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Indian Seafood Trade - Reflections and Perspectives

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Introduction

Fish and fishery products are highly traded commodities, and nearly 40 % of the global fish production goes for international trade. There was a tremendous increase in the international trade of fish and fish products consequent to structural changes in the fishery sector contributed by technological innovations in harvest and post-harvest sectors, trade liberalization policies and increase in consumption. The advanced technologies for processing, packaging, storage, transportation coupled with substantial reductions in freight charges has promoted the international trade of new product forms and entry of new producers and traders to the global market. In 2009, trade in fish and fishery products represented about 12 percent of total

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agricultural exports (FAO,2010). Apart from providing foreign exchange earnings, fish and fish products trade is a significant contributor to the economy of developing countries through generation of employment in the secondary and tertiary sectors. In 2010, 75 percent of the value of fishery exports from developing countries were destined towards developed countries. A growing share of these exports consisted of processed fishery products prepared from imports of unprocessed fish to use as raw material for further processing. The developed countries thus gain comparative advantage in trade by way of utilizing the cheap raw materials and labour available in developing countries.

India plays a major role among the Asian countries, in the global seafood export. The marine products exports from India reached 8 lakh tones, worth 2.8 billion US \$ in 2010-11 and has registered an impressive double digit growth rate since 2007-08. India exports frozen shrimp, squids and finfish in dried, live and chilled forms to different destinations. With the current demand pattern of major seafood markets and with modern machinery for freezing and processing, several exporting firms have started development and exports of processed value added products. Among the different items exported, frozen shrimp and frozen finfish accounted for about 75 % of the total volume of sea food exports from India. Even though frozen shrimp contributed only 19.24 % of the total volume of seafood exports, its share in the total value was 41.62 % in 2010-11. Frozen fish occupies prime position in terms of quantity, however its share in the total value is only 20.38 % showing low unit value realization (Rs. 84.16 per kg) (MPEDA, 2011). The seafood export trade performed well in the past decades amidst

stringent trade liberalization measures and economic recession which affected many Indian buyer countries. In India, storage, processing and transport, grading and quality control facilities are mostly oriented towards the export market, even though more than 80 % of the fish production is channeled in the domestic markets. Seafood trade influences the domestic markets significantly by way of affecting the supply-demand situation of many high valued fishes, competition for small scale traders and rise in prices in the domestic markets.

The sector is poised for a robust growth of one million tonnes and an anticipated forex earning of 4 billion dollars during 2011-12 .This assumes significance during the period of continued recession among the major buyers. The major buyers including the US, EU and Japan are affected with severe recession related economic indicators like lack of investment, lower purchasing power, acute unemployment etc. Amidst the impressive performances, the export sector is grappling with demand and supply-side constraints. The export sector is facing constraints on account of timely availability of raw material, low capacity utilization; high cost of production on account of heavy price of raw materials, high cost of compliance for meeting the quality standard of the buyer countries, incidence of alert and rejections and continued trade impediments.

On the brighter side, there exists a huge domestic demand evident from the high domestic prices and consumer's preferences towards fish and fish related products. The export markets are buyer driven with buyers being the 'price makers'. In the context of numerous trade limiting impediments and stringent quality control,

the continued spurt in domestic demand would definitely increase the options available with the exporters to harness on added revenue, with minimal transaction cost.

This paper focuses on analyzing the seafood trade in terms of performance and highlights the various bottlenecks facing the sector. This paper also suggests a roadmap for the future, through an efficient value-chain model.

Data and Methodology

SWOL Analysis

SWOL analysis (Strengths, Weaknesses, Opportunities and Limitations) was done to assess the strengths, weaknesses, opportunities and limitations of fisheries trade in India which would give the present status and help in the prediction of the future potentials of fisheries trade. The SWOL ultimately helps in the enhancement of trade domains and to exploit diversified

commodities and with newer trade partners. The Strengths and weaknesses are inherent to the system and showcase the present state of affairs whereas the opportunities and limitations highlight the future. The SWOL analysis is very important to upgrade the capacity of the export trade sector, since it helps in problem identification, planning, decision making, appropriate technology implementation, precautionary measures for accelerating fish production at sustainable level etc. It is also very important for improving, upgrading and revamping the fish trade scenario, since it helps in problem identification, planning, decision making, adoption of appropriate technologies and developing measures for long term sustenance of the sector

Different types of data consisting of time series data for marine product exports collected from MPEDA, cross sectional data on exporter's responses and panel data for domestic prices of marine fishes were collected. Appropriate econometric tools were employed to substantiate the results.

<u>Strengths</u>	<u>Weakness</u>
<ul style="list-style-type: none"> (I) Resource abundance / endowment (ii) Increased commodity diversification (iii) Improved geographic concentrations (iv) Strong institutional support and linkages 	<ul style="list-style-type: none"> (I) Exorbitant cost of production (ii) Low capacity utilization (iii) Constraints in value addition (iv) Deficiencies in the value chain constituents
<u>Opportunities</u>	<u>Limitations</u>
<ul style="list-style-type: none"> (i) Emergence of candidate species (ii) Augmented domestic market (iii) Changed world economic order (iv) Ecolabelling and certification 	<ul style="list-style-type: none"> (i) Unsustainable fishing practices (ii) Technological constraints in aquaculture (iii) Continued trade impediments (iv) Poor market information system

Reflections and Perspectives :

The reflections and perspectives under the SWOL framework is discussed under the following heads. The strengths, weaknesses, opportunities and limitations of fish trade in India based on various econometric analysis and observations are discussed in this section.

A. Strengths

i) Resource abundance /endowment

India possesses abundant and varied

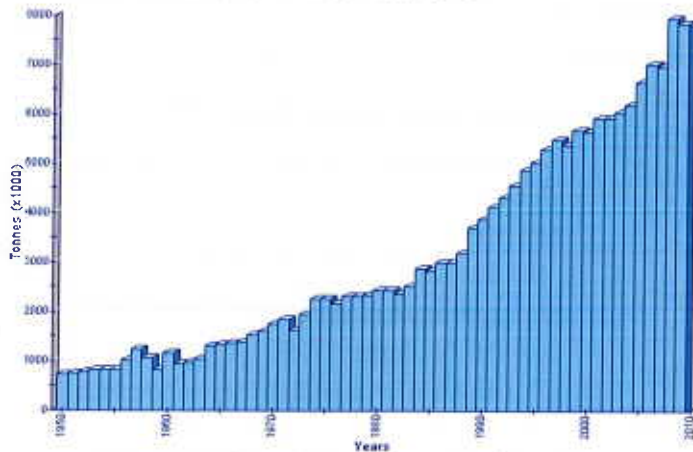


Figure 1. Fish production in India (1950-2010)

resources both in marine and inland sectors. The fish production in the country has increased from 0.75 million tonnes (1950-51) to 7.85 million tonnes (2010-11) with increase in production of cultured fish and shrimps (Figure 1). The marine fisheries sector indicates a tropical environment with multi-species, multi-gear fishery. The marine fisheries landings increased from 3.73 lakh tonnes in 1947-48 to 3.32 million tonnes

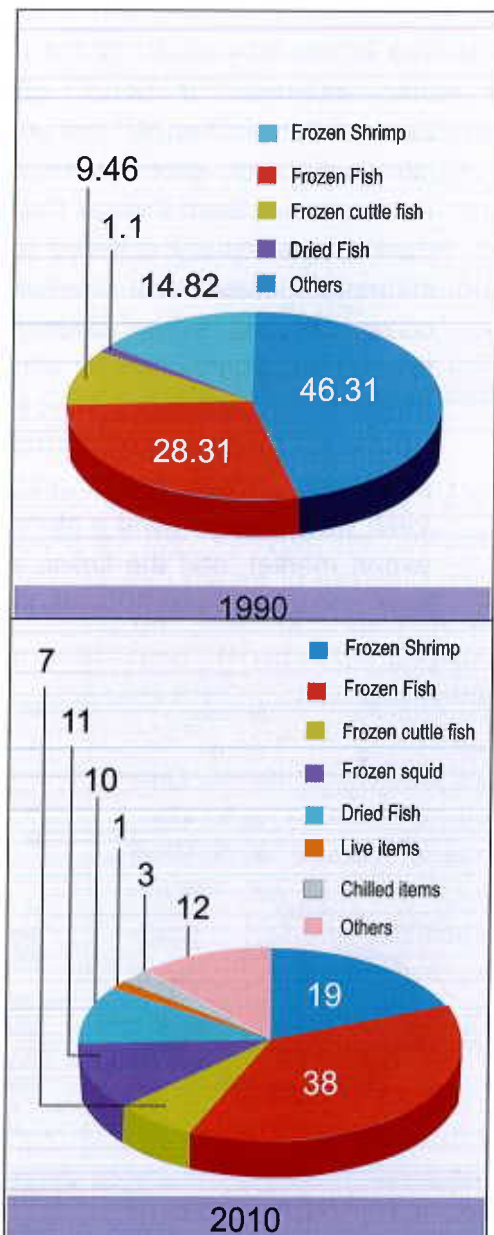
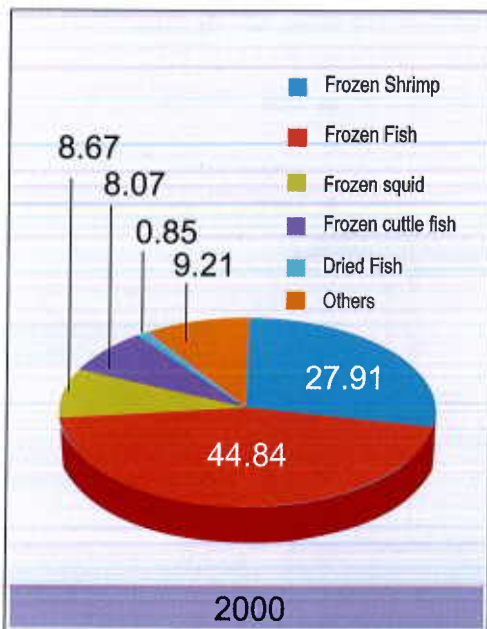


Figure 2. Commodity diversification for Indian exports



in 2010 .The contribution analysis of the landings indicated that the west coast contributed 67% and the east coast, 33%. The contribution from the four regions indicated that the northeast contributed 11.4%, southeast 22%, southwest 35.2% and northwest, 31.4%. The species-wise contribution indicated that the pelagic finfishes constituted 55% followed by demersals (26%) , crustaceans (15%) and molluscans (4%).

The aquaculture sector of the country also witnessed a boom with the increased production of P.monodon and introduction of exotic species like P.vannamei. Even though the export market was initially oriented towards shrimps, lobsters and cephalopods, commodity and market diversification opened up opportunities for exports of finfishes. Groupers, mackerels, tunnies, barracudas, pomfrets, seerfishes, ribbon fishes and other fresh water fishes found a place in the export market, and the finfish exports now occupy around 40% of the total

export volume. Expansion of fishing grounds with advancements in harvest technologies and possible fishing down the web led to the capture and marketing of new varieties like puffer fish (Lagocephalus inermis), yellow-fin tuna and some varieties of sharks with good export potential.

ii. Increased commodity diversification

The one country- one product misnomer no more exists with the Indian seafood export, which has been the single largest factor contributing to the augmented export earnings .The increased commodity diversification has been one of the major strength achieved over the years. The decadal commodity diversification analysis was done for 1990, 2000 and 2010 (Figure 2) .The results indicated that the share of frozen shrimp declined from 46 % to 19 % during 1990-2010, whereas, the share of frozen fish increased from 28 % to 45 % during 1990-2000 and then declined to 38 % in 2010. The live and chilled items also found a place in the

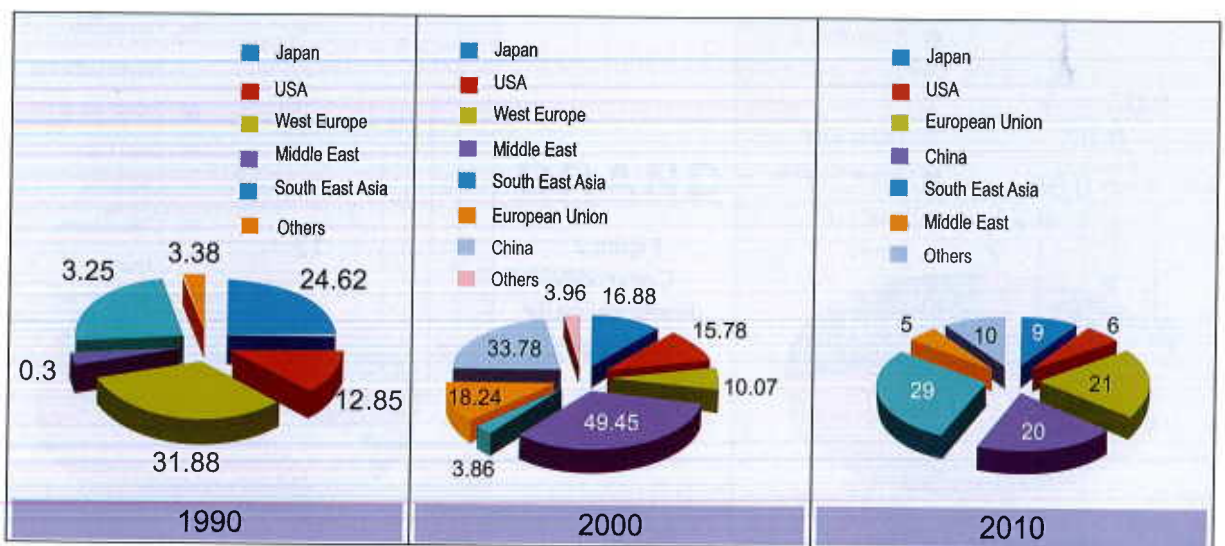


Figure . 3. Geographic diversification for Indian exports

export basket in the past decade. The disaggregated analysis of the commodity diversification also indicated that the number of species/product/form under each commodity also improved considerably, thereby reducing the pressure of meeting the buyers' requirements.

(iii) Improved Geographic concentrations

Indian seafood products had wide spread acceptance in many of the countries like EU, US, China and other countries. Japan, USA and European Union or Western Europe were the major fish importers from India, which accounted for about 60 to 65 % of the volume and about 70-75 % in value of Indian seafood exports. Strict quality regulations imposed by the US and the EU, and commodity diversification with finfish and other value added products led to geographic diversification, and market opportunities emerged in countries like Middle East, China and South East Asian countries. Even though geographic diversification emerged in countries in the middle-east and China, with the strict quality regulations in US or EU, they still

account for a major share (70-75%) in the foreign exchange earned through our export.

Decadal geographic diversification analysis was done for 1990, 2000 and 2010 (Figure 3), and the results indicated that the share of European countries in the total volume of trade declined from 32 % in 1990 to 10 % in 2000, and again increased to 21 % in 2010. The share of Middle East countries increased from 4 % to 49 % during 1990-2000 and then declined to 20 % in 2010. The share of US declined from 12 to 6 % and that of Japan from 24 % to 9 % during 1990-2010 period. The improved geographic concentration offers better competitiveness for Indian seafood exports and opportunities to thrive under changed economic environments in buyer countries.

iv) Strong institutional support and linkages

Indian seafood industry is well supported by various institutional agencies with regard to technological, marketing and financial requirements. The Marine Products Export Development Authority (MPEDA) is the nodal agency in promoting seafood exports through various activities like

registration of infrastructure facilities for seafood export trade, collection and dissemination of trade information, projection of Indian marine products in overseas markets through participation in overseas fairs and organizing international seafood fairs in India, promotion of



DOF Figure 4. Institutional supports and Linkages developed

aquaculture for production of shrimp and prawn for export, promotion of value added seafoods and promotion of tuna fishery. In addition, it also undertakes various development measures like distribution of insulated fish boxes, putting up fish landing platforms, improvement of peeling sheds, modernization of industry such as upgrading of plate freezers, installation of IQF machinery, generator sets, ice making machineries, quality control laboratory etc., for ensuring better quality products in the export markets. The Marine Fishing Regulation Act, the Aquaculture Authority Act and several other legislations in the country have supported the seafood export industry by way of promoting sustainable fish production. The Coastal Aquaculture Authority (CAA) has recently granted permission for the culture of specific pathogen free (SPF) *L. vannamei*, which is expected give an impetus to the aquaculture sector in the country in the near future.

In addition, the country has a wide network of research and development organizations which contribute significantly for the progress of the sector.

B. Weaknesses

(i) High cost of production

There exists severe paucity of raw material due to depleted landings in marine sector and disease incidence in culture sector. The major exportable species like shrimps, lobsters and high value fishes registered a downward trend in landings over the years. There

has also been a significant reduction in shrimp production due to disease outbreak and huge cost of shrimp farming. The reduction in landings coupled with geographical separation of landings often results in irregular supply of raw material, thereby resulting in non-realization of economies of scale to the different exporters. In addition, the seasonal variations in marine catches constrain the operations of the firms. During lean seasons, majority of the firms face shortage of raw materials resulting in low capacity utilization. The bigger firms either having access to backward integration or owning fishing vessels may operate to some extent, but the smaller firms either lay idle or limit their operations. The peak landings in the marine capture sector generally coincide with the peak season for exports. More than 60 % of the landings occur during the post-monsoon period which coincides with the highest export demand. Thus to restore parity between the demand and the supply, the raw materials are often purchased at exorbitant prices even by forward-marketing with the boat owners. There can be chances of deterioration in quality due to non-availability and that too, at affordable prices.

The increasing demand for fish in the domestic market as a result of population and percapita income growth-rates pushed up prices of many of the exportable fish varieties. The high purchase prices of the exportable species and other operating expenses like labour cost, water and electricity charges caused the cost of production to increase at exorbitant levels. In addition, the high cost of compliance for

EU approval, high cost incurred for purchase at distant markets, establishment cost, etc., resulted in higher unit cost of production and lower profit margins. The establishment cost of a processing plant increased considerably over the years due to stringent quality standards set by international trade regulations. The compliance cost for EU approval also increased manifold, thus resulting in huge cost of establishment. The overall compliance cost for meeting the EU norms has been estimated at 15 to 40 % of the FOB value. Often, the cost of investment is so huge that the breakevens aren't even attained after a decade of continuance in business. The analysis of the short-run and long-run gains on the SPS and compliance measures by the exporter's indicated that with the huge cost of investment required for the compliance of EU approval and HACCP implementation, the gains weren't significant due to non-capacity utilization of the processing plant and lack of raw materials. The processing plants which have implemented the compliance requirements for the EU approval are yet to break even, their cost of investment even after 8 -10 years on account of processing capacity utilization to the tune of 22-25 %.

There exists uncertainty in prices in the international market, with the economic recession spreading to most of the target markets. The price uncertainties lead to delay in payments, loss in revenue and delay in realizing new markets. The uncertainty in prices often lead to additional cost of storage and the material getting delayed in shipment

and increased demurrages. In addition, ecolabelling and other private standards by international retailers for environmental and social purposes also result in high costs and low margins.

ii. Low capacity utilization

Realization of capacity utilization of processing / exporting units was the major problem faced by many of the exporters. The reduction in landings coupled with geographical separation of landings often results in irregular supply of raw material and poor capacity utilization. In addition, seasonal variations in marine catches constrain the operations of the firms. During lean seasons, majority of the firms face shortage of raw materials resulting in low capacity utilization. The bigger firms either having access to backward integration or owning fishing vessels may operate to some extent, but the smaller firms either lay idle or limit their operations. The average capacity of processing plants was found to be 32.12 tonnes, whereas the utilization was only 12.10 tonnes (37.7%). Analysis for the capacity utilization across different quarters showed that during the period from October - December months it was 30.39%, followed by January- March at 28.29%. The processing plants processed minimal quantities during July-August and April-June. The average quantum of marine fish products processed per processing plant was found to be 2,781.70 tonnes per annum.

iii. Deficiencies in the value chain constituents

Absence of quality control at primary

production centres (landing centres) often result in poor quality of the products. Even though there occurred drastic changes in the marine fishing sector with advancements in harvest technologies, the facilities for onboard storage, freezing or processing are still lacking. In addition, many of our landing centers lack basic amenities including hygienic auctioning platforms, quality ice and packaging material. The quality deterioration and discard losses hinder our exports through reduced supply of raw materials.

Even though our export supply chain is well developed with good storage, processing and transport infrastructure when compared to the domestic marketing system, it is nowhere comparable with that of developed countries. The imports of fishes from other countries and re-exports which was a viable option for the exporting firms to realize capacity utilization couldn't gain momentum in the Indian seafood export industry, due to import restrictions for many of the items and other factors limiting the imports. The freezing and cold storage facilities available at present in the country is not sufficient for promoting large-scale imports. There are other limitations like high cost of imports and distance of

warehouses from ports, which restricts imports.

(i) Constraints in value addition

The international trade scenario is changing fast and the importers are insisting on stringent quality standards and newer types of value added and ready-to-eat products. Introduction of diversified seafood products in the export front has improved product acceptance and better unit value realization. A variety of value-added products such as fish balls, soup powder, fish cutlet, fish finger, fish flakes, fillet and fillet blocks, fish steaks, ready to serve fish curry, minced meat, surimi and extruded products, fish sauce and fish salad, IQF and AFD products and coated seafood products are now exported from the country. There is need for new innovative products catering to the demands of the domestic as well as overseas consumers, to boost our seafood trade and enhance earnings. In India, about 80 % of the catch is now utilized as fresh or chilled, 6 % as dried or cured, 4.7 % for fish meal preparation and 5.3 % for freezing and export (Ministry of Food Processing Industries, www.mospi.in). In addition, there is scope for production of a number of marine byproducts with pharmaceutical or industrial uses, which could fetch very high prices in the overseas markets. However, the potential for value-added and marine by-products is not fully utilized in the country, even though it is endowed with abundant cheap resources, labour and infrastructural facilities. There is need for development and promotion of value added products and marine by-

A Snap Shot on the Capacity Utilisation

- Average capacity - 32.12 tonnes/day
- Average capacity - 12.10 tonnes (37.7 %) utilization
- Average Quantity processed- 2781.70 tonnes
- The average number of processing days - 230 days per annum.
- Peak Operations - October to December (30.39) January- March (28.29)

products to enhance our export earnings. Even though the share of value added and marine byproducts in the total export increased over the years, the decadal average shows a meager ten percent share in the total volume of sea food exports. However, the last three years showed significant share of around 12.5 %.

Opportunities

i. Emergence of candidate species

Indian seafood sector has better opportunities with capture and trade of candidate species like puffer fish, yellow-fin tuna and certain species of sharks having good export demand. Puffer fish, which was a menace to the gears was identified as a delicacy in the far-east, fetching around a couple of dollars per kg. The success in mariculture technologies for export-oriented varieties like Cobia (*Rachycentron* sp), lobsters and open sea-cage farming offer vast scope for augmenting fish production in the future. In addition, the aquaculture sector of the country is also witnessing

a boom, with the introduction of exotic species *L. vannamei* in the culture system, which yields better returns. Enhancing production of *L. vannamei*, which is a preferred item in the European markets, may improve the performance of the seafood export industry, which suffers setback from reduction in capture and culture based shrimps. White shrimps yields better returns with per hectare production of up to 20 tonnes/ha when compared to 2-3 tonnes/ha for black tiger shrimp. The culture duration is 3 months only as compared to the duration of 5 months of tiger shrimps and yields better returns under intensive and semi-intensive farming.

ii. Augmented Domestic market

The domestic fish market is growing in leaps and bounds with population and percapita income growth rates, changes in food habits, increasing awareness on nutritional qualities of fish, improvements in transport, storage and processing facilities and access to quality fish. The exports of high value fishes like seerfishes and pomfrets declined even with increase in landings and it shows the competitiveness of the domestic market and affordability of these fishes to affluent domestic consumers. Analysis of price changes in the past decade showed that for many of the high value fishes, the price increase in the domestic market was more than that of the export market. The strong domestic market offer promising scope for the export sector in the country by utilizing the existing infrastructural facilities for developing products suited for the domestic sector

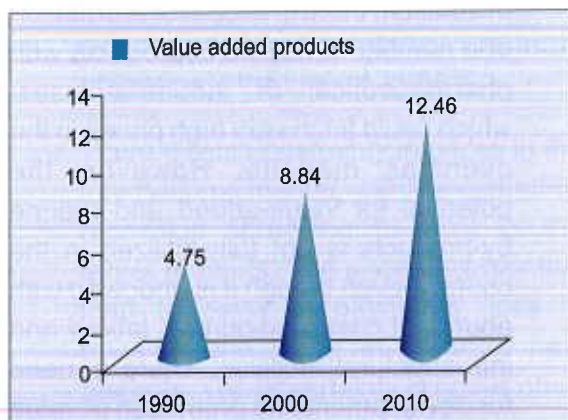


Figure 5. Share of value added items in total fish exports

and achieving economies of scale. In addition, the increase in the prices of the high value exportable finfish species like pomfrets, seerfishes, tuna, ribbon fishes and snappers in the domestic market was very much higher than that of the export market. The average retail price realised per kg for seer fishes and pomfrets were even higher than that of the unit value realised in the export market indicating the competitiveness of the domestic market (Table 1). The augmented domestic market offer promising scope for the export sector to develop quality products which cater to the needs of the domestic consumers by utilizing their existing capacity.

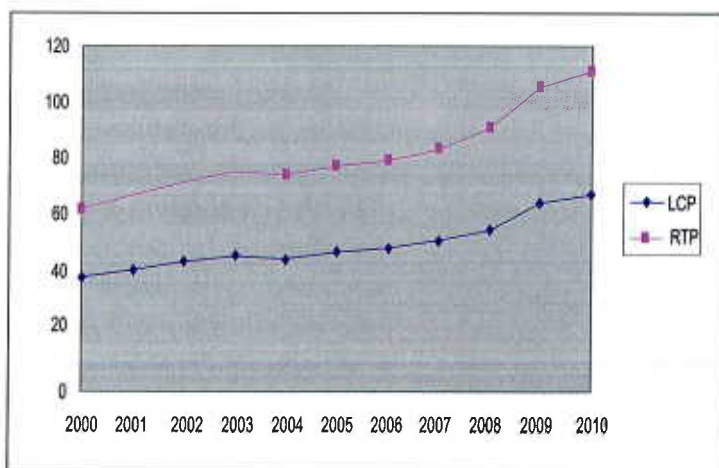


Figure 6. Growth in domestic marine fish prices at first and last sales(2000-10)

iii. Changed world economic order :Trade agreements like SAPTA and ASEAN and global recession

Indian seafood export sector performed well under the changed world trade scenario with new free trade agreements like ASEAN and SAPTA and under global economic recession, which is evidenced by the marked increase in quantity, value and unit value realized during the period 2007-11.

ASEAN with 600 million people against India's billion plus presents a substantial opportunity for Indian exporters and businessmen. The ASEAN free trade will provide an

opportunity to reap in the export economies of scale through the timely and incessant availability of raw materials, thereby increase export domain and the realm of operations. The ASEAN provides additional market access to Indian exporters and opportunities for new investment. In addition, the expected increased volume of trade will provide gainful direct and indirect employment in the sector. There also exist

Name of fish	Export price			Domestic price		
	1997-98	2007-08	% increase	1997-98	2007-08	% increase
Ribbon Fish	27	52	92.59	16	50	212.5
Pomfrets	172	228	32.56	120	248	106.67
Tuna 38	58	52.63	25	49	96	
Mackerel	40	64	59.1	30	59	96.67
Sardine	34	21	-38.5	25	42	68
Seerfish	67	133	98.51	73	265	263.01
Snappers	51	132	159.14	38	62	63.16

Table 1. Comparative analysis on the Export and Domestic price of exportable varieties/ species

possibilities of outsourcing products from overseas at competitive prices from the ASEAN members. In the short run due to competitiveness, processors will start to strengthen their plants by producing value added products and improve quality for their products. The results of impact analysis from exporters and processors are presented in Table 2 and 3.

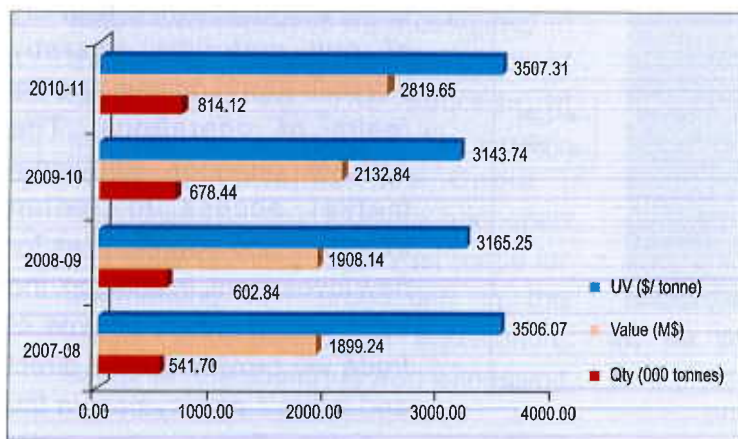
45 exporters out of 50 (90%) opined that there would be more export economics of scale due to free trade agreement. 89% of exporters agreed that free trade agreement leads to timely and incessant availability of raw materials. 75% of exporters felt that free trade agreement would increase export

domain and realm of operations related to fish exports.(Table 2)

The impact study of processors revealed that there would be higher capacity utilization of processing plants due to free trade agreement.(92%) and 85% of the processors agreed that there would be more economics of scale. 75% of (37 processors) opined that free trade agreement leads to direct and indirect employment in the sector. (Table 3)

iv. Ecolabelling and certification

The sustainable fishery management certification, labelling of fish and sea food products, allowing consumers to use their choice and buying power to select eco-labelled products are innovative approaches necessary for the marine fishing industry to survive in the future. These arrangements will provide a driver for generating a market incentive for the products. An “ecolabel” is a label which identifies overall environmental preference of a product or service within a specific product / service category based on life cycle considerations. The International Organization for



7. Performance of the seafood exports during 2007-2011

Impact factors	Response (Per cent)
1.Reaping export economics of scale	45 (90)
2.Increase export domain and realm of operations	37 (75)
3.Timely and incessant availability of raw materials	44 (89)
4.Additional market access to Indian exporters	28 (56)
5.Opportunities for new investment	15 (30)
6.Providing gainful employment 1 tonne – 200 mandays	33 (65)

Table 2. Impact analysis of fish exporters

Standardization (ISO) has identified three broad categories of Voluntary Environmental Performance Labels, with Ecolabelling fitting under the Type-I designation. Type-I clarified environmental labels as a voluntary, multiple criteria based, third party programme that awards a license that authorizes the use of environmental labels on products indicating overall environmental preferability of a product within a particular product category based on life-cycle considerations. Ecolabelling although has not yet become an established trade measure, may impact Indian seafood trade in the near future with consumer preference and better prices in overseas markets. Indian fish production and trade sectors may be able to reap the benefits with ecolabelling gaining importance in the international trade arena due to its subsistence nature and ecosystem conservation measures.

Country Of Origin (COO) is the country of manufacture, production or growth where an article or product comes from. From a marketing perspective, country of origin is a way to differentiate the product from the competitors. The country of origin has an impact on consumers' quality perceptions of a

product, as well as the ultimate preference for and willingness to buy that product. The concept of country of origin had been a long pending boon for the Indian fisheries products. There occurs significant re-exports from southeast Asian countries and China into the US and European markets. The country of origin clause and the catch certificate indicating the region from where it is being caught will potentially benefit the Indian products in the international market.

Limitations

(i) *Unsustainable fishing practices*

Even though our capture fisheries production has increased over the years, over-exploitation and targeted fishing led to declining catch trends in most of the west coast states like Maharashtra and Gujarat and stagnating catch-levels of resources in Kerala. The increased export demand led to the targeted fishing of varieties like shrimps, cephalopods, pomfrets, etc., and decline in their landings. In addition, destructive fishing methods like trawling and use of engines with huge capacities contributed to the depletion in the stock of certain resources. In addition, losses due to by-

	Impact factors	Per cent response
1.	Higher capacity utilization of processing plants	46 (92)
2.	Economics of scale	43 (85)
3.	Outsource products from overseas at competitive prices from the ASEAN members	26 (53)
4.	Direct and indirect employment in sector	37 (75)
5.	Due to competitiveness, processors will start to strengthen their plants by producing value added products and improve quality for their products	25 (50)

Table 3. Impact analysis of fish processors

catch, discards and juvenile fishing are other major factors limiting the sustainability of fish production in the country. Eventhough the situation has not reached an alarming level, unless the fishery is conserved by following responsible fishing practices, it will become a serious threat to the fish production and trade in the country.

(ii) Technological constraints in aquaculture/mariculture

Even though the aquaculture sector is expecting a boom, with the introduction of disease tolerant vannamei, it also faces several technological constraints like deficiency in supply of quality seeds, lack of expertise in hatchery and farming practices, shortage and high cost of labour, costs for pollution abatement and other environmental requirements, social risks and market failure. In the mariculture sector also, there are several limitations like absence of proper water leasing policies in most of the states, suitability to different locations, shortage of trained manpower, risks due to environmental variations and climate change, poaching and huge investment costs.

(iii) Continued trade impediments

The stringent measures set by WTO and also by private retailers in the international market for social and environmental purposes like protection of labour rights, elimination of child labour, environmental pollution, ecosystem/resource conservation etc., affect our seafood trade in the future which may require re-orientation of our capture and culture fisheries production

and trade sectors through macro level policies. In addition, the implementation of IUU Regulations may adversely affect our exports from capture fisheries sector at least in the short-run, because of it being open access and unregulated. Uncertainty in prices in the international market with economic recession spreading to most of the target markets lead to delay in payments, loss in revenue and delay in realizing new markets. The uncertainties in prices often lead to additional cost of storage and delayed shipments and increased demurrages.

There is widespread concern in exporting countries about the impact of the new traceability requirements introduced in 2010 in major markets to prevent illegal, unreported and Unregulated (IUU) fishing. The FAO Conference of the Agreement on Port State Measures also has given approval to prevent, deter and eliminate IUU fishing. This has got serious implication in the Indian seafood trade, as the marine capture fishery in the country is primarily open access and regulations exist only in the form of seasonal bans and mesh-size regulations. Elimination of IUU fishing requires imposing regulations in capture fisheries sector for product acceptance in global markets. Regulating the capture fisheries sector in the country is a difficult task and may raise several serious issues.

(iv) Poor market information systems

The lack of market and product information leads to demand and supply constraints. The taste and preference of the buyers are ever changing that it

becomes difficult to cope up with their demand. Often the demand for the product forms changes with income and seasons. On the supply side, the awareness on ecolabelling, catch-certificate and numerous trade regulations and quality standards become important. The lack of proper market intelligence and poor market news leads to lag in equipping the seafood traders. In addition, lack of proper forward and backward market linkages in both capture fisheries and aquaculture sectors affect the efficiency and viability of most of the exporting firms through low capacity utilization, high costs of procurement, storage, transport and processing.

Based on the SWOL analysis, the value chain interventions for profitable and sustainable seafood marketing is depicted in the flow diagram (Figure 8). The flow diagram indicates three levels of interventions viz., procurement of raw material, product development, and market capitalization. All these interventions require concerted efforts in the different constituents of the value chain. The value chain also suggests harnessing the potentials of the domestic markets on account of higher purchasing power and willingness to pay for some of the exportable species in the domestic market.

Conclusion

The marine products exports from India continue to surge up new heights, unabated by the global recession. During 2011-12, the quantum of exports surpassed 8.10 lakh tonnes with a forex earning of 2.85 billion dollar. The appreciation of the Indian rupee

hasn't really affected the export earnings. The reason for the sustained increase in exports is due to the demand for raw fish, rather than value-added products from the retail outlets, as the buyers opted for cheaper fish on account of lower income and increasing unemployment. Nevertheless, being a heavy export earner, the fisheries sector is facing numerous problems on account of economic shortcomings, technical constraints, institutional limitations, trade restrictions and marketing lacunae. Severe competition exists between the different competitors like Thailand, China and Southeast Asian countries, for sustaining the market share by product diversification. The seafood industry in many countries are undergoing a rapid change to process more and more "ready to cook" and "ready to eat" in convenient packs. India's predominant position in shrimp market is being eroded due to the sudden spurt in farmed shrimp production in China, Indonesia, Thailand, Vietnam etc. The problems were again complicated with the restriction placed by the USA through imposition of anti-dumping duties which has been discussed at length in the appellate body, but continues to haunt the export industry. Situations aren't rosy, with the European Union countries with changing quality standards, and cases of rejection and alerts. The SWOL analysis of the Indian export sector reveals that it had confronted the asymmetric trade opportunities impressively while competing in the world market commendably, and is poised for a million tonne export and four billion dollar revenue earnings in the near future .

