Developing Countries Dominate the Shrimp Scene

MA. LOURDES D. PALOMARES
ICLARM

Total world production of shrimps has increased steadily since the 1960s. In 1972 it was recorded at 1.2 million t live weight and increased by 71% by 1982 totalling 1.69 million t. During the last five years world production stayed at an average between 1.6 and 1.7 million t. The top 20 producing countries accounted for 83% of the world total production with India leading at 2.15 million t. Of the 101 shrimp producing countries listed in the 1983 FAO Yearbook of Fishery Statistics, 70% are developing countries.

Production of warmwater supplies of shrimps exceed those of cold water species. During the period 1971-1981, 88% of all landings were accounted for by warmwater species. But, landings of cold water species began to rise slowly as landings from the Northeast Pacific region picked up, decreasing the proportion of warmwater production to 75%.

Leading Asia/Pacific Producers

In 1983, the four leading producers from the Asia/Pacific region were India, China, Thailand and Indonesia. The other major Asian producers were Malaysia, Japan, Philippines, Vietnam, Korea and Pakistan. Total production from this region was 1,000,500 t, 56.9% of the world total (see Table 1).

Latin American countries included in the list of the top 20 major producers are Mexico, Brazil, Ecuador, Argentina and Panama. These countries on the other hand comprise 10.4% of the world total production or 185,626 t of live weight.

There are no reliable figures separately for aquaculture production, but both the International Trade Centre (ITC) surveys and the South China Sea Fisheries Development and Coordinating Programme (SCSP)-INFOFISH Marketing Digest market studies report an estimated 5% of the total shrimp supply for farmed shrimp production which in 1983 would be 89,000 t.

More shrimps enter the world trade channels as the increase in world production continues. This puts shrimp trade forward as one of the most important foreign exchange earners and thus one of the most profitable enterprises.

Markets

The demand for shrimps in the world market is generally following an upward trend. Except for the Japanese market, which experienced a decline in imports since 1982 because of the high price levels and depressed economic conditions, both the European and the US markets remained favorable (Table 2).

The Japanese market's demand for shrimps depends more on price movements than on personal income of consumers. This consumption behavior is best exemplified by the recent decline in demand because of the relatively high price levels brought about by over-buying by Japanese importers—at too high prices—during the last quarter of 1982. This temporary oversupply of shrimps resulted in the decline in imports by major suppliers.

India, the largest supplier to Japan, reported a 7% decrease to 36,900 t while Indonesia supplied a total of 21,800 t.

The US market on the other hand remained stable since 1979 and started to pick up in 1981. The upward trend in imports continued until the last quarter of 1982 and began to stabilize again at the start of 1983. After the first quarter of 1983, the market experienced a fall in cold storage holdings. This temporary decline in supply plus the poor production from domestic sources increased the demand for shrimps and thus the need to increase imports. Mexico (the leading supplier) increased supply by 5% or 34,400 t while Ecuador's exports to the US market increased by 42% as compared to 1982 or a total of 23,400 t.

The European market experienced periodical demand cycles. Cold water species being more favored decreased the demand for warmwater species, although imports for both species increased. In 1983, France increased its annual imports by 4% (28,000 t), UK by 12% (16,000 t), Italy by 15% (7,700 t) and the Netherlands by 29% (8,700 t). INFOFISH reports that the European market would have done better except for the gain in strength by the US dollar against most major European currencies and the poor performance of the Japanese market.

Table 1. Nominal shrimp catch, in tonnes, 1983. (Source: FAO Yearbook of Fishery Statistics)

Country	Catch (t)
India	214,980
China	185,790
Thailand	173,967
Indonesia	129,610
USA	119,906
Malaysia	76,475
Norway	75,035
Mexico	65,586
Japan	61,943
Philippines	55,748
Brazil	50,660
Vietnam	49,100
Greenland	41,243
Ecuador	36,600
Korea Rep	36,424
USSR	29,394
Pakistan	27,502
Australia	20,814
Argentina	19,289
Panama	13,491

Table 2. Imports of shrimps (all types) in 10 major markets in tonnes, 1983. (Source: ITC and INFOFISH).

Importing country	Imports (t)
USA	154,870
Japan	148,628
France	32,013
Hong Kong	24,155
U.K.	17,349
Sweden	13,708
Spain	12,617
Canada	12,520
Netherlands	12,169
Belgium/Luxemburg	10,265

Shrimp Supply Situation

The continuous increase in the demand for shrimps worldwide has put an ever increasing pressure on producer countries to increase their supply. This resulted in the increase in the size of trawler fleets and small vessels which engage in shrimp capture fisheries. Most major shrimp fisheries are at present being harvested to full or near-full capacity

and there is the danger of overexploiting this very important marine resource.

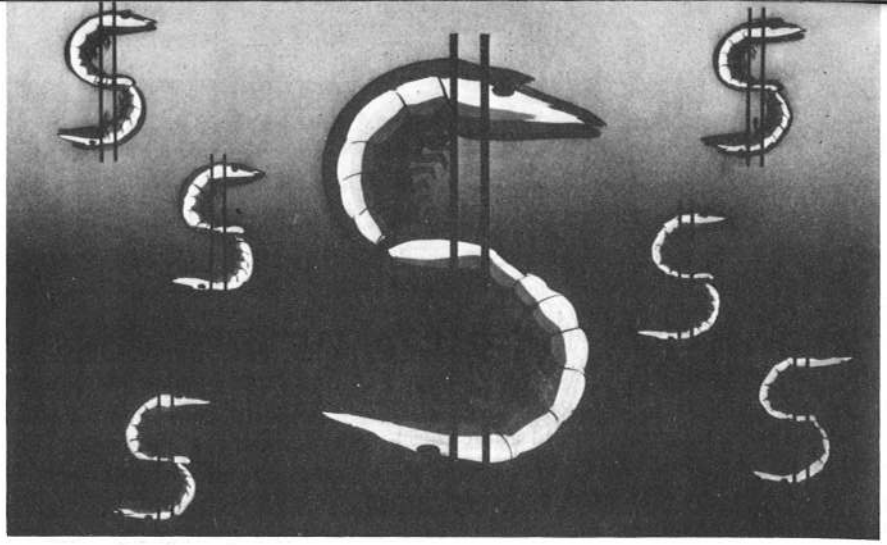
In Indonesia during the 1970s for example, one good fishing year followed by another produced a marked increase in the number of fishing vessels. In 1971, the number of vessels based in the Cilacap area alone amounted to only 13 as compared to 200 in 1976 with a corresponding increase in catch of almost 6% (171.5 t in 1971 to 3,054.5 t in 1976). In 1980, there were 161 larger trawling vessels with 121 shrimp trawlers concentrating in the Malaku and Irian Jaya areas. More than 13,000 vessels with inboard engines, on the other hand, concentrated in the Straits of Malacca, East Sumatra and the northern coast of Java. This resulted in the growth of Indonesia's fishery product exports from US$7 million in 1970 to US$253.6 million in 1982. Shrimp exports constituted 71.5% of the total revenue, 28.8% of the volume and 28% of the value of all fishery products that year. But, all these activities placed the Indonesian shrimp industry in trouble especially now that the shrimp stocks in the Straits of Malacca, the southern and northern coasts of Java and East South Kalimantan are overexploited. In the early 1980s, trawlers were banned in Indonesia.

Major shrimp fishing areas are in the same plight as Indonesia and this places the whole shrimp supply situation in uncertainty. Although overexploitation can be prevented through stock assessment and management, there is no real hope for capture fisheries to give higher yields.

Need for Aquaculture

A report in INFOFISH points out that the most realistic expectations rely on aquaculture which in the future can give a surprising boost to shrimp production.

Aside from the promise of a continuous supply of shrimps, aquaculture also offers considerable advantages over trawler fleets. The operator is given exclusive rights to his farm as opposed to an open-access fishery enjoyed by all coastal fishermen. The operator can better supervise production and can have control over the sizes of harvested shrimps. Handling and processing can be supervised better to improve product quality as opposed to managing a fleet scattered over a wide area.



Though aquaculture offers an enormous potential for expansion, there are considerable structural problems hindering large-scale production. It may have a lower operating cost than trawler fleets but it has very large capital requirements which cannot be fulfilled by ordinary fish farmers unless funding from the government or private enterprises are made available. Aquaculture research is still very new.

Shrimp Culture in Asia

The Asia/Pacific region, which is at present the leading shrimp supplier in the world, offers a most favorable site for shrimp aquaculture expansion. Factors which make it such include: i) the vast brackishwater and mangrove areas available for farming, ii) ideal climatic conditions, iii) lower labor costs and iv) the Asian aquaculture tradition. These factors are major exponents to the continuing increase both in interest and expansion of shrimp farming in the region, which may then become the principal source of cultured shrimp over the next five years. Total production in the Asia/Pacific region is estimated to reach 14,500 t in 1990.

India

India, the leading supplier of shrimps, has 1.5 million ha of brackishwater area available for farming. At present, only 43,000 ha are utilized for fish/shrimp farming yielding 15,000-17,000 t of shrimps annually. Traditional farming is being practiced in most farms with contract farmers leasing the farms for six months during the dry season. The rest of the year, the farms are used for agriculture because shrimps/fish cannot survive in low salinity waters during the wet season (see article, p. 9).

Indonesia

Indonesia is looking primarily to its *tambaks,* or brackishwater fishponds, for further development of shrimp culture. There are over 200,000 ha of these *tambaks,* employing around 400,000 people. Already some 30,000 t of shrimp are harvested annually from these ponds. Most of the production is fish, around 100,000 t/year, mainly in milkfish.

There has been strong response to the government's emphasis on improving shrimp production for export. This is reflected in the construction of 37 new private shrimp hatcheries recently over an 18-month period. It has been said that as *tambak* shrimp production has developed, large groups are buying up *tambaks* and consolidating their holdings, thereby forcing out the small producers.

During the current fourth Five-Year Plan (Repelita IV, 1984-1989) the overall aquaculture sector is expected to cover 600,000 ha as compared to the present 200,000 ha. According to the East Kalimantan fishery office, that province has made available 120,000 ha for shrimp culture. In 1984 the fishery office distributed 6.6 million shrimp seed from east Java into East Kalimantan farmers' ponds in an effort to promote shrimp culture.

Philippines

A recent development in aquaculture is the active participation of foreign funding agencies in projects that aim to increase farmed shrimp production. The Asian Development Bank, for example, gave a US$36 million grant in a project with the Philippine government. The country has around 200,000 ha of available brackishwater ponds which are used primarily for milkfish culture with incidental production of shrimp. Out of the total available pond area, about 20,000

ha are used for shrimp monoculture or polyculture with milkfish. In 1982 total production was placed at 3,920 t. With this ADB project the government aims to increase production by 1,500 t for export purposes by developing an additional 14,000 ha of ponds over a six-year period.

As is the situation with other producing countries, wild caught shrimp fry are available only on an erratic, seasonal basis which does not promise a reliable continuous source of fry for stocking the farms. In view of this, farmers are now aware of the need for more hatcheries which can provide a consistent supply of good quality fry. There were approximately 56 commercial-scale hatcheries in operation in the Philippines during 1982, 86% of which were private enterprises and the remaining 14% were government run. Most recent estimates of hatchery reared fry amounted to a total of 40 million in 1982 and 100 million in 1983. With the ADB funded project, 15 more hatcheries are scheduled to be constructed with incremental fry production amounting to 75 million postlarvae and juveniles in 1990.

Other Asian countries

Other Asian countries which have good potential for farmed shrimp production are now investing their government's money to encourage fishermen and fish farmers into shrimp farming. In Thailand, the government's Board of Trade issued a statement encouraging shrimp farming because of the recent fall in trawler catches. Loans totalling 13 million baht were given out to 120 farmers who will invest in shrimp farming ventures over an estimated area of 400 ha.

In Pakistan, private investors from Saudi Arabia joined the government in initiating a labor intensive project to put up shrimp and fish farms complete with processing facilities and cold storage areas over an estimated 194 ha of coastal land in Sind province. Production is estimated at 960 t/year.

Bangladesh at present uses 29,328 ha of land in the tidal zone for trapping and raising penaeid shrimp. Variations in the seasonal/monsoon cycle make it possible to convert salt beds or amman paddies into shrimp farms during the wet seasons. In 1983, 3,400 t of shrimps were produced from farming, most of it for export.

Shrimp Production in Latin America

Another region leading the race in shrimp production is Latin America. Ecuador and Panama have shown other countries in the region that extensive marine shrimp farming is profitable especially in an area where the relatively inexpensive coastal land is ideally suited for farming. Factors which make shrimp farming favorable there include: i) low wage rate, ii) cheap fuel, iii) favorable weather conditions, iv) low-water lifts and v) availability of postlarvae.

Ecuador

Ecuador, the region's leading producer of cultured shrimps, has an estimated 50,000 ha of unused pond capacity. Current annual culture production is placed at 14,000 t which is 70% of the country's total shrimp production.

Shrimp farmers in Ecuador are now using more sophisticated methods to improve farm yields. These improved methods require higher stocking densities which result in problems regarding supplies of wild caught postlarvae and juveniles. Since postlarvae from the wild come in seasonal peaks, the need for more hatcheries is foreseen. At present, there are four hatcheries in operation and six more are under construction and expected to operate by the end of the year. One of these hatcheries reports a production of as much as 25 million postlarvae per month.

Another problem besetting the industry is the implementation of new government control measures which aim to reduce the country's dependence on the US market. US exports slowed down in 1984 with losses amounting to US$500,000/day. These difficulties slowed down the industry's expansion and some foresee that this could go on for the next six years. However, if by 1990, the total area under cultivation can be maximized into 70,000 ha and if the average yields can be doubled by using hatchery reared postlarvae then reports estimate a total annual production increase by six times the current total or 120,000 t including capture fisheries.

Brazil

Another potential advocate of shrimp culture is Brazil since it has vast coastal lands that could be developed into farms. The current count of productive shrimp ponds is 2,300 ha. There are six major farm operators whose pond areas constitute 68.5% of the total operational farm lands. Another 24 more shrimp culture projects (both private and governmental) share the remaining 31.5%. Most of these projects culture penaeid shrimp species and there have been a surprising success in culturing *P. japonicus,* a predominantly cold water species. Freshwater aquaculture of *Macrobrachium rosenbergii* is also underway. Scattered reports indicate a pond production of less than 700 t during the past three years from two out of the six major operators.

In 1983, the Brazilian government approved a US$5 million grant that aims to develop 10 new shrimp farming projects over 3,100 ha of ponds. Estimated production is placed at 2,400 t/year (48% *P. japonicus,* 17% *P. vannamei,* 14.6% *P. stylirostris,* 20.8% *M. rosenbergii*). It is believed that production can reach 4,000-5,000 t by 1990.

Mexico

Mexico, another potential leader in shrimp farming production, expressed an interest in shrimp ranching. Fish Farming International (June 1985) reports that Fisheries Minister Pedro Ojeda Paullada had approved the construction of eight shrimp ranches covering 400,000 ha of land. These are part of 16 units of shrimp ranches expected to operate by 1988.

The total Latin American shrimp production is expected to reach an annual growth rate of 15% from 1982 to 1990. This accounts for a total output of 70,000 t by 1990.

Conclusion

With so much interest worldwide in shrimp farming, it is only fair to ask if the European, Japanese and South American markets can absorb the production that will be materializing in the next decade. Much will depend upon trawl fishing activities and the extent to which the capture fishery production of shrimp declines. A few market studies have been conducted recently, but clearly these countries rushing their aquaculture production would do well to keep a constant eye on their long-term markets and on their competitors. •