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## Indian Finfish Exports – An Analysis of Export Performance and Revealed Comparative Advantage<sup>1</sup>

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### Abstract

The export of finfish from India has been rising over the past few years and in 2006-07 it contributed almost 44 per cent of the total marine products exported from the country in quantity terms. However in value terms its contribution is only 16 per cent, indicating low unit value realization of the products. This paper has analysed the export performance and has studied the revealed comparative advantage of finfish export from India for the period 2001 to 2005. The finfish exports from India have not revealed any comparative advantage among the total marine products export in the period of study. The paper has suggested reviewing of the policy of finfish export, with a shift in emphasis to export of only high-value finfish and value-added low-value finfish.

### Introduction

Seafood export from India is an important component of its total agricultural export, with a contribution of 13.56 per cent in value terms, during the year 2006–07. The marine sector has been identified as a sunrise sector under the Special Focus Initiative of the Foreign Trade Policy of the Government of India (<http://dgft.gov.in>). Post-globalization, there are no quantitative restrictions and the export rules are very liberal. The product mix of India's seafood exports has been undergoing changes owing to the limitations in fish production and availability of raw material for processing as well as changed market perceptions. The quantitative domination of shrimp continued till the early-1990s. Although finfish export has been going on since 1970s in small quantities, the real surge came in the 1990s, almost parallel to the liberalization process and today, it is the largest single item exported among seafood products, contributing 44.19 per cent in terms of

quantity in 2006-07. However, shrimp continues to dominate the total value realization by the sector with a contribution of 53.88 per cent. Focus Product Schemes of the Foreign Trade Policy also encourage the export of value-added forms like fish fillets, loins, steaks, fish pickle, fish curry, breaded and prepared fish products, surimi analogues and canned tuna. Focus Market Scheme is aimed at different international markets with a view to enhance India's export competitiveness in selected countries.

While shrimp is high-value seafood even in the domestic market, finfishes fall within a broad spectrum of prices, domestically, from very high-value table varieties like seer and pomfret, to low value but popular food fishes like sardine and mackerel. Finfish is significant from the nutritional point of view, providing a source of cheap protein for the population, especially the coastal poor. In the year 2005, the estimated domestic demand was 6040 million kg (Mruthyunjaya, 2004) and it is likely to increase with the growing population as well as awareness about the importance of fish in human nutrition. This paper has analysed the export performance and comparative advantage of finfish exports from India.

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## Materials and Methods

The analysis is based on data of finfish export from India for the period 1991 to 2005 which has been compiled from published sources like the *Statistics of Marine Product Exports* of the Marine Products Export Development Authority (MPEDA), Ministry of Commerce and Industry, Government of India. Data on the export of different product groups has also been used for various comparative analyses. Total marine products export and import as well as product-wise export data with regard to India and world were compiled from the website of International Trade Centre-UNCTAD/WTO (<http://www.intracen.org>). Time series data on species-wise fish landings were collected from published data of the Central Marine Fisheries Research Institute, Cochin (Srinath *et al.*, 2006).

Indices were calculated for the period 2001–2005 to analyse the comparative advantage of Indian finfish exports. A modified version of the Balassa index of Revealed Comparative Advantage (RCA) was used for the study. In the Balassa index, a specific commodity in a particular country/ world is compared with the total export from the country/world (Balassa, 1965). In this study, the finfish export has been compared with the total marine products exports. Since the quantity of finfish export is increasing, the export advantage if any, was explored using the RCA index. RCA was calculated using Equation (1):

$$RCA = (x_{ij}/x_{wj})/(x_{it}/x_{wt}) \quad \dots(1)$$

where,

i = India,

j = Finfish,

w = World,

RCA = Revealed Comparative Advantage,

$x_{ij}$  = Export value of finfish (India),

$x_{wj}$  = Export value of finfish (world),

$x_{it}$  = Total marine products export (India), and

$x_{wt}$  = Total marine products export (world).

The RCA index greater than one reveals a comparative advantage of the country with respect to the particular product.

The export competitiveness of finfish was also analysed using the indices of competitiveness

formulated by Vollrath (Fertö and Hubbard, 2002). Besides using the exports as a factor, as in Balassa index, these indices have taken into consideration imports also. As for the RCA, these indices were worked out with reference to the total marine products export and import from India and world. The first index was the Relative Trade Advantage (RTA), which included both exports and imports and was the difference between Relative Export Advantage (RXA) and Relative Import Advantage (RMA). The RXA was the Revealed Comparative Advantage (RCA) using Balassa index, i.e.

$$RTA = RXA - RMA \quad \dots(2)$$

Here,  $RXA = RCA$  (or Balassa index)

and

$$RMA = (m_{ij}/m_{wj}) / (m_{it}/m_{wt})$$

where,

$m_{ij}$  = Import of finfish (India),

$m_{it}$  = Total marine products import (India),

$m_{wj}$  = Import of finfish (world), and

$m_{wt}$  = Total marine products import (world).

Thus,

$$RTA = \{(x_{ij}/x_{wj}) / (x_{it}/x_{wt})\} - \{(m_{ij}/m_{wj}) / (m_{it}/m_{wt})\} \quad \dots(3)$$

The second index was derived by taking the logarithm of Relative Export Advantage, i.e.  $\ln(RXA)$  and third index was the Revealed Competitiveness (RC) which was calculated as per Equation (4):

$$RC = \ln RXA - \ln RMA \quad \dots(4)$$

By expressing it in the logarithmic form, the indices become symmetric through their origin. A positive value of all the indices, i.e. RTA,  $\ln RXA$  and RC revealed a comparative advantage of the country with reference to the commodity.

To find out if there was any difference in comparative advantage with reference to various product groups, the analysis was also carried out for two product groups (PG) described below:

PG I: Chilled or frozen fish, fresh fish

PG II: Dried fish, salted or in brine, smoked fish, flours, meals and pellets of fish

To analyse if the exports of any particular species or species group had any comparative advantage, RCA for some selected products was also calculated.

## Results and Discussion

Out of the total marine fish landings of 2295.49 thousand tonnes in 2005, 1844.16 thousand tonnes were fin fishes, accounting for 80.34 per cent of total landings. A major share of it goes to domestic use, including human consumption and for other uses like fishmeal. The rest is exported. Even though the quantity of finfish exports from India has increased over the years, from 47.95 thousand tonnes in 1991 to 185.93 thousand tonnes in 2005, Indian exports are still less than 0.01 per cent of the world's finfish. In value terms, the export has increased from Rs 137.05 crore in 1991 to Rs 1132.58 crore in 2005. China is the main market for frozen fish, accounting for over half of the frozen fish exports, followed by South East Asia (14%) and Middle East (7%).

### Changes in Species-wise Export of Finfish

The finfish export from India as a percentage of its landings during 2005 for most species/ species-groups was negligible. In terms of percentage, it was 0.06 per cent for Clupeoids, which included fish like anchovies, 0.11 per cent for Bill fishes, 0.45 per cent for Elasmobranchs, which included sharks, skates and rays and 0.59 per cent for Bombay duck. The percentage of exports to landings was 1.90 per cent

for Barracudas, 2.06 per cent for Carangids, which included Horse Mackerel, Scads, Leather-jackets, other carangids, 2.90 per cent for mullets, 3.02 per cent for Mackerels, including Indian Mackerel and other Mackerels, 3.38 per cent for Silver bellies, 3.92 per cent for Flat fishes, which included halibut, flounders and soles and 5.62 per cent for perches.

It was significant only in the case of some species like Ribbon fishes (78.38%), Tunnies (36.59%) and Seer fishes (22.53%), which are pelagic species and Croakers (15.96%), Eels (19.57%), Pomfrets (27.61%) which are demersal species. The ten-year trend for these species has been presented in Figures 1 and 2.

### Percentage Share of Frozen Finfish Export

More than 90 per cent of the finfish exported was in the frozen form and it was a significant portion of the total seafood exports (Figure 3).

In terms of both quantity and value, frozen shrimp was the major marine product exported till the early-1990s. In terms of quantity, shrimp was replaced by frozen finfish in 1995 and the domination still continues (Figure 4).

In value terms, the contribution of frozen finfish to total seafood export was 9.90 per cent in 1990, which increased to 12.03 per cent in 2000. The liberalization of trade and positive government export policy were the main reasons for the increasing finfish export. Besides, the seafood industry largely dependent on

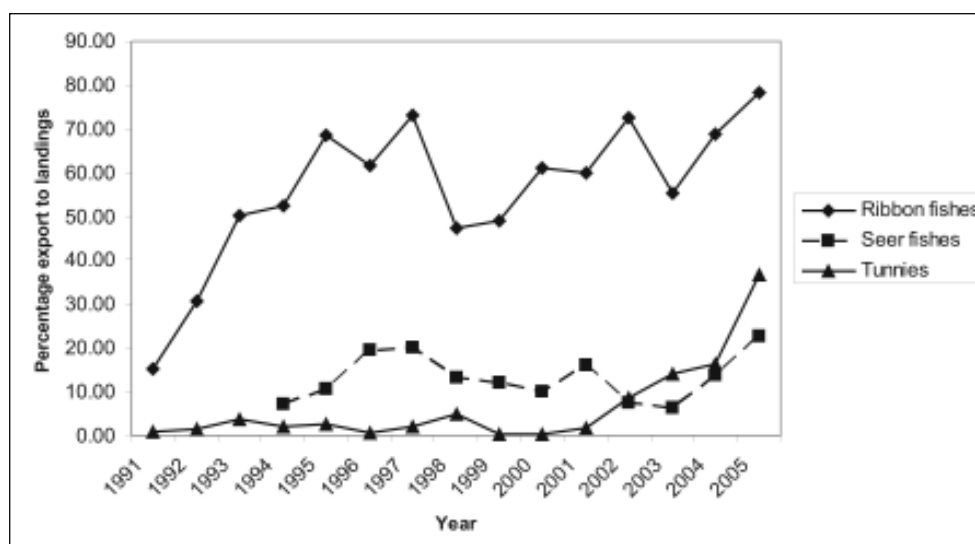


Figure 1. Percentage share of finfish export to landings – Pelagic species

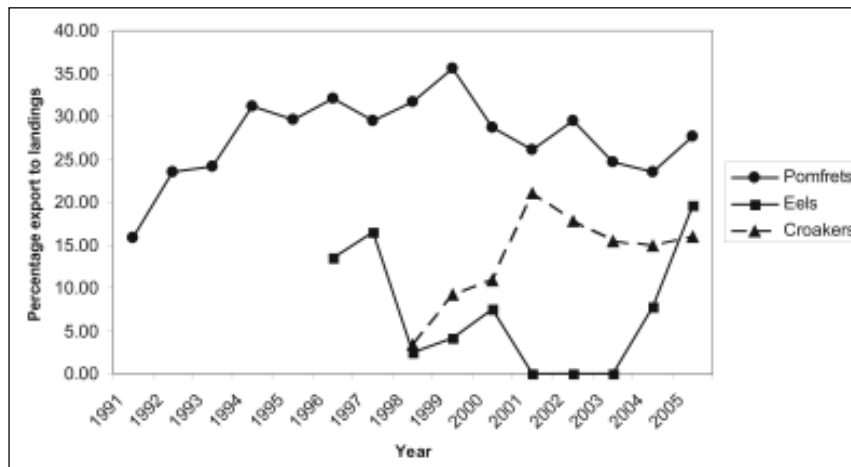


Figure 2. Percentage share of finfish export to landings – Demersal species

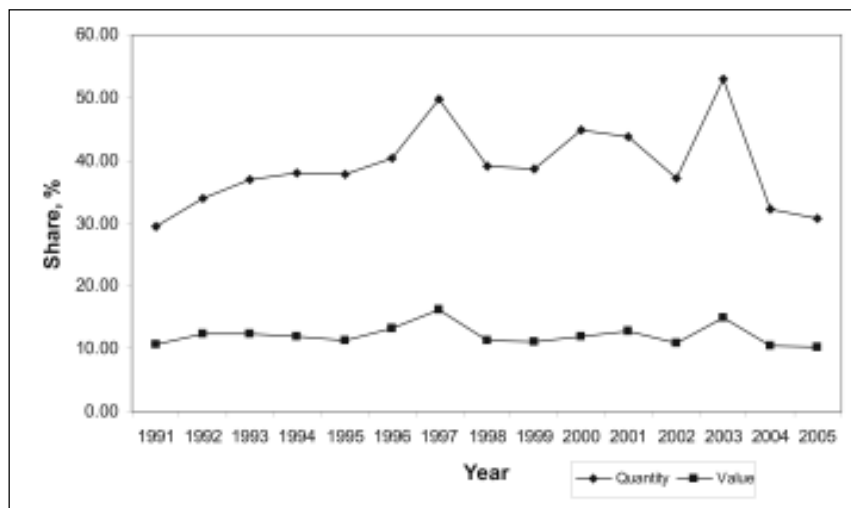


Figure 3. Percentage share of frozen finfish in total marine products export

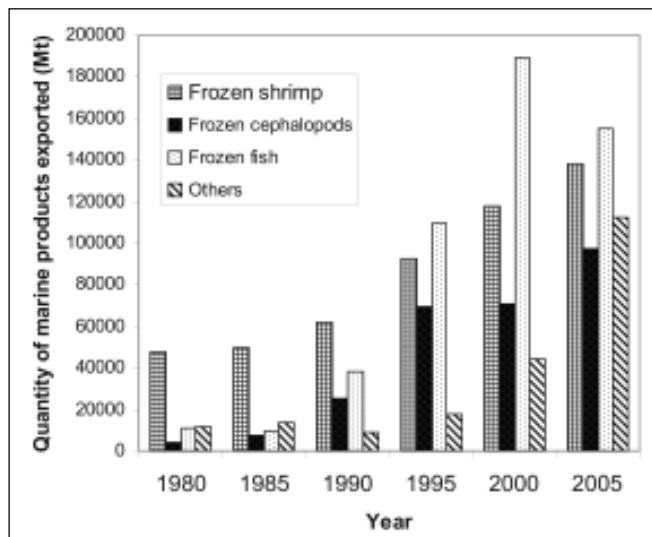


Figure 4. Export of different frozen marine products from India

shrimp, was also beset with the problems like contamination/rejections and fall in the availability of cultured raw material due to disease outbreaks.

The increase in export of finfish can be seen as an off-shoot of the increasing processing capacity being built up by the export-oriented seafood processing industry. The economic viability of the processing plants has been affected by the increasing capital investment, with the insistence of importing countries on quality standards like that set by the European Union and Hazard Analysis and Critical Control Point (HACCP) compliance insisted by the US, coupled with the high fixed costs and the limited peak production period annually which is linked with the availability of high-value species like shrimp and cephalopods. The increasing idle capacity, due to non-availability of high-value raw material, resulted in increasing the unit cost of production. This was one of the major reasons for the shift to processing and export of finfish, which is comparatively cheaper and a readily available raw material, for attaining higher capacity utilization and reduction of unit cost of production. It has been observed that the industry shifts to those products where transaction and operational costs can be kept to the minimum (FAO, 2003).

### Product-wise Finfish Export

Frozen finfish was the largest product group among finfish exports in the year 2005, accounting for 93.54 per cent in terms of quantity and 85.59 per cent in terms of value (Table 1). Export in other forms, including value-added forms, was not significant.

Among the frozen finfish products, frozen ribbonfish was the dominant product with a contribution 50.53 per cent to the quantity and 32.27 per cent in terms of value in 2005. The high-value

**Table 1. Export of different finfish products: 1991 and 2005**

Product	Quantity, %		Value, %	
	Year		Year	
	1991	2005	1991	2005
Frozen finfish products	94.51	93.54	88.60	85.59
Dried finfish products	3.03	4.31	7.21	9.27
Chilled finfish products	2.45	2.01	4.19	4.88
Value-added products and by-products	0.00	0.14	0.00	0.26

frozen pomfret was the next with just 5.31 per cent contribution to quantity, but 21.92 per cent to value. The contribution of all other products individually was less than 5 per cent to the quantity. Yellow fin tuna, croakers, seer fish, pearl spot, halibut, mackerel, anchovy, freshwater fishes, etc. were also exported in the frozen form. Usually, finfish are frozen whole or in some cases like mullet, tuna, ghol fish, snapper and reef cod, as fillets. Among chilled products, chilled reef cod was the dominant product with 37.61 per cent share in quantity and 33.02 per cent share in value. Groupers, seerfish, mullet, pomfret, kingfish, etc. constituted the other species exported in chilled condition. Dried products included fish meal, accounting for 61.85 per cent in terms of quantity of total dried products. High-end dried products included fish nails and isinglass. Fish fingers were the largest group of value-added products contributing more than 50 per cent to the quantity and value in the group of value-added products. Other value-added forms included cutlets, canned mackerel and fish curry.

### Unit Value Realization of Finfish Export

Unit value realization is an indicator of determining the economic value of a particular commodity. The unit value realization for finfish exports, excluding ribbonfish was US\$1.92/ kg in 2005, an increase of only 23 per cent over 1991-value when it was US\$1.56/kg. With the inclusion of ribbonfish, the unit value realization of finfish as a group was US\$1.38/kg in 2005, a 12 per cent increase over 1991-value. Ribbonfish which was the largest single finfish species exported, also pulled the unit value down by nearly 30 per cent. During 2005, different frozen pomfret products fetched a unit value ranging from US\$5.00 to US\$ 6.35/ kg. For all other exported finfish products, it was less than US\$5/ kg. The concentration of exports in block frozen forms, with little or no value addition, was the main reason for low value realization for finfish exports.

### Comparative Advantage and Export Competitiveness of Finfish Exports

The results of RCA and Vollrath's indices of international competitiveness have been presented in Table 2. As can be seen from this table, for total finfish the RCA was less than unity and  $\ln(RXA)$  was negative for the five-year period under study, indicating that

**Table 2. Export competitiveness of finfish to total marine products during 2001-2005**

Index	Year				
	2001	2002	2003	2004	2005
<b>Total Finfish</b>					
RCA (>1)	0.458	0.427	0.268	0.299	0.310
RMA	1.109	0.941	1.038	1.195	0.992
RTA (>0)	-0.651	-0.514	-0.770	-0.896	-0.681
ln RXA (>0)	-0.781	-0.851	-1.317	-1.207	-1.171
ln RMA	0.103	-0.061	0.037	0.178	-0.008
RC (>0)	-0.884	-0.790	-1.354	-1.385	-1.163
<b>PG - I</b>					
RCA (>1)	0.500	0.463	0.274	0.315	0.319
RMA	1.210	0.986	1.083	1.236	1.009
RTA (>0)	-0.710	-0.523	-0.809	-0.922	-0.690
ln RXA (>0)	-0.693	-0.770	-1.295	-1.155	-1.143
ln RMA	0.191	-0.014	0.080	0.212	0.009
RC (>0)	-0.884	-0.756	-1.374	-1.367	-1.152
<b>PG - II</b>					
RCA (>1)	0.112	0.096	0.210	0.154	0.177
RMA	0.149	0.413	0.444	0.603	0.609
RTA (>0)	-0.037	-0.317	-0.233	-0.448	-0.432
ln RXA (>0)	-2.189	-2.343	-1.561	-1.871	-1.732
ln RMA	-1.904	-0.884	-0.812	-0.506	-0.496
RC (>0)	-0.285	-1.459	-0.749	-1.365	-1.236

India had no comparative advantage in finfish exports. The trend for different product groups studied was also similar with the RCA being less than one and ln (RXA) being negative in both the groups. This shows that among the different marine products exported, India has no comparative advantage as far as finfish is concerned, even though the quantity exported has risen significantly.

Similarly, the other two indices, viz. RTA and RC, which give an indication of the competitiveness of the commodity, have been negative for all the studied five years for total finfish as well as PG-I and PG-II. This indicates that India's finfish export in any form, frozen, dried or chilled, has not been competitive during the period.

The RCA was calculated for the selected products, including four chilled and five frozen products, for which world export data was available and which had fetched reasonable unit value. The results have been presented in Table 3 and it revealed that India had no comparative

advantage in exporting these products. The RCA has been found less than unity for all the products for the years 2001 to 2005.

These results have clearly shown that India does not have any comparative advantage in exporting fin fishes. The primary market for these products is the developing countries having preference for low-value fishes in contrast to the preference of developed countries for high-value products like shrimp and cephalopods. This is also a major reason for low unit value realization. The present situation of finfish exports, with low unit value realization, no comparative advantage at the international level and poor export competitiveness, thus calls for a rethinking at the policy level.

India's finfish exports have mainly been in the frozen form, which is used as a raw material by the importing country. It is reprocessed and re-exported, or channelled into the domestic market in retail packs. The value the product gets is low, as no value addition is done at the exporting level. It is in spite of the fact

**Table 3. Revealed comparative advantage of selected finfish products**

Product	Year				
	2001	2002	2003	2004	2005
Chilled eel	0.498	0.218	0.000	0.132	0.502
Chilled mackerel	0.063	0.057	0.021	0.250	0.157
Chilled yellow fin tuna	0.000	0.095	0.261	0.276	0.439
Chilled other tunas	0.000	0.011	0.046	0.145	0.117
Frozen eels	0.471	0.213	0.000	0.340	0.667
Frozen halibut	0.008	0.000	0.001	0.000	0.000
Frozen mackerel	0.240	0.185	0.110	0.174	0.184
Frozen sardines	0.009	0.058	0.058	0.021	0.011
Frozen yellow fin tunas	0.010	0.009	0.026	0.077	0.139

that even basic value-added forms like chunks and fillets, which are retail market-friendly, have a ready market and fetch better price. A change in policy to encourage the production and export of value-added products is already in place and processors must be encouraged to develop infrastructure for value addition. Marketing of niche by-products like fish maws and isinglass, dried fish skin, fish oils, squalene, etc. also can be taken up.

The export of finfish is of immense concern when observed from the point of view of protein and nutritional security of the country. The volume of finfish being exported has been steadily increasing, but most of these fish species have good domestic demand and are affordable by the population. Species like sardine, mackerel, anchovies, ribbonfish, etc. form a part of the staple diet of the coastal population and the diversion of large quantities for export will affect the nutritional security of this section of the society in particular (Gopal and Unnithan, 2006). A clear guideline preventing or limiting the export of such low-value finfish must be concurrently evolved.

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