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Molluscs: status, problems, and future in Asia

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Molluscs: status, problems, and future in Asia

The aquaculture industry among developing Asian and Pacific countries has been growing faster than any other farmed food commodity group. Figure 1 compares production and growth of beef/veal, chicken, aquaculture, pig meat, and total fisheries from 1977 to 1987. From the latest available data, the average annual growth rate of the aquaculture sector during the above period was 15.1% compared to 8.9% for pork, 7.1% for chicken, and 4% for both beef/veal and total fisheries.

Mollusc culture expanding

Mollusc culture in particular has steadily increased in the last few years. Total world landings, from capture and culture, increased from 3 603 426 t (1980) to 4 524 929 t (1986), an average growth rate of 3.95% yearly.

In the mollusc fishery sector, aquaculture production is high. Over 2.8 Mt of mollusc were cultured in 1985 (Fig. 2) which accounted for over 65.5% of the year's total production of 4.4 Mt. Molluscs are cultured in numerous countries in both northern and southern hemispheres. However, culture activities have extensively developed in the Asian region,

particularly in East and Southeast Asia. Figure 3 shows the 1985 mollusc aquaculture production by continent. Asia produced the most from culture followed by Europe and North America. The landings for the three continents in 1985 were 2 094 913 t, 591 476 t, and 176 810 t, respectively, which accounted for 72.6%, 20.5%, and 6.1% of total production. Mollusc culture output in Oceania in the same year amounted to 20 511 t or 0.7% of world culture output.

Aquaculture production in Asia in 1985 by major resource group is shown in Figure 4. Finfish and seaweed culture in Asia are the most important groups in terms of landings accounting for 44% and 34%, respectively. Mollusc production ranks third, contributing 20% of total aquaculture output in 1985.

Bivalves

Bivalves are widely harvested from natural fisheries or cultured belong to the families Ostreidae, Mytilidae, and Arcidae.

Among the oysters two genera predominate, *Crassostrea* and *Saccostrea*, whereas only few species belonging to the

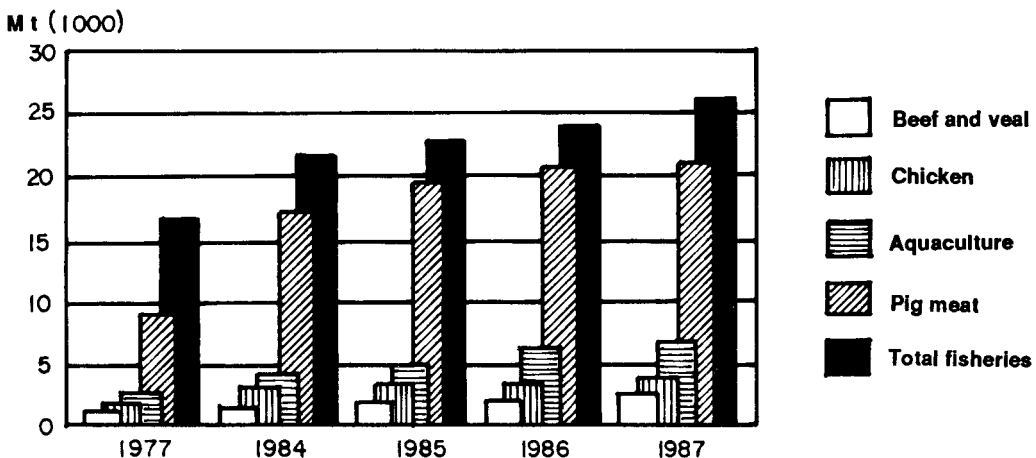


Fig. 1. Total production of meat and fish in developing Asian-Pacific countries.

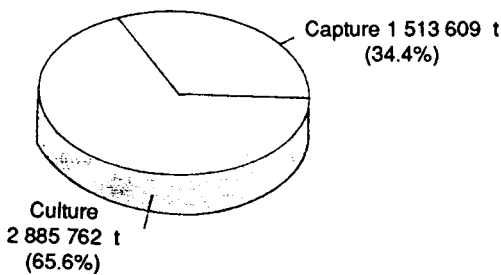


Fig. 2. World mollusc landings from capture and culture fisheries, 1985.

genus *Ostrea* are cultured. The *Crassostrea* species of commercial importance in northern Asian countries such as China and Korea are *C. rivularis*, *C. gigas*, and *C. plicatula*. Important subtropical and tropical oyster species include mainly *C. belcheri*, *C. echinata*, *C. iredalei*, *C. lugubris*, *C. madrasensis*, *Saccostrea cucullata*, and *Ostrea folium*.

Among the mussels, species belonging to the genera *Mytilus* and *Perna* are captured and/or cultured in the region. Species belonging to the *Mytilus* genus, such as *M. edulis* and *M. crassitesta* tend to be temperate water species, in contrast to the more tropical species belonging to the genus *Perna*, such as *P. viridis* and *P. perna*.

Numerous cockle species are of commercial importance in Asia. The most important ones belong to the genera *Anadara* and *Arca*. One species of major importance is *Anadara granosa* or blood cockle which is extensively cultured from southern Korea to Malaysia. Numerous other species are of

commercial importance in the region. Among these are several species of clams, scallops, and pearl oysters.

Among the clams, important genera are *Meretrix*, *Paphia*, *Macra*, *Venerupis*, *Donax*, and several others. Three genera of scallops predominate in the region: *Pactinopecten*, *Chlamys*, and *Amusium*. The pearl oysters *Pinctada margaritifera*, *P. maxima*, and *Pteria penguin* are of major importance.

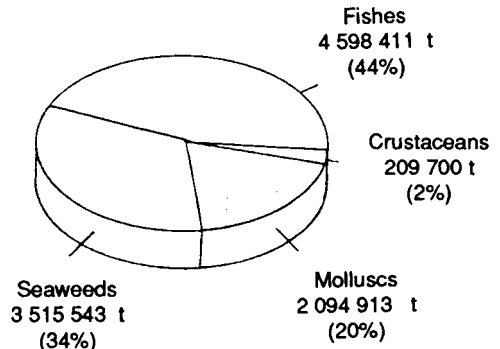


Fig. 4. Aquaculture production in Asia, 1985.

Gastropods

While there is a large number of commercially important bivalves, there are few gastropods and these are mostly collected from natural fisheries. Among this group, abalones are the most important as they are highly valued as a food item and command good prices. The most important abalone species belong to the genus *Haliotis* among which *H. discus* and *H. diversicolor* predominate. Culture of abalone is carried out in temperate Asian countries, mainly in China, Korea, and Taiwan, whereas in some tropical countries, such as the Philippines, abalones are exclusively harvested from natural fisheries. The inter-

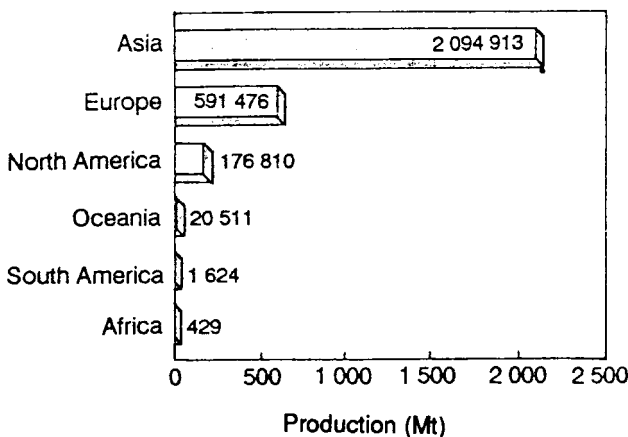


Fig. 3. Mollusc aquaculture production by continent, 1985

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est in this culture system among Asian tropical countries is growing.

Figure 5 illustrates the proportions of the more important mollusc species relative to the total landings in 1986. The Pacific oyster *C. gigas*, the common mussel *M. edulis*, and the blood cockle *A. granosa* accounted for over 50% of the landings in 1986.

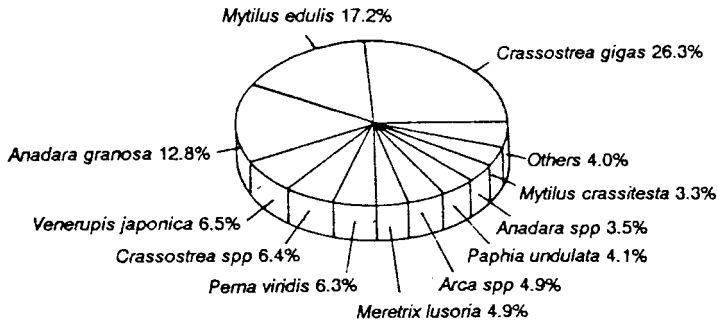


Fig. 5. Landings of top mollusc species in Asia, 1986

Problems

The mollusc industry offers great potential in many countries in Asia and the Pacific for increasing domestic food supply and foreign exchange earnings. In order to realize this potential, mollusc aquaculture programs have been launched in several countries and some have achieved good results in terms of species cultured, production, and export. However, the industry is facing a number of problems and constraints which vary in magnitude and severity according to area and country. The problems of the industry may be grouped into three: (1) environmental, (2) biological, and (3) social and institutional.

Environmental constraints include those phenomena caused directly or indirectly by man which induce deterioration of the mollusc natural environment. The most evident factor causing rapid environmental deterioration is pollution from inorganic or organic substances. The most fertile grounds for both capture and culture of molluscs are typically intertidal areas, estuaries, and shallow areas along the

coast. Unfortunately, these areas are often polluted by land runoff or direct discharges of sewage, heavy metals, and xenobiotics. Another serious problem is the occurrence of red tides which renders mollusc inedible due to the accumulation of toxic substances. Also, adverse weather conditions can cause serious losses from both capture and culture fisheries.

Biological constraints are numerous and variable. In mollusc culture, a major constraint is lack of seeds as well as limited availability of suitable culture grounds.

Social and institutional constraints are also numerous and vary from country to country. The lack of trained personnel in some countries is at present the major problem. The limited demand of molluscs in general, due to culture-

related preferences as well as health considerations, is also a limiting factor in the development of this industry.

Figure 6 lists the major constraints to the development of the mollusc industry. The percentage values were extracted from a survey conducted in fifteen East and Southeast Asian and Pacific countries partly aimed at identifying constraints in the mollusc industry. Limited seed supply appears to be the most serious constraint, followed by lack of trained personnel and poor quality control. All the constraints are interrelated which suggest that a multi-disciplinary approach is essential to solving industry problems.

Potential

There is considerable potential for further expansion and development of the mollusc culture industry in the region. To underpin this potential, many of the governments in the region have either ensured or will ensure that the following minimum conditions or actions will be provided or taken:

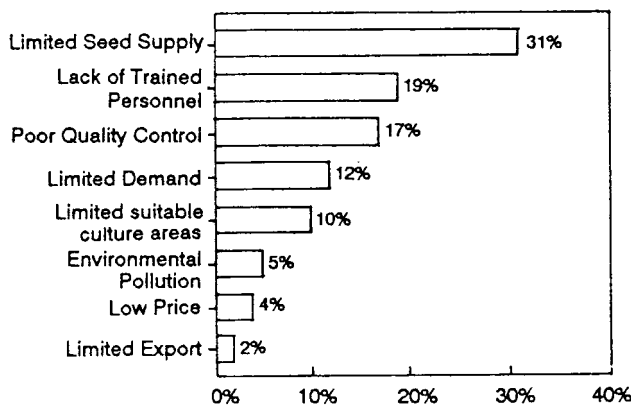


Fig. 6. Major constraints in the mollusc industry and their degree of importance.

1. **Seed supply.** Inconsistency of seed supply could be minimized through efficient management of spatfall areas and reseeded programs to create additional natural beds.

2. **Research.** Applied research on the biology, culture techniques, and post-harvest handling of mollusc should be intensified.

3. **Sanitation.** Quality control and sanitation techniques need to be improved to enhance marketability of fresh molluscs for both local and export markets.

4. **Marketing.** Markets for certain species should be developed through campaigns as well as product development to diversify the existing market which is limited to specific

areas and communities.

5. **Government/Public Involvement.** Coordination among government agencies and the private sector should be maintained to prevent and/or combat pollution which could assist in developing and expanding the industry.

6. **Training.** Training programs and extension work should be carried out for the target groups especially fishermen, technicians, and extension workers.

Source: A Lovatelli. *Bivalves: status, problems and future in Asia*. INFOFISH International 2/90.

Focus: Philippine Mollusc Industry

The mollusc industry contributed to the economic development of the country in terms of food production and dollar earning. The industry has continuously provided cheap but nutritious food. Production was 22 528 Mt in 1981 which increased to 41 700 Mt in 1985. Mollusc and shellcraft products exported in 1987 earned an estimated US\$26.55 M.

Aquaculture production of oysters and mussels is from 69-99% of total production. From 1981 to 1985, production increased yearly by 14% but decreased in the succeeding years by 25% yearly. In 1985, the country produced 1.4% of total world production of oysters and 3.7% of mussels. In the same year, the country ranked 8th in total world production of both species.

In 1981, 427 ha out of a potential area of 11 600 ha was used for oyster farming. Mussel was cultured in 217 ha of the potential 6878 ha. The average size of a mollusc farm is 2.5 m² operated on a part time basis by fishermen who have other sources of income.

Source: RF Agbayani and FF Abella. 1989. *Status of sanitation and marketing of mollusc in the Philippines*. In: **Report of the Workshop and Study Tour on Mollusc Sanitation and Marketing**; 15-28 Oct 1989; France. Bangkok, Thailand: Regional Seafarming and Development and Demonstration Project, Network of Aquaculture Centres in Asia; 98-110.