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**Fish Marketing Chain and Economic  
Analysis of Indebtedness of  
Fisher-folk of Sonmiani**

**July 2006**

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Babar Naseem Khan and his team, Head Program Development, WWF-Pakistan, Lahore

Ghulam Qadir Shah, Manager Conservation-Sindh, WWF-Pakistan, Karachi

Waqas Khan Burki

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## 1. Introduction

Pakistan's marine resources are a direct source of livelihood for over a million people in Sindh and Balochistan. The Balochistan coast extends to 770 kilometres from the mouth of Hub River in the east to the Iranian border in the west. The commercially important marine fisheries resources of Pakistan comprise about 350 different species. The other important natural resource, on which the coastal communities largely depend, are the mangrove forests, which provide a range of valuable forest products such as timber, fuel-wood and fodder. Besides providing shelter it serves as nursery and breeding grounds for shrimp, crabs and many species of fish as well as habitat for certain species of birds and mammals.

Sonmiani is one of the Tehsils of District Lasbela. Consisting of Dam Bunder, Sonmiani Town, Bhira and Baloch Goth, the livelihood of most of the people is associated with fishing. Majority of fishermen are indebted by middlemen or their agents operating in the area who provide the fishermen loan for fishing equipment and operations. It is believed that the role of middlemen is extortionist as they get major share of catch income by providing loan to the fishermen who are under bondage to sell their catch to them. These middlemen and their agents control and dominate the entire marketing chain and leave fishermen with little or no options to sell their catch directly in the open market. However, this hypothesis needs to be substantiated in this study.

In order to analyse this hypothesis, the key issues facing the fisher-folk communities in Sonmiani area were identified and, the economic causes behind them were unfolded. The nexus between higher costs, reducing income, increasing expenditures and the vicious cycle of indebtedness has been studied and the role of middleman as extortionist or otherwise has been analysed under the study.

## 2. Study Objectives

The study is aimed at a comprehensive and critical analysis of the entire fish marketing chain, various players involved in it and specifically the role of middlemen in this chain. The study focuses on the economic situation of fishermen, income, expenses and indebtedness taking into consideration various wealth groups in the area. It paves the way to develop a strategy for intervention for economic betterment of fisher-folk. Therefore, the major objective of the study was,

“To critically examine fish marketing chain in Sonmiani area to suggest sustainable livelihood intervention approach for Sonmiani fisher-folk”

In order to achieve the above objective, the research took into account the following aspects of fisher-folk of the Sonmiani area.

1. What is the current income, expenditure and debt scenario of fishermen?
2. What kinds of issues are affecting the fisher-folk?
3. What is the fish value/supply/marketing chain?
4. What are the roles of various elements within the supply chain, their incomes, costs and profits?
5. Define role and profit level of middlemen?
6. What would be a suitable intervention based on other experiences?

### 3. Methodology

The study adopted the following approaches:

- Focus on Sonmiani area in specific, identifying socio-economic causes and issues affecting fishermen.
- Studying marketing and supply/value chain system currently in place in Sonmiani, gauging role of middleman
- Search for International Best practices on sustainable livelihood approach for fishermen
- Suggest and recommend intervention approach
- Annexure - Global fishing industry – trends, issues and pressures; Pakistan fishing industry – infrastructure, policies, pressures and issues

The data was collected through following techniques:

- Literature Review
- Household Surveys
- Focus Group Discussions
- Stakeholder interviews

#### ***3.1 Household Surveys***

This was mainly done to gather specific data on fisher-folk communities living in Sonmiani area. They were focused to obtain the following information:

- Background information
- Household size, income and expenditure levels
- Assets owned
- Income cost and profit from fishing
- Fishing practices
- Average fish catch and main types of fish caught (volume and value)
- Role of middleman
- Indebtedness; and
- Other issues affecting fishermen

For the purpose of getting a true picture across various socioeconomic groups, data was collected across income categories and socio economic classes. The survey classified fishing households into three income groups, poor, middle and rich. Three variables were identified to determine the income groups namely; income, number of boats owned and indebtedness. The primary weightage was given to income. All the three variables are interlinked and are mutually interdependent (either directly or inversely).

Following is the basis on which we classified the total population into three segments:

Income: The household income criterion is similar to what is used in other researches to classify economic segments in various classes.

No. of boats: This criterion is essential as it is directly proportional to the income and indebtedness.

Indebtedness: This is essential to classify level of indebtedness of various income groups.

In table 3.1 the segmentation criteria used to define the three income groups is explained:

**Table: 3.1**  
**CRITERIA TO DETERMINE INCOME GROUPS**

VARIABLES	POOR	MIDDLE CLASS	RICH
Income	Upto 5k per month or 60k annual	From 5k to 15k per month or 60k to 180k annual	More than 15k per month
No. of Boats	0 or 1	1 to 5	More than 5
Indebtedness	Upto 50k	From 50k to 500k	More than 500k

*Developed by consultant*

Household were surveyed by using a representative sample of at least 5% of households segmented along area and income groups (Refer to Table 3.2). In order to ensure that a representative sample is drawn out, SZABIST study was used as a bench-mark. The study clearly mentions the following socioeconomic ratios area wise.

**Table 3.2**  
**INCOME GROUPS AS PERCENTAGE OF POPULATION – AREA-WISE**

Area	Poor	Middleclass	Rich
Sonmiani	20%	60%	20%
Dam Bunder	50%	40%	10%
Bhira/Baloch Goth	60%	40%	0%

*\*Source: KAP Study, SZABIST*

All the sample size allocations were done on the basis of SZABIST report<sup>1</sup>. The sample size of various income groups is given in table 3.3. In total 4 teams conducted the survey in five days. The interview approach was relaxed and open. The respondents were asked to be open and their responses were properly recorded. Proper briefing and debriefing sessions were held to ensure all teams collect valuable insights and useful data. The fisherman household questionnaire is attached as Annexure L.

Table 3.3 gives the sample size allocation:

**Table: 3.3**  
**SAMPLE SIZE ALLOCATION (Area & Segment-wise)**

Area	No. of HH*	% age	Poor	Middle-class	Rich	TOTAL	% of HH surveyed
Sonmiani	300	23%	3	10	3	16	5%
Dam Bandar	800	62%	19	16	4	39	5%
Bhira/ Baloch Goth	200	15%	6	4	0	10	5%
<b>TOTAL</b>	<b>1,300</b>		<b>28</b>	<b>30</b>	<b>7</b>	<b>65</b>	<b>5%</b>

*\*Source:: Based on KAP Study, SZABIST*

<sup>1</sup> “Study on Knowledge, Attitudes & Practices of Fisherfolk Communities about Fisheries and Mangrove Resources of Sonmiani” by SZABIST for WWF Pakistan

Table 3.4 gives detail of actual respondents surveyed:

**Table: 3.4**  
**ACTUAL RESPONDENTS (Area & Segment-wise)**

<b>Settlement</b>	<b>Poor</b>	<b>Middle</b>	<b>Rich</b>	<b>Total</b>
Sonmiani	5	12	4	21
Dam Bandar	19	17	5	41
Bhira/ Baloch Goth	6	5	-	11
<b>TOTAL</b>	<b>30</b>	<b>34</b>	<b>9</b>	<b>73</b>

*\*Source:: Based on Current Study*

### ***3.2 Focus Group Discussion***

Focus group was conducted with representatives of fishermen community and middlemen. Various issues were discussed including fishermen's income and plight, role of fishermen laborers, fishermen indebtedness, role of middlemen, harmful fishing practices and role of outsiders during fishing season.

### ***3.3 Stakeholder Interviews***

One-to-one stakeholder interviews were conducted which included various stakeholders associated with fishing industry. These included representatives of fishermen, middlemen, processors and exporters, Fishermen Cooperative Society (FCS), Mole Holders Association, Marine Fisheries Department (MFD) and Pakistan Fisher-folk Forum (PFF).

## 4. Literature Review

Basic understanding of issues and approaches was developed from literature review. The literature was reviewed from previous studies conducted on Pakistan marine fisheries in general and on Sonmiani area in specific. The literature review examined work done by various organizations to understand the global perspectives and issues faced by marine fisheries. Further, studies were reviewed from countries with similar socio-economic and cultural environment to Pakistan with a possibility of learning from their successes and/or failures while determining a course of action. The following were the objectives for review of literature:

- Collect secondary data relevant to the research question
- Understand issues affecting fishing industry in Pakistan
- Best practice search for both local and international

Following are some of the literature and reports that were relevant to the topic and were reviewed for this study:

- “Study on Knowledge, Attitudes & Practices of Fisher-folk Communities about Fisheries and Mangrove Resources of Sonmiani” by SZABIST for WWF Pakistan
- “Fishing for the future: Unilever’s sustainable fisheries initiative”
- “Analysis and the Sustainable Livelihoods Approach” by U. Kleih, P. Greenhalgh and N. Oudwater, Natural Resources Institute (NRI), 2003
- “Compliance with International Standards in the Marine Fisheries Sector: A Supply Chain Analysis from Pakistan” by Sustainable Development Policy Institute (SDPI), December 2005
- “Background Paper on Fisheries livelihoods in Pakistan” by Sikander Brohi Pakistan Fisher-folk Forum (PFF) 2002
- “The Marine Seafood Export Supply Chain in India” by Parashar Kulkarni
- “Learning from experience and best practice in regional fisheries management organizations” by A. Willock and M. Lack for WWF TRAFFIC: Follow the Leader
- “Pakistan Fisheries Strategy” by Small and Medium Enterprise Development Authority (SMEDA) 1998
- “Balochistan Fisheries Strategy” by SMEDA, 1998
- “Pakistan Fisheries Statistics 2003” by Marine Fisheries Department, Govt. of Pakistan

## 5. Sonmiani

Sonmiani is one of the tehsils of Lasbela district in Balochistan. The district is situated on the southern coast of Balochistan. The project area within Sonmiani consists of four towns/villages. The largest and most vibrant is Dam Bunder followed by Sonmiani, Bhira and Baloch Goth.

Nearly 90% of the population is dependent on fishing or fisheries resources with little or no access to alternative means of income. The fishing season lasts for seven months which provides earning opportunities to the fishermen, while in off-season the fisher-folk communities face financial crunch and unemployment. Table 5.1 below gives a statistical overview of the Sonmiani tehsil town/village-wise. This data is taken from SZABIST Study on KAP, and local CBOs.

**Table: 5.1**  
**SONMIANI STATISTICS – AREA-WISE**

Detail	Sonmiani	Dam Bunder	Bhira	Baloch Goth	TOTAL
No. of Households	300	800	130	70	1,300
Total Population	3,000	7,000	800	400	11,200
Total Schools	2	1	2	1	6
Boys Primary			1	1	2
Girls Primary			1		1
Boys Middle	1				1
Girls Middle	1				1
Boys High School		1			1
Girls High School					0
Total Health Facilities	2	4	2	0	8
Govt Dispensary	1				1
BHU		1	1		2
Pvt Male Doctor		1			1
Govt Male Doctor	1		1		3
Govt. Female Doctor		1			1
<b>Livelihoods</b>					
Fisheries	87%	96%	98%	98%	95%
Agriculture	1%				0%
Labour	2%	1%	1%	1%	1%
Business	2%	1%	1%	1%	1%
Others	8.20%	2%			3%

*Source: KAP Study, SZABIST 2005 & Local CBO data*

### 5.1 Fishing Infrastructure

Main landing points in Miani Hor are Dam Bunder, Sonmiani, Bhira and Baloch Goth. Dam Bunder is the largest fishing town, despite its importance in the local fishing infrastructure as main landing and main fish market, it does not have a jetty or proper amenities to facilitate fishermen. Considering the importance of Sonmiani as one of the key fishing resource and as a source of livelihood for the local fishermen, more importance needs to be given by the government to develop fishing facilities there. Other facilities like cold-stores etc are also non-existent.

Miani-Hor is closed for 3-4 months which means that boats from Sonmiani, Dam Bunder, Bhira and Baloch Goth are unable to access the open seas. This reduces the fishing season and directly affects the livelihood of local fisher-folk. This may also be a cause of over exploitation of fish resources during the season.

Table 5.2 below gives total fish landing in Balochsitan landing areas. The overall fish catch in 2005 reduced by 7% in comparison with 2004 while in Sonmiani (see Damb) it reduced by 9%. Sonmiani gets 11,177 metric tons contributing around 10% of the total fish catch in Balochistan. It ranks fifth after Gawadar, Pasni, Ormara and Jiwani. Its contribution is around 3% to the national marine fish catch.

**Table: 5.2**  
**BALOCHISTAN: FISH CATCH BY LANDING AREA - 2005**

Area	Qty Vol (M.Ton)		% Inc/ Dec	% Contr 2005	Rank
	2004	2005			
Gawadar	33,707	29,262	-13%	26%	1
Pasni	27,692	24,775	-11%	22%	2
Ormara	15,876	14,813	-7%	13%	3
Jiwani	12,714	12,192	-4%	11%	4
<b>Damb</b>	<b>12,128</b>	<b>11,177</b>	<b>-8%</b>	<b>10%</b>	<b>5</b>
Surbandar	8,219	7,633	-7%	7%	6
Pishukan	8,103	7,472	-8%	7%	7
Gaddani	6,315	5,318	-16%	5%	8
<b>TOTAL</b>	<b>124,755</b>	<b>112,642</b>	<b>-10%</b>		

*Source: Marine Fisheries Department - 2005*

The same issues which are faced by Pakistan fishing communities in general are also faced by Sonmiani fisher-folk. For example, depletion of fishing resources, over-fishing, harmful nets, poor management of resources are evident in Sonmiani as well. Similarly lack of proper facilities at landing points further complicates the problem. There is only one fish processing plant by the name of GABA in Dam Bunder area.

Table 5.3 gives a detailed run down of the total landing in Sonmiani of various fish types and their volumes and contribution. The main fish catch is Sardinella (*qand* or trash) – 36% it is mainly used for poultry or fish meal, followed by Indian Mackerel (*Bangra*)– 9%, Sea Catfish – 8%, Hairtail – 6% and Tuna – 5%. Apart from this substantial quantity of shrimps are caught.

**Table: 5.3**  
**SONMIANI LANDING: BY TYPE & VOLUME - 2005**

Fish Type	Qty Vol (M.Ton)		% Inc/ Dec	% Contr 2005	Rank
	2004	2005			
Sardineella	4,790	4,012	-16%	36%	1
Indian Mackerel	911	1,048	15%	9%	2
Sea Catfish	532	871	64%	8%	3
Hairtail	725	631	-13%	6%	4
Tuna	700	596	-15%	5%	5
S. Groper	123	480	289%	4.29%	6
Scads	395	409	3%	3.66%	7
Other Clupeiform	230	296	29%	3%	8
S. Croaker	181	281	55%	3%	9
Barracuda	252	271	7%	2%	10
Others (31 Species)	3,286	2,283	-31%	20%	
<b>TOTAL</b>	<b>12,127</b>	<b>11,177</b>	<b>-8%</b>		

*Source: Marine Fisheries Department - 2005*

## 5.2 Fishing Fleet

According to the Balochistan Fisheries Department 753 boats were operating in Dam Bunder in 1998. As the regular percentage of increase in fishing vessels has been around 2% nationally, its current figure is estimated to be in the range of 865.

Table 5.4 shows the breakup of various types of fishing vessels in Sonmiani area. As given in the table, 88% of all boats are wooden without in board engines; these are locally called Hori or Hora. Hori is from 18 to 27 ft long with estimated weight falling between 1 to 15 tons. Hora is 28 ft+ long with estimated weight above 15 tons.

**Table: 5.4**  
**SONMIANI FISHING VESSELS & TYPES**

	1998*	2005 (Est.)	
<b>Total Fishing Crafts</b>	<b>753</b>	<b>865</b>	
<b>Mechanized boats with in board engines</b>	<b>78</b>	<b>90</b>	<b>10%</b>
Under 1 ton	0	0	
1 - 5 Ton	0	0	
6 - 15 Ton	29	33	4%
16 - 25 Ton	38	44	5%
25 ton and above	11	13	1%
<b>Motorized boat without in board engines</b>	<b>659</b>	<b>757</b>	<b>88%</b>
Under 1 ton	85	98	11%
1 - 5 Ton	232	266	31%
6 - 15 Ton	243	279	32%
16 - 25 Ton	99	114	13%
25 ton and above	0	0	
<b>Sail Boats without engine</b>	<b>7</b>	<b>7</b>	<b>1%</b>
Under 1 ton	0	0	
1 - 5 Ton	4	4	
6 - 15 Ton	3	3	
16 - 25 Ton	0	0	
25 ton and above	0	0	
<b>Life boats fitted with in board engine</b>	<b>9</b>	<b>10</b>	<b>1%</b>
Under 1 - 5 Ton	9	0	

*Source: Balochistan Fisheries Department - 1998*

## 5.3 Fishing Gears

Main nets used by fishermen are thukree (for Shrimps), makhan (for bangra or Indian mackerel) and Katro (wire net for trash fish or gand). According to the survey harmful nets like bulo-gujjo were not used, as mentioned by the fishermen. However the fishermen surveyed reported its use by some fishermen with the support of some influential people of the area. By and large the effects of these harmful nets are known and the local communities realize the need to act against them. Local CBOs have taken initiative and lobby against it.

The survey indicated that many fishermen own more than one net and use it to catch different types of fish in different season. For example the season for shrimp is for 3 months (Aug to Oct) and for trash it is 6 months (Oct to Apr). Nets for both are different. Fishermen catch both types of fish and increase their earnings rather than relying only on one type of fish. However, the more the nets, the more their repair, maintenance and re-purchase cost.

## 6. Fish Marketing in Sonmiani

There are many complexities involved in fish marketing with different variables; for example species of fish, net used or whether it is consumed or sold locally (in Pakistan) or exported or both. Fish marketing in Sonmiani is similar to the one in Karachi apart from the role of mole-holders. Mole holders are the registered bodies to buy fish catch through payment of license fees to the Fishermen Cooperative Society at Karachi. (*For marketing system in Karachi, please refer to annexure*). There are no registered mole holders in Sonmiani area, however, those who call themselves ‘moles’ are actually agents of processing companies, beoparis<sup>2</sup> or registered mole-holders at Karachi Fish Harbor.

The price is determined by the processor/exporter and the agent is kept informed and is communicated the set price. The agent procures at or below the price set by the company and the company pays the agent agreed commission which ranges from 3 to 5% depending on type of fish. The company also finances their agent to give loans to fishermen to ensure bonded catch. The loaned middlemen only get the commission from the fishermen and have to forgo their commission to the company.

The fishermen who are indebted are bound to sell either their entire catch, or of one specific commodity (mainly shrimps or ‘*gand*’) to the loan-giver agent. The agent after deducting the operational loans/expenses from the catch, charges a commission ranging from Rs. 0.7 to 10 per kg (depending on fish type). For example commission on shrimps is Rs. 10 per kg and on *gand* (trash) is Rs. 0.67 per kg. In addition, to settle his principal amount, he deducts Rs. 5-50 per kg extra. For example with shrimps, he deducts Rs. 50 per kg to settle the principal amount and for other fish he deducts Rs. 5 per kg.

The ‘free-from-loan’ fisherman (locally known as *azad*) can sell his merchandize to anybody he chooses. In many cases his catch is auctioned and the highest bidder buys the catch. In other cases, he sells the catch to the agent or local beopari at the local market rate. The annexure IV shows that the poor people are the most indebted of the lot (70% have taken loan), followed by middleclass (50% have taken loan) and the rich (22% have taken loan). Some free from loan poor people have no boats, which means they can not take loan. The rich obviously finance themselves and do not require loans anyway. Some people are free from loan as their venture did not work out and they returned the boat to the middleman. Some of the fishermen successfully returned entire loan and own their boats now because of disciplined financial management.

The fish catch is loaded and transported to the buyers who can be processors, exporters, mole-holders in Karachi, beoparis or traders/wholesalers. The processor packs the catch and exports it or it is transported to wholesalers in the urban centers of the country. From there it reaches the local market and then the consumer.

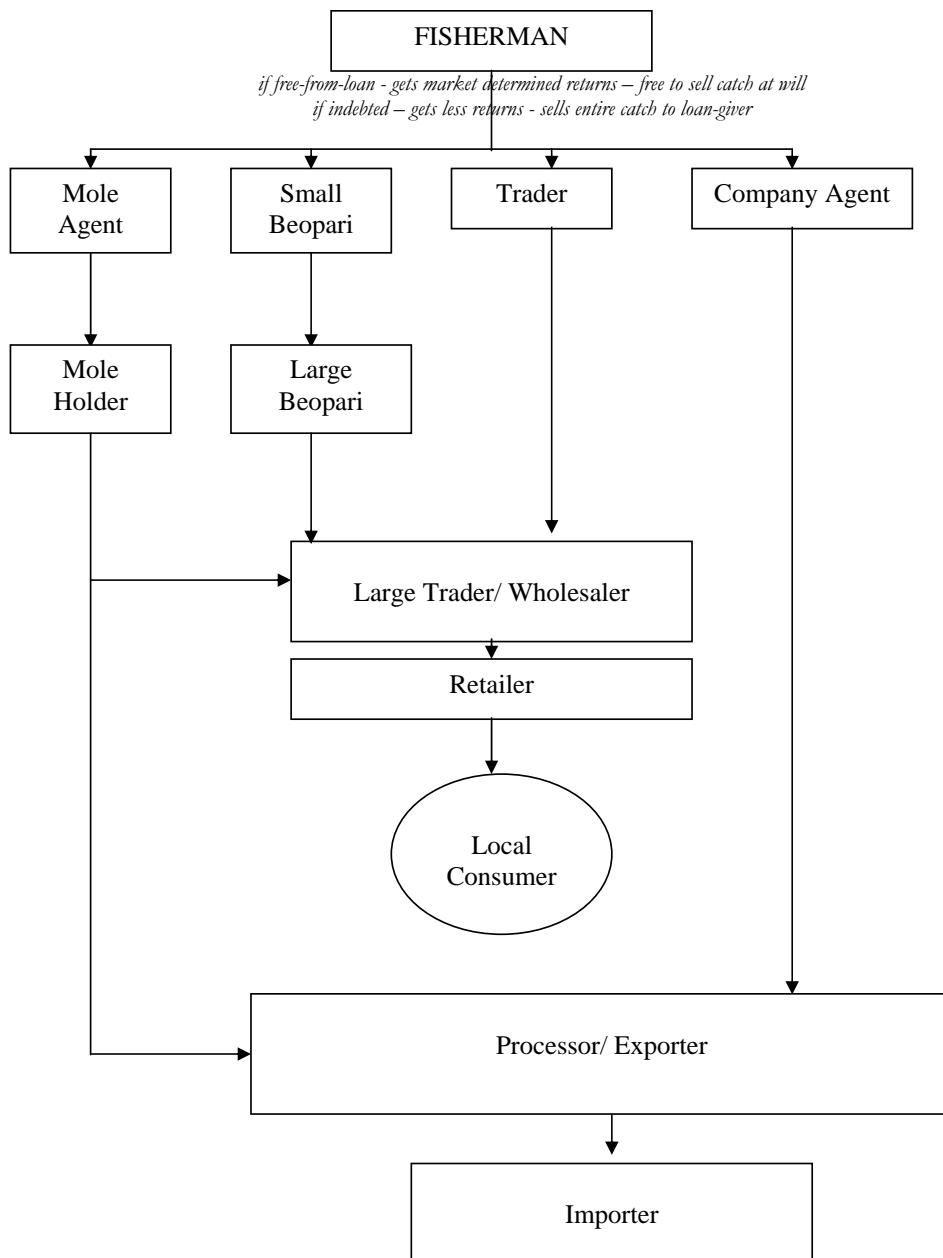
Figure 6.1 gives an overview of the fish marketing and supply chain in Sonmiani. The figure provides an overall structure, however the percentages locally consumed or exported vary from types of fish which has a direct impact on prices and livelihoods of fishermen. The

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<sup>2</sup> Beopari is the local name for middlemen. For detail please refer to 8.1.3

fisherman sell their catch to the middleman (mole agent, company agent, trader or small beopari) who subsequently sell it to their principals. The catch is then either exported or consumed locally through a network of wholesalers and retailers in major urban centers.

*Figure 6.1 Fish Marketing/ Supply Chain System at Sonmiani*



## 7. Sonmiani Fishermen

According to Balochistan Fisheries Department 5,056 fishermen operated in Dam Bunder and Sonmiani area in 1998 (Table 7.1). It is estimated that now the population will be above 6,200 on basis of increase in fisherman population at 2% annually which is the national trend.

**Table: 7.1**  
**SONMIANI FISHERMAN POPULATION**

	1998*	2005 (Est.)
<b>Total Fisherman Population</b>	<b>5056</b>	<b>6218</b>
Full Time Fishermen	3001	3691
Part Time Fishermen	1275	1568
Occasional Fishermen	780	959

*Source: \* Balochistan Fisheries Department 1998*

### 7.1 Catch Volumes

It was observed that fish catch is highly dependent on many variables. A few of them are:

- Season or months of year
- Size and type of boat
- Size and type of net
- Species of fish to be caught
- Area of fishing
- Fishing method
- Experience of fisherman
- Technology used or lack of it
- Weather, monthly and seasonal patterns
- Fishing methods used and unsustainable fishing practices by other fishermen

Even if all variables given above are positive, it does not secure a good catch, luck has a part to play in it as well. With so many variables, sometimes the same fisherman with the same equipment can catch fish worth thousands of rupees in a single journey, or might get nothing at all for weeks.

Table 7.2 provides details on main types of fish caught, average catch volumes per trip/per boat size observed during the study. It is evident that with a boat of less than 27 ft (also called Hori) the average catch is nearly a quarter of the bigger boat above 28 ft (also called Hora). In this table four main types of fish most caught have been mentioned.

**Table: 7.2**  
**SURVEY: AVERAGE CATCH VOLUMES – PER TRIP/ BOAT TYPE**

Types of Fish	Avg Catch Vol for Boat (Upto 27 ft)			Avg Catch Vol for Boat (28 ft+)		
	Per Trip	Per Month	Per Season	Per Trip	Per Month	Per Season
Shrimps ( <i>Jheenga</i> )	11	225	675	50	1,000	3,000
Trash ( <i>Gand</i> )	500	10,000	60,000	2,000	40,000	240,000
Indian Mackerel ( <i>Bangra</i> )	175	3,500	21,000	750	15,000	90,000
Pomfret ( <i>Paplet</i> )	3	60	360	13	250	1,500

*Source: Current Study; All volumes in Kgs*

The season varies according to the types of fish given in Table 7.2 (i.e. for shrimps its 3 months and for Trash, Indian Mackerel and Pomfret it is 6 months). However, it should be kept in mind that all fishermen do not catch all types of fish. What they catch is dependent on the type of boat they have, their expertise and most importantly the type of nets they own.

It can be gauged that an average boat (Hori or Hora) catches around 11 metric ton (11,000 kg) of fish or gand or shrimps etc in a year (Based on Marine Fisheries Department Statistics – figures reached by dividing total landing by total number of boats).

## 7.2 Duration and Cost of Fishing Trips

On the average, a fisherman goes out to sea around 18-20 days a month. Depending on size and type of boat average journey time is between eight hours to three days for small boat (Hori) and from three days to ten days in large boats (Hora). For eight-hour trips, the cost of fuel is less, no ice needs to be carried and no ration is required. In eight-hour trips the fisherman has to fish near the coast. This limits his area and catch. The chances of returning without a sizeable amount of fish are more in an eight-hour trip. Depending on what to catch, the labor size varies from five to ten on the small boat. On a three-day trip on Hori, the volume and chances of catching sizeable quantity of fish increase but so does the cost.

During the season, fishermen usually undertake long trips, of three to ten days on a Hora, to go into the open seas in order to increase their catch or variety of fish or both. These trips are planned beforehand and are more costly as they require more fuel, ice, ration etc. Also around 30 to 40 labourers are needed for the trip.

Table 7.3 gives details of expenses for both Hori and Hora boats. Although the number of and type of trips (either eight-hour, three-day or ten-day) varies, however, for this study the figures are based on actual responses and averages have been applied where necessary to simplify the data. Following points need to be considered when reading the table:

- Hori fisherman undertakes 'eleven' 8-hour trips and 'three' 3-day trips in a month.
- Hora fisherman undertakes 'three' 3 day-trips and 'one' 10-day trip in a month.
- Season lasts for seven months usually from 15 September to 15 April.
- The main variable in cost is fuel and ration, which for longer trips rises exponentially.

Table: 7.3

### SURVEY: AVERAGE OPERATIONAL EXPENSES – PER TRIP/ BOAT TYPE

Expenses	Avg Operational Expenses (Hori)				Avg Operational Expenses (Hora)			
	8 hr Trip	3 Day trip	Per Month	Per Season	3 day Trip	10 day Trip	Per Month	Per Season
Fuel	1,000	5,000	26,000	182,000	7,000	25,000	46,000	322,000
Ice	-	1,000	3,000	21,000	2,000	5,000	11,000	77,000
Ration & Other	500	2,000	11,500	80,500	8,000	25,000	49,000	343,000
<b>TOTAL</b>	<b>1,500</b>	<b>8,000</b>	<b>40,500</b>	<b>283,500</b>	<b>17,000</b>	<b>55,000</b>	<b>106,000</b>	<b>742,000</b>

Source: Current Study

### 7.3 Repair & Maintenance Costs

The fisherman also bears the repair and maintenance costs of the boat and net. A new boat does not need much repair and maintenance for at least the first three to five years, but after five years the repair and maintenance costs start rising continuously. Boats are made locally and there exists a small industry in Sonmiani of specialist boat makers. Nets usually last for two years. Then they have to be discarded and new nets have to be bought.

Table 7.4 gives details of average repair and maintenance costs the fisherman has to bear for both Hori and Hora boats. It should be noted that the cost of net varies according to its size. For Hora boat, large nets are used which make it more expensive. Similarly, more powerful engines are required for Hora than for Hori. Approximately Hora's repair and maintenance cost is nearly three times that of Hori.

**Table: 7.4**

#### **SURVEY: AVERAGE REPAIR & MAINTENANCE COST – PER BOAT TYPE**

Repair & Maintenance Cost	Frequency	Average Cost (Rs.)	
		Hori	Hora
Boat repair	Annual	20,000	40,000
Net repair/ purchase	Annual	20,000	80,000
Engine repair	Varies	10,000	20,000
<b>TOTAL</b>		<b>50,000</b>	<b>140,000</b>

*Source: Current Study*

### 7.4 Classification of Fishermen

Table 7.5 gives detail of surveyed households, area-wise. The last column gives the number of households for each type of fishermen. The percentages portray the percent of population which falls under the category.

**Table: 7.5**

#### **SURVEY: FISHERMAN TYPES – AREA-WISE**

Queries	Sonmiani	Dam Bandar	Bhira/ B Goth	TOTAL AVG	Households
<b>Type of fishermen</b>					
Labourers (Boat less)	48%	14%	19%	27.2%	364
Single Boat Owners	44%	56%	66%	55.4%	743
Multiple Boat Owners	8%	30%	14%	17.4%	234

The fishermen were categorized in three segments:

#### 7.4.1 Labourers

Those who do not have a boat of their own and work on others boats are categorized as laborers. According to the survey 364 households (27%) are labourers. Out of them 156 (43%) fall in the category of poor. Laborers can further be segmented into:

- Na-khuda (boat captain) who does not own his own boat but steers and operates others vessels.
- Sukhani (supervisor), driver, bhandari (cook). For small boat or Hori going for an 8 hour trip, cook and sukhani are not needed.

- Khalasi (labourer) manually pull the nets full of fish on board. Large boats (Hora) with large nets require 30-45 labourers while for small boat number of labourers varies from four to twelve depending on what species of fish are to be caught.

The labourers employed are given a share of the catch which is called 'patti'. One patti is approximately 5% of catch revenue. Generally, the boat owner also gives extra patti or share to na-khuda depending on his catch size. He also rewards the hard working labourers by giving them ½ patti on good performance. Table 7.6 explains the patti system in an example. Consider that if a boat goes out to sea carrying eight labourers plus one na-khuda and comes back with fish catch worth Rs. 12,000, following will be the distribution.

**Table: 7.6**

**AN EXAMPLE OF PATTI SYSTEM**

Total Catch (Rs.)	12,000
Operational Cost of trip (Rs.)	2,000
Net income	10,000
Boat Owner Share @ 50%	5,000
Na-khuda share @ 10%	1,000
8 labourer's share @ 40%	4,000
Per Labourer Share @ 5%	500

*Above figures are hypothetical and are not based on the survey; For understanding purpose only*

The labourers are the most vulnerable in all economic groups although they do not incur any costs (like repair, maintenance or operational). They do not earn much, especially if they work for an indebted boat owner, as their patti or share is given to them after the commission and principal interest amount is deducted from the catch value. They can not turn to moles or agents for loan as they have no boats and loan is only given to boat owners. In crunch periods they get small subsistence loans from boat-owners, who deduct it from their share but no commission or interest is charged from them.

#### 7.4.2 Single boat owners

Those who own or have leased at least one boat are considered as single boat owners. Single Boat Owners can be further segmented on the basis of size and type of boat (Hori or Hora), whether they themselves are na-khuda (boat captains) or give it to a labourer na-khuda and if they are in-debt (makrooz) or free-from-loan (azad). According to survey 743 households (55%) are single boat owners. Out of them 572 (77%) fall into middleclass income category.

- **Those who own and operate the boats themselves**  
These boat owners operate the boat as na-khuda (captain) and get their household male members to contribute by employing them as labourers. This lowers their labour cost making them economically better off. Within this segment are also those who hire labour other than household adults, they incur labour costs. If the boat owner is indebted, this means lower income and vice versa.
- **Those who have leased out their boats**  
These boat owners lease their boats to labourer na-khuda to operate the vessel and catch the fish, sharing income with the boat owner. If the boat owner is indebted, this means lower income and vice versa.

Single boat owners incur three main types of costs; repair and maintenance costs (boat, net, engine etc.), operational cost (ration, fuel, ice) and labour costs (for either na-khuda or khalasi or both). The labour cost varies in three scenarios.

Who operate own boat with own household labour	0 labour cost of net income
Who operate own boat with hired labour	40% of net income
Who lease out their boat	60% of net income
*(Net income = Gross income – Expenses or Costs)	

### 7.4.3 Multiple boat owners

Those who own or have leased more than one boat are considered as multiple boat owners. According to the survey 234 (17%) households are multiple boat owners, out of these 100 (43%) are rich households. Multiple boat owners can also be segmented into numbers of boats they own, boat types and sizes.

- Some multiple boat owners operate at least one boat themselves; other boats are managed by earning adults of their households.
- Others operate one boat and give others to labourer na-khuda.
- The third tier does not operate any boat and has given out all the boats to labourer na-khudas.

Some multiple boat owners are middlemen who have either leased out their vessels or use labourer-nakhuda to catch fish for them. Multiple boat owners incur more costs as they own more boats. But likewise their catch size is also bigger. They are better off than single boat owners.

### 7.5 Fishermen Income

As already explained, there are many variables which determine a fisherman’s income. Based on the survey conducted, the income levels of three main fishermen segments is given in Table 7.7. It should be noted that the income given below is net income, i.e. the income left after deducting all the expenditures and costs. In other words it is the “take home” income of the fisherman.

**Table: 7.7**  
**SURVEY: INCOME OF FISHERMEN**

Fisherman Type	Average Net Income**			Average Annual Net Income
	Per Month - Season*	Total Season*	Total Off Season	
Labourer	7,180	50,260	7,180	57,440
Single Boat Owner	11,150	78,050	11,150	89,200
Multiple Boat Owners	42,000	294,000	42,000	336,000

\* Fishing season lasts for 7 months i.e. from 15 Sep to 15 April

\*\* Net Income = Gross Income - Operational Costs - Repair & Maintenance Costs - Labour Cost

Source: Current Study

Table 7.8 shows the current financial condition of fishermen as compared to five years ago. 631 households (47%) said it is worse, 384 (28%) said it is better off and 326 (24%) said it is the same. This can act as an indicator of and help us map economic trend faced by the fishermen.

**Table: 7.8**  
**SURVEY: FINANCIAL CONDITION OF FISHERMEN**

Queries	Sonmiani	Dam Bandar	Bhira/ B Goth	TOTAL AVG	Households
<b>How is your financial condition now versus five years back?</b>					
Better off	19%	38%	29%	28.6%	384
Worse Off	60%	39%	42%	47.1%	631
Same	21%	23%	30%	24.3%	326

*Source: Current Study*

### **7.6 Fishermen Indebtedness**

In all cases, only those fishermen who own a boat can take a loan. The main reason for this condition is to ensure that the loan could be repaid. In other cases, the loan givers operate something similar to “leasing”. They buy the boat and lease it to the fishermen on their terms. The main condition for loan is that all the fish catch will be sold only to the loan giver and nobody else. The loan giver will make two deductions from the fish catch income:

- a) Commission
- b) Principal amount

Commission, which is a flat fee, varies from species to species, ranging from Rs. 10 per kg on shrimps and Rs. 10 per Bucket/Can (Dabba of 15 kg) of trash or *gand*. The principal amount is deducted from the catch. The rate also varies e.g. on shrimps it is Rs. 50 per kg, for trash fish it is Rs. 0.67 per kg. This is in addition to the commission charged.

The loan-givers calculate their risk by seeing credit-worthiness and previous track record of the boat owner. They have credit limits also assigned (although not written down) to reduce the occurrence of bad loans. In some cases where the boat is damaged or sunk, the issue is solved by negotiation between the fisherman and loan-giver. In most cases both parties have to bear the brunt. Normally, the loan-giver sets the fisherman free from loan.

In many cases loan, commission and repayment mechanism is linked with only one species mainly either shrimps or trash fish. For others the fisherman gets market determined returns but still has to sell to the same middleman.

Table 7.9 gives detail of the survey responses on indebtedness. According to the current study, out of the total households, 640 (47%) are indebted and the rest are free of debt. The average period of indebtedness is around five years. Out of these 640 indebted households, 364 household (57%) reported that their loan is decreasing, 148 (23%) reported it is the same and 128 (20%) reported it is increasing. Average loan size is approximately Rs. 230,000 per household (ranging from 40,000 in Sonmiani to 425,667 in Dam Bunder).

**Table: 7.9**  
**SURVEY: FISHERMEN INDEBTEDNESS**

Queries	Sonmiani	Dam Bandar	Bhira/ B Goth	TOTAL AVG	Households
<b>Indebtedness</b>					
Taken Loan	46%	47%	50%	<b>47.7%</b>	<b>640</b>
Not Taken Loan	54%	53%	50%	<b>52.3%</b>	<b>701</b>
Avg Period of loan (yrs)	4.17	6.56	3.69	<b>4.81</b>	
Loan Increasing	0%	32%	28%	<b>20.0%</b>	<b>128</b>
Loan Decreasing	67%	48%	56%	<b>56.9%</b>	<b>364</b>
Loan Same	33%	19%	17%	<b>23.1%</b>	<b>148</b>
Avg Loan Size	40,000	425,667	222,167	<b>229,278</b>	

*Source: Current Study.*

Out of the 640 households which are indebted, following is the breakup:

<b>Category</b>	<b>No. of HH</b>
Labourers	32*
Single Boat Owners	524
Multiple Boat Owners	84

*\*Were labourers when surveyed, but still carry the loan on them as they suffered losses during boat operations.*  
*Source: Current Study.*

Table 7.10 gives detail of fishermen without debt and with different economic classes.

**Table: 7.10**  
**SURVEY: FISHERMEN UNDER NO-DEBT SITUATION**

Class	Fishermen	
	Under Debt	No Debt
Poor	<b>20</b> 67 %	<b>10</b> 33 %
Middle	<b>18</b> 50 %	<b>18</b> 50 %
Rich	<b>1</b> 17 %	<b>5</b> 83 %

*Source: Current Study*

Fishermen usually take four types of loans for various reasons:

### 7.6.1 Capital loan

To buy and to maintain boat, net, engine. The size of this loan ranges from Rs. 25,000 to Rs. 1,000,000. Its repayment mechanism is by selling fish to the loan-giver who deducts it as principal amount from every catch. This is a medium to long-term loan and it usually takes years until it is paid back completely.

### **7.6.2 Operational loan**

To finance operational costs e.g. fuel, ration and ice. The size of the loan ranges from Rs. 5,000 to Rs. 25,000. Usually when the loan-giver provides an operational loan it is deducted at the end of a successful fishing trip. If the fishing trip is unsuccessful, this loan is then gradually deducted from subsequent successful fishing trips. This is a very short term loan, lasting from couple of days to couple of weeks.

### **7.6.3 Subsistence loan**

Usually taken in off-season to run the households expenses, it ranges from Rs. 2,000 to Rs. 4,000. This loan is usually repaid in the season. This is also considered as short-term loan.

### **7.6.4 Emergency or other loans**

It is usually taken for death, marriage or other requirements. The loan size ranges from Rs. 5,000 to Rs. 10,000. It is usually paid in season with the fish catch. This is also considered as short-term loan.

## ***7.7 Role of Outsiders***

Apart from the locals who work as laborers, a sufficiently large number of outsiders (estimates range from 6,000 to 10,000) come to Sonmiani area and work mainly as labourers during the season (September to April). These include Bengalis, Sindhis, Pathans, Punjabis, Gilgitis etc who flock to the area and make handsome money in the season. As the local labour is insufficient to meet the required demand for labour during the season, they welcome the outsiders in the area. Many na-khudas arrange for their boarding and lodging in Dam. However, they are kept separate from the local residential areas. They are an important factor to consider in the socio-economic scenario of Sonmiani fishing industry.

These outsiders either operate as labourers or as financiers or middlemen. They play a vital role in the fishing season when local labour is incapable of meeting the demand for manpower. Outsiders work for 6-8 months, make sufficiently good money, save it and then return back to their families. These should not be looked upon as competitors. They have no boats of their own but provide an opportunity to the locals to earn more from long fishing trips and increasing possibility of better catch.

As this study was conducted in the off-season, no outsiders were to be found in the area. However, it would be interesting to look at the marketing system of some specific people like Bengalis, to see how they market their fish and what system they follow.

## ***7.8 Key Issues of Fishermen in Miani-Hor***

The issues faced by fisherman communities and industry in general were also verified in Sonmiani area like depletion of marine resources, increasing population, over-fishing, harmful nets, deep-sea trawlers and poor management. Some specific issues pointed by the locals are described below.

### **7.8.1 Higher Costs**

The recent rise in fuel cost and subsequent inflation has really hit hard on the local fishermen. With declining fish catch and increasing expenditures, it is getting really hard for fishermen to make their ends meet. Higher cost of the input material like imported nets ranging from Rs. 30,000 to Rs. 100,000 and last for up to years. Wooden boats cost ranges from Rs. 100,000 to 1,500,000. The repair and maintenance cost multiplies as the boats grow old. On the other hand the price of fish has not climbed at the same level.

### **7.8.2 Siltation of Miani Hor**

The mouth of Sonmiani Hor is blocked for around five months in a year due to silt deposition at the mouth of the channel. This restricts the access of boats to the open sea for fishing between mid April to mid September, limiting their time of operation.

### **7.8.3 Lack of facilities**

The key landing of Dam Bunder does not have proper jetty, which is harmful for boats. Lack of proper storage facilities and processing plants adversely affects the fishing industry and makes it more dependent on Karachi.

### **7.8.4 Lack of alternative income options**

Almost 90% households are dependent on fishing with little or no alternative income options. Especially during the off-season their income ranges from 0 to 35% of monthly income in season. Due to the irregularity in income, fishermen turn to exploitative and unsustainable fishing methods during the season, to make up for low income during the off-season.

### **7.8.5 Fisherman mindset towards indebtedness**

Fishermen have a very casual mindset about the credit they get from the loan-giver. Although accepting those loans reduces their income, but still they turn to loan-givers to facilitate and finance their operations. There is little tendency for financing the operational, repair and maintenance costs through savings. In fact, the concept of savings is literally non-existent at least among poor and middleclass.

### **7.8.6 Superfluous expenditure by fishermen**

Fishermen spend superfluously. Their expenditures follow their income when the income is rising during season. However, when the income starts declining so do the expenditures but with a lesser ratio to income. Similarly the debts accumulate more during off-season.

## **8. Sonmiani Middlemen**

There are around 40 middlemen operating in the area, most of them are based at Dam. Around 10 of them are local while the rest mainly come from Karachi and a small number from other parts of the country. The role of the middlemen is very critical in the entire fish marketing system. They provide loans to the fishermen which includes capital, operational, subsistence or emergency loans. In addition to being the financiers and creditors to the fisherman, they also accumulate fisherman savings. They deduct a set amount per kg as fisherman savings with them and pay them at the end of the season for boat and net maintenance and subsistence, however this is optional. The amount is the same that the middleman charges as commission i.e. on shrimps it is a flat rate of Rs. 10 per kg; for Trash (gand) it is Rs. 10 per 15 kg Bucket/Can. Hence, they also act as saving source. The middlemen keep the book and every detail of commission and capital amount paid is entered onto the book. A copy of the book is also kept by the fisherman for his record which is regularly updated.

### ***8.1 Classification of Middlemen***

Middlemen can be segmented into the following categories:

#### **8.1.1 Company Agents**

These middlemen are agents appointed by processors or exporters. They finance the fishermen by providing loans and ensure their bonded catch. They purchase the required catch and send to the processing companies. They make money by charging commission from the fishermen (which varies from species to species) and also get commission from the processing company usually in the range of 3-5% per kg on purchase price. Most of these middlemen are also indebted to the processing company they work for, as they have taken money from the companies for investment in the fishing business. The loan they disburse is usually provided by the processing company. They are operationally involved in loan giving and recovery. They have to share the commission with the processing company.

#### **8.1.2 Agents of Mole-Holders**

These middlemen are agents (also called *Chaapra*) of registered mole-holders based in Karachi harbour. They also finance the fishermen, provide much needed loans and ensure bonded catch. They charge commission from the fishermen and also get around 3-5% commission from the mole-holders. They are financed by mole-holders in Karachi.

#### **8.1.3 Beoparis/Traders**

These middlemen make money by variance in the market rates between Sonmiani and Karachi. Generally their profit level is estimated between around 10-15% on average. Some of them also provide loans others just work as traders. Some are financed by big beoparis in Karachi, specially the ones who provide loans. Some are partnerships with financiers who have invested in this business. And others are self financed.

## 8.2 Middlemen Income & Profits

The middlemen system exists in nearly all other commodities in Pakistan like agricultural, fresh fruits, dry fruits etc. It is also practiced in the region and developed countries as well. It is the main provider of informal credit system to the growers or fishermen. They act like a micro credit financial body disbursing capital, operational and other loans of the right amount at the right time (impromptu). Thus, ensuring that the loan-taker continues to do what he is good at while reaping returns for himself and for the middleman. The middlemen do not compete among each other but there is a cartel like collusion of middlemen, where they collectively decide on the rates and fix prices. Despite this, the role of middleman is very crucial for the survival of his debtors. Similar is the case at Sonmiani.

The middlemen play a key and vital role for fishermen since:

- They provide them with much needed loans to buy/operate their vessels.
- There is no repayment time-limit on the loaned amount, there is ease to pay off as one can catch fish and regularly pay off their debt.
- There is no interest charged, only commission which is in the range of 3 to 15%. Depending on types of fish.
- There is flexibility in repayment of principal amount. If the fisherman is in dire need of money, he can ask the middleman not to deduct the extra amount from his loan, deferring the payment. This also goes in middleman's returns as he can ensure bonded catch from that fisherman as long as the fisherman is in debt. The principal amount is adjusted against the catch, in the case of shrimp, Rs. 50.
- They also act as saving source for fishermen. In many cases middlemen deducted extra amount of Rs. 10 per kg as saving for fishermen, which is given to them at the end of the season.

Although, informal financing through the middlemen is a reasonably effective system, considering the lack of alternatives available to the fishermen however, it needs to be looked critically in the wake of reducing resources (fish catch volumes) and increasing pressures on the current system. This systems needs to be adapted to the changing environment to enable fishermen to come out of the poverty cycle and increasing their earnings.

**Table: 8.1**  
**SURVEY: MIDDLEMEN – COMMISSION & LOAN REPAYMENT RATES**

Species	Current Local Market Rate (Rs/kg)	Total Annual Volumes (kg)	Adjusted Annual Volumes (kg)**	Commission from fisherman (Rs/kg)*	Loan Repayment (Rs/kg)	Annual Value at current market rate (Rs.)	Annual Commission (Rs.)	Annual Loan Repayment (Rs.)
Shrimp	270.0	264,000	126,720	10.0	50.0	71,280,000	1,267,200	6,336,000
Trash fish	4.0	4,012,000	1,925,760	0.6	0.7	16,048,000	1,155,456	1,290,259
Indian Mackerel	25.0	911,000	437,280	5.0	5.0	22,775,000	2,186,400	2,186,400
Pomfret	400.0	315,000	151,200	5.0	5.0	126,000,000	756,000	756,000
Others species	Varies	5,729,000	2,749,920	5.0	5.0	Varies	13,749,600	13,749,600
<b>TOTAL</b>		<b>11,231,000</b>	<b>5,390,880</b>				<b>19,114,656</b>	<b>24,318,259</b>
Commission (Rs per kg)							3.546	4.511

\*Includes commission from indebted fisherman only  
\*\* Revised annual volumes on the basis of loan taker's ratio, source: survey

Table 8.1 shows the volumes of indebted fishermen based on the survey findings that 48% of fishermen are indebted. It shows the commission earned by middlemen from the fishermen and the loan repayment rate which are also based on survey. Thus, calculating annual commission and annual loan repayment on the average, commission rate is Rs. 3.5 per kg while loan repayment rate is around Rs. 4.5 per kg.

Table 8.2 gives an overview of middleman's financials. From the survey it was deduced that 630 households are under debt (i.e. 48% of total households). With 40 middlemen in the area, average number of indebted households per middleman is around 16. From the survey we also know that average aggregate loan per household is Rs. 229,278. Average period of indebtedness is five years according to the survey. With all the calculations given in table 8.2, it can be concluded that the net annual ROI (return on investment) for middleman is 147%. And annual loan repaid is the 84% of the principal amount loaned. This means that in a year (which is restricted to a season) the middleman not only gets back most of his loaned amount but, also makes profit by charging commission from indebted fisherman and also charging commission from his principal (Large Beopari or Company) on the entire volume of fish and shrimps that he supplies to them.

**Table: 8.2**  
**SURVEY: MDDLEMAN – INCOME & PROFITS**

	Total	Per Middleman	Source
<b>Commission from Indebted Fishermen</b>			
A No. of HH taken loan	630	16	Based on Survey
B Average aggregate loan amount per HH (RS.)		229,278	Based on Survey
C Total amount loaned (RS.)*	144,445,140	3,611,129	TOTAL: B multiply by 630 (A) MIDDLEMAN: divided by 40
D Avg period of loan per HH (yrs)		5	Based on Survey
E Avg amount loaned per year per HH		45,856	B divided by D
F Avg total amount loaned in a yr (RS.)	28,889,028	722,226	F divided by 40
G Annual volume turnover from indebted fishermen(Kg)	5,390,880	134,772	TOTAL: Revised annual vol from Table 8.1 MIDDLEMAN: div by 40
H Annual commission from indebted fishermen (RS.)	19,114,656	477,866	TOTAL: Annual Commission from Table 8.1 MIDDLEMAN: div by 40
I Annual commission per indebted fisherman (RS.)		30,341	H Div by 630 (A)
Annual cost (RS.)	5,760,000	144,000	0*48% indebted fishermen
Annual cost per indebted fishermen (RS.)		9,000	I divide by A
Net profit on Investment (RS.)	13,354,656	21,341	I minus Annual cost
J Annual Rate of Return On Investment (ROI)	46%	46%	(H-Annual cost) div by F x 100
<b>Recovery of Principal Amount Loaned</b>			
K Annual principal loan repaid by all indebted fishermen (RS.)	24,318,259	607,956	TOTAL: Annual Commission from Table 8.1 MIDDLEMAN: div by 40
Annual loan repaid per indebted fishermen (RS)		37,997	K divided by A
L Annual principal recovered from indebted fishermen (%)	84%	83%	K divided by Fx 100
<b>Total Profit on Catch Volume from All the Fishermen (Indebted + Non indebted)</b>			
M Total annual volumes (Kg)	11,231,000	280,775	Annual volume divided by 40
N Total annual commission (RS)**	58,936,856	1,473,421	H+(M*3.546)
O Annual cost (Rs.)	12,000,000	300,000	Based on Survey
P Net Annual Return from Commission (RS)	46,936,856	1,173,421	N - O
Q Total Commission + Loan Repaid (RS)	71,255,115	1,781,378	P+K
R Amount invested (RS)	28,889,028	722,226	F
S Net profit (RS)	42,366,087	1,059,152	Q-R
T Net Annual Rate of Return on Investment (%)	147	147	S divided by R*100

\* Amount loaned is taken from table 7.9 avg loan size multiplied by no. of HH taken loan

\*\* Annual commission from principal is based on total volumes i.e. of indebted and free from loan fishermen

The following conclusions could be drawn from the data shown in the table:

- i. The rate of return on investment is approximately 46% from indebted fishermen in addition to recovery of 83% of the principal amount.
- ii. The annual rate of profit almost triples, if the commission from Beopari/Company on the entire catch is included. However, the margin of profit would be reduced if the difference in fish rates/kg that are offered to loan free

fishermen is taken into account as the cost to the middlemen and is deducted from his aggregate annual profit on Investment.

- iii. This shows that though the middleman provides easy access of loan to the fishermen but he does so at a higher rate of return than any other formal financial institution.
- iv. Analysis also shows that on average the fishermen would be able to pay back most of his loan but would not be able to free themselves from debt. This would result in accumulation of debt over the years and continuous bondage.
- v. Considering the above scenario it can be deduced that the role of middleman is extortionist.

However, in cases when middleman is under loan, he has to share his profit with his principals or financiers. Another aspect should be kept in mind, the middleman's commission is not fixed but he charges a flat fee. This means that even his earnings are not dependent on the rate fluctuation; the fisherman bears the risk or reaps benefit of any changes in rates.

The middleman bears the risk of default by the fisherman, also in case the vessels gets severely damaged or sinks, the risk is squarely on the middleman, as the fisherman is unable to pay for the price of boat. However, the occurrence of any boat sinking or damaged is very rare.

Having said the above, the life of a fisherman would be very difficult without financing options. With little or no alternative sources, little or no savings and superfluous spending habits, he would not be able to run his livelihood. Fishermen require loans mainly for leasing and operating boats. Without loans, they will be left forever in the vicious cycle of poverty.

Like in any other commodity or industry, once middleman is removed, it would raise the level of profits for fisherman along with the risk associated with it. Objectively weighing, this can only work as long as the fisherman change their mindset towards loans and spending habits and give more emphasis towards cost cutting and saving, which is a long term attitudinal change.

### ***8.3 Pros & Cons of Middlemen in Fish Marketing***

#### **Pros**

- The fish catching and marketing system would not be as efficient as it is without the substantial amounts of credit injected by middlemen and their financiers (mole holders, large beoparis or processors/ exporters). Certain developments would probably not have taken place, or only at a much slower pace, without their financial involvement.
- Given that "firm" business relationships are established, transaction costs such as searching for trustworthy business partners and contract enforcement appear to be comparatively low. The resulting interlocked transactions enhance the speed at which a commodity moves through its marketing channels.

- Long established relationships between fishermen, middlemen, processors, traders etc tend to be built on trust, which again reduces transaction costs.
- Middlemen have funded an industry which is largely neglected by formal banks and NGOs. This has provided large numbers of people in coastal areas with access to credit, which they would not have had otherwise. This has created employment and improved food security at micro and macro levels. Indirectly, the poor are likely to have also benefited due to the spin-off effects created.

#### Cons

- There is scope for exploitation due to the mostly informal nature of the credit arrangements. In particular, fisher-folk depending on intermediary traders cum moneylenders are often exposed to dubious business practices, the rules of which can vary from location to location and from middleman to middleman. The dubious business practices include improper weighing mechanisms, rejected lot (which the middleman rejects and fisherman does not get paid for it, later on the same rejected lot is sold off). Offering lower than market rate to fishermen.
- The informal credit system has the tendency to create dependency relationships resulting in increased indebtedness over time. These dependency relationships result in lower savings or looking for alternative sources of income by fishermen who take the loans for granted, thus their superfluous spending habits and little or no savings.

This demonstrates the different aspects of lending in the fish marketing chain. It is obvious that there are both positive and negative sides to this business, which need to be borne in mind when planning new interventions geared at improving fisher-folk's access to credit. A credit programme that does not fully take into account the roles of the middlemen may run into difficulties due to the market power the latter are able to wield.

Moreover, the fishermen by and large do not look for alternative sources of income as their mindset is that "a fisherman can not do anything else but fishing". Generally, the increased dependency for loans and increasing propensity for spending hints towards the fact that fishermen do not consider loaned amount as "not their money" but spend it unwisely. In addition, there is strong evidence of superfluous spending habits i.e. the fishermen will eat Rs. 100 (1.7 USD) of *Gutkha* (chewable tobacco) in a day. Similarly, if the fishermen end up with a good catch and good return, he will start spending it lavishly on food, clothing and other things without a tendency to save. So even if overall loans are decreasing the quality of life is not getting better, as other important factors are responsible for their loss in income and increasing expenditures.

## **9. Processors/Exporters**

The processors and exporter are mostly the two roles blended into one. The processing companies are exporters as well in most cases. This is the most sophisticated end of the supply chain. Issues such as the Hazard Analysis and Critical Control Point (HACCP) first emerge at the exporters end.

The processor/exporter is the price setter — the prices move downwards from the exporter to the supplier, to the agent and then to the fisherman on a daily basis. The level of transparency is very low between each of these groups. Even suppliers are unaware of the selling price of exporters. Nevertheless, exporters receive prices from their buyers in importing countries. Although, the companies were unwilling to divulge the details of their expenses and degree of profit they make, however it is believed that they make profits in the range of 40 – 50%. This is similar to what the processors and exporters earn in India (*Source: Marine Seafood Export Supply Chain India by Parashar Kulkarni Consumer Unity and Trust Society, 2005*).

## 10. Case Study: Shrimp (Jaira Type)

Shrimps were taken as case study. Its supply chain was studied in detail to identify profit levels. The following does not take into account the wastage or loss of weight due to loss of moisture from shrimps. Following are the assumption:

- The boat owner himself is na-khuda and has hired household labour.
- The boat is indebted
- Boat owner is bound to sell his catch to middleman (company agent)
- The company exports the shrimps to a foreign market, getting rate of US\$ 12 per kg

Average shrimp catch per trip (kg)	12.5
No. of trips in month (season)	20
Market price per kg at Sonmiani (Rs/kg)	270

### Income to boat-owner (Scenario A)

Cost of shrimp fishing (operational) (Rs/kg)	80
Price to indebted fisherman (Rs/kg)	260
Net income per kg (zero labour cost)	180

### Income to boat-owner (Scenario B)

Cost of shrimp fishing (operational) (Rs/kg)	80
Price to indebted fisherman (Rs/kg)	260
Labour Cost @ 50%	130
Net income per kg (50% labour cost)	50

### Income to middleman (agent)

Purchase price (Rs/kg)	260
Operational Cost (Rs/kg)	0.5
Commission from fisherman (Rs/kg)	10
Commission from processor/mole (Rs/kg)	10
Total Commission (Rs/kg)	20
Net Profit (Rs/kg)	19.5

### IF EXPORTED

#### Income to processor/exporter

Purchase price (Rs/kg)	280
Transportation Cost (Rs/kg)	10
Total cost & wastage (Rs/kg)	175
Marketed rate – export (Rs/kg)	600 (US\$ 10)
Net Profit (Rs/kg)	135

### IF CONSUMED LOCALLY

#### Income to wholesaler

Purchase price (Rs/kg)	280
Transportation Cost (Rs/kg)	10
Total cost & wastage (Rs/kg)	75
Selling rate – (Rs/kg)	420
Net Profit (Rs/kg)	55

#### Income to retailer

Purchase price (Rs/kg)	420
Total cost & wastage (Rs/kg)	10
Selling rate – (Rs/kg)	475
Net Profit (Rs/kg)	45

## 11. International Best Practices

There is a need to understand and learn from similar best practices scenarios and experiences elsewhere in the world. Two such examples have been identified both with different approaches. One from a view point of increasing the value of marine catch in order to reward fishermen who adopt sustainable fishing practices. While the other provides alternative financial options and supply route for marine catch in order to ensure that reduce the role of middlemen thus exploitative practices.

### *11.1 Marine Stewardship Council (MSC)*

The MSC was established in 1996 as a result of efforts by the Worldwide Fund for Nature (WWF) and Unilever (one of the world's largest fish buyers) to maintain and promote the productivity of the oceans, and has been working as an independent organization since 1999. It is a non-profit organization that certifies harvesting practices adopted by various fisheries all over the world. The MSC has developed principles that govern activities related to harvesting practices. Although not mandatory, these principles enshrine an important aspect of international food trade—the growing desire to regulate international trade through harmonized standards, which aim to achieve environmental sustainability and, by implication, social justice. These principles advert to market forces as a driver to promote sustainable harvesting. Fisheries are assessed for being well managed and sustainable, based on the principles given below:

- A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery;
- Fishing operations should allow for maintenance of the structure, productivity, function and diversity of the ecosystem on which the fishery depends, including the habitat and any associated dependent and ecologically-related species; and
- The fishery is subject to an effective management system that respects local, national and international laws and standards, and incorporates institutional and operational frameworks requiring responsible and sustainable resource use.

Two additional stipulations are that fishery operations:

- Ensure present and future economic and social options and benefits; and
- Are conducted in a socially and economically fair and responsible manner.

### **Limitations/ Criticism**

MSC is criticized on its philosophy of collaborating with international businesses to bring about environmental change and question its corporate ties. Moreover, the MSC has kept certain environmental groups at arms length from its certification process which casts doubt over the objectivity of the certificates awarded. Further, investigations carried out on the instructions of the MSC's five U.S. donors found that the Council lacked credibility in its certification process and would “face collapse unless drastically reformed.”

These standards are not applicable to trade between countries; they are used as a benchmark to assess their feasibility in expectation of similar regulatory standards being instituted in the foreseeable future.

Despite the criticism it has faced, it is the step in right direction. It is known for passing economic benefits/rewards for undertaking sustainable and environment friendly practices. This need to be further explored and analyzed before initiating a business venture.

### ***11.2 Micro-finance in Bangladesh – Best Practice***

One of the best practices being followed in Bangladesh is Community Development Centre or CODEC based in Chittagong, Bangladesh. It initially started its credit program by distributing mechanized fishing boats and gradually became involved both in micro-credit as well as mid-term and long-term financing against income generating activities. CODEC also provided loans against housing in limited capacity. In some very specific cases CODEC provided loans without interest; and under a very special project CODEC provided credit to the fishers to free them from Dadan (local middlemen). In January 2002, CODEC also initiated a credit program for the hardcore poor and for the well-off members of the village communities.

Due to the seasonal nature of fishing with fisherman hardly earning anything between certain months of the year, makes him more dependent on middlemen for loans. This loan is mainly used for subsistence and to make their fishing gears ready at the onset of season.

CODEC is currently operating its Savings and Credit Programme to meet the aforesaid requirement of credit of the poor fisherfolk/coastal communities and to bring them out of the clutches of the informal credit market. CODEC introduced another credit product, named Dadan-free Loan (usury-debt redemption loan), on pilot basis for freeing some of the Chittagong fishers from the clutches of the dadandars and usurers.

#### **Limitations/Criticism**

- Micro-credit helps the poor population to have less dependency on moneylenders and dadandars however, the total elimination of exploitative money lending and Dadan transaction is not possible through micro-credit. This is mainly due to the fact that micro-credit requires some procedures and rules, which do not allow members to borrow money whenever they badly require it. On the other hand, moneylenders and dadandars do often disburse money without following any rules and procedures.
- Moreover, the rules, regulations and procedures of the established micro-credit programme exclude the very poor (hard-core poor) and gradually it (micro-credit program) shifts its target groups to the upper strata of the poor population and the middle class.
- Sometimes, the repayment schedules are also not feasible to the borrowers as most of the poor people are somehow dependent on the fishing season or availability of work. Even the loan money invested in a profitable project does not secure regular flow of money for repayment in accordance with NGO rules.
- The “Dadan Free Loan” gives the option to the fishers to sell their catches by their won, have the opportunity to bargain and thus, allow them to receive higher prices.

But for their very urgent need (e.g. loss of fishing gears and catches in the sea due to piracy) in a few cases, they had to borrow money from the dadandar again.

- Micro-credit may be an option to those people for survival, but in many cases difficult to self-sustain.
- In most of the cases the money is used for non-productive or consumption purposes which do not allow them to repay the loan as per schedule. As a consequence, the debt burden is becoming heavier on a daily basis.

## 12. Intervention Approach

Following the literature review, in-depth household surveys with fisherfolk communities and interviews with government and non-government stakeholders, a clear understanding of issues pertaining to fisherman has been reached. The review of best practices around the globe and within the region has given us a direction to take in the current scenario. Fishermen, in the focus group discussions, identified the following as possible interventions that could improve their livelihood status:

- Government support for credit for boats, nets, etc.
- Government support for infrastructure i.e. cold storage, packaging, marketing, etc.
- Government support for roads, jetties
- Local fish harbor

The fishermen were most adamant in their demand for local level buying and selling. They were of the view that it is very difficult, almost close to impossible, for them to take their catch to Karachi and sell it to buyers there. Examples were quoted where fishermen did take their catch to Karachi, but were unable to sell their catch at the right price and profit as they had little knowledge of negotiation and also did not know who to deal with, hence came back with lesser income and higher costs. There is no facilitation at the Karachi Harbor for fishermen of Sonmiani as all buying and selling is done through the middlemen.

According to most of them, the Fishermen Cooperative Society based in Karachi Harbor is a political body that is working to reap profits for its members. This is a body that was formed under the auspices of Government of Sindh in 1951, and was formed to ensure the welfare of the poor fishermen and provide benefits to them. Its board consists of elected as well as government nominated members. But lately, like other such bodies, it has become ineffective and does not perform its functions in letter and spirit.

With these discussions as the backdrop, the researchers came up with the suggestion of forming a Sonmiani Fisher-folk Development Cooperative. This Cooperative would work towards economic betterment and increased efficiency of fisher-folk communities. Its key functions would be to:

1. Give proper training about sustainable fishing methods, techniques, tools and use of technology to facilitate profitable fishing
2. Facilitate fisher-folk in purchase of boats, nets and engines at competitive rates.
3. Explore cheaper and better options/materials in fishing gears and vessels which are more efficient than the ones being currently used.
4. Give proper on-boat storage facilities to reduce wastage and sustain quality of catch
5. Develop, operate and maintain storage facilities at landing areas
6. Support with en-masse negotiation with middlemen, getting better rates
7. Operate micro-credit financing to fisher-folk, more or less on the same practice as CODEC in Bangladesh
8. Operate saving scheme of fisher-folk, induce saving habits
9. Facilitate and support in setting up of processing units in the area, providing locals with alternative sources of income, and getting better rates for their catch.
10. The option to introduce MSC certification for the first time in Pakistan, increasing profits and ensuring fisher-folk communities get the maximum benefits.

### 13. Business Plan: Sonmiani Fisher-folk Development Cooperative (SFDC)

The Sonmiani Fisher-folk Development Cooperative (SFDC) will be formed as an independent company to provide much needed training, operational, financial, and marketing support to the fishermen. Its main aim would be to provide sustainable livelihood to Sonmiani fisher-folk and to make them economically better-off. The company will function mainly by providing special services and facilities to the local fisher-folk. It will also be empowered to procure fish stocks from the fishermen and market it locally and internationally through its own network, passing additional

“Most of the hundreds of MFIs that are providing micro finance services to the poor around the world are non-government organizations (NGOs), usually societies, trusts or foundations. They tended to have added micro finance to their earlier development oriented activities when they saw the need of their members for capital. However, strictly speaking, either the statutes under which they are registered or the regulatory authority for financial institutions in their country do not usually permit micro finance services especially if the NGOs are accepting savings deposits from their clients. Yet without the micro finance activities of these small NGOs, mostly very poor households would not have access to capital for additional income - generation through self-employment.” (*Financing Micro finance for Poverty Reduction: David S. Gibbons and Jennifer W. Meehan, 20 March 2002*)

benefit to the communities involved. The Cooperative would provide the local community a platform for sustainable livelihood which protects the environment and the local ecosystem through sustainable fishing methods. Fisher-folk communities will benefit from the Cooperative in two ways. Firstly, increasing technical, managerial, infrastructure and financial support; secondly increase in profits, which will ultimately lead into improvement of livelihood of local community.

The objectives of the Cooperative will be:

- A. Training & Research: Providing training to local community (capacity building) on sustainable fishing practices and modern techniques, also improve profitability by wastage reduction.
- B. Operational: Provide technical support/advice and facilitate fisher-folk in purchase of boats, nets, engine, ice boxes and other equipment on competitive rates. Explore cheaper and technically better options for efficient fishing. It will also provide fisher-folk with value added services like cold storage, transportation, facilitate in easy access to Karachi market.
- C. Financial: Provide financial support in shape of micro-finance loans for capital and operational expenditures, introduce saving schemes, give innovative investment opportunities, provide loans for alternative livelihood initiatives, focus on women-folk for economic activity.
- D. Marketing: Market the sustainable harvested marine species locally as well as in international markets, develop a network of local and international buyers/customers and develop partnerships for increased business opportunities.

Following are the keys to success for the Cooperative:

1. Buy-in and active participation of local stake holders
2. Professional management to run the Center
3. Clear responsibilities and system/processes of working
4. Transparent financial system
5. Network of customers/buyers in local as well as international markets

The company will be formed on the lines of a cooperative and it will be run on a non-profit basis. As the main objective for the company will be to support the local fisher-folk communities to increase their profitability, it is imperative that local stakeholders be involved right from the start. Also, the middlemen need to be involved in this venture. They can act as a marketing channel, at least for the first few years. This would reduce the possible oppositions to such an initiative from middlemen and ensure smooth functioning of this venture.

### ***13.1 Mission Statement***

“To support fisher-folk communities by providing them with sustainable livelihood through eco-friendly fishing and alternative income sources, safeguarding interests of local community and passing increasing economic benefit to the stake-holders.”

### ***13.2 Startup Costs***

Table 13.1 gives detail account of startup costs. The figures are based on market estimations.

**Table: 13.1  
STARTUP COSTS**

<b>Detail</b>	<b>Costs (Rs.)</b>
<b>One Time Cost</b>	
Renovation	150,000
Office furniture	150,000
Computers x 5	100,000
Misc	100,000
Vehicles x 2	2,400,000
<b>TOTAL INITIAL COST</b>	<b>2,900,000</b>
<b>Annual Salaries</b>	
MD	600,000
Secretary Finance	360,000
Managers x 3	900,000
Executives x 5	600,000
Admin Executive	120,000
Peon	48,000
Security Guard x 2	72,000
<b>TOTAL SALARIES</b>	<b>2,700,000</b>

<b>Operational</b>	
Office Rent for one year	360,000
Utilities	120,000
Transport	120,000
<b>TOTAL OPERATIONAL</b>	<b>600,000</b>
<b>TOTAL COST 1ST YEAR (RS.)</b>	<b>6,200,000</b>
<b>TOTAL COST/ YEAR (RS.)</b>	<b>3,300,000</b>
<b>TOTAL COST 1-5 YRS (RS.)</b>	<b>19,400,000</b>
<b>TOTAL COST 1-5 YRS (US\$)*</b>	<b>323,333</b>
* Exchange rate Re 1= US\$ 60	

*Developed by Consultant on market estimations*

### 13.3 Management Structure

The cooperative will operate on basis of membership, set criteria for membership and minimum viable membership number will be defined, after which the cooperative will become active.

The Board of Directors will have representatives from WWF and local fisher-folk to ensure community involvement in the project. The board will give strategic support to the Managing Director and ensure active participation of the local stakeholders. All the staff hired for this cooperative will be professional. The MD will be the administrative head of the company. He will be assisted by the Finance Director who will manage the financial affairs including micro-finance, he will be supported by at least two executives. Three managers in charge of their respective departments (Operational, Training & Research and Marketing) will report to the MD. They will be supported by one executive each.

### 13.4 Financial Plan

This part provides the financial feasibility of the project along with forecasts. It is suggested that to meet the setting up costs and to pass some benefits to the fisher-folk, funding and grant options should be considered from government and non-government sources.

#### 13.4.1 Procurement Forecast

Table 13.2 provides details about estimated procurement. Selected species have been identified for procurement. Average procurement has been kept at 5% of total volume from beginning and then rising gradually upto 15% of total volume by 2011. The criteria for species selection have been on the basis of volume and market value.

**Table: 13.2**  
**PROCUREMENT FORECAST**

PROCUREMENT	2007	2008	2009	2010	2011
<b>TOTAL PROCUREMENT (kg)</b>	<b>273,650</b>	<b>390,772</b>	<b>574,993</b>	<b>717,592</b>	<b>941,839</b>
<b>Sardineela (Gand)</b>	200,600	286,457	421,501	526,033	690,418
<b>Indian Mackerel (Bangra)</b>	52,400	74,827	110,103	137,408	180,349
<b>Pomfret (Paplet)</b>	10,650	15,208	22,378	27,927	36,655
<b>Shrimps (Jheenga)</b>	10,000	14,280	21,012	26,223	34,418

*Developed by Consultant*

### 13.4.2 Costs

Table 13.3 gives detail of procurement, storage, transportation, marketing, operational and startup costs. Rates for respective species are current market rates for free-from-loan fishermen. Marketing cost includes business development initiatives and commissions for middlemen etc. Operational costs cover salaries and fixed costs. In order to finance the initial costs, which come to around 2.02 million per month (16 Million div by 8 months) some donor or micro credit institution can be approached. This running finance will be necessary to provide life blood to the organization.

**Table: 13.3**  
**COST FORECAST**

	2007	2008	2009	2010	2011
<b>TOTAL COSTS (Rs.)</b>	<b>19,072,200</b>	<b>18,505,102</b>	<b>25,225,007</b>	<b>30,634,883</b>	<b>38,829,792</b>
<b>Procurement Cost (Rs.)</b>	7,977,600	11,392,013	16,762,533	20,919,641	27,457,029
<b>Sardineela</b>	702,100	1,002,599	1,475,253	1,841,115	2,416,464
<b>Indian Mackerel</b>	1,048,000	1,496,544	2,202,058	2,748,168	3,606,970
<b>Pomfret</b>	3,727,500	5,322,870	7,832,223	9,774,614	12,829,181
<b>Shrimps</b>	2,500,000	3,570,000	5,253,000	6,555,744	8,604,414
<b>Storage (Rs.) @ Rs.2/kg</b>	547,300	781,544	1,149,987	1,435,183	1,883,678
<b>Transportation (Rs.) @ Rs.2/kg</b>	547,300	781,544	1,149,987	1,435,183	1,883,678
<b>Marketing Cost (Rs.)</b>	1,000,000	1,150,000	1,322,500	1,520,875	1,749,006
<b>Operational Cost (Rs.)</b>	4,000,000	4,400,000	4,840,000	5,324,000	5,856,400
<b>Startup Cost</b>	5,000,000	-	-	-	-

*Developed by consultant*

### 13.4.3 Revenue

Table 13.4 gives detail of revenue, profit and profit shared with community. As with other businesses, the cooperative will break-even in three years and then start making profits.

**Table: 13.4**  
**REVENUE FORECAST**

	2007	2008	2009	2010	2011
<b>TOTAL REVENUE (Rs.)</b>	<b>10,101,250</b>	<b>15,121,163</b>	<b>23,596,686</b>	<b>31,342,094</b>	<b>44,351,280</b>
<b>Sardineela</b>	1,003,000	1,575,512	2,529,004	3,419,214	4,832,927
<b>Indian Mackerel</b>	1,572,000	2,431,884	3,853,601	5,496,336	9,017,426
<b>Pomfret</b>	4,526,250	6,615,567	10,070,001	12,986,273	17,594,306
<b>Shrimps</b>	3,000,000	4,498,200	7,144,080	9,440,271	12,906,621
<b>Profit (Revenue-Costs)</b>	<b>(8,970,950)</b>	<b>(3,383,938)</b>	<b>(1,628,321)</b>	<b>707,211</b>	<b>5,521,488</b>
<b>Profit sharing @ 80%</b>	-	-	-	353,605	2,760,744
<b>Net profit</b>	-	-	-	353,605	2,760,744

*Developed by Consultant*

### 13.4.4 Profit Sharing

The Cooperative will disburse 80% of the profits earned by it among the local stakeholders according to the share of their fish contribution. This profit may not be given immediately, but can be invested by the Cooperative on behalf of the fisher-folk to provide them with support finances at crunch times. It will however keep 20% for itself for business development, research and other initiatives. The savings can be invested in setting up some storage facilities or processing plant in Sonmiani which would earn better dividends for fisher-folk.

The Cooperative will gradually become self sustainable in three to four years, with ability to reinvest capital in research, marketing initiatives will further strengthen its position. The profits estimated can be increased by marketing branded or value-added products and streamlining production and reducing wastage.

### ***13.5 Benefits to fisher-folk***

Local stake holders will reap following benefits from the Cooperative:

1. Increasing technical, managerial, infrastructure and financial support
2. Increase in local market prices
3. Increase in profits earned directly and indirectly
4. Improved livelihood

## Annexure - I

### *A. Fishing: Global Trends*

According to FAO Fisheries Department "Review of the State of World Fishery Resources: Marine Fisheries"

"Total marine capture fishery catches in the Western Indian Ocean increased from a 1950's catch of ~0.5 million tonnes to nearly 3.8 million tonnes in 1992, since when they have declined slightly.....these resources include Indian mackerel and various clupeoids and pelagic percomorphs. The recent decline in pelagic percomorphs is largely due to declines in the Persian Gulf and Gulf of Oman, where the species form the basis of the most important commercial fishery in the area. Catches of the large pelagics have also increased relatively steadily since the 1950s, with large increases in skipjack and yellowfin being reported since the early 1980s. While total catches of the crustaceans (Shrimps, prawns, etc.) appear to have been relatively constant since the early 1970s, catches of valuable penaeid shrimps have increased sharply since the mid 1980s. Catches of various of these species are of tremendous local importance in certain parts of the region."

The Arabian Sea has "...enormous number of small fishing vessels in this area makes monitoring of stock status and implementation of fisheries management measures difficult. Almost any form and size of fish that can be caught is saleable. Given the scarcity of alternative employment, fishing intensity will remain high, increasing whenever the catch rates and economic conditions will allow it to do so. Small-scale shrimp fisheries are important in both Pakistan and along the west coast of India. Gear restrictions are few and the size and range of fishing effort creates major difficulties for management."

"There are tropical areas (such as the Western Indian Ocean) where significant increases in production of tunas and mesopelagic fish may be realizable given strong upwelling, but for most other tropical areas, other than those with locally high production areas associated with coral reefs and estuaries, further increases in production are constrained by nutrient supply. Such nutrient supply is generally poor in stratified tropical waters, and fishery productivity usually drops off rapidly with depth. Here, despite a relatively short history of intensive fishing, there appears to be limited future potential for further increases in production per shelf area, and if there such a potential, this seems likely to come from further exploitation of small pelagic resources and tunas."

"The process of development of a fishery as described by changes in landings with time. This process comprises of four phases: (I) undeveloped, (II) developing, (III) mature, and (IV) senescent. The results shown for 1994 indicate that about 35% of the 200 major fishery resources are senescent (i.e. showing declining yields), about 25% are mature (i.e. plateauing at a high exploitation level), 40% are still "developing", and 0% remain at low exploitation (undeveloped) level. This indicates that around 60% of the major world fish resources are either mature or senescent and, given that few countries have established effective control of fishing capacity, these resources are in urgent need of management action to halt the increase in fishing capacity or to rehabilitate damaged resources. A strikingly similar conclusion was reached by FAO<sup>s</sup>, which concluded that 44% of the stocks for which formal assessments were available were intensively to fully exploited, 16% were over fished, 6% depleted, and

3% slowly recovering, concluding therefore that 69% of the known stocks were in need of urgent management. That same study, using a global production model, with estimates of the world capacity, concluded that the demersal high-value species were over fished and that a reduction of at least 30% of fishing effort was required to rebuild the resources.”

“In a review of the state of world fisheries undertaken in 1994, showed that the annual relative rate of increase of world reported landings had significantly decreased since 1950 and was approaching zero, indicating that the maximum production from the world's conventional marine resources under current exploitation regimes was being approached and that the mean catches of the last few years were probably very close to that maximum

According to “Marine Resources” by Friends of the Earth and Halifax Initiative:

“The world’s fisheries are in a crisis. Seventy-five percent of major marine fish stocks are either fully exploited, overexploited, or depleted. Only two oceanic regions, the Eastern Indian Ocean and the Western Central Pacific, still have potential for “development”, with all the others being exploited close to their maximum capacity. Biodiversity is threatened. Some species of fish have virtually disappeared. Stocks of predatory fish higher on the food chain have declined, with smaller fish lower on the chain being harvested to make up the biomass, a phenomenon Pauly refers to as “fishing down the food web.” Fragile marine habitats, such as mangroves and coral reefs are being rapidly destroyed.

Since 1998, growth in employment in the capture fishery seems to have stagnated. Fish is an important source of revenue for developing countries. Thirty-three percent of world fish production (live weight equivalent) was exported in 1998. In value terms developing countries as a whole constitute nearly 50% of fish export. Meanwhile, 77% of all fish (by value) is imported by Japan, the USA and the EU. Fish also represents a major source of protein for developing countries, especially for those with large coastal populations. For example, fish contributes over 50% of total proteins in Bangladesh and North Korea, among others. In industrialized countries, on the other hand, its percentage contribution to animal protein intake is around 7-8%. However, in 1997, the per capita provision of fish in industrialized countries was 27.7 kg, whereas in the Low Income Food Deficit Countries excluding China, it was 7.8 kg.

Developed country’s demand and developing country’s need for foreign exchange is a major cause of over fishing, but there are others: overcapacity; over-efficient and destructive technologies; population pressure; land and sea based pollution and destruction of habitats; the complexity of management given biological, environmental and social factors, undefined access regimes, overlapping jurisdictions, and a large and diverse number of actors; and poor regulation and enforcement. Sustainable management of the fisheries must address these, as well as balance the competing uses of the fisheries: food security; livelihood for fishing communities, and revenues for developing countries.”

According to “Outlook for fish to 2020: Meeting Global Demand” by International Food Policy Research Institute and World Fish Center:

“In the past 30 years the global appetite for fish has doubled. From 45 million metric tons in 1973, total fish consumption jumped to more than 91 million tons in 1997. This enormous growth signals changes in who is consuming fish and where. Consumption of fish in the

developed countries stagnated between 1985 and 1997, mainly because populations remained stable and people there were already eating large quantities of fish. But at the same time, rapid population growth in the developing world, along with increases in the average amount of fish consumed per person in those countries, led to soaring increases in global fish consumption. Since the early 1970s production, consumption, and long-distance trade of fish have risen dramatically, almost entirely because of changes taking place in developing countries. The primary driver of most of these changes has been the increased consumption of fish in developing countries. As population in these countries has grown and consumers have become richer, the resulting increased demand for fish has altered markets for seafood around the world.

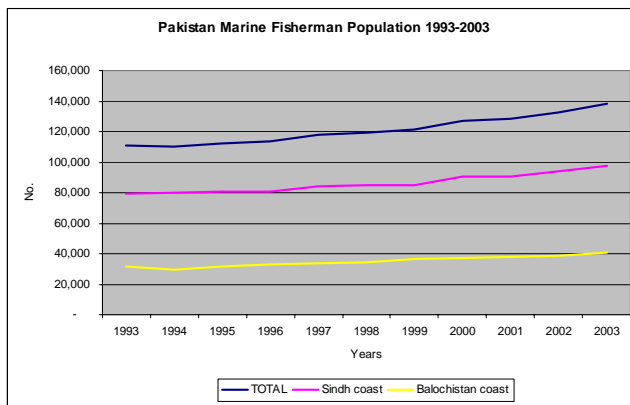
Evidence suggests that the large increases in supply of fish in recent decades have resulted from large increases in demand for fish as food in developing countries. Global consumption of fish has doubled since 1973, and the developing world has been responsible for 90 percent of this growth. Whereas the growth of fish as food in the richer countries has tapered off, in the poorer countries it has grown rapidly. Developing countries now account for more than 70 percent of the total production of fish for food, by 1997 the developing countries were producing twice as much as the developed countries. Fish products are a heavily traded commodity, and the direction of trade is changing. Roughly 40 percent of global fish output by value in 1998 was traded across international borders (about 33 percent by weight), compared with less than 10 percent of global meat output. The high share of trade in fish is astounding for such a highly perishable commodity group. It reflects major changes in human diets around the world, changing supply infrastructure in both the North and the South, and the ongoing globalization of high-value food chains.

The prices of many animal-origin foods have declined steeply over the past several decades because of increased production and stagnating demand in the traditional markets of the North. In sharp contrast, consumers have experienced a long-term increase in the real prices of fresh and frozen fish since World War II.”

**B. Pakistan: Marine Fisheries Overview**

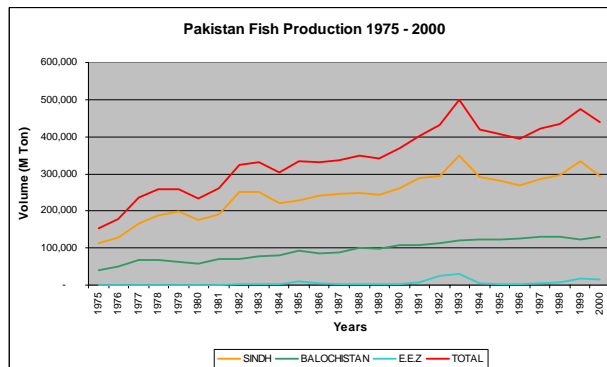
Pakistan has a coastline of 1,050 km and a total fishing area of approximately 300,270 sq km. Pakistan’s fishing grounds are termed as highly rich in marine life with a vast variety of species having commercial value. The fisheries sector contributes around 1% to the GDP of Pakistan.

Recent FAO data reported that Pakistan’s total fish production for 2003 was 576,804 metric tonnes where 564,743 metric tonnes came from capture fisheries and only 12,061 metric tonnes were produced from aquaculture. Total value of exports for the period 2003-2004 was registered at US\$ 156 millions. Principal export markets are USA, Japan, Sri Lanka, Singapore, the EU and the Gulf States.



Source: Marine Fisheries Department - 2003, Govt. of Pakistan

More than 294,673 fisher-folk, out of which 138,072 (47%) marine fisher-folk, find employment in the sector, while the secondary sector (fishery products processing, input provision and marketing) provides employment and income to more than 110,000 households (FAO data 2003). Capture fisheries and aquaculture together provide employment for around 1% of the total labour force available in the country.



Source: Marine Fisheries Department - 2003, Govt. of Pakistan

Regarding fish consumption, for Pakistan, there was very little increase in per capita fish consumption (i.e. the estimate of the total supply available for human consumption divided by the population total) from 1.0 kg in 1961 to 2.3 kg in 2001, while the world average over the same period increased from 9.0 kg to 16.3 kg (FAO, 2004).

Since 1998, overall fish production has decreased by nearly 2 percent per year. Despite its endowment in natural resources, Pakistan ranks 28<sup>th</sup> among fishing nations in terms of production, and 50<sup>th</sup> in terms of export earnings.

In addition to the supply of sub-optimal quality fish products on domestic markets, consumers' awareness needs to be raised about the benefits linked to increased fish consumption.

<b>Landings 2005</b>								
Species	Sindh	% Contr	Balochistan	% Contr	EEZ	% Contr	TOTAL	% Contr
<b>SMALL PELAGICS</b>	<b>50,860</b>	<b>23%</b>	<b>37,292</b>	<b>33%</b>	-	<b>0%</b>	<b>88,152</b>	<b>26%</b>
Shads	189	0%	-	0%	-	0%	189	0%
Sardineella	15,796	7%	15,736	14%	-	0%	31,532	9%
Misc Clupeoids	13,274	6%	3,108	3%	-	0%	16,382	5%
Thyssas	7,155	3%	-	0%	-	0%	7,155	2%
Scads	1,021	0%	3,744	3%	-	0%	4,765	1%
Indian Mackerel	13,425	6%	14,704	13%	-	0%	28,129	8%
<b>DEMERSALS</b>	<b>119,397</b>	<b>54%</b>	<b>53,886</b>	<b>48%</b>	<b>1,444</b>	<b>26%</b>	<b>174,727</b>	<b>51%</b>
Sharks	9,199	4%	3,009	3%	42	1%	12,250	4%
Guitar Fish	398	0%	299	0%	-	0%	697	0%
Rays	7,844	4%	2,086	2%	-	0%	9,930	3%
Wolf Herrings	492	0%	787	1%	-	0%	1,279	0%
Bombay Duck	51	0%	-	0%	-	0%	51	0%
Cat Fish	17,265	8%	9,063	8%	13	0%	26,341	8%
Eels	2,941	1%	1,289	1%	41	1%	4,271	1%
Threadfin Breams	7,574	3%	-	0%	18	0%	7,592	2%
Barracudas	892	0%	2,568	2%	4	0%	3,464	1%
Mullets	8,854	4%	412	0%	-	0%	9,266	3%
Groupers	7,103	3%	5,499	5%	7	0%	12,609	4%
Croakers	10,983	5%	4,817	4%	58	1%	15,858	5%
Silver Whittings	421	0%	-	0%	-	0%	421	0%
Cobia	345	0%	1,523	1%	-	0%	1,868	1%
Queen Fish	7,548	3%	2,313	2%	13	0%	9,874	3%
Travellies	1,524	1%	1,798	2%	-	0%	3,322	1%
Snappers	2,168	1%	-	0%	1	0%	2,169	1%
Grunts	2,947	1%	1,648	1%	8	0%	4,603	1%
Emperors	421	0%	1,428	1%	-	0%	1,849	1%
Threadfin	109	0%	431	0%	-	0%	540	0%
Misc Sea Breams	791	0%	-	0%	-	0%	791	0%
King Soldier Breams	841	0%	483	0%	-	0%	1,324	0%
Ribbon Fish	9,787	4%	12,272	11%	1,104	20%	23,163	7%
White Pomfret	2,104	1%	1,824	2%	-	0%	3,928	1%
Soles	570	0%	337	0%	-	0%	907	0%
Black Pomfret	1,675	1%	-	0%	-	0%	1,675	0%
Others	14,550	7%	-	0%	135	2%	14,685	4%
<b>LARGE PELAGICS</b>	<b>22,567</b>	<b>10%</b>	<b>20,533</b>	<b>18%</b>	<b>3,719</b>	<b>68%</b>	<b>46,819</b>	<b>14%</b>
Dolphin Fish	711	0%	1,994	2%	-	0%	2,705	1%
Spanish Mackerals	3,421	2%	3,800	3%	4	0%	7,225	2%
Tunas	17,411	8%	12,656	11%	3,306	60%	33,373	10%
Saifish	1,024	0%	2,083	2%	409	7%	3,516	1%
<b>SHELL FISH</b>	<b>28,885</b>	<b>13%</b>	<b>931</b>	<b>1%</b>	<b>314</b>	<b>6%</b>	<b>30,130</b>	<b>9%</b>
White Shrimps	3,142	1%	245	0%	-	0%	3,387	1%
Pink/ Brown Shrimps	5,124	2%	-	0%	-	0%	5,124	2%
Kiddy Shrimps	10,111	5%	301	0%	-	0%	10,412	3%
Lobsters	422	0%	154	0%	-	0%	576	0%
Crabs	4,355	2%	65	0%	19	0%	4,439	1%
Ivory Shells	310	0%	67	0%	-	0%	377	0%
Cephalopods	5,421	2%	99	0%	295	5%	5,815	2%
<b>TOTAL</b>	<b>221,709</b>		<b>112,642</b>		<b>5,477</b>		<b>339,828</b>	
<b>% Contr</b>	<b>65%</b>		<b>33%</b>		<b>2%</b>			

Source: Marine Fisheries Department - 2005, Govt. of Pakistan

### ***C. Pakistan Policies***

Frequent policy changes are a direct outcome of dual jurisdiction. Constitutionally, jurisdiction over the sea is shared both by the federal and provincial governments. The 12-NM territorial zone bordering the coast falls under provincial jurisdiction. The 12 to 200-NM Exclusive Economic Zone (EEZ), where trawlers and local launches are free to operate, falls within the federal government's remit. In addition, federal control has traditionally extended into territorial waters in the shape of agencies in charge of maritime security, shipping and ports. In recent years, this control has become more pervasive via the Maritime Pollution Board and the Karachi Fishermen Cooperative Society.

The **Marine Fisheries Department (MFD)** of the federal government performs the following functions:

- Conservation of fisheries resources;
- Management and development of resources along scientific lines;
- Training of fisheries and fish farmers and in-service training;
- Extension services of the private sector;
- Revenue earning through auctioning/licensing of water resources; and
- Supplies of quality fish-seed to private fish farmers on subsidized rates.

#### **Provincial laws**

The provincial and federal laws and regulations governing the fishery sector are:

- The Sindh Fisheries Ordinance, 1980, includes rules and regulations for marketing, handling, transportation, processing and storage of fish and shrimp for commercial purpose and sale of fish used for domestic and inter-provincial trade
- Sindh Fisheries Rules 1983, 1995.
- Karachi Fisheries Harbour Authority Ordinance, 1984.
- Coastal Development Authority Act of Sindh, 1994.
- The Balochistan Sea Fisheries Act No. IX 1971. Fishing vessels operating in Balochistan's territorial waters are registered under this act. Furthermore, fishing licenses and processing of fish and fishery products in territorial water of Pakistan along the coast of Balochistan are issued under this act.
- Balochistan Sea Fisheries Ordinance Amendment, 1994.
- Balochistan Sea Fisheries Rules, 1971.

#### **Federal laws**

- Exclusive Fishery Zone Act, 1975.
- Exclusive Fishery Zone Rules, 1990.
- Territorial Waters and Maritime Zones Act, 1976.
- Pakistan Environmental Protection Ordinance, 1983.
- Pakistan Environmental Protection Act, 1997.

In addition, there is the following fisheries-related legislation:

- The Agricultural Produce (Grading and Marketing) Act, 1937. Dry fish, shell fish and fish meal are graded according to this act.
- The Pakistan Animal Quarantine (Import and Export for Animal and Animal Products)
- Ordinance 1979: The “health certificates” are issued to regulate trade and to check the introduction of or spread of diseases.
- The Karachi Fisheries Harbour Authority Ordinance 1984: Covers smooth functioning of harbour operations and provides laws to periodically inspect hygienic conditions prevalent at the harbour and in various processing and ice plants, and cold storages located at the harbour.
- The Coastal Development Authority Act Sindh Act No. XXVIII 1994: Covers development operations, management and maintenance of coastal areas including development of fisheries, livestock, horticulture and agriculture.
- Pakistan Fish Inspection and Quality Control Act, 1997: Deals with the registration and
- Inspection of fish processing plants.

***D. Pakistan Fishing Infrastructure***

Out of total 682 miles of coastline, Balochistan has 477 miles (70%) and Sindh has 205 miles (30%). Below is the detail of landing points and harbours:

Sindh Province	Balochistan Province
1. Karachi	1. Gawadar
2. Korangi	2. Pasni
3. Ibrahim Haidery	3. Ormara
4. Shams Peer	4. Gaddani
5. Lath Basti	5. Bhunda
6. Hawks Bay	6. Beroo
7. Manjhar	7. Sonmiani
8. Sonari	
9. Mubarak Village	
10. Kaitee Bandar	
11. Shah Bandar	
12. Kharo Chaan	
13. Jathi	
14. Jhungi	
15. Badeen	

Over all process flow from harvesting to processing needs much to be desired. Principal craft used by fishermen is wooden trawlers/gill netters, most are old and have outlived their utility. Facilities of on-board chilling system are missing. The lack of education and training is also an impediment. Not fully trained and aware of latest technology and fishing techniques, the cycle of fish catch is haphazard and causes no or low catch resulting in regular losses to fishermen. It is estimated that 50% of voyage time is lost just in finding the

fish. To preserve the fish, it is put in ice in the fish holds, which are not insulated. Two third of the piled up fish in fish holds is crushed, de-shaped or damaged catch, resulting in poor returns to fishermen. The handling of fish at landing points further damages the catch, while lack of proper storage facilities, washing and handling further deteriorates fish catch. Transportation of catch from other landing points to processors or Karachi fish harbour market also is not properly done and needs much to be desired.

## Fish Processing

Fish processing sector is better managed in Pakistan, but still lags behind international technological advancements which have resulted in change in demand patterns and loss of market share. Fish being a perishable item needs to be preserved in time. Fish processing has three main areas namely;

- Value addition process
- Freezing
- Packaging

<b>PROCESSING PLANTS AND THEIR CAPACITIES</b>											
<b>(1996-2003)</b>											
TYPE OF PLANTS	NUMBER OF PLANTS IN OPERATION										
	Plants installed	Installed capacity per day		1996	1997	1998	1999	2000	2001	2002	2003
Freezing	21	273.75	N	17	17	17	18	18	18	18	18
			I	233.25	233.25	233.25	273.25	273.25	273.25	273.25	273.25
Canning	11	106.29	N	1	1	1	1	1	1	1	1
			I	13	13	13	13	13	13	13	13
Fishmeal	11	163.00	N	8	8	8	8	8	8	8	8
			I	107	107	107	107	107	107	107	107
Oil-Extraction	1	5.00	N	-	-	-	-	-	-	-	-
			I	-	-	-	-	-	-	-	-
Dehydration	1	5.00	N	-	-	-	-	-	-	-	-
			I	-	-	-	-	-	-	-	-
N= number of Plants											
I= installed capacities per day											
Capacity in Metric tons.											
<b>PROCESSING PLANTS AND THEIR CAPACITIES</b>											
<b>(1996-2003)</b>											
		1996	1997	1998	1999	2000	2001	2002	2003		
Freezing	Q	45,746	53,904	46,040	57,167	52,189	52,239	52,239	52,239	52,239	
	V	4,338,003	6,183,517	4,817,979	5,711,010	6,428,302	6,183,517	6,353,334	6,353,334	6,353,334	
Canning	Q	86	7	8	9	5	4	5	5		
	V	7,615	797	860	960	601	503	523	523		
Fishmeal	Q	897	1,507	1,568	2,306	3,983	5,059	6,466	6,466		
	V	6,540	18,179	22,535	32,292	50,057	83,862	110,626	110,626		
Total	Q	46,729	55,418	47,616	59,482	56,177	57,302	58,710	58,710		
	V	4,352,158	6,202,493	4,841,374	5,744,262	6,478,960	6,267,882	6,464,483	6,464,483		
Q= Quantity in Metric tons											
V= Value in '000' Rs.											

CAPACITY UTILIZATION: FISH PROCESSING PLANTS									
(1996-2003)									
		1996	1997	1998	1999	2000	2001	2002	2003
Freezing	I	233.25	233.25	233.25	273.25	273.25	273.25	273.25	273.25
	V	26.73	26.73	26.73	26.90	26.90	26.90	26.90	26.90
	%	11.46	11.46	11.46	11.52	11.52	11.52	11.52	11.52
Canning	I	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00
	V	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
	%	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92
Fishmeal	I	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00
	V	11.96	11.96	11.96	11.96	11.96	11.96	11.96	11.96
	%	11.17	11.17	11.17	11.17	11.17	11.17	11.17	11.17
I= Installed capacities operation Plants per day									
V= Operational capacity per day in Metric tons									
% = percentage of capacity utilized									

Source: Marine Fisheries Department - 2003, Govt. of Pakistan

## E. Fishing Fleet & Fishing gear

### Vessels

More than 22,000 registered fishing vessels of various sizes, ranging from small to medium-sized boats, large launches and trawlers, engage in fishing. Almost one-third are shrimp trawlers; the bulk of these are owned by investors outside the community. Boat and shore fishing is done in creeks and within the 12-mile territorial limit which falls under provincial jurisdiction. The larger launches go further off shore into deeper waters on extended fishing excursions. The following types of vessels are currently operating in fisheries sector:

#### 1. Trawlers

With sized from 2- to 45 feet keel length and crew ranging from 12-20 men, they weigh around 0.6 tons and are fitted with 66-240 HP engines. They remain in operation from August to May. These need to be registered with Marine Mercantile Department (MMD).

#### 2. Gill-netters

Size varies from 45-60 feet keel strength and crew ranges from 15-34 men, it weighs 0.6 to 2.5 tons. These need to be registered with Marine Mercantile Department (MMD).

#### 3. Long Liners

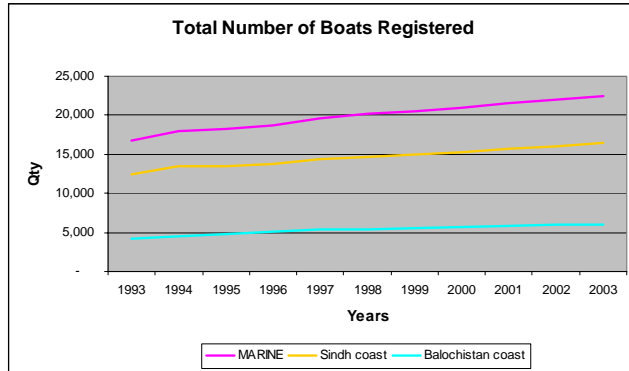
These are mainly deep sea fishing vessels, similar to trawlers but are equipped with winches for pulling the net. Their capacity is large and they have powerful engines. These need to be registered with Marine Mercantile Department (MMD).

#### 4. Horas

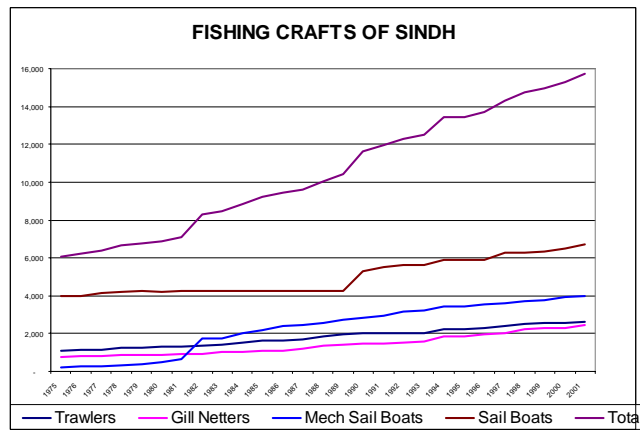
These are same as gill netters with average length between 30 to 40 ft. They are used for fishing voyages of one to three days. They have removable fish holds. Many vessels operating outside Karachi are not registered.

#### 5. Dhoonda or Horis

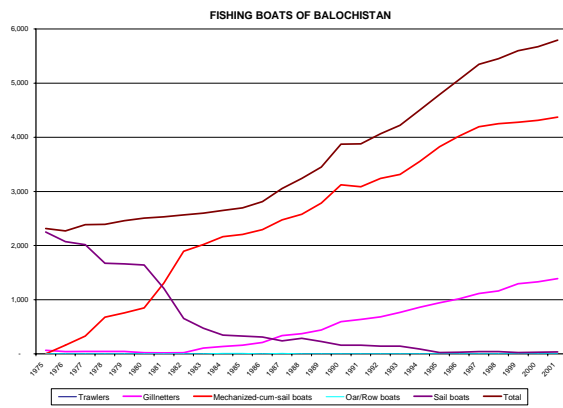
These are small lifeboats converted into fishing gill netters. They use small nets and kundi. Sizes are below 30 feet and voyage ranges between one to three days.



Source: Marine Fisheries Department - 2003, Govt. of Pakistan



Source: Marine Fisheries Department - 2003, Govt. of Pakistan



Source: Marine Fisheries Department - 2003, Govt. of Pakistan

### **Fishing Gears**

The fishing gears vary according to type of fish to be caught. The type of fish caught is dependent on the mesh size. The following types of fishing methods or gears are used

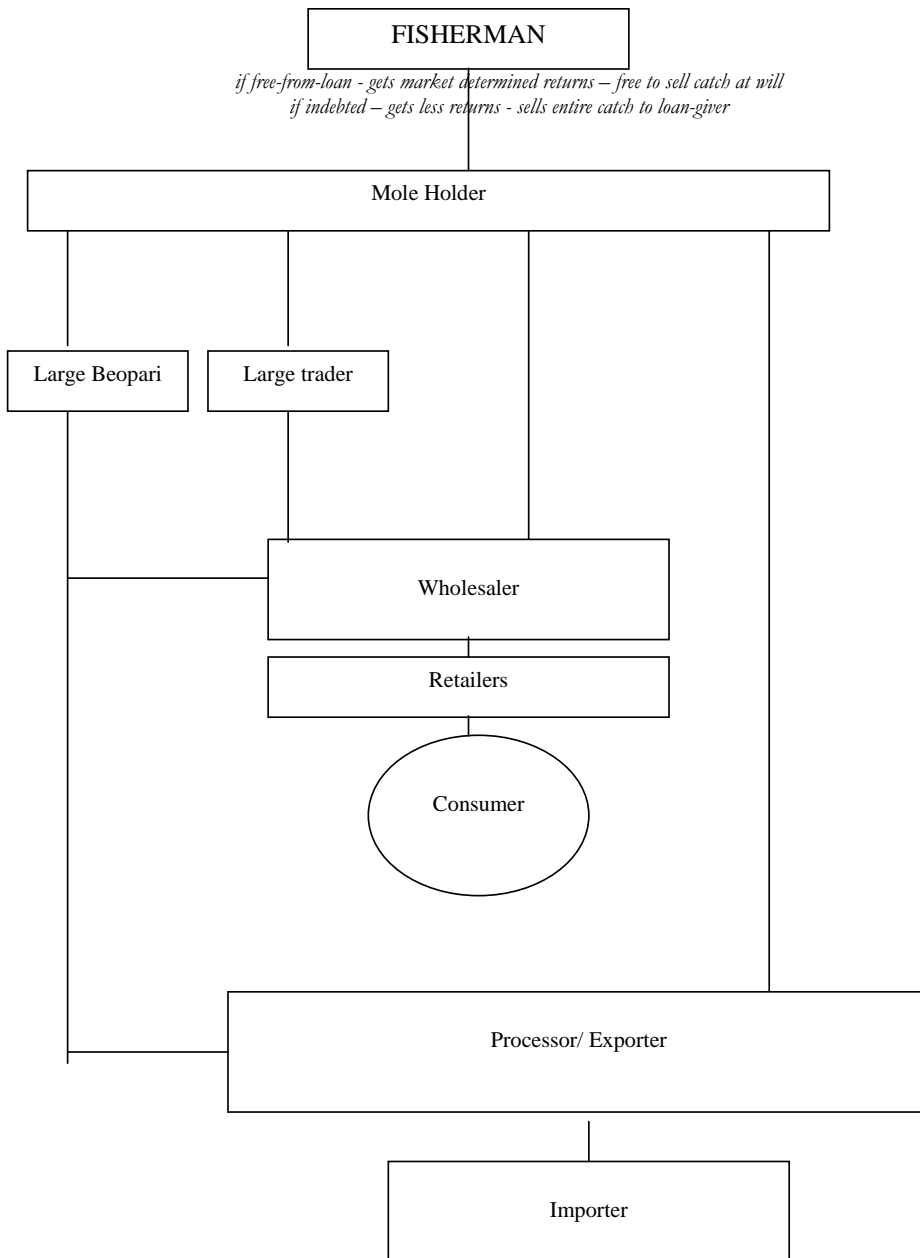
1. Gill nets
2. Trawl Nets
3. Beach Seines
4. Cast Nets
5. Hard Lines
6. Long Lines

### ***F. Fish Marketing System (In case of Karachi Harbor)***

The marketing channel of fish is more or less similar to those of agriculture products, and within the region as well. The supply chain of fish is channelled from boat owner/ fish catcher to commission agents to wholesaler to retailer and finally to the consumer in the local market or exported.

The boat owner/fish catcher catches the fish and brings it to the landing point. The operational cost (diesel, ration, ice, salt etc.) is deducted from the income generated. The rest of the income is distributed on profit-sharing basis between the boat owner, na-khuda (captain) and other labourers. The fish is brought to the auction-hall where the mole holder (commission agent) authorized by Fisherman Cooperative Society (FCS) facilitates the auction to wholesales, retailers, processors or exporters. The fisherman pays 6.25% of commission to the mole holder; this commission is divided equally between the mole and FCS. The purchaser, if processor/exporter brings it to the factory, processes it, packages and exports the catch. If local wholesaler, further sells to wholesalers or retailers across the country, ending up with consumers in local market.

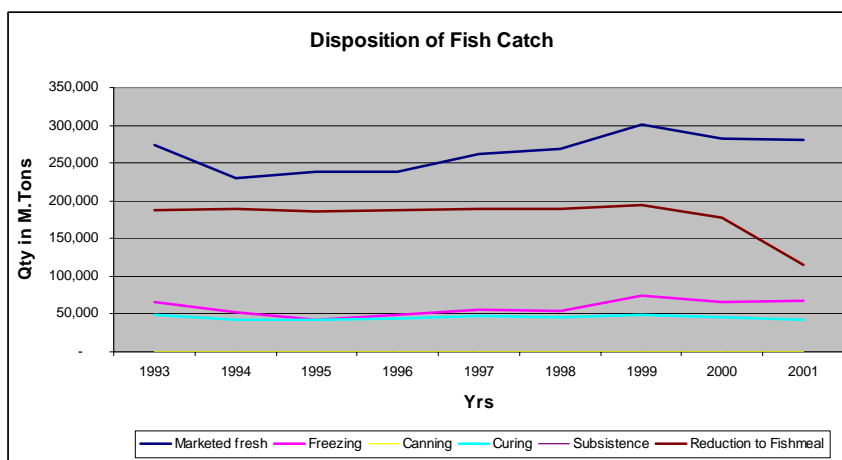
*G. Fish Supply Chain*



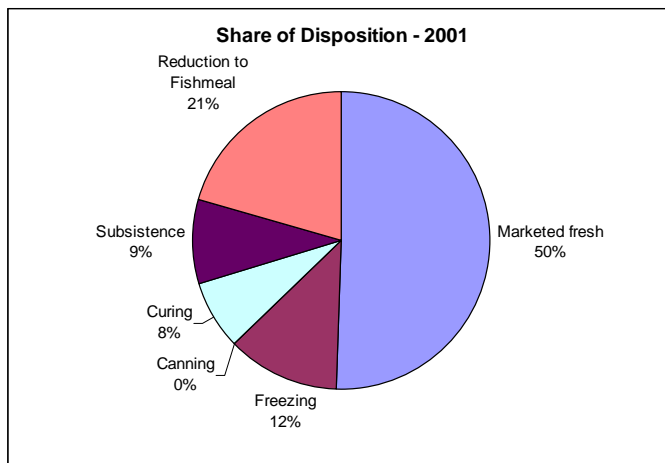
### H. Uses of Fish Catch (Disposition)

The marine catch is utilized through of disposition including marketed as fresh, freezing, canning, curing and reduction to fish meal, other purposes and for subsistence use.

Out of total marine fish production the percentage for human consumption ranged between 69.68% to 70.18 during the year 1993 to 1999. Rest of the catch was utilized for other purposes especially reduction to fish meal.



Source: Marine Fisheries Department - 2003, Govt. of Pakistan



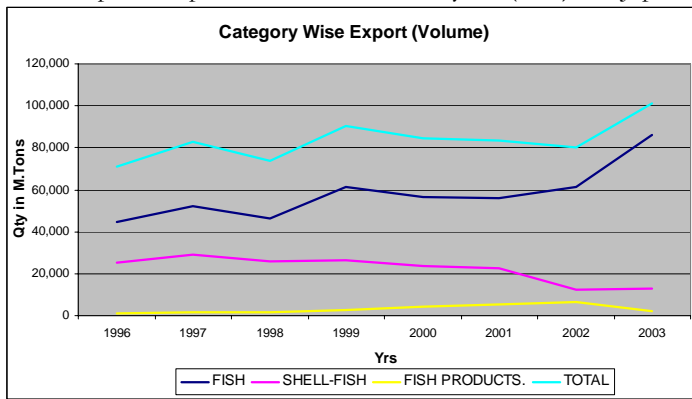
Source: Marine Fisheries Department - 2001, Govt. of Pakistan

### I. Fish Export

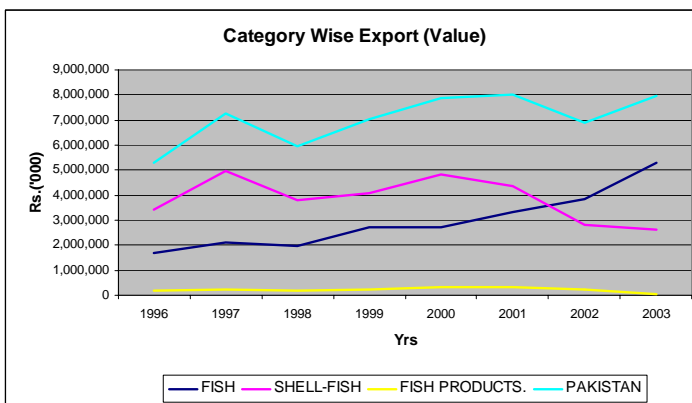
With low domestic fish consumption, many fish species are exported to Europe, the USA, the Far East and the Middle East. Pakistan exports fish with little value addition. The bulk of the exports comprise a few fish species, mainly shrimp that constitute approximately 66 per cent of total fish exports. The other species exported are Indian mackerel, ribbon-fish, tuna, sole and crab. Over-fishing, including during the breeding season (June–August), has led to a steep decline in shrimp catches. Sardines are caught as trash fish and converted into chicken feed.

Pakistan’s contribution of export to total fish production lies at 14% and with marine fish production lies at 19%. Value wise, Pakistan exports stand in 2003-04 was at US\$ 156 Million. Within the exported marine species, shrimps account for nearly 20% of volume and 47% of value catch (signalling they get the best prices) while fish contributes to 78% of volume and 50% of value. Overall approximately 55% of shrimp production is exported while 13% of overall fish production is exported.

Almost 60% of shrimps are exported to EU, followed by US (15%) and Japan (10%).



Source: Marine Fisheries Department - 2003, Govt. of Pakistan



Source: Marine Fisheries Department - 2003, Govt. of Pakistan

## ***J. Key Issues***

### **Depletion of Fish Resources**

The fisher-folk communities report major decreases in the fish catch. They claim that a number of fish species, which were in abundance in the past have now become completely extinct. In fact there are two major indications of decrease in the catch of coastal fisheries in Pakistan. These indications are:

- Considerable Reduction in the Catch of Some Fish Species
- Little Growth in Overall Catch despite Increase in the Fishing Fleet

### **Increasing Population of fisher-folk households**

Increasing population adds extra pressure on the resources. Fisherman household populations have increased, which leads to more boats, exploitative fishing methods and unsustainable fishing leading to low fish catch.

### **Population Shift from Agriculture & Other Sectors**

Many households have turned to fishing as source of income, which previously were dependent on for example agriculture or other professions. Fishing provides good opportunity to earn during the fishing season. Medium to large-scale labour migration is noticed in the fishing months starting from September up to April. These temporary fishermen come from all over Pakistan to earn livelihood in the coastal areas where they are employed as labour. They are welcomed by the locals as they need manual labourers in order to run their fishing operations.

### **Over Fishing**

Fishermen are continuously using exploitative fishing methods and unsustainable approach leading to over fishing of coastal waters. In some cases even small fish are caught disturbing the food chain and hence leading to even lower catch volumes.

### **Deep Sea Trawlers**

Under deep seas fishing policy of 1995, 29 long liners and deep sea fishing trawlers were issued licenses to fish with the 200 nautical mile area close to Pakistan coast. These deep-sea trawlers have also been engaged in over-fishing. Being fully mechanized and computerized, these deep-sea trawlers continue fishing unabated, catching marketable fish and throwing the rest in the sea further polluting the environment.

### **Harmful Nets**

As the lust of maximization of benefits from the fisheries resources increased, variety of new nets was introduced to ensure catch of more and more quantity of fish. The newly introduced nets have started causing mass destruction of marine life through over-fishing. Made from nylon, these nets harm the catch quality and the reduced mesh size ensures that even young and small fish are caught in it. There are different types like 'bullo-gujjo' kato (wire net) etc. They have compounded to the woes of fishery.

### **Pollution of coastal waters**

The growing pollution of the seawater has also endangered the fish species. Urban and industrial waste is causing great environmental and economical harm to fishing industry and specifically to the fisher-folk communities.

**Poor Management of fishery resources**

The management of the fisheries sector by the government is marred with problems. These problems can be categorized as under:

- No Integrated Coastal / Fisheries Management System
- Lack of Proper Implementation on the Laws and Rules
- Poor Coordination Between Various Departments

Despite the fact that the coastal region is main source of livelihoods for a large population and it is also manned with variety of natural resource, the government lacks a comprehensive and integrated coastal management plan.

## Annexure - II

### *Study Terms of Reference (TORs)*

The specific terms of reference of the study are as follows. The study should:

1. Be specific to Sonmiani area.
2. Give a comprehensive 'economic analysis of indebtedness' of various fisher-folk groups (e.g. fish labourers, small boat owners, large boat owners, multiple boat owners etc.) at Sonmiani.
3. Collect 'baseline information on level of indebtedness of various fisher-folk groups' including period of indebtedness.
4. Estimate 'average catch volumes' for different sizes of boats per trip and per month.
5. 'Compare catch prices' received by individuals at different levels along the entire marketing chain.
6. Analyze the entire marketing chain to 'assess the financial costs, benefits and profit margins for various groups' involved in the entire supply chain (e.g. fish labourers, small boat owners, large boat owners, multiple boat owners, middlemen, trading companies, etc.).
7. Discuss the mechanism of repayment of loan taken by middlemen, mark-up rates and assess savings of fisher-folk to determine their repayment capabilities.
8. Compare the 'situation of local fisher-folk without any loan', their marketing channel, profit margins and savings.
9. Assess the 'role and situation of 'outsiders' such as, Bengali fisher-folk and others, marketing chain followed by them and their profit margins.
10. Analyze the role of middlemen in terms of 'extortionist or reasonable' in extending loans to the fisher-folks, including analysis of risks, profit margins and transaction costs.
11. Assess possible 'options or intervention which fisher-folk themselves see as profitable' to them such as, competitive financing MFIs, or by private entrepreneurs in the area.
12. Discuss proposals with local communities to determine local level acceptance of proposed interventions and possible contribution of local communities in implementing them.
13. Also, through literature search suggest possible 'options or interventions, based on similar experiences from elsewhere' which could be pilot tested in the area and would yield reasonable profit margins to the fishermen while limiting the extortionist role of middlemen.
14. Based on the analysis of whole situation, 'suggest practical strategies for implementation of few promising interventions' to improve fishing livelihoods for the poorer fishing households and supporting measures required for their implementation.
15. Conduct 'simple business analysis' (cost estimate and business plan) for few promising interventions/strategies for pilot testing
16. Consider possible social and cultural impacts of proposed interventions.
17. Any other relevant information that is useful in analyzing the whole situation.

## Annexure - III

### A. Fisherman Survey Questionnaire:

Fisherman Questionnaire			
<b>GENERAL INFORMATION</b>			
Name: _____	Address: _____	Locality _____	
<b>AREA &amp; HOUSEHOLD</b>			
Amenities in area	<input type="checkbox"/> School	<input type="checkbox"/> Medical	<input type="checkbox"/> Power
	<input type="checkbox"/> Sewerage	<input type="checkbox"/> Water	
Roads	<input type="checkbox"/> Inter district	<input type="checkbox"/> Intra district	
	<input type="checkbox"/> Metalled Road	<input type="checkbox"/> Unmetalled	
Educational Institutions in area	<input type="checkbox"/> Primary (Male)	<input type="checkbox"/> H/School (Male)	<input type="checkbox"/> Traditional (Madrassa maktab)
	<input type="checkbox"/> Primary (Female)	<input type="checkbox"/> H/School (Female)	<input type="checkbox"/> Training/ vocational inst
	<input type="checkbox"/> Middle (Male)	<input type="checkbox"/> Higher Sec (Male)	<input type="checkbox"/> Any Other _____
	<input type="checkbox"/> Middle (Female)	<input type="checkbox"/> Higher Sec (Female)	
No. of Adults in household	Males _____	Females _____	
No. of Children in household	Males _____	Females _____	
	<b>Total Males</b> _____	<b>Total Females</b> _____	<b>Total Household Size</b> _____
Literacy rate in household	Male _____	Female _____	<b>Total Literacy rate</b> _____
<b>SOCIAL &amp; EDUCATIONAL BACKGROUND</b>			
Tribe/Zaat _____			
Education level of respondent	<input type="checkbox"/> Primary	<input type="checkbox"/> Middle	<input type="checkbox"/> Matric
	<input type="checkbox"/> College	<input type="checkbox"/> University	<input type="checkbox"/> Illiterate
	<input type="checkbox"/> Informal	<input type="checkbox"/> Madrassa Maktab	
<b>HISTORIC BACKGROUND</b>			
Father's occupation _____			
Grandfather's occupation _____			
How long have you lived here _____			
Where did you come from before Sonmiani _____			
How was the fish catching, selling done in your father's time _____			
_____			
_____			
_____			
<b>ECONOMIC BACKGROUND</b>			
Household Income sources	<input type="checkbox"/> Labour	<input type="checkbox"/> Fishing	<input type="checkbox"/> Employment
	<input type="checkbox"/> Business/trade	<input type="checkbox"/> Livestock	<input type="checkbox"/> Farming <input type="checkbox"/> Other _____
Avg HH monthly income	Fishing Season (Sep - May) _____		
	Off fishing Season (Jun - Aug) _____		
No. of earning adults in household	Males _____	Females _____	
Are you better of or worse off than five years back		Better Off _____	Worse off _____
Household Income Contribution (%)	Labour _____	Fishing _____	Employment _____
	Business _____	Livestock _____	Farming _____ Other _____
Avg monthly expenditure	Food _____	Clothing _____	Education _____
	Fuelwood _____	Transportation _____	Ceremonies _____
	Medicine _____	Any other _____	
What do you owns in household (#s)	House _____	Car _____	Motorcycle _____
	Nets _____	Boat _____	Land _____
	Horse/ donkey cart _____	Cycle _____	Other _____
<b>COSTS &amp; SAVINGS</b>			
<b>Costs per year</b>			
Boat Repair _____	Net Repair _____	Labour _____	Fuel _____
Ration _____	Ice _____	Other _____	
Average cost per trip _____		Average trips per month _____	
How much you save after monthly expenditure _____			
Where do you keep the saving	<input type="checkbox"/> At home	<input type="checkbox"/> In bank	<input type="checkbox"/> any share, committee
	<input type="checkbox"/> Other _____		
Which banks exists in your locality _____		Have you got account in any of the bank _____	
<b>FISHING</b>			
Role in fishing _____			
Fishing Gear used	<input type="checkbox"/> Thukri	<input type="checkbox"/> Kato Nets	<input type="checkbox"/> Sangal Nets
	<input type="checkbox"/> Katro Net (wire net)	<input type="checkbox"/> Guju Net	<input type="checkbox"/> Bhan Net
	<input type="checkbox"/> Bhoolo Gujo Nets	<input type="checkbox"/> Makhan	<input type="checkbox"/> Other _____
Do you own above fishing gear	YES _____	NO _____	
Boats Used	<input type="checkbox"/> Katti	<input type="checkbox"/> Rachins	<input type="checkbox"/> Hori
	<input type="checkbox"/> Doonda	<input type="checkbox"/> Hora	<input type="checkbox"/> Other _____
No. of Boats Owned _____	Types _____	Sizes _____	Capacity of fish _____
Average time in the sea per day (hrs) _____			
How do you store your catch	<input type="checkbox"/> Deck	<input type="checkbox"/> Basket	<input type="checkbox"/> Ice Box <input type="checkbox"/> Other _____
Do you perform sorting on boat _____			
Who do you sell to?	Company _____	Market _____	Other _____



**B. Middleman Survey Questionnaire:**

<b>Middleman Questionnaire</b>			
<b>GENERAL INFORMATION</b>			
Name:	Company	Address:	
<b>BACKGROUND</b>			
Are you a local or immigrant?		Where are you from?	
How long have you lived here			
Where did you come from			
What has been your family profession		Tribe	
Education level	<input type="checkbox"/> Primary	<input type="checkbox"/> Middle	<input type="checkbox"/> Matric
	<input type="checkbox"/> College	<input type="checkbox"/> Secondary	<input type="checkbox"/> Illiterate
Specific Role as middleman	Company/ agent	Transporter	Auctioneer
	Processor	Shop Keeper	Other
Type of company	Sole proprietorship	Partnership	Other
Who shares the profit/income?			
Is it registered/ licensed?	Yes	No	How many people work in your company?
How many months do you work for?			
How do you finance your company?		Self finance (saving)	Loan
If from loan, where do you take loan from			
What is the interest rate/ repayment mechanism			
<b>ECONOMIC BACKGROUND</b>			
Avg Company monthly income	Fishing Season (Sep - May)		
	Off fishing Season (Jun - Aug)		
Avg company annual income	2005	2004	2003 2002
Do you think you are worse off or better off in the last 5 years			
Avg company monthly expenditure	Employees	Rent	Utilities
	Storage	Transportation	Maintenance
	Labour	License/fees/fines	Any other
Owns (#s)	House	Car	Motorcycle
	Nets	Boat	Land
	Fishing Equipment	Business (type owned)	Other
<b>FISHING</b>			
Type of fish Bought	Avg monthly purchase (kg)	Avg purchase price (Rs / kg)	Avg sale price (Rs.)
	In season		
<b>FISH</b>			
1.			
2.			
3.			
4.			
5.			
6.			
<b>SHRIMP</b>			
1			
2			
3			
<b>CRAB</b>			
1			
2			
3			
<b>TOTAL</b>			
Do you rent or lease boats/ fishing gears or any other items to fishermen			
How many nets you own			
How many boats you own	Type	Size	
How do you store your catch	<input type="checkbox"/> Cold store	<input type="checkbox"/> Ice boxes	<input type="checkbox"/> Other
Where you sell your catch			
Who do you sell you fish to?	<input type="checkbox"/> Beopari	<input type="checkbox"/> Processor	<input type="checkbox"/> Exporter
	<input type="checkbox"/> Company	<input type="checkbox"/> Transporter	<input type="checkbox"/> Other
<b>LOAN TYPE DETAIL MATRIX</b>			
<b>Capital Loan</b>	<b>Operational Loan</b>	<b>Subsistence Loan</b>	<b>Emergency/ Other Loan</b>
e.g. boat, nets, house etc	e.g. diesel, ice, kerosene	e.g. ration, food etc.	Ceremonies, death etc.
Avg Loan Size			
What are the terms of credit			
Is there any repayment time period		If Yes, what is it?	
Do you charge interest ?			
If no, how do you make money			
How do fishermen repay their loan			



### ***C. Stakeholder Interview Sheet***

#### **Background**

Name

Company name: Sole ownership/ partnership

Operating since

Size of company (small, medium, large)

Specialty/ deals in which type of fish

#### **Data (purchase & sale)**

What type of fish you buy, how much you buy, at what rate

How much you sell / qty, at what rate

How much you buy from Somniani area (Sonmiani+Dam+Bhira)

Do you see the catch as increasing or decreasing?

What is your annual turnover?

#### **Supply Chain**

Who do you buy from?

Do you buy fish from fishermen directly, if no why not?

What type of storage facilities you have

Who do you sell your product to?

How much fish is for local consumption and how much for export (%age)

Which local markets is fish supplied to, who supplies

How much is exported, what, where, how, why?

How can Somniani Hor be compared with other areas/ markets

Do you do grading?

#### **Indebtedness**

Do you loan money to moles in Sonmiani

How many moles have you loaned to

How much have you loaned to moles

How many fishermen have the moles loaned to

What are the terms and condition of payment (for loan you give)

Do you/ have you taken loan, if yes from where and how much

What are the terms and condition of payment (for loan you took)

#### **Policy, regulations and implementation**

Are you registered/ licensed

What benefits you get from being registered/licensed

Do you follow any certifications or quality standards, if yes, which ones and why?

Did you see any change in your sale by following standards?

Do you see improvement in fishery sector?

What is government's role, are you satisfied, what they should do

Are you aware of the fishery policies?

Are the implemented well

#### **Suggestions**

What is your opinion of the current system?

What should be done in fisheries to improve fish production, fisherman's plight?

How can we get increased prices?

What further value addition can we perform at various levels?

## **MARINE FISHERY DEPARTMENT & FISHERMAN COOP. SOCIETY**

### **Policy, regulations & implementation**

What is your role (functions, byelaws?)

Fishery rules, procedures and policies

Ownership rights

Are fisherman, moles & companies registered/ licensed

Criteria for fisherman, moles & companies

Any specie that has become extinct or endangered recently

Illegal methods used in fish catch

How do you monitor and implement

Any fine on illegal catch, is it functional

Cases of fines occur during last year

Reducing fish catch in Miani Hor, do you see closed channel an issue

### **Production & Marketing**

Catch per season in Miani Hor, type

Detailed area wise, fish type wise data on production

Avg production of fish, area wise, type wise

Is the catch from Sonmiani increasing or decreasing (annual production trend)

### **Supply Chain**

Any certification exist/ required for fisherman, moles, companies, processors & exporters

Do you monitor, support the fish supply chain

### **Strategy & Suggestions**

How can we improve fishery production from Sonmiani?

How to control illegal catch/ nets method of fishing

Suggestions

## Annexure - IV

### Tabulated Survey Findings

<b>Overall Findings - Area Wise</b>				
<b>Queries</b>	<b>Sonmiani</b>	<b>Dam Bandar</b>	<b>Bhira/ Baloch Goth</b>	<b>TOTAL AVG</b>
<b>Household</b>				
Avg # of adults in HH	7	7	6	6
Avg # of kids in HH	5	7	5	6
Avg HH Size	12	14	10	12
Avg Earning adults	3	3	10	5
<b>Income &amp; Expenditures</b>				
Totally dependent on Fishing as income Sources	74%	74%	72%	73%
Avg monthly income - Season	14,803	27,986	20,544	21,111
Avg monthly income - Off Season	5,499	5,460	3,991	4,983
Avg Annual Income	140,417	245,726	180,320	188,821
Avg Monthly Expenditure	11,464	16,412	11,992	13,289
Avg Annual expenditure	137,570	196,940	143,900	159,470
Avg Annual Costs (boat & net)	45,986	61,482	42,086	49,851
<b>How is your financial condition now versus five years back?</b>				
Better off	19%	38%	29%	28.6%
Worse Off	60%	39%	42%	47.1%
Same	21%	23%	30%	24.3%
<b>Type of fishermen</b>				
Labourers (Boat less)	48%	14%	19%	27.2%
Single Boat Owners	44%	56%	66%	55.4%
Multiple Boat Owners	8%	30%	14%	17.4%
<b>Indebtedness</b>				
Taken Loan	46%	47%	50%	47.7%
Not Taken Loan	54%	53%	50%	52.3%
Avg Period of loan (yrs)	4.17	6.56	3.69	4.81
Loan Increasing	0%	32%	28%	20.0%
Loan Decreasing	67%	48%	56%	56.9%
Loan Same	33%	19%	17%	23.1%
Avg Loan Size	40,000	425,667	222,167	222,167

<b>Survey Findings for Poor - Area Wise</b>				
<b>Queries</b>	<b>Sonmiani</b>	<b>Dam Bandar</b>	<b>Bhira/ Baloch Goth</b>	<b>TOTAL AVG</b>
<b>Household</b>				
Avg # of adults in HH	6	6	6	6
Avg # of kids in HH	3	4	4	4
Avg HH Size	8	11	10	10
Avg Earning adults	2	2	2	2
<b>Income &amp; Expenditures</b>				
Totally dependent on Fishing as income Sources	83%	90%	67%	80%
Avg monthly income - Season	5,700	6,142	4,208	5,350
Avg monthly income - Off Season	1,600	1,289	1,723	1,538
Avg Annual Income	52,000	54,295	40,560	48,952
Avg Monthly Expenditure	5,030	5,592	5,450	5,357
Avg Annual expenditure	60,360	67,105	65,400	64,288
Avg Annual Costs (boat & net)	25,500	28,583	16,417	23,500
<b>How is your financial condition now versus five years back?</b>				
Better off	0%	26%	33%	19.9%
Worse Off	80%	63%	50%	64.4%
Same	20%	11%	17%	15.7%
<b>Type of fishermen</b>				
Labourers (Boat less)	60%	37%	33%	43.4%
Single Boat Owners	40%	63%	67%	56.6%
Multiple Boat Owners	0%	0%	0%	0.0%
<b>Indebtedness</b>				
Taken Loan	80%	63%	67%	69.9%
Not Taken Loan	20%	37%	33%	30.1%
Avg Period of loan (yrs)	8.25	7.17	5.25	6.89
Loan Increasing	0%	67%	50%	38.9%
Loan Decreasing	50%	25%	0%	25.0%
Loan Same	50%	8%	50%	36.1%
Avg Loan Size	47,500	132,500	77,500	85,833

<b>Survey Findings for Middleclass - Area Wise</b>				
<b>Queries</b>	<b>Sonmiani</b>	<b>Dam Bandar</b>	<b>Bhira/ Baloch Goth</b>	<b>TOTAL AVG</b>
<b>Household</b>				
Avg # of adults in HH	7	7	4	6
Avg # of kids in HH	6	8	2	6
Avg HH Size	13	15	6	11
Avg Earning adults	3	3	2	2
<b>Income &amp; Expenditures</b>				
Totally dependent on Fishing as income Sources	71%	70%	83%	74%
Avg monthly income - Season	11,208	14,065	11,800	12,358
Avg monthly income - Off Season	5,646	3,841	-	3,162
Avg Annual Income	112,250	127,882	94,400	111,511
Avg Monthly Expenditure	16,313	10,903	7,630	11,615
Avg Annual expenditure	195,750	130,835	91,560	139,382
Avg Annual Costs (boat & net)	46,625	49,612	23,800	40,012
<b>How is your financial condition now versus five years back?</b>				
Better off	33%	47%	20%	33.5%
Worse Off	50%	35%	40%	41.8%
Same	17%	18%	40%	24.8%
<b>Type of fishermen</b>				
Labourers (Boat less)	33%	6%	0%	13%
Single Boat Owners	67%	65%	100%	77%
Multiple Boat Owners	0%	29%	0%	10%
<b>Indebtedness</b>				
Taken Loan	33%	59%	60%	50.7%
Not Taken Loan	67%	41%	40%	49.3%
Avg Period of loan (yrs)	3.25	6.50	2.33	4.03
Loan Increasing	0%	30%	33%	21.1%
Loan Decreasing	50%	20%	67%	45.6%
Loan Same	50%	50%	0%	33.3%
Avg Loan Size	62,500	344,500	120,000	175,667

<b>Survey Findings for Rich</b>			
<b>Queries</b>	<b>Sonmiani</b>	<b>Dam Bandar</b>	<b>TOTAL AVG</b>
<b>Household</b>			
Avg # of adults in HH	7	8	8
Avg # of kids in HH	6	9	8
Avg HH Size	14	17	15
Avg Earning adults	3	5	4
<b>Income &amp; Expenditures</b>			
Totally dependent on Fishing as income Sources	67%	63%	65%
Avg monthly income - Season	27,500	63,750	45,625
Avg monthly income - Off Season	27,500	63,750	45,625
Avg Annual Income	330,000	765,000	547,500
Avg Monthly Expenditure	13,050	32,740	22,895
Avg Annual expenditure	156,600	392,880	274,740
Avg Annual Costs (boat & net)	65,833	106,250	86,042
<b>How is your financial condition now versus five years back?</b>			
Better off	25%	40%	32.5%
Worse Off	50%	20%	35.0%
Same	25%	40%	32.5%
<b>Type of fishermen</b>			
Labourers (Boat less)	50%	0%	25.0%
Single Boat Owners	25%	40%	32.5%
Multiple Boat Owners	25%	60%	42.5%
<b>Indebtedness</b>			
Have taken Loan	25%	20%	22.5%
Not Taken Loan	75%	80%	77.5%
Avg Period of loan (yrs)	1.00	6.00	3.50
Loan Increasing	0%	0%	0%
Loan Decreasing	100%	100%	100%
Loan Same	0%	0%	0%
Avg Loan Size	10,000	800,000	405,000

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