CHAPTER 3 : SHRIMP INDUSTRY

3.1 World Shrimp Production

World production of shrimp grew by 48 percent from 2.58 million tonnes in 1989 to 3.83 million tonnes in 1998 (Table 1). Of the total production in 1998, Asian countries produced some 70 percent while the rest of the world contributed about 30 percent. Shrimp production comes from two sources, that is, capture fisheries and aquaculture. Production from capture fisheries forms about 70 percent of total shrimp production and aquaculture forms about 30 percent. World's shrimp landings from capture fisheries totalled 2.71 million tonnes in 1998 as compared to 1.96 million tonnes in 1989. Production of cultured shrimp expanded greater at about 80 percent during this period as compared to the production of captured shrimp at 38 percent. Cultured shrimp production almost doubled during this period from about 600,000 tonnes in 1989 to over 1 million tonnes in 1998. The bulk of this increase was largely due to increased harvesting by Asian countries.

3.2 ASEAN Shrimp Production

The four ASEAN countries of Indonesia, Malaysia, the Philippines and Thailand together produced about 23 percent of the world production at 891,431 tonnes in 1998 (Table 1). However, the contribution of these four ASEAN countries to total world production has been declining since 1993 from 30 percent in 1993 to 27 percent in 1996 and 23 percent in 1998. Shrimp production from these four countries grew by only 39 percent from 1989 to 1998 as compared to the world's growth of 48 percent for the same period.

Table 1 : Production of Shrimp from 1989 to 1998 (tonnes)

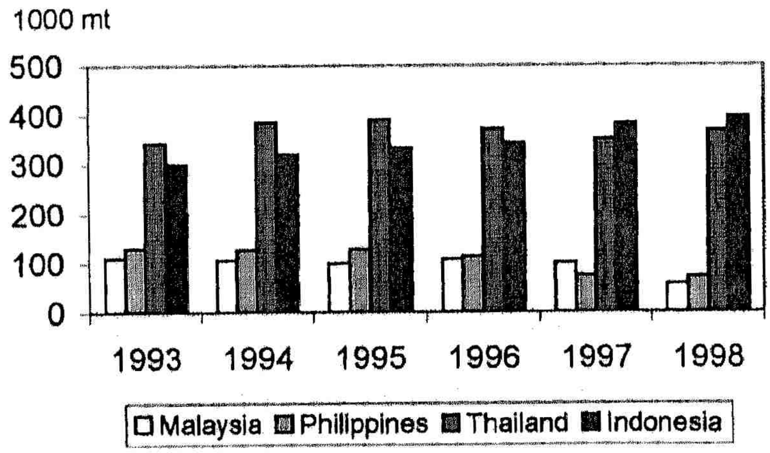
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cultured Shrimp										
Indonesia	98,371	107,295	140,131	141,690	138,806	135,058	146,608	151,759	167,445	168,500
Malaysia	2,070	2,340	3,057	2,963	3,994	5,858	6,779	7,749	9,519	9,835
Philippines	47,861	53,989	51,434	78,396	95,816	92,647	90,491	78,067	41,610	37,798
Thailand	93,496	119,510	162,051	184,884	225,515	265,524	260,713	240,339	227,560	243,800
ASEAN-4	241,798	283,134	356,673	407,933	464,131	499,087	504,591	477,914	446,134	459,933
Others	378,704	388,863	475,503	481,745	383,566	391,598	447,002	482,140	554,431	653,954
World	620,502	671,997	832,176	889,678	847,697	890,685	951,593	960,054	1,000,565	1,113,887
Share of ASEAN-4 (%)	39.0	42.1	42.9	45.9	54.8	56.0	53.0	49.8	44.6	41.3
Captured Shrimp										
Indonesia	149,513	150,658	157,331	169,460	161,892	184,678	185,870	191,371	214,796	226,470
Malaysia	107,550	104,392	101,667	126,405	105,761	100,545	92,786	100,237	91,445	47,231
Philippines	34,862	33,004	33,436	40,397	34,319	33,919	37,028	35,135	33,115	33,810
Thailand	109,634	104,847	127,811	115,681	117,579	119,525	128,541	130,444	123,366	123,987
ASEAN-4	401,559	392,901	420,245	451,943	419,551	438,667	444,225	457,187	462,722	431,498
Others	1,558,610	1,574,599	1,634,579	1,660,664	1,662,254	1,848,622	1,892,610	1,997,802	2,137,534	2,281,952
World	1,960,169	1,967,500	2,054,824	2,112,607	2,081,805	2,287,289	2,336,835	2,454,989	2,600,256	2,713,450
Share of ASEAN-4 (%)	20.5	20.0	20.5	21.4	20.2	19.2	19.0	18.6	17.8	15.9
Total Shrimp Production										
Indonesia	247,884	257,953	297,462	311,150	300,698	319,736	332,478	343,130	382,241	394,970
Malaysia	109,620	106,732	104,724	129,368	109,755	106,403	99,565	107,986	100,964	57,066
Philippines	82,723	86,993	84,870	118,793	130,135	126,566	127,519	113,202	74,725	71,608
Thailand	203,130	224,357	289,862	300,565	343,094	385,049	389,254	370,783	350,926	367,787
ASEAN-4	643,357	676,035	776,918	859,876	883,682	937,754	948,816	935,101	908,856	891,431
Others	1,937,314	1,963,462	2,110,082	2,142,409	2,045,820	2,240,220	2,339,612	2,479,942	2,691,965	2,935,906
World	2,580,671	2,639,497	2,887,000	3,002,285	2,929,502	3,177,974	3,288,428	3,415,043	3,600,821	3,827,337
Share of ASEAN-4 (%)	24.9	25.6	26.9	28.6	30.2	29.5	28.9	27.4	25.2	23.3

Source : FAO, 2000

Note : Shrimp as in species group No. 45.

Cultured shrimp production has overtaken captured shrimp landings as the main source of supply for the ASEAN countries due to dwindling marine resources and the increased investment into shrimp farming in the early nineties. The contribution of cultured shrimp to total production had increased from about 38 percent in 1989 to 52 percent in 1998. Production of cultured shrimp was at 459,933 tonnes in 1998 as compared to captured shrimp at 431,498 tonnes. These four ASEAN countries together contributed about 41 percent of the world's cultured shrimp production. Among the four ASEAN countries, Thailand was the main producer of shrimp from 1993 to 1996 but Indonesia overtook Thailand as the top producer from 1997 to 1998 (Figure 1). The share of Indonesian shrimp production to total ASEAN production was 44 percent in 1998 while Thailand, the Philippines and Malaysia each accounted for 41 percent, 8 percent and 7 percent respectively.

Figure 1 : Shrimp Production in the four ASEAN Countries, 1993-1998



Source : Data obtained from Table 1

Indonesia

Of the total shrimp production of 394,970 tonnes in Indonesia in 1998, about 57 percent came from capture fisheries while the rest were from aquaculture. In the capture fisheries, shrimps were caught mainly by trawlers and landings in 1998 totalled 226,470 tonnes, the highest in the region. Shrimp trawling was banned by the Indonesian Government in 1980 but was relaxed in 1985 for the eastern part of Indonesia particularly Irian Jaya waters. The catch from this sector is not likely to increase in the future. Indonesian shrimp culture is heavily concentrated in Sulawesi. Most of the farms in Indonesia use the extensive culture system and only about 10 percent practise the intensive system. Cultured shrimp production experienced a rapid growth of more than 70 percent over the period from 1989 to 1998. In 1998, Indonesian farmers harvested 168,500 tonnes of shrimp and more than 60 percent of the production comprised of black tiger prawn (*Penaeus monodon*). Indonesia is the world's biggest producer of banana prawn (*Penaeus merguiensis*) supplying about 70 percent of the world production in 1998.

Thailand

Thailand shrimp production experienced the greatest growth among the four ASEAN countries during the period from 1989 to 1998. Shrimp production grew more than 80 percent from 203,130 tonnes in 1989 to 367,787 tonnes in 1998. The increase in shrimp production was due to the phenomenal increase in cultured shrimp production, which witnessed a 160 percent growth during the same period. Thai cultured shrimp industry expanded rapidly during the late eighties and early nineties, especially during the late eighties when shrimp prices increased markedly in response to higher demand in the international market and also to the continuous crop failure in Taiwan Province of China. Since 1991, Thailand has overtaken China as the world's main producer of cultured shrimp. During the early eighties, shrimp farming in Thailand mostly involved extensive methods and the species cultured was banana prawn. However, during the late eighties, intensive and semi-intensive methods were practised in almost all coastal provinces and farmers switched to culturing black tiger prawn. The major culture areas are central Thailand, upper Gulf of Siam, east of Bangkok, Nakornsrithai and the Suratani to Patani area.

Landing from captured fisheries ranged between 100,000 to 130,000 tonnes a year during 1989 to 1998. The share of captured shrimp to total shrimp production had gone down from 54 percent in 1989 to 34 percent in 1998. Landings from this sector are likely to remain in the same range in the future.

The Philippines

Shrimp production from the Philippines had decreased about 13 percent from 82,723 tonnes in 1989 to 71,608 tonnes in 1998. Catches from the sea remained fairly stable at around 33,000 to 40,000 tonnes during the period from 1989 to 1998 whereas production from aquaculture varied greatly from 37,000 to 96,000 tonnes during the same period. Shrimp culture in the Philippines had grown steadily from the early eighties to the early nineties with rising prices in both world as well as local market. The rising price of shrimp encouraged many sugar-cane farmers to utilize their farmland for shrimp farming especially in the Island of Negros where most of the intensive farms were set up. Many fish pond operators in Luzon and Visayas also switched from milkfish to shrimp culture. More than 90 percent of cultured shrimp in the Philippines comprise of black tiger prawn.

Malaysia

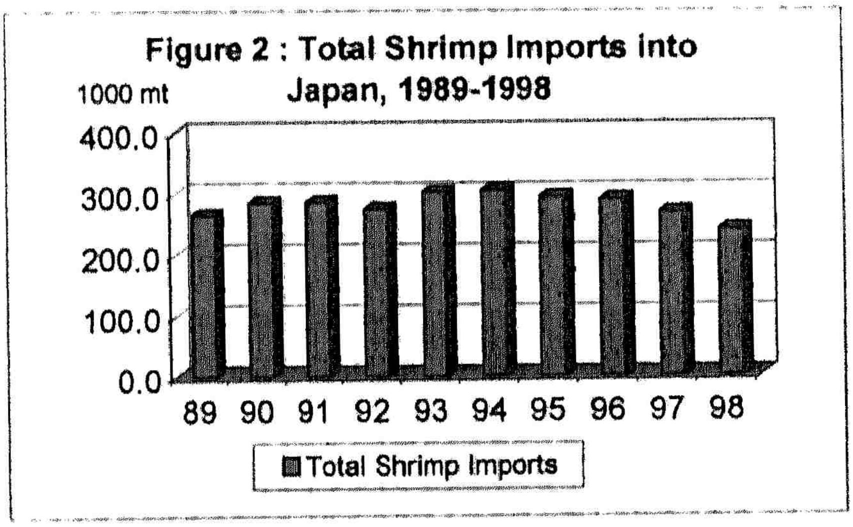
Malaysian shrimp production remained fairly constant at around 100,000 tonnes from 1989 to 1997. However, there was a sudden drop of production by about 40,000 tonnes in 1998 due largely to the reduced catches from the sea. Shrimp landings from the sea reduced by 48 percent from 91,445 tonnes in 1997 to 47,231 tonnes in 1998. Shrimps were caught mainly by trawlers in the West Coast of Peninsular Malaysia particularly in the states of Kedah, Penang, Perak and Selangor. Although shrimp culture in Malaysia has started far back in the seventies, its contribution to total shrimp production remains insignificant. Cultured shrimp production accounted for less than 10 percent of total production from 1989 to 1997 except in 1998 where its contribution increased to 17 percent as a result of reduced landings from the seas. More than half of the cultured shrimp production in Malaysia comes from the states of Sabah, Perak and Kedah. Farms are mainly small or medium-scale and are involved in intensive method of culturing. The main species cultured is black tiger prawn, which accounted for more than 90 percent of total cultured shrimp. Although Malaysia has the perfect climatic conditions for round-the-year shrimp culture, its production is very low in comparison to the other countries in the region. This is mainly due to land and management problems.

3.3 International Trade for Shrimp

While most of the shrimp production comes from developing or newly industrialized countries in the tropics, most of this shrimp is consumed in industrialized countries in the northern hemisphere. The main markets are Japan, United States and European Union. However, in recent years several new markets have emerged in Asia. Among the emerging Asian markets are Hong Kong, Taiwan, South Korea and Singapore. Shrimp is the most important seafood product traded internationally. International trade for fresh and frozen shrimp is in the range of US$ 8.5 to 9 billion per year. Cultured shrimps had been the driving forces behind the strong increase in shrimp trade during the late eighties and early nineties. Over one quarter of the shrimp traded internationally comes from aquaculture. Thailand and Indonesia are among the world's top exporters of cultured shrimp. The other major exporters of cultured shrimp are Bangladesh, China, Ecuador, India, Mexico and Vietnam.

Japanese Market

As a major market, the Japanese market affects the equilibrium of the world's shrimp market. Japan has dominated the international shrimp market both in volume and value. Being one of the highest per capita consumption of shrimp in the world, Japan's domestic shrimp production is insufficient to meet local demand. Therefore, the bulk of the demand has to be met by imported sources. In terms of value, fresh and frozen shrimp accounted for about 19 percent of the total seafood imports into Japan in 1998. Imports of shrimp increased from 264,200 tonnes in 1989 to a record high of 303,700 tonnes in 1994 (Figure 2). The growth in imports in the late eighties and early nineties may be attributed to import liberalisation, increasing shrimp consumption, economic development, appreciation of Yen, increased and consistent supply of shrimp particularly cultured black tiger shrimp from Asian countries and increased marketing efforts by foreign suppliers.



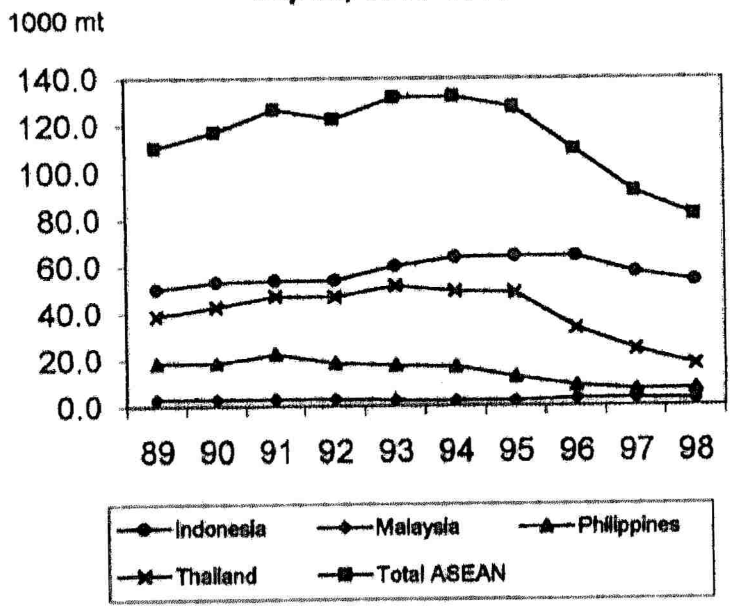
Source : Refer to Appendix 1

However, from 1995 onwards, the import of shrimp has been declining due to recession and the shrinking disposable income. Imports of shrimp in 1998 had gone down to 239,200 tonnes. Among the seafood products, frozen shrimp has the highest income elasticity at 0.8, followed by tuna and salmon each at 0.2

(Kano, 1989). As the shrimp market is the most sensitive to income change, its consumption has gone down the most compared to the other seafood products due to the economic recession. Short supplies of tropical shrimp, high prices and a weaker yen were among the other factors that caused the decline in shrimp consumption in the Japanese market. The United States overtook Japan as the world's major market for the first time in 1997.

Japan is the main market for shrimp for Indonesia, the Philippines and Malaysia. Japan's shrimp imports from the four ASEAN countries of Indonesia, Thailand, the Philippines and Malaysia increased from 110,300 tonnes in 1989 to a record high of 132,300 tonnes in 1994 (Figure 3).

Figure 3 : ASEAN Shrimp Imports into Japan, 1989-1998



Source : Refer to Appendix 1

However, imports from these four countries started to decline from 1995 onwards to only 81,700 tonnes in 1998. One of the main reasons for the decline in imports was the reduction in production from Indonesian and Thai farms due to disease problems. These four ASEAN countries together took about 34 percent of the Japanese shrimp market's share. Indonesia is the top supplier of shrimp to Japan exporting about 53,700 tonnes valued at US$657.5 million in 1998. Thailand, which is the world's largest producer of cultured shrimp, ranked only as the fourth top supplier to Japan exporting about 17,800 tonnes in 1998. The major market for Thai's shrimp is the United States importing some 92,300 tonnes from Thailand in 1998. The Philippines and Malaysia ranked as the eighth and sixteenth biggest exporters to Japan in 1998 (Table 2).

Table 2 : Japan's Top 20 Shrimp Exporters in 1998

Ranking in volume	Country	Quantity (tonnes)	Value (million US$)	Share (%)
1	Indonesia	53,726.0	657.5	22.5
2	India	50,410.9	541.5	21.1
3	Vietnam	26,709.2	218.8	11.2
4	Thailand	17,782.9	255.8	7.4
5	China	12,197.4	78.5	5.1
6	Canada	10,278.1	69.3	4.3
7	Greenland	10,015.4	66.4	4.2
8	Philippines	7,383.7	92.7	3.1
9	Australia	5,644.1	78.1	2.4
10	Ecuador	4,554.4	52.5	1.9
11	Myanmar	4,473.1	47.9	1.9
12	Russia	4,149.2	37.9	1.7
13	Sri Lanka	3,930.2	57.3	1.6
14	Bangladesh	3,748.1	35.8	1.6
15	Iceland	3,592.9	30.7	1.5
16	Malaysia	2,767.1	34.4	1.2
17	Madagascar	2,352.8	21.4	1.0
18	Argentina	1,829.9	17.1	0.8
19	Mozambique	1,680.4	15.4	0.7
20	Brazil	1,462.1	18.5	0.6
	Others	10,462.8	133.8	4.4
	Total	239,150.7	2,561.3	100.0

Source : Japan Marine Products Importers Association

United States Market

Since 1997 the United States has overtaken Japan as the world's major market. The US shrimp market was very strong in the late nineties as a result of the country's expanding economy and the high value of the US dollar. US imports of shrimp from the four ASEAN countries grew steadily from 38,200 tonnes in 1989 to 110,100 tonnes in 1998. The steady growth of imports from these four ASEAN countries was largely due to the increased supplies from Thailand. Thailand, which accounted for more than 80 percent of ASEAN shrimp exports into the US in 1998, increased its shrimp exports from 22,000 tonnes in 1989 to 92,300 tonnes in 1998. In fact, Thailand is US top shrimp supplier since 1993. The other major suppliers of shrimp to the US are Ecuador, Mexico and India. While total shrimp imports into the US had risen by more than 30 percent from 1989 to 1998, imports from Malaysia had decreased by some 80 percent from 3,600 tonnes to about 700 tonnes during this period. Imports from the Philippines also fell from 6,400 tonnes to 1,800 tonnes in the same period while Indonesian shrimp imports increased marginally from 6,100 tonnes to 15,300 tonnes.

European Union Market

Although European Union as a whole is the third largest market for shrimp in the world, its imports from ASEAN countries is low as most countries in Europe still prefer the traditional form and smaller size cooked-and-peeled coldwater shrimp (*Pandalus sp.*) Therefore, it is difficult for large tropical black tiger shrimp to replace the coldwater *Pandalus* shrimp, particularly in the northern part of Europe where the market has remained very traditional. Large tropical shrimp represents less than 30 percent of the total volume marketed in Northern Europe. The major importing country in the European Union is Denmark but most of the shrimp imported are re-exported to EU member countries, Japan and US. Most of Denmark's imports come from Greenland and the Faeroe Islands. Greenland is the main exporter to the European Union. The bulk of the shrimp exported by Greenland and Faeroe Islands are channeled through Denmark for logistic reasons. Other important shrimp suppliers to the European Union are Thailand, Argentina, India and Iceland.

Other Asian Markets

The saturated Japanese market, the import restrictions in the US and the EU import ban have forced Asian producers to turn their attention to the development of domestic markets. Due to the strong economic advancement in the early nineties, South East Asia and the Far East emerged as the fastest growing markets for all kinds of seafood. Shrimp is one of the major items that enjoyed good demand in this area. Countries like Thailand, Malaysia, China, India and Indonesia started to expand their domestic markets. Regional markets also started to expand resulting in an increase in trade volume between the Asian countries. Import of fresh and frozen shrimp by the seven major importing countries in Asia i.e Hong Kong, Taiwan, Singapore, Malaysia, Thailand, China and South Korea was in the range of 100,000 to 120,000 tonnes during period 1990 to 1996. Imports of these seven countries reached a record high in 1997 at 130,400 tonnes before falling to 110,500 tonnes in 1998, which was the lowest since 1994. The low imports in 1998 reflect the drop in consumption by these countries as a result of the Asian financial crisis. In South East Asia and the Far East, shrimp is usually consumed at the catering level, namely seafood restaurants, hotels, ordinary eateries and food stalls. Sales in this sector reduced between 20 to 40 percent in 1998 as the average frequency of outdoor eating declined from three days a week to about once a fortnight (Ferdouse, 1999). Among the seven Asian countries, Thailand was the only country that recorded an increase in imports in 1998, but most of the imports were re-exported after further processing.

3.4 Issues Affecting Shrimp Trade

As imports from developing countries increase, there is a tendency for the developed countries to introduce more protectionist measures to safeguard their domestic industry. In the shrimp industry, the increased trade between the developing and developed nations in the last decade has tempted many western markets to adopt protectionist policies to safeguard their domestic industry and to some extent the environment and the consumers' health from sub-quality products.

Externalities

Lately, there has been increasing publicity, primarily in North America and EU countries, about environmental and social issues related to shrimp culture. Environmental and social concerns influenced cultured shrimp exports to these countries and some non-governmental organizations have called on seafood importers and consumers to exercise selectivity in their purchases of shrimp according to the perceived sustainability of shrimp farming practices. These calls target on shrimp imports from specific countries without further distinction regarding the actual practices of shrimp production, including that from captured fisheries. The importance of sustainable aquaculture with no or limited externalities will force many exporting countries to adopt various legal and regulatory measures to ensure that shrimp culture is conducted in a sustainable manner in order to maximize socio-economic benefits and preserve the environment.

Production of shrimp from captured fisheries has come under attack by activist groups in the United States who claim that it is threatening sea turtles with extinction. This incidental capture of sea turtles by shrimp trawlers has prompted several shrimp embargo directives in the United States. Under this shrimp embargo programme, certain shrimp imports are prohibited unless the harvesting nation is certified as having either a comparable regulatory programme to that in the US, or a shrimping technology using Turtle Excluder Devices (TEDs) which were developed by US regulators for the domestic shrimp fleets. This embargo was imposed in 1996 with a ban against shrimp from all nations that was caught with fishing gear harmful to sea turtles.

Further disturbance in the shrimp market is envisaged with activist groups, particularly those in the west, broadening their attacks against shrimp production. The introduction of eco-labeling schemes as a market-based incentive for encouraging the adoption of best practices in both shrimp culturing and fishing will force many exporting countries to adopt more sustainable production practices.

Quality

With growing concern about food safety, the EU and the US Food and Drug Administration have enforced stringent health regulations with regard to quality control and assurance on imported seafood. The introduction of mandatory HACCP (Hazard Analysis Critical Control Point) requirements for exports to the US and EU in 1997 is now having an impact on shrimp trade. These regulations make the producer fully responsible for the quality of his product. If assurances do not exist that the imported seafood product has been processed under conditions that are required, the product will appear adulterated and will be denied entry. Therefore, all imported seafood products sold to markets adopting this approach must come from plants with a HACCP plan. The investments needed to bring a processing plant up to the standards of a HACCP plan are substantial, and many companies, especially in developing countries feel that the implementation of the new regulations on seafood products is in fact a non-tariff measure against value-added products originating from developing countries.

Tariffs

Despite steady reduction in tariffs on seafood products in recent years, tariffs as well as import licenses continues to pose as barriers to trade in many countries. Many fast growing economies in Asia find difficulty to export to important markets in the developed countries as most of these countries give competitive advantages to their domestic producers through higher tariffs, especially for processed products. However, tariffs in these countries will be greatly reduced through liberalisation of trade and growing membership in the World Trade Organization. Average tariffs on imports from developing countries were estimated at 4.8 percent in 1998, a cut of 27 percent from the previous levels (Lem and Shehadeh, 1998).

3.5 Outlook for ASEAN Shrimp Trade

The shrimp industry in ASEAN countries are facing the arduous task of upgrading their facilities to meet the requirements of existing markets and, at the same time, to ensure their products remain affordable and price-competitive in the international markets. With all the environmental concerns and stringent import regulations imposed by the western markets, ASEAN countries will have to depend very much on the Japanese and other Asian market for their shrimp exports. Competition in the Japanese market will intensify as more Asian countries increase their shrimp exports to Japan. However, other Asian markets such as Hong Kong, Singapore, Taiwan and South Korea offer good opportunities for the ASEAN countries and thus reduce the pressure for sales to traditional markets. In fact, some of these markets offer very high prices that are unthinkable to western buyers. In anticipation of the strong growth prospects and import liberalisation of seafood products in these countries, ASEAN sales of shrimp to these markets should grow steadily in the future.