

# Fisheries Development and Management in Southeast Asia: Spotlight on Malaysia

Malaysia is an independent federation consisting of 13 states, 11 of which constitute Peninsular Malaysia and jut sharply into the southernmost portion of the South China Sea. The country forms the eastern boundary of the Straits of Malacca on the west and is washed by the waters of the South China Sea on the east. Two of Malaysia's states, Sarawak and Sabah, are on the islands of Kalimantan (formerly Borneo).

Peninsular Malaysia ranks as the world's 28th strongest fishing power, followed by Sarawak at 68th and Sabah at 85th (FAO, 1978). The fishing industry plays a vital role in the Malaysian economy, earning foreign currency, providing employment for 4.77% of the labor force in the agricultural sector, and furnishing the cheapest and largest source of protein available in the country which accounts for about 2/3 of the supply to the population.

Landings of marine and freshwater fish in the 13 Malaysian states reached about 516,000 metric tons (mt) in 1976, with the marine catch overwhelmingly dominant by weight (99.9%). Peninsular Malaysia yielded 80% of the marine landings, and of these, 72% were from the west coast. As is typical of other Southeast Asian countries, the marine fisheries are multispecies fisheries, comprising primarily manure/trash fish (31%), penaeid shrimps (12%), cockles *Anadara granosa* (7%), *Clupea* and *Sardinella* (5%), and *Rastrelliger* spp. (4%). About 40 species of fish and shellfish are taken in commercial quantities. Most of the catch is marketed fresh (65%), whereas 12% is cured in various ways and 3% is converted into fertilizer and fishmeal.



*Tan Cheng Kiat of the regional development office, Kuala Besut, inspects prawns which have just been landed at a local port.*

The pelagic species are maximally exploited on the west coast of Peninsular Malaysia, but the stocks off the east coast of the peninsula, the west coast of Sabah, and Sarawak are believed to be underexploited.

In sharp contrast in importance to the Malaysian economy are the freshwater fisheries which contributed a comparatively paltry 2289 mt to total fish landings in 1976. Of these landings about 6% were attributable to aquacultural activities. In Peninsular Malaysia 10,313 fish ponds with average size of 0.44 ha were in operation under the management of nearly 7000 fish farmers whose efforts to stock the ponds were aided by nine institutions and fish breeding stations. These stations distributed 2.1 million fry in Peninsular Malaysia, primarily *Puntius gonionotus*, common carp, bighead carp, grass carp, tilapia, sepat siam, and *Macrobrachium*

*rosenbergi* which were raised in paddy fields and their irrigation and drainage canals, ponds, mining pools, reservoirs, other impoundments, and rivers.

Aquaculture in Malaysia is in its early developmental stages and has much potential for expansion, especially in marine and brackish waters. Cockle culture is the most important coastal culture activity, practiced on about 4000 ha. Marine prawns are grown on a limited scale in Johore, occupying about 330 ha of mangrove swamps, and pearl oysters and milkfish are raised in Sabah. Milkfish and mullet culture has potential in the mangroves, but natural supplies of seed are not yet available in Peninsular Malaysia. Sheltered coastal areas could be used for cage culture of groupers, sea bass, threadfin, and rabbitfish. Oysters also have high potential for culture, in that several areas on the east and west coasts of Peninsular Malaysia have been found suitable for collection of oyster spat, hence might lend themselves to raft culture.

Culture of *Macrobrachium* larvae is carried out on only an experimental basis, and production of postlarvae is insufficient to supply the farmers. Since the country already has about 3200 ha of fishponds in operation, however, potential for expanding *Macrobrachium* culture is extremely high.

To boost aquaculture production, the Fisheries Division maintains six hatcheries for production of common carp and Lampam Jawa fry which are distributed free to farmers and stocked into public waters. Culture of freshwater fish is potentially promising, but thus far development



*Traditional fishing vessel in Kuala Besut, east coast of Malaysia.*

has been restricted by the lack of fry of suitable species for cultivation. The Chinese carps have not been bred on a large scale in Malaysia because they must be stimulated to spawn by hormone injection. Fry are still being imported from Hong Kong and Taiwan. Research on induced breeding of these species via purified salmonid gonadotropin has been conducted by the Malaysian Agricultural Research and Development Institute with assistance from the International Development and Research Centre of Canada.

In addition, the government has taken steps to develop fisheries by establishing MAJUIKAN (Fisheries Development Authority), MARDI (Malaysian Agricultural Research and Development Institute), and introducing the Diploma in Fisheries course at the University of Agriculture Malaysia.

Fish and fish products are important foreign currency earners for Malaysia. The 111,500 mt exported fetched M\$282 million in 1976. Fresh, chilled, and frozen prawns were the most lucrative of all exported commodities, contributing 58% to the

total; fresh, chilled, and frozen fish and other shellfish followed with 22%, and fish salted, in brine, smoked, or boiled contributed 10%.

Drawing on surrounding markets in Thailand, Japan, Singapore, Indonesia, China, and Taiwan, Malaysia imported 119,500 mt of fish worth M\$102.5 million in 1976. Peninsular Malaysia imported 94% of the total by weight. The main imports were marine fish other than tuna and sauries.

The fishing community, numbering 73,500 in 1976, is regarded as the poorest in the country. Besides lacking capital to modernize and expand their fishing operations, the fishermen suffer from low productivity, an imperfect marketing system, and underemployment in the fishing industry. Most of the fishermen do not own boats and gear.

The average income of fishermen engaged in subsistence fishing is about \$60 per month (1974 figures). This low-income group comprises 70% of the fishermen, most of whom live on the east coast and operate small fishing boats, use traditional gear, and are affected by bad weather

conditions such as the northeast monsoon. During the monsoon period, fishermen's income can be reduced by \$20 per month.

The middle income fishermen are those engaged in more productive fisheries such as those using purse seines and trawls. They comprise 20% of the fishing population, earning \$100-200 per month. These fishermen are better organized than the subsistence fishermen and have risen from a subsistence to a market economy.

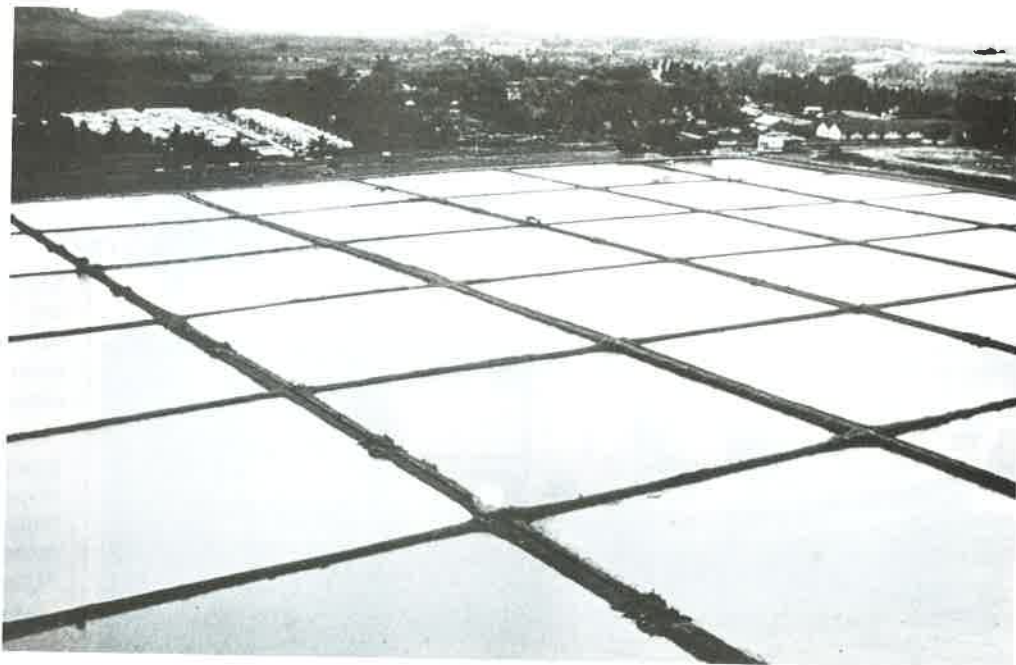
Representing the upper income group are the skilled fishermen—skippers, engineers, and efficient fishermen—who may receive \$250 or more per month. About 10% of all fishermen are part of this elite group.

Marine fisheries of Malaysia are regulated by the Fisheries Act No. 8 of 1963 aimed to conserve and protect fish in estuarine and maritime waters. It prohibits use of certain methods for catching fish, requires licensing of fishing gear to catch fish, sets restrictions for fishing in specified zones at certain times, and prescribes minimum size limitations on fish caught and mesh size used. Inland water fisheries are also covered by the Act, but do not apply in any of the 11 states in Peninsular Malaysia until having been adopted by the state legislature.

Since gaining its independence in 1957, the Malaysian government has taken a greater interest in fisheries than it had prior to that time. A Fisheries Division was erected to look after fisheries development, and it now operates several major hatcheries which raise freshwater fish fry for farmers. During the First and Second Malaysia Plans (1965-1970, 1970-1975), emphasis shifted to inshore fisheries, especially during the Second Plan when the New Economic Policy was introduced. The Fisheries Development Authority (MAJUIKAN) was established during this period. Owing to declining catches from inshore areas, the Third Malaysia Plan emphasizes offshore and deepsea fishing.

Responsibility for freshwater fisheries is no longer lodged with the Fisheries Division; instead it has been transferred to the Malaysian Agricultural Research Development Institute

*MARDI ponds are ideally constructed to allow replication of experiments and statistical analysis of results.*



(MARDI). Marine fisheries fall mainly within the purview of MAJU-KAN which facilitates implementation of the fisheries development program. It is focused on the poorest section of the fishing community and is attempting to upgrade their living conditions by providing alternative occupations for some fishermen, at the same time establishing integrated fishing enterprises to increase productivity, production, and income of fishermen. Major programs under this new policy are the MAJU-KAN trawler floats and fish landing/marketing complexes, other infrastructure, fishermen's associations, subsidy schemes, the South China Sea Project, and joint ventures with foreign countries in deepsea fishing.

Governmental policy is to encourage formation of sound organizations among fishermen so that governmental assistance can be channeled to fishermen effectively. These organizations also provide a forum for settlement of disputes. To this end, Parliament passed the Fishermen's Association Act in 1971 to organize the fishermen into effective working groups to (1) increase fish production and income through new and/or improved methods of fishing; (2) provide and organize services essential to the fishing industry such as boat gear, credit, marketing, accounting, storage, and processing; (3) harness and accumulate fishermen's capital by encouraging savings, deposits, and investments; and (4) generate economic activities.

Statistics and information used in this article were derived from the following sources:

- Annual Fisheries Statistics 1976. Ministry of Agriculture Malaysia, Fisheries Division. Kuala Lumpur. 1977. 136 p.
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- Development of the Fisheries Sector in Malaysia. *Kajian Ekonomi Malaysia* XIII, No. 1 and 2, 1976. 281 p.
- Tiews, K., Editor. Proceedings of the International Seminar on Southeast Asia, Berlin, 19 November to 6 December, 1974. German Foundation for International Development, Federal Research Board for Fisheries, and Food and Agriculture Organization of the United Nations. 1976. 522p.

## U.S. Fish and Wildlife Service Develops Information System on Pacific Islands

The U.S. Fish and Wildlife Service has developed a comprehensive information system containing over 15,000 references to natural resource information about the Pacific Islands. The data base features literature on biological, ecological, physical, chemical, and socioeconomic processes characteristic of the Trust Territory of the

Pacific. The time period covered is approximately the last 50 years, but earlier publications have been included if they are particularly relevant to the subject area. Citations refer to both published and unpublished material, including doctoral and masters' theses and foreign language publications. The data base will be useful to managers, scientists, and scholars studying physical, chemical, biological, and socioeconomic aspects of the Pacific Islands and constitutes a large centralized collection of natural resource information about the Pacific area.

Also available is a volume of 10 research "status papers" covering special topics relevant to the Pacific islands:

- Wildlife refuges and endangered species of the Hawaiian Islands and the Trust Territory of the Pacific Islands. Gerald J. Bakus.
- Botanical summary of the terrestrial ecosystem of the Hawaiian Islands, American Samoa, and the U.S. Trust Territory of the Pacific Islands. Grant Gerrish and Kent W. Bridges.
- Birds and their habitats on Pacific Islands. Andrew J. Berger.