Chapter-1

INTRODUCTION

Section I

1.01 Introduction

Before independence, the Indian economy was a typical colonial economy characterised by lack of development and no industrial base. In the initial years, the country struggled to overcome mass poverty and chronic unemployment. It also tried to bridge income inequalities, increase productivity and reduce its dependency on agriculture (Rosen, G., 1988). During the last six decades, India has achieved remarkable economic growth. It is visualised in rapidly rising GDP, increased employment and export growth which has been possible through industrial development in which, the fishing industry has played an important role.

The fishing industry and aquaculture has contributed to food security, employment generation, foreign exchange earnings, and poverty alleviation (Mruthyunjaya, 2003; Malhotra and Sinha, 2007). Presently, the industry contributes 1.2 percent share towards India's GDP, and occupies a prominent place in the economy. It provides livelihood to 15 million people, and earns foreign exchange to the tune of Rs 8363 crores per annum (Government of Gujarat, 2006 and Government of India, 2005). India is the fourth largest producer of fish in the world followed by China, Peru and Japan and the second largest producer of fresh water fishes followed by China. (FAO, 2000).

1.02 Role of Fishing Industry in Economic Development

Many fishers live in the world's poorest countries where their communities are often marginalized and landless (World Bank, 2008). As fishing is the livelihood of last resort for 230 million poor fishermen in the world. Also, fish is the primary source of protein for over 1 billion people in the world. The global consumption of fish increased by 21% between 1992 and 2002. World fish

production was 133 million tons in 2002, a 35 % increase over the figure for 1991. Of this, US$ 58 billion of fish was exported. The export value of world trade in fish is more than the combined value of net exports of rice, coffee, sugar and tea. According to the World Bank, half of global fish trade comes from developing countries (World Bank, 2008).

Bizzarri, G. (2009) analyzed the correlation between 'Fisheries and Economic Development'. According to him the fisheries sector usually makes a valuable contribution to economic development of coastal areas. The relative dispersion of coastal small-scale fisheries adds to maintaining economically viable rural communities and balancing the trend towards growing coastal urbanization. In addition to its direct contribution, the indirect multiplier effects of the fisheries sector on economic development are often significant through intrasectoral interactions (e.g. between capture fisheries and ancillary activities such as net-making, or between capture fisheries and aquaculture through the supply of fishmeal), as well as intersectoral interactions (e.g. between forestry and fisheries through the supply of timber for boat-building, or between agriculture and aquaculture through the supply of feed). The infrastructure developed for fisheries (feeder roads, landing sites and coastal havens, water-retaining ponds) tend to trigger further economic development in other sectors such as tourism or agriculture. He pointed out that "Fisheries should be properly developed today to ensure a bountiful future" (Bizzarri, G., 2009).

Apparently fisheries sector is small in terms of volume but it significantly contributes to national income, nutritional security, export earning and in fulfilling social objectives with a great promise to contribute further (Sinha V.R.P., 2005).

In India, fishery has been playing an important role in the production and exports. It is a sunrise sector of the economy. The total world fish production was 133 million tons in 2002. The share of India in global fish production has grown gradually from about 2.6 per cent in 1960s and 1970s to 4.7 per cent in 1999-2000. Compared to the growth in global fish production, the growth in India has been at a faster rate, mainly due to increasing contribution from inland fish

production. The production of fish increased from a level of 7.5 lakh tons in 1950-51 to 64 lakh tons in the country during 2003-04 against harvestable potential of 84 lakh tons registering an average growth of 4.29 % over the same period (Government of India, 2005).

Fishing as an occupation has been in vogue since time immemorial. Till recently it was reckoned to be a supplementary enterprise practiced by fishermen community on subsistence level with little external input (Krishnan, M. et al, 2000). But with the changing consumption pattern, emerging market forces and technological developments, fisheries sector in India is undergoing a transformation (Kumar, A. et al, 2003). It has witnessed an impressive transformation from a traditional subsistence activity to a well developed diversified commercial enterprise with vast untapped potential (Salim, S. et al, 2005).

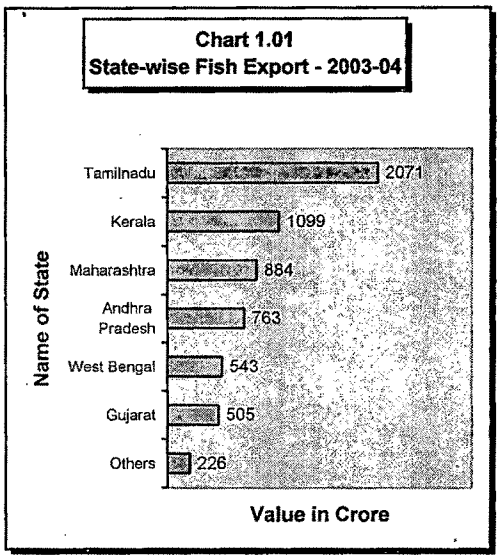
The country has a long coastline of 8118 km. and equally large estuaries, backwaters and lagoons etc. highly amenable for developing capture as well as culture fisheries. After declaration of Exclusive Economic Zone in 1976, the marine area available to India is estimated at 20.20 lakh sq. km (comprising of 8.6 lakh sq. km on west coast, 5.6 lakh sq. km. on east coast and 6 lakh sq. km. around the A&N Islands) in addition to the free access to the international waters (Government of India, 2005). Thus, vast resources both inland and marine reflect huge potentialities for fishing industry. The production of fish in India is mainly in the states such as Andhra Pradesh, West Bengal, Tamil Nadu, Kerala and Gujarat. The production and export from various states is shown in table below.

1.03 State-wise Fish Production and Export

Table 1.01
Fish Production – State wise - 2004
(in '000 Tons)

State	Marine	Inland	Total
Andhra Pradesh	263.93	680.71	944.64
Gujarat	609.14	45.48	654.62
Karnataka	187.00	70.00	257.00
Kerala	608.52	76.18	684.70
Maharashtra	420.01	125.12	545.13
Orissa	116.88	190.02	306.90
Tamil Nadu	373.00	101.14	474.14
Uttar Pradesh	0.00	267.00	267.00
West Bengal	181.60	988.00	1169.60
Others	181.42	914.24	1095.66
Total	2941.5	3457.89	6399.39

Source: Handbook on Fisheries Statistics *op. cit.*



Source: Handbook on Fisheries Statistics *op. cit.*

As the Table shows that West Bengal is the biggest producer of fish in India with a production of 11.7 lakh tons followed by Andhra Pradesh, Kerala and Gujarat. Gujarat ranks first in the production of marine fish whereas West Bengal tops in the production of inland fish. Though, Tamil Nadu is much behind other states in the production, the state continues to be the largest exporter of fish products in the country followed by Kerala. Gujarat lags much behind in export being only sixth.

1.04 Profile of Fishing Industry of Gujarat

Gujarat State lies on the northwest coast of India, and is situated between 20.1° and 24.7° North Latitude, and 68.4° and 74.4° East Longitude. It has three distinctive regions; the peninsula of Saurashtra, the desert and marshy area of Kutch, and the mainland of central and south Gujarat. To the west of the state lies the Arabian Sea and in the north and northwest lies Pakistan. The Gulf of Kutch and Gulf of Khambhat make the coastal region rich in marine resources. About 80 river systems pass through the state. According to 2001 Census Gujarat had a

population of 5.06 crores, which is 4.93 percent of India's population. The urban population is 37.36 percent and the State ranks third in urbanization.

The state has a coastline of 1,600 km. and equally large areas of estuaries, backwaters and lagoons that can be used for fishing. After the declaration of Exclusive Economic Zone (EEZ) in 1976, the marine area available to Gujarat is estimated at 2.14 lakh sq km., in addition to free access to international waters. This reflects a huge potential for the fishing industry.

Gujarat is one of the industrially advanced states in the country. Fishery is an important industry in Gujarat. It helps augment food supply, generation of employment, and earning foreign exchange. The industry contributes significantly to the socio-economic development of Gujarat. It provides livelihood to five lakh people and earns foreign exchange of about Rs 700 crores per annum, contributing 1.67 percent share to the State GDP (Government of Gujarat, 2006).

In olden days, surplus fish was processed in Gujarat by drying in direct sunlight. A small amount of quality fish like Pomfret was transported to Crawford Market in Bombay. It was also exported to the nearby countries.

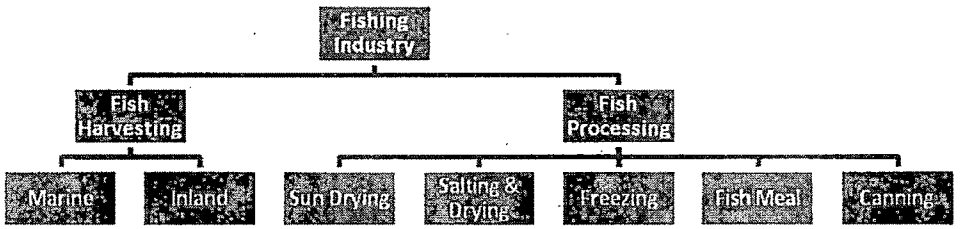
By 1970, trawler fishing was blooming and there was an increase in the production of quality fish. Shrimp and other quality fishes were sent to Bombay for processing and exporting to overseas market. By 1972 freezing units were established in Gujarat. Export figures are available since 1972-73. According to MPEDA, export of fish was 208 tons, valued at Rs.0.40 crore then (Trivedi and Upadhyay, 2001).

In Gujarat, 58 fish processing units are in operation presently. This is attributed to fish production, the availability of transportation facility and liberal government policy and. Fish is being exported from Pipavav, Okha, Porbandar, Kandla, Mundra and Ahmedabad to more than 70 countries such as Japan, USA, China, European Union etc. The varieties include frozen shrimp, fin fishes, squid, cuttle fish and surimi.

1.05 Structure of Fishing Industry

According to the Food and Agricultural Organisation, the fishing industry means both commercial and recreational activity, with two main branches: fish harvesting and processing. While detailing the basics of the study, the following explanations are necessary:

Chart .1.02



- Harvesting: Commonly, fish is caught from the sea, which is marine fishing whereas that from the rivers is inland fishing. Fishes are also nurtured in an artificially created environment, called aquaculture. Catching fish by any of the three ways is harvesting.

- Processing: Harvested fish needs to be processed for preservation. This is generally done for export purpose. There are many ways of processing fish for preservation: (a) Sun Drying, (b) Salting and Drying, (c) Freezing, (d) Conversion into fish meal and (e) Canning.

  (a) Sun Drying: Fish is dried in direct sunlight. This is the cheapest method of preservation.

  (b) Salting and Drying: In this method, salt is applied to the fish before drying.

  (c) Freezing: This is the most popular method of fish processing for export. Fish is frozen in processing units to preserve it for long. This accounted for 53% of the total fish processed in 2002, followed by canning (27%), and curing (20%).

(d) Conversion into Fish Meal: Powdered fish is used as poultry feed besides being consumed by human beings.

(e) Canning: Presently this method of fish being packed in cans is not adopted in Gujarat.

1.06 Relationship between Fishing Industry and Fish Processing

The relationship, if any, between fishing industry and fish processing has never been examined, although this is important for formulating policy on relevant issues such as increase in international trade. This can be useful for prediction of growth of fish processing by fishing industry.

An attempt has been made here to understand this relationship. Linear regression method has been used for the purpose.

An important indicator of the growth of fish processing industry is the magnitude of export. It is assumed here that higher the growth of fish processing, higher would be the export or vice versa. Hence, export of fish is taken as a broad indicator of the growth of fish processing here. Fishing industry is measured by fish production. The data relates to the period of 1991-92 to 2006-07. Data for production in fishing industry has been sourced from Gujarat Fisheries Statistics, while those for export of processed fish are the data published by Gujarat Fisheries Statistics and Society of Fisheries Technologists.

The model is:

$$\gamma = \alpha + \beta\chi$$

Export Value = -15819.9 + 0.529 Production Value
t = (-1.82)** (8.76)* [1]
r^2 = 0.846

R shows the correlation between the independent variable production and dependent variable export. The absolute value of R indicates the strength, larger values indicating a stronger relationship. In the table, the value of R is 0.920. It

[1] Note: * , ** and *** indicate level of significance at 1 per cent, 5 per cent and 10 per cent respectively.

clearly shows that there exists a strong relationship between the growth of fishing industry and the growth of the fish processing. R square is the proportion of variation in the dependent variable, explained by the regression model. As is shown in the table, the value of R Square is found to be 0.846 which indicates that 84% growth of fish processing is explained by the growth of fishing industry. The value of adjusted R square is 0.835. The coefficient for production is 0.529. So, every unit increase in production will result into an increase in export by 0.52 units, holding other variables constant. The significance level is 0.000. It indicates that growth of fishing industry plays a pivotal role in the growth of fish processing. It means that growth of fishing industry and growth of fish processing have positive a relationship. As the growth of fishing industry increases, the growth of fish processing also increases, and vice versa.

GROWTH OF FISH PROCESSING IN GUJARAT

1.07 Fish Production and Surplus of Fish in Gujarat

Fish production has been increasing continuously in Gujarat. In 1990-91, the production of fish was 5.46 lakh tons that increased to 6.61 lakh tons during 2000-01 that has further increased to 7.5 lakh tons in the year 2006-07. Though consumption is increasing both in absolute terms and also proportionately, the surplus is decreasing in proportionate as well as absolute terms though it has started increasing during the past couple of years.

Table 1.02
Surplus of Fish in Gujarat

Year	Production (tons)	Consumption (tons)	Surplus (tons)	Surplus As % of total production
1990-91	546419	153995	392424	71.82
1991-92	569887	153662	416225	73.04
1992-93	660257	217314	442943	67.09
1993-94	684855	339030	345825	50.50
1994-95	715361	304898	410463	57.38
1995-96	658509	250649	407860	61.94
1996-97	725346	308002	417344	57.54
1997-98	772805	360485	412320	53.35
1998-99	631728	415073	216655	34.30
1999-00	741280	523910	217370	29.32
2000-01	661065	417102	243963	36.90
2001-02	701603	538570	163033	23.24
2002-03	777905	609621	168284	21.63
2003-04	654572	483694	170878	26.11
2004-05	635579	462189	173390	27.28
2005-06	733820	570856	162964	22.21
2006-07	753583	502864	250719	33.27

Source: Gujarat Fisheries Statistics *op. cit.*

1.08 Fish Export

Fish processing is a branch of the fishing industry[2]. In Gujarat, the number of fish processing units increased from 18 in 1987-88 to 53 in 2007-08. It has been revealed in the literature that fish production, high rate of return on export, liberal government policy are some of the main contributing factors behind this success. Gujarat contributes 30.71% to the national marine export in terms of quantity, and 15.12 % in terms of value. The contribution of the state to total marine export from the country has increased to 1.88 lakh tons that is worth Rs. 1264.61 crores during the year 2006-07 (Government of Gujarat, 2008).

[2] The detailed understandings of various aspects are discussed in section on research methodology.

Table 1.03
Export of Fish

Year	Quantity (Tons)	Value (Rs. in Crores)
1980	7,000	18.93
1990	22,000	75.25
2000	1,24,000	615.65
2007	1,88,000	1264.60

Table 1.04
Growth of Fish Export (CAGR %)

Year	Quantity	Value
1980 to 1990	12	15
1990 to 2000	19	23
2000 to 2007	6	11

Source: Gujarat Fisheries Statistics *op. cit.*

As the table shows, Gujarat exported fish worth Rs.19 crores in 1980 which increased to 75 crores in 1990. It touched 615 crores in 2000 and 1264 crores in 2007. Therefore, it can be said that export of fish has increased rapidly in the last two decades. The export has increased by more than 66 times in terms of value during 1980 to 2007.

The value of export increased at a rate of 15% p.a. (CAGR) during the period 1980 to 1990. This increased to 23% during 1990 to 2000. However, the growth rate has declined since 2000 considerably as can be seen from above table. It is matter of concern for the future of the fish processing industry.

1.09 Employment in Gujarat Fish Processing

In Gujarat, employment in fish processing increased from 3363 in 2001 to 12545 people in 2008 (Thomas, K., 2003). A fish processing unit on an average employs between 50 to 2000 people. The number of people employed has been increasing due to increase in fish processing units as well as volume of export.

1.10 Number of Fish Exporters

The number of fish exporters has been increasing over the years. There was an increase of over 600 fish exporters in a single year, from 1074 in 2004 to 1749 in 2005, in India. Of these, Gujarat has 58 exporters.

1.11 Export Price

The increase in the export price may be an incentive for the growth of export of fish. Export price of fish has more than doubled. It increased from Rs.

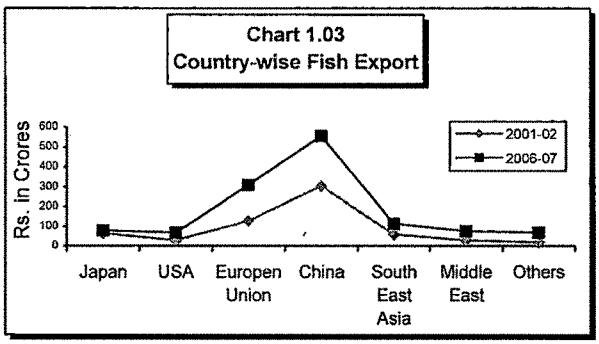
27 per kg in 1980-81 to Rs. 67 per kg in 2006-07. The price increase may be due to strong consumer taste and preferences, high operational cost and widening of demand-supply gap (Government of Gujarat, 2008).

1.12 Direction of Export

Table 1.05
Direction of Export of Marine Products from Gujarat

COUNTRY		2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
JAPAN	Q.	7179	6492	4574	4790	6697	8503
	V.	62.85	75.42	39.05	44.00	52.99	77.98
USA	Q.	4021	3773	3738	4993	6424	7484
	V.	27.93	30.96	26.94	39.25	64.61	67.74
EURO. UNION	Q.	15936	21844	19142	20706	30208	28284
	V.	127.82	188.06	163.92	182.28	298.21	309.09
CHINA	Q.	86168	88957	63443	68004	68199	108881
	V.	301.83	373.89	268.83	301.57	345.64	554.69
SOUTH E. ASIA	Q.	11795	7412	11224	14195	14453	16727
	V.	58.77	54.05	68.04	78.91	85.42	113.27
MIDDLE EAST	Q.	3650	2932	3799	3929	5138	7030
	V.	28.09	22.15	33.22	36.30	51.71	74.57
OTHERS	Q.	3426	2367	2466	3334	5365	11257
	V.	18.43	15.83	14.41	22.28	36.30	67.27
GUJARAT TOTAL	Q.	132175	134047	108386	119951	136485	188166
	V.	625.72	760.36	614.41	704.59	934.88	1264.61

Source: Gujarat Fisheries Statistics *op. cit.*
Note: Q. = Quantity in Tons, V. = Value in Crore Rupees



Source: Gujarat Fisheries Statistics *op. cit.*

Table shows that China is the main importer of fish from Gujarat. Compared to 2000-01, export to all countries registered a positive growth in 2006-07 in terms of quantity and value as can be seen from chart.

Table 1.06
Direction of Export
(Growth Rate %)

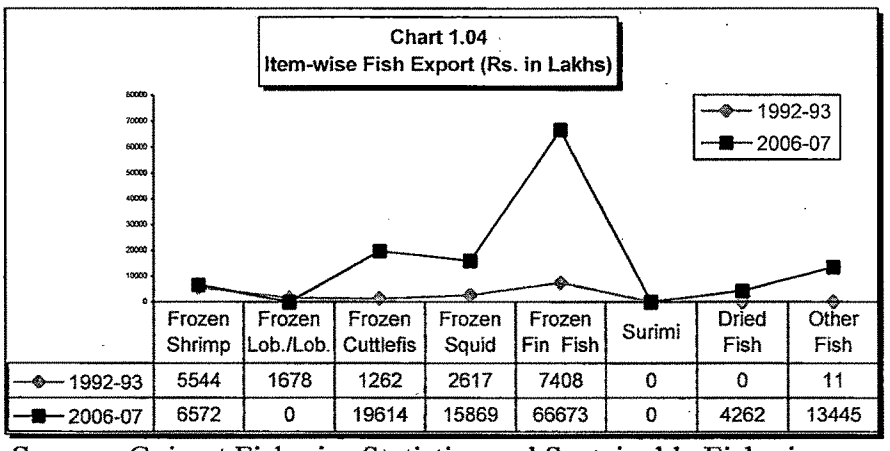
Country	CAGR (%)
Japan	1
USA	19
European Union	19
China	13
South East Asia	14
Middle East	22
Others	30

Source: Computed on the basis of table 1.06

The export of fish to The USA and European Union has grown at a compounded rate of 19% per annum and to the with Middle East countries at a rate of 22% per annum during 2001-02 to 2006-07. The rate of growth in export to Japan is low. This may be due to demand for the specific type of fish in Japan.

1.13 Composition of Fish Export

There is a large availability of fin fish in the coastal area of Gujarat. Frozen fin fish constitutes the major share in total fish export of Gujarat (59%). In 2006-07, all fish types registered a positive growth except frozen lobster/lobster as can be seen from following graph. Frozen lobster that was exported during the early 1990s is no more being exported since 2001 whereas surimi and dried fish are the new products being exported now. Hence, new products are emerging and contributing to the exports.



	Frozen Shrimp	Frozen Lob./Lob.	Frozen Cuttlefis	Frozen Squid	Frozen Fin Fish	Surimi	Dried Fish	Other Fish
1992-93	5544	1678	1262	2617	7408	0	0	11
2006-07	6572	0	19614	15869	66673	0	4262	13445

Source: Gujarat Fisheries Statistics and Sustainable Fisheries Development: Focus on Gujarat *op. cit.*

Table 1.07
Item-wise Fish Export from Gujarat during 1992-93 to 2006-07

Year		Frozen Shrimp	Frozen Lobster/ Lobster Tails	Frozen Cuttlefish /fillets	Frozen Squid	Frozen Fin Fish	Surimi	Dried Fish Items	Others Fish Items	Total Fish Export
1992-93	Q	4808	632	3195	6714	28133	--	--	96	43578
	V	5544	1678	1262	2617	7408	--	--	11	18520
	P	115.31	265.51	39.50	38.98	26.33	--	--	11.46	42.50
1993-94	Q	5255	518	6100	5066	42498	--	--	356	59793
	V	7872	1418	3328	2258	11934	--	--	136	26946
	P	149.8	273.75	54.56	44.57	28.08	--	--	38.20	45.07
1994-95	Q	7773	410	7614	9990	60741	--	--	459	86987
	V	12212	1616	4507	4644	18646	--	--	189	41814
	P	157.11	394.15	59.19	46.49	30.70	--	--	41.18	48.07
1995-96	Q	5295	516	6417	10577	59223	--	--	530	82558
	V	8897	1883	3515	5488	19447	--	--	298	39528
	P	168.03	364.92	54.78	51.89	32.84	--	--	56.23	47.88
1996-97	Q	5969	388	7451	14188	91816	--	--	3401	123213
	V	503	1535	4540	7472	31788	--	--	2220	48058
	P	8.4269	395.62	60.93	52.66	34.62	--	--	65.27	39.00
1997-98	Q	6275	380	7630	9432	97195	--	--	4649	125561
	V	11889	1401	5507	5014	37597	--	--	2377	63785
	P	189.47	368.68	72.18	53.16	38.68	--	--	51.13	50.80
1998-99	Q	4951	304	6475	8099	6129	--	--	4474	30432
	V	8084	1021	3324	4662	17098	--	--	2556	36745
	P	163.28	335.86	51.34	57.56	278.97	--	--	57.13	120.74
1999-00	Q	2806	225	3705	8229	53361	4831	1383	79.00	74619
	V	4850	1006	2122	5038	21504	3567	812	39	38938
	P	172.84	447.11	57.27	61.22	40.30	73.84	58.71	49.37	52.18
2000-01	Q	2886	110	13066	8331	74300	6968	841	17657	124159
	V	5579	606	8022	5203	33390	4414	468	3902	61584
	P	193.31	550.91	61.40	62.45	44.94	63.35	55.65	22.10	49.60
2001-02	Q	4006	--	10298	12841	93596	--	1153	10281	132175
	V	6171	--	6989	7873	33618	--	665	7256	62572
	P	154.04	--	67.87	61.31	35.92	--	57.68	70.58	47.34
2002-03	Q	2192	--	15061	15211	88785	--	1183	11215	133647
	V	4434	--	11852	11947	37746	--	1140	8917	76036
	P	202.28	--	78.69	78.54	42.51	--	96.37	79.51	56.89
2003-04	Q	3542	--	13011	14435	64340	--	1131	11899	108358
	V	5881	--	9912	10288	26842	--	918	7573	61414
	P	166.04	--	76.18	71.27	41.72	--	81.17	63.64	56.68
2004-05	Q	3180	--	11267	10530	78710	--	1014	11797	116498
	V	5625	--	8637	78710	36595	--	652	8420	138639
	P	176.89	--	76.66	747.48	46.49	--	64.30	71.37	119.01
2005-06	Q	3837	--	16538	21121	78738	--	1114	15126	136474
	V	6072	--	14156	20321	40794	--	881	11241	93465
	P	158.25	--	85.60	96.21	51.81	--	79.08	74.32	68.49
2006-07	Q	3977	--	18511	16584	129867	--	2592	16613	188144
	V	6572	--	19614	15869	66673	--	4262	13445	126435
	P	165.25	--	105.96	95.68	51.33	--	164.43	80.93	67.20

Source: Gujarat Fisheries Statistics and Sustainable Fisheries Development: Focus on Gujarat *op. cit.*

Note: Q. = Quantity in Tons, V. = Value in Rupees Lakhs, P. = Price in Rs.

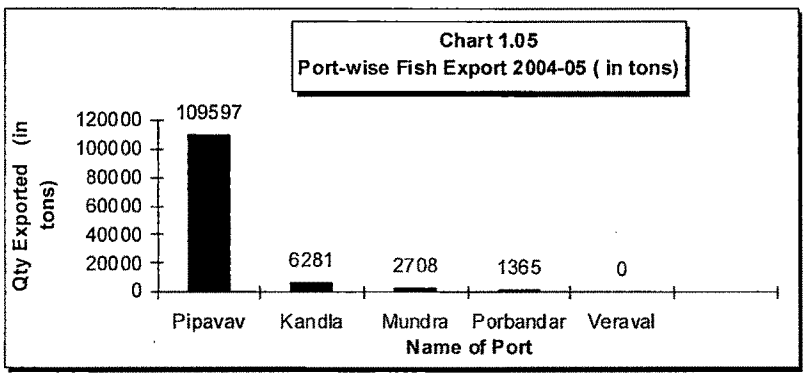
Table 1.08
Growth of Item-wise Fish Export from Gujarat during (CAGR %)
(1992-93 to 2006-07)

Frozen Shrimp	Frozen Lobster/ Lobster Tails	Frozen Cuttlefish /fillets	Frozen Squid	Frozen Fin Fish	Surimi	Dried Fish Items	Others Fish Items
-1	37*	13	7	12	30**	9***	45

* From 1992-93 to 2000-01 **From 1999-2000 to 2001-2002 ** *From 1999-00 to 2006-07

The rate of annual growth for item-wise export of fish shows that the export of frozen lobster/lobster tails has increased at 37% p.a. during 1992-93 to 2006-07and other fish items that includes many varieties at a rate of 45% per annum. Even the growth in the export such as Surimi has increased by annual 31% p.a. in just one year i.e. 1999-2000 to 2000-2001. Hence, the high rate of growth in the export of fish is an indication of high potentialities for export.

1.14 Port-wise Fish Export



Source: Gujarat Fisheries Statistics 2005 *op. cit.*

Fish is exported from five ports in Gujarat, namely Pipavav, Kandla, Porbandar, Mundra and Veraval. 90% of the fish is exported from Pipavav port for three reasons. First, 75% of fish processing units of Gujarat are located in Veraval, for which Pipavav is the nearest port. Second, good and cheap shipment facility is available at Pipavav port due to large volume. Third, no shipment facility exists at Veraval at present. This shows that the availability of infrastructure for export plays an important role in the concentration of processing units in a particular area.

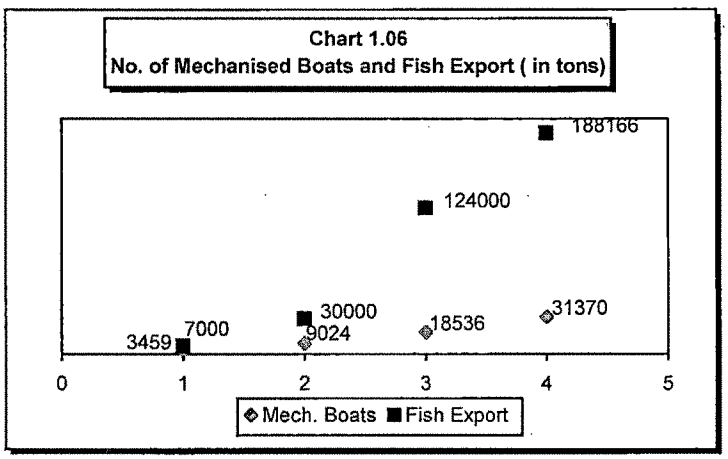
1.15 Export Markets

Earlier, fish was exported in only to few countries like Sri Lanka, Singapore, and Malaysia as noted by Trivedi and Upadhyay (Trivedi and Upadhyay, 2001). However, in the present times, fish is exported to more than 70 countries. Hence, over the years, there has been a diversification of the markets.

More ever, earlier only dried items were exported to countries like Sri Lanka and Singapore. Now due to improvement in quick transportation facility and processing technologies, frozen products, canned products, and even live fishes are exported.

1.16 Mechanized Boats and Export of Fish

Mechanized boats are considered as the most important factor in achieving fish production targets. Without mechanized boats, Gujarat would not have succeeded in fish production. Mechanized boats have planted the seeds of fish export from Gujarat. Upadhyay & Trivedi mention that the use of trawler[3]



Source: Gujarat Fisheries Statistics *op. cit.*

boats for fishing increased the production and export of Shrimp and other quality fishes from Gujarat (Upadhyay & Trivedi, 2001). The following chart clearly shows how fish export increased as number of mechanized boats rose. This would also mean that as export of fish increases, employment generation via increase in mechanised boat will take place. The correlation analysis also shows that

[3] Trawler is a type of mechanized boat.

mechanized boats and fish export are positively correlated. The near perfect correlation ship can also be understood by the fact that the Karl Pearson correlation value for the increase in the mechanised boats and exports is 0.989.

1.17 Government Schemes

The Government has been constantly increasing the number of export promotion schemes to earn valuable foreign exchange, and achieving fish export targets. For instance, when a fish processor wants to buy machinery, a subsidy up to 40-50% of the value of the machinery is provided by the Government. Similarly, an interest subsidy of 2% is provided to the processor on loans, and a cash incentive on each exported container (8% of F.O.B. value). Presently, there are 20 such export promotion schemes for the fish exporters.

It is obvious from the above facts that several factors have contributed to the growth of fish processing industry in Gujarat. This growth promises a bright economic future for the state, provided care is taken to nurture this industry in a sustainable manner. The export of fish from Tamil Nadu (2071 crores) and Kerala (1163 crores) is much higher than that from Gujarat (900 crores in 2006-07) even though the production Gujarat is quite high. The growing demand for fish and fishery products by the importing countries like Japan, USA, EU, China, and Middle East countries can be met by promoting export. For this, improvement in quality and enhancement of the existing processing facilities is imperative. This requires a deeper understanding of the issues. The analysis will be useful in taking right business or policy decisions. Thus far, no detailed study of the fish processing industry has been undertaken. The present study attempts to fill this gap.

1.18 Rationale of Study

Fisheries promise to contribute a vital share to the global food basket. The present demand and supply gap is widening because of population growth, agriculture and industrial pollution, competing demands for water resources, man made changes in waterways and many other constraints. All of these may reduce potential growth in fisheries. The future is also uncertain due to unknown

consequences of weather abnormality and global climatic change on fish habitats. To obviate or mitigate these adverse effects, pragmatic fisheries research is needed (Sinha, V.R.P., 2005).

Experts have also recommended that research in this area is an urgent need. The thrust areas and arguments for undertaking such a study are as follows:

- ✓ Fish processing, value addition, packaging, marketing and waste utilization are thrust area of research (Malhotra and Sinha, 2007).
- ✓ Research in packaging and the conversion of low value fish to high value products (Malhotra and Sinha, 2007).
- ✓ Ravindra Dholakia studied the comparative economic growth experience of Gujarat in 17 sectors. He found that fishing is the weakest sector in Gujarat, where special attention needs to be focused to achieve better performance (Dholakia, R., 2007).
- ✓ Malhotra and Sinha carried out a SWOT analysis. They have mentioned that the lack of reliable data is one of the greatest weaknesses of this sector.' It makes it difficult to plan, execute and monitor any project in absence of such data and leads to confusion in assessment of the situation (Malhotra and Sinha, 2007).
- ✓ Marine Fishing Policy has recommended research in fish processing in terms of waste utilization, packing and quality (Government of India, 2004).

It is reported that Indian fishery, particularly the processed fishery products are much cheaper than those of the countries in competition. Despite this, the exports are low from India compared to many other countries (NCAP, 2004). It is therefore pertinent to study the problems and prospects of this industry.

Section II

1.19 Objectives of the Study

The present study has been undertaken with the following objectives:

1. Identify problems of fish processing.
2. Attempt an assessment of the economics of fish processing.
3. Examine the relationship between fishing industry and the fish processing.
4. Assess whether fish processing units run at optimal levels from an economic point of view.
5. Explore the challenges faced in the marketing of fish by the processing industry.
6. Examine the government support system for the fish processing industry.
7. Suggest policy recommendations for prospects of fish processing.

1.20 Hypotheses

1. Fish processing industry is a labour-intensive industry and therefore generates employment.
2. Growth of fish processing industry leads to increase in foreign exchange.
3. Fish processing units run at optimum levels.
4. The adoption of quality standards has an impact on the performance of the fish processing units.

1.21 Research Methodology

1.21.1 Preliminary Training

In order to identify the problems confronting the fishing industry, the researcher undertook training from the experts in the field. A preliminary survey was later carried out in five different areas to get an insight into the problem. Visits were also paid to various fisheries research institutes of Gujarat and in other

parts of India, namely MPEDA, CMFRI, CIFT, and Fisheries Department. Visits were also paid to boat building yards, and fisheries co-operatives.

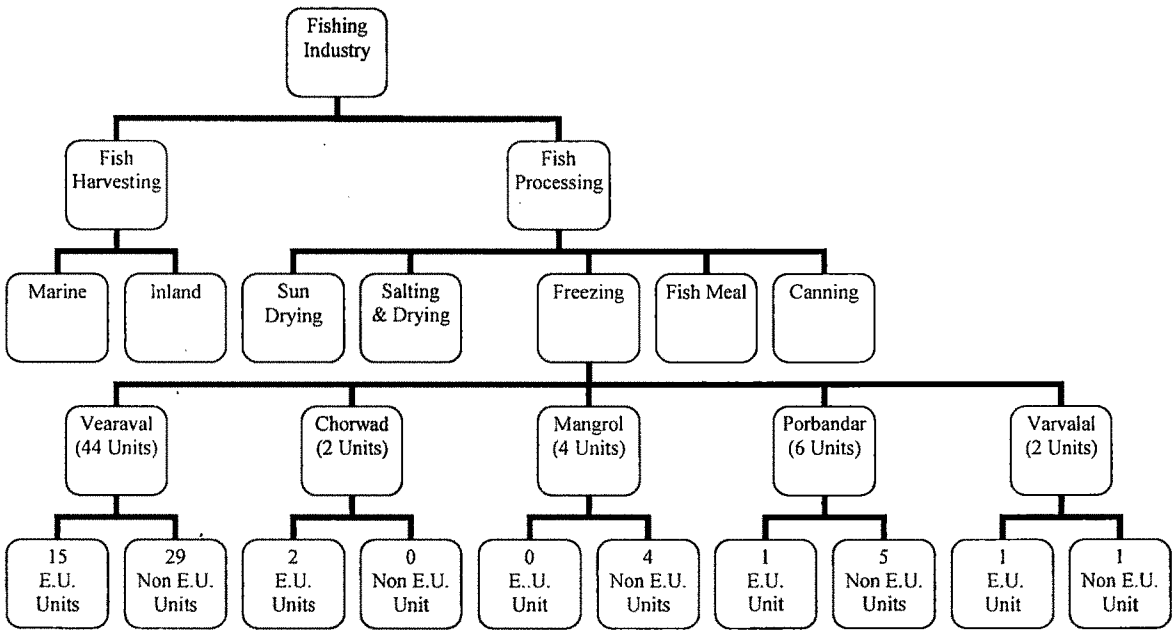
1.21.2 Geographical Area

The area of study is Gujarat state. Primary data have been collected from all fish processing units of Gujarat state. All fish processing units of Gujarat are spread over in five major centres i.e. Veraval, Chorwad, Mangrol, Porbandar and Varvala.

1.21.3 Sampling Technique

Sampling derived on the basis of multistage stratified sampling and sequential techniques. Details of number of E.U. units and Non-units in each centre are as under.

Chart 1.07



As per fish exporters association of India (Gujarat region), there are total 58 fish processing units in Gujarat. Initially 70% units have been selected with minimum one unit from each fish processing centre. Units have been selected from both E.U. and Non-E.U. in same ratio. But they were not sufficient to reach the facts. So, it was necessary to extend sample size 10%. Same problem had been

faced again. Therefore, remaining 20% also have been compelled to include in the survey.

1.21.4 Period of Study

Secondary data has been collected since 1972-73 and onwards. This is because the Gujarat fish processing industry incepted during this year. Primary data relates to the year 2006-07.

1.21.5 Scope of Study

The present study is limited to fish processing only. A brief description of the data collected is as follows:

(1) **General Information**

Location of the units, year of inception, ownership pattern, turnover, installed capacity and its utilization, ownership of fish processing equipments, product range, employment, wages and salary and wastage of fish.

(2) **Cost and Profit**

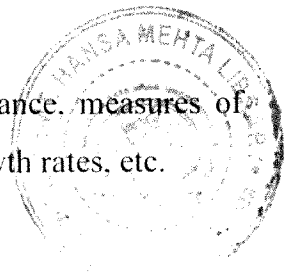
This includes cost of raw-material, labour, cleaning, freezing, packing, transport, marketing, etc. Item-wise profit and loss in fish processing

(3) **Problems and Challenges**

finance, value added products, packaging, quality standard, price realisation, raw material, marketing, overseas markets, infrastructure facilities, government policy, competition, legal procedures, tariff & non tariff barriers, survival etc.

1.21.6 Processing of Data

Initially the questionnaires were edited for coding. The edited questionnaires were then coded for tabulation. SPSS computer software was used for tabulating data. Various statistical tools used in analysis include correlation,



regression, T-test, Chi-square test, One Way analysis of Variance, measures of central tendency, frequency statistics, descriptive statistics, growth rates, etc.

1.21.7 Problems and Limitations

The study is limited to freezing only. The data has been collected from the operational units. However informal discussions were carried out with the owners of the closed units. The respondents were non-cooperative to questions related to cost and profit. Some respondents initially replied that these were confidential matters and therefore cannot be shared. They were too reluctant to share any information. They would even understate income and overstate expenses. These cases were cross checked with MPEDA data and discussed with experts in the field.

1.21.8 Chapter Scheme

The thesis is divided into eight chapters. Chapter One introduces the problem. Chapter Two deals with the review of literature. Chapter Three is about the profile of fish processing units. Chapter Four deals with the Economics of fish processing. Chapter Five looks at various aspects related to marketing of the products of fish processing industry. Chapter Six examines the interplay between the government and the fish processing industry. Chapter Seven deals with the problems and prospects of fish processing. Chapter Eight pertains to the conclusions and recommendations.

REFERENCES:

Andrew, P. (1999) *Economics of Brakishwater Shrimp Culture.* New Delhi: Daya Publishing House.

Bizzarri, G. (2009) *Fisheries and Economic Development* http://www.fao.org/fishery/topic/13304/en [viewed on 15.10.2009].

Boopendranath, M., et al (2003) *Sustainable Fisheries Development: Focus on Gujarat.* Cochin: Society of Fisheries Technologists.

Chhaya, N. (2001) *Gujarat Fisheries – An Overview.* Thiruvananthapuram: National Fish Worker's Forum.

DGFT (2009) Export Import Data Bank http://www.dgft.delhi.nic.in

Dholakia, R., (2007) Source of Economic Growth and Acceleration in Gujarat. *Economic and Political Weekly,* Vol. XLII, No. 9, March 3, 2007, pp. 770-778, Mumbai.

Gopakumar, K. (2006) *Textbook of Fish Processing Technology.* New Delhi: Directorate of Information and Publications of Agriculture, Indian Council of Agriculture Research.

Government of Gujarat (2006) *Gujarat Fisheries Statistics 2004-05.* Gandhinagar: Commissioner of Fisheries, Government of Gujarat.

Government of Gujarat (2008) *Gujarat Fisheries Statistics 2006-07.* Gandhinagar: Commissioner of Fisheries.

Government of India (2004) *Comprehensive Marine Fishing Policy.* New Delhi: Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries, Government of India.

Government of India (2005) *Hand Book on Fisheries Statistics 2004.* New Delhi: Ministry of Agriculture, Department of Animal Husbandry & Dairying, Government of India.

Krishnan M. et al (2000) Aquaculture Development in India: Problems and Prospects in NCAP Workshop Proceedings, 2002, New Delhi: National Centre for Agricultural Economics and Policy Research.

Kumar, A., Katiha, P., & Joshi, P. (2003) A Profile of People, Technologies and Policies in Fisheries Sector in India in NCAP Workshop Proceedings, 2003, New Delhi: National Centre for Agricultural Economics and Policy Research.

Malhotra and Sinha (2007) *Indian Fisheries and Aquaculture in a Globalizing Economy.* Delhi: Narendra Publishing House.

Mankiw, N. (2001) *Principle of Economic.* New York: Thomson-South-Western.

Mruthyunjaya (2003) Edited by Kumar A., Katiha, P. and Joshi P., A Profile of People, Technologies and Policies in Fisheries Sector in India in NCAP Workshop Proceedings, 2003, New Delhi: National Centre for Agricultural Economics and Policy Research.

NCAP (2004) *Strategies & option.* New Delhi: National Centre for Agriculture Economics and Policy Research (NCAP).

Rosen, G., (1988) *Industrial change in India 1970-2000.* New Delhi: Allied Publishers Private Limited.

Salim, S. et al (2005) *Fisheries Economics and Marketing – An Introduction.* Mumbai: Central Institute of Fisheries Education.

Sinha, V.R.P. (2005) *Fisheries Research Planning and Management in Developing Countries.* Delhi: Narendra Publishing House.

Thomas, K. (2003) Eds. Boopendranath et al (2003) *Sustainable Fisheries Development: Focus on Gujarat.* Cochin: Society of Fisheries Technologists.

Trivedi and Upadhyay (2001) *Gujarat Fisheries 2010 : Opportunities and Challenges.* Ahmedabad: Sardar Patel Institute of Economic and Social Research.

World Bank (2009) *Fisheries* http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0,,menuPK:295589~pagePK:141159~piPK:141110~theSitePK:295584,00.html [viewed on 19.12.2009].