

# Analysis of Indian Shrimp Exports and its Prices in Major International Markets

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Huge quantities of shrimp are produced in developing countries for export to Japan, United States, and Western Europe. Shrimp is one of the major seafood export product from India and the country is the 4<sup>th</sup> largest exporter of shrimp in Asia with a 2.43% share in the 50 billion dollar world seafood market. This paper discusses the trend in shrimp export prices in the major markets viz., Japan, USA and the EU countries. The competitiveness of Indian shrimp exports to the US market was studied and it was found that the country's relative competitiveness was less compared to its competing countries. An analysis of prices of frozen shrimp exports from India to the major international markets is also presented.

Keywords : Shrimp exports, revealed comparative advantage (RCA), India, international market

Shrimp trade is today's multibillion-dollar industry. China ranks first in shrimp production producing over three times its nearest competitors viz., India, Thailand, and Indonesia. The production of shrimp in India during 2006 through capture was 3.43 lakh metric tonnes (MT). The shrimp culture in India has been commercially developed during last few years due to liberalization of economy, high profitability and a good international market. The shrimp production in 1996-97 was 70 686 MT and has been on the rise during the past decade and in 2005-06 it was 1 43 170 MT (Anon, 2006). Andhra Pradesh is the leading producer of shrimp with more than 70 000 MT produced during 2005-06.

Share of shrimp in India's total marine product export was 54% in 2006-07. Shrimp exports from India are primarily to Japan, USA and European Union (EU) markets. Japan was the leading importer of shrimp from India till 2002. Afterwards though USA became the chief importer of shrimp, when the antidumping investigations came into practice, a drop occurred in the imports of

shrimp by USA. Since 2005, EU is the largest market for Indian shrimp.

Kagawa et al. (2006) examined the nature of linkages between Japan, a major importer of shrimp and two major exporting countries namely Thailand and Vietnam. Salayo (2000) developed Hedonic price indexes to account for quality changes over time and studied their impact on price-quality relationships in the shrimp industry in the Asia Pacific Region. Anon (2007) analysed the Indonesian shrimp sector and highlighted the constraints hindering the export performance. Geethalakshmi et al. (2007) discussed shrimp exports to major markets and emphasized the need for developing the vast untapped domestic market. Gopal et al. (2009) analysed implications of the anti-dumping duty levied on India and five other countries on exporting shrimp to USA and found that there was a decrease in shrimp exports to USA from these countries.

The rapid changes in the value of dollar against the Indian currency have been

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negatively affecting the Indian shrimp exports. The exports have slumped by approximately 20 per cent in rupee value due to the appreciation of rupee against US dollar. The increasing competition by other shrimp producing countries that harvest Vannamei shrimp (*Penaeus vannamei*) with lower production cost and shorter duration of culture compared to Indian black tiger shrimp has also negatively affected the shrimp trade. This paper describes the results of a study undertaken to analyse the prices of frozen shrimp exports from India and its competitiveness in the international markets.

### Materials and Methods

Week ending prices of black tiger shrimp in various popular grades exported to US, Japan and EU from India, Indonesia, Thailand, Vietnam and Bangladesh were collected during the period 2001 to 2006. The data were collected from various sources viz., MPEDA statistics, PRIME publications and import statistics provided by United States International Trade Commission (USITC) and National Marine Fisheries Service (NMFS), USA.

The competitiveness with respect to shrimp exports from India to USA was explored by taking into consideration the performance of other major shrimp exporters to USA namely, Bangladesh, Ecuador, Thailand, Vietnam, Mexico and Indonesia. Data on total shrimp exports to USA and all other shrimp importing countries from these seven competing countries were collected. The revealed comparative advantage (RCA) was computed separately for each country using Balassa's index (Balassa, 1965) given by:

$$RCA_{ij} = \frac{s_{ij}}{s_i}$$

where  $s_{ij} = X_{ij} / \sum_i X_{ij}$  is the ratio between country  $i$ 's export of goods  $j$  (denoted as  $X_{ij}$ ) and the world export of

goods  $j$ ; and  $s_i = \sum_j X_{ij} / \sum_{i,j} X_{ij}$  is the ratio between country  $i$ 's total exports and the total exports of the entire world. Another major shrimp exporter, China has not been considered for this analysis because of want of required data. Standard statistical techniques were used wherever necessary to draw conclusions from the data.

### Results and Discussion

Shrimp has overtaken tuna as the most consumed seafood in USA with the per capita consumption being 4.4 pounds during 2005. Black Tiger (BT) and Scampi were the items preferred in US market from India. There is immense consumer demand for Indian black tiger shrimp as it is of better quality than the white Vannamei type found in USA. India therefore has a cutting edge over other shrimp exporters. The popular grades in which India exports black tiger shrimp are under 15, 16/20, 21/25, 26/30, 31/40 and 41/50.

The prices of black tiger shrimp, India exported to USA during 2006 in the popular grades 16/20, 21/25, 26/30 and 41/50 were analysed. The price ranged from 8.93 to 13.01 \$ per kg for the grade 16/20, 6.72 to 10.80 \$ per kg for the grade 21/25, 6.17 to 9.92 \$ per kg for the grade 26/30, 5.29 to 8.05 \$ per kg for the grade 31/40 and 4.63 to 7.72 for the grade 41/50 during 2006.

The weekly prices realized by headless black tiger shrimp exported by India, Indonesia, Thailand, Vietnam and Bangladesh to USA during 2002 to 2005 were compared for the popular grades (in which continuous data are available) 16/20 and 21/25. It was found that Indian exports of headless (HL) black tiger shrimp realized more or less same price as that of Bangladesh products. Fig.1 (a) gives the week ending prices of HL black tiger shrimp exported from India and Indonesia to US shrimp market in the grade 16/20. The trend in prices followed the same pattern when compared to other popular

Table 1. Percentage share of Indian shrimp exports in the International shrimp markets

Year	USA		JAPAN		European Union	
	% Share (Quantity)	% Share (Value)	% Share (Quantity)	% Share (Value)	% Share (Quantity)	% Share (Value)
2001	7.39	4.99	17.53	16.73	3.30	2.77
2002	11.20	7.13	13.97	13.75	4.30	3.48
2003	10.74	6.90	12.07	10.60	4.03	3.20
2004	8.76	5.43	13.04	11.31	6.28	5.30
2005	9.14	5.59	11.27	10.15	5.22	4.24
2006	6.03	3.96	12.41	11.47	6.77	4.54

grades from these two countries. Fig 1(b) gives the week ending prices realized by other competing countries like Bangladesh, Vietnam and Thailand for their shrimp exported to US shrimp market in the grade 16/20. It can be seen that in comparison to Indonesia, Thailand and Vietnam, the prices realized by Indian shrimp products were lower. The pattern of price realized for other popular grades of BT was similar. The BT shrimp which was enjoying good demand in US market realised lower prices in the recent times because of the gaining popularity of Vannamei shrimp.

Owing to the above reasons and the anti-dumping issue, the market share of

Indian shrimp in the US shrimp market has declined. Table 1 gives the percentage contribution of Indian shrimp exports in terms of quantity and value from 2001 to 2006 in the international shrimp markets. The share of Indian shrimp at USA shrimp market which was as high as 11.2% during 2002 declined to 3.96% during 2006 (Table 1).

Comparative advantage can be used as a descriptive concept to provide a basic explanation of the international pattern of specialization in production and trade (Anon, 1986). The RCA approach is used to find out whether a country's actual high specialization in an activity (shrimp trade in this case) implies that it has strong comparative

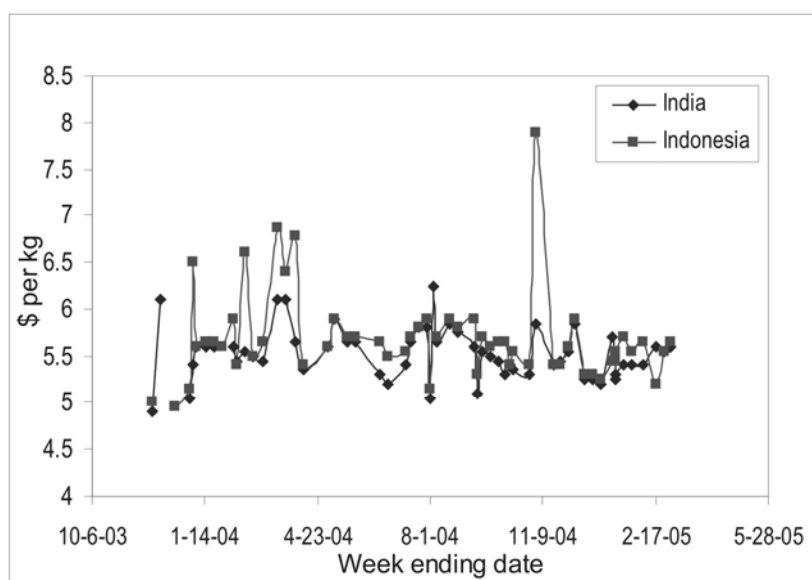


Fig. 1(a) Comparison of Black Tiger shrimp export prices (Grade 16/20)

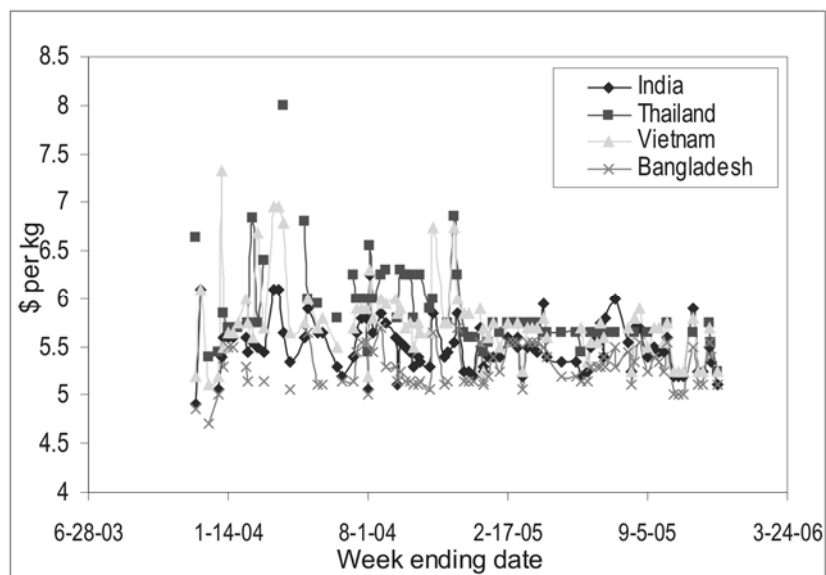


Fig. 1(b) Comparison of Black Tiger shrimp export prices (Grade 16/20)

advantage in that activity (Balassa, 1965). Table 2 gives the RCA of India and its competing countries with respect to shrimp export to USA market. The RCA of shrimp exports to USA from India was computed as 0.44 during 2006. This indicates that India has revealed comparative disadvantage in shrimp exports to USA during the current period. The RCA of Thailand was 0.79, Indonesia 0.89 and Mexico 0.83 for shrimp exports to US during the same year. Gopal et al. (2009) studied the competitiveness of fin fish exports from India and reported that India's finfish export in any form, frozen, dried or chilled, hasn't gained export

competitiveness during 2000 to 2005. The results of this study also show that Indian shrimp exports have not attained export competitiveness in US market during 2006.

Although USA has been a major importer of Indian shrimp, it was Japan which bought the higher grades. So, India earned better revenue from shrimp exported to Japan. The average grades of Indian shrimp like the 16/20, 21/25, 26/30 etc which were priced at \$5.35, \$4.90 and \$2 per pound respectively were sold at the US market. The higher grades like u/5, u/6 etc which were priced at \$12 and \$11.5 per kg were exported to Japan. The major species of shrimp exported to Japan were BT prawn (*Penaeus monodon*), White prawn (*Fenneropenaeus indicus*), Brown (*Farfantepenaeus aztecus*) and Flower (*Penaeus semisulcatus*). Japanese have great preference for medium and large sized cultured BT shrimp. However, there has been a drastic decrease in shrimp exports from India to Japan for the past several years (from 50 411 MT in 1998 to 25 545 MT during 2005). Table 1 gives the declining share of Indian shrimp exports to the Japan market. Over a span of 6 years, the share of Indian shrimp to Japan market has been reduced by 30% (Table 1).

Table 2. Revealed comparative advantage (RCA) of Indian shrimp in the US market during 2006

Country	% Market share (In terms of value of trade)	RCA
Bangladesh	3.04	0.24
Ecuador	4.83	0.25
India	3.96	0.44
Vietnam	7.90	0.57
Thailand	23.18	0.79
Mexico	5.88	0.83
Indonesia	8.69	0.89

Initially, quality problems especially the muddy moldy smell emerging from cultured shrimp from Bhimavaram led to decrease in Japanese imports of BT shrimp from India. Later, the fall in the value of yen and better price in other markets (USA and EU) led to a decrease in the market share of Indian shrimp exports to Japan. On analysis of the unit value realized by the shrimp exports to Japan from 2002 to 2006, it was seen that the value realised over the years has decreased till 2004 and it stabilized afterwards (Table 3). This can be attributed to the instability in the value of yen. A comparison of the unit value realized by Indian shrimp exports to Japan with shrimp exports from competing countries revealed that India realized lesser unit value than Sri Lanka, Thailand, Indonesia and Vietnam (Table 3).

As evident from Table 1, India's export of shrimp to EU has been on the rise during the past years. To the EU market, Brown, Pink, White and Black Tiger shrimp are exported. Black Tiger is one of the major varieties of shrimp exported to the EU from various ports of India. The major shrimp importing countries at EU are United Kingdom (UK), Netherlands, Belgium, Spain, France, Italy and Germany. Belgium is the largest market for Indian frozen shrimp among the EU countries. Around 32.08% of value was realized from Belgium out of the total shrimp exported to EU during 2006.

The data pertaining to weekly prices of HL Black Tiger shrimp in popular grades realized in the EU market during 2000 to 2006 was analysed. Table 4 gives the monthly

Table 3. Unit value of shrimp exports to Japan

Exporting Country	Unit value (1000 yen per kg)				
	2002	2003	2004	2005	2006
Sri Lanka	1.34	1.15	1.08	1.15	1.16
Bangladesh	0.72	0.66	0.61	0.6	0.63
Thailand	1.22	1.04	0.93	0.86	0.9
China	0.86	0.76	0.74	0.74	0.8
India	1.06	0.84	0.78	0.83	0.91
Indonesia	1.22	1.07	0.95	0.96	1.05
Vietnam	0.98	0.94	0.89	0.91	1.02

Table 4. Average prices of Headless frozen shrimp (Grade 21/25) exported to EU countries

Month	Average price (US \$ per kg) for Grade: 21/25					
	2001	2002	2003	2004	2005	2006
January	12.60	8.65	8.97	8.35	7.79	5.60
February	13.04	9.54	9.35	6.93	8.03	-
March	13.56	9.64	8.09	8.00	8.45	-
April	11.92	9.09	8.00	7.11	8.59	9.50
May	12.05	9.25	8.62	7.88	7.82	8.80
June	-	-	8.55	7.25	7.53	7.10
July	7.00	8.77	8.73	8.63	8.48	7.88
August	-	7.50	9.01	7.74	7.69	8.03
September	8.10	8.33	9.26	7.55	8.27	9.60
October	7.47	8.85	8.23	7.88	8.33	-
November	-	9.38	7.66	7.97	7.60	8.69
December	8.13	8.90	5.46	7.96	7.80	9.50

average prices in dollar per kg realized by HL frozen shrimp from India in the grade 21/25 exported to EU during 2000 to 2006. The prices were on the decrease till 2004 and there seems slight stability in 2005. The trend observed was similar in case of other popular grades of HL shrimp viz., 16/20, 25/30 and 31/40. The price fall was drastic from 2002 onwards and the percentage variation in prices in comparison with previous year ranged from 23 to 30%.

Considering the prospects of the expanding domestic markets in several shrimp producing countries, an assessment of the contributing factors to the shrimp exports especially the prices may help to initiate appropriate managerial interventions in time. India should take note of the aggressive expansion and continued development taking place in competing countries and come up with strategies that will ensure quality produce through aquaculture. Increase in culture production must ensure that a proportion of production is diverted to domestic market sector. The main competition that India faces with regard to trade comes from Vietnam and Thailand. Thailand's shrimp production by culture during 2004 was 3 25 000 MT. India's advantage is that it can increase its production of shrimp by extending the farming area. The production costs in India are also lower. In the Japanese market, the demand for processed shrimp varieties such as tray pack, Sushi and bread-battered items are gradually increasing. Taking into account of the growing demand for these products, Indian exporters should take up value addition of products. Diversification of markets has to be explored to bring the Indian shrimp trade to benefit.

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