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Basic Assessment on the Export Performance of Fish and Fish Products in India

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ABSTRACT

Fishery is an important sector in Indian economy, provides employment to millions of people and ensures the country's food security. At present India is contributing about 4 per cent share among the major marine capture producing countries in the world. The production quantity of Indian fish and fish products through inland and marine has increased over the years due to technological developments in production, captures, processing, distribution, transportation, and storage. This study assesses the export performance at basic level of fish and fish products from India. The global and national level data on marine products production, utilization and trade were collected from Food and Agricultural Organization (FAO) and Marine Products Export Development Authority (MPEDA) websites respectively. The results show that production of world fisheries & aquaculture, utilization of world fisheries and aquaculture products by human over the period from 1986 to 2018 has increased and the trade value of the export of fish at global level during the year 2018 is about 164.1 billion US dollars. China, holds the major share in marine capture production, followed by Peru and Indonesia. In India, Frozen shrimp remained the major export item followed by frozen fish. At present India is contributing about 4 per cent among the major marine capture producing countries in the world. India export majority of the marine products to United States of America, followed by China, South East Asia and European countries. Among Indian states, Andhra Pradesh is the leading exporter, followed by Tamil Nadu, West Bengal, Maharashtra and Kerala. Thus, the performance in production of fish and fish products export shows an increasing trend at national level.

HIGHLIGHTS

- The paper analyzes the production and export status of Indian fisheries sector.
- The fish production over the period from 1980-81 to 2019-20 have increased from 24.42 lakh tonnes to 104.37 lakh tonnes respectively. The frozen shrimp and the frozen fish are the major exportable products from India, which shares 51 per cent and 17 per cent of the total marine exports from India respectively.
- The export of frozen shrimp and frozen fish shows the increasing trend. India exports 26 per cent of the fish and fish products to China followed by 24 per cent to United States of America, South East Asia and European countries of its total exports.

Keywords: Fish export, Export performance, Growth analysis

Fisheries sector is a source of livelihood for around 2.8 crore number of fishers, fish farmers, fish workers and fish vendors at primary level and several crores along the

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value chain and helps in socio-economic development in India.

In India, fisheries sector contributes 1.24 % to the Indian economy during the year 2019-20. Fisheries are an important source of food, nutrition, employment and income in India. Fish being an affordable and rich source of animal protein, is one of the healthiest options to mitigate hunger and malnutrition. The sector has immense potential to more than double the fishers and fish farmers' incomes, as envisioned by the government. In 2019-20, India's total fish production is about 14.16 metric million tonnes, in that 3.72 MMT produced through marine fish production and 10.43 MMT are through inland fish production. Indian government spent ₹ 64025.86 lakh for the development of fisheries sector in the year 2019-20. India exports 12,89,651 tonnes and the value of export is 46,662.85 crores. Tripura, Kerala, Manipur, Odisha and Assam are the top five states consuming fish. According to the year 2019-20, in India, the total fish landing centres is 1548 No's. There are 7 major commissioned fishing harbours and 62 minor commissioned fishing harbours (Handbook on Fisheries Statistics, 2020).

This indicates potential for Indian marine products exports through up-scaling technologies and multilateral negotiations. In this context, this study has attempted to assess the export performance of fish and fish products in India.

LITERATURE REVIEW

India exporting marine products to more than 100 countries over the world with the increase growth over the years. India has enormous fishery sources with a large coastline and inland. (MPEDA 2020). The export earnings of frozen items during 2000 is high compare to the earnings through canned items in 1990. (Bhattacharya, 2004). Krishnan and Ayyappan (2005) revealed that export performances having challenges like declining of shrimp catches in India. The Indian Government allotted a highest amount to the Fisheries Department during 2021-22 while comparing earlier years.

Methodology of the Study

The study reviews the performance of fish and fish products by collecting and reviewing the data collected from various websites. The data on production, utilization and trade details were collected for international level from FAO website. The national level data on product wise and market-wise marine product details were collected from the MPEDA website and through the Handbook of fisheries statistics. Necessary analysis were employed the actual status of Indian fish and fish products production and export.

(i) Conventional Analysis (Averages and Percentages)

The percentages and averages were used to calculate the share or Indian export at global level, marketwise and product wise share of various fish and fish products.

(ii) Analysis of Growth

Growth rates were used to measure the past performance of the economic variables. Compound growth rate has been calculated to find out the growth performance of Indian fish production and export. The growth rates were estimated by using the exponential growth function of the form.

$$Y = a\, b^t\, e_t$$

Where,

Y = dependent variable; t = time variable; e_t = error term and a and b are unknown constants to be estimated.

The unknown constants a and b were estimated by applying methods of least squares by transforming the equation into logarithmic form:

$$ln Y = ln\, a + t\, ln\, b$$

Where,

$ln\ Y$ is natural logarithm of Y; $ln\ a$ and $ln\ b$ are similarly defined.

The compound growth rate 'r' was computed by using the relationship:

$$r = (\text{Antilog of } (ln\ b) - 1) \times 100$$

(iii) Coefficient of Variation

The coefficient of variation (CV) is generally used to measure variability in any variable on account of its ease of use and interpretation. The CV is calculated to find out the variability in export of various products and markets. It can be obtained by the following formula,

$$CV = Standard\ deviation / Mean \times 100$$

RESULTS AND DISCUSSION

(i) Status of Global Fish Production

Global fish production is estimated to have reached about 179 million tonnes in 2018. Of the overall total, 156 million tonnes were used for human consumption, equivalent to an estimated annual supply of 20.5 kg per capita. The remaining 22 million tonnes were destined for non-food uses; mainly to produce fishmeal and fish oil (FAO 2020).

From the table 1, it is noticed that the production over the period from 1986 to 2018 has increased from 101.8 million tonnes to 178.5 million tonnes at global level. Regarding, utilization by human is increased from million 71.8 to 156.4 million tonnes, but the utilization for non food use shows declining from 29.9 million tonnes to 22.2 million tonnes. The value of the export of fish in the year 2018 is 164.1 billion US dollars.

(ii) Major Producing countries and Territories

Table 2, shows the major marine capture producing countries in the world. China holds the major share (15

Table 1: World fisheries and aquaculture production, utilization and trade

Sl. No.	Particulars	1986-1995 (average/year)	1996-2005 (average/year)	2006-2015 (average/year)	2018
1	Production (Total fisheries and aquaculture)	101.8	125.6	149.5	178.5
2	Utilization (Human)	71.8	98.5	129.2	156.4
	Utilization (Non-food uses)	29.9	27.1	20.3	22.2
3	Trade (export in quantity)	34.9	46.7	56.7	67.1
	Trade (value in USD billions)	37.0	59.6	117.1	164.1

**Production, utilization and trade in million tonnes (live weight).*

Table 2: Major marine capture producing countries

Sl. No.	Country or Territory	1980's Production (avg/year)	1990's Production (avg/year)	2000's Production (avg/year)	2018 Production (avg/year)	Percentage of total
1	China	3.82	9.96	12.43	12.68	15
2	Peru	4.14	8.10	8.07	7.15	8
3	Indonesia	1.74	3.03	4.37	6.71	8
4	Russian federation	1.51	4.72	3.20	4.84	6
5	United States of America	4.53	5.15	4.75	4.72	6
6	India	1.69	2.60	2.95	3.62	4
7	Viet Nam	0.53	0.94	1.72	3.19	4
8	Japan	10.59	6.72	4.41	3.10	4
9	Norway	2.21	2.43	2.52	2.49	3
10	Chile	4.52	5.95	4.02	2.12	3
11	All other countries	36.82	32.26	33.12	34.22	39
12	World total	72.1	81.86	81.56	84.84	100.00

per cent) in marine capture production, followed by Peru (8 per cent) and Indonesia (8 per cent) at global level.

(iii) Status Indian Fish Production

India produced 24.42 lakh tonnes of fish during 1980-81, in that, 15.55 lakh tonnes and 8.87 lakh tonnes are through marine and inland production. During 2019-20 it is around 141.64 lakh tonnes, in that 37.27 lakh tonnes and 104.37 tonnes through marine and inland production.

Table 3: Fish production in India over the decades

Sl. No.	Year	Marine	Inland	Total
1	1980-81	15.55	8.87	24.42
2	1989-90	22.75	14.02	36.77
3	1999-00	28.52	28.23	56.75
4	2009-10	31.04	48.94	79.98
5	2019-20	37.27	104.37	141.64

From the table 3, it is noticed that during the early periods *i.e.*, 1980-81 to 1990-91 the marine production was high in India, whereas after year 2000-01 the inland production was high and the marine production was stable. This may be because of the technological development in the fisheries sector and the increase demand for the fish consumption. The Fig. 1 shows the trend in marine, inland and total fish production in India over the year from 1980-81 to 2019-20.

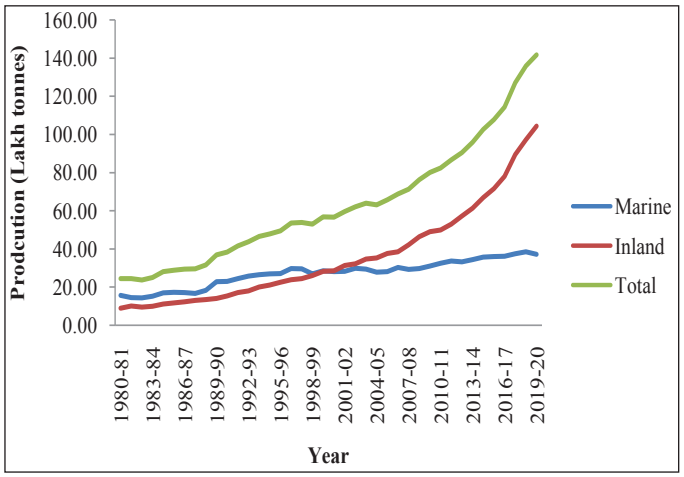

Fig. 1: Trend in marine, inland and total fish production

(iv) Total export of fish and fish products and its value from India over the years

Indian export of fish and fish products from India shows the increasing trend over the years from 2009-10 to 2019-20. Fig. 2 shows the trend in the export quantity of fish and fish products from India and Fig. 3 shows the trend in the export value of fish and fish products from India.

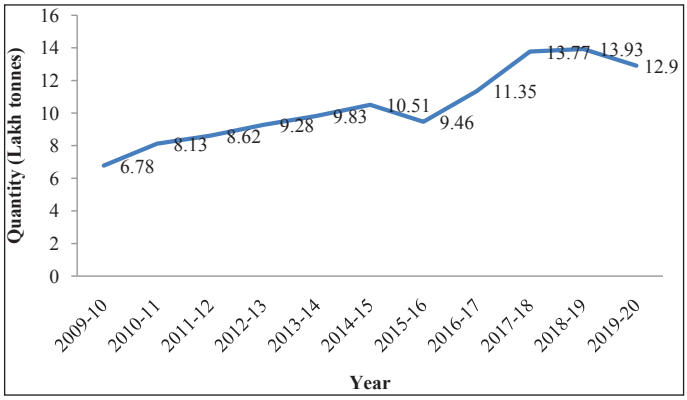

Fig. 2: India's trend in export quantity of fish and fish products (lakh tonnes)

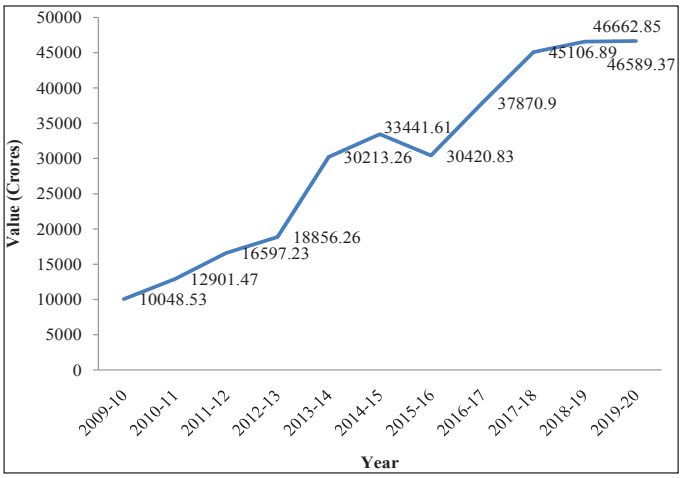

Fig. 3: India trend in export of fish and fish products in value (in Crores)

(v) Product wise export from India (2019-20)

Frozen shrimp, frozen fish, frozen squid dried items, live items, chilled items and other fish products are the major products that are export from India. The following figure shows the export percentage of fish and fish products from India during 201-20.

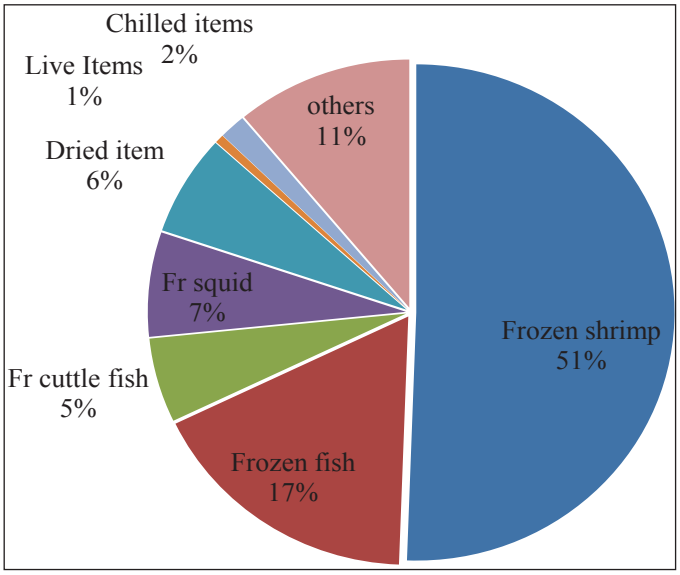

Fig. 4: Export quantity of marine products from India

Fig. 4 shows the percentage of export quantity of fish and fish products from India. Frozen shrimp remained the major export item (51%) followed by frozen fish (17%). At present India is contributing about 4 per cent among the major marine capture producing countries in the world. All the other items, contributes very less to the total export.

(vi) Trend in product wise export performance from India (2009-10 to 2019-20)

The trend in product wise export performance over the year from 2009-10 to 2019-20 is detailed below;

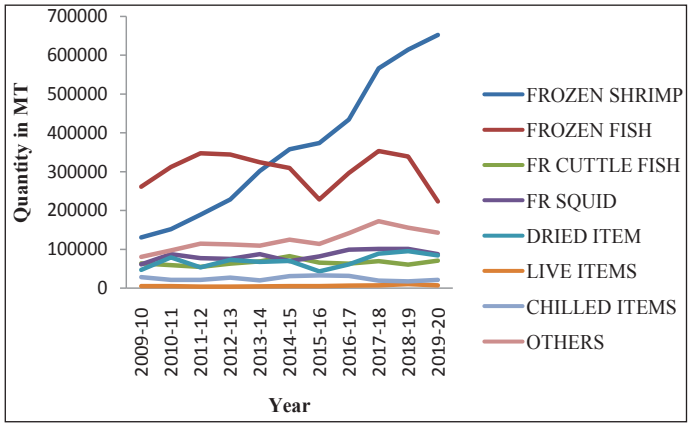

Fig. 5: Product wise export performance from India (2009-10 to 2019-20)

Fig.2 shows the trend in the export quantity over the year. The export quantity of frozen shrimp has increased from 130533 MT in 2009-10 to 652253 MT in 2019-20. Frozen fish export has increased from 260979 MT in 2009-10 to 223318 MT in 2019-20. The export trends of all the other marine products are stable in export over the years. India's marine exports were mainly dependent on the performance of shrimp (black tiger prawn) throughout the 1970s and 1980s (Das, 2007).

(vii) Product wise growth analysis

The growth rate of total marine products found positive and significant at one per cent level. Table 4 shows the product wise growth rate of quantity from India.

Table 4: Growth Analysis (Product wise)

Sl. No.	Product	CGR (%)	SE
1	Frozen shrimp	17.82***	0.008
2	Frozen fish	-2.17*	0.017
3	Frozen Cuttle Fish	1.39*	0.012
4	Frozen Squid	2.37**	0.012
5	Dried Items	2.94*	0.026
6	Live Items	7.82***	0.016
7	Chilled Items	-0.9*	0.027
8	Others	5.22**	0.010
9	Total	6.12***	0.008

Note: ****, ** and * indicate significance at 1 %, 5 % and 10 % levels, respectively.*

The value of frozen shrimp found positive and significant at one per cent level. In case of frozen fish the value found negative but significant at 10 per cent level. The growth rates of all the other products were found positive except chilled items.

(viii) Coefficient of variation in product wise export from India (2009-10 to 2019-20)

The CV is the ratio between standard deviation and mean. It shows the dispersion of data points around the mean. The results of coefficient of variation in product wise export are shown in table 5.

Table 5: CV in product wise export

Sl. No.	Product	Mean	SD	CV
1	Frozen Shrimp	363584.8	185487.5	51.01
2	Frozen Fish	303552.5	46558.12	15.33
3	Frozen Cuttle Fish	65525	7316.672	11.16
4	Frozen Squid	84498.55	12988.04	15.37
5	Dried Items	69484.73	16983.26	24.44
6	Live Items	6048.727	1697.036	28.05
7	Chilled Items	24737.73	5770.685	23.32
8	Others	124118.5	26714.03	21.52
9	Total	1041551	234068.5	22.47

From the table 5 we can conclude that coefficient of variation is high in Frozen shrimp (51.01 %), since, export quantity of frozen shrimp has increased from 130533 MT in 2009-10 to 652253 MT in 2019-20. The coefficient of variation for total marine products export is 22.47 %.

(ix) Market wise export from India (2019-20)

India export fish and fish products to majority of the countries in the world. Fig. 6 indicates the market share of Indian marine products among the world.

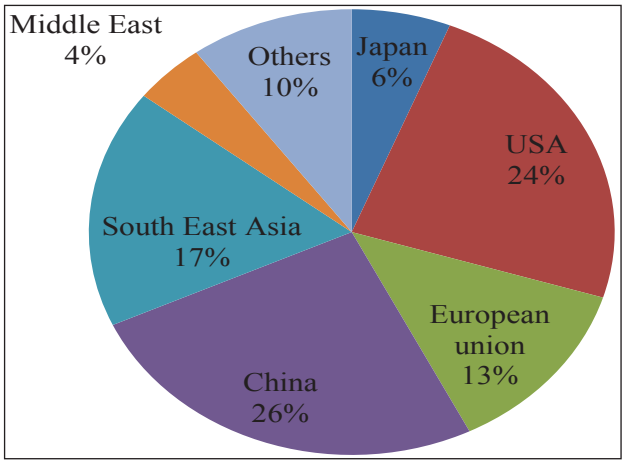

Fig. 6: Market wise share of marine products from India (2019-20)

Fig. 6, shows the market wise share of marine products from India. India export 26% of the marine products to China, followed by 24 % to United States of America, 17 % to South East Asia and 13 % to European countries. In the late 1970s and early 1980s, when the Indian exports of marine products majorly comprised dried items, including dried fish, dried shrimp, shark fins and fish maws, the export markets were confined to Singapore, Sri Lanka and Myanmar to a great extent (Kumar, 2004 and Das *et al*. 2016). Subsequently, as the canned and frozen items assumed prominence in developed nations including Japan, USA, Canada and European Union became considerable importers.

(x) Trend in market wise export from India (2009-10 to 2019-20)

The trend in the market wise export from India is detailed below;

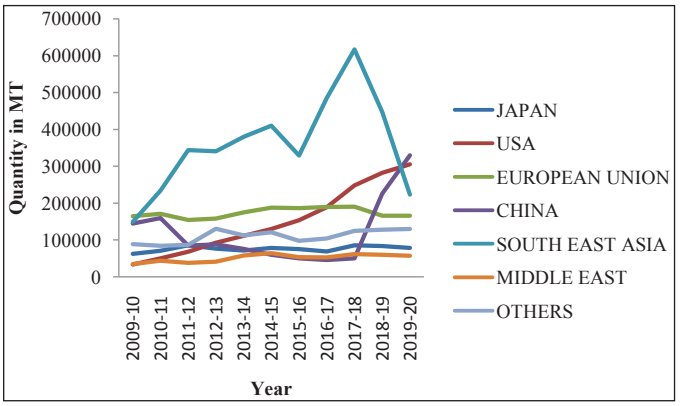

Fig. 7: Market wise export performance over the year from India (2009-10 to 2019-20)

Fig. 7 indicates the market-wise share of India from 2009-10 to2 019-20. USA, China and South East Asia were the major importers of Indian marine products. The export trend to all other countries remains stable.

(xi) Market wise growth analysis

The growth rate of total market wise export performance of marine products found positive and significant at one per cent level. Table 6 shows the product wise export growth rate from India.

Table 6: Growth Analysis (market wise)

Sl. No.	Market	CGR (%)	SE
1	Japan	1.517*	0.008
2	USA	23.09***	0.011
3	European Union	0.875***	0.007

4	China	2.018*	0.066
5	South East Asia	6.486**	0.034
6	Middle East Asia	5.250***	0.012
7	Others	3.764*	0.011
8	Total	6.698***	0.007

*Note: ***, ** and * indicate significance at 1 %, 5 % and 10 % levels, respectively.*

The growth rate value of USA, European Union and Middle East Asia found positive and significant at one per cent level. Except others in table 6 all the other values found positive and significant at 5 per cent level.

(xii) Coefficient of variation in market wise export

The results of coefficient of variation in market wise export are shown in table 7.

Table 7: CV in product wise export

Sl. No.	Market	Mean	SD	CV
1	Japan	76252.68	7365.212	9.65
2	USA	151097.3	93820.18	62.09
3	European Union	173536.2	13163.75	7.5
4	China	119201.2	89686.66	75.23
5	South East Asia	359909.3	131317	36.48
6	Middle East Asia	51620.74	10294.46	19.94
7	Others	109933.1	18229.16	16.58
8	Total	1041551	234068.4	22.47

From the table 7, coefficient of variation is high in exporting marine products to China (75.23 %) and USA (62.09 %). India exports majority of the marine products to USA, China and South East Asia. The coefficient of variation for total market wise marine products export is 22.47 %.

(xiii) Export performance of Indian states

In India, the state Andhra Pradesh stands first in inland production with 36.1 lakh tonnes Gujarat leads in marine production with 7.01 lakh tonnes during 2019-20.

From the Fig. 8, it can be noticed that the export trend of Andhra Pradesh is increasing over the years followed by Tamil Nadu, West Bengal, Maharashtra and Kerala.

The export performance of all the selected states shows the increasing trend whereas, Andhra Pradesh shows stands high.

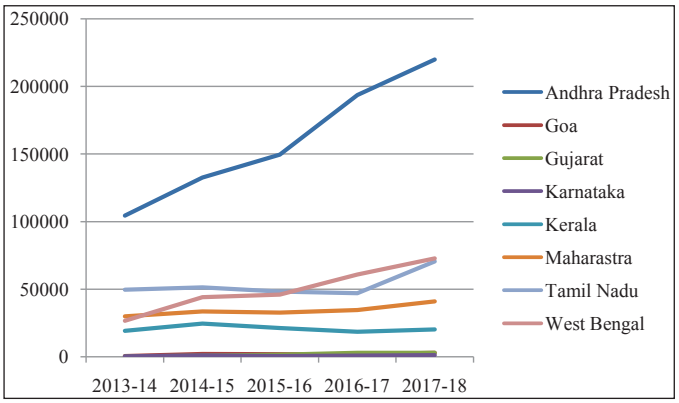

Fig. 8: Trend of Indian states in export over the years

CONCLUSION AND POLICY RECOMMENDATION

The Indian seafood industry is a well growing industry. India stands 6th in marine capture production among all the countries and it contributes 4 per cent to the total marine capture production. The fish production over the period from 1980-81 to 2019-20 have increased from 24.42 lakh tonnes to 104.37 lakh tonnes respectively. The frozen shrimp and the frozen fish are the major exportable products from India, which shares 51 per cent and 17 per cent of the total marine exports from India respectively. The export of frozen shrimp and frozen fish shows the increasing trend. India exports 26 per cent of the fish and fish products to China followed by 24 per cent to United States of America, South East Asia and European countries of its total exports.

Thus the performance of Indian fisheries sector is improved over the years, there is a potential to increase the performance of marine products industry in India. Mobilize resources and more numbers of capacity building programmes to the fishers and fish farmers will increase the production percentage. The inland production of fish may increase through providing more subsidies to the fish producing farmers. It will increase the production and fill the supply-demand gap. To increase the export the trade barriers may get relaxed up to certain level and therefore the export may increase

or the export procedures may get loosen up for the countries where the export value is high. Frozen shrimp and frozen fish are the major exported items from India and hence the production should be increased. The possibility of value addition in marine products will increase the export performance. Also it is necessary to assess the stock level and to develop new fish catching mechanisms to retain the fish stocks at sustainable level. Recognize and improve the role of women in fish culture, strengthen participatory approaches and other developmental programmes will empower the fisheries community. Thus, by focusing more on fisheries sector and through implementation of various schemes, the sector can grow tremendously, contributes more to Indian economy and providing employment to millions of people and it will ensure food security.

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