

# AQUA Dept NEWS

Internal Newsletter of the SEAFDEC Aquaculture Department

Special Feature

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## IRAP survey for CLM completed

by W.G. Yap and V.T. Sulit

The Site Visitation Survey for the Integrated Regional Aquaculture Program for Cambodia, Lao PDR and Myanmar (CLM), which commenced 28 June, has been completed as of 10 July. The visits to the CLM area make up the second phase of the IRAP Site Visitation Survey. As previously reported (ADN No. 19) the first phase of the Survey from 12 to 23 May cover the BIM area (Brunei-Darussalam, Indonesia, and Malaysia). This leaves out only Vietnam, which together with the three countries is often referred to as the CLMV area.

The trips were scheduled and started at the height of the SARS crisis and Vietnam was deliberately left for last since it was the only one among the four with local SARS infection. It was feared that a two-week quarantine may be imposed on the survey team and delay the rest of the program had Vietnam been visited ahead. Although Vietnam was eventually declared SARS free early on, the trips had already been scheduled and it was too late to modify it since it involved several countries.

### Trip schedule and persons involved

The CLM survey was actually conducted in reverse order starting

with Myanmar (28 June to 2 July), then Lao PDR (3 to 6 July) and ending with Cambodia (7 to 10 July). As with the first phase of the survey, the second phase involved these reporters (Fred Yap and Virgilia Sulit) throughout the duration of the survey plus a set of two experts for each country depending upon the species and culture system involved. In Myanmar the experts involved were Marrietta Duray and Dr. Joebert Toledo both from TMS since the species involved were sea bass and grouper for coastal aquaculture. In Lao PDR, the experts were Dr. Catalino de la Cruz (formerly with CLSU and ICLARM) for the rice-fish farming and Engr. Angelito Gonzal of BFS for carp and tilapia seed production. In Cambodia, Engr. Gonzal stayed on since the species involved included also carp and tilapia but Sujin Nukuan of the Department of Fisheries (DOF), Thailand came on board for Pangasius breeding and farming.

### To Ngapali Resort via Air Mandalay

The trip to Myanmar took the survey team to the coastal townships of Thandwe and Tongguk in the State of Rakhine along the Bay of Bengal quite close to the border with Bangladesh. Although less

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## AQD celebrates 30<sup>th</sup> anniversary



*Dr. Rolando Platon welcomes the participants of AquaBiz, a seminar held in line with AQD's 30<sup>th</sup> anniversary*

AQD celebrated its 30<sup>th</sup> anniversary on July 9 with a thanksgiving mass and the Dean Domiciano K. Villaluz Memorial Lecture.

Loyalty certificates were distributed to 14 awardees after the mass. The following awardees served the Department for 20 years: Quirico Ganon, Manuel Laron, Noel Claudio, Leticia Magallanes, Rufil Cuevas, Teresita Hilado, Ricardo Gabayeran, Edgardo Ledesma, Luisa Pacino, Jesus Ledesma, Jr., Jose Libe, Emmanuel Tamon, Roger Traviña, and Julkie Turao.

Lecture speaker, Dr. Anicia Hurtado, discussed the prospects of seaweed industry, among others.

In the afternoon, Isidro Tendencia's painting exhibit at

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than 400 km northwest of the capital Yangon (which is along the Andaman Sea) the road to Rakhine is mountainous and a land trip would have taken more than ten hours. For this reason DOF Myanmar brought the survey team to Rakhine by air to the Ngapali Airport in the company of Minn Thame, DOF Deputy Director. Being the monsoon period it was raining heavily throughout the Myanmar trip. Luckily however the twin-engine propeller driven 50 seater Air Mandalay aircraft servicing the area managed to land and take off on time at the Ngapali airport in Thandwe when the AQD survey team arrived and left.

Ngapali airport is named after the beach area, which is a popular resort but it is located in the township of Thandwe. We were booked at the Lin Thar Oo Beach Resort, which owing to the monsoon was practically a ghost re-

sort. It faces the vast expanse scenic Ngapali coast with its white sand and rocky outcroppings although the resort itself has seen better days and a bit expensive at \$15 a day. On our first night I was awoken at 4:30 am when I felt my hair being tousled. To my great disappointment it was only a little mouse!

Upon arrival the team was taken to the shrimp hatchery in Lontah that was built by DOF but is being operated privately by the Leo Shrimp Company. During the monsoon period from July to October the salinity drops down to at least 15 ppt and the hatchery cannot operate. Thus the hatchery operates only during the dry months. A separate and smaller hatchery was built with FAO assistance to serve as a demonstration small-scale hatchery. With very little modification this can be used also for sea bass propagation during the dry months.

### Broken bridge to Toungguk

The next day we went to Toungguk, which is along the mountainous route to Yangon. Toungguk has also been proposed by DOF Myanmar as the site for the second phase of the mangrove friendly shrimp culture demonstration. Although only some 65 km away from Thandwe the trip normally takes more than 2 hours passing through the zig-zag roads and several bridges once at the low land since the coastal area of Rakhine is criss-crossed with rivers and creeks. About 10 km away from Toungguk we encountered a broken bridge. A team of workers was furiously working under the heavy rain to make it passable.

After more than two hours as lunchtime fast approached the work was still not completed. Two large passenger/cargo-trucks were also waiting. The same was true at the opposite side where

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*Dr. Joebert Toledo (left) and U Minn Thame (right) in front of our cottages in Ngapali Beach*



*Crossing the broken bridge on the way to Toungguk was a reminiscent of the Tigbauan Bridge incident*



*Minus Fred Yap who was the photographer, the survey team in Ngapali Beach, while preparing for a long trip*



*The team in front of the Toungguk Fisheries Office*



*IRAP survey...from page 2*

vehicles from Yangon were also piled up. So the Fishery Officer of Thandwe, U Myo Aung who was with us arranged for one of the trucks at the opposite side of the bridge to take us to Toungguk. We crossed the bridge via the exposed and slippery beams and made it to the other side. With Mayette and Veling safely in the front seat the guys clambered over the miscellaneous cargo at the back all covered with tarpaulin. We reached Toungguk and had a late lunch only to be told that it was no longer possible to take a boat to our final destination at the coast because of the tidal situation and the currents.

To make the best of the situation a meeting was arranged with a crab farmer – the only one in Toungguk. The farmer, U San Thaug was actually merely into fattening. He bought undersized or underweight crabs and fatten them for two crop cycles then harvest them for shipment to Yangon for eventual export to Taiwan. At the time of the visit he and his wife and daughter were busy packing some 350 kg of crabs. His daughter finished B.S. Zoology and he thought it was a good qualification for her to help out in his crab business since good paying jobs were scarce anyway. He proudly told us that he met Dan Baliao in early 2003.

When we got back to the broken bridge using a borrowed pickup at about 2 pm the bridge was already passable. But then we forgot that the vehicle we used, a rented Toyota Hi-Ace was already out of fuel and was supposed to fill up upon arrival in Toungguk had the bridge been passable. So the pickup had to go back to Toungguk and bring gasoline to where the Hi-Ace was stranded. We finally made it back to Thandwe close to 5 pm.

### **Irrawady Delta**

We flew back to Yangon after two nights in Thandwe and from the air saw the vast Irrawady delta covered with rice fields and crisscrossed with tidal rivers forming some tracts into islands. And it occurred to us that perhaps we could stock them with sea bass fry for growing into large fingerlings for eventual stocking in fish cages or grow-out ponds. Some of the ricefields appear to be yellowish and probably not doing too well due to saline water intrusion. Sea bass fingerling production can help in increasing the farmers' income. The authorities in Myanmar used to be edgy about using ricefields for raising fish concurrently thinking that it may diminish their rice production. However this year it appears that the green light has been given for integrated rice-fish farming with the Secretary No. 1 himself launching the program shortly before our visit. But first of all the DOF ought to study its financial viability considering that a kilogram of sea bass reportedly sells for 1,500 Kyats while low-value fish cost anywhere from 200 to 300 Kyats per kilogram.

Flight back to Bangkok was not until late in the afternoon. So after a debriefing at the DOF office there was some time left to do some shopping at Lady Luck shortly after lunch and at Aung San Bogyoke market afterwards. And as lady luck would have it, Ambassador Phoebe Gomez, Philippine Envoy to Myanmar walked into the shop as we were ogling at the large jade, rubies and sapphires while buying the low-grade affordable items. She was as surprised and delighted to see us as we also were to see her.

### **Vientiane to Vang Vieng**

After a night in Bangkok we were off again to Lao PDR where we

were met at the new Wattaway International Airport by Bounma Luang Amath, Deputy Head, Technical Division, Directorate of Livestock and Fisheries (DLF). After a courtesy call on the DLF Director General (DG), Singkham Phonvisay, we took time to register our presence at the Philippine Embassy. There we were amiably entertained by one of the attaches, Eduardo Cruz. One of us run out of passport pages even as it had four more years to go, applied for a new one, this time for 64 pages and got it in less than 30 minutes. How's that for service?

The ambassador was in Manila but we met the charges d' affaire, Raul Dado who was very keenly interested in our project. It turned out he started his career as a veterinarian but ended up in the foreign service. He was trying to start a bilateral agricultural project to assist Lao PDR and had not thought about aquaculture until after meeting us. He lost no time to invite us for dinner, which had to wait till our last night since the DG of DLF had already planned a welcome dinner that evening.

That same afternoon we were taken to the Livestock and Fishery Office of the Municipality of Vientiane. Van Phaeng Houangsavanh, Deputy Chief of Livestock and Fisheries Section

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*The Team with DLF DG Singkham Phonvisay (front) and Lao PDR National Coordinator Somphanh Chanphengxay (back)*

of the Municipality, said that the office was interested in promoting aquaculture and was producing tilapia fingerlings in its hatchery for grow-out in cages in Mekong and Namxouang Rivers. That evening we had the welcome dinner tendered by Singkham. It was sumptuous and included among others a tom-yam like soup made of soft shell turtle (not in the CITES list we were assured) and fried frog legs.

The next day we headed for Vang Vieng with Bounma himself at the wheels. Along the way we visited the newly-established Namxouang Aquaculture Development Center that was built under the JICA-assisted Aquaculture Improvement and Extension Project (AQIP). The Center has complete facilities for water analysis, feed formulation, fish breeding and growing. Its well laid-out pond system is cement lined (bottom as well as dikes) due to poor water retention. However it appears that the Center has no one with the capability to use the various laboratory equipment.

We then visited the tilapia hatchery in Vientiane Province, which produces red tilapia obtained from Thailand as part of the bilateral assistance package from the Singapore government. While tilapia is now acceptable in Laos, the red tilapia fingerlings have few takers. It appears that the Lao-tians are not familiar with the red tilapia strain and think it is more suitable as ornamental fish. As a result the hatchery produced and sold 100,000 fingerlings last year which is only 10 percent of its one million fingerling capacity.

### **No time for the caves of Vang Vieng**

It was late afternoon when we finally reach Vang Vieng and was

greeted by the magnificent limestone cliffs it is famous for which seems to come out straight from a Chinese painting. Vang Vieng is a mountain resort area and lodging was not a problem nor expensive at US\$8.00 a night. There were many backpacking European tourists in the area. One can go kayaking or rafting using huge rubber tires in its clean and swift river, which ultimately leads to the Mekong River. There are also many caves to explore both on dry land and at the river level. Unfortunately we did not have the time for all that.

Oh yes you can have balut in Laos, only it is called 'kai-lu'. Bounma, our constant companion, made sure we had some when we had dinner in Vang Vieng. Well balut is balut by whatever name but they do cook them at least 3 days earlier in Laos. Also instead of seasoning it with just plain salt they use pre-mixed salt and pepper.

### **Rice-fish farmer**

Early the next morning before we can even have our breakfast we were already interviewing Boun Sou. We failed to ask if he was the youngest in the family. He let us into a hut which apparently serves as the village karaoke bar in the evening and is operated by his daughter who we must have disturbed as she slept in her room. Boun is a rice farmer who last year integrated fish culture with his rice. He was not exactly satisfied with the result because the common carp he stocked grew only to 250 grams although he recovered 180 of the 200 fish he stocked. He claims that some of his friends who also went into rice fish farming harvested 800-gram fish. He blamed it on the lack of irrigation water towards the end of the 150-day rice crop since the community-managed irrigation

system stops the flow of water to the canals towards the dry season in order to conserve the water for drinking and other domestic use. Like most Laotian farmers, he planted glutinous rice – the preferred staple in Laos.

### **Smuggled fish**

Then we headed back to Vientiane and along the way at Nasaythong saw several concrete tanks along the roadside. Signboards with fish painted on them indicated what they were selling. We stopped by and talked with the sellers. They were selling carp and catfish fingerlings, which they scooped out for us to see. However the ladies tending them were either evasive or were not knowledgeable as to the source of the fingerlings. We were told that the breeding ponds were located 5 km away and accessible only by motorbikes.

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*Postcard view of Vang Vieng Mountain from a hotel porch*



*Beautiful fish fingerling lady trader in Nasaythong*

A short distance away we stopped by Kham Sing, a carp breeder. His ponds were just behind his house and he also has a series of concrete tanks including a circular one designed in the typical Chinese way. He learned his art in Vietnam and has been in the business for 29 years. However he lamented the entry of fingerlings from Thailand bought by traders at very low prices and hinting that the fish in the roadside holding tanks we visited actually were smuggled in from Thailand. It is reportedly bought at 25 Kips and sold for 100 Kips — the going rate for fingerlings locally. (US\$1.00 = 10,000 Kips).

### Laotian ingenuity

Then it was time for lunch which we had at a floating restaurant moored at the 37,000 ha Namxoung Reservoir. While eating we heard the splatter of rain on the tin roof and sure enough water was soon dripping from the gutter-less eaves. But to our surprise the deck outside remained dry. Indeed the sun was shining with only some wispy clouds in the sky and everywhere else all around there was no indication of rain except for the steady pitter and patter on the roof tops and the dripping from the eaves. Then it dawned on us that the tin roof was actually fitted with a sprinkler to cool it down under the mid-day sun. And indeed once we were up the steep banks of the reservoir we saw the perforated rubber hose along the whole length of the floating restaurant's rooftop. Low-cost and instant air-conditioning! Laotian ingenuity!

### Au Revoir Vientiane

Having been under French rule until 1975, Laos still has vestiges of France. Many of the govern-

ment buildings still carry French signage below the Laotian ones. Officially the government now discourages the use of French and is encouraging English instead. The newer signs now have English instead of French. Many of the old houses and buildings in Vientiane are typically European and many are being restored to their past glory. One still sees baguettes piled like cordwood along the sidewalks or peddled from bicycles. Right across from the Asian Pavilion Hotel where we were checked in there is a large wine store called Vins de France which boasts of Le Plus Grand Choix de Vin Francais d'Asie. Indeed a peep inside can convince one it has "the biggest selection of French wines in Asia".

### Getting Riel in Phnom Penh

Riel is the currency of Cambodia but upon arrival we were advised not to change too much since it is not convertible. At any rate it is hardly necessary since all the prices in hotels, restaurants and shops are quoted both in Riel and US Dollars and sometimes also Thai Baht. So one can freely use any of the three currencies anywhere in Cambodia. This is also true in Lao PDR where one can use the US Dollar and Thai Baht side by side with the local currency Kips.

It is true as well in Myanmar except that in Myanmar there is also a currency device called the Foreign Exchange Certificate (FEC), which is supposed to be what one can use for payment outside. Visitors to Myanmar are required to change a minimum of US\$200 to FEC at the airport. Theoretically one unit of FEC is equal to one US Dollar. But shops anywhere gives it a lower value in Kyats than the greenback. When we were there the exchange rate for FCE was only 600 Kyats while

that for the greenback was 900 Kyats.

Phnom Penh's Pochentong International Airport can put the old NAIA terminal to shame. Here we were met by Chin Da, the Vice Chief of the Aquaculture Division. Immediately upon arrival we went directly to pay a courtesy call on the Director General of the Department of Fisheries, Nao Thouk and met with Ing Try, the Deputy Director and Hav Viseth the Acting Chief of the Aquaculture Division. After a heavy welcome lunch hosted by Ing Try we headed back to the DOF office for a briefing on the schedule laid out for us.

Along the way we touched base with the Philippine Embassy to inform them of our presence. Since the ambassador-designate has not yet reported we were attended to by Consul Dinno Oblena. We briefed him on our purpose in Cambodia since sooner or later he may learn about the coming and going of Filipino experts from the government in the course of project implementation. He was thankful for informing the Embassy about IRAP and also briefed us on the agricultural projects being implemented in Cambodia by Filipino experts under a bilateral program.

Back at the DOF Office we were able to meet briefly with Rene Agbayani who is now based

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The Team with Rene Agbayani (center), DOF Cambodia Deputy Director Ing Try (second from right) and Thai Expert Sujin Nukuan (right)



there as an expert in Socio-economics for a year under an ADB project. Then it was time to head towards Takeo Province, which is about two hours away from Phnom Penh. Takeo is the home province of the late and unlamented Pol Pot but there were no vestiges of him there. Takeo does not look like a place one would like to be stuck in for a long time but surprise of surprise the rooms at the Manthipeap Guest House where we checked in had cable TV which carried CNN and other international offerings. It appears that Internet service is also available in Takeo.

#### **From porter and taxi driver to fish farmer**

The next day after calling on the Provincial Fisheries Office Deputy even before breakfast we were off to the farms. First stop after breakfast was Khiev Sam. Six years ago he was porter hauling heavy cargo at the river port in Phnom Penh. Now he is a fish farmer, breeding common carp, silver barb and tilapia and earning an estimate 8 million Riels last year which at 4,000 Riel to the dollar is about \$2,000 out of his 0.6 ha farmland.

The next stop was Som Hekk. He used to own and drive a taxi for a living until maintenance cost far outstripped his meager earnings until he lost not only his taxi but even his 1.2 ha ricefield which he was forced to offer as collateral to borrow money to finance his taxi operation. Now he is also a fish farmer earning at least 12 million Riel last year besides getting his land back. These are heartwarming stories that deserve a longer treatment. So watch for it in a later issue of ADN or in SEAFDEC Asian Aquaculture.

It was late in the afternoon when we got back to Phnom Penh, checked into the Golden Gate Hotel and was pleasantly surprised to learn that the room rate included laundry service! What a good time for the laundry after almost three weeks of travel. Evening was free time. Sujin was already out with a Thai friend with the Mekong River Commission Secretariat. Having had our fill of regional cuisine we decided to have something different – Greek moussaka. It was good and heavy, so heavy we decided to take a long walk around Phnom Penh's central area after dinner so we don't suffer the same fate as that young singer in Dos Palmas.

#### **Another day, another province**

The ninth of July saw us in Prey Veng province 90 km east of Phnom Penh at the other side of the Tonle Sap or Mekong River. Vehicles cross the river by taking a ferry at Neak Luong. Upon reaching the other side of the river we were met by a rush of vendors hawking everything from eggs to fried cricket and fried beetles (the aquatic diving type). They also eat crispy fried spiders in Cambodia but I didn't get to see these until we got to the art deco inspired Psar Thmei (New Market) in Phnom Penh.

In Prey Veng we only had one stop, the Bati Fisheries Research Center. Established in 1988 with assistance from PADEK a non-government organization. The Center was built for develop local capability in fish propagation and culture and to train farmers on any technology developed. Initially it concentrated on silver barb and common carp. In 1998 it succeeded in spawning and larval rearing of the Mekong catfish,

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*The freshwater fish hatchery (topmost) and pond nursery (middle) operated by Khiev Sam and his family (bottom)*



*Som Hekk's hatchery*



*Som Hekk with wife who assists him not only in fish breeding but also in fingerling trading and rice-fish farming*

# New JIRCAS expert joins AQD

AQD celebrated...from page 1



Dr. Ikunari Kiryu



Yukio Maeno

Dr. Ikunari Kiryu, a researcher from the Japan International Research Center for Agricultural Sciences (JIRCAS), is conducting a study at AQD from July 1 this year to March 2006.

Dr. Kiryu, a fish pathology expert, is working on the "Development of control methods for factors suppressing sustainable production of aquaculture species." He will be working with Dr. Leobert dela Peña and Dr. Erlinda Lacierda of Fish Health Section, TMS.

Before joining JIRCAS this year, Dr. Kiryu worked as a researcher at the National Research Institute of Aquaculture (NRIA) in Japan since 1999. He obtained his PhD in Fish Pathology at Tokyo University, Japan.

Welcome to AQD Dr. Kiryu and wife, Tamami Kiryu.

Prior to Kiryu's assignment at AQD, JIRCAS senior researcher Yukio Maeno has been conducting his study here since November 1, 2000. Maeno's term ends on July 25 this year.

Also with Dr. Lacierda and Dr. dela Peña, Maeno worked on "Systems for sustainable production of aquatic animals in brackishwater mangrove areas." He is a Fish Physiology and Pathology expert.

Maeno was senior researcher at NRIA before working at JIRCAS. He obtained his M.S. in Fisheries at Hokkaido University, Japan, where he also finished his B.S. Fisheries.

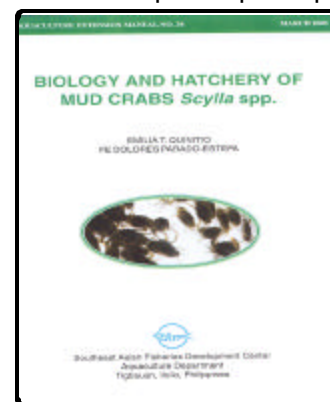
Farewell to Maeno!

Both JIRCAS researchers are conducting their studies here through SEAFDEC-JIRCAS collaboration.

FishWorld was launched. His exhibit's theme was "Fish, Fishing, and Fishfarming." The paintings are still on show at FishWorld.

Also in line with the anniversary celebration, AquaBiz was held at Iloilo City from July 7 to 8. Among the 250 participants was Mayor Tomas Osmeña of Cebu City. With AquaBiz' success and Osmeña's invitation, another AquaBiz seminar will be held at Cebu City on August 28 and 29.

The extension manual, "Biology and Hatchery of mud crab *Scylla* spp." was launched on July 8 during the AquaBiz. Dr. Rolando Platon and authors, Dr. Emilia Qunitio and Dr. Fe Estepa, distributed complementary copies to sectoral representatives chosen from the AquaBiz participants.



Mud crab manual

IRAP survey...from page 6

*Pangasius hypophthalmus*, and is now routinely doing it. The Center would now like to extend the technology to farmers but has not been able to get funding for the proposed training program.

## Crystal clear wishes

We got back to Phnom Penh early enough to have a debriefing with Ing. Happy to be through with the official functions we were excited to proceed to the Russian market. Then the rain poured in torrents just as the DOF office was

closing. But rain or shine it was the only chance to do any shopping at all. So we went after 5 pm only to find most of the stalls in the market closed or closing. Undaunted we managed to buy a few stuff fashioned from silver and local stones.

That evening we treated our constant guides and companions, Chin Da and Hav Viseth to a dinner at a place of their choice. They brought us across the Friendship Bridge to the other side of Ton Le Sap River where there is a row of large restaurants.

The next day we left Phnom

Penh but not before stopping by the Central Market for Sujin to find his Czech crystal ware from Eastern Europe. For lovers of crystal goblets and stemware, which rings clean and true instead of a dull clink when struck, Phnom Penh is the place for you. Half the price that you can get it for in Bangkok said Sujin.

We left Cambodia greatly inspired by the achievement of a former porter and a former taxi driver and hope that IRAP will be able to replicate their kind not only in Cambodia but also all over Southeast Asia.

## Land Bank of the Philippines collaborates with AQD & BFAR

The Land Bank of the Philippines collaborates with AQD and BFAR, dubbed "Partnership for the Promotion of JMANTTP Technologies," to increase fish production through technology promotion activities.

The partnership will promote economically viable, environment-friendly, and socially equitable aquaculture technologies generated under JMANTTP that are suitable for adoption by fisherfolk and fishfarmers.

Primary-beneficiaries of the Partnership are Land Bank-assisted cooperatives (BACs), newly-accessing cooperatives (NACs), potential newly-accessing cooperatives (PNACs), and

small and medium enterprises (SMEs).

Promotion within Panay Island is through Land Bank's Western Visayas Technology Promotion Center (WVTPC). The Bank's regular Technical Capability-Building Program will promote JMANTTP projects outside Panay.

A working committee (WC) is responsible for the overall management of the Partnership. WC is composed of the Chair – Head of Land Bank Development Assistant Department, and members - JMANTTP Program Director (AQD) and JMANTTP Co-Program Director (BFAR).

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## Seaweed as biofilter

Seaweed could be used as a biofilter in a recirculating water system.

Ma. Rovilla Luhan discussed the use of seaweed as biofilter during a seminar on June 26 at TMS. Luhan's presentation is titled "Growth and agar quality of *Gracilaria* grown in a filter tank."

Seaweed, *Gracilaria heteroclada*, was stocked at a density of 1 kg per m<sup>2</sup> in a filter tank of a recirculating water system. The study was conducted to determine the growth, agar quality and uptake pattern of Nitrogen, and to observe the water quality in a recirculating system.

Growth and agar quality of *Gracilaria* were determined. The Nitrogen levels in the seaweed and water were monitored every hour for the first 24 h, and every 24-h from day 2 to day 15.

*G. heteroclada* achieved a specific growth rate (SGR) of

about 10% per day in 15 days of culture. Weight increased four times without significant change in the gel strength. The seaweed absorbed 11% of Nitrogen from the water. These results showed that *Gracilaria* could be used as a biofilter in a recirculating water system.

*Man thrives,  
oddly enough,  
only in the  
presence of a  
challenging  
environment.*

Anon

**2<sup>nd</sup> quarter SAA  
now available**

The 2<sup>nd</sup> quarter issue of SAA is now off the press.

The issue features the toxicity of commonly used pesticide, Endosulfan. Also in this issue are launching of Integrated Regional Aquaculture Project (IRAP), and AQD's live food production.

Get your copy now. Enjoy reading!



## Round up

**Mila Castaños and Salvador Rex Tillo, Jr.** attended the SEAFDEC Information Staff Exchange Program Meeting in Bangkok, Thailand, July 16-18.

### **Resigned:**

**Amadeo Biter**, July 16  
*Farming Systems and Ecology  
Section, RD, TMS*

**Joval Martinez**, July 1  
*Nursery Section, RD, TMS*

**Shariff Marlo Wee**, June 15  
*DevCom, TID, TMS*

**Edgel May Bayag**, June 15  
*Nursery Section, RD, TMS*

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