AQUACULTURE FISHERIES IN JAPAN AND IN THE PHILIPPINES - A COMPARISON

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At the outset, I would like to express my thanks for the privilege given me to be with you this morning. MAGANDANG UMAGA PO SA INYONG LAHAT.

I would like to speak this morning on the topic "AQUACULTURE FISHERIES IN JAPAN AND IN THE PHILIPPINES - A COMPARISON". In Japan, we have two most popular Aquaculture methods, namely: Pond Culture method and Marine Culture method.

In the Pond Culture method, the fry obtained from the hatcheries by artificial propagation techniques or from natural sources are being reared in the culture ponds up to marketable size. The culture of Yellow tails and Red Sea Breams are good examples. On the other hand in the Marine Culture method, millions of fry from artificial breeding in hatcheries are being liberated into the open sea and let them grow up to maturity under natural conditions, instead of stocking them in culture ponds. In other words, this type of fishery is a combination of artificial and natural methods and is sometimes called "Farming Fishery". Unlike in Pond Culture, wherein the products belong to the pond owners only, in the Marine Culture method, the products belong to nature, hence, to everybody.

The pond Culture industry is not as popular in Japan as it is in the Philippines. This is due to the scarcity of cultivable pond areas. In fact, we usually make use of existing salt beds and convert them into culture ponds. Thus, if we just depend upon Pond Culture method, consumption demand for marine products could never be met.

Realizing the limitations in Pond Culture industry, Marine Culture method was developed by the Japanese ten years ago to help meet the demands for marine products and to replenish the declining populations of marine resources in natural waters due to overexploitation and due to industrial pollution of fishing and spawning grounds. However, in order to effectively replenish the stock in the sea, there is the problem of securing millions of fry for stocking. Ten years ago, this great quantity of fry needed for stocking could not be produced artificially. Thus, during that time, pond culture and marine culture fisheries depended mainly upon natural sources. After a few years, however, mass seed production technique of Kuruma ebi 'scientific name, Penaeus japonicus) was establish by the Seto Inland Sea Fish Farming Association researchers under the leadership of Dr. Motosaku Fujinaga. As a result of the pioneering work of Dr. Fujinaga on Kuruma ebi, artificial propagation techniques of other species - for example, other shrimps, crab, abalone, flatfish and rockfish - were studied and established. The results of the researches of fisheries universities and fisheries laboratories supported by the Japanese government, were propagated to Prefectural Fisheries Experimental Stations and to fisheries cooperatives located throughout Japan.

At present we can produce two hundred million fry of Kuruma ebi or prawn and also several million fry of other edible shrimps, crab, abalone, rock fish, in others in a year. By the way, which is more profitable for fishermen, Pond Culture or Marine Culture? In my opinion, if we apply the modern techniques in artificial propagation in large scale, and if we can use cheap, unpolluted and large pond areas, pond culture fishery is more profitable than marine culture fishery. It is because, in pond culture method, we can exterminate the predators and competitors easily and also ponds could be easily managed than the natural sea. In the case of the marine culture method, most of the fry liberated into the sea are under the mercy of predators. And also, it is a pity that there is no good method yet on how to evaluate the restocking effects.

In spite of this situation, the fishermen are forced to release their fry into the open sea due to Japan's geographical limitations and also due to pollution of shallow coastal areas.

The following are the steps taken in the marine culture method: (This is in the case of Kuruma ebi, Penaeus japonicus.)

Step I. Artificial Seed Production in the Hatchery

The mother shrimps used for spawning are usually big shrimps weighing over 50 grams on the average. The larvae hatched out are reared artificially up to stocking size or 20 mm body length for about 30 days. Presently, we can produce two hundred million fry of the above-mentioned size in a year. On the average one hundred thousand fry or an equivalent of 30 percent survival rate from nauplii larvae to fry stage, could be produced from one spawner. On the other hand, under natural conditions, only a small percentage of the larvae can survive, thus I think the effect of artificial rearing is tremendous. We usually use 200 to 500-ton concrete tanks in the hatchery.

Step II. Rearing in the Nursery Ponds

The fry from the hatchery, owing to its very small size, are not directly released into the sea but are first reared in the nursery ponds. This is to train them to escape from enemies, train them to search and catch their foods and to acclimatize them to their natural habitat in the sea. It is, in short, a training for survival. Usually we keep the fry in the nursery for one or two weeks which is situated in shallow coastal waters surrounded with artificial dikes.

Step III. Release of Fry into the Sea.

Generally, shrimps are nocturnal in habit and are usually observed inhabiting shallow coastal waters to escape from big predators. Thus, we release the fry into the sea during night time or during the lowest tide. Furthermore, we appeal to fishermen to refrain from catching the newly released young shrimps until they reach marketable size.

Step IV. Recapture of the Adult Shrimps

After about six months the released shrimps reach marketable size of about 15 cm in body length. Some of the shrimps migrate to spawning grounds. It is considered good, if fishermen could catch three percent of the total number of fry stocked.

Now, I would like to comment on the Aquaculture Fisheries in the Philippines. Frankly speaking, I think the pond culture fishery in the Philippines has brighter future for development than that in Japan for the following reasons:

1. The fish being reared in Philippine ponds has higher growth rate because water temperature is constantly high, from 27°C to 31°C and that fish or shrimps could be cultured throughout the year.

2. There is less pollution of coastal waters by industrial plants and sewage disposal, except for a few areas.

3. There are vast areas of undeveloped mangrove swamps and estuaries in various parts of the country. Also, the price of potential pond areas is much cheaper than that in Japan.

4. The spawning seasons of useful fishes are longer in the Philippines than in the temperate zones, thus more fry could be produced for a longer period.

5. Water management in culture pond could easily be done due to wide range between low and high tides. In this case, competitors and predators of cultured fish or shrimps could easily be handled.

6. Lab-lab, which is a conglomeration of diaroms and zooplanktons, grow naturally in nursery and culture ponds which serves as a cheap supply of feeds for Bangus and other species. And,

7. The price of sea foods is high and demand is great.

In connection with the above-mentioned observations, I would like to suggest that artificial seed production techniques best suited for tropical and sub-tropical zones conditions be studied and established, in order to fully develop the fish pond industry.

I would like to suggest further, that Bangus culture and Sugpo culture be given priorities due to the following reasons:

1. Both species have high market value and are in great demand.

2. Both grow rapidly in ponds the whole year round.

3. Bangus are generally herbivorous, specifically plankton-feeders. Thus, pond owners could just apply both organic and inorganic fertilizers in their ponds to grown natural feeds. And,

4. Bangus and Sugpo could be cultured together without problems at all. Thus, higher yield per acre of pond could be expected.

By the way, the AQUACULTURE DEPARTMENT of SEAFDEC, Southeast Asian Fisheries Development Center, located in Tigbauan, Iloilo, and the MSU-Institute of Fisheries Research and Development in Naawan, Misamis Oriental, are now conducting researches in seed production and cultivation of some valuable marine species, Sugpo (scientific name, Penaeus monodon), Long-legged Giant Prawn (Macrobrachium rosenbergii), Alimango (Scylla serrata), Alimasag (Portunus pelagicus), Oysters, Seaweed and other species of high economic values. It is hoped that SEAFDEC would in some day contribute to the fisheries economic development of the country.

It is observed that population growth increases remarkably around the world every year. Twenty years from now, it is estimated that the world population would reach the five or six billion mark. Scientists believe that the animal proteins requirements of the increasing population could only be supported by the sea.

Thus, the full development of aquaculture fisheries in the Philippines will play a major role in supplying the protein needs of the world in the near future. This is only possible if both the government and private sectors join hand in hand together in the wise and efficient utilization of our natural marine resources.

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