

million pesos for the fishpond and deepsea fishing industries.

Furthermore, it is probably high time now that the Government adopt an insurance scheme for the fishing industry whereby disaster and losses to fishermen could be guaranteed and adequately compensated.

With the Government's policy to increase fish production is the program to expand areas of development of fishponds. To do this, the Bureau will deploy more extension workers to the provinces where they will guide new fishpond operators on the proper construction and layout of fishponds and improvement of production techniques. It also intends to lease some 8,800 hectares of swamp lands yearly to the private sector for development into fishponds.

At the same time, more knowledge on the commercially important freshwater and brackishwater fishes especially their life history, spawning, population, ecology and on other commercially important invertebrates are to be secured in accordance with set priorities for the proper management and conservation of our lakes, rivers and estuaries.

Funds given to fish biology and breeding studies should depend on the priority areas of research. These studies should be through team efforts or through agencies with facilities for this purpose. In the case of estuarine biology and ecology studies, the research activities need expensive equipment. Because of this, the funding must be shared by the different agencies involved in the research.

The SEAFDEC is establishing through the Bureau of Fisheries and the Mindanao State University (MSU), an Inland Fisheries Center, a regional center especially in shrimp culture. The MSU also has a shrimp hatchery center in Naawan, Misamis Oriental, Mindanao. Both these projects are well-funded, ranging into millions of pesos.

The University of the Philippines has just started an NSDB/AID assisted Inland Fisheries Project at Leganes for brackishwater fish culture and the Central Luzon State University for freshwater fish culture with multi-million pesos funding.

Scientific personnel contributions may be tapped from different agencies, if necessary. To alleviate the lack of technical manpower, scholarships must be secured to send abroad for training or graduate studies deserving Filipinos who are inclined to these disciplines including mariculture.

The Fishermen's Training Center which will train deck officers and master fishermen in marine fisheries through

the Bureau of Fisheries and FAO, has been approved for implementation by the United Nations Development Program.

In connection with marketing, the National Food and Agriculture Council (NFAC) through the Fish Marketing Action committee for 1972-75 has proposed to complete the Navotas fishing harbor project this year. Feasibility studies on the proposed establishment of a Fish Port in Lucena, Quezon as well as in other areas like Bacolod; Iloilo; Sta. Ana, Cagayan; Poro Pt., La Union; Legaspi, Albay; Dumaguete City; Davao; and Zamboanga have been considered. Assessments of transport used in the distribution of fish from Navotas-Malabon-Divisoria launching points to evolve improvements were scheduled as well as for Damortis, La Union; Lucena City; Mercedes, Camarines Norte; Iloilo City; Bacolod City; Cadiz, Occidental Negros; and Zamboanga City.

It may be recommended that research on the improvement of marketing infrastructure and transport facilities should be conducted with the end in view of facilitating the flow of fish distribution, reducing market costs and excessive profit margins. It is also necessary to bring to barrio level the knowledge that there is on fish handling and preservation including the use of new techniques to produce improved fishery products for both the domestic and export markets.

Aside from tapping the private sector and the agencies interested in fisheries development for assistance, the Central Bank is extending credit to municipal fishermen in kind like marine engines, nets and other fishing paraphernalia.

Because the number of fishing barrios is great, more feasibility studies are being undertaken to determine which barrios can qualify in this credit scheme. This financial assistance would also be extended to the fish processing and handling sector of the industry and feasibility studies would also include this sector.

Lastly, for the improvement of the statistics on fisheries, collection, updating, consolidation and interpretation of fisheries data and information are being made more systematic. Past studies of major fisheries should be reviewed and updated to cope with the recent innovations and changes. Studies on new and/or little-known fisheries and fishing industries to complement existing fisheries and industries should be initiated. Through these, all fisheries data and information can serve as a basis for the scientific analyses of our fisheries and for the formulation of policies regarding their proper development and management and their wise conservation.

SEAFDEC/SCS, 73: S-9

**The country report of the Republic of Singapore
Status of Fisheries Development in Singapore**
by
**Primary Production Department
Republic of Singapore**

With increasing conflict in the utilisation of limited land resources for industrialization, urbanisation, water

conservation, recreation and farming, Singapore, an island of 585 sq. km. and approximately 2.1 million population,

must look to the sea for its future food supply. Infrastructures have been established during the past few years aiming at offshore fisheries development in the Republic while plans have been initiated for the maximum utilisation of limited inland and coastal waters for intensive aquaculture.

The total local production in 1972 was 15,662 tons representing about 25% of total fish landings in Singapore. Of the 45,295 tons of fresh fish imported 80% came from West Malaysia while exports amounted to 3,967 tons.

The landings from offshore waters made up about 72.9% of the local production of fish in 1972. 33.4% of the landings was caught by otter trawling and 29.4% by trolling. Longlining landed 9.7% while all other methods together brought in only 0.4%. Of the 254 inboard powered boats registered for fishing purposes, 117 were used in otter trawling, 77 in trolling and 10 in longlining. There were 1,602 fishermen licensed for working in inboard powered boats.

Singapore realises the importance of offshore fisheries and is nurturing its development. There are five fish processing plants operating in Singapore, three are under construction and six sites have been offered for similar development. At the main fishing port, the total cold storage capacity available is about 3,000 tons. This main fishing port, located at Jurong, provided landing facilities for 756 local and foreign vessels last year to discharge 13,227 tons. The Primary Production Department also provides facilities for inspection of processing plants and issues health certificates for fish products.

In subscribing to the policy of regional cooperation Singapore is providing building facilities, scientific and

service staff and one-third of the operating cost to the Marine Fisheries Research Department, one of the departments of the Southeast Asian Fisheries Development Center (SEAFDEC) to conduct offshore fisheries research with the aim of contributing to fisheries development in the region. At the Fisheries Training Centre, a joint project with UNDP, training in offshore fishing, navigation and engineering know-how is carried out.

Local production from inshore fisheries was 21.6% of the total landings in 1972. Apart from other minor gears, the production was mainly from palisade traps. However, during the last decade, the production has dropped by almost 40%.

Singapore has largely relied on traditional methods of fish cultivation. However, emphasis has recently been laid on more scientific approaches. The re-orientation will directly lead to more intensive methods of farming highly priced fish for maximum utilisation of land and water resources, and will intimately involve socio-economic factors. Some of the projects have resulted in the successful mass production of marble goby fingerlings (*Oxyeleotris marmorata*) and juveniles of *Macrobrachium resenbergi*. Experiments on the intensive culture of grouper (*Epinephelus tauvina*) in floating cage-nets and the breeding of *Siganus oramin* and marine prawns (*Penaeus indicus* and *Matapenaeus ensis*) have been encouraging.

Ornamental fish and aquarium plants are cultivated for local and foreign markets. In 1972, the export value for these two items totalled more than S\$10 million. The Freshwater Fisheries Laboratory has continued to provide technical assistance to hobbyists, breeders and exporters.

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The country report of the Kingdom of Thailand

by

Department of Fisheries

Ministry of Agriculture and Cooperatives

Bangkok, Thailand

Fishery Administration

The development of the Thai fisheries during the past few years has resulted in a spectacular increase of total landing of fish; particularly marine fish landing (Table 1). According to recent fisheries statistics, the total catches of both marine and freshwater fish increased from 1.44 million metric ton in 1970 to 1.58 million metric ton in 1971. This remarkable increase of marine fish landing is mostly due to the rapid development of commercial trawl recently, and of which resulted a drastic decline in the abundance of demersal fisheries resources in the Gulf of Thailand (Table II). The Ministry of Agriculture and the Co-operatives, therefore, announced a new conservational measure in July 1972 in accordance with the provisions of the Fisheries Act of B.E. 2490 (1947), commercial trawling operations of all types and sizes of trawlers are now prohibited within three kilometers off shores.

Planning

In recognizing the prominent role of fisheries in the supply of needed animal protein food, the Government of Thailand has incorporated the fisheries development program in its overall economic and social development plans since 1961. The Department of Fisheries, Ministry of Agriculture and Co-operatives, has already set up the current fisheries development program in the Third National Economic and Social Development Plan (1972-1976).

One of the most significant development policies at present is to initiate and promote the expansion of deep-sea fishing industry. Based on the Third National Economic and Social Development Plan, the Accelerated Program of Agricultural Development has been set up recently by the Ministry of Agriculture and Co-operatives. Because of its great demand in the international markets, marine shrimp is considered as one of the agricultural