

Knowing Asian aquaculture and fisheries

By MB Surtida

Asia has always been the hub of aquaculture. For 300 centuries, fish have been farmed in China, and eventually through the region. Today, as demand for food grows proportionately with the population (30.1% of world population live in Asia), aquaculture is a logical option.

The following article gives a bird's eye view of aquaculture and fisheries in Asia. Hopefully, it will be useful to students whose work can influence laws, rules, policy, and regulations on aquaculture and fisheries, with the view in mind to sustainable aquaculture.



CHINA

Mainland China covers nearly 40% of latitude, thus climates vary widely - tropical, subtropical, temperate, cool-temperate. It has 18,400 km of mainland coastline and 14,200 km island coastline with 1.3 million hectares of cultivable shallow water and mudflat. It has three big rivers, Yantze, Yellow, and Pearl. China has 20 million ha of inland water of which 30% are under cultivation. In 1996, yield of aquatic products was 32.88 million tons. Of this total, fishing takes 43% and aquaculture, 57%.

China's population is 1.2 billion with the inland northwest areas sparsely populated.

Aquaculture

China has developed its freshwater aquaculture for more than 3,000 years. It is the first country to have succeeded in the artificial propagation of silver, bighead, grass, and black carps. It has also improved its techniques for the artificial propagation of other species. In recent years, China's mariculture has risen rapidly, the mariculture area increased to 822,070 ha in 1996, up from 365,000 ha in 1986 and the total mariculture production reached 4.32 million tons.

Yield of aquatic products in 1996 (x 1,000 tons)

Inland farming	10,989.5	33%
Inland fishing	1,762.9	5%
Marine farming	7,639.0	23%
Marine fishing	12,489.8	39%
Total yield	32,881.2	100%

Output of marine aquaculture (x 1,000 tons)

	1978	1994	1996
Crustacean	0.45	92.00	204.60
Fish	1.73	101.10	823.50
Seaweeds	191.49	730.10	929.11
Shellfish	255.83	2522.80	8526.75

Problems of the aquaculture and fisheries industry

Inadaptability of science and technology to rapid fisheries development. China considers fishery technical extension very important. In the whole country, there are over 5,000 fishery technical extension organization with technical staff of 17,000. But very few of these staff work at fishfarms. Thus, new techniques and achievements are not extended to most farmers.

There is a shortage of personnel from secondary technical schools at most

fishfarms. Student proportion of universities/colleges to secondary technical schools is 4:3.

Environmental protection. A huge quantity of untreated wastes becomes a serious problem in fisheries. Factories discharge a lot of sewage and industrial wastes into rivers and coastal areas. For example, shrimp culture yield in China dropped from first place (global) with annual yield of 220,000 tons in 1992 to 60,000 tons in the last years. Farms suffered heavy losses due to shrimp diseases.

Marine fishes are caught excessively. It may appear that output has increased steadily over the years but this is due to the increasing number of fishing vessels, gears, and intensified fishing of coastal and in-shore resources. It is not due to increased productivity of the sea.



INDONESIA

The islands and part of islands that form Indonesia cover 1,919,443 km². At least 3,000 of the country's 13,667 islands are inhabited, with a population of 200 million people. Indonesia is tropical, daily temperature fluctuates between 21- 32°C.

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Coastal aquaculture

In 1985, total fisheries production was about 2.4 tons and rose to about 4.0 tons in 1994. Brackishwater pond production was 156,400 tons in 1985; 346,200 tons in 1994, and annually increased by 9.4%. Cage culture production increased annually by 70.6% from 746 tons in 1985 to 33,011 tons in 1994.

Brackishwater culture

Brackishwater pond production was 156,367 tons in 1985 and 346,214 tons in 1994, increasing annually by 9.42%. Milkfish and shrimps were the species mainly produced, their contributions were 44.22% and 38.24% of total production.

Brackishwater fish culture production came from East Java 23.87%, South Sulawesi 21.50%, West Java, 19.96%, and Central Java 10.40%. Total production was 262,190 tons or 75.73% of total brackishwater fish culture production (346,214 tons).

Molluscs of economic importance include the cockle *Andara granossa* (19,400 ha); the mussel *Mytilus viridis* (19,700 ha); oyster (7,500 ha); and pearl oyster (2,200 ha).

Seaweed culture

There are 355 collected seaweed species from Indonesia waters. About 55 species of them have been utilized by Indonesians as food (salad, vegetable, and soup thickening) and medicinal treatments. The total area planted to seaweeds is 21,000 ha.

Constraints

With Indonesia's industrialization, many industries have been established in watershed and coastal areas. Some of these industries dump toxic waste, endangering the carrying capacity of coastal waters to support coastal aquaculture in some areas. The uncontrolled development of industries neglect the regulations concerning the green belt in coastal areas, thus destroying the nursery grounds of the marine biota.



BANGLADESH

Bangladesh is a tropical country in the south coast of Asia. It is surrounded by India, Myanmar, and the Bay of Bengal. Bangladesh has four distinct seasons: summer, rainy, winter, and spring with 125 km sea beach and 960 km-long coastal belt. The river Karnofuly has 68,800 ha with an annual fish production of 50,000 t.

Bangladesh consists of 80% plane land, 8% hilly areas, and 7% coastal belts.

Bangladesh is the ninth largest country in the world in terms of population. Its total area is 148,393 km² with a total population of 124 million, approximately 900 persons per km². About 79% of the population live in the rural areas and 21% in the urban areas. Population growth rate is 2.2% with a literacy rate of 36.6%.

Status of fisheries

The fisheries sector provides almost 4.7% of the national income and 14% from the agricultural sector. Almost 11.2 million people work permanently and temporarily in the fisheries sector, about 10% of the total population directly or indirectly involve themselves in fisheries.

Fisheries contribute 10% of total export of Bangladesh (\$482.84 million in 1995-1996). Fish and fisheries products is its third exportable item.

Of the country's total area, 9380 km² are rivers; 0.29 million are closed waters (lakes); and 0.14 million are coastal shrimp farms. Bangladesh has 716 km of coastline.

There are 260 indigenous and 12 exotic species of shrimps cultured in inland Bangladesh. In ocean areas (Bay of Bengal), 495 species of fish and 36 species of shrimps have been identified. The area of

marine water bodies of Bangladesh is 164 km². Twenty-two percent of total catch comes from marine water bodies.

Production

Inland aquaculture has produced 390,000 tons of common, grass, silver carps; catfishes, and other fishes in 1995-1996. This is valued at US\$ 6.82 million. In contrast, marine fish catch -- mullet, shrimp, etc -- amounted to 279,000 tons valued at US\$3.48 million while inland catch fishery -- catfish, carp, tilapia, etc -- amounted to over 0.5 million tons valued at US\$ 1 billion.

Marine fisheries resources management

Trawler fisheries contribute 95% of the total harvested marine fishes. This is regulated by the government.

It has been recognized that the total stocks in marine water bodies are not limited. To maintain equilibrium, the number of trawlers have been fixed and mesh size of the nets are controlled. Marine surveys are being conducted for stock assessment, identification of new fishing grounds to determine the location of marine fishes like tuna and mackerel.

Artisanal fisheries include 3,317 mechanized and 114,000 ordinary boats. These are not yet regulated by the government.

Constraints

Fisheries production is not sufficient to meet demand of the increasing population with a low literacy rate. In rural Bangladesh, there are many derelict ponds which are not reconstructed for fish culture. But rural illiterate people do not know how to culture fish, thus, inland open fisheries and marine areas are over exploited. Now, fishery extension workers are working and motivating farmers to make use of these resources.

List of references will be provided upon request. - Ed.

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Cambodia, India, and Myanmar