market access for the exporters and also encourages enhanced marketing efforts by exporters through the concept of “brand promotion”.

The policy advocates and defines clearly that there will be ‘no quantitative restriction on exports’ and clearly lays out that no license will be required for the import of 125 species/groups of fish, crustaceans, molluscus and other aquatic invertebrates. It restricts the import of Whale shark as per the international convention and allows restricted import of live fishes as specified under EXIM Code 0301.

## 3.2 State Government Policies

### Policies and Act – Government of Orissa

The state of Orissa has the following policies, acts and regulations to govern the fishery sector –

1. State Reservoir Fishery policy
2. Orissa Marine Fishery Regulation Act
3. Chilka Bill

#### 3.2.1 State Reservoir Fishery Policy

The policy is framed for scientific management of reservoir and other inland water resources of the state through active intervention of fisher/ entrepreneurs etc. and to generate gainful rural income with special reference to fishing communities and economic rehabilitation of displaced persons. This will also generate direct revenue in the form of lease value and royalties and indirect revenues in form of taxes for the State Exchequer.

The major objectives of the policy are –

1. To augment fish production from the vast untapped / under tapped reservoir resources through scientific management.

2. To generate gainful rural employment with special reference to fishing communities and economic rehabilitation of displaced persons.
3. To introduce systematic management strategies both for conservation and sustained fish production
4. To attract increasing investments from private sector.
5. To stimulate entrepreneurship for fishery sector with special reference to reservoir fishery.
6. To substitute traditional methods by introduction of advanced technology in operation of reservoir fishery.
7. To develop skill among fishermen / fisherwomen in reservoir operation and organizational strengthening.
8. To generate substantial revenue for the state

The policy states that the ownership of the water resources will be shared between the village panchayat and the department Fisheries & ARD depending on the size of the resource. The policy gives a cutting edge to agriculture over fishery and defines that interests of agriculture will be given priority in case of conflict between the two.

The policy provides leasing right to the Primary Fishermen Cooperative Society/Societies formed under the Orissa Cooperative Societies Act, 1962 or Society/Societies registered under the Orissa Self- Help Cooperative Societies Act, 2001 (P.F.C.S.). This makes it imperative for the entire primary groups whether formal or informal, to acquire registration from the specified state bodies to get lease over the water resource. Also the policy states that the lease will be granted through open auction in case no society comes forward for leasing any water resource. This implies that the grant of lease will clearly witness the dominance of power and money with the deserving but less influential individuals being reduced to mere spectators in the bid to control and utilize the water resources of the state.

The policy clearly spells out the conservation framework to improve upon the conservation status of the fresh water aquatic bio-diversity, which includes size of the carp, size of gill net, disposal of industrial effluent, etc. But the policy seems to be ineffective in terms of implementation and enforcement measures defined in its own clauses and articles.

### **3.2.2 Orissa Marine Fishery Regulation Act**

The Orissa Marine Fishing Regulation Act came into force in 1984 (DOF, 1997). The act defines the natural coastal resource as the state property with all the management and usages right defined by the state. It negates the common ownership of the resource by the community and the management rights thereof.

The act was formulated mainly to protect the interests of the traditional fishermen, by restricting the fishing operations of the mechanised trawlers to within 5 km from the shore and also prohibits fishing activities of the trawlers from neighbouring states entering into the marine zone of the state.

The act makes mandatory the registration of all the craft operating in the state against the prescribed registration and license fee for different types of vessels. The act gives discretionary power to the government to regulate the fishing operation along the coastline of the state. The state holds the power to regulate the number and type of vessel, area for fishing, period of fishing, species of fishes and the types of fishing gear permissible for fishing.

The act clearly defines the role and responsibility of the government officials and also empowers them to taken action against the violators of the act. The penalties levied upon the offender have been defined but at the same time the act has space for appeal against the charges levied by the officials in the office of the appropriate appealing authority. The act has a special mention of offences by the companies and other corporate bodies to check the exploitation of the resources by them.

The act is void of a concrete enforcement plan. For instance, it does not define the human resources required to effectively monitor and control the fishing activity, the sources of fund that

would be required to meet the operations, the co-ordination between various government bodies, etc.

### 3.2.3 Chilka Bill

The Chilka Bill provides a sanctuary status to the Chilka Lake under the Orissa Forest (Shooting) Rules 1972 and measures were initiated to declare the area a sanctuary under the Wildlife (Protection) Act 1972. In this background, the Chilka bill is of paramount importance.

Chilka lake has been declared a 'Ramsar site' and hence the conservation is the utmost priority.

It clearly prohibits any fishing activity, except the traditional fishing in and around the resource. It clearly specifies that any fishing operation can be carried on only after obtaining proper lease from the government. Red-tapism is evident as the entire process is complicated with the formation of “Fishfed” which obtains lease from the district collector and then in turn lease it out to the Primary fisherman Co-operatives that are registered with it. The process is an obstacle to the informal groups and the private entrepreneurs who are totally dependent on fishery as a source of livelihood.

The bill makes a distinction between the original inhabitant and the migrants who have settled in and around Chilka and are equally dependent on the natural resource for their livelihood. This in some manner creates conflict between the aboriginals and the migrants over the resource.

The bill takes into account the illegal capture of resource by the industries and explicitly specifies punitive measures against such occurrence under various provisions. Though the bill takes the interests of the primary co-operative into account but it does not specify any punitive action against the industries indulging in these practices.

The bill creates an autonomous authority Chilka Development Authority (CDA). This body co-ordinates with all the stakeholders and undertakes all activities related to the development and conservation of the resource. It gives discretionary power to the body to take up any activity, which will have implication on conservation front of the resource.

## CHAPTER 4

# The Study

### 4.1 Study Methodology

The study “Value Chain analysis of Fishery in Puri and Ganjam District of Orissa” has been structured to capture the essence of the processes and flow of the value chain in fishery. The framework of the study will help understand the levels of the value chain –its role and importance, the cost of operation, the barriers to entry, mobility and exit, the economy of scale, the effect of market forces viz. the demand and supply forces, etc. The study has been designed to map the key processes and flows in the value chain of fishery in respect to the local market, regional markets and the international market.

### 4.2 Research Planning and fieldwork

#### 4.2.1 Research framework

The framework employed in the research “Value Chain analysis of Fishery in Puri and Ganjam District of Orissa” is a stratified framework in which the stakeholders are employed on the horizontal axis of inquiry and the various concerns and issues, processes and flows, etc are on the vertical axis. This framework is so designed as to map the entire value chain across levels of the value chain and to bring them on a common axis so as to induce a complete and holistic understanding of the chain.

#### 4.2.2 Tools and Techniques

The study has adopted various tools and techniques for collection of information on various aspects. Some of them are detailed below.

- Secondary Research
- Primary survey through structured questionnaire of the key stakeholders
- Personal interviews of the key respondent
- Group discussions
- Observation method

#### Secondary Research

Under secondary research, a thorough desk review was undertaken 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 fishery sector to collect information related to the issue on hand.

#### Primary Research

Primary research was conducted in Puri and Ganjam district to collect first hand information on the specific parameters developed on the basis of objectives of the study. In the primary research, both qualitative and quantitative approach has been adopted

#### In-depth Interview

In depth interviews were conducted to obtain information from the key respondents on the issues and concerns of the value chain of fishery in the study area. Different semi structured questionnaires were prepared for the purpose and used as the tool of research.

#### Group Discussions

Various Group Discussions were arranged between the fisherman as well as the different players of the value chain. These discussions were useful in finding out the different aspects of various value chains for fishery. It also helped in validating the information collected by the individual investigators through face-to-face interviews with individuals or otherwise. Instruction moderating schedules were used as tools for the purpose.

**Observation technique**

Observation were keenly made during the course of group discussions and penned. While interviewing the respondents, observations were gathered from their reactions. The investigators’ impression from their own experience during the course of investigation was also taken as part of observation.

Thus observation was quasi-participant type. Operations of the activities, the manner of functioning of various players of the value chain at different levels was keenly observed. These observations formed an essential part of the entire fieldwork.

**4.2.3 Study area<sup>8</sup>**

The study on “Value Chain Analysis of Fishery in Puri and Ganjam district of Orissa” was conducted according to the preferential sampling of the researcher. The selection of the study area was on the basis of importance of the landing center, the number of fisherman at the landing center, the volume of trade generated, etc. The regional markets were selected on the basis of the size of operation, number of forward and backward linkages, the volume of daily trade, etc.

The places covered were mainly the landing centers in Puri and Ganjam. These landing centers were both marine landing centers and brackish water landing centers. Also two inland villages were covered to understand the value chain of fresh water fishery. One village was also taken up for study purpose to understand the value chain of fish culture. The major regional market for fishery was covered during the study to develop a good understanding of the fishery value chain.

**4.2.4 Sampling<sup>9</sup>**

The study sampling has been done to incorporate all the stakeholders in the study and hence helps to produce a complete picture of the fishery value chain.

**4.3 Limitations of research**

The limitations of research are as follows –

1. At length interviews of the exporters were not possible due to time constraint on the part of the interviewee.
2. No access to the financial records of the players of the value chain was one of the critical limitations.
3. Unawareness of the primary respondent on price, quantum and other important variables of the trade.
4. Unavailability of the senior officials of government for response specifically State department of Forest and Department of Fisheries, Govt. of Orissa.

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<sup>8</sup> See annexure - 6

<sup>9</sup> See annexure - 7

## CHAPTER 5

# Fishery – Puri and Ganjam District

Puri and Ganjam are the coastal districts of Orissa with Ganjam having 26 fishing villages and 14 fish landing centers. An about 20,000 fishermen population is dependent on In-land, Brackish Water and Marine fisheries in Ganjam district. While Puri is having 85 fishing villages with a total fisherman population of 67,161 who are dependent on fishery as the main source of livelihood. The number of official landing center in Puri district is 12. The total fish catch of Ganjam district is 14053.22 MT while that of Puri District is 25,000 MT (*Provisional data – 2003-04, Directorate of Fishery, Puri and Ganjam*).

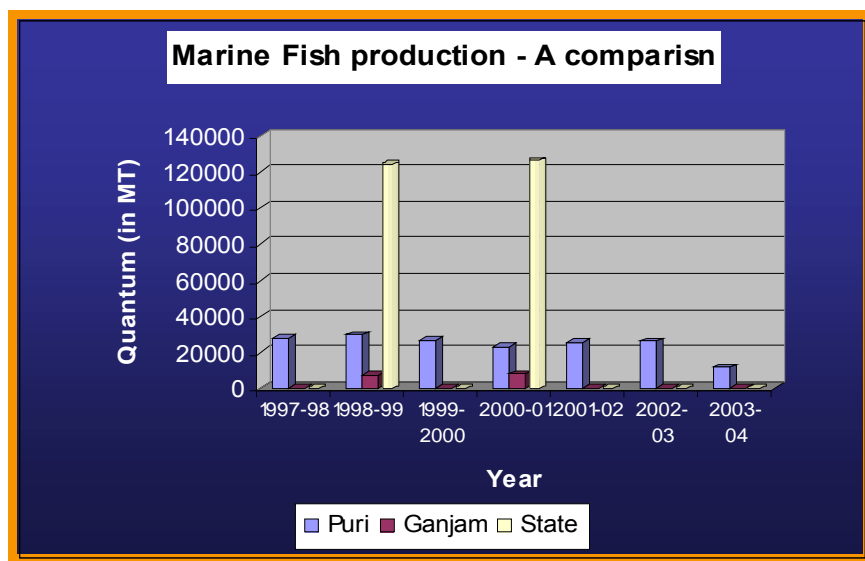
### 5.1 Components of Fishery

Fishery in Puri and Ganjam district can be classified according to the nature of the operation i.e. ‘Capture and Culture’. Further, it can be divided on the type of water resource i.e. fresh water, marine water and brackish water. Marine water fishery may be further classified on the basis of the distance of fishing operation from the coastline. The major component of fishery in the district of Puri and Ganjam are the following –

1. Marine fishing
  - a. Coastal fishing
  - b. Ocean fishing
2. Freshwater fishing
3. Brackish water fishing
4. Fish culture

#### 5.1.1 Marine fishing

The total coastline of the 2 district is about 215 Km with Ganjam having a coastline of 60 km and Puri having a coastline of 155 Km. The fishery activity is taken up in the entire coastline by the fishery villages located along the coastline. Traditional fishing with catamarans and the country boat is a common parlance in normally all the villages but the new technology is on the rise in the bigger landing centers where the advent of trawlers, Beach Landing crafts (BLC) and Fiber Reinforced Plastic boat (FRP’s) are commonly present.



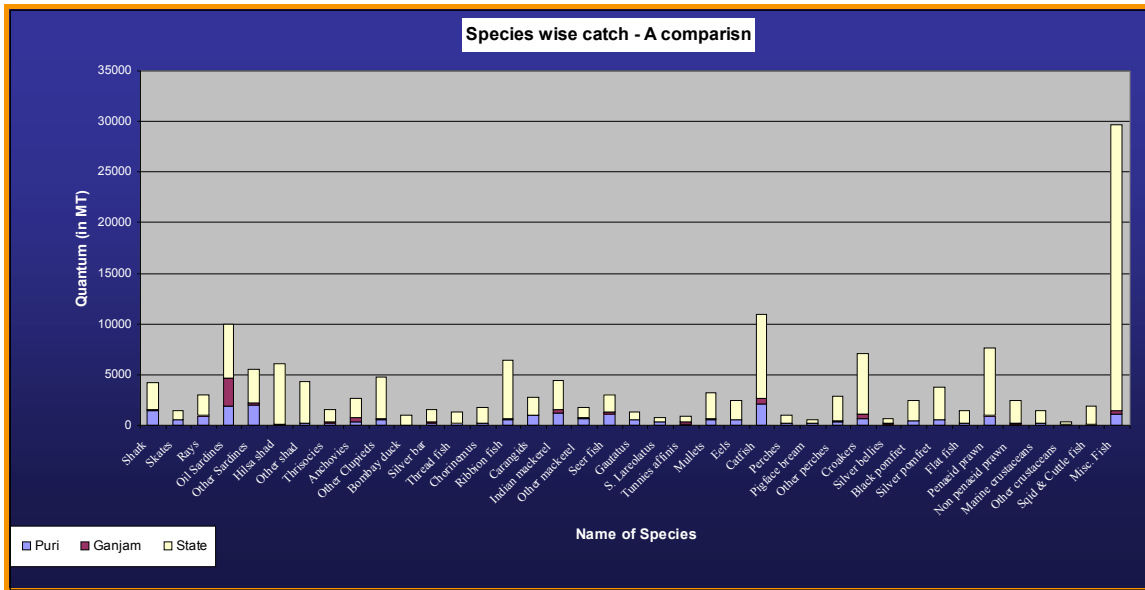
(Graph –

5.1)

The above graph gives the production of capture fish in the district of Puri and Ganjam vis a vis the state average annual production. It is clear from the graph that Puri district has substantial production of the marine catch as compared to Ganjam district.

The peak season for fishing in both the districts and normally in all the coastal villages is from October to February. The important varieties of catch are the Prawns, Pomfrets, Clupeids, Catfish, Carangids, Perches, Seerfish, Mackerals, Sardines and Sharks. The graph below shows the average annual production of the important fish species of the two districts and their contribution to the state average annual production.

The important contribution of Puri district to the state production is of sharks. Skates, Rays, Sardines, Indian mackerel, Carangids, Seer fish, Gautatus, Tuna, Mulletts, catfish, Silver bellies and Pomfrets. The contribution of Ganjam district are Anchovies, Sardines, Silver bellies, Perches and Catfish<sup>10</sup>.



(Graph – 5.2)

**Coastal Fishing**

Coastal fishing can be defined as the fishing operation taken up within 5 Km form the coastline. Coastal fishing is taken up mainly by the catamarans and the country boat. Also now days, motorized country boats viz. Inboard machine engines (IBM’s) and Outboard motor engines (OBM’s) are commonly involved in coastal fishing. Coastal fishing is a daily phenomenon in both the districts with fisherman leaving the coastline early in the morning around 3 AM and coming back with the catch around 3 PM in the afternoon.

**Ocean Fishing**

Ocean fishing or deep-sea fishing involves fishing beyond 5 Km of the coastline. It normally involves trawlers, BLC and FRP’s, which are involved in the fishing operation. Normally, oceanic fishing is highly mechanized with the use of sophisticated equipments and gadgetries. This type of fishing is highly capital intensive and takes a form of industry rather than subsistence livelihood. The normal practice of this type of fishing is that once the craft goes out for fishing then the period of fishing varies from 3 – 8 days depending on the size of the craft. These craft has onboard freezing facility for the catch.

<sup>10</sup> See annexure - 8

### 5.1.2 Freshwater Fishing

Freshwater fishing is based on the inland water resources and is an important source of fish. The inland water has been exploited for its aquatic resources by the communities to meet their food requirement and also is a means of livelihood to many.

The total quantum of production from the fresh water fishery has been 21,223 MT annually in the two districts. The average annual production of fresh water fish is for Puri district is 15,971 MT while that of Ganjam district is 5,252 MT.

### 5.1.3 Brackish water Fishing

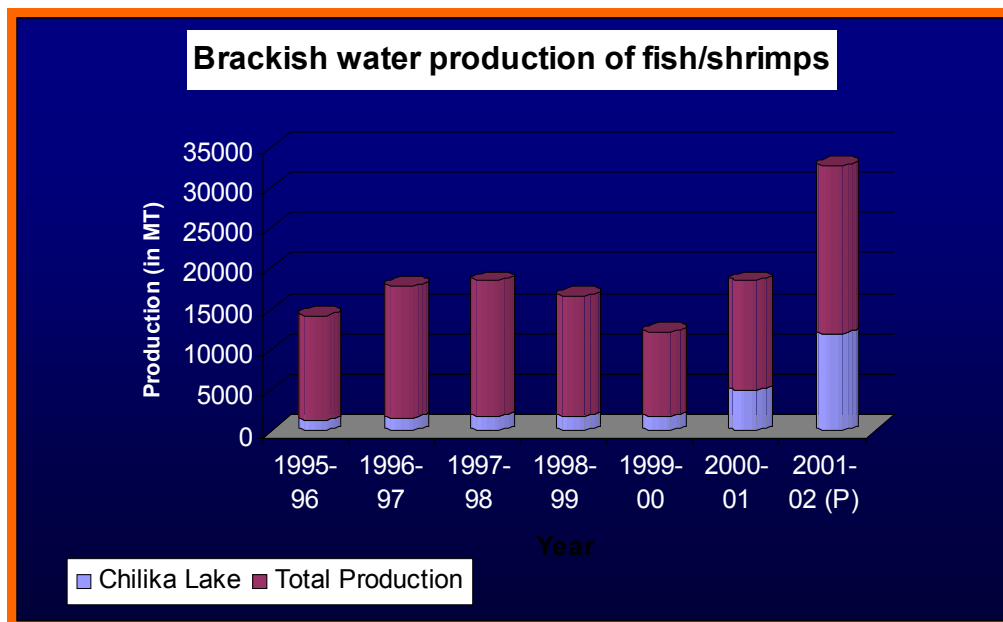
Puri and Ganjam district are endowed with the brackish water coastline of the Chilka lake. The unique natural water resource has resulted in the development of the brackish water diversity, which is different from both the fresh water and marine water ecology. The contribution of prawn and shrimps from this resource is important from the economic point. The fishing in the Chilka Lake in both the districts is highly regulated by the government.

The fishing in the lake is permitted only through the traditional means using country boats and catamarans. The trawlers and other big fishing gears are not allowed. The traditional ways of fishing, which is still followed by the fishing community in the lake, are –

- Jano
- Uthapani
- Bhani

All these methods of fishing are specifically for the prawns and the shrimps, which are in abundance in the natural habitat.

The graph below gives the production from the Chilka Lake over the years and compares it with the overall all production of fishes and shrimps from the brackish water resource of the state. The increase in the contribution from Chilka is because of the advent of the OBM's and the IBM's that has increased in number substantially.



(Graph – 5.3)

### 5.1.4 Fish culture

The culturing of fish species that are in high demand has taken a big proposition now days in both the districts. Especially, the areas near the mouth of the rivers and nearby Chilka are involved in

culturing of fish. In earlier days, fish culture related only to the inland fresh water culture i.e. seeding of ponds and reservoirs with desired species. However, in the recent years the pisciculture has taken a new dimension - inland brackish water culture of specifically prawn and shrimps has increased considerably in the recent times.

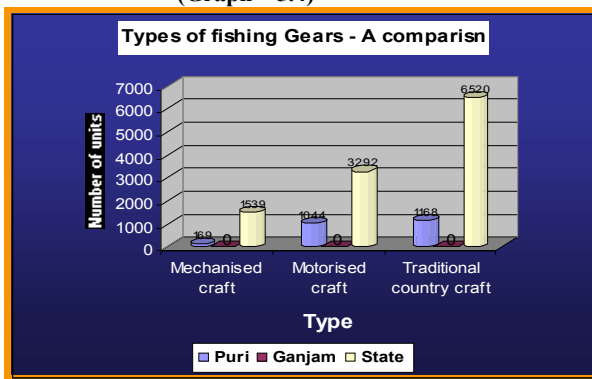
The fresh water culture is normally taken up with minimal investment through lease arrangement over the community water resources that are either leased by the panchayats or the state department on annual basis. The lessee normally invests only in the fish seeds and cleaning operation of the water resource. The growth in the production of fresh water species through culture has boosted its average annual growth rate as compared to fish capture from the marine resources.

## 5.2 Fishing Gears

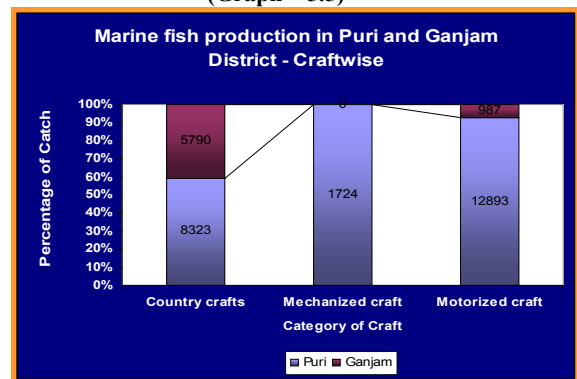
Puri and Ganjam are not naturally gifted with natural depression and orifices. The possibility of artificial harbour is negligible because of the shallow coastline. This has, in a certain way, hampered the development of the fishing industry in the districts. The implication of the natural constraint is clear from the fishing gears that are in vogue in both the districts.

In both the districts of Puri and Ganjam, traditional craft with motorized engines (OBM's & IBM's) dominate the trade. The motorized boats are fewer in number as compared to their non-motorized counterparts. The trawlers and other bigger fishing gears are absent in Ganjam district but the prevalence of the same is on the rise in Puri district. The biggest landing center -Nuagarh Jetty in Astrang is catering to the small trawlers.

(Graph – 5.4)



(Graph – 5.5)



The above graph gives the comparison of the fishing gears in both the district and as well as the contribution of the different types of fishing gear to the average annual production in the district. The total number of fishing gear in Puri district is 2, 381 out of which almost 50% are traditional craft. The second highest incidence is of motorized traditional craft, which is almost 40% and the rest which amounts to 7% are the mechanized gears. In Ganjam district, 85 % of the crafts are traditional crafts, which include catamarans and country boats and the rest 15 % are the motorized country boats. No small trawlers or the big fishing craft is reportedly operating from the district.

Net is one of the most important fishing gears used to catch fish. The usages of nets have been the traditional practice in Puri and Ganjam districts. Traditionally the nets used were hand made using cotton threads whereas now (approximately since last two decades) there is a clear shift to the nylon fiber branded nets, which are available in the local market.

The fishing net is one of the major capital investments in the fishing operation and may range from Rs. 10,000 to Rs. 1, 50,000. The nets used for fishing are species specific and a fisherman normally keeps 2-3 nets for making the catch. The use of net is also season specific due to the abundance of various species in a particular season. The normal life of a net is 5- 7 years but again it depends on the usage, quality of fiber used, type of net etc. The concerned fisherman

carries out the repair of the net, as and when required. The following are the most common nets used in both the districts –

**Table – 5.1 Details of net used for fishing in Puri and Ganjam**

Sr.	Name of Net	Specific species	Average Price
1	Jago Jaal	Panikiya, Khonda	75,000
2	Koni Jaal	Koni, Magar, Kauntia, Bhetki	50,000
3	Kockle Jaal	Kockle	10,000
4	Pomfret Jaal	Pomfret	25,000
5	White Pomfret Jaal	White Pomfret	20,000
6	Disco Jaal	Chingri (Prawn)	15,000
7	Benjru Jaal	Benjru	25,000
8	Lines	Koni, Kauntia, Magura	

### 5.3 Landing center

Landing center are the points where the fisherman anchor their craft, unload their catch and conduct sale.

Almost all the landing centers in these two districts, with a few exceptions, do not have a permanent infrastructure (e.g. jetty/harbour) to anchor the crafts and conduct the sale. However in most of the coastal villages, there are clearly demarcated sites along the entire coastline that serve as landing centers. The exceptions are the bigger landing centers, which have “Jetty” to anchor the crafts. The landing centers of the two districts are given below –

**Table 5.2 List of important landing centers in Puri and Ganjam**

Important Landing Centers in Puri and Ganjam District				
	Sr	Puri	Sr	Ganjam
	1.	Pentakota	1.	Gopalpur
	2.	Sapakothi	2.	Arijipalli
	3.	Chandrabhaga	3.	Bakshipalli
	4.	Ramachandi	4.	Nuogoraband
	5.	Nuagarh	5.	Patisunapur
	6.	Kaliakona	6.	Dighipalli
			7.	Haripur
	7.	Sahana		
	8.	Tolia	8.	Katura
	9.	Harachandi	9.	Sabilla
	10.	Arakhakuda		
	11.	Khirisahi		
	12.	Sciandi Ramlanka		

Nuagarh (Astrang) and Balugaon on Chilka have a proper “Jetty” built for anchoring of the crafts. The Astrang landing center harbours smaller trawler and other mechanized crafts, which amounts to 83 in number because of the facility of “Jetty”.

## CHAPTER 6

# Market and Product Segmentation

The market based on its own characteristic, consumer preference and habits, volume of trade, supply orientation, demand configuration, etc. defines itself into various categories.

There is a wide range of value products ranging from low value to high value, depending on the species, quality, size, etc. Therefore these can be clustered into various segments based on the uniqueness of the species that consequently define the market for the entire range of products into distinct segments. These are further sub-divided into product lines within these segments.

This segregation of product and market into distinct segments provides insight to compare the value chain, keeping into focus the product and market characteristics and find out uniqueness, if any.

### 6.1 Market segmentation

It is defined as “a selection of groups of people who are most receptive to a product. The segmentation of the market is done on demographic variables such as age, sex, race, income, occupation, education, household status, and geographic location; psychographic variables such as life-style, activities, interests, and opinions; product use patterns; and product benefits etc.

Segmentation classifies people into groups based on shared characteristics (Sanyal and McLaughlin 1993).

NiMble has segmented the fish market on the basis of demographic variables. The segregation of the species has been done on the basis of the demand of the various species in different markets. This segregation is an indicative categorization based on the cumulatives of price, availability, demand of the specific species in the market, availability of the species in the market, etc. The following table gives the market segmentation of important species.

Sr.	Product segment	Average price / Kg
1	Export value product	300- 1200
2	High value product	150- 300
3	Average value product	50- 150
4	Low value product	< 50

Table 6.1 Preferential ranking of species – Market wise

Sr.	Name of Fish Specie	Local market	Regional market	Export Market
1	Bual	*	***	Nil
2	Bhetki	Nil	***	*
3	Singhi	*	***	Nil
4	Magur	*	***	Nil
5	Pabta	*	***	***
6	Ladush	*	***	Nil
7	Leta	***	*	Nil
8	Saul	***	*	Nil
9	Sala	*	**	***
10	Koni	*	***	*
11	Pakhal	***	*	Nil
12	Panikiya	***	*	Nil
13	Kockle	**	***	*
14	Pomfret	*	***	***
15	Pomfret (Black)	Nil	*	***
16	Prawn (Tiger)	Nil	*	***
17	Prawn (White)	Nil	*	***
18	Prawn (Brown)	Nil	**	*
19	Lobsters	*	*	***
20	Crab	*	**	***
21	Ribbon fish	*	***	***
22	Cuttle fish	**	**	*
23	Barahai	***	*	Nil
24	Kanakurda	**	**	Nil
25	Shankar	*	***	Nil
26	Khainga	**	***	Nil
27	Minzoram	*	***	*
28	Scodi	*	Nil	***
29	Patharmundi	*	**	***
30	Telia	***	**	Nil
31	Boria	***	*	Nil
32	Faasi	***	**	Nil
33	Kanakurda	***	**	Nil
34	Para	***	*	Nil
35	Tumdra	*	***	*
36	Bomi	**	***	Nil
37	Benjoram	*	***	***
38	Kauntia	Nil	***	**

(\* - Shows the importance of the species in various market)

### 6.1.1 Local Market

Local markets are essentially the markets nearby the landing centers (in the periphery of 25-30 km accessible by bicycles), which include villages, haats of blocks and tehsils, sub division and nearby towns. The demand in these markets is generally stable except for the deviations during special occasions e.g. marriages, festivals, rath yatra etc.

The characteristics of these markets are –

1. Demand for the average to low value product is based on the availability.
2. Purchasing power of the consumer is the limiting factor for consumption of high value product
3. Number of sellers is limited.
4. Demand for the marine species is limited due to food habit of the community. Only limited species are in demand.
5. Demand for the fresh water fish is higher than the marine species.
6. High value product rarely enters the local market.

7. Demand is affected highly by the religious prohibitions to the extent that the market closes due to absence of the buyers from the market.
8. The cost of operation is low as the product is consumed locally and the shelf period is low.

### 6.1.2 Regional Market

Regional markets are the bigger markets situated in the state capitals, large cities or metropolitan cities with variegated supply and demand linkages. The numbers of operators, though limited, are higher than local markets. These markets normally cater to a larger geographic location and the volume of trade is high. The number of buyers is high as compared to the local market. The characteristics of these markets are –

1. Serves as a channel to cater to up-country markets and distant markets.
2. Serves as a connecting channel with the retailer, end user and the producer
3. More capacity to absorb the glut in the supply due to high number of demand channels.
4. Price fluctuation is high and can happen on a daily basis depending on the demand of the larger market for the product.
5. Purchasing power of the end buyers is higher than that in local markets.
6. Demand for high end product is high
7. Demands in these markets are affected by local occurrences- festivals, marriages, etc and instances of regional or national occurrence.
8. Costs of operations are higher than the local markets due to logistical factors –e.g. market cess/fee, loading/unloading operations, vehicle parking charges, storage costs, secondary/tertiary transportation, commissions etc.

### 6.1.3 Export Market

Export market is the international market with a different set of norms and practices as compared to the regional and local market. The quality concern is the highest for this market and hence it ends up using the high value product. The competition in this market is very high and the demand is of very specific nature limited to few species only. Geographically these markets are the farthest and hence the cost of operation to meet the demand of this market is very high. The number of sellers in this market is limited but the number of buyers is high. The main features of this market are –

1. Large market with large number of buyer and sellers tending towards perfect market
2. Price awareness is very high in this market
3. Demand and price of the product is highly fluctuating
4. Quality is the most important concern in this market

The Indian Fishing industry caters to only select products; mainly shrimp and lot of other varieties with high potential like sea bass, tuna, and sardines are not on the exporter's radar screens as these are relatively low value products

The important markets identified during the field study are as follows –

Table 6.2 List of important market for fishery

Sr.	Local market	Regional market	Export Market
1	Villages along the coastline	Kolkata	Japan
2	Villages in the periphery of 25-30 Km. of the landing center	Chennai	USA
3	Uma (Dry fish)	Hyderabad	U.A.E
4	Behrampur	Vishakhapatanam	European Union
5	Balugaon	Tatanagar	Middle east countries
6	Ganjam	Delhi	China
7	Puri	Mumbai	
8	Astrang	Bhubneswar	
9	Brahmagiri		
10	Pipili		
11	Kakatpur		
12	Konark		
13	Nimapara		
14	Khallikote		
15	Patrapur		
16	Aska		
17	Others		

## 6.2 Product Segmentation

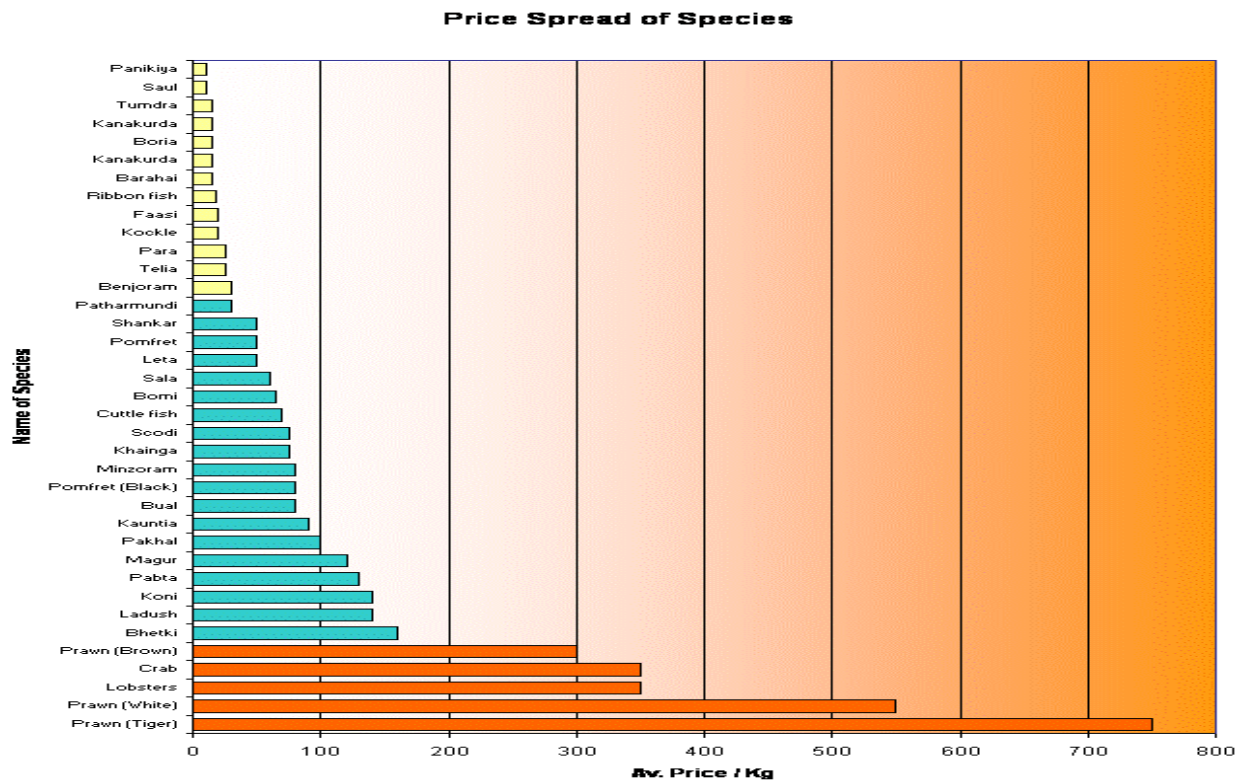
Product segmentation is the process through which products having similar affinity and nature cluster together and follows almost the same line of growth, cater to the similar kind of market and behave in a similar way under the forces of demand and supply. This leads to congressional mapping of the product, which then can be clubbed together into specific segments.

In the fishery value chain, the value of the product can be distinctly classified in four value slabs –

1. Export value product
2. High value product
3. Average value product
4. Low value product

Table 6.3 Average prices for various product segments for fishery

This classification is based on the primary study for the various traded species of the fish. The average price of the fish species is the average mean price of the species given by the respondent. The price of the species was spread on a web diagram to observe the congressing of the species on price factor.



(Graph 6.1)

### 6.2.1 Export value product

These products are the premium category product, which fetches a premium price in the market on final consumption. The products in this category undergo value chain with very low cost of operation and hence the profit margin of this segment is very high.

The product undergoes a standard processing procedure according to the specified international norms for it. The operation is normally taken up by the processing plant owners and the exporters. The processing plants have to conform to FDA, EU, ISO norms etc for supplies to respective markets.

The feeder chain to these units are normally specified in terms of procurement being made at the landing centers, collection at the collection point which may be an outlet run by the units or the middleman who in turn are tied up to these units formally or informally for the specified species. Normally the trawler owners are the main feeders to these channels as the species found in deep sea are available to them and the quantum of catch being high makes bulk purchase easier. The only exception to this is the prawn species, which follows the common collection procedure in which the product moves from the landing center to the middleman and then up to these units.

The value chain is dominated by the export / processing houses and even here by a select few. The value chain of this segment is more organized as compared to other products because of the influence of the global market which is more streamlined in terms of product standard and high competition. This segment is placed in an open market with market forces of demand and supply governing the value chain.

The “Dollar Value” concept followed by the middleman gives an indication of the ‘open market’ for this product category. This procedure ensures a fair flow profit to the level of middleman in the

value chain. The exporter fixes the product prices for this segment every week and the association of the trawler owners is based on the international prices of the product.

### 6.2.2 High Value Product

The product of this segment are normally finally consumed in the domestic market. These products fetched a good price but are highly species oriented. The supply chain followed in this segment starts from the landing center where procurement is made, the collection point in this case is the middleman ‘gadiwala’s’ followed by the agents and the wholesaler at the regional market which then feeds it to the distribution channel comprising of the sub- retailers and the retailers.

The product of this segment undergoes minimal processing. The sorting of the product is taken up by the middleman who further also takes up temporary freezing arrangement and arrangement for the transportation to the destination market. The profit margins for this segment is moderate to high depending upon the species of catch, quality of catch, size of catch, present market demand, etc.

The middleman and the wholesalers dominate the value chain of this segment. The prices of the product in this segment are normally governed by the prices in the regional market. Normally the Kolkata market and the Chennai market are the leading markets that govern the prices of this segment. The product prices of this segment in the regional market are dictated by the daily market demand and hence the prices of the product are variable. The market for this segment is unorganized and the uncertainty is high in terms of profit margins of the products.

### 6.2.3 Average value product

This product segment caters to the products that are not in high demand either in the local market or the regional market. The product line of this segment is normally consumed in the local market with a certain percentage of it being moved to the regional market. The importance of Kolkata regional market is very high in this segment as it normally governs the countrywide prices of the product line. Apart from normal consumption, these products also meet the industrial requirement for poultry feed and other ancillary units as well.

The product of this segment normally takes up the supply chain for the high value products and hence the players and the processes for this segment are the same. The wholesalers who have a high influence on the entire chain dominate the value chain of this segment. The profit margin in this segment is on the lower side as compared to the high value chain and the export value chain.

### 6.2.4 Low value product

This product segment caters to the small fishes of very low economic value. The prices of the product line is determined the local players only. As it is a product of low value, the chain is a diffused chain and is dominated by the fisherman. The direct buyers / retail agent are the important players in this segment.

The value addition for the product line is normally seen at the primary level and the difference between the value added product and the raw product is high. The profit margin on the raw product is minimal but that on the value added is high. This again becomes crucial with the involvement of the various levels of players.

The normal supply chain of this product segment initiates at the landing center and directly ends up with the final consumers or the retailers who pick up the raw product for the fresh consumption.

### 6.3 The ‘BCG’ Matrix for fishery

The matrix is based on the product life cycle that can be used to determine what priorities should be given in a product portfolio in the business unit. It has two dimensions –

1. Market share
2. Market Growth

The BCG growth – share matrix displays the various business units on a graph of the market growth vs. market share.....

It provides a framework for allocating resources among different business units and at the same time allows comparing many business units at a glance.

#### Four quarters of the matrix

##### Cash cow

These are business units that have large market share in a mature, slow growing industry. Cash cows require little investment and generate cash that can be used to invest in other business units.

##### Stars

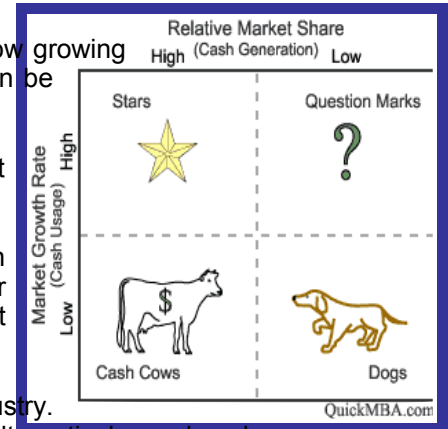
These are the business units that have a large market share in a fast growing industry and require investment to maintain their lead.

##### Question mark

These are the business units that have a small market share in a high growth market. These business units require resources to grow in their market share but whether they will succeed and become stars is not known.

##### Dogs

These are business units that have small market share in a mature industry. It may not require investment but ties up capital, which could have been alternatively employed.



In fishery, when we try to employ the BCG concept with the limitation that the species wise market growth rate is not available for the analysis, the modified BCG frame work when employed, comes out with interesting points. It picks up the product segment and places them in the four quadrant of the matrix.

The framework in the context of analysis has taken up profit margin or cash generation of the product lines and compared it with the investment or the cash usages required in the business. The following gives the indicative picture of the various product lines.

This modified matrix has been used to show the positioning of the product and their state of profit for the various players of the value chain. It also maps the product line on the basis of their product life cycle, which may be further identified with their future growth and profit. Also at the same time it will give estimates of the investments required in any of the interventions that have to be planned for the product line.

#### Cash cows

The cash cows of fishery industry are the high value products meant for the domestic markets. They show the attribute of yielding a constant profit over the period of years. The contribution of the product line of this segment has been more or less regular.

The cash cows are the stable product with an established value chain with a low requirement of investment and a stable return pattern. The players of the value chain are certain about the profit margin and the sharing ratios are normally fixed and acceptable. The norms of the trade for the cash cows are established and hence the replication of the chain can be a difficult proposition.

The following table gives the species wise profit margin across the value chain –

**Table – 6.4 Income from sale to the players in ‘Cash cow’ product category**

Name of species	Price in the final market	Income to the fisherman group	Income to the Middleman
-----------------	---------------------------	-------------------------------	-------------------------

Sala	60	20- 25	10-20
Bomi	65	25 -30	20-25
Cuttle fish	70	35 -40	20-25
Khainga	75	35 -40	15-25
Scodi	75	15 -30	25-30
Bual	80	40- 45	20-25
Pomfret (Black)	80	50 -55	15-25
Minzoram	80	50 -60	20-30
Kauntia	90	30- 50	25-30
Pakhal	100	60- 80	25-30

### Stars

The stars on the fishery industry are the export value products as the product line produces exemplary profit. Yet the markets (global) for these product lines are not fully explored. There is a vast potential in this segment to grow and yield a higher annual turn over.

The stars are growing segment and needs more investment to grow into a full-scale segment. The value chains for stars are highly specialized and most capital intensive.

The following table gives the species wise profit margin across the value chain –

**Table 6.5 Income from sale to the players in ‘Star’ product category**

Name of species	Price in the final market	Income to the fisherman group	Income to the Middleman
Lobsters	350	240 - 270	30-35
Crab	350	170- 250	30-35
Prawn (White)	550	300- 350	50-60
Prawn (Tiger)	750	400- 450	70-80

### Question mark

The ‘Question mark’ of the fishery sector is the products that do not have a defined market. It is being traded on a price that may not be the true representative of its value. This can be attributed to the reason that the market potential for these products is still undefined and unexplored. It has the potential to turn into the “Stars” if proper investment and marketing intelligence is employed in it. At present, these products are traded at a decent profit figures and the demand of the product line is sufficient enough to cover the supplies and at times are beyond the supplies also. The following table gives the important product line of this segment –

**Table 6.6 Income from sale to the players in ‘Question mark’ product category**

Name of species	Price in the final market	Income to the fisherman group	Income to the Middleman
Magur	120	70- 80	25-30
Pabta	130	50- 70	30-35
Ladush	140	100- 110	20-25
Koni	140	70 - 90	10-15
Bhetki	160	80 -100	20-25

Prawn (Brown)	300	150 - 220	15-40
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## Dogs

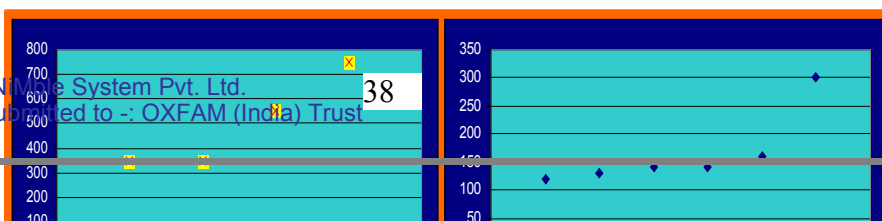
The ‘dogs’ of fishery industry are the low value products that include small fishes, small crabs, etc., which are low on demand parameters. The product nature of this segment is of the type that inhibits the increase in the profit margin. The growth potential of this segment is very limited until and unless some new technology is introduced which changes the product nature completely.

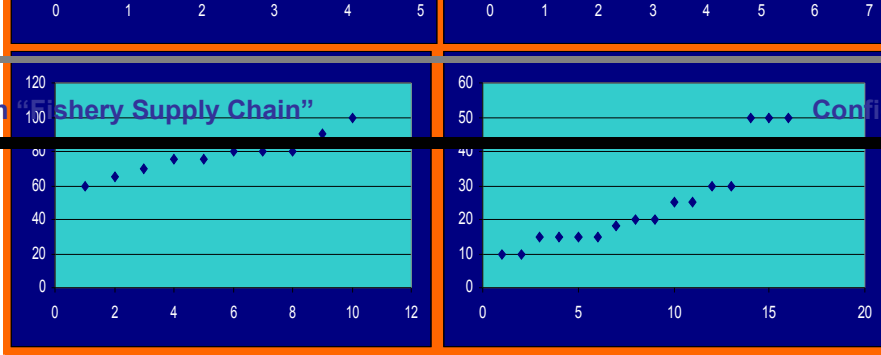
The need for investment in the product line is minimal. The value chain of this product is a degenerate chain with negligible number of operators. The retail agents or the direct customers normally dominate the value chain for this segment. The following table gives the species wise profit margin across the value chain –

**Table 6.7 Income from sale to the players in ‘Dog’ product category**

Name of species	Price in the final market	Income to the fisherman group	Income to the Middleman
Saul	10	3- 4	2-3
Panikiya	10	5 - 6	4-5
Barahai	15	8- 10	5-7
Boria	15	5 - 7	7-10
Kanakurda	15	10-12	5-7
Tumdra	15	8-10	2-6
Ribbon fish	18	8 - 10	5-6
Kockle	20	15 - 17	5-6
Faasi	20	15 -17	5-6
Telia	25	18- 20	5-7
Para	25	18 - 20	5-7
Patharmundi	30	8-10	10-15
Benjoram	30	15- 17	10-12
Leta	50	25- 30	15-25
Pomfret	50	30- 35	10-15
Shankar	50	30 - 35	10-15

The BCG matrix for the various species of fishes is shown below in the four-quadrant viz. the stars, question mark, cash cow and the dogs. A parallel can be drawn from the business cycle in which the maximum product and the product lines are “Dog” i.e. of low profitability margins. This is followed by stable product segment, which has a stable market and average to good profit margin. Here in this segment, the number of products is sufficient enough to carry on the operation profitably even if some other product line is making losses or if some investment is made on the part of the profit margin earned by the product line of this segment. The question marks have usually higher number of products, as they are uncertain about the future value of the product. It can move to the star segment or can become dogs if the margin of the returns even after investment and other consideration is not sufficient to maintain the profitability. The stars are the very limited number of the product lines that yield high level of profit. The costs of operation of the stars are generally high and the product line is unique in itself. The advantage of the product line is natural in case of fishery.





Approximate Cost of operation

**Figure – 6.1 Diagram of the BCG matrix for Fishery**

The profit margin (per Kg.) of the various species has been taken on the Y – axis and the cost of operation (per Kg.) on the X – axis. The cost of operation has been taken on cost intervals, as it was difficult to segregate the cost of operation of individual species. The species were spread on a cost continuum to see the spread on the product segment matrix. It is worthwhile to mention that an assumption has been made on the part of the researcher to develop the BCG matrix for the fishery.

The species has been plotted on the matrix from the tables given above along with the product segments. Hence the species can be located on the matrix from left of all the four quadrants in ascending order.

## CHAPTER 7

## The Supply Chain

### 7.1 Value Chain – Definition

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 (Kaplinsky and Morris).”

**Value Chain**  
*“A vertical alliance of enterprises collaborating to achieve a more rewarding position in the marketplace”*

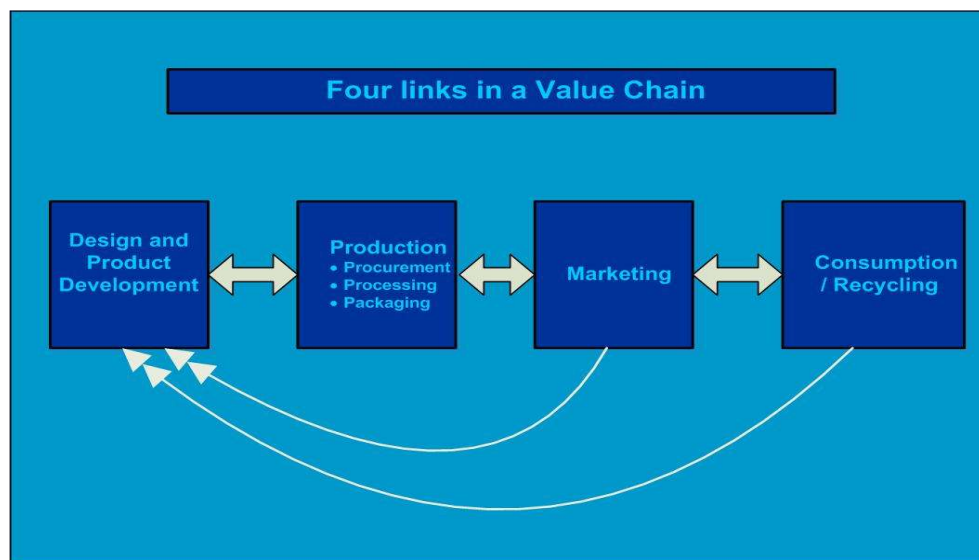
The above definition is a stand true for the value chain of goods and services as well and can be used to describe our case of study. The value chain in the fishery sector can be defined as the movements of the product (fish) from the landing centers to the final consumer taking into consideration the entire gamut of service providers at the various levels of the chain, the value addition done, the service provided or the subsequent value added to the product before consumption in lieu of the profit from the operations undertaken by them.

### 7.2 Key Elements of Value Chain Analysis

The value chain can be broken down into four elements of importance –

1. Design and Product development
2. Production
3. Marketing
4. Consumption / recycling

These elements describe the transition processes undergone by a product or a service before it is finally consumed. All the key elements can be broken down into various sub-components and further into processes and sub processes depending on the product as the case may be.



**Figure 7.1 – Elements of Value chain**

In case of fishery value chain, we may think of value chain starting from the landing center except in case of fish culture. The reason can be delineated to the availability of the product naturally

without undergoing any cost of production and hence the first level will be determined at the landing center rather than the sea.

The design and product development can be assumed to be a component of fish quality, size, variety, species, etc. which intersects the element of production. Production element entails procurement, processing and packaging of the product depending on the final market, species quality, etc. The production element of the value chain is the feeder to the supply chain of direct marketing and the purchases made by the exporters and bulk buyers for resale after value addition.

### 7.3 Barriers to entry, mobility and exit

The value chain is an important construct for understanding the distribution of returns arising from design, production, marketing, coordination and recycling. Essentially, the primary returns accrue to those parties who are able to protect themselves from competition. This ability to insulate activities can be encapsulated by the concept of rent, which arises from the possession of scarce attributes and involves barriers to entry.

**Ricardo** argued that economic rent accrues on the basis of unequal ownership/access or control over an existing scarce resource

There are a variety of forms of rent. It may range from high cost of operation, high fixed cost, control and access over ancillary chains, access to premium services, access to information and marketing intelligence, etc. These barriers to entry will inhibit the new player to enter the trade easily.

The barrier to mobility makes it difficult for the existing player to move the trade operation from one location and other. In fishery value chain, the mobility barriers are the credit flow to its supplier / fisherman, transportation barrier to move the product from the other landing centers, availability of other infrastructures, government licensing regulation for the fisherman, etc.

Exit barriers are the barriers that make it difficult for the existing players to quit the business operation. In case of fishery value chain, the exit barrier lies in form of huge capital investment, etc. which makes it difficult for the operator to quit business.

**Table 7.1 Barriers to trade**

Sr.	Actors of the Value chain	Entry Barriers	Mobility Barriers	Exit Barriers
1	Fisherman	<ul style="list-style-type: none"> <li>Capital investment for boat and net</li> </ul>	<ul style="list-style-type: none"> <li>License regulation of the government</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
2.	Middleman	<ul style="list-style-type: none"> <li>Existing consortium of the middleman</li> <li>Informal supply links</li> <li>Linkages to the external market</li> </ul>	<ul style="list-style-type: none"> <li>Fixed capital and assets</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
3.	Agents	<ul style="list-style-type: none"> <li>Social acceptance for the trade</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
4.	Wholesaler	<ul style="list-style-type: none"> <li>Existing consortium of the wholesaler</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
5.	Exporter	<ul style="list-style-type: none"> <li>High cost of operations</li> <li>Linkages with the external market</li> <li>Government rules and regulation</li> <li>High capital investment</li> </ul>	<ul style="list-style-type: none"> <li>Fixed capital and assets</li> <li>Exhaustive feeder channel</li> <li>Large quantum of trade</li> </ul>	<ul style="list-style-type: none"> <li>High capital</li> <li>Government rules and regulation</li> </ul>

## 7.4 Types of Supply Chains

### 7.4.1 Producer driven Supply chain

Producer driven supply chain is the demand driven chain in which the producers have a larger say on the prices of the commodity and hence are in a commanding position to control the supply and thereby the prices. In case, if the numbers of buyers are large or demand outstrips supply, extreme anomalies can be found.

The Producer driven supply chain was observed albeit to a limited extent in the high and average value products. In this case the fishermen or the trawler owners at times do not agree to auction rates if they feel the rates are low. However, the high perishability of the product tilts the balance of trade towards the buyer

### 7.4.2 Buyer driven Supply Chain

The buyer driven supply chain is the supply driven chain in which the buyers owing to the generic nature of the product or low quality or the abundant availability is on the top of the chain and determines the price of the product.

Buyer driven supply chain was observed to be the key driver of business operations. The high perishability of the product coupled with limited market knowledge and access to formal credit distorts the price in favour of the buyers who set the market tone.

## 7.5 Value Chain

The value chain in fishery is distinct for the product segments and market segments. These segments can be associated to the specific species. Again if we understand the nature of the product, the availability of the species are specific in terms of depth of water, micro climate of shallow and deep water, food availability of fishes, etc. Hence the product can be related to the type of fishing gears and in turn normally with the size of operation.

The coastal species are different from the species found in the deep sea. The availability of the catch is different for the fisherman using different type of fishing gears. Here to bring in contention is the association of the mode of operation used for fishing with the product, which becomes

specific and hence varied value chain can be demonstrated for the various categories of the fisherman.

On the basis of the distance traversed, type of fishing gear, NiMble has identified three different supply chains in Ganjam and Puri from the perspective of “producers” as under –

1. Traditional boat owners using catamaran and sail
2. Boat owners using motorized craft
3. Trawler owners

The rationale for looking at the supply chain from these three players being:

- 1) In NiMble’s opinion these are the most important players as without them, the basic material will not be available.
- 2) At least two of the above three are the target beneficiaries in OXFAM supported ongoing intervention in the fishery sector in these two districts
- 3) Research findings indicate that they are the most vulnerable groups within the supply chain

### 7.5.1 Traditional Boat Owners

The traditional boat owners have a defined and distinct chain due the nature of the catch. This can be related to the species caught, size of the species, availability of the species, etc. Normally the non-motorized boats operate on the coastal water in a periphery of 5 Km.

The catch is smaller in size and is generic in nature. Another point worth mentioning is that due to the biological nature of some of the species, the craft owners are able to catch few high value species. The supply chain from the point of origin moves the product as per their segment attributes.

The ‘brown connectors’ in the following map depicts the supply chain for the low value product and are destined for the local market. The ‘red connectors’ are the channels of delivery of the select few average value products to the larger domestic market on preference and demand of these species. The ‘blue connectors’ are the links showing the high value product, which are in demand in the international chain.

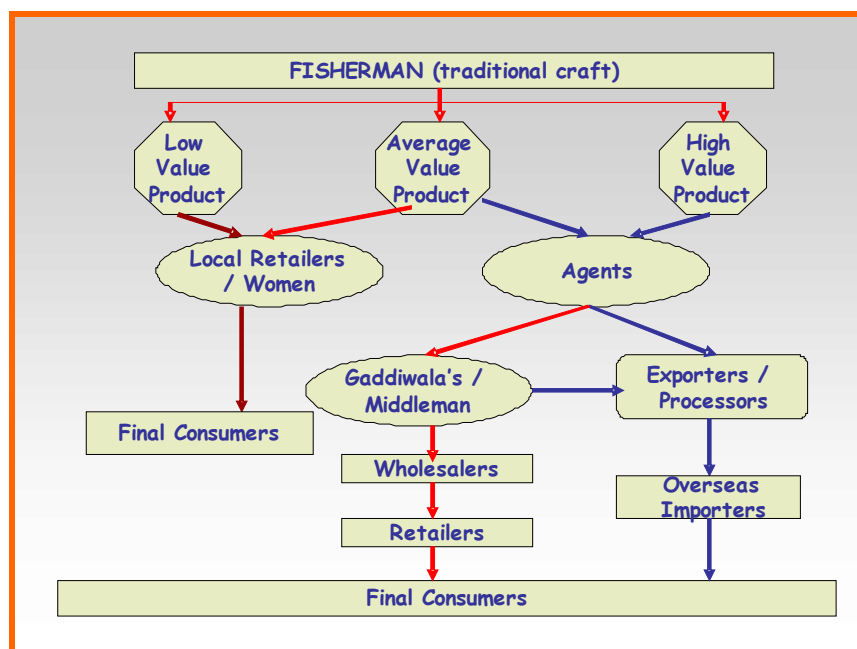


Figure 11: Supply Chain for traditional craft owners

### 7.5.2 Fishermen with Motorized Craft

Normally the species caught by the motorized craft are different from the coastal fisherman as the distance traversed by them is normally from 25- 50 Km. The available species in the deep water is different due to different ecological conditions. The major catches are in high demand in the regional market and hence follow the attribute of the average and high value products. The destined market is the upfront country market where these species are sold on a premium price.

The ‘brown connectors’ in the following map depicts the supply chain for the low value product and are destined for the local market. The ‘blue connectors’ are the links showing the channels of delivery of the select few average value products to the larger domestic market on preference and demand of these species. The ‘red connectors’ are the channels of delivery of the majority high value products to the larger domestic market on preference and demand of these species.

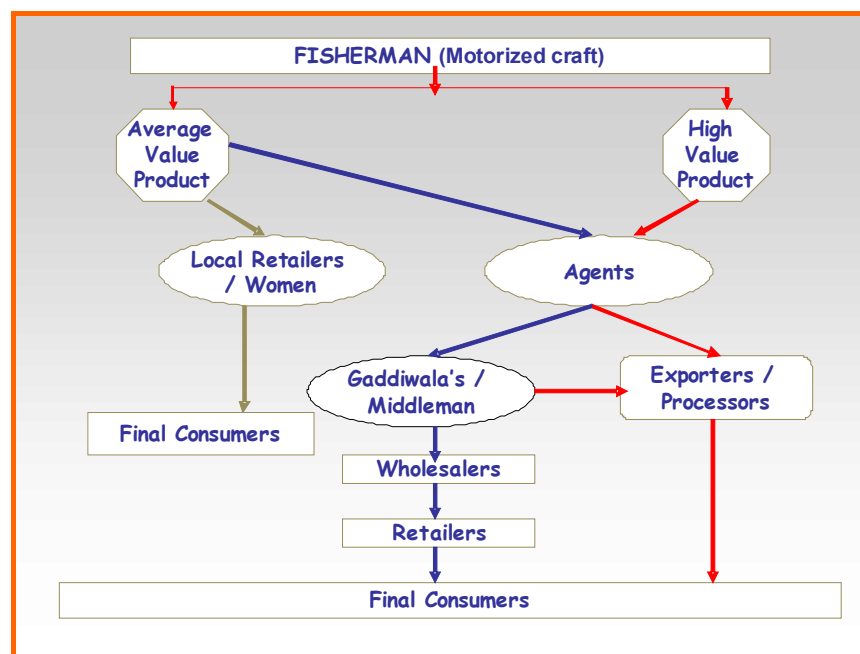
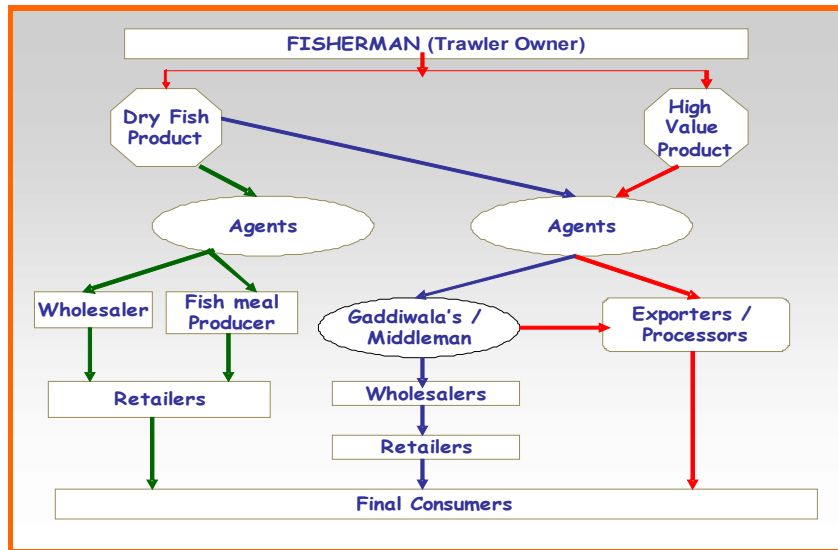


Figure 12 Supply chain for motorized craft owner

### 7.5.3 Trawler owners

The major catch of this segment are the fishes found in the deep sea due to unique ecological environment. The product falls in the segment of low value catch, which is dried on-board and the high value products that are channeled to the regional and upfront country market and to the international market.

The ‘green connectors’ in the following map depicts the supply chain for the low value product that is dried and is destined for the local market. The ‘blue connectors’ are the links showing the channels of delivery of the select few average value products to the larger domestic market on preference and demand of these species. The ‘red connectors’ are the channels of delivery of the majority high value products to the larger domestic market on preference and demand of these species and the export oriented products that are destined for the international market



## 7.6 Players in the Chain

Players are the actors who take up various activities in the chain in lieu of certain returns accruing to them. The roles and responsibilities of the players are defined and specific. The actors perform unique function in the chain, which is exclusive in nature and hence categorizes the actors based on the activity undertaken/service provided by them.

Irrespective of the chain based on the product or market segmentation, the actors present in the chain are as follows –

- Fishermen who do not have a boat
- Fishermen, boat and net owner
- Trawler owner
- Auction agents
- Commission/Collection agents
- Transporters
- Ice Providers
- Godown owner (Gaddiwala's)
- Wholesaler
- Exporters
- Head loaders
- Cycle vendors
- Petty sellers trading fish in kind
- People working as fish packers at the landing centers and in processing units
- Ancillary participants

### Fishermen Without Boats

This category constitutes the largest number of actors in the chain. It comprises of people who are capable of fishing but cannot take up the operation as they are poor and vulnerable and do not have the resources to undertake fishing on their own. They tie up with the fishermen owning boats; gaddiwalas who recommend them to fishermen tied up with them or their own boat and trawler owners.

The main role of the labourers is to support and assist the boat owners in the fish capture. They also take up the repair and maintenance of the fishing gears for the boat owners with whom they are associated. The cost of operation for this segment is negligible as no capital investment is required on their part to enter the trade.

The payment to them is made on the basis of percentage/part of the catch per voyage. The terms and condition for payment is normally same in the districts of Ganjam and Puri. The total cash

generated through fishing is distributed equally among the members participating in the operation after deducting the variable cost of operation. The remaining cash is distributed equally amongst the members including the boat, net and machine as one part respectively. Additionally they are provided food if the voyage is longer than a day.

The average daily earning for this segment is Rs. 80 – 100 per day and the average annual income accruing to this segment is Rs. 13,846 with a standard deviation of Rs.4, 651. This is based on the primary study taken up in Puri and Ganjam district.

### **Fishermen - Boat and Net Share Owners**

Normally the actor in this segment has one or two boats. Either the owner accompanies the hired crew for fishing or some family member of the boat owner accompanies the crew. The fisherman is generally tied up with any of the gaddiwala's because of the credit linkages and other accessory facilities provided by them. In some cases, the boat owners do not go for fishing, instead act as an agent or auctioneer at the landing center. Another important activity taken up by the fisherman is to auction the catch after it lands on the coastline. The fisherman is also accountable for the management of the variable inputs and hence is responsible for its availability.

The cost of operation for this segment is high. The capital investment in this segment is mainly in the fishing gears. Another major expenditure is the variable expense in terms of operating cost of the trade. The cost of operation of the traditional boat without motor is Rs. 72, 097 (Fixed cost being Rs. 65273 and variable cost being Rs.6825) and that for motorized craft is Rs. 4,05,870 (Fixed cost being Rs. 196762 and variable cost being Rs. 209108). The income generated for this segment is on part basis i.e. 1 part each for the boat, net and machine (if applicable) after deducting the cost of fuel and his share from the catch. The average annual income accruing to this segment with traditional craft without motor is Rs. 20,090 with a standard deviation of Rs. 7,077 and that for the motorized craft is Rs. 31,954 with a standard deviation of Rs. 15,600. (Based on the primary data collection in Puri and Ganjam district)

### **Trawler Owners**

This segment has a limited presence in Puri district and is totally absent from Ganjam district. The actor in this segment has taken up fishery as a commercial venture as compared to the livelihood venture of the traditional fishermen with country craft with or without motors. The major role and responsibility of the actor is to invest the capital required to carry on the activity and to arrange for the operational inputs required for the venture. The trawler owners normally do not accompany the fishing operation; instead they take up the additional role of running a 'Gaddi' at the landing center.

The crew is paid 12-15% of the catch in case of bigger trawlers and 20% in case of small trawlers. This percentage is determined after deducting the cost of operation for each voyage. Within the crew, the percentage is divided in parts on the basis of which 2 parts goes to the driver and 1 part shared amongst the remaining crewmembers. The smaller generic fish, which is dried onboard, is distributed equally among the crew of the trawlers and the owner does not get anything from it.

The cost of operation for this segment is high as compared to others. The total cost of operation is Rs. 18,68,067 (Fixed cost being Rs. 1500000 and variable cost being Rs. 368067) with a standard deviation of Rs.2, 77,143. The average annual income accruing to the trawler owner is Rs. 2,66,666 with a standard deviation of Rs. 2,886.

### **Auction agents**

The actors of this segment do not trade in fish themselves, but only arrange for the sale through an auction or bargaining system. The auctioneers generally belong to the fishing community and often come from the same village and are attached to 'Gaddiwala's'. The auctioneers sometimes take the role of an agent for the boat owners also and have the responsibility of ensuring the realization of money from the buyers.

They don't have any cost of operation in terms of fixed or variable cost. The auctioneers charge Re. 1 / kg in return of this service from the fishermen. Another supplementary role in this category, which is observed specifically in the landing centers in Puri district is the auctioneers' assistants who support the auctioneer in discharge of his function and is paid on daily basis by the auctioneer. The payment received by the assistant ranges between Rs. 40-60 per day.

### **Commission/Collection agents**

As the name suggests, they act as agents of either the large export houses or external traders for defined fish species. Their role is confined to participating in the auctions, procuring fish and handing it over to the traders.

They don't have any cost of operation in terms of fixed or variable cost. They receive a commission in return, which is similar to that of the agents i.e. Re. 1/ kg from the external buyers and in some cases a nominal consolidated amount, which may range from Rs. 5,000 to Rs. 20,000 per annum. The operations costs and accessories like cell phones etc are borne by the principal.

During specific season for particular fish species, these agents are authorized by principals to hire boats and buy fish directly from crafts at sea, thus making short-circuiting the established mechanism.

### **Godown owner**

They are the dominant players in the chain. They provide backward and forward linkages, undertake sorting, packing and transportation and financial support to boat owners and creating linkages for hiring of crew. They have the ability to take risk and have better market access and information. The informal linkages, both backward and forward, in the value chain are very strong. They have fisherman tied up with them because of the credit flow and the wholesaler / exporter are tied up for supply informally to make sale for their purchase

The number of players is limited and hence makes the venture profitable. They generally govern the prices at the landing centers through their agents and the auctioneers.

The capital investment by them in the business is low ranging from Rs. 1, 00,000 to Rs. 2, 50,000 in terms of infrastructure and other fixed investment. But the capital required to meet the operational cost like purchases of the fish, transportation and storage, credit supply to the fisherman (capital employed in the business) is high with an average daily requirement of Rs. 50,000 to Rs. 2, 00,000 depending on the size of operation and the quantum of business undertaken by them. .

### **Wholesaler**

They are normally located in the bigger markets and regional markets. In fact the term wholesaler is a misnomer as many of them perform the role of commission agents. They take up the responsibility of arranging for the products i.e. create backward linkages to the landing center via the middleman / Gaddiwala to meet the requirement of the buyers of the market -the forward linkages. The chain allows a limited number of players in this segment as the profitability is severely impeded if the number increases. They are linked to the various landing centers across the districts and the state and cater to a large number of smaller markets.

The wholesaler also frequently acts like an agent to the middleman in this trade. In this capacity he serves as an auctioneer and provides service of auctioning the product sent by the middleman. The wholesaler in this potential normally charges 5-7 % of the sale value from the middleman after deducting all the operational / variable expenses occurred on his part.

The capital investments by them are in the form of purchase of the “gaddi / aadhat” in the regional markets. However, it was difficult to ascertain the cost of gadi as these are generally family businesses and are in operation for over many years. The capital employed is negligible as

compared to the turnover from the business due to its very nature i.e. acting as commission agents. Even in instances where they perform the role of wholesaler as is generally understood, they do not employ capital in the range of Rs 5-10 Lakh. The annual income of the large and renowned wholesalers is estimated to be approximately RS 25-30 Lakhs.

### **Exporters**

The actors of this segment are the big business houses, which are at the top of value chain. The segment allows very few players, as the volume of trade is very high for the high quality products. The segment has an access and control over the production resources both legally as well as by taking gratuitous advantage of their position in the value chain. This control over the resource is linked with the credit supply, which is pumped in the value chain by them. This control can be termed as “pre auction of the product”.

The major roles and responsibility of the players is to make the huge capital investment in terms of the fixed capital like machinery, building, transportation, ice plant, refrigeration, etc and the variable cost in terms of purchases of the raw product, salary, transportation overhead, etc is high. The actor is also responsible for disposing off the product in the international market.

The investments in processing plants are subject to the types of equipments and machinery they contain. Typically a prawn processing plant costs between Rs 10-12 crore to set up. Additionally most of the exporters have also established hatcheries to provide seedlings for prawn culture. Typically a prawn hatchery with 10 crores seedling capacity requires about Rs 5 crores for its establishment. The variable cost at any given day (read estimated from two large exporters) is around Rs 1 crore.

### **Transporters**

The actors in this segment are the private operators who transport the shipment to the larger country markets. The operators are normally linked to the ‘gaddiwalas’ for their business who hire them in large volumes.

The capital cost employed in the business is high on the vehicle and other assets. The charges for shipment are done on ‘quintal basis’, which from Puri and Ganjam varies, from Rs.350- 500 per quintal to the Kolkota and Vishakhapatnam market. The charges increase on the basis of distance from the origin of the shipment.

### **Ice Providers**

The ice providers are the ‘lifeline’ to the supply chain of the fishery. The service is normally taken up by the factory owners / private entrepreneurs who are linked to them. The ice provider are directly linked to the middleman in the sense that the middleman are the most important customers and hence their business relies on them heavily. The ice provider normally charges Rs. 80-100 per block of ice, which normally ranges 120-125 kg. This price is the indicative price for the study area.

They provide credit facility on business terms to the middleman depending on the informal relationship with them. The ice provider also caters to the small retailers whose requirement of ice is low.

### **Head loaders**

In Puri and Ganjam, women head loaders constitute the largest number of petty traders seen at the beach, although overall they are accounted for the purchase of only a small percentage of the catches landed. They are a major source of supply of fish for the communities within and close to the coastal areas. Also another important activity of salting and drying of fish is taken by the women folk.

In all the villages where women head loaders operate, it was found that the valued product are out of their reach and they are in the trade for average value to low value products. The major competition in this segment of the value chain comes from the cycle traders. This is because the product segment for both of them is same.

The investments normally do not exceed Rs.300 to 500 on a daily basis with an average income of Rs.100 to 150 accruing from the venture daily. The actor has to arrange for the ice required for the trade and the arrangement for the doorstep delivery of the goods to the final consumers.

### **Cycle vendors**

Bicycle fish vendors are prevalent segment in majority of the landing centers especially in Puri district. In Ganjam district the prevalence of this actor is limited to the bigger landing centers. The cycle traders come from different villages, and are involved in both procurement and sale of fish individually. They form one of the large groups in the value chain but they are highly unorganized. As a consequence they are not the dominant players of the value chain even though the quantum of purchases made by them collectively is rather high.

It was found during the primary investigation in Puri and Ganjam district that average to low quality fish are procured by them, as they cannot compete on price for the high to export quality product in the auction. The markets for these vendors are the local villages, haats, daily fish market and door-to-door selling. The player makes arrangement for the transportation and icing for the procurement.

The actor of this segment normally makes purchase of an average of 30-40 kg per day of mixed species, normally 2 to 3 species, with the investment of Rs. 800 to Rs. 1000. The average income of Rs.250 to 300 accrues to the actor on a daily basis from this venture.

### **Petty sellers trading fish**

These were amongst the poorest people in fishing villages who do not own boat or net and are incapable of taking up fishing on their own. This group mainly comprises of old age people. They collect fish in low quantity from the boat landing at the coast throughout the day and then sell the collection to the buyers, which normally for them are the bicycle vendors or the women head loaders.

This collection of fish from the boats is without of any charges from the fisherman. This section of the community is extremely vulnerable and poor.

### **People working as fish packers at the landing centers and in shrimp processing industries**

The commission agents of the business houses and the exporters employ workers to collect, sort, grade and pack shrimp and high-end fish for onward transport to the processing unit. At the processing factories, women are normally employed for processing operations.

The processing units employ normally about 50 to 80 people, which can go up with the size of operation, for sorting, grading, peeling and packing. It came out during the interview of the processing unit owners that they preferred to employ girls from southern states initially because they were considered adept at tasks such as sorting, grading and peeling, but now the employment scenario has changed in favour of the locally available manpower.

At the landing center and in the various markets there are also head-loaders who move fish between traders or for loading, unloading and packaging operation. They also provide service in terms of manpower to the value chain responsible for moving goods in the ‘production-consumption chain’ from one place to other.

All these players are normally either salaried employees as in the case of workers employed by the commission agents, employee of the processing units or daily wage earners as in the case of workers required for moving product in the value chain.

### Ancillary participants

Ancillary participants involved in the supply of ice, salt and fuel to the various actors of the value chain and are generally the larger operators. Transporters comprise of another set of ancillary participants who provide service for the movement of goods and local conveyance.

Basket weavers are another set of participants that are a large segment in the trade of brackish water produce. Also railway porters, ice crushers, ice plant workers, salt sellers, gunny-bag manufacturers and rope makers, etc., are all ancillary participants.

### Summary of Actor’s Roles and Responsibilities

**Table 7.2 Summary of roles and responsibilities of players in the fishery value chain**

Actors	Role and Responsibilities
Fisherman Does not have a boat	<ul style="list-style-type: none"> <li>goes as wage labourer for fishing, under labour contract, in an informal group called ‘Meli’</li> </ul>
Fisherman, boat and net share owner	<ul style="list-style-type: none"> <li>Arranges for worker and other variable factors for capture.</li> <li>Normally goes with the group, gets share for his boat and net and also his own wage share</li> <li>Sometime plays role of commission agent also.</li> </ul>
Trawler owners	<ul style="list-style-type: none"> <li>Arrange for the worker</li> <li>Takes care of availability of variable inputs</li> <li>Make arrangement for transportation / sale of the product</li> <li>Meet the credit requirement of the crew.</li> </ul>
Auction agents	<ul style="list-style-type: none"> <li>Belong to the fishing community</li> <li>Tied to the godown owners’</li> <li>Ascertains the value of catch</li> <li>Ensures that the catch goes to the specified godowns that have advanced money to fishermen.</li> </ul>
Commission agent / Collection agent	<ul style="list-style-type: none"> <li>Participate in the auction</li> <li>Collect fish at landing centre</li> <li>Supply to the specified godowns or exporters</li> </ul>
Godown owner/trawler owner	<ul style="list-style-type: none"> <li>Participate in the auction through agents</li> <li>Make arrangement for transportation / sorting / weighing / storing</li> <li>Operates his own mechanised boat</li> <li>Runs a storage house and transport arrangement</li> <li>Sends fish to wholesale markets</li> <li>Meet the credit requirement of the fisherman</li> </ul>
Wholesalers	<ul style="list-style-type: none"> <li>Make arrangement for the product</li> <li>Make arrangement for sale / auction</li> <li>Provide support facilities to the middleman</li> <li>Meet all the requirement of moving the product</li> </ul>
Exporters	<ul style="list-style-type: none"> <li>Own processing unit, where they process, pack</li> <li>Sell directly abroad or through their clearing and forwarding agents.</li> </ul>
Transporters	<ul style="list-style-type: none"> <li>Loading and unloading of the shipment</li> <li>Transportation of the shipment to the distant market</li> </ul>
Ice providers	<ul style="list-style-type: none"> <li>Supply of ice to the middleman and the retailers</li> <li>Provide credit supplies to the middleman on preferential business terms</li> </ul>
Head loaders/Cycle vendors	<ul style="list-style-type: none"> <li>Purchase fish directly from auction</li> <li>Cater to nearby retail markets.</li> </ul>
Petty sellers trading fish in kind	<ul style="list-style-type: none"> <li>Collect fish at the landing center</li> <li>Sell to the local vendors</li> </ul>

Ancillary participants

- Provide service in terms of manpower

## CHAPTER 8

# The Fishery Chain – Analyzed

### 8.1 Business Analysis of Fishery Value Chain

Business analysis of the fishery value chain has been taken up in the study to understand the present context situation in which the chain operates. This analysis will help in understanding of the very nature of the fishery business, the stakeholder in the value chain, their concerns and issues, cost of operation of various operators in the value chain, the profit margin at the various levels of the value chain, etc.

At present situation, we find that the producers (fishermen) in the value chain are located separately and are disjoint sets in terms of the boat capacity and the primary trade of the captured fish. The second set of players i.e. the middleman are a consortium of traders who are united and are supported by agents / auctioneers who help them become dominant in the trade. The third set of players consists of the wholesalers who are highly business-oriented group and have also formed an association. They have their strength in the volume of the trade that is available to them because of the market characteristics. Exporters are another group, which are disjoint and compete for the products specific for the international market. The value chain for them is an integrated chain in which they have control over both the backward and the forward linkages of the chain. This segment has internal competition amongst them and is separate from the domestic trade of the products. The other players of the chain include the local traders, the ancillary facility provider, etc. which are in a diffused formation without any specific interest or role to play in the value chain.

The value chain in fishery is critically limited in terms of poor communication facilities and infrastructure, which leads to the inefficient usages of resources. Also the unique characteristics of fresh aquatic products like uncertain productivity, putrescibility and transport difficulty leads to many problems in traditional value chains. The present distribution channel is more or less incompetent to sustain the rapid development of ‘New Economy’. Further more, domestic producers are facing foreign competitors who are backed by strong ‘dollar power’ and clearly have the upper hand in the trade. Therefore, in the given context it becomes imperative to understand the intricacies of the business operation of the fishery value chain.

### 8.2 Nature of Business

Due to its very nature, the fishery sector constitutes a value chain composed of two different phases forming a system: the capture / culture -or primary- phase, and the industrial -or secondary- phase. Together with a range of support services -which include transportation, commercialization and other activities-, they form a “production –distribution – consumption” complex.

The industrial phase, in turn, is composed of three cycles: the first cycle is freezing; the second cycle involves physical processing that makes it possible to obtain a standard frozen product; and the third cycle is production of processed foods.

#### 8.2.1 Primary Phase- Secondary Phase Articulation

The articulation between the catch / culture and industrial phases has been an area of concern for the fishery sector. In general, through practical constraints and facilitation and the use of multiple means, links have been established between the crafts and the processing plants, providing certain minimum stability to the chain, but the scenario continues to be bleak for the poor fisherman as the trade barriers created by the players of the value chain sharply and critically hampers the profit margin for him.

On the other hand the problem connected with the method by which the product is prepared in the catch / culture phase is of prime concern to the industrial phase because of the barriers to trade created by the global market standards, which limits the possibilities for its industrial processing.

### 8.3 Dynamics within the Supply Chain

Supply chain maps are not complete without understanding the dynamics – both explicit and implicit. It allows researchers to gain insight into the linkages between the players as well as inter-dependencies and systems and processes in vogue.

In NiMble's opinion the following are worth mentioning:

#### 8.3.1 Socio-cultural

In Ganjam and Puri district, people of Telugu origin dominate fishing. These people have settled in the coastal villages over generations. They resolutely guard their traditions by strictly practicing in-community marriages either in Orissa or in Andhra Pradesh. Many of them still maintain two houses – one in Orissa and one in Andhra with some even having different set of families in these two states.

This group has socially been looked down upon by mainland Oriyas – as their main source of livelihood and food consumption is marine fish species which till a few years back would not be allowed in Oriya households as it was considered fit to be eaten only by low caste people.

Within the Telugu fishermen community, there is an informal system of delineating the coastline in smaller areas known as “BARAF”. The control over these “BARAF” lies with the local groups within the village. Normally at BARAFs, fishermen from within the sub-group allocated can anchor the craft. If craft of others land up at non-designated BARAF, it attracts a penalty.

The only social inter-mingling has been that of the language – i.e. these people have learned the Oriya language.

#### 8.3.2 Economic

**INFORMAL** mechanisms govern the fishermen economy even today. There is complete nonexistence of formal credit mechanism.

This has led to the dominance of “Patron-Client Relation” within the economy. The Patron (read trader/wholesaler/exporter) provides credit without any records and collaterals. Lending is normally done for repairs and purchase of boats (lenders part money for boat and make sure that fisherman invests in the boats) and nets. Money is also advanced for special social occasion like conduct of marriages, tonsuring ceremony, death rituals etc as also for other needs like medicines etc. Against these, the fishermen pledges the first right over the catch to the moneylender. Interest rates are normally range between 36-48 per cent per annum but in some instances were found to go as high as 100 per cent.

The sanskritization of the “Patron-Client” relationship has become so endemic that client does not even have the right to change the Patron. Social, economic, political and in extreme cases even the threat of use of violence is used as means to get the errant back to fold

The trade is entirely without documentation and written records. Weighing of the catch by the buyer or his agent in smaller landing centers is “Ocular” i.e. it is not weighed but estimated visually. Even then it is not recorded but quantities are agreed upon.

Additionally 10 per cent of the auction value is deducted by the gaddiwala on the account of losses incurred due to drying.

The “ocular” weighing is always in the favour of the buyer and not the fishermen. On an average the fisherman loses 10-15% of the catch here itself.

The prices, though determined at the auctions, are not paid on the spot. The payments normally take place at the end of the day or the next day. Since no documentation is done, some respondents as well as NGO office bearers cited instances when the fishermen is paid further less as quantities are tampered with and only the buyer has “sale record”

### 8.3.3 Political

Most of the “patrons” enjoy the patronage of political leaders. The political patronage is obtained through provision of percentage stake in the business, party donations or outright payments for getting favourable decisions and policies.

People in hushed tones talk about the prevalence of “Mafia” like control over the fishery supply chain – in the entire state by a select group of exporters/wholesalers

It also allows the “patrons” to undertake subversive activities to damage a rival’s business or indulge in high handedness with fishermen. E.g. in Paradip and Gopalpur it was mentioned by a few respondents that there have been instances when a leading patron has outrightly challenged his rivals and gone to the extent of bombing the rival’s vehicles.

### 8.3.4 Gender

Women play an important role in the fish supply chain at the village level. Typically, they are entrusted with the role of 1) sale of the low value products in and around the villages, 2) salting and drying of fish and 3) sale of dried fish.

However, they have limited or negligible say in decision-making process as the entire process and procedures in the chain is highly male dominated.

The auction of the catch is a domain of the males and the women actors have negligible role to play. Their participation in the entire process is limited to products of generic nature and not of interest to their male counterparts.

The women have a high involvement in the ancillary support services but the exploitation by the dominant players in terms of wages is prevalent. Other instances of exploitation can be seen in the market where the women are the majority retailers and are harassed by the collectors of the market cess, Other points worth mentioning is the lack of basic amenities to encourage women to play a important role in the chain.

The dry fish market at Uma is the largest in the region. The dry fish preparation and marketing is normally the domain of the women. The trade in Uma market starts in the morning at 4 am in the morning and hence the women sellers have to spend the night in the market yard where physical and sexual exploitation have been reported. The women sellers reported that the market cess collector harass them on the charges for the produce and often unduly charge them.

The other problem is the lack of basic amenities and infrastructure like toilets, retiring rooms etc. In its absence, they are forced to relieve themselves in the open; sleep in the open in the market sheds, which creates problems.

8.

The fish supply chain –being highly perishable is totally dependent on the timely availability of ice-crushed /flakes for extending the keeping quality as well as the shelf life. This again is controlled either directly/indirectly by the “patrons”. Throughout the study and field visits, the NiMble team did not sight an ice factory in the vicinity of the landing centers. Enquiries revealed that ice was

generally made available from the plant of the exporters or brought by traders from nearby townships. (Except Balugaon landing center which owns an ice factory due to the initiative of the private entrepreneur and Chilka Development Authority)

Transport is another vital link in the supply chain that is influenced a lot by the dynamics of “Patron-Client Relationship”. In the first place, refrigerated or insulated vans are not available in the local transport markets – barring a few which the exporters own. Most of the fish is transported by road using plain trucks, which are covered and packed with ice, husk and salt in a manner that it suffices for the entire duration of the journey – ranging from few hours to few days. Secondly, the first right to vehicles available in the market lie with the patron to the extent that others maybe denied a vehicle if the “patron” wishes so. Even when the transport is undertaken by train – the socio-economic-political nexus operates in manner – somewhere through direct bribes and elsewhere by a combination of the three that goods booked for journey are delayed – in case of highly perishable product like fish, it may mean total loss for a consignment – an anecdote provided to us by a Samudram representative.

## 8.4 Stakeholder

The important stakeholders who are associated with the value chain can be divided into three categories –

**Table 8.1 List of stakeholders**

Conservation	Subsistence livelihood	Economic / Industry
<ul style="list-style-type: none"> <li>▪ Government</li> </ul>	<ul style="list-style-type: none"> <li>▪ Traditional Fisherman (Coastal fishing)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Middleman &amp; wholesalers</li> </ul>
<ul style="list-style-type: none"> <li>▪ NGO's and other institution</li> </ul>	<ul style="list-style-type: none"> <li>▪ Labourers</li> </ul>	<ul style="list-style-type: none"> <li>▪ Exporters and processing units</li> </ul>
<ul style="list-style-type: none"> <li>▪ Individuals</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ancillary service provider</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trawler owners (deep sea fishing)</li> </ul>
<ul style="list-style-type: none"> <li>▪</li> </ul>	<ul style="list-style-type: none"> <li>▪ Women head loader</li> </ul>	<ul style="list-style-type: none"> <li>▪ Other service providers</li> </ul>
<ul style="list-style-type: none"> <li>▪</li> </ul>	<ul style="list-style-type: none"> <li>▪ Bicycle vendors</li> </ul>	<ul style="list-style-type: none"> <li>▪</li> </ul>

### Conservation

This group promotes conservation ideology and is against destructive practices that are not in harmony with and create ecological imbalance. In the Puri and Ganjam coastline, the major concern of the group is focused on turtle conservation.

### Subsistence Livelihood

This group comprises of poor fisherman whose entire livelihood comes from the sea. The fisherman community is in conflict with the trawler owners. The disjoint nature of operation makes them prone to exploitation at the hands of the other players of the value chain. The capital requirement for operation is the controlling tool in the hands of the other operators who create the distribution inequality in the chain.

### Economic / Industry

In the fishery value chain the industry / processors are on the top. The scale of operation, cost of capital employed and competition at the global level is very high. The other segments in this category are the feeders – to the industrial market i.e. the agents, middleman and the wholesalers. This segment caters both to the domestic retail market as well as to the requirement of the processing houses and the exporters. This segment makes the cost of operation of the value chain high and brings distortion to the chain in terms of in equality in profit distribution. The access and control of this segment on the entire chain is very high.

## 8.5 Cost of operation of the players in the value chain

### 8.5.1 Fisherman

The cost of operation of the fisherman depending on the type of craft and the size of operation has been calculated on the basis of the primary study in Puri and Ganjam district. The cost of operation of the producer segments is given below.

**Table 8.2 Cost of operation of the fisherman**

Cost heads	Traditional boat owners (without motors) in Rs.	Boat owners with motorized engine in Rs.	Trawler owners in Rs.
<b>Fixed cost</b>			
Boat/ craft	20700	47391	1166667
Net	65500	98682	333333
Motor	NA	24864	Cost is included in boat.
License	156	213	400
Sub total	<b>86356</b>	<b>171150</b>	<b>1500400</b>
<b>Variable cost</b>			
Fuel	0	149250	316667
Repair	4450	10043	50000
Insurance	97	189	1000
Renewal of license			
Sub total	<b>4547</b>	<b>159483</b>	<b>367667</b>
<b>Total</b>	<b>90903</b>	<b>330633</b>	<b>1868067</b>

\* All the costs are averages of the respondent from the primary study.

### 8.5.2 Middleman and Wholesaler

The cost of operation of the middleman and the wholesaler has been calculated on the basis of the primary study. The costing is an indicative list of expenses borne by the service providers in lieu of their roles in the supply chain. The cost of operation of the service providers is given below.

**Table 8.3 Cost of operation of the middleman and wholesaler**

Cost sheet for the middleman in the Regional market		
Fixed cost	Variable cost	
Fixed cost depends on the size of operation and the volume of trade	Auction	Rs. 1 /Kg
	Sorting and weighing	Salaried employee
	Packaging	Salaried employee
	Icing	Salaried employee
	Loading	Daily wages (Rs. 45-50)
	Transportation	Rs. 350-500/ Q on road Rs. 170/ Q on railways
	Cost of ice	Rs. 40-50/ 60 kg
	Cost of packing material	Rs. 10 / 60kg
	Commission agent	5- 7% of the auction price
	Sales tax	1% of the sale value

- All the costs are averages of the respondent from the primary study

Cost sheet for the wholesaler in the Regional market	
Fixed cost	Variable cost

Fixed cost depends on the size of operation and the volume of trade	Commission / Market cess / tax	Depending on the market
	Bilty	Re. 1-2
	Dan	Re. 1
	Hisabana	Re. 1
	Cart	Rs. 23
	Arat collie	Rs. 16
	Postage	Rs. 7
	Deposits	Rs.100
	Railway bond	Rs.10
	C/S fund	Re. 0.50
Loading and unloading	Rs. 50-70 / Q	

\* All the costs are averages of the respondent from the primary study.

### 8.6 Fish Bone Analysis

Also called as “Ishikawa diagram”, the fishbone diagram is an analysis tool that provides a systematic way of looking at effects and the causes that create or contribute to those effects. It helps to visually display many potential causes for a specific problem or effect.

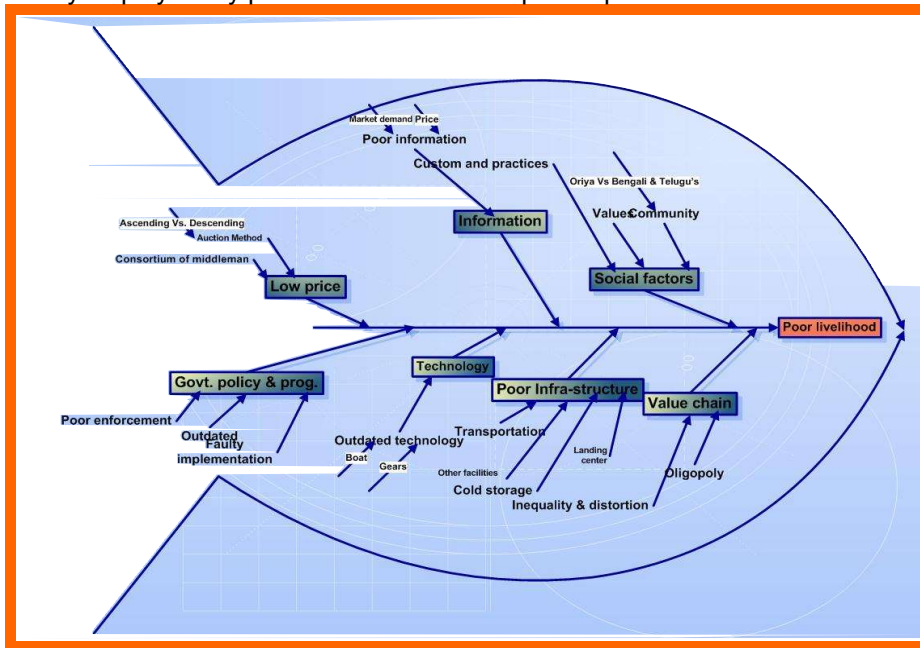


Figure 8.1 Fish bone analysis

The analysis has been taken to enhance understanding of livelihood context of the fisherman. The analysis helps to understand the ‘causes’ that contribute to the effect i.e. ‘poor livelihood’ of the fisherman. The causes that have been observed during the ‘quasi participant’ discussions throughout the primary study are listed below –

1. Exploitation by the supply chain
2. Lack of Information
3. Poor infrastructure
4. Outdated technology
5. Low pricing
6. Social factors
7. Government policy, rules and regulation

#### Exploitation by the supply chain

The exploitation of the fisherman is prevalent in both Puri and Ganjam district by the other dominant actors of the supply chain. The oligopoly of the few middlemen has distorted the profitability balance in their favour. This has supplemented the distortion and inequality in the chain and reduced the say of the fisherman in the supply chain.

**Lack of Information**

Information gap on price and market has created a lacuna and reduced the bargaining power of the fisherman. The due diligence of the fisherman is severely downsized because of the non-existent information channel on prices and demand of the various species in the bigger markets. The player has to completely depend on the middleman to fix the price of the catch and hence has to compromise on the income aspect. The absence of parallel information channel has limited the awareness of the players.

**Poor infrastructure**

In both the district Puri and Ganjam, the lack of adequate infrastructure like chilling plant, Jetty, weighing facility, etc. has forced the phenomenon of “distress selling”. This has been one of the crucial factors limiting the profitability of the fisherman.

**Outdated technology**

The fishing technology used by the fishermen community is outdated. The crafts with or without motors are a common parlance in both the districts. The use of modern fishing gears is negligible and hence the size of operation, maneuvering for fishing gets severely impeded. The use of remote sensing and Geographic Information Systems is non-existent which otherwise would have helped in augment the capture by the fisherman.

**Low pricing**

The low pricing of the catch is prevalent in both the districts. The consortiums of middlemen through their respective auctioneers deliberately play with the existing prices thus reducing the price of the catch.

**Social factors**

The traditional customs and traditions in a way come in conflict with the modern technology and thus impede the development of the fisherman. The class conflicts between the various communities (Oriya – Bengali – Telgu) prevent them from uniting and presenting a united front before their exploiters.

**Government policy, rules and regulation**

Inefficient execution and implementation of government policies and programs, in a way has delayed the development of the fishermen. The snag between the planning and implementation is obvious when ‘ground triangulation’ of various programs was done in Puri and Ganjam district. The wasteful use of the resources on the part of the government has been a limiting factor in the development of the fishermen. This is mentioned in nuance of wrong timing of the program, selection of beneficiaries, etc.

### 8.7 VRIO - traders’ competitive capabilities framework

This framework is employed to find out the relevance of the traditional value chain for fishery sector. In this analysis, the efficiency, effectiveness and usability of the value chain is analyzed in terms of the value of the product for the customer i.e. to say the price of the product that the final consumer is paying or is willing to pay. This helps us to assign a ‘final value to the product’. The second component of the framework is the consequence of the larger market (global market), which acts as a competitor to the product with the domestic market. The understanding of this elements helps to gain insight in terms of product acceptance and demand in the larger market.

Keeping in focus the demand attributes, the question ‘whether an option of a parallel value chain is viable or not’ has been checked. Also parameters of inefficiency, if any, in the existing chain has been cross checked with the proposed supply chain. The last element employs the concept of branding and product positioning in the market. It checks the uniqueness of the ‘value chain’ against elements of product standard and modus operandi of delivery.

In short the basic question VRIO analysis puts forward are –

V = what is the supply value for customers?

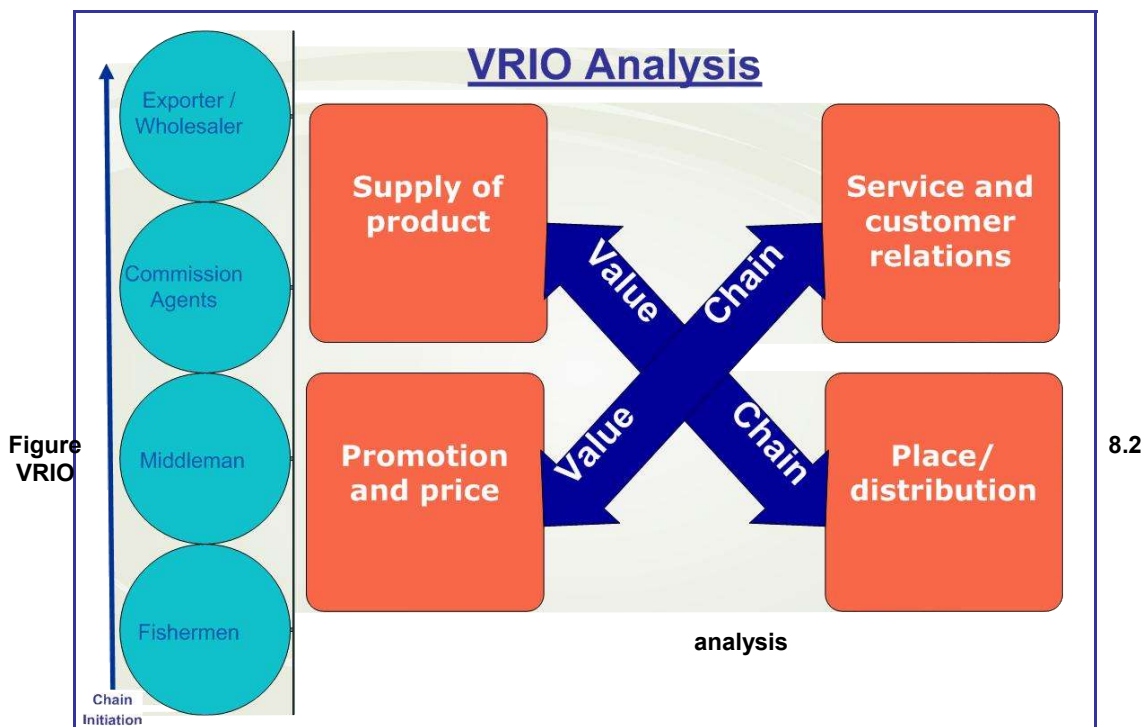
R = how rare is the supply compared to competitors?

I = Can the supply be imitated?

O = is the supply covered by organizational uniqueness?

To summarize we can say that this analysis is all about checking the value chain in terms of –

1. Supply of product
2. Place/ distribution
3. Promotion and price
4. Service and customer relations



### 8.7.1 Supply of product

The supply of the fishes from the landing center is through the middleman via agents / auctioneer to the wholesaler or the commission agent at the regional market. The international market takes up the value chain of exporters via commission agent to the international market directly or through buyer arrangement. Both the supply chains are robust in the sense that the backward linkages of the chain, which serves as the feeder channel, are strongly networked and supported by other linkages like credit, informal relationships and other fringe facilities which keep the feeder channel or the fishermen base intact for the present value chain.

The operational efficiency of the value chain for domestic market, in delivery of goods can be considered to be average to good based on the parameters of timely delivery, packaging and transportation. But the value chain is inefficient in handling the volume of trade as losses from drying of the community amounts for 3 – 7 %, various species are dried owing to lack of buyers for them, grading and sorting operations and because the information gap between the market and the producer is high.

### 8.7.2 Place/ distribution

The present value chain for fishery is concentrated mainly to few regional markets that include Kolkata and Bhubneswar. There is some movement of product to Delhi, Mumbai and Vishakhapatanam market as well. The potential of other markets is yet to be explored which may be lucrative and profit yielding. The value chain is limited in terms of number of market and spread of the product on geographical locations.

Also the value chain needs to explore and identify the location of potential customers, which are catered by supply chain originating at other location, and ‘push’ the product strategically in the new markets. The limitation of the present value chain in terms of marketing intelligence is immense. The market information to the players of the value chain is limited. The middleman of the present chain is the link to the domestic market. The price information is limited to him and is normally not shared with the players lower in the value chain. The feeder channel is unaware of the market demand of the external market and normally the produce is dispatched without this information to the markets. This severely impedes the profitability of operation.

### 8.7.3 Promotion and price

The present value chain of fishery does not practice promotion and pricing strategy for the product. The marketing of the product is done under the generic brand value that is highly associated with the species in trade. The branding of the source is not prevalent in this trade. Except for the prawn coming from Chilka, which has an association with the place of origin, no other variety has any specific branding to segregate the product from other available offer in the market.

Prawns from Chilka are considered to be of good quality, size and taste and of natural brackish water origin; hence it fetches a premium price in the market.

The value chain completely loses any distinction in terms of market acceptance of its product. The product does not get premium price because of its superior quality or any special feature. The lacunae created can be traced in product positioning and branding that hampers the profit margin, which it would have generated otherwise.

### 8.7.4 Service and customer relations

The value chain for fishery normally has informal flow of relationship between the players and ‘word of mouth’ is the normal parlance in trade. The product ‘fish’ can be placed in the non-branded fast moving consumer goods and hence shows distinct characteristic of non-association of the customer with the product.

The entire trade is not formalized in terms of contracts and agreements between the actors of the value chain. The flow of good and services are on mutual trust and agreement, which are not documented. The trade is highly unorganized in terms of credit and finances. The credit services

flows from the actors who are at the top of the value chain to the actors who are in lower rung. Another discrepancy is the credit leverage given to the wholesaler by the middleman on the produce. Normally the services in terms of credit and ancillary services are provided by the middleman to the fisherman and the agents who are linked to him. The commission agent at the wholesale market provides service of 'auction' to the wholesaler and takes all the responsibility of moving the goods / products in the market.

**Table 8.4 Comparison of traditional value chain with parallel value chain**

Traditional value chain		Parallel value chain	
Present Strength	Present weakness	Proposed Strength	Inherent Weakness
<ul style="list-style-type: none"> <li>▪ Established linkages between the players in the chain</li> <li>▪ Processes and operations of business is known</li> <li>▪ Market information and knowledge is high</li> <li>▪ High support from the ancillary service provider. Eg. Ice factory, transporters, etc</li> <li>▪ Supported by strong disjoint groups of fisherman.</li> <li>▪ Cash needs and credit requirement is met within the value chain</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low margins and high risk</li> <li>▪ Small investments in demand promoting measures</li> <li>▪ Low willingness to use resources</li> <li>▪ Gross margin of retailers increase</li> <li>▪ Intense competition in primary production and low profitability due to lack of entry barriers in it.</li> <li>▪ High distribution costs</li> <li>▪ Too many levels prevalent in the value chain</li> </ul>	<ul style="list-style-type: none"> <li>▪ Association of small groups of fisherman can be created</li> <li>▪ High degree of coordination between primary production, processing, transportation and buyer can be created.</li> <li>▪ No redundant intermediaries</li> <li>▪ Utilize economies of scale in all stages</li> <li>▪ All stages are allowed to plan and optimize resource use</li> <li>▪ Several species have a potential to obtain higher prices through positioning of differentiated fresh fish products</li> <li>▪ Product range and differentiation</li> <li>▪ Cost efficiency in distribution</li> <li>▪ Volume and timing of trade can be incorporated in the value chain</li> <li>▪ Price subsidies can be given over bulk and regular purchase</li> <li>▪ “Market rather than sell” should be promoted</li> <li>▪ Long-term cohesive industry associations.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Social and cultural differences between the communities.</li> <li>▪ Inability to employ the operational cost in business</li> <li>▪ Inability to sustain the incubation period of business as “hand to mouth” condition exists for the fisherman.</li> <li>▪ Linkages with the external market, both the domestic and export market is non-existent.</li> <li>▪ Conflict with the established traditional value chain.</li> </ul>

## CHAPTER 9

# Conclusion and Recommendation

### Conclusion

The research on the value chain of fishery illuminated the processes and procedure that are in vogue in the traditional value chain. It identified the various levels that exist in the present value chain and analyzed its strength and weakness. The research helped in analyzing the roles and responsibilities of the various players and at the same time looked in empathically into the problems of the various players. The study also identified the various stakeholders of the fishery business – the co-operation and conflict between their interests and the platforms where they can synergize their actions for the sustainable and effective use of the natural resource in the best interest of all. The study also looked into various policies and issues related to the fishery business and analyze their implications, both positive and negative on all the players.

The research sees the entire business in the perspective of an industry but has tried to maintain livelihood focus throughout. NiMble’s research indicates that the fishery business can be looked into “market” and “product” terms. This inter-alia would help in identifying the individual products / species in terms of their potential to earn profit, the demand and the supply parameters.

### Key Study Findings:

#### *Supply Chain*

The control over the entire supply chain is in the hands of few large players i.e. traders and exporters. The price of majority of species within these two districts at most of the landing center is determined by these “select few”.

There are large numbers of “intermediaries” within the supply chain who add to the prices of the species without adding “value” to the extent of the final price realized by end consumers. Only about 20-25% goes to the first leg of the supply chain i.e. fishermen. Notable exception observed being for high value products like prawns and pomfrets (where intermediaries are less in number) where fishermen are fetched between 60- 70% of the consumer price.

The logistical infrastructure is weak except in Balugaon (being on the national highway). Efforts are being made by the Chilka Development Authority to spruce up the logistical facilities including marketing yard, chilling centers, weighing machines etc. However, in other centers there is much to be desired and as comprehended by us, any significant short to middle term development is highly unlikely. There is complete absence of insulated vehicles except those owned by the exporters, which have an adverse effect on the keeping quality. The same is true for timely availability of transportation vehicles though few individual traders are resorting to use of own vehicles.

Market mechanism on the surface seems to be in line with perfect marketing practices in terms of auctions etc for determination of prices and buyers but in-depth investigations point to the implicit control over these mechanism by the “select few” (at least at the landing centers).

The research findings point out to the presence of patron-client relationship throughout the supply chain. The absence of clear-cut policy on the rights over sea – from livelihood perspective and well laid out guidelines and regulations for its enforcement - not only strengthen but also perpetuate the patron-client relationship.

The absence of formal credit mechanism in fact propels the fishermen to get into this relationship – as otherwise they would not have means to get on with their traditional means of livelihood

There is prevalence of “Advance Mortgaging of the Catch”. The fishermen are loaned money by the traders/exporters who in turn have absolute right over the catch- in essence the fishermen lose right over their catch even before venturing into the sea.

### **Regional Markets**

The regional markets are governed by the local demand and preference for fish species and to an extent by the upcountry markets they cater to. In the regional markets also auction is the most common prevailing system for determination of prices. However unlike other agriculture produce, most of the wholesalers at these regional markets function as commission agents on behalf of the suppliers from the landing centers with a few exceptions.

The payment system adopted at the regional market is two fold - cash intermingled with credit. The credit is dependent on the relationship that the buyer in these regional markets enjoys with the sellers. The payments to the suppliers at the landing centers are through bank transfers or pay orders mostly on the same day.

There is enough scope of for any player from the landing centre to tie up with leading wholesalers in the regional market.

### **Regulatory Mechanism**

Regulatory mechanisms were found weak, reasons being manifold- from the absence of adequate infrastructural facilities like speedboats etc for control over deep-sea fishing to insufficient manpower. Hence the provision made under OMFRA to safeguard the interest of the traditional fishermen is at best not functional.

There is no regulatory mechanism over trade leading to 1) loss to the state exchequer and 2) more importantly transparency and streamlining of business operations.

The only notable exception has been the control over ‘ban of use of trawlers’ during the breeding season of the Ridley Turtles. At the conclave of river with sea, it is ensured that only non-motorized boats are allowed to operate.

### **Gender**

Though women play an important role – in so far as the dry fish supply chain is concerned, they have no voice in decision-making process. The market practices are not suited to their convenience and lack of education; infrastructure facilities and basic amenities make them vulnerable to exploitation in all forms. The marginalization of women increases with every step of the value chain with complete exclusion at the top end.

## Recommendations

“Macho Samastanku Khaiba Ko Dea – Godamwala, Dalal, Paikari Bkrata, Khuchra Vaipari Aevam Bado Raptanikari, Kebaro keutamanoku Chadi”

B. Raja Behara (Fisherman)  
Pentakota, Puri

(The fish feed everyone – the Gaddiwala, the middleman, the wholesaler, the retailer and the big export houses; except the poor fisherman.)

Based on the study findings, for an intervention in the fishery supply chain by OXFAM, NiMble recommends a multi-fold approach:

### 1. Policy Advocacy:

- a. NiMble recommends the policy advocacy in terms of the strict enforcement of regulatory mechanisms by the regulatory bodies.
- b. Lobbying for enacting of Act for creation of Fishery Produce Marketing Committees
- c. Setting up of FPMC yards at select locales within easy reach of smaller landing centers looking at financial viability and volumes
- d. Establishment of transparent and streamlined auction mechanism under supervision of a committee consisting of fishermen representative, trade representative and government officials
- e. Strengthening the infrastructure facilities in existing market yards like Balugaon- especially basic amenities for women players
- f. Advocacy for establishment of Community Property Rights over near shore fishing activities (References can be used from the activity undertaken in Japan and Philippines for establishment of such community rights)
- g. Enacting legislation for disbursement of credit using formal channels i.e. Rural regional banks, micro-credit organizations
- h. Advocacy for policy impetus on the establishment of aquaculture for species other than shrimp in the local economy – like Tuna, Sea Bass (already under pilot testing in Andhra Pradesh and Kerala) and other major varieties having export potential
- i. Advocating for enactment of legislation providing the first right over catch to fishermen groups like “Samudram”

### 2. Strengthening the Existing Supply Chain – Short Term

NiMble feels that at this point in time with some of the interventions that OXFAM is currently engaged in requires further resource inputs – both financial and non-financial

- a. **Strengthening the activities under “Samudram”** – the Women’s Marketing Co-operative in Ganjam and replicating it in Puri as well.

One of the major impediments to the financial viability of Samudram is the limited financial resource that it has. This limits the purchase of the catch and participation in the auctions. The second is the absence of trained marketer/trader well versed in fish trade. Third is the inability of the group in having well-established tie-ups with regional markets and market players. Fourth, again relating to financial resources is the lack of cold storage or equipment for keeping the product at the various locations for a longer time. Fifth constraint is the absence of a well worked out transport mechanism. We feel that OXFAM can support the “group” in all these areas. It could think of replicating “The Anand Pattern of Dairy Co-operatives Business Model” with suitable modifications.

Financial Resources – An estimate of the working capital for procurement of fish can be made and OXFAM can work with micro-credit institutions, NABARD, Regional Rural Banks etc for flow of financial resources to Samudram as well as to associated

individual fishermen for meeting their financial requirements (for nets, boats etc) as well. Oxfam could do well to link Micro Finance Institutions or work on creation of community level venture capital funds to fund the operations of the groups associated with Samudram.

Market tie-ups – OXFAM can leverage its national and international presence for establishing marketing tie-ups in these markets for Samudram.

Other tie-ups – Oxfam should leverage its position with various private insurance sector players for provision of not only general insurance, life insurance for fisher folk but also strive on provision of occupational risk insurance to cover the artisanal fisher folks.

Trained marketer – OXFAM on a contract basis can hire a trained marketer who would initially establish the market linkages and supervise the trade on behalf of Samudram. However, OXFAM should ensure that one of the mandates for this person should be the training of select group from Samudram in all marketing activities and establishing capacities so that Samudram can eventually take up this activity on its own

Establishment of cold chain /stores- OXFAM needs to explore opportunities with movement under its various schemes, donors – national and international, NABARD etc to work out a mechanism of soft loans cum grant for setting up of village level cold chains within Samudram. Over a period of time, the grant could be phased out and Samudram using its own resources can undertake all such activities.

Transportation – here again OXFAM can leverage its brand to work out an arrangement with leading transport companies (to begin with) to provide timely availability of vehicles to Samudram. It could also hire the services of consultants to work out the economical routes (use of distribution/procurement models) for bringing the produce from various centers to on centralized place from where the collective catch can be sent to regional markets based on rates and demand.

Quality Assurance- Oxfam needs to invest and train the fisherfolks on quality assurance practices mainly on hygiene and sanitation issue which have a strong linkage to the quality of the product. This would not only ensure better quality of the product but also increased shelf life.

#### **b. Establishment of Market Intelligence System –**

Lack of dynamic market intelligence is one of the major constraints affecting adequate returns to fishermen. OXFAM can help set up a dynamic market intelligence on the lines of commodity portals for players to have real time updated information on demand and prices for fish species at major markets in the vicinity.

### **3. Strengthening the Existing Supply Chain – Long Term**

- The incipient development of new fishery activities.
- The potential transformation of traditional fishery activities.
- International commercialization of fishery products.

#### **New Fishery Activities**

The main opportunities here are in:

1. Direct investment and/or transfer of technology, technical assistance, equipment and input supply for breeding of high yielding species and other species, taking advantage of the environmental conditions of the water bodies specifically Chilka.

2. Transfer of technology, technical assistance, and equipment and input supply for aquaculture activities in the coastal and inland waters.
3. Transfer of technology, technical assistance, and equipment and input supply for the catching of traditionally unexploited species such as tuna, shrimps, crab-, etc.

### **Transformation of Traditional Fishery Activities**

The main opportunities are available in:

1. Technical assistance in the design of new strategies for the fishery sector, towards overcoming the limits and stagnation of traditional activities like motorization of the traditional craft, use of fish lines, fish prediction data, application of GIS and remote sensing etc.
2. Transfer of technology, technical assistance and equipment and input supply for the development of artisanal fishing.
3. Transfer of technology on quality assurance practices and protocols
4. Direct investment and/or transfer of technology, technical assistance, and equipment and input supply to move industrial plants into the third cycle of production (production of food prepared with fish and other sea products).

### **Foreign Trade**

The main opportunities are available in:

1. Distribution in international markets of fishery products, both new and traditional, towards opening of new markets.
2. Processing of species caught in the nearby states (using currently idle capacity) so as to promote the export horizon for export.
3. Partial processing in the country of local catches and final re-processing in other markets.

## Glossary

**Act** - A product, such as a statute, decree, or enactment, resulting from a decision by a legislative or judicial body

**Barf** – An informal demarcation in the landing center possessed by a group of fisherman for the purpose of anchoring boats and keeping nets.

**Bill** – A draft of a proposed law presented for approval to a appropriate legislative body.

**Continental Shelf** - seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 metres or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of the said areas and to the seabed and subsoil of similar submarine areas adjacent to the coasts of islands

**Dotho** – A traditional wooden craft used for fishing

**Exclusive Economic Zone** – The exclusive economic zone is an area beyond and adjacent to the territorial sea, subject to the specific legal regime established in this Part, under which the rights and jurisdiction of the coastal State and the rights and freedoms of other States are governed by the relevant provisions of this Convention. (Article 56 of provisions of the Territorial Waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act of 1976)

**Fishing Gears** – Equipment used for a fishing

**Gadiwala’s** – A person engaged in collection of fish at the landing center and subsequently making it available in the larger market and in the process earning his livelihood

**Gillnetters** The size of the vessels varies from open boats up to large specialised drifters, operating on the high sea. It can be as big as a trawler and harvest catch worth Rs.1,00,000. It uses a powerful 10 HP to 40 HP marine engine, has iceboxes and storage facilities and can do a sea voyage for 3 to 4 days

**Gross Domestic Product** – GDP is defined as the total value of all goods and services produced within that territory during a specified period (most commonly, per year).

**IBM** – a traditional boat fitted with internal motors

**Livelihood** – Livelihoods are the assets, activities and entitlements by which people make a living.

**Livelihood security** – the adequate and sustainable access to income and resources to meet basic household needs (including adequate access to food, potable water, health facilities, educational opportunities, housing, and time for community participation and social integration).

**Landing centers** - structure providing a place where boats can land people or goods

**Meli** – A group of fishermen going out for fishing in a boat

**OBM** – A traditional boat fitted with out board motors

**Policy** - A policy is a plan of action for tackling political issues. It is often initiated by a political party in government, which undergoes reforms and changes by interested actors.

**Traditional Boat** – These boats are an outrigger, built in sewing technique and totally made of wood. The bottom part of the boat was a dugout log, on which sides two rows of strakes had been sewn up. It was equipped with fishing nets, wooden oars and a small iron anchor.

**Trawler** – A trawler is a fishing vessel designed for the purpose of operating a trawl, a net that is dragged along the bottom of the sea (or sometimes above the bottom at a specified depth). Refrigeration machinery aboard allows trawlers to stay out for several weeks.

**Annexure - 1**  
**List of coastal states and Union territory**

<b>Sr</b>	<b>Name of coastal states</b>	<b>Sr.</b>	<b>Name of coastal union territory</b>
1	Andhra Pradesh	1	Andaman and Nicobar Islands
2	Goa	2	Dadra and Nagar Haveli
3	Gujarat	3	Daman and Diu
4	Karnataka	4	Lakshadweep
5	Kerala	5	Pondicherry
6	Maharashtra		
7	Orissa		
8	West Bengal		
9	Tamil Nadu		

**Annexure – 2**  
**Details of export of sea food from India**

<b>Sr.</b>	<b>Year</b>		<b>Export</b>
1	1999-00	Q	340,003.00
		V	5,095.73
		\$	1,184.23
2	2000-01	Q	440,473.00
		V	6,443.89
		\$	1,416.32
3	2001-02	Q	424,470.00
		V	5,957.05
		\$	1,253.35
4	2002-03	Q	467,297.00
		V	6,881.31
		\$	1,424.90
5	2003-04	Q	412,017.00
		V	6,091.95
		\$	1,330.76

**Q: Quantity in MT, V: Value Rs. Crore, \$: US Dollar in Million**

### Annexure – 3 Coastal statistics of Orissa

#### 3 A Coastline lengths

Sr	District	Coastline length (in Km)
1	Balasore	80
2	Bhadrak	50
3	Kendrapara	155
4	Jagatsingpur	68
5	Puri	67
6	Ganjam	60
<b>Total</b>		<b>480</b>
<b>Coastal Orissa</b>		<b>974</b>

#### 3 B Areas of continental shelf

	Depth zone	Area of continental shelf (km <sup>2</sup> )
1	0-20	6820
2	20-50	8650
3	50-100	4810
4	100-200	3550
<b>Total</b>		<b>23830</b>

**Annexure – 4****Production of Fish and Crab in Orissa 1995-96 to 2001-02**

Sr.	Year	Inland Fish Production			Marine fish	Total	Crab production
		Fresh	Brackish	Total			
1	1995-96	121.94	12.9	134.84	123.2	258.04	-
2	1996-97	127.29	16.2	143.5	133.46	276.95	-
3	1997-98	135.64	16.78	152.42	156.08	308.5	0.15
4	1998-99	145	14.9	159.9	124.33	284.23	0.47
5	1999-00	124.86	10.44	135.3	125.94	261.24	0.54
6	2000-01	125.11	13.44	138.55	121.09	259.64	1.35
7	2001-02 (P)	147.4	20.66	168.06	113.89	281.95	1.15

**(In thousand MT)****Note : P : Provisional.****Source : Economic Survey, 2002-03, Govt. of Orissa.**

## Annexure – 5

### Marine Fish Landings in Orissa

Fishes	1998	1999	2000
Clupieds-Wolf Herring	0	0	0
Clupieds-Oil Sardines	7526	4226	4753
Clupieds-Other Sardines	2446	2679	3002
Clupieds-Hilsa Shad	4206	4062	5459
Clupieds-Other Shads	3481	2616	3719
Clupieds-Stolephorus	0	0	0
Clupieds-Thryssa	1438	641	1088
Clupieds-Anchovies	2043	906	1642
Clupieds-Other Clupieds	4945	2729	3676
Bombay Duck	1089	1635	913
Half Beaks & Full Beaks	0	0	0
Flying Fish	0	0	0
Ribbon Fish	4690	5282	5133
Carangids-Horse Mackerel	0	0	0
Carangids-Scads	0	0	0
Carangids-Leather Jackets	0	0	0
Carangids-Other Carangids	2231	3874	1577
Mackerel-Indian Mackerel	3943	3031	2610
Mackerel-Other Mackerel	438	1207	903
Seer Fishes	0	0	0
Seer Fishes-S Commerson	3561	1924	1523
Seer Fishes-S Guttatus	3050	2037	707
Seer Fishes-S Lineolatus	2271	1295	381
Seer Fishes-Acanthocybium SPP	0	0	0
Tunnies-E Affinis	242	1497	533
Tunnies-Auxis SPP	0	0	0
Tunnies-K Pelamis	0	0	0
Tunnies-T Tonggol	0	0	0
Tunnies-Other Tunnies	0	0	0
Bill Fishes	0	0	0
Barracuda	0	0	0
Mulletts	2715	2654	2306
Unicorn Cod	0	0	0
Elasmobranchs	5913	0	0
Elasmobranchs-Sharks	1021	6968	2545
Elasmobranchs-Skates	1290	1761	837
Elasmobranchs-Rays	1989	3509	1784
Eels	7485	3911	1740
Cat Fishes	0	7458	7515

Lizard Fishes	0	0	0
Perches-Rock Cods	0	0	0
Perches-Snappers	1666	0	0
Perches-Pig Fact Breams	1223	579	315

**Break-up of face to face quantitative interviews and in-depth interviews**

	TOTAL	Puri	Ganjam
1. Fisherman			
Fishing trawler owner	6	3-4	1-2
Multiple boat owner	10	5-6	3-4
Single boat owner	35	18-20	13-15
Labour fisherman worker working for owners	20	8-10	8-10
Fisherman taking equipments on hire	20	8-10	8-10
2. Fisherwoman involved in allied activities	20	8-10	8-10
Boy child involved in fishing / allied activities	20	8-10	8-10
3. Co-operative society member – Secretary	10	3-5	3-5
4. Village Panchayat Member – Mukhiya / Headman	10	3-5	3-5
5. Middleman			
People sourcing out better wholesale buyers	10	8-10	8-10
Employed by wholesale buyers	10	4-5	4-5
6. Wholesale buyer	8	4-5	2-3
7. Bulk buyer / processed food buyer / exporter	4	2	2
8. Govt. official associated with department of fisheries and fishing community	4	2	2
9. People involved in the supply chain in the regional centers like Kolkatta, Delhi, Chennai, Mumbai, Bhubaneshwar etc.	25		
<b>TOTAL</b>	<b>237</b>	<b>109</b>	<b>103</b>
Perches-Threadfin Breams	323	1258	620
Perches-Other Perches	0	805	2251
Goat Fishes	2822	0	0
Thread Fins	13465	0	979
Croakers	3198	7345	5351
Silver Bellies	0	4440	413
Big Jawed Jumber	0	0	0
Pomfrets-Black Pomfret	3776	3220	1773
Pomfrets-Silver Pomfret	4851	4653	2860
Pomfrets-Chinese Pomfret	0	0	0
Flat Fishes-Halibut	0	0	0
Flat Fishes-Flounders	0	0	0
Flat Fishes-Sole	2540	1295	1109
Crustaceans-Penaeid Prawns	3884	6552	5938
Crustaceans-Non-Penaeid Prawns	4650	3345	1925
Crustaceans-Lobsters	0	0	0
Crustaceans-Crabs	860	528	1098
Crustaceans-Stomatopods	0	0	0
Crustaceans-Others	67	352	228
Molluscs	0	0	0
Cephalopods	874	1031	1599
Silver Bar	4381	2742	1174

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White Fish	0	0	0
Miscellaneous	17792	21720	26775
<b>Total</b>	<b>134385</b>	<b>125767</b>	<b>108754</b>

\* Quantity in tonne

**Annexure – 6****List of places where primary study was conducted**

<b>Sr.</b>	<b>Puri</b>	<b>Ganjam</b>	<b>Regional Market</b>
1	Pentakota	Dighipalli	Kolkatta
2	Arakudh	Haripur	Chennai
3	Satpada	Katura	Vishakhapattanam
4	Arupatanam	Arjapalli	Mumbai
5	Brahamagiri	Gopalpur	Bhubneswar
6	Paraspota	Balugaon	Delhi
7	Nuagarh	Sabilia	
8	Astrang	Paradeep	
9	Gopinathpur		
10	Nuanoi (Beldar)		
11	Ramchandi (Brahmagiri)		
12	Balioharchandi (Konark)		

## **Annexure – 7**

### **Details of sampling of respondent**

## Annexure – 8

### Production of fishes species wise (2000-01)

Sr.	Name of species	Puri	Ganjam	State
1	Shark	1446	158	2637
2	Skates	529	0	932
3	Rays	929	69	1983
4	Oil Sardines	1882	2798	5293
5	Other Sardines	2024	189	3339
6	Hilsa shad	68	2	6077
7	Other shad	205	0	4144
8	Thrisocias	264	40	1207
9	Anchovies	335	469	1833
10	Other Clupieds	552	145	4096
11	Bombay duck	17	0	1013
12	Silver bar	261	27	1310
13	Thread fish	185	0	1093
14	Chorinemus	214	0	1505
15	Ribbon fish	549	150	5715
16	Carangids	977	21	1761
17	Indian mackerel	1205	300	2902
18	Other mackerel	660	82	1007
19	Seer fish	1152	181	1698
20	Gautatus	565	14	785
21	S. Lareolatus	365	4	422
22	Tunnies affinis	162	143	596
23	Mulletts	540	79	2571
24	Eels	519	0	1938
25	Catfish	2124	513	8367
26	Perches	254	0	690
27	Pigface bream	199	0	355
28	Other perches	283	145	2506
29	Croakers	715	386	5963
30	Silver bellies	106	156	457
31	Black pomfret	476	8	1976
32	Silver pomfret	561	4	3180
33	Flat fish	185	0	1236
34	Penaeid prawn	874	121	6608
35	Non penaeid prawn	110	125	2147
36	Marine crustaceans	193	28	1219
37	Other crustaceans	102	0	259
38	Sqid & Cuttle fish	77	28	1774
49	Misc. Fish	1063	395	28274

