REVEALED COMPARATIVE ADVANTAGE (RCA) AND TRADE COMPLEMENTARITY BETWEEN INDIA-ASEAN TRADE: A STUDY WITH REFERENCE TO FISHERIES SECTOR.

By

B.P. Sarath Chandran
Assistant Professor of Economics,
VVM’s Shree Damodar College of Commerce & Economics, Goa
bpschandran@yahoo.com
Phone- 0832 2742914
Mobile - 09423445350

and

Dr.P.K.Sudarsan
Associate Professor,
Department of Economics, Goa University
sudhapazhu@yahoo.com
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Introduction

World trading system witnessed proliferation of Regional Trade Agreements (RTAs) in the post ninety particularly post WTO period. Multilateral Trade Liberalisation under WTO despite many efforts made limited progress to liberalise trade and remove barriers. Forging Regional Trade Agreements is considered as an alternative to overcome some of the multilateral difficulties such as transaction costs, arriving consensus among diverse groups and venturing deeper and technical areas of reforms. As USA turned towards regionalism and EU became a successful model of regional integration, RTAs received big fillip as countries across the world formed bilateral, sub regional and regional trade agreements. India after initial hesitation started regional trade initiatives to expand trade volume and to promote regional economic cooperation. After initiating bilateral trade agreements with Sri Lanka, Singapore, Thailand and South Korea, for the first time it signed a RTA with a regional block, ASEAN on 13th August 2009. Realising the importance South East Asian region in India’s economic development, India gave special attention to the region through its ‘Look East Asia’ policy. India signed a Framework Agreement on Comprehensive Economic Cooperation with ASEAN in October 2003. After six years of negotiation, India signed FTA with ASEAN on 13th Sep 2009 which came into effect from 1st January 2010. Under the agreement commodities are grouped into five categories for tariff reduction namely Normal Track-1 (NT-1), Normal Track-2 (NT-2), Sensitive and Highly Sensitive Track (ST), Special Products (SP) and Negative List (NL). Of the 12169 products with 8 digit classification, 63.89 percent products are in NT-1, 10.29 percent products are in NT-2, 14.83 percent in ST, 0.33 percent SP and 10.66 in NL. Rule of Origin (RoO) applicable for the agreement is 35 percent value Addition. The agreement also provides Safeguard Measures for a country experiencing serious injury to domestic industries and under the provisions of GATT and WTO.

Objective and Methodology

India ASEAN agreement on trade in goods generated heated debate on its likely impact on various sectors of the economy. South East Asian nations have the expertise in regional
integration and are better prepared to manage the situation compared with India. Similar agroclimatic conditions make India and ASEAN producing similar products and competing with each other after the agreement. There is a strong apprehension among the section of population that there will be large scale import of agricultural products, plantation crops and fisheries products from ASEAN Countries. This can affect the domestic prices and displace large number of people from their occupation jeopardizing the livelihood of large section of the population. In this context the paper made an attempt to understand the trade structure between India and ASEAN countries and explored whether they are complementary or similar to each other. The likely impact of India ASEAN agreement on the prospects of bilateral trade is done with special reference to fishery sector.

The study used Trade Intensity Index (TII) and Revealed Comparative Advantage (RCA) Index to see trade complementarity and Similarity between India and ASEAN countries. The trade intensity index (TII) is used to determine whether the value of trade between two countries is greater or smaller than would be expected on the basis of their importance in world trade. It is defined as the share of one country’s exports going to a partner divided by the share of world exports going to the partner. It is calculated as,

\[ T_{ij} = \frac{\frac{x_{ij}}{X_j}}{\frac{x_{wij}}{X_{w}}}, \]

Where \( x_{ij} \) and \( x_{wij} \) are the values of country i’s exports and of world exports to country j and where \( X_i \) and \( X_w \) are country i’s total exports and total world exports respectively. An index of more (less) than one indicates a bilateral trade flow that is larger (smaller) than expected, given the partner country’s importance in world trade.

Trade Intensity Index is further divided in to Export Intensity Index (EII) and Import Intensity Index (III) for looking the pattern of exports andImports. Following Kojima (1964) and Drysdale (1969), the index of trade intensity is restated as follows,

\[ EII \text{ between India and ASEAN} = \frac{x_{ik}/X_i}{M_A/(M_W - M_i)} \]
$X_{IA} = \text{India’s Export to ASEAN}; \ X_I = \text{India’s total Export}; \ M_A = \text{Total Import of ASEAN}; \ M_w = \text{Total World imports}; \ M_I = \text{Total Imports of India}$

$$III \ between \ India \ and \ ASEAN = \frac{x_{IA}/x_I}{x_A/(x_W-x_I)}$$

$M_{1A} = \text{Import of India from ASEAN}; \ M_I = \text{Total Import of India}; \ X_A = \text{Total Export of ASEAN}; \ X_W = \text{Total World Export}; \ X_I = \text{Total Export of India}$

Revealed Comparative Advantage Index shows how competitive is a product in countries’ export compared to the products share in world trade. A product with high RCA is competitive and can be exported to countries with low RCA. The RCA index of country ‘i’ for product ‘j’ is often measured by the product’s share in the country’s exports in relation to its share in world trade:

$$RCA_{ij} = \frac{x_{ij}/x_{Wj}}{(x_{ij}/x_{Wj})}$$

Where $x_{ij}$ and $x_{Wj}$ are the values of country i’s exports of product j and world exports of product j and where $X_{it}$ and $X_{wt}$ refer to the country’s total exports and world total exports. A value of less than unity implies that the country has a revealed comparative disadvantage in the product. Similarly, if the index exceeds unity, the country is said to have a revealed comparative advantage in the product.

Vollrath (1991) offered three alternative specifications of revealed comparative advantage, following analyses of international competitiveness in agriculture (Vollrath, 1987 and 1989; and Vollrath and Vo, 1990). The first of these measures is the relative trade advantage (RTA), which accounts for imports as well as exports. It is calculated as the difference between relative export advantage (RXA), which equates to the Balassa index, and its counterpart, relative import advantage (RMA):

$$RTA = RXA - RMA$$

where, $RXA = \text{Balassa Index and RMA} = (mj / mt) / (mnj / mnt)$

Vollrath’s second measure is simply the logarithm of the relative export advantage (ln RXA); and his third measure is revealed competitiveness (RC), defined as:
RC = ln RXA – ln RMA.

The advantage of expressing these latter two indices in logarithmic form is that they become symmetric through the origin. Positive values of Vollrath’s three measures, RTA, ln RXA and RC, reveal a comparative/competitive advantage.

**India ASEAN Trade - Broad Trends**

India’s trade with ASEAN remained moderate compared with its potential. The total trade which was 2.9 billion in 1993 rose to 37.23 billion in 2007. This was achieved mainly by the concerted efforts and renewed focus given by the Indian Government to the East Asian region. In the year 2007, ASEAN’s export to India was 24.83 billion and Import was 12.39 billion US Dollars. ASEAN enjoys favourable trade account with India and had a trade surplus of 12.44 billion in the year 2007. ASEAN India trade was growing steadily in the nineties except during East Asian crisis period and entered in to double digit growth trajectory in recent years. For the year 2007, export grown at 31.23 percent while import witnessed a growth of 26.81 percent. For the 2003-08 period, ASEAN exports to India grew at an average annual rate of 28.90 percent while imports for the same period grew at 33.68 percent. ASEAN-6 account bulk of India’s trade with ASEAN countries.

The major export commodities of ASEAN to India are HS-27(Mineral fuels, min oils & products of distillation; bitum substances; mineral wax), HS-84(Nuclear reactors, boilers, machinery & mechanical appliances/parts) and HS-85(Electrical machinery, equipments & parts; sound equipment, television equipments). The top 10 export commodities account 80 percent of the ASEAN export in 2007. The major import categories of ASEAN from India are HS-71(Natural or cultured pearls; precious/semi precious stone/metal; imitation jewelry; coin), HS-27(Mineral fuels, mineral oils & product of distillation; bitum substances; min wax), HS-29(Organic chemicals) and HS-72(Iron and Steel). The top ten import item account 73.5 percent of the ASEAN import in 2007.

India’s simple average MFN tariff for the year 2007 was 14.5 percent for which agricultural products were subjected to 34.4 percent and non-agricultural products at 11.5 percent. The MFN tariff for ASEAN is lower in ASEAN countries compared to India. While Singapore got near zero MFN rate other major ASEAN countries have rates ranging 6 to 10 percent.
Trade Intensity Index between ASEAN and India

It is revealed from Table 1 that India’s export intensity as well as import intensity with ASEAN is above one for most of the years. This means India’s exports and imports are intense with ASEAN countries compared with its trading pattern with rest of the world. The natural trading partner theory reveals countries tend to trade more with neighbors and close proximate partners. ASEAN countries being geographically closer to India, value of these indices are likely to come down once it is adjusted for geographical distance. ASEAN’s Export Intensity Index is higher than Import Intensity Index as it exports more to India compared to its imports.

Country wise look at the trade intensity showed India’s export Intensity is above one for Indonesia, Malaysia, Myanmar, Singapore, Thailand and Vietnam. For others (Brunei, Laos, Cambodia and Philippines) the export intensity is fluctuating over the years. Myanmar, Singapore and Vietnam are the three countries with whom India got high export intensity. For the year 2007, except Cambodia, Laos and Philippines, India got high trade intensity with all ASEAN countries. Tables 2 gave the country wise export and import intensity of India with ASEAN countries.

Table: 1 Trade Intensity Index between ASEAN and India

<table>
<thead>
<tr>
<th>Year</th>
<th>India's EII with ASEAN</th>
<th>ASEAN's EII with India</th>
<th>India's III with ASEAN</th>
<th>ASEAN's III with India</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>0.9127</td>
<td>1.7143</td>
<td>1.5770</td>
<td>1.5372</td>
</tr>
<tr>
<td>1995</td>
<td>1.0903</td>
<td>1.5260</td>
<td>1.1218</td>
<td>1.2206</td>
</tr>
<tr>
<td>2000</td>
<td>1.1437</td>
<td>1.9671</td>
<td>1.2942</td>
<td>1.2737</td>
</tr>
<tr>
<td>2005</td>
<td>1.8592</td>
<td>1.7215</td>
<td>1.1954</td>
<td>1.4685</td>
</tr>
<tr>
<td>2006</td>
<td>1.4429</td>
<td>1.5353</td>
<td>1.6801</td>
<td>1.3635</td>
</tr>
<tr>
<td>2007</td>
<td>1.4872</td>
<td>1.4775</td>
<td>1.6059</td>
<td>1.3997</td>
</tr>
</tbody>
</table>

Source: Computed from DOTS, IMF

India is importing smaller volumes from the less developed countries of ASEAN which is reflected in the low Import intensity Index with Brunei, Cambodia and Lao PDR. Imports are also restricted with Philippines and Vietnam with import intensity well below one.
India’s import intensity was small with Thailand for many years but improved strongly after signing the bilateral trade agreement. India’s imports from ASEAN traditionally confined to Singapore and Malaysia. Import intensity is markedly high with Myanmar as it shares geographical border with India and in close proximate with north eastern states of India. This exceptionally high import intensity is also due to Myanmar’s low imports from the rest of the world due to political reasons. For all other countries, the index follows a range except for Cambodia in the year 1995.

**Revealed Comparative Advantage for India and ASEAN – Commodity Groups**

RCA is calculated for eight ASEAN countries across 16 major commodity groups for 17 years to identify specific advantage in trade. The commodities for which RCA are calculated include Agricultural Products, Food, Fuels and Mining, Fuels, Manufactures, Iron and Steel, Machinery and Transport Equipment, Office and Telecom equipments, EDP and OE, IC and EC, Pharmaceuticals, Chemicals, Automotive, Textiles and Clothing.
<table>
<thead>
<tr>
<th>Commodity Classification</th>
<th>High Comparative Disadvantage RCA &lt; 0.5</th>
<th>Low Comparative disadvantage 0.5 &lt; RCA &gt; 1</th>
<th>High RCA RCA 1 to 2</th>
<th>Strong RCA RCA Above 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Products</td>
<td>Brunei, Cambodia, Singapore</td>
<td>-</td>
<td>India, Indonesia, Malaysia, Philippines</td>
<td>Thailand, Vietnam</td>
</tr>
<tr>
<td>Food</td>
<td>Brunei, Cambodia, Singapore</td>
<td>-</td>
<td>India, Indonesia, Malaysia, Philippines</td>
<td>Thailand, Vietnam</td>
</tr>
<tr>
<td>Fuels &amp; MP</td>
<td>Cambodia, Philippines, Thailand</td>
<td>India, Malaysia, Singapore</td>
<td>Vietnam</td>
<td>Brunei, Indonesia</td>
</tr>
<tr>
<td>Fuels</td>
<td>India, Cambodia, Philippines, Thailand</td>
<td>-</td>
<td>Malaysia, Singapore</td>
<td>Brunei, Indonesia, Vietnam</td>
</tr>
<tr>
<td>Manufacture</td>
<td>Brunei</td>
<td>Indonesia, Vietnam</td>
<td>India, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand</td>
<td>-</td>
</tr>
<tr>
<td>Iron &amp; Steel</td>
<td>Brunei, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand</td>
<td>-</td>
<td>India,</td>
<td>-</td>
</tr>
<tr>
<td>Chemicals</td>
<td>Brunei, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand</td>
<td>Singapore, Thailand</td>
<td>India</td>
<td>-</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>Brunei, Cambodia, Indonesia, Malaysia, Philippines, Vietnam</td>
<td>-</td>
<td>India</td>
<td>-</td>
</tr>
<tr>
<td>Machinery &amp; Transport Equipments</td>
<td>India, Brunei, Cambodia, Indonesia, Vietnam</td>
<td>Thailand</td>
<td>Malaysia, Philippines, Singapore</td>
<td>-</td>
</tr>
<tr>
<td>Office &amp; Telecom</td>
<td>India, Brunei, Cambodia</td>
<td>-</td>
<td>Thailand</td>
<td>Malaysia, Philippines,</td>
</tr>
</tbody>
</table>
### Equipments

<table>
<thead>
<tr>
<th>Equipments</th>
<th>Indonesia, Vietnam</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDP &amp; OE</td>
<td><strong>India</strong>, Brunei, Cambodia, Vietnam</td>
<td>Indonesia, -</td>
</tr>
<tr>
<td>Telecom</td>
<td><strong>India</strong>, Brunei, Cambodia, Vietnam</td>
<td>Philippines, Indonesia, Singapore, Thailand</td>
</tr>
<tr>
<td>IC &amp; EC</td>
<td><strong>India</strong>, Brunei, Cambodia, Indonesia, Vietnam</td>
<td>-</td>
</tr>
<tr>
<td>Automotive</td>
<td><strong>India</strong>, Brunei, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam</td>
<td>-</td>
</tr>
<tr>
<td>Textiles</td>
<td>Brunei, Cambodia, Malaysia, Philippines, Singapore</td>
<td>Vietnam</td>
</tr>
<tr>
<td>Clothing</td>
<td>Singapore</td>
<td>Brunei, Malaysia</td>
</tr>
</tbody>
</table>

### Marine Products

Total world fish production, excluding aquatic plants (capture and aquaculture), showed new growth in the 2003-2006 period, increasing from 126 million tonnes in 2003 to 140 million tonnes in 2007. Compared with production figures a decade ago, the current supply represents an increase of more than 20 million tonnes. This additional supply is entirely due to increases in aquaculture production, which in 2006 reached 52 million tonnes (excluding aquatic plants) or 36 percent of total output. Estimates for 2007 show new growth in farmed production to 53 million tonnes. However, there is some concern that the rate in aquaculture production growth is slowing down, whereas supplies from capture fisheries seem to have reached a long-term state of stability, despite some single year variability mostly linked to South American catches.
Country wise production of fishery production for the year 2008 showed that China is way ahead compared to the rest of the lot with India in distant second (5.23 percent) and Peru third (5.2 percent). Other leading producers of fishery products in the world are Indonesia (4.53), USA (3.79), Japan (3.52), Chile (3.29), Vietnam (3.07) Thailand (2.75) and Philippines (2.30).

Main Exporters of Fishery Commodities

World fishery exports reached 87.97 billion US dollars in 2007 which increased from the previous year figure of 80.93 billion US$. Top 50 countries account for 94.1 percent for the year. During the corresponding period the global imports increased from 86.61 billion dollars to 94.0 billion dollars. The largest exporter of fisheries products in the world is China (9.25billion) followed by Norway (6.23 B$) and Thailand (5.71). Other leading exporters are USA, Denmark, Vietnam and Chile. The top three importers of fishery products for the year 2007 are USA (13.63 billion), Japan (13.18 b$) and Spain (6.98b$).

Shrimp is the most important commodity with about 17% of international trade in value terms. It is interesting to note that this share is declining in recent years, due to lower prices for shrimp.
worldwide. Groundfish is another important group with 15% of trade. Tuna is third with 9%, however also for this commodity which is of most interest to all of you a certain decline in importance can be noted. The relative importance of salmon as an export item has increased over the past years from 5% in the early 1990s, to reach 7% in 1999 and 8% in 2004 as a result of the booming salmon farming industry in Norway and Chile. It is very likely that salmon will overtake tuna as the third most important fish commodity in a few years from now.

Total imports reached the record figure of US$ 96 billion in 2007. Japan and USA stayed the main fish importing countries, with the USA overtaking Japan in 2007, quite a historical event. In fact, Japanese import volumes have been declining in recent years due to weaker domestic demand associated with a long-term shift towards reduced fish consumption. In 2007, imports, which are dominated by shrimp, tuna and salmon, showed a 3.2 percent decline from 2006 to below US$13 billion. The USA is the now the world’s major fish import market. With a growing population and a long-term positive trend in seafood consumption, imports reached US$13.3 billion in 2006 and US$13.6 billion in 2007. Imported quantities of edible fish products reached 2.50 million tonnes (product weight) in 2006, but fell slightly in 2007 to 2.46 million tonnes due to market weakness in the final months of the year. The largest US import item in value is shrimp followed by salmon, crab and tuna. Of note is the strong increase in tilapia imports in 2007 (volume +10 percent, value +16 percent) and crab (volume +8 percent, value +18 percent). However, shrimp imports fell back somewhat in 2007 to 557 000 tonnes (- 5.6 percent) and US$3.9 billion (-5.1 percent).

The EU as a group is the major trade block, with US$ 41 billion worth imported in 2007. The EU thus represents almost 40% of total imports. In recent years, there has been some discussion whether the intra-EU trade should also be reported in the official FAO statistics, as about 50% of the total.
Fig: 2 Major Exporter and Importers of Fishery Commodities

<table>
<thead>
<tr>
<th>Leading Exporters-2007 (Value)</th>
<th>Leading Importers- 2007 (Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China 10%</td>
<td>Others 33%</td>
</tr>
<tr>
<td>Norway 7%</td>
<td>Japan 14%</td>
</tr>
<tr>
<td>Thailand 6%</td>
<td>Denmark 8%</td>
</tr>
<tr>
<td>USA 5%</td>
<td>Spain 7%</td>
</tr>
<tr>
<td>Denmark 4%</td>
<td>UK 4%</td>
</tr>
<tr>
<td>Spain 3%</td>
<td>Germany 5%</td>
</tr>
<tr>
<td>Chile 4%</td>
<td>China 5%</td>
</tr>
<tr>
<td>Vietnam 3%</td>
<td>Italy 5%</td>
</tr>
<tr>
<td>Netherlands 4%</td>
<td>France 6%</td>
</tr>
<tr>
<td>Others 69%</td>
<td>Others 15%</td>
</tr>
</tbody>
</table>

Fishery Trade Profile of ASEAN Countries

Indonesia’s production from marine capture fisheries in 2004 was 4,501,070 tonnes. In the marine capture of 2004, tunas represented 16.6% of production, shrimp was 5.5%, other fishes was 70.3% and other aquatic organisms was 7.6%. The number of persons active in aquaculture increased from 2,384,208 in 2003 to 2,459,355 in 2004. The main destinations of Indonesian exports are China, Thailand, Japan, United States of America, Singapore and Republic of Korea.

Production from the marine capture fisheries of Malaysia was estimated to be 1,381,423 tonnes in 2007. In 2004 the contribution of the fishery sector to GDP amounted to 1.73 percent. The fishery sector also provided direct employment to 111,000 people in 2006. Per capita consumption of fish was estimated to be 52.1 kg (live weight equivalent) in 2005. Malaysia has always been a net importer of fish in term of volume and an exporter in monetary terms. Based on statistics from 2007, in value terms, the greatest portion of the imported fish came from China, with a share of 21.0 percent, followed by Thailand (19.8 percent), Indonesia (15.1 percent), Viet Nam (8.6 percent), Myanmar (5.1 percent) and India (4.8 percent). In the same year, in value terms, the United States was the main market for Malaysian exports of fish and fishery products with a share of 24.5 percent, followed by Singapore (13.2 percent), Italy (9.3 percent), Japan (7.2 percent), China (6.2 percent), Australia (5.0 percent) and others.
In 2003, the fisheries sector of Philippines had a total value of US$ 1,832 million, accounting for 2.2% of GDP. Major varieties of commercial fishing are Roundscad, Frigate tuna, Skipjack, yellow tuna. Around 70% of the total catch is consumed fresh or chilled, while 30% is processed into cured, canned, frozen products or disposed of live. The Philippines is an exporter as well as importer of fish and fishery products. In 2003, the balance of trade was positive in terms of quantity and value. The products consisted mainly of fresh and processed fish, crustaceans and molluscs. Leading fishery products were tuna, shrimp and seaweed. The major export destinations of tuna were Japan and the United States of America. According to the 2002 Census of Fisheries (NSO, 2005), there were 2,009,300 fishing operators and aquafarm operators.

Thailand is one of the top fish producing nations in the world. Its geographic advantage contributes to the high annual fish production. Thailand has a coastline of about 2,600 km. The marine fishing grounds in the Gulf of Thailand and in the Andaman Sea, within Thailand’s Exclusive Economic Zone, cover a total area of about 316,000 km². In 2007, total production was about 3.9 million tonnes, of which 58.2 percent came from marine capture fisheries. The major markets for Thai fish products are Japan, the USA and the EU. Of the total export value, shrimp products and canned tuna contributed 36 percent and 27 percent, respectively.

Table: 4 Fishery Profile of India and ASEAN Countries (Average 2003-05)

<table>
<thead>
<tr>
<th>Country</th>
<th>Production (Tonnes)</th>
<th>Imports (Tonnes)</th>
<th>Exports (Tonnes)</th>
<th>Food Supply (Tonnes)</th>
<th>Per Capita Supply (Kg/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>617,655</td>
<td>9,700</td>
<td>544,713</td>
<td>528,727</td>
<td>4.7</td>
</tr>
<tr>
<td>Brunei</td>
<td>2,877</td>
<td>10,604</td>
<td>160</td>
<td>130,14</td>
<td>35.6</td>
</tr>
<tr>
<td>Cambodia</td>
<td>373,116</td>
<td>4,200</td>
<td>5,5812</td>
<td>321,504</td>
<td>23.4</td>
</tr>
<tr>
<td>Indonesia</td>
<td>562,9869</td>
<td>44,809</td>
<td>95,7610</td>
<td>466,8629</td>
<td>20.9</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>99,067</td>
<td>5,099</td>
<td>17</td>
<td>104,151</td>
<td>18.7</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1,450,432</td>
<td>453,197</td>
<td>286,404</td>
<td>1,395,101</td>
<td>55.4</td>
</tr>
<tr>
<td>Myanmar</td>
<td>193,3452</td>
<td>2,428</td>
<td>356,153</td>
<td>1,150,831</td>
<td>24.2</td>
</tr>
<tr>
<td>Philippines</td>
<td>271,9266</td>
<td>117,856</td>
<td>210,703</td>
<td>2,626,371</td>
<td>31.7</td>
</tr>
<tr>
<td>Singapore</td>
<td>7508</td>
<td>280,278</td>
<td>115,326</td>
<td>1,619,42</td>
<td>37.9</td>
</tr>
<tr>
<td>Thailand</td>
<td>391,9042</td>
<td>127,4563</td>
<td>201,1872</td>
<td>2,039,855</td>
<td>32.6</td>
</tr>
<tr>
<td>Vietnam</td>
<td>30,79637</td>
<td>50,435</td>
<td>835,826</td>
<td>2,128,579</td>
<td>25.4</td>
</tr>
<tr>
<td>World</td>
<td>1,315,82279</td>
<td>352,16574</td>
<td>346,64631</td>
<td>1,047,18031</td>
<td>16.3</td>
</tr>
</tbody>
</table>
Seafood is the third major export product of Vietnam after textile-garments and crude oil. The main export markets for fishery products are USA (35%), Japan (26%), China/Hong Kong (7%) and Europe (6%). The main export products are shrimp, fish, squid, cuttlefish & octopus and dried sea fish products. Among export products, frozen shrimp is the highest earner, pulling 40% of the total revenue. A considerable labour force of around three million persons are employed in the fisheries sector in Vietnam or around 10% of the total population of Vietnam derives their main income direct or indirect from fisheries.

**Fishery Trade Profile of India**

India got a coastal length of 8118 kms. Fisheries play an important role in the national economy, providing full-time or part-time employment to 14.66 million people. The contribution of fisheries to GDP at the current prices (2003-04) is 1.07%. There are 11 800 registered primary fisheries societies in India, with a membership of 1 917300 beneficiaries it is also a major contributor to foreign exchange earning fetching US$ 1,365 million during 2004. Since the fall in the export earnings during 2003-04, the dollar earnings have increased steadily till 2008-09

**Table: 5 Export Trend of marine products**

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantity (MT)</th>
<th>Value (million US$)</th>
<th>Unit Value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>467297</td>
<td>1424.9</td>
<td>3.05</td>
</tr>
<tr>
<td>2003-04</td>
<td>412017</td>
<td>1330.76</td>
<td>3.23</td>
</tr>
<tr>
<td>2004-05</td>
<td>461329</td>
<td>1478.48</td>
<td>3.2</td>
</tr>
<tr>
<td>2005-06</td>
<td>512164</td>
<td>1644.21</td>
<td>3.21</td>
</tr>
<tr>
<td>2006-07</td>
<td>612641</td>
<td>1852.93</td>
<td>3.02</td>
</tr>
<tr>
<td>2007-08</td>
<td>541701</td>
<td>1899.09</td>
<td>3.51</td>
</tr>
<tr>
<td>2008-09</td>
<td>602835</td>
<td>1908.63</td>
<td>3.17</td>
</tr>
</tbody>
</table>

Source: MPEDA, Ministry of Commerce and Industry, GOI

Export of marine products from India reached an ever time record of Rs.8607.94 crore and US Dollar 1908.63 million during 2008-09 exporting 602835 MTs of seafood products. There was an increase of 11.29% in quantity, 12.95% in rupee earning and 0.5% in US$ earning compared to the exports during the previous year. This is a very creditable achievement for Indian seafood
industry considering the global melt down in the economy and reduced demand for consumer products.

**Composition and Direction**

Frozen shrimp continued to be the single largest item of export in terms of value accounting for about 44% in the total export earnings. In terms of quantity, fish accounted for the major share at 40% (shrimp 21%) as could be observed from the table below.

**Table: 6 Composition of Indian Marine Exports**

<table>
<thead>
<tr>
<th>Item</th>
<th>2007-08 Qty. (T)</th>
<th>2008-09 Qty. (T)</th>
<th>Value Million ($)</th>
<th>Value Million ($)</th>
<th>Percent Growth</th>
<th>2008-09 Qty.</th>
<th>Price</th>
<th>Share in Qty.</th>
<th>UV ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frozen Shrimp</td>
<td>136223</td>
<td>126042</td>
<td>980.62</td>
<td>839.3</td>
<td>-7.47</td>
<td>-14.41</td>
<td>21</td>
<td>6.66</td>
<td></td>
</tr>
<tr>
<td>Frozen Fish</td>
<td>220200</td>
<td>238543</td>
<td>326.29</td>
<td>375.23</td>
<td>8.33</td>
<td>15</td>
<td>40</td>
<td>1.57</td>
<td></td>
</tr>
<tr>
<td>Fr Cuttle Fish</td>
<td>45955</td>
<td>50698</td>
<td>185.66</td>
<td>168.17</td>
<td>10.32</td>
<td>-9.72</td>
<td>8</td>
<td>3.32</td>
<td></td>
</tr>
<tr>
<td>Fr Squid</td>
<td>34172</td>
<td>57125</td>
<td>101.29</td>
<td>142.87</td>
<td>67.17</td>
<td>41.05</td>
<td>9</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Dried Item</td>
<td>22414</td>
<td>31688</td>
<td>64.72</td>
<td>92.51</td>
<td>41.38</td>
<td>42.94</td>
<td>5</td>
<td>2.92</td>
<td></td>
</tr>
<tr>
<td>Live Items</td>
<td>2498</td>
<td>3434</td>
<td>17.21</td>
<td>21.82</td>
<td>37.47</td>
<td>26.84</td>
<td>1</td>
<td>6.36</td>
<td></td>
</tr>
<tr>
<td>Chilled Items</td>
<td>6541</td>
<td>21453</td>
<td>29.62</td>
<td>48.39</td>
<td>227.98</td>
<td>63.35</td>
<td>4</td>
<td>2.26</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>73698</td>
<td>73851</td>
<td>193.68</td>
<td>220.33</td>
<td>0.21</td>
<td>13.76</td>
<td>12</td>
<td>2.98</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>541701</td>
<td>602835</td>
<td>1899.09</td>
<td>1908.63</td>
<td>11.29</td>
<td>0.5</td>
<td>100</td>
<td>3.17</td>
<td></td>
</tr>
</tbody>
</table>

Source: MPEDA, Ministry of Commerce and Industry, GOI

Frozen Shrimp continued to be the major export item accounting for 44% of the total export earnings, even though their share in the exports during the period dropped by 8%, 4% and 15% in quantity, Rupee value and dollar value, respectively. Fish, the principal export item in quantity terms and the second largest export item in value, accounted for a share of about 40% in quantity and 20% in export earnings. The frozen fish recorded an export growth of about 8% in quantity, 32% in rupee value and 15% in dollar earnings. Frozen cuttlefish contributed 8% in quantity and about 9% in value terms to the export basket. Export of frozen squid grew very
remarkably registering a growth of 67% in quantity, 55% in rupee terms and 41% in US dollar terms respectively. All other items also recorded a growth in exports during 2008-09.

**Major export markets**

European Union (EU) continued as the largest market during the year with a percentage share of 32.6% in $ realization followed by China 14.8%, Japan 14.6%, USA 11.9%, South East Asia 10%, Middle East 5.5% and Other Countries 10.6%.

**Table: 7 Direction of Indian Marine Exports**

<table>
<thead>
<tr>
<th>Country</th>
<th>Qty. (Tons)</th>
<th>Value (USD Million)</th>
<th>Export Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>57271</td>
<td>278.61</td>
<td>14.6</td>
</tr>
<tr>
<td>USA</td>
<td>36877</td>
<td>227.29</td>
<td>11.91</td>
</tr>
<tr>
<td>EU</td>
<td>151590</td>
<td>622.87</td>
<td>32.63</td>
</tr>
<tr>
<td>China</td>
<td>147312</td>
<td>281.9</td>
<td>14.77</td>
</tr>
<tr>
<td>South East Asia</td>
<td>88953</td>
<td>191.08</td>
<td>10.01</td>
</tr>
<tr>
<td>Middle East</td>
<td>27177</td>
<td>105.2</td>
<td>5.51</td>
</tr>
<tr>
<td>Others</td>
<td>93654</td>
<td>201.68</td>
<td>10.57</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>602835</strong></td>
<td><strong>1908.63</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: MPEDA, Ministry of Commerce and Industry, GOI
European Union (EU) remained the largest market for Indian seafood accounting for 151590 MT (25%) in quantity, Rs.2800 crore (32.5%) in rupee terms and US $ 623 million (33%) in US dollar terms. Share of European Market has come down from 35% to 32.6% in US dollar terms during the year. A very important feature of the export trend is the increase in exports to China. China got into the second place from the 3rd position held in last year with a share of 15% in US dollar terms. Japan was relegated to 3rd position with an overall export of 57271 MT having a value of US $ 278.61 million. Share of export to Japan has also gone down to 14.34% from 16% during the previous year. Exports to USA have fallen further to US $227.29 million (-10.18%) relegate it to 4th position. But exports to USA have shown slight increase in quantity and rupee value. Exports to South East Asia registered a remarkable growth with 39% increase in quantity, 52% increase in rupee terms and 33% increase in US $ term. The share of South East Asia has increased to 10% from 7.5% in US $ terms during the year. Exports to Middle East also registered growth with 5.5% increase in quantity, 20.8% increase in rupee value and 7.3% increase in US $ terms. Share of all other countries is 10.6%. (MPEDA).

Exports were effected from 19 land/air ports. The major ports to handle the export cargo during the year in the order of US $ earnings were Kochi (17.6%), JNP (17.3%), Pipavav (16.1%), Chennai (12.6), Vizag (10.5%), Calcutta (8.4%), Tuticorin (8%), Mangalore (2.8%), etc. A total 23 land/air ports handled marine cargo during the year. The major ports in the order of US $ earnings were Kochi (17.6%), JNP (17.3%), Pipavav (16.1%), Chennai (12.6), Vizag (10.5%), Calcutta (8.4%), Tuticorin (8%), Mangalore (2.8%), etc. While JNP and Pipavav increased their share, there was a reduction in the share of Chennai and Vizag. (MPEDA)

Foreign trade policy of 2004-09 showed no quantitative restrictions on export of marine products from India. Licence under Foreign Trade Policy not required for import of 125 species/groups of fish, crustaceans, molluscus and other aquatic invertebrates covered under FREE policy. Import of five groups of live fish permitted under Restricted Policy. Import of Whale Shark (Rhincodon types) and parts and products of the species is restricted. (MPEDA)
Tariff elimination of Marine Products under India ASEAN FTA

Marine products are classified into seven major categories (hs-4 digits) under which there are 142 tariff lines. India ASEAN FTA envisages tariff reduction for marine products through three different modes namely Normal Track-1 (NT-1), Normal Track – 2 (NT-2), Sensitive Track (ST) and an Exclusion List (EL) which is created to protect vulnerable products from tariff liberalisation. Of the 142 products, 82 are in NT-1, 3 are in NT-2, 06 are in the ST and 51 are kept in the EL. While all products in the category of Live fish and Molluscs are kept in the NT-1, entire products under Fish fillets and other fish meat (0304) are under the EL list.

Table:8 No. of Tariff lines under Tariff elimination category of AIFTA

<table>
<thead>
<tr>
<th>HS-4 Classification</th>
<th>No. of Tariff Lines</th>
<th>NT-1</th>
<th>NT-2</th>
<th>ST</th>
<th>EL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live Fish 0301</td>
<td>7</td>
<td>7</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fish, fresh or Chilled 0302</td>
<td>29</td>
<td>15</td>
<td>06</td>
<td>08</td>
<td></td>
</tr>
<tr>
<td>Fish Frozen 0303</td>
<td>41</td>
<td>21</td>
<td>03</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Fish Fillets and other fish meat 0304</td>
<td>14</td>
<td>-</td>
<td>-</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Fried Fish, salted or inbrine 0305</td>
<td>18</td>
<td>15</td>
<td>-</td>
<td>03</td>
<td></td>
</tr>
<tr>
<td>Crustaceans whether in Shell or not 0306</td>
<td>14</td>
<td>05</td>
<td>-</td>
<td>09</td>
<td></td>
</tr>
<tr>
<td>Molluscs, whether in shell or not 0307</td>
<td>19</td>
<td>19</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>142 (100.00)</td>
<td>82 (57.75)</td>
<td>03 (2.11)</td>
<td>06 (4.23)</td>
<td>51 (35.92)</td>
</tr>
</tbody>
</table>

Table – 9 provides import and export share of India’s trade with ASEAN region for the year 2008 and their categorization in the India ASEAN FTA agreement. India’s largest item of import was Shrimps and prawns which is placed under the Exclusion list. The third and fifth important items of import are also kept in the Exclusion list where fourth largest item is in the Sensitive List. This showed the major items of India’s import are adequately protected under the agreement. Similarly top six items of India’s export which alone accounted 76.18 percent are placed in the negative list.
<table>
<thead>
<tr>
<th>Product</th>
<th>Product Name</th>
<th>Import share</th>
<th>Category under AIFTA</th>
<th>Product</th>
<th>Product Name</th>
<th>Export share</th>
<th>Category under AIFTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>030613</td>
<td>Shrimps and prawns</td>
<td>34.88</td>
<td>EL</td>
<td>030374</td>
<td>Mackerel (Scomber scombrus, Scomber)</td>
<td>17.58</td>
<td>EL</td>
</tr>
<tr>
<td>030741</td>
<td>Live, fresh or chilled</td>
<td>26.22</td>
<td>NT-1</td>
<td>030379</td>
<td>Other</td>
<td>15.80</td>
<td>EL</td>
</tr>
<tr>
<td>030490</td>
<td>Other</td>
<td>19.42</td>
<td>EL</td>
<td>030624</td>
<td>Crabs</td>
<td>15.14</td>
<td>EL</td>
</tr>
<tr>
<td>030269</td>
<td>Other</td>
<td>9.29</td>
<td>ST</td>
<td>030613</td>
<td>Shrimps and prawns</td>
<td>12.89</td>
<td>EL</td>
</tr>
<tr>
<td>030379</td>
<td>Other</td>
<td>4.81</td>
<td>EL</td>
<td>030342</td>
<td>Yellowfin tunas (Thunnus albacares)</td>
<td>7.78</td>
<td>EL</td>
</tr>
<tr>
<td>030322</td>
<td>Atlantic salmon (Salmo salar) and D</td>
<td>2.23</td>
<td>NT-1*</td>
<td>030420</td>
<td>Frozen fillets</td>
<td>6.99</td>
<td>EL</td>
</tr>
<tr>
<td>030420</td>
<td>Frozen fillets</td>
<td>1.27</td>
<td>EL</td>
<td>030749</td>
<td>Other</td>
<td>4.35</td>
<td>NT-1</td>
</tr>
<tr>
<td>030559</td>
<td>Other</td>
<td>0.57</td>
<td>NT-1</td>
<td>030269</td>
<td>Other</td>
<td>4.27</td>
<td>ST</td>
</tr>
<tr>
<td>030319</td>
<td>Other</td>
<td>0.56</td>
<td>NT-1</td>
<td>030741</td>
<td>Live, fresh or chilled</td>
<td>3.50</td>
<td>NT-1</td>
</tr>
<tr>
<td>030563</td>
<td>Anchovies (Engraulis spp.)</td>
<td>0.23</td>
<td>EL</td>
<td>030343</td>
<td>Skipjack or stripbellied bonito</td>
<td>3.28</td>
<td>NT-1</td>
</tr>
<tr>
<td>030729</td>
<td>Other</td>
<td>0.21</td>
<td>NT-1</td>
<td>030739</td>
<td>Other</td>
<td>1.06</td>
<td>NT-1</td>
</tr>
<tr>
<td>030110</td>
<td>Ornamental fish</td>
<td>0.15</td>
<td>NT-1</td>
<td>030371</td>
<td>Sardines (Sardina pilchardus, Sardii)</td>
<td>0.83</td>
<td>EL</td>
</tr>
<tr>
<td>030799</td>
<td>Other</td>
<td>0.10</td>
<td>NT-1</td>
<td>030110</td>
<td>Ornamental fish</td>
<td>0.79</td>
<td>NT-1</td>
</tr>
<tr>
<td>030569</td>
<td>Other</td>
<td>0.06</td>
<td>NT-1</td>
<td>030232</td>
<td>Yellowfin tunas (Thunnus albacares)</td>
<td>0.59</td>
<td>EL</td>
</tr>
</tbody>
</table>

**RCA Index for India and ASEAN Countries in Fisheries Products**

This section provides Revealed Comparative Advantage (RCA) of India and six major countries of ASEAN namely Cambodia, Malaysia, Philippines, Singapore, Thailand and Vietnam in the marine products category. The RCA for the period 2002-07 are calculated and the mean value along with standard deviation is taken for comparison. India’s mean RCA for HS-3 is 2.48 which demonstrated that India got comparative advantage in this product category. But the decomposition of this category in to HS-4 digits showed India got definite comparative advantage in select products. India got high RCA in Crustaceans whether in Shell or not (7.21) followed by Molluscs, whether in shell or not (3.20) and frozen fish (1.84). India has comparative disadvantage in Live fish (0.17), Fresh or Chilled fish (0.26), fish fillets (0.25) and fried fish (0.31). India’s import is very low giving positive values for Comparative Trade Advantage (RTA). Positive values for REA and RC shows revealed comparative advantage.
Tab: 10 RCA Indices for India in Marine Products

<table>
<thead>
<tr>
<th>HS-4 Digit</th>
<th>RCA</th>
<th>RTA</th>
<th>REA</th>
<th>RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>2.48 [0.62]</td>
<td>2.45 [0.63]</td>
<td>0.88 [0.25]</td>
<td>4.63 [0.43]</td>
</tr>
<tr>
<td>Live Fish 0301</td>
<td>0.17 [0.09]</td>
<td>0.17 [0.09]</td>
<td>-1.88 [0.52]</td>
<td>6.56 [2.89]</td>
</tr>
<tr>
<td>Fish, fresh or Chilled 0302</td>
<td>0.26 [0.04]</td>
<td>0.17 [0.08]</td>
<td>-1.35 [0.14]</td>
<td>1.12 [0.55]</td>
</tr>
<tr>
<td>Fish Frozen 0303</td>
<td>1.84 [0.55]</td>
<td>1.84 [0.55]</td>
<td>0.57 [0.32]</td>
<td>6.17 [0.66]</td>
</tr>
<tr>
<td>Fish Fillets and other fish meat 0304</td>
<td>0.25 [0.07]</td>
<td>0.24 [0.07]</td>
<td>-1.42 [0.26]</td>
<td>-1.43 [0.26]</td>
</tr>
<tr>
<td>Fried Fish, salted or inbrine 0305</td>
<td>0.31 [0.11]</td>
<td>0.29 [0.11]</td>
<td>-1.23 [0.33]</td>
<td>3.12 [0.73]</td>
</tr>
<tr>
<td>Crustaceans whether in Shell or not 0306</td>
<td>7.21 [1.76]</td>
<td>7.19 [1.76]</td>
<td>1.95 [0.24]</td>
<td>5.68 [0.19]</td>
</tr>
<tr>
<td>Molluscs, whether in shell or not 0307</td>
<td>3.20 [0.41]</td>
<td>3.18 [0.41]</td>
<td>1.16 [0.13]</td>
<td>5.15 [0.45]</td>
</tr>
</tbody>
</table>

Cambodia got Revealed Comparative Advantage in Live Fish (1.26) Crustaceans whether in Shell or not (2.67) and Revealed comparative Disadvantage in other categories in Fresh or chilled fish (0.15), frozen fish (0.44), fish fillets (0.01) and Molluscs (0.04). Malaysia’s comparative advantage are in Live fish (2.66) and Crustaceans whether in Shell or not (1.69) and disadvantage in other product category. Philippines’ comparative advantage are in Live fish (4.48), Frozen Fish (1.97), Crustaceans whether in Shell or not (2.05) and Molluscs (1.81). Live fish is the only category Singapore got comparative advantage (2.09) and other categories they got comparative disadvantage.

Tab: 11 RCA Indices for Cambodia in Marine Products

<table>
<thead>
<tr>
<th>HS-4 Digit</th>
<th>RCA</th>
<th>RTA</th>
<th>REA</th>
<th>RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>0.0 [0.0]</td>
<td>-0.74 [0.0]</td>
<td>-28.20 [28.20]</td>
<td>-27.90 [27.90]</td>
</tr>
<tr>
<td>Live Fish 0301</td>
<td>1.26</td>
<td>1.23</td>
<td>0.23</td>
<td>3.72</td>
</tr>
<tr>
<td>Fish, fresh or Chilled 0302</td>
<td>0.15</td>
<td>0.15</td>
<td>-1.89</td>
<td>-1.89</td>
</tr>
<tr>
<td>Fish Frozen 0303</td>
<td>0.44</td>
<td>0.11</td>
<td>-0.82</td>
<td>0.28</td>
</tr>
<tr>
<td>Fish Fillets and other fish meat 0304</td>
<td>0.01</td>
<td>0.01</td>
<td>-4.23</td>
<td>2.45</td>
</tr>
<tr>
<td>Fried Fish, salted or inbrine 0305</td>
<td>0.10</td>
<td>0.10</td>
<td>-2.32</td>
<td>4.78</td>
</tr>
<tr>
<td>Crustaceans whether in Shell or not 0306</td>
<td>2.67</td>
<td>0.08</td>
<td>0.98</td>
<td>0.03</td>
</tr>
<tr>
<td>Molluscs, whether in shell or not 0307</td>
<td>0.04</td>
<td>0.03</td>
<td>-3.31</td>
<td>3.09</td>
</tr>
</tbody>
</table>
Tab: 12 RCA Indices for Malaysia in Marine Products

<table>
<thead>
<tr>
<th>HS-4 Digit</th>
<th>RCA</th>
<th>RTA</th>
<th>REA</th>
<th>RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>0.63</td>
<td>0.00</td>
<td>-0.47</td>
<td>0.00</td>
</tr>
<tr>
<td>Live Fish 0301</td>
<td>2.66</td>
<td>1.66</td>
<td>0.97</td>
<td>0.98</td>
</tr>
<tr>
<td>Fish, fresh or Chilled 0302</td>
<td>0.18</td>
<td>-0.90</td>
<td>-1.76</td>
<td>-1.84</td>
</tr>
<tr>
<td>Fish Frozen 0303</td>
<td>0.16</td>
<td>-0.58</td>
<td>-1.93</td>
<td>-1.62</td>
</tr>
<tr>
<td>Fish Fillets and other fish meat 0304</td>
<td>0.10</td>
<td>-0.17</td>
<td>-2.83</td>
<td>-1.47</td>
</tr>
<tr>
<td>Fried Fish, salted or inbrine 0305</td>
<td>0.09</td>
<td>-0.28</td>
<td>-2.47</td>
<td>-1.45</td>
</tr>
<tr>
<td>Crustaceans whether in Shell or not 0306</td>
<td>1.69</td>
<td>0.90</td>
<td>0.51</td>
<td>0.81</td>
</tr>
<tr>
<td>Molluscs, whether in shell or not 0307</td>
<td>1.01</td>
<td>0.76</td>
<td>-0.01</td>
<td>1.42</td>
</tr>
</tbody>
</table>

Tab: 13 RCA Indices for Philippines Marine Products

<table>
<thead>
<tr>
<th>HS-4 Digit</th>
<th>RCA</th>
<th>RTA</th>
<th>REA</th>
<th>RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>1.30</td>
<td>0.95</td>
<td>0.26</td>
<td>1.30</td>
</tr>
<tr>
<td>Live Fish 0301</td>
<td>4.48</td>
<td>4.19</td>
<td>1.50</td>
<td>2.74</td>
</tr>
<tr>
<td>Fish, fresh or Chilled 0302</td>
<td>0.27</td>
<td>0.26</td>
<td>-1.34</td>
<td>3.40</td>
</tr>
<tr>
<td>Fish Frozen 0303</td>
<td>1.97</td>
<td>0.74</td>
<td>0.66</td>
<td>0.46</td>
</tr>
<tr>
<td>Fish Fillets and other fish meat 0304</td>
<td>0.36</td>
<td>0.28</td>
<td>-1.05</td>
<td>1.52</td>
</tr>
<tr>
<td>Fried Fish, salted or inbrine 0305</td>
<td>0.80</td>
<td>0.78</td>
<td>-0.39</td>
<td>3.51</td>
</tr>
<tr>
<td>Crustaceans whether in Shell or not 0306</td>
<td>2.05</td>
<td>2.02</td>
<td>0.71</td>
<td>4.27</td>
</tr>
<tr>
<td>Molluscs, whether in shell or not 0307</td>
<td>1.81</td>
<td>1.42</td>
<td>0.59</td>
<td>1.52</td>
</tr>
</tbody>
</table>

Tab: 14 RCA Indices for Singapore in Marine Products

<table>
<thead>
<tr>
<th>HS-4 Digit</th>
<th>RCA</th>
<th>RTA</th>
<th>REA</th>
<th>RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>0.26</td>
<td>-0.18</td>
<td>-1.36</td>
<td>-0.55</td>
</tr>
<tr>
<td>Live Fish 0301</td>
<td>2.09</td>
<td>0.83</td>
<td>0.73</td>
<td>0.50</td>
</tr>
<tr>
<td>Fish, fresh or Chilled 0302</td>
<td>0.04</td>
<td>-0.44</td>
<td>-3.69</td>
<td>-2.94</td>
</tr>
<tr>
<td>Fish Frozen 0303</td>
<td>0.40</td>
<td>-0.10</td>
<td>-0.93</td>
<td>-0.22</td>
</tr>
<tr>
<td>Fish Fillets and other fish meat 0304</td>
<td>0.20</td>
<td>0.00</td>
<td>-1.66</td>
<td>-0.07</td>
</tr>
<tr>
<td>Fried Fish, salted or inbrine 0305</td>
<td>0.35</td>
<td>-0.24</td>
<td>-1.08</td>
<td>0.53</td>
</tr>
<tr>
<td>Crustaceans whether in Shell or not 0306</td>
<td>0.14</td>
<td>-0.29</td>
<td>-2.13</td>
<td>1.26</td>
</tr>
<tr>
<td>Molluscs, whether in shell or not 0307</td>
<td>0.27</td>
<td>-0.31</td>
<td>-1.34</td>
<td>0.78</td>
</tr>
</tbody>
</table>
Tab: 15 RCA Indices for Thailand in Marine Products

<table>
<thead>
<tr>
<th>HS-4 Digit</th>
<th>RCA</th>
<th>RTA</th>
<th>REA</th>
<th>RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>3.36  [0.30]</td>
<td>1.32 [0.35]</td>
<td>1.21 [0.09]</td>
<td>0.50 [0.12]</td>
</tr>
<tr>
<td>Live Fish 0301</td>
<td>1.60 [0.28]</td>
<td>1.53 [0.32]</td>
<td>0.45 [0.17]</td>
<td>3.33 [0.98]</td>
</tr>
<tr>
<td>Fish, fresh or Chilled 0302</td>
<td>0.49 [0.09]</td>
<td>0.00 [0.0]</td>
<td>-0.74 [0.19]</td>
<td>0.05 [0.57]</td>
</tr>
<tr>
<td>Fish Frozen 0303</td>
<td>0.80 [0.30]</td>
<td>-6.47 [0.54]</td>
<td>-0.28 [0.33]</td>
<td>-2.26 [0.24]</td>
</tr>
<tr>
<td>Fish Fillets and other fish meat 0304</td>
<td>2.56 [0.53]</td>
<td>2.31 [0.56]</td>
<td>0.92 [0.21]</td>
<td>2.34 [0.42]</td>
</tr>
<tr>
<td>Fried Fish, salted or inbrine 0305</td>
<td>1.41 [0.11]</td>
<td>1.25 [0.11]</td>
<td>0.34 [0.08]</td>
<td>2.16 [0.20]</td>
</tr>
<tr>
<td>Crustaceans whether in Shell or not 0306</td>
<td>7.89 [1.10]</td>
<td>7.06 [1.11]</td>
<td>2.06 [0.14]</td>
<td>2.34 [0.49]</td>
</tr>
<tr>
<td>Molluscs, whether in shell or not 0307</td>
<td>6.45 [0.55]</td>
<td>5.38 [0.50]</td>
<td>1.86 [0.09]</td>
<td>1.80 [0.09]</td>
</tr>
</tbody>
</table>

Thailand is a leading fish exporter and they got a high comparative advantage of 3.36. The highest RCAs for Thailand are in Crustaceans whether in Shell or not (7.89) Molluscs, whether in shell or not (6.45). Thailand also got comparative advantage in fish fillets (2.56), Fried fish (1.41) and Live fish (1.60). Thailand’d comparative disadvantages are in Fresh or Chilled fish (0.49) and frozen fish (0.80). The highest RCA for the whole ASEAN region is for Vietnam and got very high RCA values in Crustaceans whether in Shell or not (32.19), Fish Fillets and other fish meat (16.41) and Molluscs, whether in shell or not (16.62). Vietnam got high RCAs across all product groups and there is no comparative disadvantage.

Tab: 16 RCA Indices for Vietnam in Marine Products

<table>
<thead>
<tr>
<th>HS-4 Digit</th>
<th>RCA</th>
<th>RTA</th>
<th>REA</th>
<th>RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>13.83 [0.42]</td>
<td>13.04 [0.46]</td>
<td>2.63 [0.03]</td>
<td>2.87 [0.11]</td>
</tr>
<tr>
<td>Live Fish 0301</td>
<td>3.83 [3.40]</td>
<td>3.66 [3.32]</td>
<td>0.89 [1.18]</td>
<td>2.85 [0.72]</td>
</tr>
<tr>
<td>Fish, fresh or Chilled 0302</td>
<td>1.52 [1.01]</td>
<td>1.36 [0.96]</td>
<td>0.29 [0.56]</td>
<td>2.19 [0.53]</td>
</tr>
<tr>
<td>Fish Frozen 0303</td>
<td>2.43 [0.93]</td>
<td>1.37 [1.12]</td>
<td>0.84 [0.34]</td>
<td>0.80 [0.55]</td>
</tr>
<tr>
<td>Fish Fillets and other fish meat 0304</td>
<td>16.41 [6.19]</td>
<td>15.84 [6.02]</td>
<td>2.74 [0.40]</td>
<td>3.41 [0.41]</td>
</tr>
<tr>
<td>Fried Fish, salted or inbrine 0305</td>
<td>4.93 [0.37]</td>
<td>4.78 [0.33]</td>
<td>1.59 [0.07]</td>
<td>3.71 [0.71]</td>
</tr>
<tr>
<td>Crustaceans whether in Shell or not 0306</td>
<td>32.19 [3.80]</td>
<td>30.82 [3.25]</td>
<td>3.47 [0.12]</td>
<td>3.21 [0.30]</td>
</tr>
<tr>
<td>Molluscs, whether in shell or not 0307</td>
<td>16.62 [0.80]</td>
<td>16.10 [0.72]</td>
<td>2.81 [0.05]</td>
<td>3.47 [0.19]</td>
</tr>
</tbody>
</table>
The mean RCA values for fish products in HS-2 and HS-4 digits classification for India and six ASEAN countries explains the trade structure of Marine products for India and ASEAN countries. RCA for HS-03 showed there is revealed comparative advantage for India, Philippines, Thailand and Vietnam and comparative disadvantage for Cambodia, Malaysia and Singapore. The two ASEAN countries namely Vietnam and Thailand enjoy very high RCA indicating their strong advantage in this product category. The decomposition of this in to HS-4 digits showed countries enjoying advantage in specific product categories. India’s comparative advantage lies in frozen fish, Crustaceans and Molluscs. Malaysia has comparative advantage in live fish and Crustaceans while Singapore got comparative advantage in only live fish. Thailand got comparative advantage in all except fresh of chilled fish (0302) and frozen fish (0303) while Vietnam got exceptionally high RCA across all product categories.

SMART Simulation on Fisheries Products

In order to understand the impact of India-ASEAN FTA on marine products, SMART simulation method of the World Integrated Trade Solution (WITS) are employed with different tariff cuts. WITS is a partial equilibrium simulation model using infinite elasticity of substitution. Four alternate scenarios of tariff reduction namely 16.66 percent, 33.3 percent, 66.6 percent and 100 percent cut are employed in the simulation to get the requisite results. India’s MFN tariff for the marine products are 30 percent and this works out as 5 percent, 10 percent, 20 percent and all 30 percent reduction in tariff rates. Sensitive products whose tariff will not fall to zero percent and Exclusion list products are removed from the database to get the FTA impact.

Table: 17 SMART Simulation Results for Marine Products Under Various Tariff Cuts

<table>
<thead>
<tr>
<th>Tariff Reduction</th>
<th>Trade Creation (’000)</th>
<th>Trade Diversion (’000)</th>
<th>Total Trade Effect (’000)</th>
<th>Trade Value (’000)</th>
<th>Revenue Effect (’000)</th>
<th>Welfare Effect (’000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.66 Percent cut</td>
<td>179.07</td>
<td>0</td>
<td>179.07</td>
<td>1,906.50</td>
<td>23.828</td>
<td>43.503</td>
</tr>
<tr>
<td>33.3 Percent Cut</td>
<td>357.926</td>
<td>0</td>
<td>357.926</td>
<td>1,906.50</td>
<td>33.187</td>
<td>82.25</td>
</tr>
<tr>
<td>66.6 Percent Cut</td>
<td>715.852</td>
<td>0</td>
<td>715.852</td>
<td>1,906.50</td>
<td>8.515</td>
<td>141.75</td>
</tr>
<tr>
<td>100 Percent Cut</td>
<td>1,074.85</td>
<td>0</td>
<td>1,074.85</td>
<td>1,906.50</td>
<td>-74.503</td>
<td>175.068</td>
</tr>
</tbody>
</table>
The simulation results showed trade creation from the RTA increases as the tariff reduction increases. When there is 100 percent tariff reduction, trade is created to the tune of 1.07 million US dollars. This together with the initial trade of 1.906 million takes the total trade to 2.981 million US dollars. The revenue collection from tariff reductions increases in the initial stage but turn in to negative as there is a 100 percent tariff cut. Keeping similar trend with trade creation, consumer welfare also increases as there was deeper tariff reductions. The increase in consumer welfare from 100 percent tariff cut of marine products turn out to be 175.068 million.

Table: 18 Market View of Tariff reduction

<table>
<thead>
<tr>
<th>Tariff Line Code</th>
<th>Imports Before ($) '000</th>
<th>Change In Revenue ($) '000</th>
<th>New Revenue ($) '000</th>
<th>Change In Revenue ($) '000</th>
<th>Consumer Surplus ($) '000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ornamental Fish</td>
<td>46.193</td>
<td>5.427</td>
<td>7.754</td>
<td>0</td>
<td>-7.754</td>
</tr>
<tr>
<td>Pacific Salmon</td>
<td>306.656</td>
<td>0.111</td>
<td>91.224</td>
<td>90.869</td>
<td>-0.355</td>
</tr>
<tr>
<td>Livers and roes</td>
<td>3.049</td>
<td>2.11</td>
<td>0.229</td>
<td>0</td>
<td>-0.229</td>
</tr>
<tr>
<td>Halibut</td>
<td>2.749</td>
<td>0.131</td>
<td>0.206</td>
<td>0</td>
<td>-0.206</td>
</tr>
<tr>
<td>Others (030349)</td>
<td>170.074</td>
<td>151.769</td>
<td>4.301</td>
<td>0</td>
<td>-4.301</td>
</tr>
<tr>
<td>Cod</td>
<td>11.453</td>
<td>17.627</td>
<td>1.48</td>
<td>0.761</td>
<td>-0.718</td>
</tr>
<tr>
<td>Pacific Salmon &amp; Danube Salmon</td>
<td>262.525</td>
<td>0.175</td>
<td>78.009</td>
<td>77.666</td>
<td>-0.343</td>
</tr>
<tr>
<td>Other (030549)</td>
<td>1.715</td>
<td>0.013</td>
<td>0.46</td>
<td>0.435</td>
<td>-0.025</td>
</tr>
<tr>
<td>Other (030559)</td>
<td>392.652</td>
<td>868.711</td>
<td>116.453</td>
<td>111.265</td>
<td>-5.188</td>
</tr>
<tr>
<td>Other (030729)</td>
<td>189.225</td>
<td>8.545</td>
<td>48.447</td>
<td>29.649</td>
<td>-18.799</td>
</tr>
<tr>
<td>Live, fresh or chilled (030731)</td>
<td>2.795</td>
<td>0.538</td>
<td>0.545</td>
<td>0</td>
<td>-0.545</td>
</tr>
<tr>
<td>Other (030739)</td>
<td>122.234</td>
<td>1.132</td>
<td>36.447</td>
<td>35.885</td>
<td>-0.562</td>
</tr>
<tr>
<td>Other (030759)</td>
<td>81.27</td>
<td>6.055</td>
<td>23.993</td>
<td>9.881</td>
<td>-14.112</td>
</tr>
<tr>
<td>Other (030799)</td>
<td>76.485</td>
<td>0.002</td>
<td>17.839</td>
<td>17.838</td>
<td>-0.001</td>
</tr>
</tbody>
</table>

Market View

The market view showed the trade creation, revenue change and consumer surplus at six digits product categories. The two product groups which showed highest trade creation for India are
other categories in Pacific Salmon and Danube Salmon (030559) and other (030349). The highest drop in revenue is taking place in Sea Bass (030377) and other Molluscs (030729). The biggest consumer surplus is recorded in Pacific Salmon and Danube Salmon (030559) with an increase of 167 thousand US dollar.

Table: 19 Exports view of Marine Products under India ASEAN FTA

<table>
<thead>
<tr>
<th>Exporter / HS Tariff Line Code Name</th>
<th>Exports Before ($'000)</th>
<th>Exports After ($'000)</th>
<th>Change In Revenue ($'000)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Thailand</strong></td>
<td>86.262</td>
<td>867.173</td>
<td>780.911</td>
</tr>
<tr>
<td>Other (030559)</td>
<td>11.264</td>
<td>764.072</td>
<td>752.808</td>
</tr>
<tr>
<td>Other (030759)</td>
<td>38.836</td>
<td>52.668</td>
<td>13.832</td>
</tr>
<tr>
<td>Sea Bass</td>
<td>17.063</td>
<td>24.265</td>
<td>7.202</td>
</tr>
<tr>
<td>Ornamental Fish</td>
<td>19.096</td>
<td>26.162</td>
<td>7.066</td>
</tr>
<tr>
<td>Other (030799)</td>
<td>0.003</td>
<td>0.006</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>Total Singapore</strong></td>
<td>410.952</td>
<td>734.785</td>
<td>323.833</td>
</tr>
<tr>
<td>Other (030349)</td>
<td>57.344</td>
<td>213.309</td>
<td>155.965</td>
</tr>
<tr>
<td>Other (030559)</td>
<td>5.963</td>
<td>126.405</td>
<td>120.442</td>
</tr>
<tr>
<td>Other (030729)</td>
<td>79.239</td>
<td>98.941</td>
<td>19.702</td>
</tr>
<tr>
<td>Cod (Gadus morhua, Gadus ogac)</td>
<td>8.695</td>
<td>26.543</td>
<td>17.848</td>
</tr>
<tr>
<td>Sea bass 030377</td>
<td>213.256</td>
<td>219.396</td>
<td>6.14</td>
</tr>
<tr>
<td>Liver and roes (030270)</td>
<td>3.049</td>
<td>5.159</td>
<td>2.11</td>
</tr>
<tr>
<td>Other (030739)</td>
<td>2.126</td>
<td>3.751</td>
<td>1.625</td>
</tr>
<tr>
<td>Live, fresh or chilled (030731)</td>
<td>2.795</td>
<td>3.333</td>
<td>0.538</td>
</tr>
<tr>
<td>Pacific salmon, Danube salmon (030541)</td>
<td>3.328</td>
<td>3.815</td>
<td>0.487</td>
</tr>
<tr>
<td>Pacific salmon, Danube salmon (030212)</td>
<td>3.436</td>
<td>3.871</td>
<td>0.435</td>
</tr>
<tr>
<td>Halibut (030331)</td>
<td>2.749</td>
<td>2.88</td>
<td>0.131</td>
</tr>
<tr>
<td>Other (030549)</td>
<td>0.241</td>
<td>0.278</td>
<td>0.037</td>
</tr>
</tbody>
</table>

Exports view

The Exporter’s view showed that Thailand and Singapore increase their exports to India in marine trade after the implementation of FTA agreement. Thailand’s total exports expected to grow from 86,262 dollars to 8,67,173 dollars an increase of 7,80,911 dollars. Almost the entire growth in exports is coming from Mumbai duck, seer without head, sprats and others (752,808).
Marine exports of Singapore is also expected to grow by 323,833 dollars from an initial export of 410,952 dollars to 734,785 dollars after the implementation of FTA. The biggest export gains are coming from Other (030559), Other (030759), Other (030729) and Cod (Gadus mohua, Gadus ogac).

**Sensitive Products**

Simulation results for sensitive products (tariff elimination up to 5 percent) showed that marginal trade creation and welfare effect which is lower than the revenue loss.

**Table: 20 Simulation Results for Sensitive Products**

<table>
<thead>
<tr>
<th>Tariff Reduction</th>
<th>Trade Creation ($ '000)</th>
<th>Trade Diversion ($ '000)</th>
<th>Total Trade Effect ($ '000)</th>
<th>Trade Value ($ '000)</th>
<th>Revenue Effect ($ '000)</th>
<th>Welfare Effect ($ '000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To 5 percent</td>
<td>0.487</td>
<td>0</td>
<td>0.487</td>
<td>122.412</td>
<td>-0.935</td>
<td>0.117</td>
</tr>
</tbody>
</table>

**Conclusion**

The study made an attempt to understand the trade complementarity between India and ASEAN countries in the context of India ASEAN Free Trade Agreement. Export Intensity Index and Import Intensity Index showed there is scope for India to improve trade with some countries particularly the less developed ones. RCA at commodity group level showed that there are trade complementarity between India and ASEAN to be exploited which can enhance bilateral trade. India’s comparative advantage in the marine exports is mainly on the Crustaceans whether in Shell or not (0306) and Molluscs, whether in shell or not (0307) and here all the major ASEAN countries got trade similarity with India. But the India-ASEAN agreement addresses this problem of trade similarity by placing major import and export items of marine trade under exclusion list. The simulation exercise carried out showed that tariff elimination leads reasonable trade creation and marginal welfare increase with nominal tariff revenue decline. When we incorporate India’s increased trade with ASEAN due to their tariff reduction, the trade off is not substantial. The apprehension that India-ASEAN FTA will lead to substantial import of marine products in to India is unfounded.
References


Kawai, Masahiro (2004), ‘Regional Economic Integration and Cooperation in East Asia,’ mimeo


