



# Asian Aquaculture

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## Increased dialogue among aquaculture R&D agencies

Initiatives are being taken by agencies and national systems concerned with fisheries and aquaculture development to hold dialogues and thresh out among themselves the kinds of involvement they should take in the field of aquaculture.

This observation was made by AIA director Joseph C. Madamba following the successive visits in a period of less than two months of representatives of two organizations with international character and three national aquaculture systems to the SEAFDEC Aquaculture Department.

These are the Oceanic Institute based in Hawaii, the International Center for Living Aquatic Resources Management (ICLARM) based in Manila, Thailand's Inland Fisheries Division of the Directorate General of Fisheries, the People's Republic of China Technical Mission, and Cuba's Ministry of Fisheries.

Previous to these, two experts working in French Polynesia (Tahiti), Kevin Muench, consultant for research and development, and Philippe Siu, milkfish program manager, came to SEAFDEC in Iloilo to find out the latest in milkfish artificial breeding and discuss probable research links between SEAFDEC and the Aquaculture Research Department of French Polynesia's Fisheries Service. And only recently, two ranking agriculture department officials of Sarawak,

Malaysia also visited the Department research installations and projects to see how they could incorporate fish culture into Sarawak's food campaign.

From October to November, the SEAFDEC Aquaculture Department separately held dialogues with heads or representatives of these entities and forged linkages with one of them — the Oceanic Institute.

Also in October, representatives of the

FORD FOUNDATION came to SEAFDEC and conferred with AIA director Madamba. They were Dr. John Cool, associate representative of the Ford Foundation in the Philippines, Dr. Fran Korten agriculture expert of Ford Foundation, together with Dr. James Anderson, visiting professor of the University of the Philippines at Los Baños. The three were briefed on the program

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Dr. Hiralal Chaudhuri (back to camera) explains technology verification schemes to be instituted by AIA to Thailand's inland fisheries director Ariya Sidthimunkta (right) and the South China Sea Programme project officer Herminio Rabanal (with glasses). AIA director J.C. Madamba (left) also briefed the visitors on the pilot aquaculture industry support projects that SEAFDEC has initiated particularly the Aquaculture Resource Management Program.



## Increased dialogue.... (From p. 1)

thrusters of the Asian Institute of Aquaculture. They were particularly interested in participating in the Aquaculture Resources Management Program, especially with continuing involvement with the Panay Island Consortium for Rural Agriculture Development (PICRAD). The Consortium is composed of 6 colleges and universities in the four provinces of Panay Island.

An 8-member ICLARM delegation headed by three members of ICLARM's Board of Trustees, Dr. Max Day, Dr. H. Burr Steinbach and Dr. Soemarmoto, and included ICLARM Director and Technical Staff, were in SEAFDEC on 2-3 November 1978 to look at the facilities and discuss with SEAFDEC officials possible linkage areas for research, technology verification, and training in aquaculture. Incorporated in Manila in January 1977, ICLARM is a non-profit scientific center which aims to assist developing countries in developing and managing their aquatic resources to meet the people's nutritive, social, and economic needs. The Center conducts and stimulates research on all phases of production, management, preservation, distribution, and utilization of fish and other aquatic life. One of its five program areas is aquaculture. With the trustees was ICLARM's director for information services, Johanna Reinhart, who was especially interested in developing a mutually reinforcing information and documentation program with the Department.

Meanwhile, Deputy Minister Shih Lin of the People's Republic of China Ministry of Economic Relations with Foreign Countries led a 12-member Technical Mission to the Philippines which visited SEAFDEC and other agricultural development projects in Iloilo. He was welcomed at plane side by Iloilo Gov. Conrado Norada, NEDA Regional Executive Director Alex Umadhay and AIA Director Joseph Madamba and representatives of all government and private agencies operating in Panay Island. Many aquaculture experts believe that the technology verification program of SEAFDEC could benefit much from the Chinese experience because China has developed to a high  
(Continued on p. 6)

## MESSAGE

In this December issue of *Asian Aquaculture*, we have placed on focus the growing close relations among agencies, national systems, institutions and people concerned with research and development for aquaculture.

The Southeast Asian Fisheries Development Center (SEAFDEC) Aquaculture Department has always had its door open to all who wish to share in the endeavour of developing the aquaculture industry of nations; it has always sought cooperation from everyone; and it has certainly not been a miser in sharing its discoveries, inventions, and resources and capabilities with the fisheries world.

Although cooperation and unselfishness are not virtues to be displayed only on seasons like Christmas, as they are qualities required of every worker all the time, it is nevertheless on occasions like this that we can appropriately remind ourselves of the need to observe them.

To our colleagues in the fishing and aquaculture industry the world over, I extend, on behalf of the members of the SEAFDEC Aquaculture Department, a warm Christmas greeting and a fervent wish for a more fruitful New Year.

*Domiciano K. Villaluz*

DOMICIANO K. VILLALUZ

Chief

Aquaculture Department  
Southeast Asian Fisheries Development Center

## Freshwater fisheries expands program

The SEAFDEC Aquaculture Department Freshwater Fisheries Station, located in Binangonan, Rizal along the shores of the 93,000-hectare Laguna Lake has drafted a program for expansion. These include the piloting of a fish feed mill and the establishment of a pilot freshwater sugpo (*P. monodon*) cage culture. The feed mill will have a capacity of about 250 kilograms a day which, according to Dr. Benjamin Cer. Gabriel, freshwater fisheries research program leader, and Dr. Julia Pantastico who developed the algae cake fish feed, will be enough to supply the requirement of the pilot

sugpo farm consisting of 100 cages of 100-cubic meter capacity. Tilapia breeding which aims to come up with a suitable and fast-growing cross has been started and will also be accelerated. Other freshwater programs touch on the development of larval rearing techniques for the freshwater shrimp species, now gradually disappearing in most freshwater bodies and the setting up of a model eco-community in the fishing village near the station in collaboration with the Ministry of Human Settlements and the National Environmental Protection Council.

# Cuba expands her aquaculture industry



**Sr. Enrique Oltuski, Fisheries Deputy Minister of Cuba**

From a production of 20 thousand tons of fish — captured and raised — and a per capita fish consumption of four kilograms, Cuba, with a modern deep-sea fishing fleet and improved coastal fishery, has been in recent times averaging 250 thousand tons a year. Of this, a mere 5000 tons is from aquaculture. Cuba's 9.5 million population has increased its per capita fish consumption to 12.5 kilograms.

At present, however, the State has trained its attention on developing its aquaculture industry for several reasons, chief among which, according to Cuban Fisheries Deputy Minister Enrique Oltuski Ozacki, are (1) the new regime of the seas which extends nations' economic zones to 200 miles offshore and (2) the presence of a 2,500-kilometer virtually untapped brackishwater resource.

In an interview with ASIAN AQUACULTURE at the SEAFDEC Aquaculture Department, Sr. Oltuski said Cuba has two main areas for aquaculture expansion — the freshwater dams and reservoirs of which there are presently 60 thousand hectares of water surface and thrice that area when all the hydro projects of the country are completed; and the extensive mangrove belt around Cuba.

This aquaculture resource base has a potential production of from 50 to 100 thousand tons of fish yearly, Oltuski estimates. Cuba has also a few big lakes and numerous rivers that can be cultivated for fish, he added.

Eventually, and if properly utilized, the country's brackishwater resource should be able to make up for whatever the marine fleet will not be able to capture, agreed Dr. Benjamin Cer. Gabriel of the SEAFDEC Aquaculture Department Freshwater Aquaculture Center who is also chairman of the Philippines' mangrove committee. Dr. Gabriel visited Cuba recently on the request of the Cuban government to assess its brackishwater potentials.

Minister Oltuski said they have been stocking freshwater bodies with tilapia, silver carps, bigheads and grass carps, and bass. They are expanding their oyster farms from the present fifteen to some thirty farms by 1982. The 30 farms are expected to yield 10 thousand tons per year, he said.

We shall try to cultivate mullets in our brackishwater areas, Oltuski said, hastily adding that he received the tip from Dr. Hiralal Chaudhuri of the SEAFDEC Aquaculture Department "just now."

Chaudhuri is an artificial breeding (carps, milkfish) specialist who had been India's Central Inland Fisheries Research Institute aquaculture division head and presently SEAFDEC's regional aquaculture coordinator and in charge of AIA's technology verification program.

Sr. Oltuski and four of his fisheries specialists were in the Philippines on 4 to 11 November to visit various fisheries and aquaculture projects. He said that Cuba's interest in Philippine aquaculture stems much from the obvious similarities in the climatic conditions of the two countries. Cuba and the Philippines are in the same latitude and have similar climates that it should be fairly easy to transfer Philippine-developed aquaculture technology to Cuba, he deduced.

At Panay Island, the Cuban Mission observed, aside from the facilities and projects of the Department's main station in Tigbauan, Iloilo, the progressive aquaculture farms of Atty. Ceferino delos  
*(Continued on p. 7)*



The first trainees from Nigeria of the University of the Philippines-SEAFDEC Aquaculture Department graduate program, Messrs. Cyprian I. Ohazulike, Sunday Ikoton, and Jonathan O. Omoloyin (left to right) discuss pond management principles with Dr. Hiralal Chaudhuri of the Asian Institute of Aquaculture and faculty member of the University of the Philippines. The three Nigerian government scholars are now enrolled in the University of the Philippines for a 2-year course leading to the degree of Master of Science in Fisheries major in Aquaculture. They are Fisheries Officers assigned to the extension service. Nigeria has a big program on fish seed multiplication and has launched an accelerated fish production program, they reported. The three are involved in organizing cooperatives, and assisting the clients of the seed multiplication project.





## Fish farming can help conserve mangrove\*

The vast mangrove areas in the Indo-Pacific region can help mitigate the mounting food problem in the region through their being tapped for aquaculture or fish farming. Now bolstered by recent breakthroughs in hatchery technology, aquaculture can expand to the mangrove areas without fear of depleting its valuable forest resources. Properly designed fishponds provide mangrove conservation plus additional income from forest products as a bonus.

This, according to Herminio Rabanal, fishery officer for aquaculture development of the South China Seas Fisheries Development and Coordinating Program based in Manila.

Mangrove farming has advantages both from forestry and fisheries viewpoints. Where suitable, its practice should not only be encouraged but supported, he said.

Rabanal pointed out that this kind of mangrove fish farming has been demonstrated by some progressive fishpond operators in coastal and estuarine areas. In building fishponds, the operators plant mangrove seedlings in tidal flats around the sites to provide additional buffer area that can protect the fishpond from hard wind and waves, especially during typhoons. These mangrove seedlings also provide an effective sanctuary for fish and other aquatic animals. An effective nursery area will come up perhaps on the fifth year when trees reach a half-meter growth. After about 30 years, the fishpond operator can cut the mangrove trees for additional income. One must, however, replant to continue conserving the mangrove area.

The prospect of mangrove farming to provide fishery resources sanctuaries and future forestry products is exciting considering that there are about 10 million hectares of mangrove areas all over the world. A more recent evaluation provides

an estimate of 600,000 hectares in Indonesia, 400,000 in the Philippines, 300,000 in Thailand, and 150,000 in Malaysia, or close to 2 million ha in Southeast Asia alone. If the tidal flats are added, this figure can easily double.

Developed aquaculture in coastal and estuarine areas in the Indo-Pacific region has an aggregate total of 1.2 million ha. Of these, Indonesia has 185,000 ha, Philippines - 175,000, Thailand - 10,000 and Malaysia - 4,500 or a total of 374,500 ha.

Rabanal emphasized the need for proper site selection and fishpond design to succeed in mangrove fish farming. Only improperly selected and poorly designed and managed fish farms tend to sacrifice mangrove conservation. Such fish farms either fail or have relatively low production.

Site selection and fishpond design are explained by Rabanal as follows:

### *Tidal Characteristics and Site Selection*

As water supply is a major requirement in aquaculture development, tidal characteristics prevailing in an area is a determining factor not only for selection of suitable sites but for proper management after the project is developed. Different areas all over the world have various tidal characteristics such as frequency of fluctuation (once or twice a day), amplitude (narrow or high) or annual shift in level, etc. Of these characteristics, the amplitude is of great importance in aquaculture.

There are three types of tides based on amplitude, namely: 1) narrow amplitude or areas with a daily range of fluctuation of 0.5 meter or less and with an annual fluctuation approaching a maximum of only 1 meter; 2) medium amplitude or those with daily fluctuation of 1 to 2 meters and with a maximum annual fluctuation of 3 meters; 3) high amplitude or those with daily fluctuation of 3

to 5 meters with maximum annual fluctuations of over 5 meters.

Of the above types, the first (low amplitude) and the third (high amplitude) are unsuitable for aquaculture development. In the first case, fishponds will suffer from difficulty in renewing the pond water because the high tides are not high enough to provide sufficient head to cause water flow and the low tides are not low enough to effect adequate lowering of water level in the pond. In this case, it may be difficult to completely drain even during periods when it is necessary to drain, clean, and dry the ponds. Sites located under this tidal characteristic can be managed properly only if one uses pumps, but this will mean more expense.

Some examples of areas with this type of tidal fluctuations are northwestern Luzon in the Philippines, most of the northern coast of Java island and the northeastern coast of Irian Jaya province in Indonesia, parts of the southeastern coast of Thailand (Chanthaburi), most of the coasts around Sri Lanka, and the eastern coast of Madagascar.

Areas with high tidal amplitude, on the other hand, include the western coast of Madagascar, coast of Bangladesh, part of northeast coast of India, coast of Sarawak state in east Malaysia, and the southern coast of Irian Jaya in Indonesia. The fluctuations in these areas are so great that development would require enormous dikes to fend off the pressure of water during high tides and prevent the ponds from being completely drained during low tides. As a result, the places

\*Based on H.R. Rabanal, "Forest Conservation and Aquaculture Development of Mangrove Areas," *International Workshop on Mangrove and Estuarine Area Development for the Indo-Pacific Region - Proceedings*, Philippine Council for Agriculture and Resources Research, Los Baños, Laguna, 1978, pp. 145-151.



# ch & Development Notes

with these tidal characteristics have very extensive belts of untouched mangrove jungles such as the south coast of Irian Jaya and the west coast of Madagascar.

Mangrove areas vary in elevation in relation to tidal fluctuations. This ranges from highest to lowest as follows:

1. sites with elevation reached only by occasional extreme high tides of the year
2. sites with elevation reached only by the higher high tides
3. sites with elevation reached by lower high tides
4. sites with elevation at average higher low tides
5. sites with elevation at average lower low tides
6. sites with elevation drained only by extreme low tides
7. sites not drained by any tide or always under water.

Mangrove areas with categories 1, 2, 6 and 7 are unsuitable for aquaculture development. There may be instances where sites under category 2 can be made suitable by some excavation and site 6 can also be made suitable if some filling can be done in the area. This will, however, entail considerable expenses.

The most suitable sites in relation to the tide, therefore, are those with eleva-

tion below the lower high tides and those that can be drained at least during the lower tides.

One must also consider the soil in choosing the site for mangrove fish farming. A predominantly clayey soil is favorable. Those that are rocky or predominantly sandy are not suitable sites. Dikes cannot be built on rocky or corally substratum and sandy soils. Some mangrove areas have a substratum consisting of thick peaty soil mostly of undecomposed and acidic bottom. These types of mangroves are unsuitable for aquaculture development.

Many areas are thickly forested by big mangrove trees. While these areas can be gradually cleared and developed for fishpond purposes, the large expenses needed to clear and the very slow process to have the area in productive state negate their development for aquaculture.

### *Properly Designed Projects*

In designing the fishpond, one must consider adequate waterways for the drainage for tidal as well as flood waters from the watershed above the site. Also, there must be an adequate buffer zone of mangrove vegetation to provide wind and

wave brakes from the coast or river bank. This is especially important in areas where typhoons regularly occur.

Proper layout inside the aquaculture project is also very important. Waterways and water control structures for watering and draining must be provided. Relatively large-sized projects (50 ha or more) require internal growth of mangrove to provide wind and wave brakes inside the aquaculture system. This would also regulate sudden fluctuation in temperature and other physico-chemical conditions. Maintaining some vegetation at appropriate location within the system maintains proper nutrient cycle in the system. All these should contribute to the proper design of the project leading to its success.

### *Hatchery Technology*

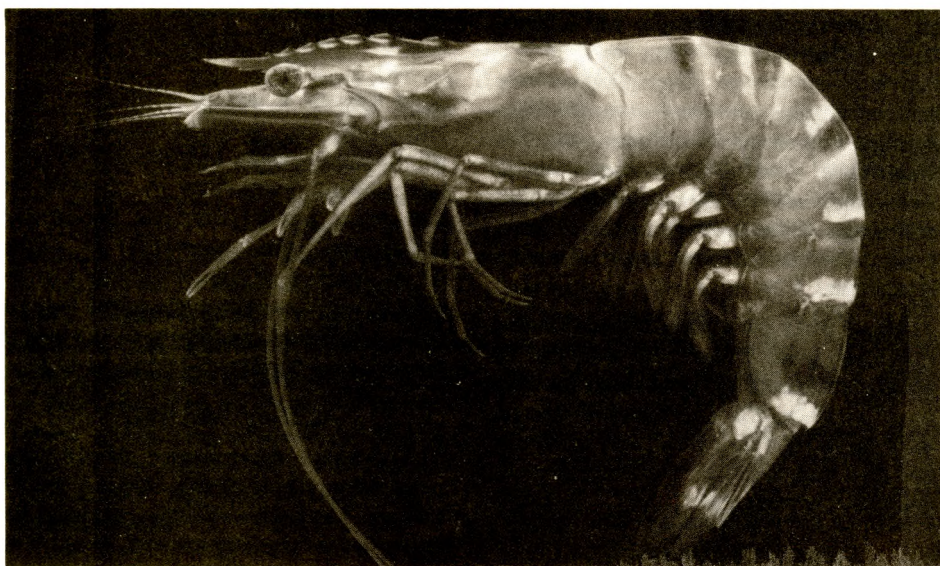
The rapid development of fish seed production of cultivable aquatic species through hatcheries should encourage the expansion of the aquaculture industry to mangrove areas. Initially, the induced breeding of cultivable freshwater species were accomplished, e.g. Chinese carps, common carp, Indian major carps. This development has been shifting to species found in brackish and marine waters. Induced breeding of mullet has been accomplished in pilot scale and can now be put in commercial stage. The hatchery technique for cultivable penaeid shrimps has been accomplished and is now in commercial stage in Japan and other areas and under development in the Philippines. The seabass, *Lates calcarifer*, and grouper, *Epihephelus tauvina*, both valuable food fish, have spawned in Thailand and Singapore, respectively. The fertilization of milkfish ova has been done experimentally in the Philippines, and it is perhaps only a matter of time before the production of milkfish fry can be realized.

These developments come just right at a time when aquaculture seedling production from natural areas is fast shrinking. With more rational development of mangroves for aquaculture and the initiation of mangrove farming in suitable areas, the greatest benefit for the greatest number may be achieved. ●





# Edible crustaceans in the Philippines



### 1. *Penaeus monodon* FABRICIUS

English name: Giant tiger prawn, Jumbo tiger prawn, Leader

Philippine name: Sugpo (Tagalog), Lucon (Ilongo), Pansat (Cebuano)

This is the biggest species among penaeid shrimps and prawns found in Southeast Asian waters. Sugpo, as it is locally known, is considered a delicacy in the Philippines and is an expensive food item with a retail price of ₱60-₱80 (US\$8.60-\$11.40) per kg. (kilogram) in Manila and ₱30-₱50 in local areas.

One of the largest females caught had a carapace length of 8.2 cm and body weight of 240 g. The body is uniformly glabrous: carapace with well developed antennal and hepatic spines. Hepatic carina is horizontally straight. The rostrum is usually armed with 7 or 8 dorsal and 3

ventral teeth.

The body is transversely banded and live color ranges from reddish in deep waters to darkish brown or blacky in shallow brackish waters, particularly fishponds. Pleopods are brown to blue, fringing setae red.

Fry of this species usually abound along the shoreline or mangrove creeks and are stocked in fishponds for cultivation by local pond owners. The annual production of sugpo from commercial trawlers amounts to approximately 2,500 tons in the Philippines. However, fishpond owners have not come up with any data regarding pond production. The Aquaculture Department of Southeast Asian Fisheries Development Center (SEAFDEC) located at Tigbauan, Iloilo, Philippines, is capable of producing more than 10 million sugpo fry per year from one of the big concrete hatcheries (200 tons each in capacity) and from a barangay hatchery (1 to 3 tons).

The geographical distribution of this species is throughout the Indo-West Pacific region, from Japan and Taiwan, India to South Africa and Australia. ●

## Increased dialogue... (From p. 2)

degree a method for working in applied research to their field production operations. On the other hand, China could gain much from the research results as well as researchers' training programs available in the Philippines and other leading aquaculture institutions in Asia.

Recently, too, the Thai Director of the Inland Fisheries Division, Ariya Sidthimunkta, came to the SEAFDEC Aquaculture Department headquarters for a briefing on the brine shrimp (*Artemia salina*) experiments and to discuss with AIA director Madamba and technology verification in-charge H. Chaudhuri some of the pilot projects SEAFDEC has initiated especially the Aquaculture Resource Management Program (see AA, Nov. 1978) and the proposed pilot operationalization of the *barangay* (village) prawn hatchery. It was learned that Thailand has recently embarked on an extensive prawn research, development, and production program financed with a US\$15 million loan from the Asian Development Bank. The Thai fisheries director was accompanied by the aquaculture development officer of the South China Sea Fisheries Development and Coordinating Program (SCSP), Dr. H. Rabanal, who revealed that SCSP is deeply involved with the Thai project.

All these recent dialogues clearly indicate a growing interest among agencies not only in undertaking aquaculture R & D activities and initiatives but also in doing these in the spirit of cooperation, notes Madamba. He pointed out that delegates to the Regional Workshop on Aquaculture Development Strategies for Asia held in Manila last August have noted an apparent confusion in terms of the kind of involvement agencies concerned with aquaculture undertake. In the "Asian Plan of Action for Aquaculture and Small Fishfarmer Development," the workshop participants expressed concern over the possibility of unnecessary duplication of efforts and thrusts. They urged regular dialogues among agencies, donor institutions, and countries to rationalize the initiatives. This should be done with the view of complementing and mutually reinforcing each other's aquaculture development programs, the delegates declared. ●

\*This is the first of a series of notes on edible crustaceans contributed by H. Motoh, a Japanese aquaculture expert working with the SEAFDEC Aquaculture Department. Motohsan has recently conducted an extensive survey of edible crustaceans in the Philippines,



## Cuba expands...

(From p. 3)

Santos and the Jamandres (Tirso and Ernesto), and the rice-fish culture farm of Dr. Parra. Their observation tour brought them to various hatcheries and nurseries for prawn and milkfish and to the Bureau of Fisheries and Aquatic Resources research and production/demonstration farm in Molo, Iloilo City.

Cuba has a fisheries research center staffed with some 100 university graduates with training in biology and oceanography. These same researchers, and others who will be recruited, will form the core group for Cuba's expanded aquaculture research and development program, Oltuski said. They will however need further training and re-orientation for work in aquaculture.

Cuba's main fisheries export is the spiny lobster caught offshore at a quantity of 10 thousand tons yearly and which generates US\$50 million annually.

There are five aquaculture enterprises, all state-run, currently operating. They handle the processing and marketing components of the fishery industry.

While Cuba's economy is largely based on sugar, the country needs to generate as much return as it could obtain from its other resources to fuel its accelerated socio-economic developmental activities, Oltuski concluded. ●

## Notes from our readers

It was indeed a very pleasant surprise to receive a copy of the *Asian Aquaculture*, Vol. 1, No. 1, recently . . . I would like to take this opportunity to congratulate the AIA on producing the *Asian Aquaculture*. It is most informative and the articles are well written. I should be grateful if you can continue to place me on the mailing list and, at this stage, since our Field Station is badly in need of scientific literature, I should be most grateful if you can also put the Station which is under the coordinatorship of Dr. Ong Jin Eong under your mailing list as well.

—Dr. Wong Tat Meng  
Acting Dean, School of Biological Sciences  
Universiti Sains Malaysia  
Penang

\* \* \*

I have a copy of your *Asian Aquaculture* magazine, Vol. 1, No. 1 July issue, which we have found as good reference material for the "Lingap ng Pangulo sa Barangay" school-on-the-air program and Masagana Farm Program aired over two radio stations weekly and daily, respectively, in Roxas City.

—Bienvenido P. Cortes  
Punta Tabuc, Roxas City  
Philippines

In the July issue of the *Asian Aquaculture*, it was reported that Mr. Rolando Platon has developed a small-scale hatchery for prawns. The hatchery's advantages were featured in our August 1978 issue under fishing tips, one of the regular departments of our magazine.

We will run another story on how to construct the said hatchery in our next issue. Could you please send us immediately a copy of the guideline for the design, construction and operations of the hatchery?

—Leo A. Deocadiz  
Editor, Philippine Farmers' Journal  
Quezon City

\* \* \*

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 . . .

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



Members of the Cuban mission led by fisheries deputy minister Enrique Oltuski (with the dark glasses) take a look at the *Tilapia nilotica* culture trials of the Bureau of Fisheries and Aquatic Resources. Briefing them is BFAR Region 6 director, H. Magsuci. To the right of the minister is Sra. Maria Consuelo Kautzman, a fishery biologist at the Cuban Centro Investigaciones Pesqueras.

### ERRATUM

Dr. Richard Neal is Aquaculture Advisor for USAID, Washington, not a staff member of the Oceanic Institute as he has been identified in *Asian Aquaculture* Vol. 1, 5 (Nov.). Our apologies.

# PROTECT THE WATERS



# Fish farm news-an industry development support

Another vehicle in support of the fish farming industry of the Philippines has been put into operation by the SEAFDEC Aquaculture Department. Part of AIA's technology information dissemination program, the FISH FARM NEWS has been designed as a popular news service primarily written for radio but can also be published in the print media, especially community newspapers and agricultural magazines.

Originally planned as a monthly publication, the first issue was released on October 1. Now it comes out fortnightly to deliver more information to the fishery/aquaculture community.

In mimeographed easy-to-read form, the FISH FARM NEWS gives out at least 10 stories per issue. Aside from fish farming tips, the news service also contains some information on crop and livestock production and resource conservation as most fish farmers are also engaged in such enterprises.

## Rationale

Aquaculture — or fish farming — holds much promise for the development of the small fish farmers. It can provide new opportunities for rural employment, it can serve in some places as the base for a rural industry, and it is no doubt a potentially rich source of protein — considerations by no means insignificant in a highly populated developing country like the Philippines.

Fish farmers, like all other primary producers, need a regular source of popular, timely and useful information. FISH

FARM NEWS intends to bring to them tips that coincide with the different phases of production, new government policies and industry developments as decision aids, and new inventions and ideas to let them know of the opportunities for improvement.

There are now around 650 subscribers to the FISH FARM NEWS composed of some 200 radio stations, 65 community newspapers, 7 national and regional magazines, all national daily newspapers, all fishery schools and some 200 individuals working in the fishery industry—all in the Philippines.

The FISH FARM NEWS is by no means an original idea. The first of this kind, *Radio Farm News*, was initiated and produced by the UP at Los Baños Department of Development Communications (then Department of Agricultural Information and Communications) sometime in 1962. In 1973, the Philippine Council for Agriculture and Resources Research (PCARR) — on the demand from the Philippine rural broadcasting community — put up the *PCARR Farm News* as a replacement to UPLB's *Radio Farm News* which had been discontinued. ●

## Seminar on resource use and management of Asian coasts slated this month

The Agricultural Development Council, Inc. has scheduled a seminar on "Resource Use and Management in the Coastal Zones of the Asian Humid Tropics," for 18-21 December in Bangkok. Areas for discussion include Environment of the Asian Humid Tropics Coastal Zone, Typologies of Human Ecosystems in these areas, Perceptions and Definitions of the Coastal Zone, Resource Use and Management, Problems and Recommendations and Future Research for Coastal Zone Use and Management, and Future Programs. Some 32 experts from all over the world have been invited to participate.

### SEASON'S GREETINGS

To all  
our readers

from the Editorial Staff,  
Asian Aquaculture

## ANNOUNCEMENT

For information on the local and international training programs of the SEAFDEC Aquaculture Department, send for a copy of the Training Programs Brochure. Address communications to the Director, Asian Institute of Aquaculture, SEAFDEC Aquaculture Department, P.O. Box 256, Iloilo City, Philippines.

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