Asian Aquaculture

VOL. 2 NO. 1 TIGBAUAN, ILOILO, PHILIPPINES JANUARY 1979

Aquaculture development projects in Asia underway

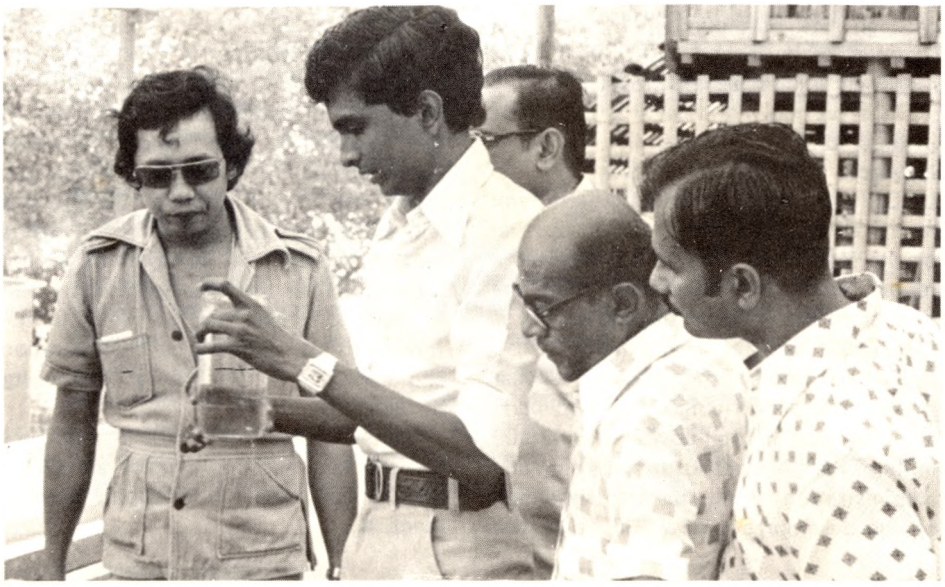
Towards the end of 1978, the Asian Development Bank approved U.S. $23.11 million worth of loans and technical assistance for aquaculture development projects to be undertaken in Thailand and the Philippines. In November, the ADB approved a $14 million concessional loan and a technical assistance grant of $110 thousand to Thailand for a large-scale aquaculture development project. This was closely followed by the Bank's approval of a $9 million loan to the Philippines for a fish pen development project to be implemented in the 93,000-hectare Laguna de Bay freshwater lake.

Earlier, the ADB granted technical assistance for the study and preparation of a proposed high priority integrated fisheries development project for Sumatra in Indonesia and a grant to help finance a feasibility study for the formulation of Pakistan's Second Fisheries Development Project.

Fish and Shrimp in Thailand

The Thai project, which will have a total cost of U.S.$41.8 million, is aimed at increasing fish and shrimp production to meet local demand for fish products, improve income and employment opportunities of small fish farmers, and for export. It is expected to result in an increase in fish and shrimp production of at least 11,700 metric tons annually, valued at some $25 million, of which about 3,400 metric tons would be exported. At

(Continued on p. 2)



These four Indian researchers (right to left) — Messrs. N.N. Pillai, N.C. Basu, M.S. Muthu (partly hidden), and P. Ravichandran — are observing hatchery operations at the SEAFDEC Aquaculture Department's sub-station in Batan, Aklan. Briefing them is Mr. Rolando Platon, Barangay Hatchery Project leader. The observation is part of the Indian scientists' 3-month training course on prawn breeding and culture scheduled from Nov. 27, 1978 to Feb. 23, 1979. The training is the first to be held under a collaboration work plan for scientific and technical cooperation between the Indian Council for Agricultural Research (ICAR) and the SEAFDEC Aquaculture Department. (Story on p. 2)

Four Indian scientists undergo training at SEAFDEC

Four Indian fishery scientists are now in Tigbauan, Iloilo for a three-month — Nov. 27, 1978 to Feb. 23, 1979 — training course on prawn breeding and culture. They are the first batch from India to undergo such a training under a collaborative work plan for scientific and technical cooperation between the Indian Council for Agricultural Research (ICAR) and the SEAFDEC Aquaculture Department.

The four now in training are Messrs. M.S. Muthu, N.N. Pillai, P. Ravichandran, and N.C. Basu.

The collaborative work plan is included in a memorandum of agreement signed by officials of ICAR and the SEAFDEC aquaculture department in July 1977. The plan provides for an exchange of trainees, expertise and information. SEAFDEC scientists may engage in studies offered by ICAR while ICAR scientists may attend training courses offered by SEAFDEC. The sending institution provides international travel costs while the host shoulders boarding, lodging and internal travel costs.

SEAFDEC offers the following study programs: milkfish culture techniques and allied aspects; prawn breeding and culture; nutrition and feeds of fish and prawns; fish culture in pens; mass culture of fish food organisms; induced breeding of milkfish; and milkfish-prawn-livestock integrated farming system.

On the other hand, fisheries research institutions in India, through ICAR, offer SEAFDEC scientists studies on the following subject matters: soil and water chemistry, freshwater fish culture, induced breeding of carps and catfish, fish endocrinology, control of aquatic weeds and algal bloom, prawn culture, culture of fish food organisms, culture of mussel, seaweed and pearls, and aquaculture documentation. ●

Aquaculture development... *(From p. 1)*

full development, some 9,000 people are expected to be benefited by the project, the life span of which is until March 1984.

There are six sub-projects in the Thai aquaculture development project: (1) upgrading or rehabilitation of about 9,000 hectares of brackishwater shrimp ponds in several coastal provinces, including the installation of water pumps; (2) development of 2,000 hectares of swampland into small shrimp/fishpond holdings in estate settlements in two provinces, including the installation of water pumps; feed processing plant, ice storage facilities and transport equipment; (3) installation of two pilot marine shrimp hatcheries with maturation pens and field spawning laboratories at two sites; (4) construction of a fresh water prawn hatchery and broodstock pond near Songkhla Lake; (5) setting up of 3,000 Pangasius fish cages in rivers in central Thailand and the construction of a supporting hatchery; and (6) development of about 1,000 hectares of land into small integrated farms at selected sites in central Thailand, including the construction of fish ponds, a feed processing plant, ice plant, ice storage facilities, and transport equipment.

Agencies involved in the implementation of the project are the Thai Department of Fisheries in the Ministry of Agriculture and Cooperatives, the Department of Cooperatives Promotion, and the Bank for Agriculture and Agricultural Cooperatives.

Lake Farming in RP

The Laguna de Bay Fish Pen Development Project in the Philippines is designed to increase the total fish supply in the communities surrounding the Laguna Lake including Metro Manila through the development of fish pen modules to be owned and operated primarily by small-scale fishermen.

This particular project was conceived in the course of the comprehensive water resources development study of the UNDP with the Asian Development Bank as the executing agency. ADB's approval of the loan came after it had received a report from its consultant that the quality of the water in Laguna de Bay is suitable for fisheries development.

To be implemented over a 4-year period, the period consists of two parts and will have a total cost of U.S.$23.06 million. Part A involves the provision and administration of sub-loans to fishermen or the development of 2,500 ha of fish

pen modules while Part B involves the construction of a fish hatchery/nursery complex which will stock the fish pen modules and the provision of related facilities and services.

Implementation of Part A will be the responsibility of the Development Bank of the Philippines with assistance from the Laguna Lake Development Authority, the agency responsible for the development of the Laguna de Bay area. Part B implementation will be the responsibility of the Lake Development Authority.

At full development, the project will generate self employment for about 1,500 fishermen families, or 9,300 individuals, and is expected to increase the annual income of each family from the present level of less than ₱9,000 to between ₱18,500 and ₱41,700 (U.S.$1 = ₱7.3).

It should improve the supply of fish to nearby markets and will provide employment opportunities for some 950 unskilled workers in the hatchery/nursery complex and the project management office. The project is expected to intensify economic activity in the lake region arising from improved financial position of resident fishermen and from project needs for ancillary facilities and services.

About 16,300 metric tons of fish annually is expected to be produced by the project all of which will be consumed in the Laguna de Bay region, including Metro Manila. At the present annual per capita fish consumption of 33 kg., this will satisfy the demand of about half a million people. The introduction of improved fish pen modules operated by 2 to 5 families is expected to result in the formation of sound group cooperation and activities in the fishery community of the area.

Other sources of financial assistance for the lake farming project are OPEC Special Fund and the Philippine Government. ●

Overview

The milkfish research development program of SEAFDEC

Milkfish *Chanos chanos* Forskal research and development is one of the four priority programs of the SEAFDEC Aquaculture Department owing to the popularity of the species as a food item. It is the staple protein diet and preferred fish of over 200 million peoples. It is farmed extensively in the Philippines, Indonesia and Taiwan with a total area of 400 thousand hectares from which a quarter of a million tons of fish valued at US$100 million are annually produced. In the Philippines alone, milkfish gives direct employment to some 170 thousand workers. It accounts for 10 percent of the country's fish production of 1.2 million tons a year. Some 176,000 hectares of pond in the country are cultivated for milkfish.

Despite its importance and the length of time fish farmers have been raising the species, yield of milkfish has remained low. Although Taiwanese fish producers have been producing an average of 2 tons per hectare a year, Filipino pond owners have been getting a low yearly average of only 640 kilograms per hectare. A few progressive pond raisers in the Philippines however easily equal or even exceed the average Taiwanese yield which indicates problems in the transfer of technology. While technology and experience show a potential yield of 2000 or more kilograms, per hectare per year, actual average yield is more than three times less.

The milkfish industry has incipient problems. Among the more serious ones are: seasonality of fry because the source of fish seed is largely from the wild; inadequate understanding and therefore inadequate application of pond design and management principles as they apply to raising fish; fish nutrition and predator control. On top of these biology-related problems are socio-economic constraints such as lack of production and management inputs, traditional practices, inequities caused by market forces, and inadequate production and post-harvest support to fish farmers.

While the more recent projects initiated by the Aquaculture Department such as the Aquaculture Resource Management Program (AA Vol. 1 No. 5) are aimed at an integrated approach toward solving the aquaculture industry problems, including milkfish, the main thrust of the SEAFDEC R & D program for the species has largely been along seed production. A steady supply and a reliable source of seed should be able to trigger a more widespread farming of milkfish and a more efficient utilization of fish farming resources especially land.

As in animal breeding, the fundamental guideline of the milkfish research program is to understand fully the life cycle of the species so that the life cycle can be duplicated under controlled conditions and so that the performance of the species can be improved by inducing it to grow bigger and faster and to multiply more rapidly.

Research Milestones

After about three years of painstaking work, the milkfish research team of the Department has succeeded in inducing mature milkfish (sabalo) caught from the wild to ovulate in captivity; is on the verge of breaking through the mortality barrier in the artificial rearing of larvae; and has developed improved ways of cultivating the fish in ponds and pens.

Laboratory Achievements

These research milestones were made possible with the following laboratory achievements: success in trapping and transporting without injury and the domestication of the wild adult milkfish; induction of the newly caught spawner to ovulate through hormonal (SG-G100) injection; success in artificial fertilization of the eggs using the "dry method"; incubation of the fertilized eggs and documentation of all the stages in the embryonic, larval and post larval development; rearing of the larvae past the critical period after previous trials had resulted only in near total mortality.

Research Techniques

The inroads into the mysteries surrounding the life of the milkfish were made only after the problems associated with the capture of milkfish spawners from the *otoshi-ami,* a Japanese trap net and the local fish corral known as *baklad* and their safe transport to the laboratory were overcome. Safe transportation of the wild spawner was achieved with the development of transport cages and handling procedures to minimize injury. Spawners that enter the fish corral and *otoshi ami* are transferred to a floating cage by means of a scoop net. The cage is tied underneath the outrigger of the pumpboat and slowly brought to shore; the fish is then guided into a plastic bag

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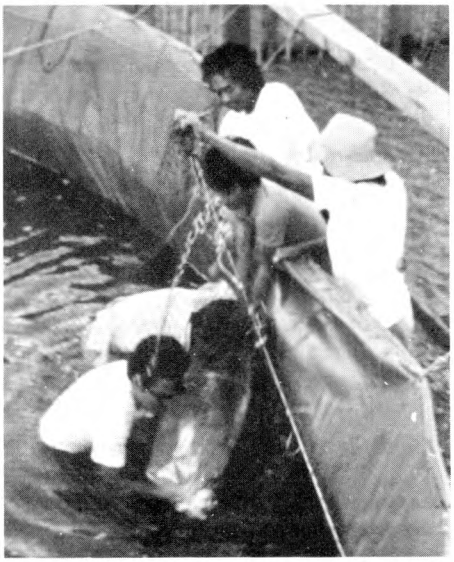


Status of aquaculture in so

In recent years, most of the countries in Latin America have recognized the need to give greater priority to fish and shellfish production through aquaculture for domestic consumption, especially to meet the food and nutrition requirements of rural populations. Experimental or small-scale aquaculture has been developed in some inland and coastal waters of the region. However, aquaculture has not yet received the level of recognition and importance as a national economic activity in many of the countries.

Although aquaculture is still at an experimental stage, there are systems of culture that have reached a production or pilot-scale stage of development. These include large-scale pond culture of trout, tilapia, carps, raft or rope culture of oysters and mussels in coastal waters and the cage culture of tilapia.

The main handicap to the expansion of the industry in the region is the crucial importance of trained manpower and the lack of technical knowhow.

The status of aquaculture in some Latin American countries follows:

ARGENTINA

In Argentina, there is a small number of commercial trout farms in operation. However, it was estimated in 1974 that an area of approximately 1,010,500 ha of lakes and rivers are available for fish cultivation.

Aquaculture still remains in an experimental stage, although trout culture has reached a pilot-scale stage of development. Other species which are being cultivated include: *Salmo solar sebago, Salmo trutta, S. gairdnerii, Salvelinus tontinalis, Ctenopharyngodon idella, Basilichthys bonariensis, Patagonia hatcheri* and *Percichthys* sp.

The average production of salmonids in 1974 was 1,600 tons per ha, and 4,000-5,000 tons per ha of silverside (*B. banariensis*). In addition, there are hydro-electric dams which when stocked with silverside could yield 510 tons per year.

BOLIVIA

Bolivian aquaculture is mainly based on the production of fingerlings of some species of salmonids, and of silverside for stocking in open waters with the aim of improving its total fish production. Small-scale culture of *Tilapia rendalli* and *Cyprinus carpio* is also being carried out.

Culture area of *Salmo gairdnerii* covers about 400,000 ha at Lake Titicara which yields a total production of more than 800 tons annually. On the other hand, a total of 50,000 ha is being utilized for the culture of *Basilichthys bonariensis* which yields a total of 150 tons per year.

CHILE

Freshwater aquaculture in Chile is based principally on salmonid cultivation. In addition, atherinids and freshwater prawns are also being cultivated at an experimental stage.

Salmonids are cultivated to produce eggs and alevins for the repopulation of rivers and lakes; and to stock them in cages in the Andean lakes. The salmonid species being cultivated include: *Salmo gairdnerii, S. trutta,* and *Salvelinus tontinalis.* Experiments are also being carried out with Pacific salmon, *Oncorhynchus keta* and *O. masou* which are imported from Japan.

In addition, trout are also cultivated in cages at a production stage. However, production record has been very low due to mass mortalities caused by unidentified disease problems. Although important parasites and bacterial diseases have been diagnosed, there is no central body which coordinates these activities.

COLOMBIA

Salmonid cultivation predominates in Colombian cold waters while tilapia culture predominates in warm water. Experiments are also being conducted on the cultivation of native fish species which include *Prochilodus reticulatus* (bocachico), *Brycon henni* (sabaleta), *Megalops atlanticus* (sabalo), *Pimenlodus clarias* (barbudo), *Mugil brasiliensis* (Lebranche), etc.

Species of *Macrobrachium* are also being studied for possible production-scale cultivation. Mullet and oysters (*Crassostrea rhizophorae*) are cultivated at a small-scale level in brackish and marine waters.

The total pond surface area currently available is approximately 50 ha. In addition, it was estimated that the area of coastal lagoons and estuaries on the Caribbean Coast provides about 3,000 km^2 available for aquaculture development.

The main problems encountered in developing aquaculture in Colombia are the lack of suitable installation for experimental purposes, and the lack of data on the biology of local species.

COSTA RICA

Fish production in Costa Rica has increased considerably, from a total production of 2,589 tons in 1960; 9,683 tons in 1970; to a total of 13,516 tons in 1974. Most of the catch came from artisanal marine fisheries.

Aquaculture is still a new activity in Costa Rica. Its development has been quite slow due to the lack of proper techniques even for a small or medium production scale.

ne Latin American countries*

Costa Rica has more than 45,000 ha of estuarine waters available for aquaculture development. In 1975, it was estimated that if only 600 ha of the mangrove areas could be developed and stocked with shrimps, it would yield more than 500 tons per year; and if 200 ha could be utilized to culture molluscs, it would yield an estimated annual production of more than 1,000 tons.

Studies have also been undertaken to evaluate various species which have considerable potentials for cultivation. Recently three species of carps have been studies thoroughly which include: *Ctenopharyngodon idella, Aristichthys nobilis,* and *Hypophtalmichthys molitrix.* In addition, *Tilapia nilotica, T. mossambica* and *T. hornorum* were also studied with very good results.

Other species which are being studied for export purposes are the eel (*Anguilla rostrata*) and the freshwater shrimp (*Macrobrachium* spp.).

CUBA

The initial development of the fisheries industry in Cuba increased its total fish production from 21,900 tons in 1958 to 165,043 tons in 1974. It was not until 1960, that aquaculture development was started. From this period various studies were undertaken to develop aquaculture. Its development has taken part in the considerable increase of its fish production. In 1966, production through aquaculture was only 10 tons, but this was improved to 5,000 tons.

At present, the Cuban government has plans to develop techniques on the application of various modes of culture (monoculture, polyculture, semi-intensive, intensive, etc.). In order to attain its goals, the Cuban government plans to exploit its inland and marine waters for the development of aquaculture. Preliminary studies have already been undertaken for the cultivation of the following species in inland waters: *Anguilla rostrata, Rana catesbeiana, Tilapia* spp. *Cyprinidae, Ctenopharyngodon idella, Crocodylus* spp. and Xantidae; and for the cultivation of *Crassostrea rhizophorac, Penaeus schmitti, Mugil* spp., Spongiaria and Cheloniidae in marine waters.

ECUADOR

In 1973, the fish production of Ecuador was about 152,900 tons. According to its development plan, it aims to increase its total production to 309,000 tons in 1980. The country's development plan includes improvement of its marine fisheries as well as aquaculture.

In order to attain its aims to develop aquaculture, experiments are being undertaken to study various fish species suitable for culture in the country. The following species showed potentials for culture: *Penaeus vannamei, Ostrea columbiensis, Ostrea cortesiensis, Mytella guyanesis, Dormitator latrifons, Ichtyolephas humeralis, Salmo gairdnerii,* etc.

The rivers of the plains are known to possess a rich fish fauna, but the range of species is not fully known. Rainbow trout (*Salmo gairdnerii*) is the main species found in Andean lakes of Ecuador. Carp (*Cyprinus carpio*), goldfish (*Carassius auratus*), tilapia (*Tilapia mossambica*) and black bass *Micropterus salmoides* are other species which have been experimentally cultivated.

EL SALVADOR

The total fish production of El Salvador in 1974 was 8,170 tons, composed of commercial fisheries 5,862 tons; artisanal fisheries 1,100 tons; and aquaculture 1,208 tons.

The government considers developing aquaculture by introducing fish culture in rural areas in pilot scale, and cage culture in lakes and lagoons. For fish culture in inland waters, experiments were already undertaken on the culture of *Tilapia aurea* polycultured with *Cichlasoma managuense.* It also plans to culture tilapia hybrid (*T. hornorums* and *T. nilotica*), and freshwater prawns (*Macrobrachium tenellum*).

In fish cage culture, *T. aurea* is exclusively used, and in mariculture, *Penaeus vannamei* and *Ostrea iridescens* are being utilized.

GUYANA

It is estimated that 15,000 metric tons of finfish was produced by Guyana in 1974 together with 6,000 metric tons of shrimps. The bulk of the catch was provided by marine capture fisheries with no contribution from aquaculture.

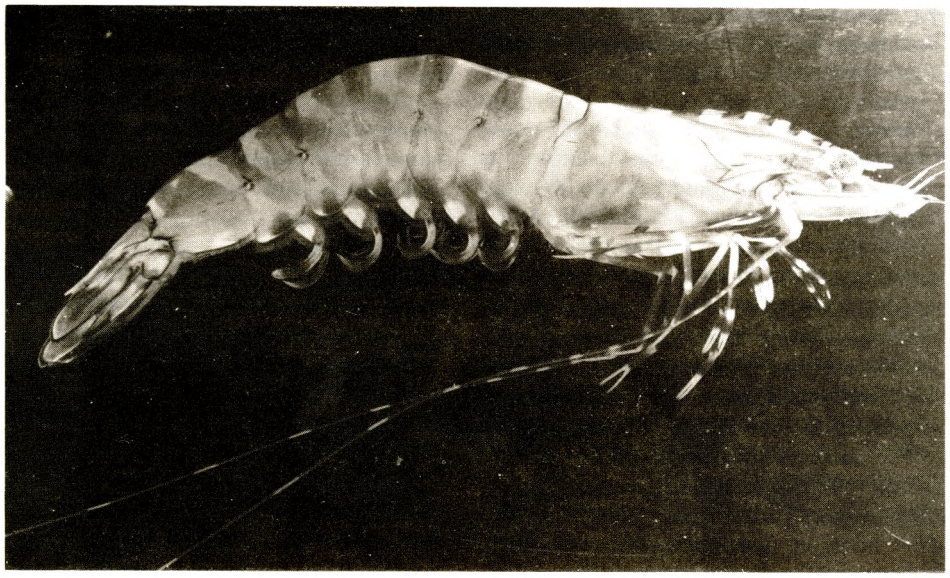
However, there is approximately 810 ha of unused land in Guyana which could be developed for aquaculture. With this area, a potential 3,000 metric tons of fish could be produced by 1980.

The government has developed a ten-year plan for its brackish and freshwater areas. For the past three years, studies on the monoculture of *Tilapia mossambica* and *Hoplosternum littorale* were carried out in fertilized freshwater ponds and mixed culture of other suitable species in brackishwater enclosures which include croaker, mullet, tarpon, and tilapia. ●

*Information source of this article is the UNDP/FAO report, "Aquaculture Planning in Latin America," which was translated from the original Spanish text by the staff of the External Affairs Division, Aquaculture Department, SEAFDEC.

R & D NOTES

Edible crustaceans in the Philippines*



Penaeus semisulcatus DE HAAN

English name: Green tiger prawn, Bamboo nude prawn, Grooved tiger

Philippine name: Hipon (Tagalog), Hipon bulik (Tagalog), Hipon windu (Tagalog), Kuyan (Aklan)

Measuring approximately 22 cm in body length, this species is one of the big penaeid shrimps. Its appearance is similar to that of *P. monodon* because of its relatively large size, rostrum armed with 7 or 8 dorsal and 3 ventral teeth, and reddish color with dark stripes. However, the two are distinguished by the following characteristics:

1. Hepatic carina is inclined downward anteriorly in *P. semisulcatus* but is horizontal in *P. monodon.*
2. White and red transverse stripes are present as bands in the antenna of *P. semisulcatus*, but are absent in *P. monodon.*
3. Rostrum is more less straight in *P. semisulcatus* but strongly sigmodial in *P. monodon.*
4. Adrostal carina reaches well beyond epigastric tooth in *P. semisulcatus* but not in *P. monodon.*

Carapace and abdomen are uniformly glabrous. The body color life is pale brown with dark brownish red transverse bands, and pleopods are pale blue fringed with crimson hairs.

One of the common species among the genus *Penaeus* in the Philippine waters, it is mostly caught by commercial trawlers from the open sea, and by fish corrals located in coastal waters. Unlike *P. monodon*, it is seldom caught from fishponds.

It is widely distributed in the Indo-West Pacific waters extending to the Red Sea, South Africa and Australia. There is a great demand for this species for export with the name of "Flowar" and has national market price of ₱20-₱35/kg.

*Second in a series of contributions submitted by H. Motoh, Japanese aquaculture expert working at the SEAFDEC Aquaculture Department in Tigbauan, Iloilo, Philippines.

The milkfish research...

(From p. 3)

filled with water. The plastic bag containing the fish is placed on a stretcher and transported to the experimental tank where the fish is slowly and carefully released into the water.

The success in artificial fertilization has bridged a wide gap in the knowledge on the nature of the milkfish egg and larvae. It also set the stage for attacking the next problem which was the artificial rearing of larvae. The researchers' first attempt, however, resulted in almost total mortality. The next try yielded 38 percent fertilization and 73 percent hatching rate. Key to the success has been attributed to the improved rearing techniques used and to the kinds of larval feeds given which included chlorella, brachionus, trochophore larvae of oysters and others.

Other research activities related to the milkfish program were the ultrasonic tagging and tracking of spawners in an initial attempt to find out where they spawn, whether in the deep or in coastal waters; determination of the salinity preference of fry; stocking of fry and stunting techniques for fingerling as one method to maintain a steady supply of seedlings.

Meanwhile, milkfish juveniles have been stocked in maturation pens and cages in the Igang sub-station (in Guimaras Island) for the development of a broodstock. Studies have also been started on the critical areas of pond culture such as natural and supplementary feeding and predator control and on pond design and management.

All these should lead to the establishment of hatcheries, nurseries, and seedbanks in order to promote the widespread farming of milkfish for protein production among tropical rural communities.

Milkfish could become the mainstay of an expanded rural-based fish culture industry with the eventual harnessing and application of these and other research results. For the waters to yield more, science and technology must devote greater efforts and investments towards attaining success similar to what livestock husbandry has gained in the domestication and selective breeding for better breeds of animals. ●

Notes from our readers

Dear Mr. Bueno:

We would like to extend our sincerest gratitude thru this letter for the continuous supply of your informative newspaper. Hence, our new address is as stated on the lowest portion of this letter-head.

However, we would like to request that all our other stations be furnished with a copy of your *Asian Aquaculture,* addressed to the News Director. Attached herewith is a list of all our stations with their corresponding addresses for your convenience.

Warmest regards.

Very truly yours,

Henry R. Canoy
President
Radio Mindanao Network, Inc.

VILLAGE LEVEL PRAWN HATCHERY TRAINING

Dr. Frank M. Garay (left) of Bohol, Philippines receives certificate after completing the Training on Small-Scale Sugpo Hatchery Management held from Oct. 16 to Nov. 30, 1978 at SEAFDEC Aquaculture Department's sub-station in Batan, Aklan. Congratulating him are from right: Dr. Thomas G. Flores, deputy director of the Asian Institute of Aquaculture; Mr. Luis Rodriguez, Prawn Broodstock Maturation Project leader; Mr. Rolando Platon, Barangay (village) Hatchery Project leader; and Mr. Graciano Aaron, Batan sub-station head. The other participants are: Mr. Alan C. Apostol of Malabon, Metro Manila; Mr. Warlito V. Besana, BFAR, Roxas City; Mr. Nestor M. de Leon, Quezon City; Mr. Vic T. Domondon, Sto. Tomas, La Union; and Mr. Elmo P. Fabula, Quezon Province. Mr. Isaac C. Mana-ay of Pandan, Antique attended as observer. The training was an offshoot of new developments in the SEAFDEC Aquaculture Department's Barangay Hatchery Project which was organized to scale down prawn hatchery technology to a level that can be adopted by villages with minimum financial input. The recent training is the second held under this program. The first was offered from September to November, 1977 at Tigbauan and involved 10 participants of which, according to Mr. Platon, five have now built their own small hatcheries.

Dear Dr. Madamba:

As I did in my last correspondence, I would like to congratulate you again for your fine work in the new publication, *Asian Aquaculture.* It is an excellent publication!

In Volume 1, Number 1 of *Asian Aquaculture,* there is a brief article on an aquaculture conference that was held in Manila. Would you please send me some background information on this conference? Specifically, I am interested in the following: (1) copy of the agenda or program; (2) a list of the speakers and their addresses; (3) a list of the attendees; and (4) information on the proceedings.

Sincerely,

Robert Rosenberry
Aquaculture Digest
San Diego, California 92126

Dear Joe:

I appreciate having the copy of *Asian Aquaculture* of July 1978 and have mixed feelings about extending congratulations to you on your appointment as Director of the AIA. I do wish you all the best in this important new post but also regret to see you leave the domain of directors of national agricultural research systems. PCARR, as you know, is one of the 3 or 4 best models for persons from developing countries to study — reflecting excellent progress over the 6 years since its planning.

Dil Athwal and I returned recently from Bangladesh where we were members of a joint team to review their national research capabilities. Arrangements have been made for 5 or 6 Bangladesh agricultural leaders, including Drs. Amirul Islam and K.M. Badrudozza, to visit India, Indonesia and the Philippines. They will be in the Philippines October 23-26, 1978. Joe Drilon (PCARR director-general) has been notified, but I hope you also will be able to meet them and be sure they are provided with key information and reports.

I note that Tom Flores is an editorial advisor to *Asian Aquaculture.* I send best wishes to him as well as to you.

Sincerely,

A.H. Moseman
International Agricultural Development Services (IADS)
New York

AIA director: PCARR's Pantas awardee for 1978

Dr. Joseph C. Madamba, director of the Asian Institute of Aquaculture (AIA), was the recipient of the PANTAS AWARD, the only one given in 1978 by the Philippine Council for Agriculture and Resources Research (PCARR). Madamba received the award during PCARR's sixth anniversary celebrations held on November 17, 1978 at Los Baños, Laguna.

PCARR cited Madamba who "as first PCARR director-general. . . successfully guided the institution toward its goal of making agriculture and resources research a significant contributor to national development."

Madamba played a vital role from the conception, establishment and development of PCARR — now considered as a model national research system for Third World countries to follow. PCARR (then Philippine Council for Agricultural Research) was created in November 1972 by President Ferdinand E. Marcos to put an end to uncoordinated, mismanaged, irrelevant, and self-serving research effort. for agriculture, forestry, fisheries, and later mines.

PANTAS is a Pilipino word which means sage, a wise man, an intellectual. The significance of the award lies in the fact that the management of scientific undertaking requires wisdom, foresight and vision. ●

AIA Director J.C. Madamba receives the Pantas Award from PCARR Director-General J.D. Drilon, Jr. during PCARR's 6th anniversary celebrations on Nov. 17, 1978.

10th World Mariculture Society meet

The Tenth Annual Meeting of the World Mariculture Society is scheduled for January 22 to 26, 1979 at the Hilton Hawaiian Village Hotel in Honolulu.

This was learned in a letter sent by Dr. Edward D. Scura, program chairman of the meeting, to AIA Director Joseph C. Madamba. Dr. Madamba has been invited to participate in the meeting and is presenting a paper on Subsistence Aquaculture and Technology Transfer among Developing and Developed Countries.

Some of the topics lined up for discussion are: Intensive culture of bivalve molluscs; Farming of freshwater prawns; Farming of marine shrimp; Hatchery techniques for crustaceans; Genetics; Materials, design and construction of enclosures; Nutrition of broodstock; Economics and marketing; Business development and planning; Pathology and diseases; Finfish propagation and larval survival; Pond and enclosure management; General nutrition and feed formulation; Aquaculture in Southeast Asia and the Pacific Basin; Integrated aquaculture, waste recycling and water quality; Ocean ranching; and Aquaculture legislation and government incentives and constraints. ●

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