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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 in to effect from 1st January 2010. Under the agreement commodities are grouped in to 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 agro climatic 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. 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 and Imports. Following Kojima (1964) and Drysdale (1969), the index of trade intensity is restated as follows,

$$EII \text{ between India and ASEAN} = \frac{X_{IA}/X_I}{M_A/(M_W-M_I)}$$

X_{IA} = India's Export to ASEAN; X_I = India's total Export; M_A = Total Import of ASEAN; M_W = Total World imports M_I = Total Imports of India

$$III \text{ between India and ASEAN} = \frac{M_{IA}/M_I}{X_A/(X_W-X_I)}$$

M_{IA} = Import of India from ASEAN; M_I = Total Import of India; X_A = Total Export of ASEAN; X_W = Total World Export; X_I = 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:

$$RCA_{ij} = \frac{(x_{ij}/X_{it})}{(x_{wj}/X_{wt})}$$

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 $RMA = (m_{ij} / m_{it}) / (m_{nj} / m_{nt})$

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.

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

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

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.

Table: 2 India's Export and Import Intensity Index with ASEAN Countries

Year		BRU	CAM	INDO	LAO	MAL	MYA	PHI	SING	THAI	VIET
1990	EII	0.05	4.58	0.82	0.10	0.84	0.42	0.32	0.99	1.18	0.57
	III	0.00	0.00	0.94	0.82	2.60	30.93	0.07	1.83	0.38	3.30
2000	EII	0.30	0.85	1.77	1.11	1.06	2.43	0.84	0.94	1.26	2.04
	III	0.01	0.12	1.87	0.00	1.78	11.40	0.20	1.35	0.61	0.11
2005	EII	2.17	0.95	2.56	0.40	1.08	3.37	1.08	2.80	0.94	1.93
	III	0.01	0.02	2.54	0.01	1.28	10.17	0.37	1.03	0.77	0.28
2007	EII	1.21	0.53	1.77	0.32	1.19	3.07	0.59	1.90	1.25	1.49
	III	0.01	0.01	1.85	0.01	2.03	8.75	0.13	2.03	1.06	0.22

Source: Computed from DOTS, IMF

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 and India in food products for 17 years to identify specific comparative advantage in trade. RCA for food is high for India, Indonesia, Malaysia, Thailand and Vietnam and low for Brunei, Cambodia, Philippines and Singapore. The average RCA showed that the two ASEAN countries namely Vietnam and Thailand are having a strong RCA of above two. But Brunei, Cambodia and Singapore got a very low RCA in food and India which got a mean RCA of 1.8374 can export food articles to these nations.

Table: 3 RCA for Food in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	1.69	0.0741		1.21	1.27	2.06	0.57	3.13	
1995	2.20			1.30	1.08	1.46	0.45	2.20	
2000	2.06		0.14	1.26	0.83	0.68	0.34	2.10	3.78
2001	1.86	0.01	0.17	1.22	0.85	0.77	0.32	2.30	3.85
2002	1.80	0.01	0.11	1.45	1.03	0.71	0.31	2.00	3.49
2003	1.66	0.01	0.06	1.44	1.18	0.82	0.27	1.94	3.15
2004	1.49		0.16	1.77	1.16	0.86	0.27	1.89	3.03
2005	1.42		0.14	1.74	1.06	0.93	0.25	1.78	3.00
2006	1.49		0.15	1.85	1.11	0.96	0.25	1.80	

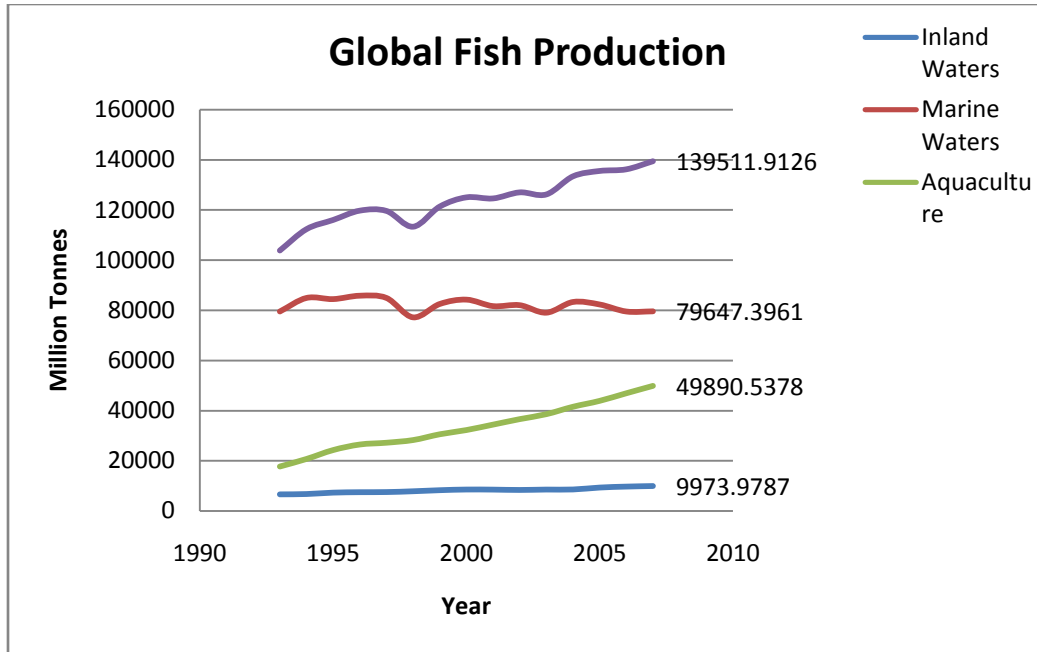
Source: Computed from WTO database

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 (32.55 percent) 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).

Fig: 1 Global Fish Production



Main Exporters of Fishery Commodities

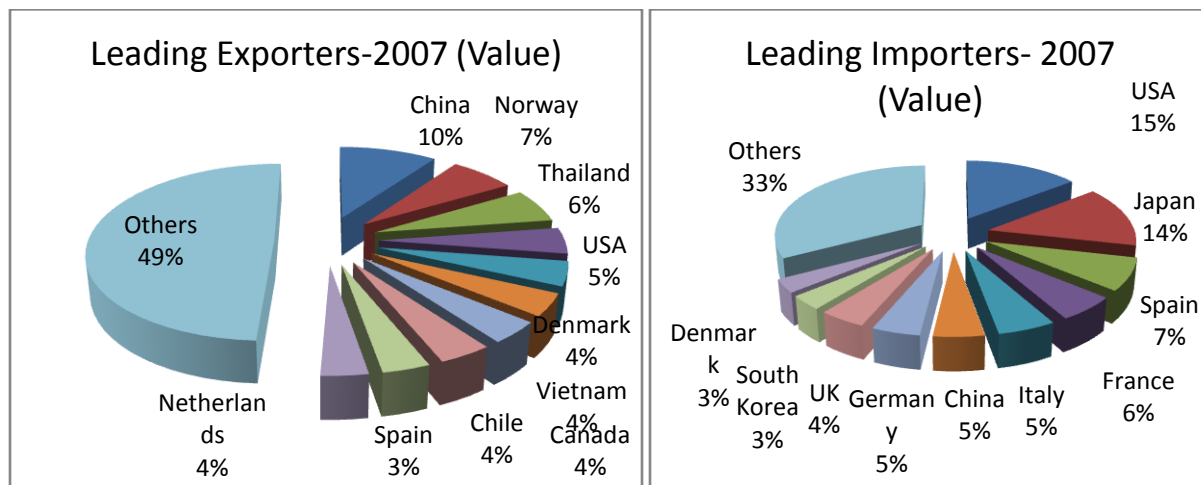
World fishery exports reached 87.97 billion US dollars in 2007 which increased from the previous year figure of 80.93 billion US \$. Top 50 countries account for 94.1 percent for the year. During the corresponding period the global imports increased from 86.61 billion dollars to 94.0 billion dollars. The largest exporter of fisheries products in the world is China (9.25billion) followed by Norway (6.23 billion dollars) and Thailand (5.7 billion dollar). Other leading exporters are USA, Denmark, Vietnam and Chile. The top three importers of fishery products for the year 2007are USA (13.63 billion \$), Japan (13.18 billion \$) and Spain (6.98billion \$).

Shrimp is the most important commodity with about 17 percent 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 percent of trade and Tuna is third with 9 percent. 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. 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 were 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 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.

Fig: 2 Major Exporter and Importers of Fishery Commodities



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)

	Production (Tonnes)	Imports (Tonnes)	Exports (Tonnes)	Fish Supply (Tonnes)	Per Capita Supply (Kg/Year)
India	6176551	9700 (0.15)	544713 (8.82)	5287278	4.7
Brunei	2877	10604 (368.58)	160 (5.56)	13014	35.6
Cambodia	373116	4200 (1.13)	55812 (14.96)	321504	23.4
Indonesia	5629869	44809 (0.80)	957610 (17.01)	4668629	20.9
Lao PDR	99067	5099 (5.15)	17 (0.02)	104151	18.7
Malaysia	1450432	453197 (31.25)	286404 (19.75)	1395101	55.4
Myanmar	1933452	2428 (0.13)	356153 (18.42)	1150831	24.2
Philippines	2719266	117856 (4.33)	210703 (7.75)	2626371	31.7
Singapore	7508	280278 (3733.06)	115326 (1536.04)	161942	37.9
Thailand	3919042	1274563 (32.52)	2011872 (51.34)	2039855	32.6
Vietnam	3079637	50435 (1.64)	835826 (27.14)	2128579	25.4
ASEAN	19214266	2243469 (11.68)	4829883 (25.14)	14609977	30.58
World	131582279	35216574 (26.76)	34664631 (26.34)	104718031	16.3

Source: FAO Statistics

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

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

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

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

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.

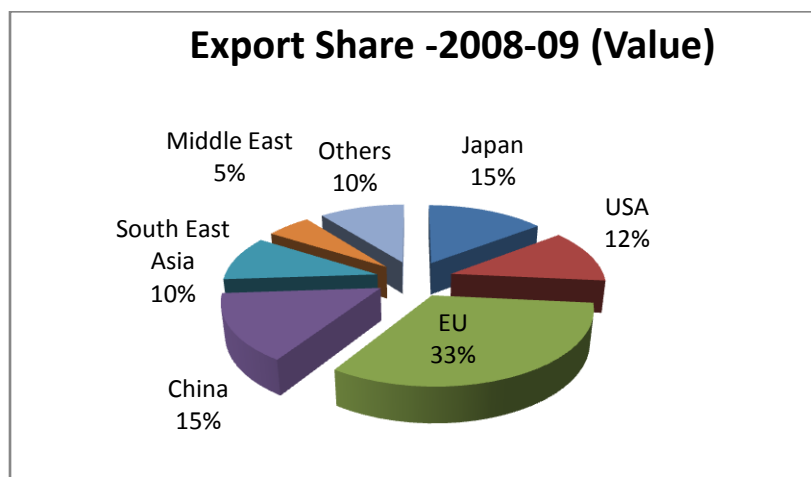
Major export markets

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%. If we take ASEAN+3 regional grouping, then India's export will be maximum (above 40 percent) to this entity.

Table:7 Direction of Indian Marine Exports

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

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%) relegating 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). Kochi is the major port exported marine products earning an export share of 17.6 percent. 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 in to seven major categories (hs-4 digits) under that 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

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

Source: computed by the author

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: 9 India’s Trade share and Product categories of Marine Products under ASEAN – India FTA

Product	Product Name	Import share	Category under AIFTA	Product	Product Name	Export share	Category under AIFTA
030613	Shrimps and prawns	34.88	EL	030374	Mackerel (Scomber scombrus, Scomber	17.58	EL
030741	Live, fresh or chilled	26.22	NT-1	030379	Other	15.80	EL
030490	Other	19.42	EL	030624	Crabs	15.14	EL
030269	Other	9.29	ST	030613	Shrimps and prawns	12.89	EL
030379	Other	4.81	EL	030342	Yellowfin tunas (Thunnus albacares)	7.78	EL
030322	Atlantic salmon (Salmo salar) and D	2.23	NT-1*	030420	Frozen fillets	6.99	EL
030420	Frozen fillets	1.27	EL	030749	Other	4.35	NT-1
030559	Other	0.57	NT-1	030269	Other	4.27	ST
030319	Other	0.56	NT-1	030741	Live, fresh or chilled	3.50	NT-1
030563	Anchovies (Engraulis spp.)	0.23	EL	030343	Skipjack or stripbellied bonito	3.28	NT-1
030729	Other	0.21	NT-1	030739	Other	1.06	NT-1
030110	Ornamental fish	0.15	NT-1	030371	Sardines (Sardina pilchardus, Sardi	0.83	EL
030799	Other	0.10	NT-1	030110	Ornamental fish	0.79	NT-1
030569	Other	0.06	NT-1	030232	Yellowfin tunas (Thunnus albacares)	0.59	EL
	Total EL	60.61 (69.9)			Total EL	77.60 (81.87)	

Source: computed by the author

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.

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.

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's 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.

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.

Comparison of RCA across ASEAN countries and India on HS-4 digits showed that India enjoyed comparative advantage in frozen fish, Crustaceans and Molluscus. For frozen fish India got trade complementarity with Cambodia, Malaysia, Singapore and Thailand, for Crustaceans with Singapore and for Molluscus with Cambodia, Malaysia and Singapore.

Table: 10 Comparison of RCA between India and ASEAN Countries

RCA based classification							
	India	Cambodia	Malaysia	Philippines	Singapore	Thailand	Vietnam
03	*			*		*	*
Live Fish 0301		*	*	*	*	*	*
Fish, Fresh or Chilled 0302							*
Fish Frozen	*			*			*
Fish Fillets and Other Fish meet 0304						*	*
Fried Fish, salted or inbrine 0305						*	*
Crustaceances	*	*	*	*		*	*
Molluscus	*			*		*	*

Source: Based on author's calculation

Table: 11 Comparison of RC between India and ASEAN Countries

	India	Cambodia	Malaysia	Philippines	Singapore	Thailand	Vietnam
03	*			*		*	*
Live Fish 0301	*	*	*	*	*	*	*
Fish, Fresh or Chilled 0302	*			*		*	*
Fish Frozen	*	*		*			*
Fish Fillets and Other Fish meet 0304		*		*		*	*
Fried Fish, salted or inbrine 0305	*	*		*		*	*
Crustaceance s	*	*	*	*		*	*
Molluscus	*	*	*	*		*	*

Source: Based on author's calculation

The Revealed Competitiveness (RC) showed that India got competitiveness in all HS-4 digit categories except Fish Fillets. But other major ASEAN fish economies such as Thailand, Vietnam, and Philippines also got Revealed Competitiveness in all categories. Only Malaysia and Singapore are showing less competitive in some product categories. In order to get the relative strength of the TC index, it is classified in to four categories namely 0 to 2, 2 to 4, 4 to 6, and above six. The relative strength of the RC showed India enjoys high RCA in five product categories. This includes frozen fish where India got high export share.

Table: 12 Relative Strength of RC between India and ASEAN Countries

Revealed Competitiveness (RC) values					
HS-4 Digit	<0	0-2	2-4	4-6	>6
03	Cambodia Singapore	Malaysia Philippines Thailand	Vietnam	India	
Live Fish 0301		Malaysia Singapore	Cambodia Philippines Thailand Vietnam		India
Fish, Fresh or Chilled 0302	Cambodia Malaysia Singapore	India Thailand	Philippines Vietnam		
Fish Frozen	Malaysia Philippines Singapore Thailand	Cambodia Vietnam			India *
Fish Fillets and Other Fish meet 0304	India Malaysia Singapore	Philippines	Cambodia Thailand Vietnam		
Fried Fish, salted or inbrine 0305	Malaysia Singapore		India Philippines Thailand Vietnam	Cambodia	
Crustaceances	Singapore	Cambodia Malaysia	Thailand Vietnam	India Philippines	
Molluscus	Singapore	Malaysia Philippines Thailand	Cambodia Vietnam	India	

Source: Based on author's calculation

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: 13 SMART Simulation Results for Marine Products Under Various Tariff Cuts

Tariff Reduction	Trade Creation (\$ '000)	Trade Diversion (\$ '000)	Total Trade Effect (\$ '000)	Trade Value (\$ '000)	Revenue Effect (\$ '000)	Welfare Effect (\$ '000)
16.66 Percent cut	179.07	0	179.07	1,906.50	23.828	43.503
33.3 Percent Cut	357.926	0	357.926	1,906.50	33.187	82.25
66.6 Percent Cut	715.852	0	715.852	1,906.50	8.515	141.75
100 Percent Cut	1,074.85	0	1,074.85	1,906.50	-74.503	175.068

Source: Computed by the author

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.

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: 14 Market View of Tariff reduction

	Imports	Imports	Tariff	Tariff	Tariff	
Tariff Line Code	Before (\$ '000)	Change In	Revenue (\$ '000)	New Revenue (\$ '000)	Change In Revenue (\$ '000)	Consumer Surplus (\$ '000)
Total	1,906.50	1,074.85	450.632	376.129	-74.503	175.068
Ornamental Fish	46.193	5.427	7.754	0	-7.754	0.456
Pacific Salmon	306.656	0.111	91.224	90.869	-0.355	0.033
Livers and roes	3.049	2.11	0.229	0	-0.229	0.079
Halibut	2.749	0.131	0.206	0	-0.206	0.005
Others (030349)	170.074	151.769	4.301	0	-4.301	1.919
Cod	11.453	17.627	1.48	0.761	-0.718	1.369
Sea bass	237.427	12.504	23.246	1.881	-21.364	0.659
Pacific Salmon & Danube Salmon	262.525	0.175	78.009	77.666	-0.343	0.052
Other (030549)	1.715	0.013	0.46	0.435	-0.025	0.003
Other (030559)	392.652	868.711	116.453	111.265	-5.188	167.136
Other (030729)	189.225	8.545	48.447	29.649	-18.799	1.734
Live, fresh or chilled (030731)	2.795	0.538	0.545	0	-0.545	0.052
Other (030739)	122.234	1.132	36.447	35.885	-0.562	0.333
Other (030759)	81.27	6.055	23.993	9.881	-14.112	1.236
Other (030799)	76.485	0.002	17.839	17.838	-0.001	0.001

Source: Computed by the author

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).

Table: 15 Exports view of Marine Products under India ASEAN FTA

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

Source: Computed by the author

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: 16 Simulation Results for Sensitive Products

Tariff Reduction	Trade Creation (\$ '000)	Trade Diversion (\$ '000)	Total Trade Effect (\$ '000)	Trade Value (\$ '000)	Revenue Effect (\$ '000)	Welfare Effect (\$ '000)
To 5 percent	0.487	0	0.487	122.412	-0.935	0.117

Source: Computed by the author

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 ASEAN countries particularly the less developed ones. RCA for food products showed that there is comparative advantage for India, Indonesia, Malaysia, Thailand and Vietnam and comparative disadvantage for Brunei, Cambodia, Philippines and Singapore. India is one of the significant fish exporters but the share of fish import in India's total import is abysmally small. India's huge national population makes the per head availability of fish one of the lowest in the world. Under the India ASEAN FTA, 59.86 percent tariff lines in marine products are kept under Normal Track (NT-1 and NT-2) and 35.92 percent tariff lines are kept in Excluded List (EL). Marine products accounting to 60.61 percent of India's import and 77.6 percent export are kept under Exclusion List. 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. The same trend follows in other indices also. The Revealed competitiveness (RC) Index showed India got competitiveness in all products except fish fillets (0304). The relative strength of RC showed India enjoyed high RC values in five HS-4 categories indicating India's competitiveness in that category. SMART simulation results 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 study revealed India has taken adequate precaution to protect its marine sector from large scale dumping. The apprehension that India-ASEAN FTA will lead to substantial import of marine products in to India is unfounded.

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APPENDIX

APP-Tab: 1 Mean RCA Indices for India in Marine Products

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

APP-Tab: 2 Mean RCA Indices for Cambodia in Marine Products

HS-4 Digit	RCA	RTA	REA	RC
03	0.0	-0.74	-28.20	-27.90
Live Fish 0301	1.26	1.23	0.23	3.72
Fish, fresh or Chilled 0302	0.15	0.15	-1.89	-1.89
Fish Frozen 0303	0.44	0.11	-0.82	0.28
Fish Fillets and other fish meat 0304	0.01	0.01	-4.23	2.45
Fried Fish, salted or inbrine 0305	0.10	0.10	-2.32	4.78
Crustaceans whether in Shell or not 0306	2.67	0.08	0.98	0.03
Molluscs, whether in shell or not 0307	0.04	0.03	-3.31	3.09

APP- Tab: 3 Mean RCA Indices for Malaysia in Marine Products

HS-4 Digit	RCA	RTA	REA	RC
03	0.63 [0.10]	0.00 [0.07]	-0.47 [0.15]	0.00 [0.11]
Live Fish 0301	2.66 [0.32]	1.66 [0.32]	0.97 [0.13]	0.98 [0.16]
Fish, fresh or Chilled 0302	0.18 [0.06]	-0.90 [0.17]	-1.76 [0.31]	-1.84 [0.40]
Fish Frozen 0303	0.16 [0.08]	-0.58 [0.08]	-1.93 [0.54]	-1.62 [0.42]
Fish Fillets and other fish meat 0304	0.10 [0.08]	-0.17 [0.04]	-2.83 [1.28]	-1.47 [1.11]
Fried Fish, salted or inbrine 0305	0.09 [0.02]	-0.28 [0.05]	-2.47 [0.22]	-1.45 [0.30]
Crustaceans whether in Shell or not 0306	1.69 [0.31]	0.90 [0.33]	0.51 [0.18]	0.81 [0.34]
Molluscs, whether in shell or not 0307	1.01 [0.20]	0.76 [0.13]	-0.01 [0.20]	1.42 [0.14]

APP-Tab: 4 Mean RCA Indices for Philippines Marine Products

HS-4 Digit	RCA	RTA	REA	RC
03	1.30 [0.20]	0.95 [0.15]	0.26 [0.15]	1.30 [0.0]
Live Fish 0301	4.48 [0.43]	4.19 [0.49]	1.50 [0.10]	2.74 [0.28]
Fish, fresh or Chilled 0302	0.27 [0.06]	0.26 [0.06]	-1.34 [0.23]	3.40 [0.23]
Fish Frozen 0303	1.97 [0.49]	0.74 [0.32]	0.66 [0.25]	0.46 [0.11]
Fish Fillets and other fish meat 0304	0.36 [0.09]	0.28 [0.06]	-1.05 [0.26]	1.52 [0.15]
Fried Fish, salted or inbrine 0305	0.80 [0.61]	0.78 [0.60]	-0.39 [0.85]	3.51 [0.70]
Crustaceans whether in Shell or not 0306	2.05 [0.19]	2.02 [0.18]	0.71 [0.09]	4.27 [0.35]
Molluscs, whether in shell or not 0307	1.81 [0.30]	1.42 [0.30]	0.59 [0.16]	1.52 [0.17]

APP- Tab: 5 Mean RCA Indices for Singapore in Marine Products

HS-4 Digit	RCA	RTA	REA	RC
03	0.26 [0.06]	-0.18 [0.06]	-1.36 [0.22]	-0.55 [0.20]
Live Fish 0301	2.09 [0.28]	0.83 [0.36]	0.73 [0.13]	0.50 [0.21]
Fish, fresh or Chilled 0302	0.04 [0.05]	-0.44 [0.12]	-3.69 [0.91]	-2.94 [1.03]
Fish Frozen 0303	0.40 [0.07]	-0.10 [0.04]	-0.93 [0.19]	-0.22 [0.10]
Fish Fillets and other fish meat 0304	0.20 [0.07]	0.00 [0.07]	-1.66 [0.35]	-0.07 [0.34]
Fried Fish, salted or inbrine 0305	0.35 [0.11]	-0.24 [0.06]	-1.08 [0.29]	-0.53 [0.10]
Crustaceans whether in Shell or not 0306	0.14 [0.08]	-0.29 [0.08]	-2.13 [0.56]	-1.26 [0.52]
Molluscs, whether in shell or not 0307	0.27 [0.06]	-0.31 [0.02]	-1.34 [0.21]	-0.78 [0.13]

APP-Tab: 6 Mean RCA Indices for Thailand in Marine Products

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

APP- Tab: 7 Mean RCA Indices for Vietnam in Marine Products

HS-4 Digit	RCA	RTA	REA	RC
03	13.83 [0.42]	13.04 [0.46]	2.63 [0.03]	2.87 [0.11]
Live Fish 0301	3.83 [3.40]	3.66 [3.32]	0.89 [1.18]	2.85 [0.72]
Fish, fresh or Chilled 0302	1.52 [1.01]	1.36 [0.96]	0.29 [0.56]	2.19 [0.53]
Fish Frozen 0303	2.43 [0.93]	1.37 [1.12]	0.84 [0.34]	0.80 [0.55]
Fish Fillets and other fish meat 0304	16.41 [6.19]	15.84 [6.02]	2.74 [0.40]	3.41 [0.41]
Fried Fish, salted or inbrine 0305	4.93 [0.37]	4.78 [0.33]	1.59 [0.07]	3.71 [0.71]
Crustaceans whether in Shell or not 0306	32.19 [3.80]	30.82 [3.25]	3.47 [0.12]	3.21 [0.30]
Molluscs, whether in shell or not 0307	16.62 [0.80]	16.10 [0.72]	2.81 [0.05]	3.47 [0.19]